

Evaluation of the Cost Impact of Florida’s specific changes to 2015 I-Codes “Prescriptive Code Changes”

RINKER-CR-2017-101

Final Report

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Submitted to

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EXECUTIVE SUMMARY

The study examined the Florida specific changes in the 2017 Florida Building Code in addition to the changes between the 2012 International Building Codes as incorporated in the 2014 Florida Building Code (effective June 30, 2015) and the 2015 International Building Codes (including: International Building Code (IBC); International Residential Code (IRC); International Energy Conservation Code; International Mechanical Code; International Plumbing Code; International Fuel Gas Code; International Code for Existing Buildings; and National Electrical Code).

The I-Codes 2015 changes that are prescriptive in nature and have the potential of changing the cost of construction were identified and used in the prototypes of two residential and five commercial/institutional building information models to determine the impact of these code changes on their construction costs. RS Means 2017 Cost data for the Orlando Region was used to price these prototype buildings. Model based quantities were used and verified along with some SF style estimates from RS means for certain systems that were not fully defined in the prototype BIM models. Based on these construction cost estimates, it was determined that the relative increase in cost due to the prescriptive 2015 ICC code changes ranged from approximately 3% for the Retail building to approximately 12% for the Mid-rise Apartment building with an average of 7.6% for the commercial/institutional buildings and an average of 9.9% for the residences.

Subsequently, prescriptive 2015 Florida specific code changes were included in the prototype buildings in order to determine the cost impact of these changes. Based on these construction cost estimates, it was determined that the relative increase in cost ranged from approximately 9% for the Retail building to approximately 18% for the Mid-rise Apartment building with an average of 11.5% for the commercial/institutional buildings and an average of 9.7% for the residences. The cost impact of the Florida specific code changes on the 2015 I-Codes averaged 5% for the commercial/institutional buildings and **-0.19%** for the residences. The largest cost impact for the 2015 Florida specific changes came from proposed code change E6460, the installation of Lightning Protection Systems (LPS). The anticipated cost of the LPS was estimated to add 1-5% to the buildings total cost. Cost data for the central Florida area (Orlando) were used but the resulting cost percentage differences should be roughly the same for other regions.

Future research should focus on the use of the developed models and estimates to evaluate future code changes. In addition, workshops should be conducted to introduce and encourage designers, builders and other code change petitioners to use the models to prospectively evaluate the cost impact of their proposed code changes. In addition, the modeling of other type of buildings should be explored to develop an even more diverse set of building models. Finally, since the 2018 I-Codes will be available by year's end, their cost impact should also be determined.

Overview

This research provides an assessment of the potential cost impacts of the Florida's specific changes to the 2015 I-Codes that are prescriptive in nature and that have the potential of adding cost to construction by identifying those code changes/provisions that are prescriptive in nature and have the potential of adding cost to construction and by estimating the costs of the rest of the code changes using good engineering judgment and feedback from general contractors and consulting. A standard set of baseline residential and commercial building designs previously modeled using building information modeling (BIM) were updated to reflect the prescriptive Florida specific changes and were used to produce cost estimates and extract the cost impact of the prescriptive Florida specific code changes. Figure 1 shows the general process used to conduct this research.

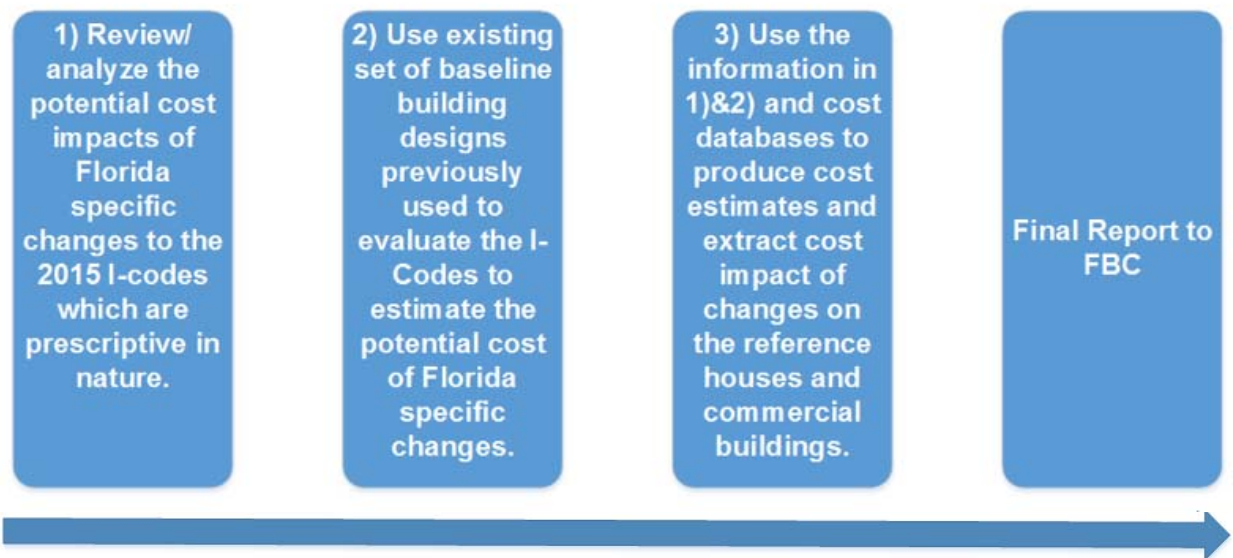


Figure 1. Research Plan

If any of the information gathered is seen as providing clear direction for one or more code recommendations, the recommendation(s) will also be written up and presented to the Commission. Effort will be made to provide a preliminary draft report by February 1, 2017.

Scope 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.

(2) Use the standard set of baseline residential and commercial building designs previously used to evaluate the I-Codes to estimate the potential cost of the prescriptive Florida's specific changes.

(3) Use the information in (1) and (2) and cost databases to produce cost estimates and extract cost impact of changes on the reference houses and commercial buildings.

Sources of cost data will include R.S. Means Cost Data; distributors' or big box retailers' websites, and building contractors.

Work Completed

All work has been completed on the project including contracting subcontractors, background research, soliciting and acquiring plans for 1-story and 2-story houses, middle school, small office building, small hotel and 20-story apartment building. The building information modeling (BIM) process has been completed for these plans for the 2012 and 2015 I-Codes. Figure 2 highlights the research tasks that have been completed or are in progress at the compilation of this draft final report.

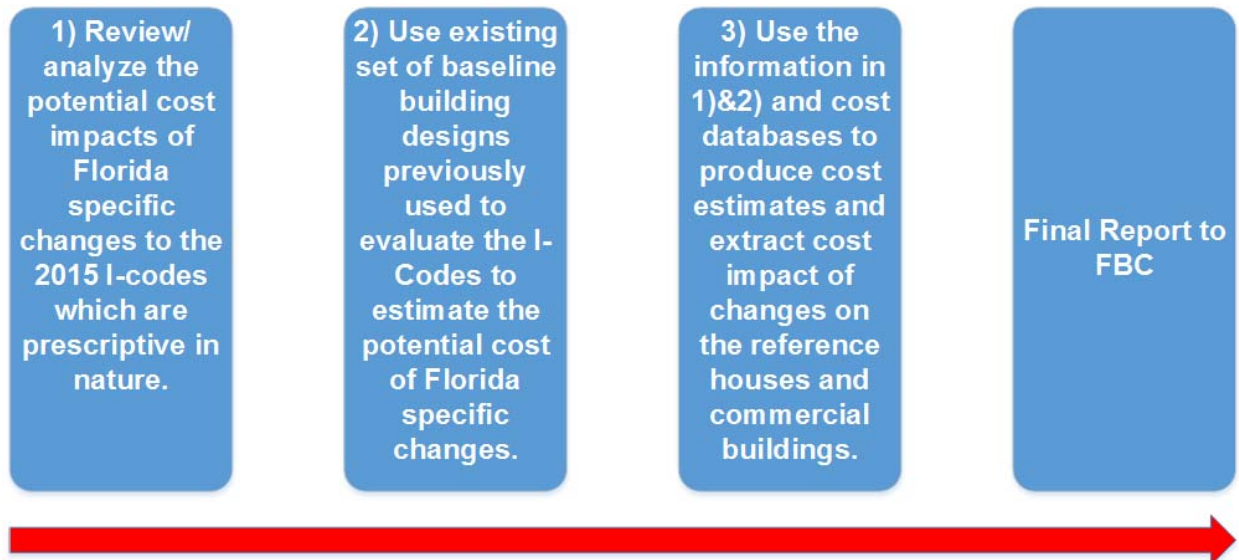


Figure 2. Research progress to date.

Building Information Models and Associated Cost Impacts

Each building type is discussed and the changes modeled are listed in the subsequent subsections based on Levels 1 and 2 of the ASTM Uniformat II Standard E1557 associated with each building type. The ASTM E1557 standard provides a common structure linking the building program, specifications, and estimates. A comparison of the cost impact of changing from the 2012 to 2015 I-Codes is shown in Table B1. Table B2 is a comparison of the cost impact of changing from the 2012 to 2015- I-Codes with the addition of the proposed Florida specific changes to the 2015 I-Codes. Table B3 shows the cost comparison between the 2015 I-Codes and Florida specific code changes.

The cost impact of the 2015 I-Code changes on the 2012 I-Codes ranged from approximately 3% for the Retail building to approximately 12% for the Mid-rise Apartment building with an average of 7.6% for the commercial/institutional buildings and an average of 9.9% for the residences. The cost impact of the Florida specific code changes and the 2015 I-Code changes on the 2012 I-Codes ranged from approximately 9% for the Retail building to approximately 18% for the Mid-rise Apartment building with an average of 11.5% for the commercial/institutional buildings and an average of 9.7% for the residences. The cost impact of the Florida specific code changes on the 2015 I-Codes averaged 5% for the commercial/institutional buildings and **-0.19%** for the residences.

Table B1. Summary I-Codes Changes Cost Impact Comparison

	Building Type	2012 I-Codes	2015 I-Codes	Change in Cost
1	Small Office	\$ 10,920,905	\$ 11,446,962	4.82%
2	Retail	\$ 23,396,814	\$ 24,025,125	2.69%
3	Elementary School	\$ 7,802,722	\$ 8,446,532	8.25%
4	Small Hotel	\$ 6,947,121	\$ 7,628,069	9.80%
5	Mid-Rise Apartment	\$ 36,076,878	\$ 40,518,001	12.31%
6	1-Story Residence	\$ 217,807	\$ 238,972	9.72%
7	2-Story Residence	\$ 316,621	\$ 348,566	10.09%
Average Change in Cost (Entire Sample):				8.24%

Table B2. Summary I-Codes Changes Cost Impact Comparison

	Building Type	2012 I-Codes	2015 I-Codes + FL Specific Changes	Change in Cost
1	Small Office	\$ 10,920,905	\$ 11,974,429	9.65%
2	Retail	\$ 23,396,814	\$ 25,489,407	8.94%
3	Elementary School	\$ 7,802,722	\$ 8,869,639	13.67%
4	Small Hotel	\$ 6,947,121	\$ 7,996,754	15.11%
5	Mid-Rise Apartment	\$ 36,076,878	\$ 42,408,259	17.55%
6	1-Story Residence	\$ 217,807	\$ 238,370	9.44%
7	2-Story Residence	\$ 316,621	\$ 348,118	9.95%
Average Change in Cost (Entire Sample):				12.04%

Table B3. Summary 2015 I-Codes Changes Cost Impact Comparison with Florida Specific Changes

	Building Type	2015 I-Codes	2015 I-Codes + FL Specific Changes	Cost Difference i	Change in Cost
1	<i>Small Office</i>	\$ 11,446,962	\$ 11,974,429	\$ 526,467	4.61%
2	<i>Retail</i>	\$ 24,025,125	\$ 25,489,407	\$ 1,464,282	6.09%
3	<i>Elementary School</i>	\$ 8,446,532	\$ 8,869,639	\$ 423,107	5.01%
4	<i>Small Hotel</i>	\$ 7,628,069	\$ 7,996,754	\$ 368,685	4.83%
5	<i>Mid-Rise Apartment</i>	\$ 40,518,001	\$ 42,408,259	\$ 1,890,258	4.67%
6	<i>1-Story Residence</i>	\$ 238,972	\$ 238,370	(\$602)	-0.98%
7	<i>2-Story Residence</i>	\$ 348,566	\$ 348,118	(\$448)	-0.13%
Average Change in Cost (Entire Sample):					3.44%

Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements
A. SUBSTRUCTURE	A10 Foundations	A1010 Standard Foundations A1020 Special Foundations A1030 Slab on Grade
	A20 Basement Construction	A2010 Basement Excavation A2020 Basement Walls
B. SHELL	B10 Superstructure	B1010 Floor Construction B1020 Roof Construction
	B20 Exterior Closure	B2010 Exterior Walls B2020 Exterior Windows Exterior Doors
	B30 Roofing	B3010 Roof Coverings B3020 Roof Openings
C. INTERIORS	C10 Interior Construction	C1010 Partitions C1020 Interior Doors C1030 Specialties
	C20 Staircases	C2010 Stair Construction C2020 Stair Finishes
	C30 Interior Finishes	C3010 Wall Finishes C3020 Floor Finishes C3030 Ceiling Finishes
D. SERVICES	D10 Conveying Systems	D1010 Elevators D1020 Escalators & Moving Walks D1030 Material Handling Systems
	D20 Plumbing	D2010 Plumbing Fixtures D2020 Domestic Water Distribution D2030 Sanitary Waste D2040 Rain Water Drainage D2050 Special Plumbing Systems
	D30 HVAC	D3010 Energy Supply D3020 Heat Generating Systems D3030 Cooling Generating Systems D3040 Distribution Systems D3050 Terminal & Package Units D3060 Controls & Instrumentation D3070 Special HVAC Systems & Equipment D3080 Systems Testing & Balancing
	D40 Fire Protection	D4010 Fire Protection Sprinkler Systems D4020 Stand-Pipe & Hose Systems D4030 Fire Protection Specialties D4040 Special Electrical Systems
	D50 Electrical	D5010 Electrical Service & Distribution D5020 Lighting & Branch Wiring D5030 Communication & Security Systems D5040 Special Electrical Systems
	E10 Equipment	E1010 Commercial Equipment E1020 Institutional Equipment E1030 Vehicular Equipment E1040 Other Equipment
E. EQUIPMENT & FURNISHINGS	E20 Furnishings	E2010 Fixed Furnishings E2020 Movable Furnishings
	F10 Special Construction	F1010 Special Structures F1020 Integrated Construction F1030 Special Construction Systems F1040 Special Facilities F1050 Special Controls & Instrumentation
F. SPECIAL CONSTRUCTION & DEMOLITION	F20 Selective Building Demolition	F2010 Building Elements Demolition F2020 Hazardous Components Abatement

Figure 3. ASTM UNIFORMAT II Classification of Building Elements (E 1557)

Small Office Building

The design for the permitted drawings for this 7-story office building were for the shell only, and the interior floor build outs were left for future tenants. In this regard, additional costs implications may be realized once the building is designed to completion by tenants. The proposed code changes were evaluated based solely on the approved shell and infrastructure drawings. A typical small office building model is shown in Figures A-1 thru A-3. As shown in Table A-1, the 2015 ICC changes and the additional FL specific code changes mostly impacted the Services level of the prepared cost estimate. Overall the proposed electrical system changes and LPS addition had the largest monetary impact on the total estimated building cost.

2015 ICC Code Changes - The HVAC, fire protection and electrical systems all showed an increase in cost due to at least 6 of the 2015 ICC code changes. The HVAC systems had an increase in cost due to 2015 IECC C403.2.4.5, C403.2.7 and IMC 603.10 changes. These changes added zone isolation devices (areas over 25,000 SF, e.g. each level of the office space), insulation on supply and return air duct plenums and duct supports at no greater than 12' spacing. The fire protection system is impacted by 2015 IBC-Non-Structural Fire Protection and Life Safety Section 903.3.8 changes due to the large floor areas. The electrical systems in the building required automatic switch controls and daylight response controls based on the 2015 IECC C405.2.2 and C405.1 changes. The daylight sensing controls were estimated at a frequency of 1 per 2500 SF assuming that the building would be divided or need more than 1 device per floor.

Florida Specific Code Changes - Three FL specific code changes drove the majority of the cost increase reported. The primary contributor to the cost increase was due to E6460 change, the installation of Lightning Protection Systems (LPS). The anticipated cost of the LPS was estimated to add 1-5% to the buildings total cost. Additional cost increases were reported due to code changes S6976-R1 and S6977-R1, which add provisions for the use of fiber and WWF in addition to control and contraction joints for concrete slabs-on-grade.

Table A-1. SMALL OFFICE BUILDING (138,715 SF) COSTS COMPARISON

<i>ASTM Uniformat II Levels</i>	<i>2012 I-Codes</i>	<i>2015 I-Codes</i>	<i>2015 I-Codes+ FL Specific Changes</i>
1 Substructure	\$ 310,352	\$ 310,352	\$ 321,690
A10 - Foundations	\$ 310,352	\$ 310,352	\$ 321,690
A20 - Basement Construction	\$ -	\$ -	\$ -
2 Shell	\$ 4,772,801	\$ 4,772,801	\$ 4,773,816
B10 - Superstructure	\$ 2,914,531	\$ 2,914,531	\$ 2,914,531
B20 - Exterior Enclosure	\$ 1,824,162	\$ 1,824,162	\$ 1,825,177
B30 - Roofing	\$ 34,108	\$ 34,108	\$ 34,108
3 Interiors	\$ 1,089,086	\$ 1,089,086	\$ 1,089,086
C10 - Interior Construction	\$ 308,211	\$ 308,211	\$ 308,211
C20 - Stairs	\$ 199,908	\$ 199,908	\$ 199,908
C30 - Interior Finishes	\$ 580,966	\$ 580,966	\$ 580,966
4 Services	\$ 4,748,667	\$ 5,274,724	\$ 5,789,838
D10 - Conveying	\$ 728,036	\$ 728,036	\$ 728,036
D20 - Plumbing	\$ 302,556	\$ 302,556	\$ 302,556
D30 - HVAC	\$ 65,318	\$ 170,743	\$ 170,743
D40 - Fire Protection	\$ 1,868,315	\$ 1,873,315	\$ 1,873,315
D50 - Electrical	\$ 1,784,443	\$ 2,200,075	\$ 2,715,188
5 Equipment & Furnishings	\$ -	\$ -	\$ -
6 Special Construction	\$ -	\$ -	\$ -
7 Building Sitework	\$ -	\$ -	\$ -
Total Cost:	\$ 10,920,905	\$ 11,446,962	\$ 11,974,429

Small Office:

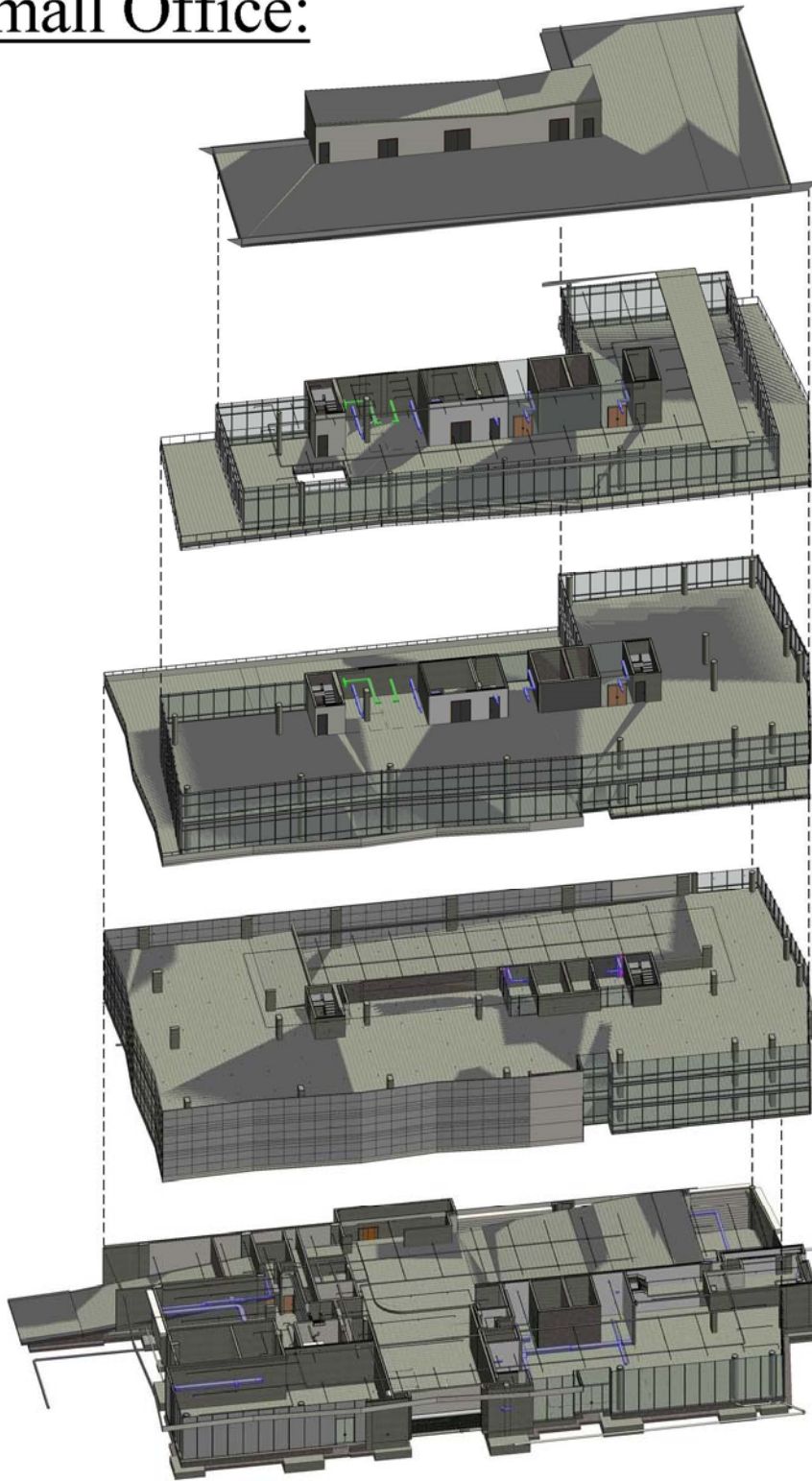


Figure A-1. 3D sections of Small Office Building

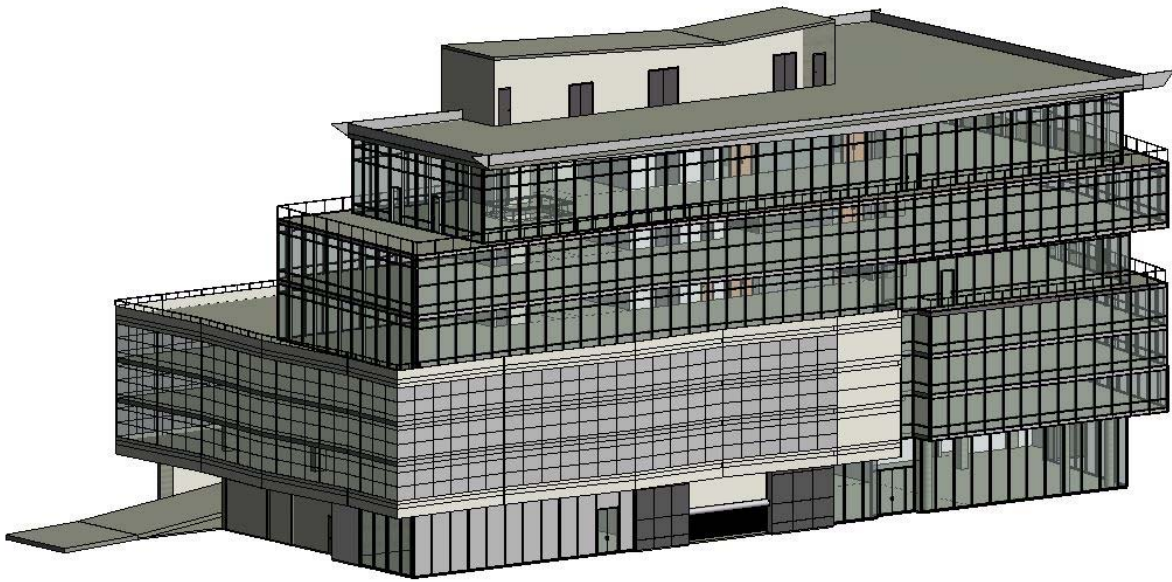


Figure A-2. 3D Model of Small Office Building

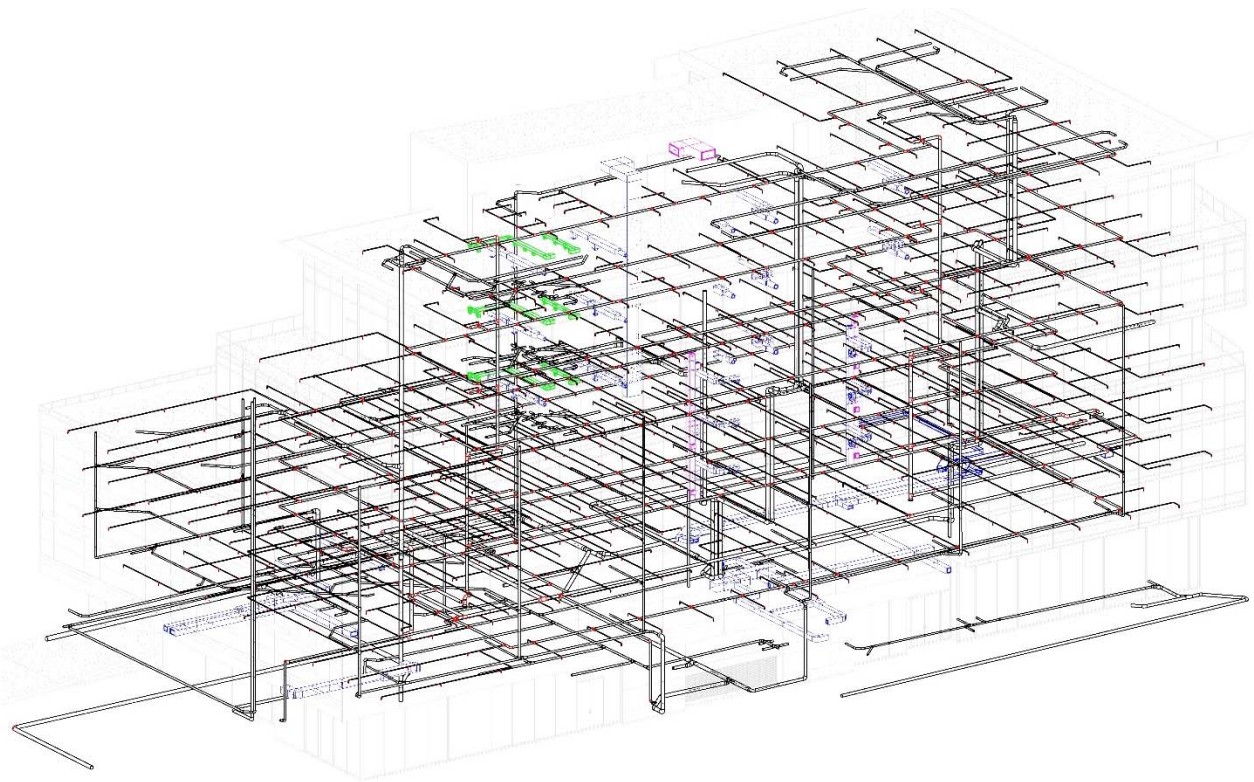


Figure A-3. 3D Model of MEP systems for Small Office Building

Retail Space

Typical retail spaces are shown in Figures B-1 thru B-3. The retail spaces modeled and utilized to develop this estimate have a parking structure on the lower level with large open areas above, from which the retail spaces can be accessed. It is an “open-air” style retail plaza and the retail spaces themselves are to be built out by the tenants. Due to this, major utility connections were made available in the approved drawings but there were limited MEP finishes as it was assumed that the tenants would complete this work and get it approved separately. The proposed code changes were applied to the drawing set for the main retail space and the tenant built-outs were not evaluated. The 2015 ICC and 2015 FL specific changes mostly impacted the retail building at the Services level of the prepared cost estimate. Overall the light switch and daylight control changes accounted for the largest impact on cost of the 2015 ICC code changes and the LPS addition was the largest cost increase factor for the 2015 FL specific code changes.

2015 ICC Code Changes - The plumbing, HVAC, fire protection and electrical sub levels of the estimate all saw impacts from the proposed 2015 ICC code changes. In the proposed 2015 ICC code changes the plumbing system saw a minor decrease in cost due to 2015 IPC 1002.1 changes, eliminating the need for traps in the parking garage floor drains. The HVAC systems saw an increase in cost due to the 2015 IECC C403.2.7 and IMC 603.10 changes. These changes would add insulation to the supply and return air duct plenums and duct supports at no greater than 12’ spacing. The fire protection system would be impacted by the 2015 IBC-Non-Structural Fire Protection and Life Safety Section 903.3.8 change due to the large floor areas. The electrical systems in the spaces will require automatic switch controls and daylight response controls based on the 2015 IECC C405.2.2 and C405.1 changes. The daylight sensing controls were estimated at a frequency of 1 per 2500 SF assuming an average size for the retail locations.

Florida Specific Code Changes - The FL specific code changes primarily impacted the electrical level. The primary contributor to the cost increase was due to proposed change E6460, the installation of Lightning Protection Systems (LPS). The anticipated cost of the LPS was estimated to add 1-5% to the buildings total cost. Outside of the Services level of the cost estimate, additional cost increases were reported due to code changes S6976-R1 and S6977-R1, which add provisions for the use of fiber and WWF in addition to control and contraction joints for concrete slabs-on-grade. Additionally, proposed changes S6826 and S6840, which require ladder type joint reinforcing and corrosion protection on horizontal reinforcing respectively, led to an increase in the cost reported for the Shell level of the cost estimate.

Table B-1. RETAIL SPACE (409,933SF) COSTS COMPARISON

<i>ASTM Uniformat II Levels</i>	<i>2012 I-Codes</i>	<i>2015 I-Codes</i>	<i>2015 I-Codes+ FL Specific Changes</i>
1 Substructure	\$ 2,255,246	\$ 2,255,246	\$ 2,558,734
A10 - Foundations	\$ 2,255,246	\$ 2,255,246	\$ 2,558,734
A20 - Basement Construction	\$ -	\$ -	\$ -
2 Shell	\$ 10,897,059	\$ 10,897,059	\$ 10,977,723
B10 - Superstructure	\$ 9,041,350	\$ 9,041,350	\$ 9,041,350
B20 - Exterior Enclosure	\$ 1,770,425	\$ 1,770,425	\$ 1,851,089
B30 - Roofing	\$ 85,283	\$ 85,283	\$ 85,283
3 Interiors	\$ 1,424,925	\$ 1,424,925	\$ 1,424,925
C10 - Interior Construction	\$ 411,821	\$ 411,821	\$ 411,821
C20 - Stairs	\$ 443,168	\$ 443,168	\$ 443,168
C30 - Interior Finishes	\$ 569,936	\$ 569,936	\$ 569,936
4 Services	\$ 8,819,585	\$ 9,447,896	\$ 10,528,027
D10 - Conveying	\$ 853,948	\$ 853,948	\$ 853,948
D20 - Plumbing	\$ 974,524	\$ 982,908	\$ 982,908
D30 - HVAC	\$ 698,993	\$ 951,202	\$ 950,202
D40 - Fire Protection	\$ 5,987,616	\$ 5,992,616	\$ 5,992,616
D50 - Electrical	\$ 304,504	\$ 667,222	\$ 1,748,353
5 Equipment & Furnishings	\$ -	\$ -	\$ -
6 Special Construction	\$ -	\$ -	\$ -
7 Building Sitework	\$ -	\$ -	\$ -
Total Cost:	\$ 23,396,814	\$ 24,025,125	\$ 25,489,407

Retail:

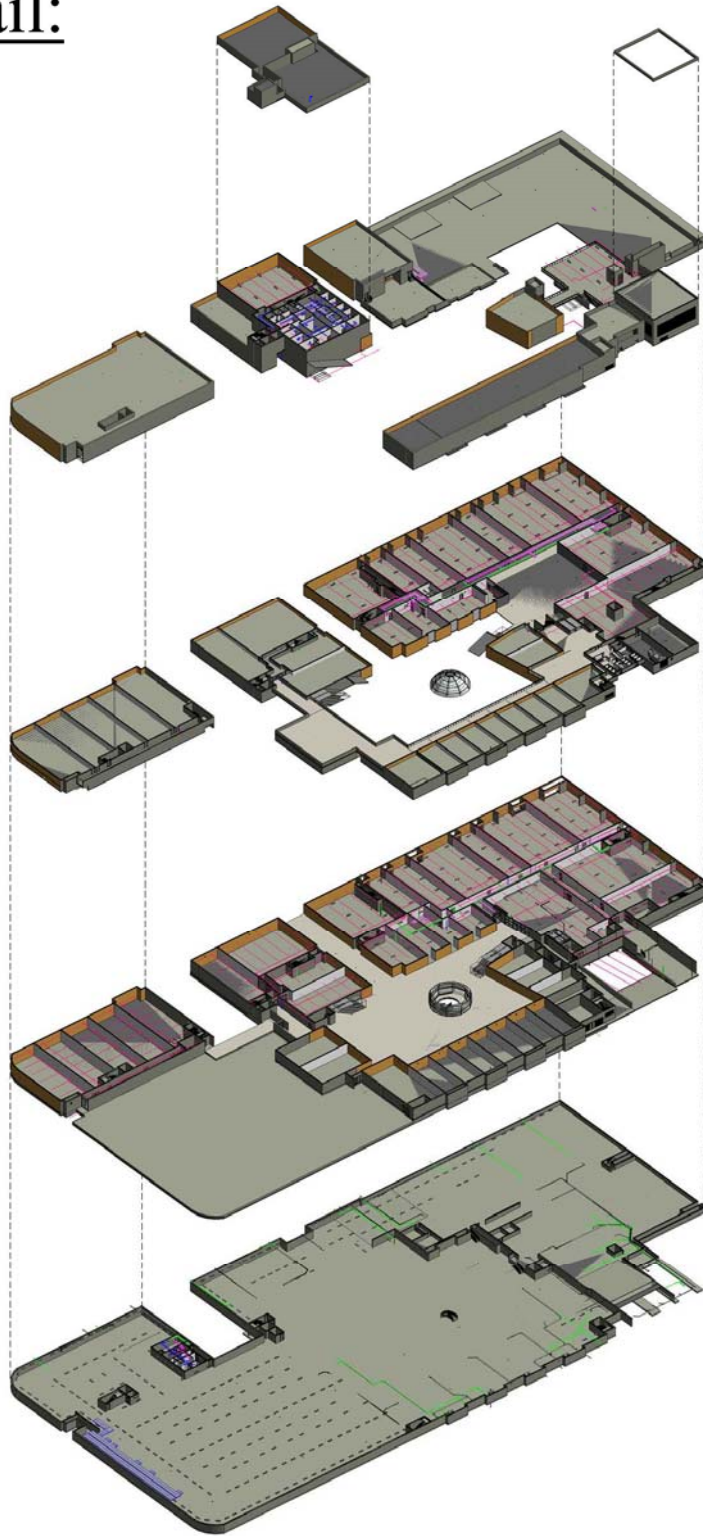


Figure B-1. 3D sections of Retail Space

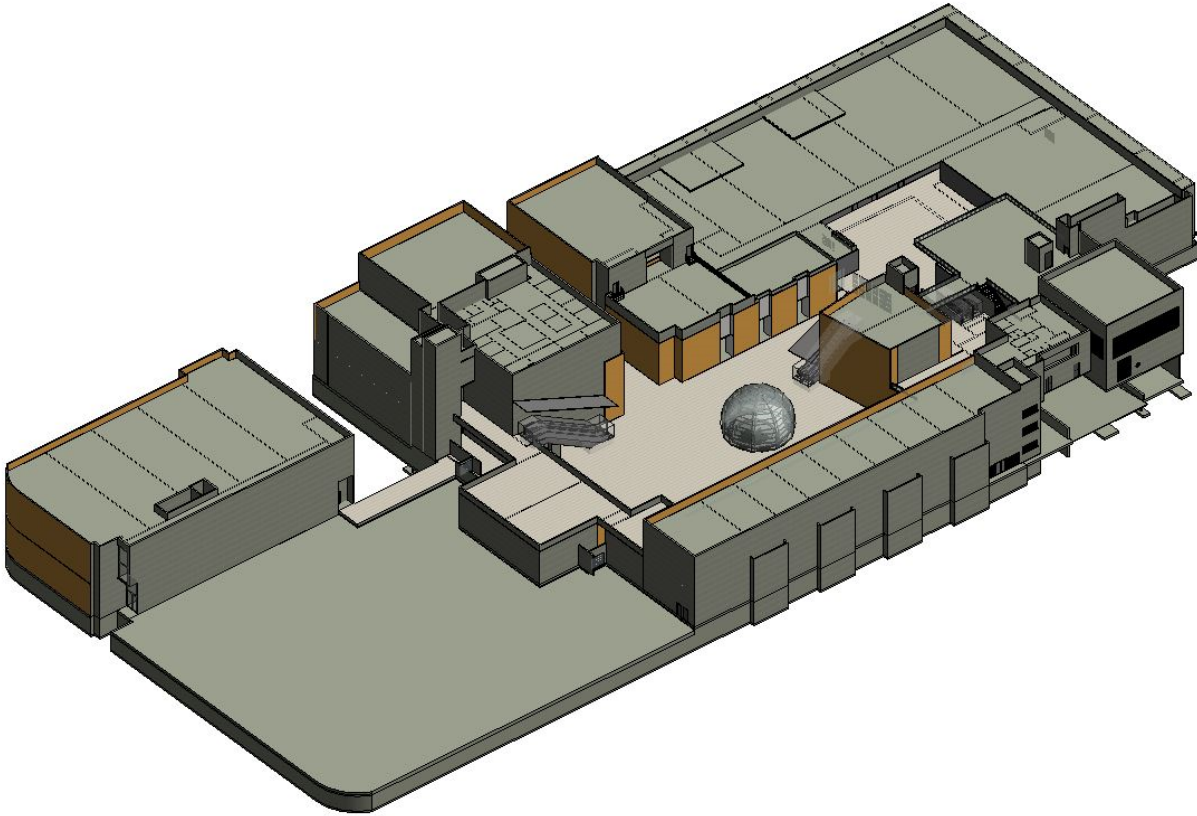


Figure B-2. 3D model of Retail Spaces

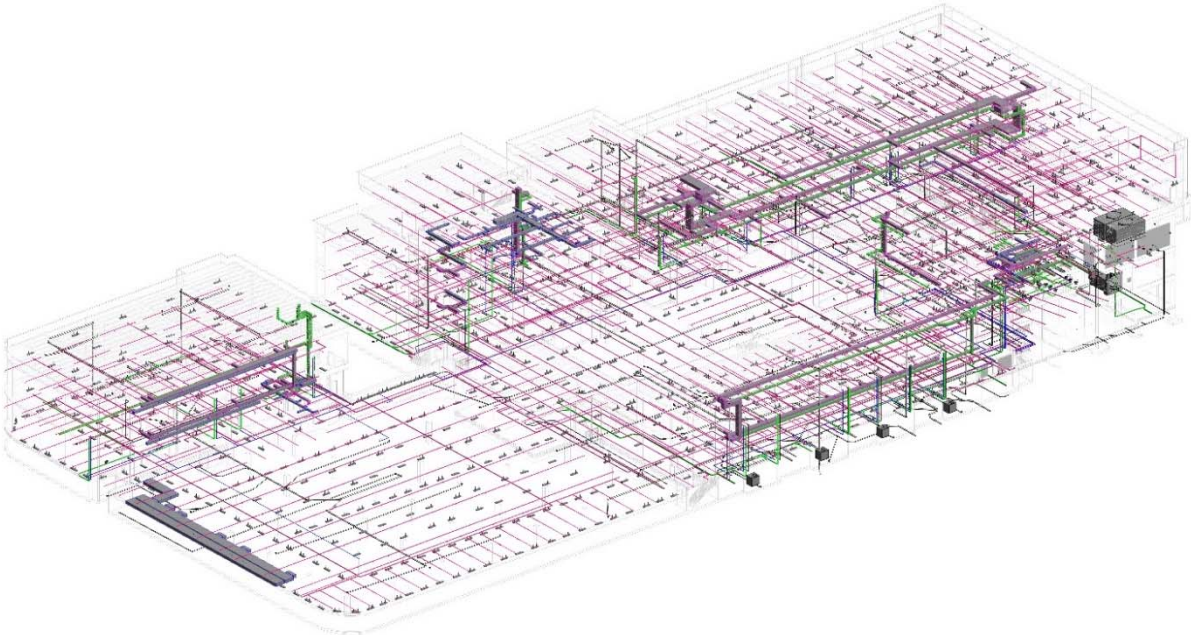


Figure B-3. 3D Model of MEP systems for Retail Spaces

Elementary School

As shown in Figures C-1 thru C-3, the elementary school building has two levels in the classroom areas and one level near the cafeteria and auditorium spaces. The building is a public school building with largely standard materials and was designed with performance and longevity in mind. The 2015 ICC and 2015 FL specific code changes mostly impacted the elementary school building at the Services level of the prepared cost estimate, with a smaller impact seen in the Substructure level. The HVAC and LPS related code changes accounted for the largest increase in cost for this building type for both the 2015 ICC and 2015 FL specific code changes.

2015 ICC Code Changes - The HVAC had an increase in cost due to the 2015 IECC C403.4.2.1, C404.2, C403.2.7 and IMC 603.10 changes. These changes would add static pressure sensors for VAV's, increased water heater performance, insulation on supply and return air duct plenums and duct supports at no greater than 12 FT spacing. The fire protection system would be impacted by the 2015 change IBC-Non-Structural Fire Protection and Life Safety Section 903.3.8 changes due to the large cafeteria and circulation spaces. The electrical systems in the building will require automatic switch controls and daylight response controls based on the 2015 IECC C405.2.2 and C405.1 changes. The daylight sensing controls were estimated at a frequency of 1 per 2500 SF assuming an average area. The proposed 2015 IBC-Non-Structural Fire Protection and Life Safety Section 423.4 change related to the need for a storm shelter in Group E buildings where 250 MPH tornado winds are possible is not necessary because Florida is classified below those maxima.

Florida Specific Code Changes - The primary contributor to the cost increase for the 2015 FL specific code changes was due to proposed change E6460, the installation of Lightning Protection Systems (LPS). The anticipated cost of the LPS was estimated to add 1-5% to the buildings total cost. Outside of the Services level of the cost estimate, additional cost increases were reported due to code changes S6976-R1 and S6977-R1, which add provisions for the use of fiber and WWF in addition to control and contraction joints for concrete slabs-on-grade.

Table C-1. ELEMENTARY SCHOOL (90,726 SF) COSTS COMPARISON

<i>ASTM Uniformat II Levels</i>	<i>2012 I-Codes</i>	<i>2015 I-Codes</i>	<i>2015 I-Codes+ FL Specific Changes</i>
1 Substructure	\$ 700,228	\$ 700,228	\$ 743,241
A10 - Foundations	\$ 700,228	\$ 700,228	\$ 743,241
A20 - Basement Construction	\$ -	\$ -	\$ -
2 Shell	\$ 3,737,916	\$ 3,737,916	\$ 3,737,916
B10 - Superstructure	\$ 1,636,810	\$ 1,636,810	\$ 1,636,810
B20 - Exterior Enclosure	\$ 1,260,650	\$ 1,260,650	\$ 1,260,650
B30 - Roofing	\$ 840,456	\$ 840,456	\$ 840,456
3 Interiors	\$ 1,276,392	\$ 1,276,392	\$ 1,276,392
C10 - Interior Construction	\$ 584,401	\$ 584,401	\$ 584,401
C20 - Stairs	\$ 79,310	\$ 79,310	\$ 79,310
C30 - Interior Finishes	\$ 612,681	\$ 612,681	\$ 612,681
4 Services	\$ 2,088,186	\$ 2,731,996	\$ 2,970,565
D10 - Conveying	\$ 64,985	\$ 64,985	\$ 64,985
D20 - Plumbing	\$ 634,069	\$ 634,069	\$ 634,069
D30 - HVAC	\$ 317,914	\$ 719,128	\$ 719,128
D40 - Fire Protection	\$ 607,906	\$ 612,906	\$ 612,906
D50 - Electrical	\$ 463,313	\$ 700,909	\$ 1,081,003
5 Equipment & Furnishings	\$ -	\$ -	\$ -
6 Special Construction	\$ -	\$ -	\$ -
7 Building Sitework	\$ -	\$ -	\$ -
Total Cost:	\$ 7,802,722	\$ 8,446,532	\$ 8,869,639

Elementary School:



Figure C-1. 3D sections of Elementary School



Figure C-2. 3D model of Elementary School

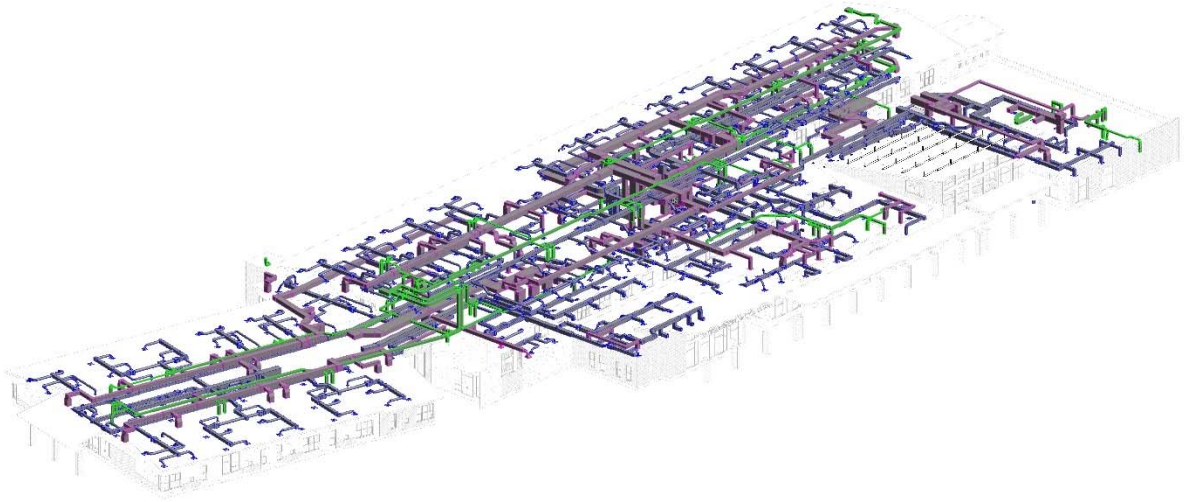


Figure C-3. 3D model of MEP systems for Elementary School

Small Hotel

As shown in Figures D-1 thru D-3, the hotel modeled for this estimate is a three level building with 128 hotel rooms, a full service kitchen and lobby area with standard hotel amenities. Each room has its own dedicated package HVAC unit and exhaust system. Both the exterior enclosure and interior partitions are primarily CMU structure walls with stucco or gypsum finish respectively. The changes related to the building services accounted for the largest portion of the cost increase for both the 2015 ICC and 2015 FL specific code changes in the small hotel building.

2015 ICC Code Changes - The HVAC, fire protection and electrical systems in the building had increases in cost due to the proposed 2015 ICC changes. The HVAC systems increased in cost due to proposed 2015 IMC 507.2, IECC C403.2.7 and IMC 603.10 changes. These changes would add a Type I exhaust hood over cooking equipment in the kitchen, insulation on supply and return air duct plenums and duct supports at no greater than 12 FT spacing. The fire protection system would be impacted by the 2015 IBC-Non-Structural Fire Protection and Life Safety Section 903.3.8 change due to the large lobby and circulation spaces. The electrical systems in this small hotel increased due to the 2015 IECC C405.2.2 and C405.2.3 changes. These changes call for the addition of manual lighting controls for the hotel and master switches for each hotel room.

Florida Specific Code Changes - The primary contributor to the cost increase found in the 2015 FL specific code changes was due to proposed change E6460, the installation of Lightning Protection Systems (LPS). The anticipated cost of the LPS was estimated to add 1-5% to the buildings total cost. Outside of the Services level of the cost estimate, additional cost increases were reported due to code changes S6976-R1 and S6977-R1, which add provisions for the use of fiber and WWF in addition to control and contraction joints for concrete slabs-on-grade. Additionally, proposed changes S6826 and S6840, which require ladder type joint reinforcing and corrosion protection on horizontal reinforcing respectively, led to an increase in the cost reported for the Shell and Interiors level of the cost estimate, due to the use of CMU throughout the building.

Table D-1. SMALL HOTEL (72,024 SF) COSTS COMPARISON

<i>ASTM Uniformat II Levels</i>	<i>2012 I-Codes</i>	<i>2015 I-Codes</i>	<i>2015 I-Codes+ FL Specific Changes</i>
1 Substructure	\$ 260,286	\$ 260,286	\$ 278,388
A10 - Foundations	\$ 260,286	\$ 260,286	\$ 278,388
A20 - Basement Construction	\$ -	\$ -	\$ -
2 Shell	\$ 1,980,038	\$ 1,980,038	\$ 1,987,358
B10 - Superstructure	\$ 1,098,060	\$ 1,098,060	\$ 1,098,060
B20 - Exterior Enclosure	\$ 808,987	\$ 808,987	\$ 816,307
B30 - Roofing	\$ 72,991	\$ 72,991	\$ 72,991
3 Interiors	\$ 1,416,588	\$ 1,416,588	\$ 1,416,588
C10 - Interior Construction	\$ 802,456	\$ 802,456	\$ 802,456
C20 - Stairs	\$ 64,134	\$ 64,134	\$ 64,134
C30 - Interior Finishes	\$ 549,998	\$ 549,998	\$ 549,998
4 Services	\$ 3,290,208	\$ 3,971,156	\$ 4,314,419
D10 - Conveying	\$ 165,710	\$ 165,710	\$ 165,710
D20 - Plumbing	\$ 553,339	\$ 553,339	\$ 553,339
D30 - HVAC	\$ 979,430	\$ 1,162,767	\$ 1,162,767
D40 - Fire Protection	\$ 865,972	\$ 870,972	\$ 870,972
D50 - Electrical	\$ 725,758	\$ 1,218,368	\$ 1,561,631
5 Equipment & Furnishings	\$ -	\$ -	\$ -
6 Special Construction	\$ -	\$ -	\$ -
7 Building Sitework	\$ -	\$ -	\$ -
Total Cost:	\$ 6,947,121	\$ 7,628,069	\$ 7,996,754

Small Hotel:

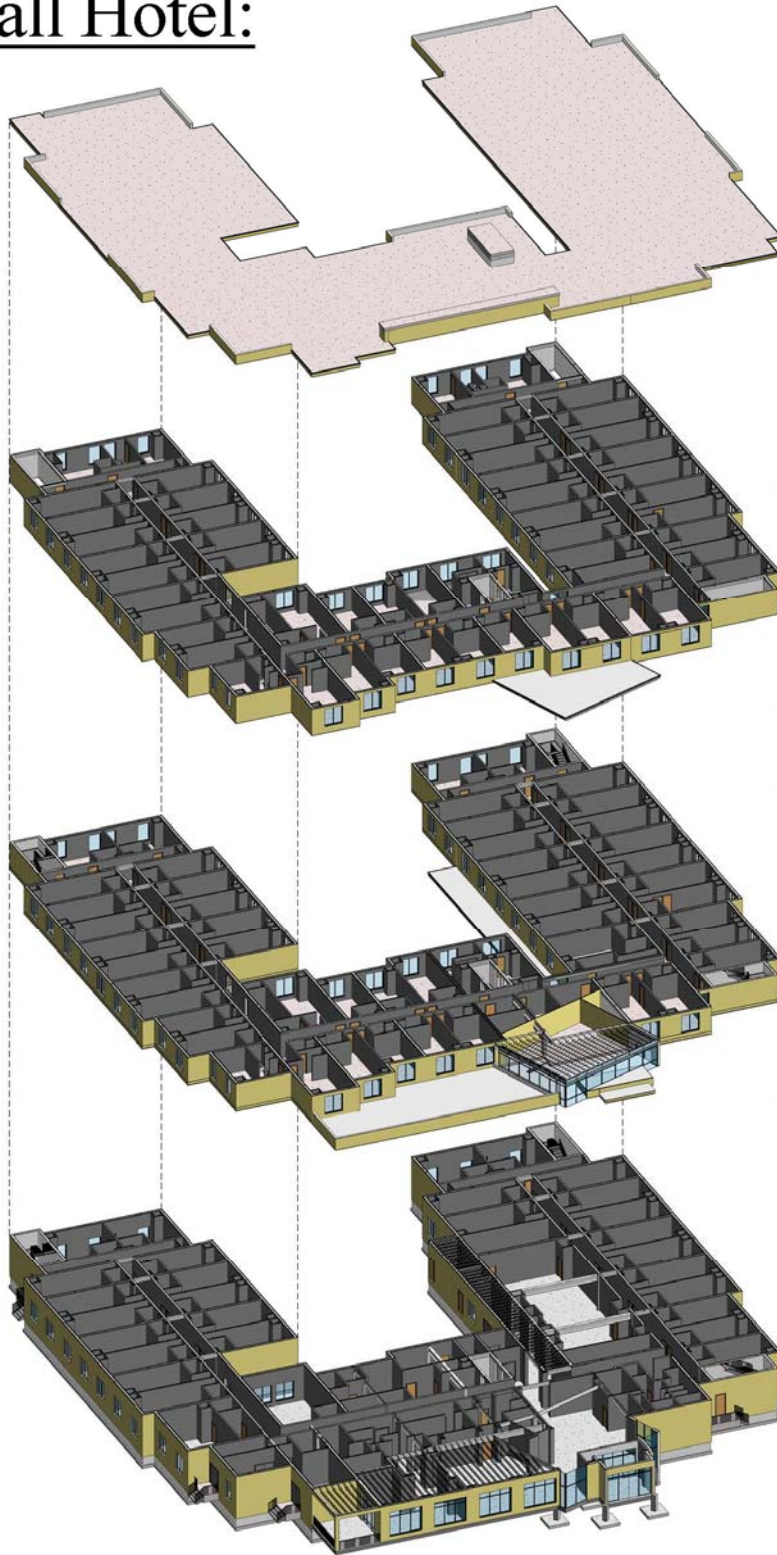


Figure D-1. 3D sections of Small Hotel



Figure D-2. 3D model of Small Hotel

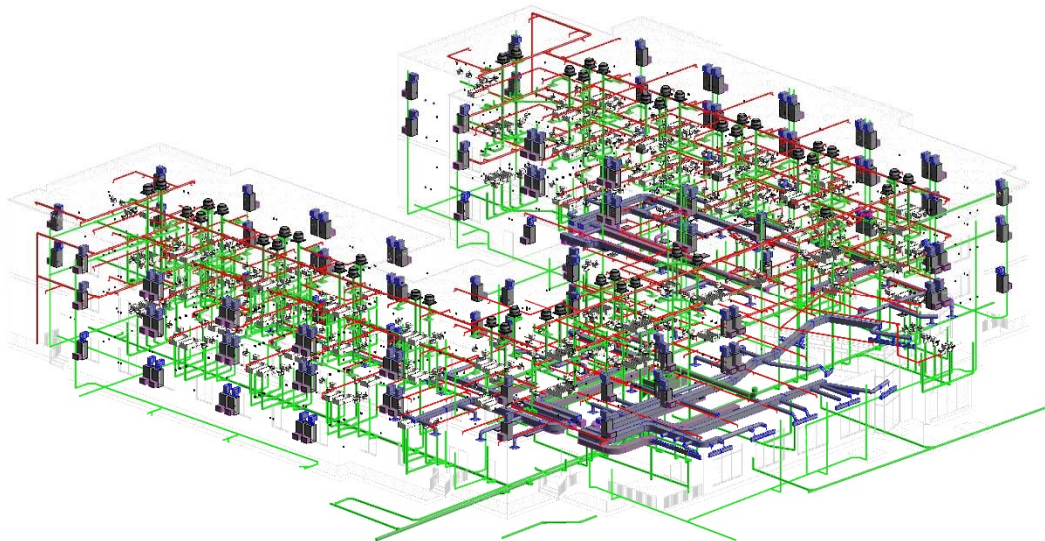


Figure D-2. 3D model of MEP systems for Small Hotel

Mid-Rise Apartment Building

As shown in Figures E-1 thru E-3, the midrise apartment building has a 20 level residential tower and an attached 7 level parking structure. It is a concrete structure building with a largely curtain wall façade system. The residential tower reaches an overall height of 209' with the highest occupied level at 197' 10". The proposed code changes impacted the midrise apartment building at the Services level of the prepared estimate. Overall cost changes related to the 2015 ICC and 2015 FL specific code changes are evenly distributed between MEP systems and LPS system additions.

2015 ICC Code Changes - The plumbing system had a minor decrease in cost due the 2015 IPC 1002.1 change, eliminating the need for traps in the parking garage floor drains. There was a cost increase in plumbing due to the 2015 IECC C404.2 change related to increased water heater performance. The HVAC systems saw an increase in cost due to the 2015 IECC C403.2.7 and IMC 603.10 changes. These changes would add insulation to supply and return air duct plenums and duct supports at no greater than 12 FT spacing. The fire protection system is impacted by the 2015 IBC-Non-Structural Fire Protection and Life Safety Section 903.3.8 change due to the large common and circulation spaces. The electrical systems in the building requires automatic switch controls and daylight response controls based on the 2015 IECC C405.2.2 and C405.1 changes. The daylight sensing controls were estimated at a frequency of 1 per 2500 SF assuming an average area.

With its highest occupied level at 197' 10" this building is the only one out of the seven representative samples that meets the requirements for proposed code change IBC-Non-Structural Fire Protection and Life Safety Section 403.6.1 for a second fire service access elevator. This cost was added to Services level of the estimate as a lump sum of \$50,000 for fire rating upgrades to the existing elevator lobbies based on the report of the consultants.

Florida Specific Code Changes - The primary contributor to the cost increase found in the 2015 FL specific code changes was due to proposed change E6460, the installation of Lightning Protection Systems (LPS). The anticipated cost of the LPS was estimated to add 1-5% to the buildings total cost. Outside of the Services level of the cost estimate, additional cost increases were reported in the Foundations level due to code changes S6976-R1 and S6977-R1, which add provisions for the use of fiber and WWF in addition to control and contraction joints for concrete slabs-on-grade.

Table E-1. MID-RISE APARTMENT BUILDING (589,555 SF) COSTS COMPARISON

<i>ASTM Uniformat II Levels</i>	<i>2012 I-Codes</i>	<i>2015 I-Codes</i>	<i>2015 I-Codes+ FL Specific Changes</i>
1 Substructure	\$ 1,498,735	\$ 1,498,735	\$ 1,545,295
A10 - Foundations	\$ 1,498,735	\$ 1,498,735	\$ 1,545,295
A20 - Basement Construction	\$ -	\$ -	\$ -
2 Shell	\$ 12,849,079	\$ 12,849,079	\$ 12,870,467
B10 - Superstructure	\$ 10,084,546	\$ 10,084,546	\$ 10,105,934
B20 - Exterior Enclosure	\$ 2,693,593	\$ 2,693,593	\$ 2,693,593
B30 - Roofing	\$ 70,940	\$ 70,940	\$ 70,940
3 Interiors	\$ 8,145,259	\$ 7,354,169	\$ 7,354,169
C10 - Interior Construction	\$ 2,300,013	\$ 2,300,013	\$ 2,300,013
C20 - Stairs	\$ 64,001	\$ 64,001	\$ 64,001
C30 - Interior Finishes	\$ 4,990,156	\$ 4,990,156	\$ 4,990,156
4 Services	\$ 14,374,895	\$ 18,816,017	\$ 20,638,327
D10 - Conveying	\$ 1,456,072	\$ 1,456,072	\$ 1,456,072
D20 - Plumbing	\$ 5,983,803	\$ 7,440,747	\$ 7,440,747
D30 - HVAC	\$ 2,332,483	\$ 3,642,044	\$ 3,641,044
D40 - Fire Protection	\$ 181,170	\$ 236,170	\$ 236,170
D50 - Electrical	\$ 4,421,366	\$ 6,040,985	\$ 7,864,295
5 Equipment & Furnishings	\$ -	\$ -	\$ -
6 Special Construction	\$ -	\$ -	\$ -
7 Building Sitework	\$ -	\$ -	\$ -
Total Cost:	\$ 36,867,967	\$ 40,293,514	\$ 41,980,629

Mid-Rise Apartment:

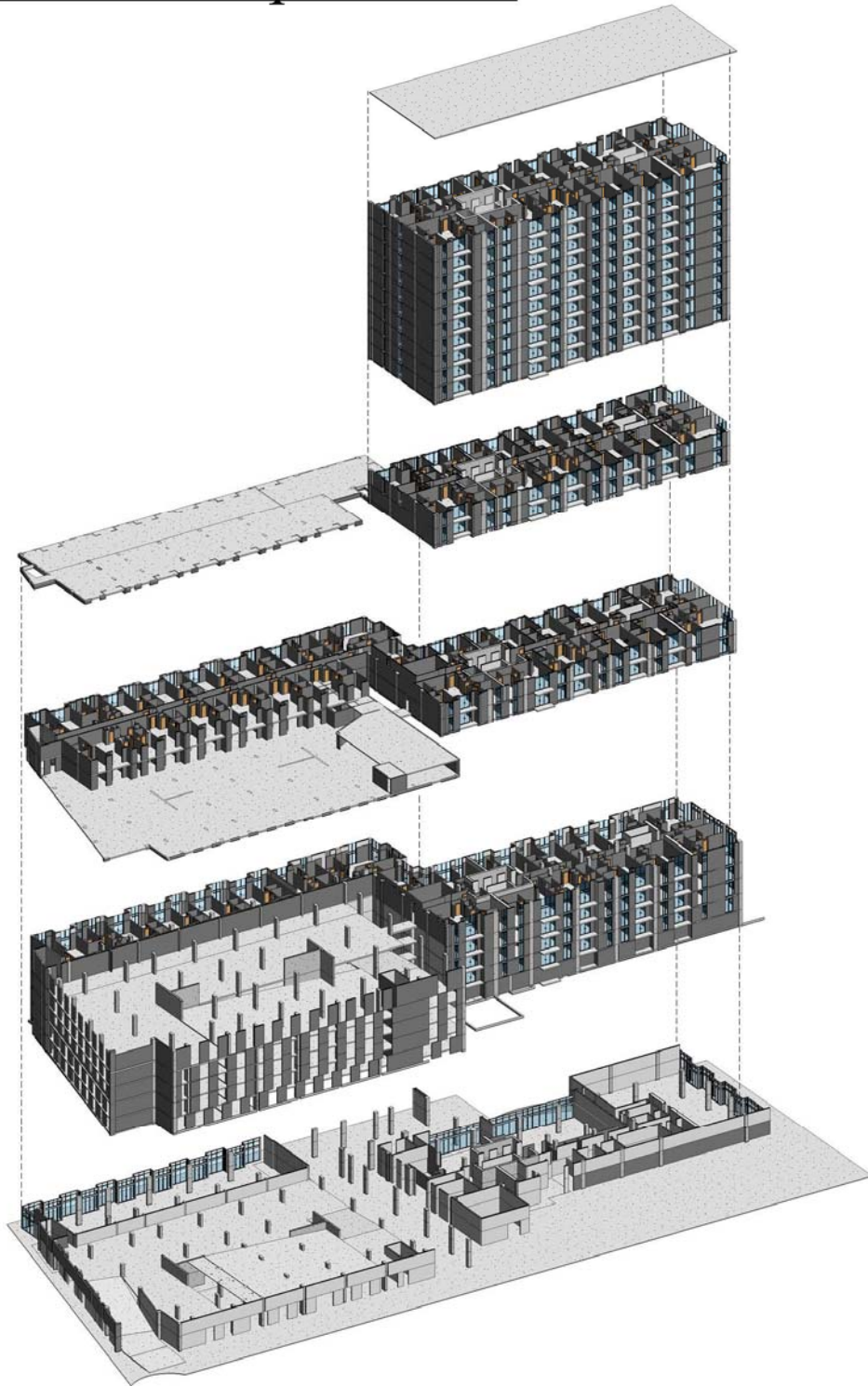


Figure E-1. 3D sections of Mid-Rise Apartment Building

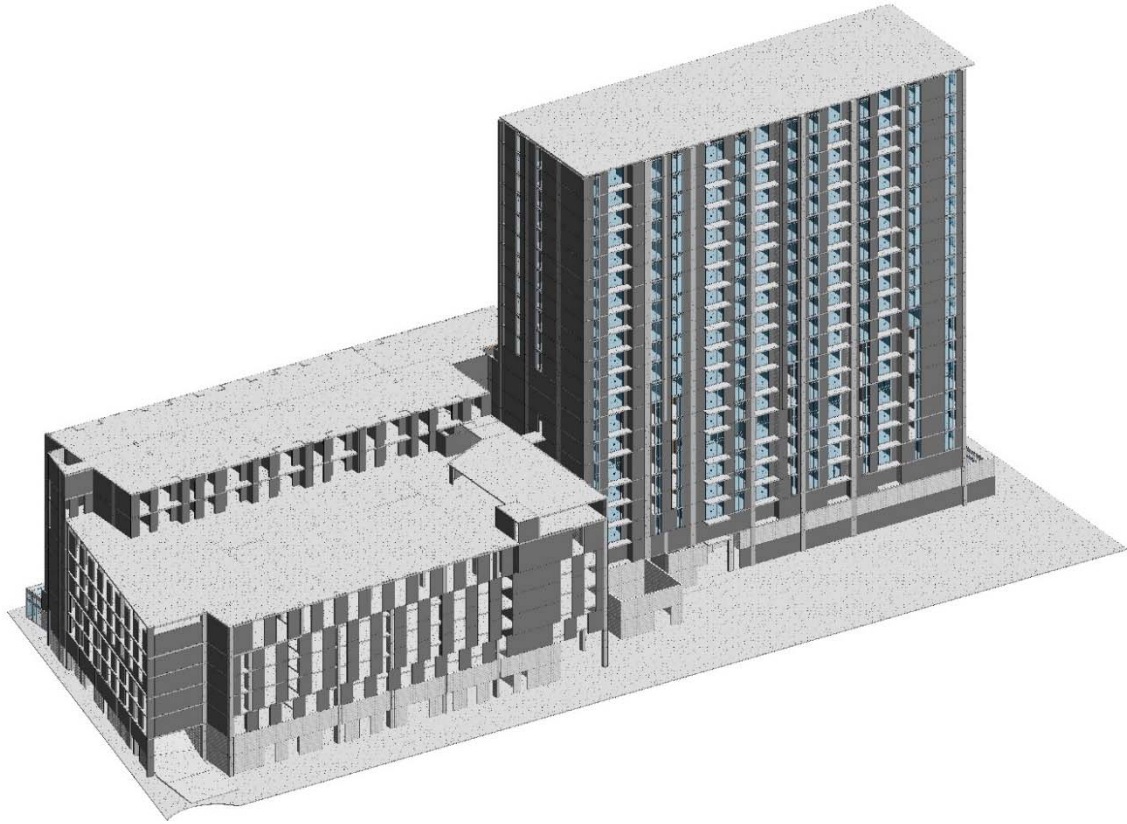


Figure E-2. 3D model of Mid-Rise Apartment Building

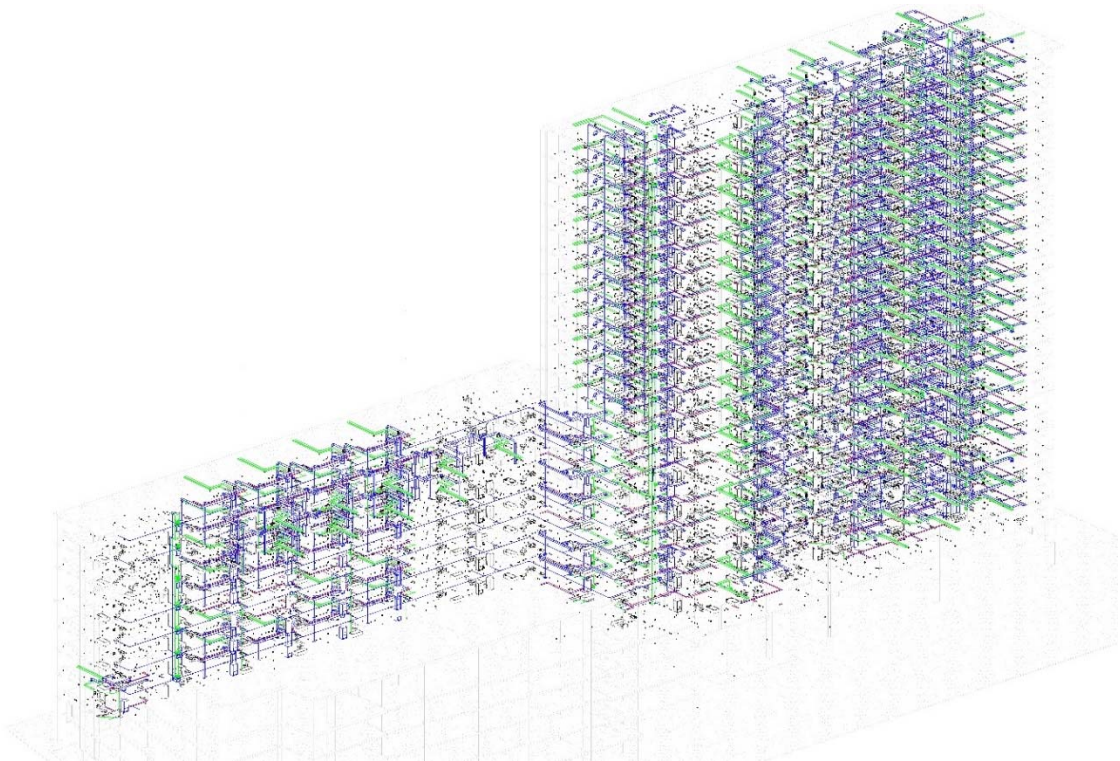


Figure E-2. 3D model of MEP systems for Mid-Rise Apartment Building

1-Story Residence

As shown in Figures F-1 thru F-3, the residence has three bedrooms and an open concept kitchen and family room. There is an attached 385 SF two car garage and a concrete outdoor area connected the family room and kitchen. The hip roof is constructed of pre-engineered roof trusses with a standard shingle roof covering. The proposed code changes impacted the 1 story residence at the mechanical and electrical levels of the prepared estimate. Approved plans based on the 2012 Florida building code were used to develop the model for estimation and code adjustments to meet the 2015 ICC and 2015 FL specific proposed code changes.

The mechanical level was impacted by the 2015 IECC C404.2, and R403.1.1 changes. These changes increase duct supports to no greater than 12' apart, increase water heater performance and add a programmable thermostat. The electrical level was impacted by proposed NEC 210.52G.1 code change. This change added one GFCI receptacle per car in the garage. The drawings used to develop this model already had GFCI outlets in the laundry room and within 6 feet of water as indicated in the proposed building code changes per proposed code change NEC 210.8.A. Outside of the Services level of the cost estimate, additional minor cost increases were reported due to code changes S6976-R1 and S6977-R1, which add provisions for the use of fiber and WWF in addition to control and contraction joints for concrete slabs-on-grade. Overall the 2015 FL specific code changes showed a very small percentage increase with the major increase coming in the HVAC category of the 2015 ICC code changes.

Table F-1. 1-STORY RESIDENCE (2242 SF LIVING; 385 SF GARAGE) COSTS COMPARISON

	<i>2012 I-Codes</i>	<i>2015 I-Codes</i>	<i>2015 I-Codes+ FL Specific Changes</i>
1 <i>Site Work</i>	\$ -	\$ -	\$ -
2 <i>Foundations</i>	\$ 15,719	\$ 15,719	\$ 17,312
3 <i>Framing</i>	\$ 41,260	\$ 41,260	\$ 41,260
4 <i>Exterior Walls</i>	\$ 40,084	\$ 40,084	\$ 40,084
5 <i>Roofing</i>	\$ 18,782	\$ 18,782	\$ 18,782
6 <i>Interiors</i>	\$ 32,642	\$ 32,642	\$ 32,642
7 <i>Specialties</i>	\$ -	\$ -	\$ -
8 <i>Mechanical</i>	\$ 56,482	\$ 76,595	\$ 75,595
9 <i>Electrical</i>	\$ 12,837	\$ 13,890	\$ 12,695
Total Cost:	\$ 217,807	\$ 238,972	\$ 238,370

1-Story Residence:

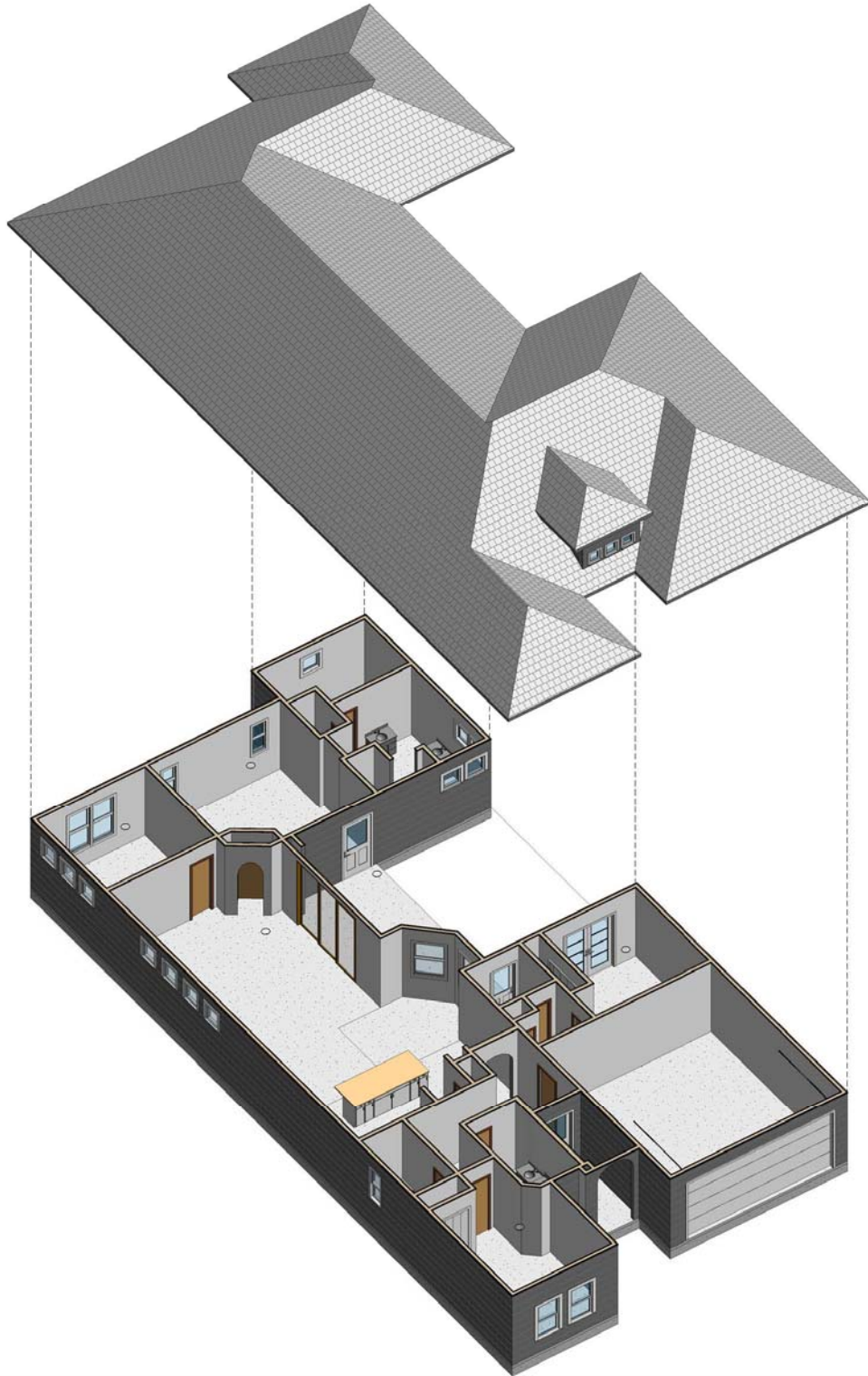


Figure F-1. 3D sections of 1-Story Residence

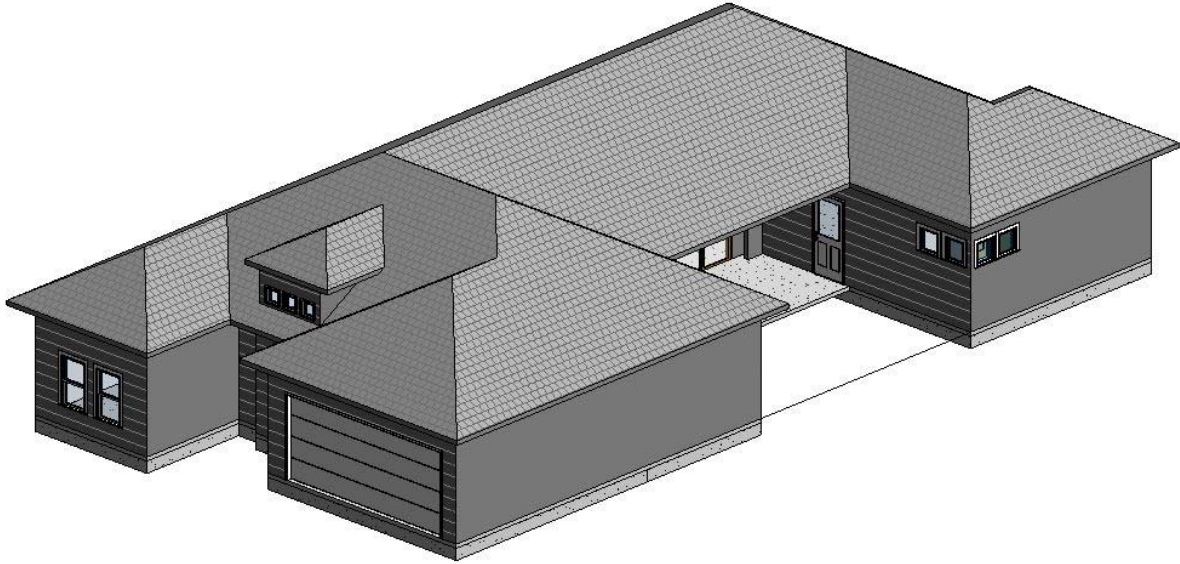


Figure F-2. 3D model of 1-Story Residence

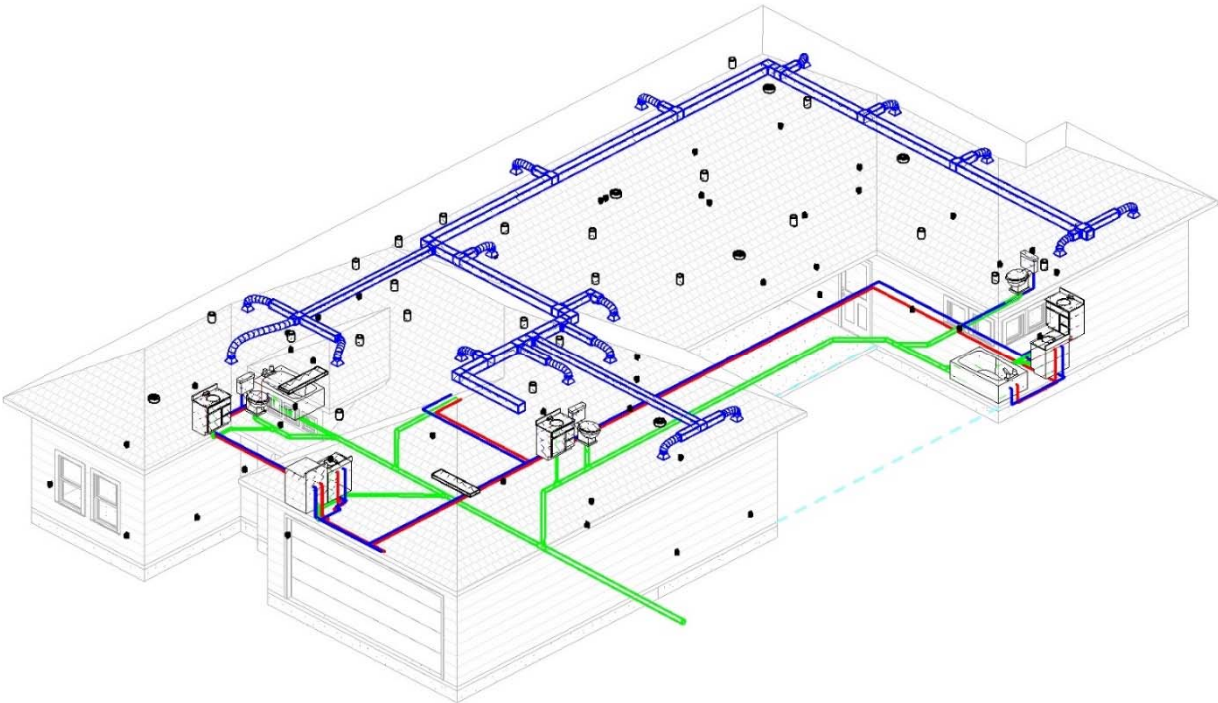


Figure F-3. 3D model MEP systems for 1-Story Residence

2-Story Residence

As shown in Figures G-1 thru G-3, the residence has three bedrooms with the master suite on the lower level and two bedrooms on the second level. There is a 497 SF attached two car garage and an open style floor plan on the first floor. In addition to the two bedrooms, the second level has a game room and a bathroom connected to the two bedrooms. The roof over the lower level is a hip roof and the second level has a gable roof. Both roofs are made from pre-engineered roof trusses with a standard roof shingle covering. The 2015 ICC and 2015 FL specific code changes impacted the 2-Story residence at the Mechanical and Foundation levels of the prepared estimate.

The mechanical level was impacted by the 2015 IECC C404.2, and R403.1.1 changes. These changes increase duct supports to no greater than 12' apart, increase water heater performance and add a programmable thermostat. The building code changes related to the electrical system did not have an impact on the estimate because the approved drawings used to develop the model already met the new electrical requirements. Specifically, the GFCI receptacle requirements indicated in the NEC 210.8A and 210.52.G.1 code changes were already met or exceeded. Outside of the Services level of the cost estimate, additional cost increases were reported due to code changes S6976-R1 and S6977-R1, which add provisions for the use of fiber and WWF in addition to control and contraction joints for concrete slabs-on-grade. Overall the 2015 FL specific code changes showed a very small percentage increase with the major increase coming in the HVAC category of the 2015 ICC code changes.

Table G-1. 2-STORY RESIDENCE (4459 SF LIVING; 521 SF GARAGE) COSTS SUMMARY

	<i>2012 I-Codes</i>	<i>2015 I-Codes</i>	<i>2015 I-Codes+ FL Specific Changes</i>
1 <i>Site Work</i>	\$ -	\$ -	\$ -
2 <i>Foundations</i>	\$ 28,776	\$ 28,776	\$ 31,071
3 <i>Framing</i>	\$ 40,309	\$ 40,309	\$ 40,309
4 <i>Exterior Walls</i>	\$ 58,812	\$ 58,812	\$ 58,812
5 <i>Roofing</i>	\$ 27,578	\$ 27,578	\$ 27,578
6 <i>Interiors</i>	\$ 67,536	\$ 67,536	\$ 67,536
7 <i>Specialties</i>	\$ 1,431	\$ 3,291	\$ 3,291
8 <i>Mechanical</i>	\$ 68,704	\$ 98,789	\$ 97,789
9 <i>Electrical</i>	\$ 23,475	\$ 23,475	\$ 21,732
Total Cost:	\$ 316,621	\$ 348,566	\$ 348,118

2 Story Residence:

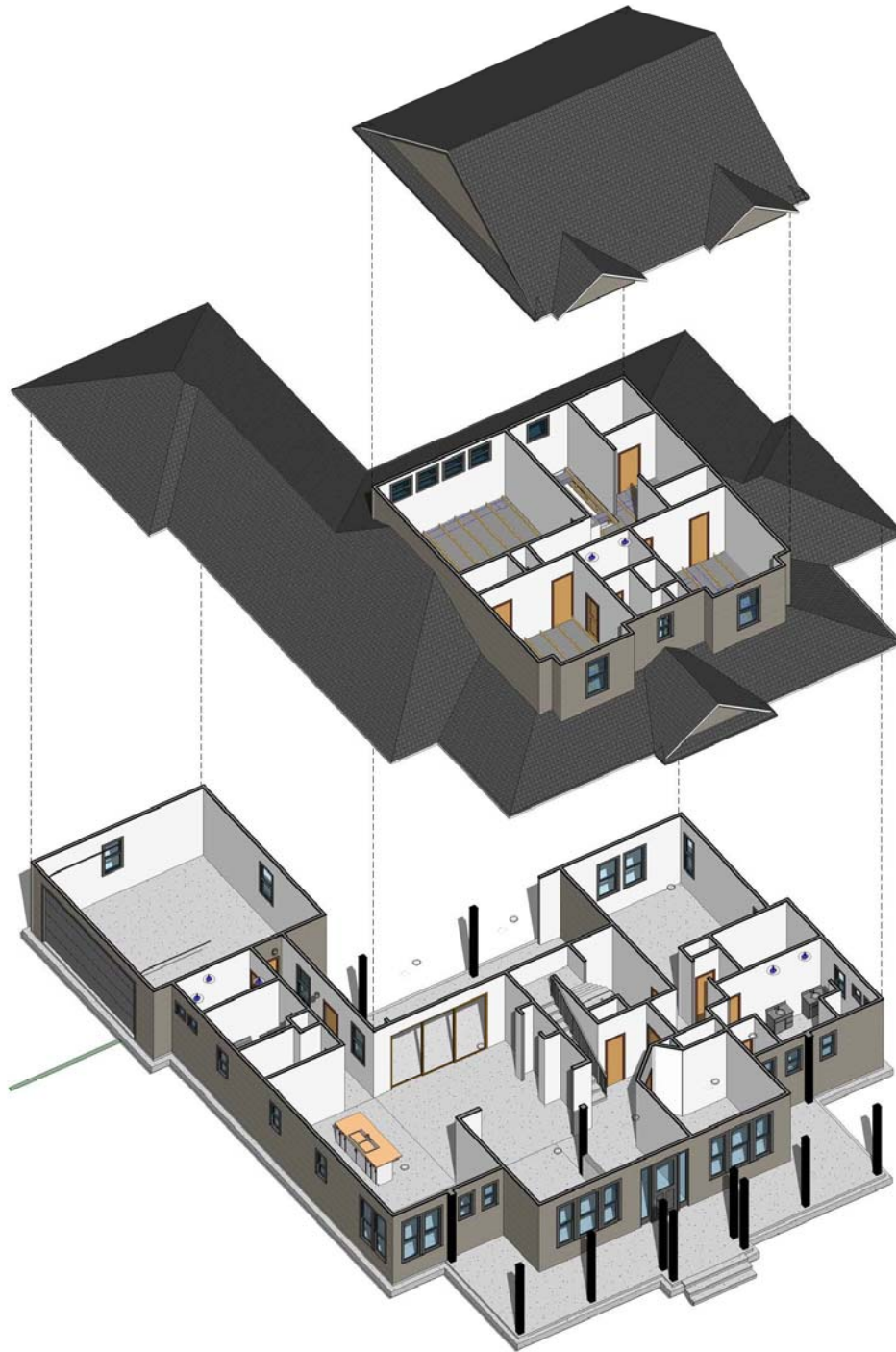


Figure G-1. 3D sections of 2-Story Residence

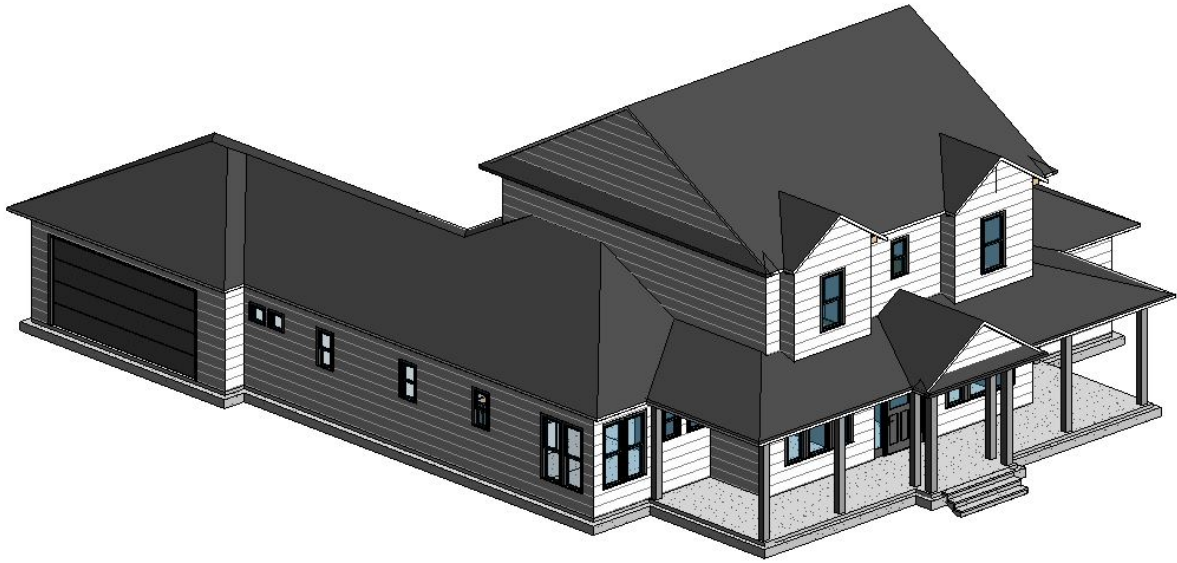


Figure G-2. 3D model of 2-Story Residence

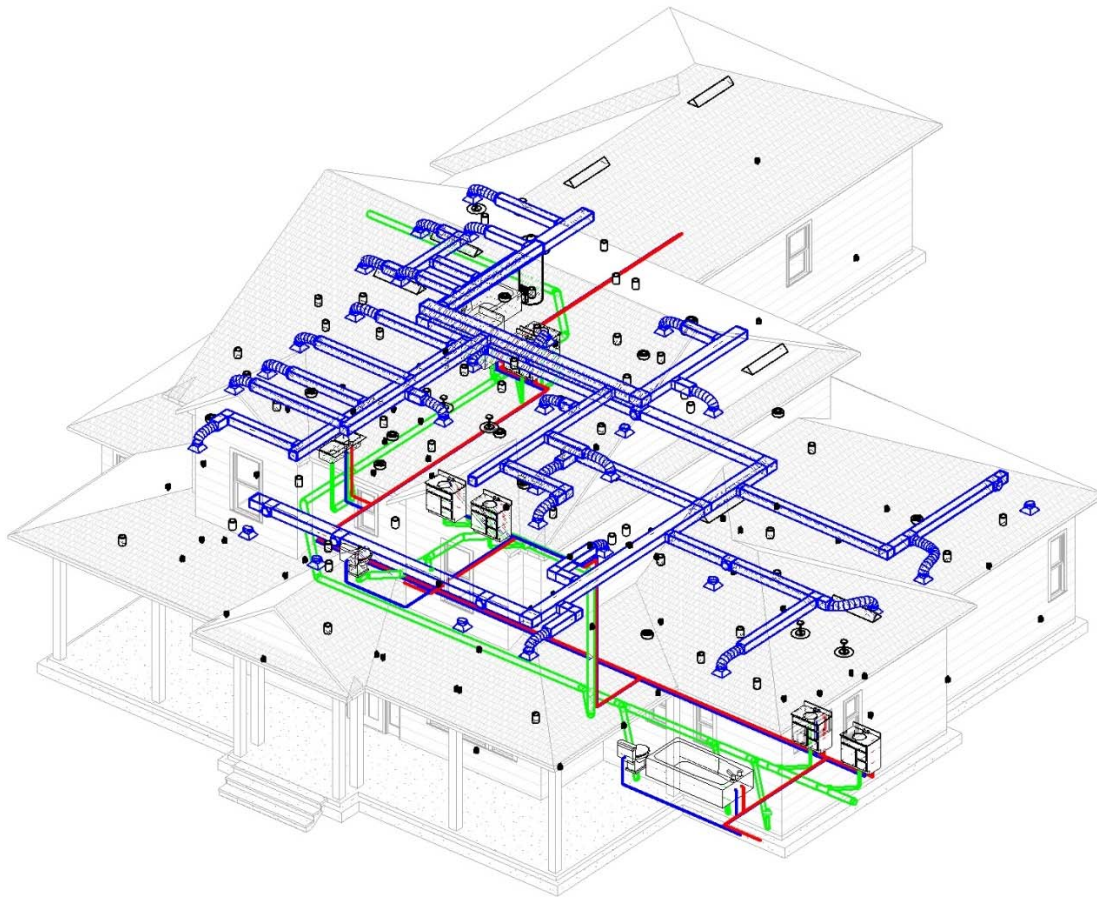


Figure G-3. 3D model MEP systems for 2-Story Residence

Conclusions and Recommendations

I-Codes 2015 changes that are prescriptive in nature and have the potential of impacting construction cost were identified and used to develop cost estimates for two prototype residential (2) and five prototype commercial/institutional building information models. These construction cost estimates were developed for the prescriptive 2012, 2015 I-codes and 2015 FL specific code changes based on models of each of the seven building types.

RS Means 2017 Cost data for the Orlando area was used to price these prototype buildings. Model based quantities were used and verified along with some SF style estimates from RS means for certain systems that were not fully defined in the models. Based on these construction cost estimates, it was determined that the cost impact of the 2015 I-Code changes on the 2012 I-Codes ranged from approximately 3% for the Retail building to approximately 12% for the Mid-rise Apartment building with an average of 7.6% for the commercial/institutional buildings and an average of 9.9% for the residences. The cost impact of the Florida specific code changes and the 2015 I-Code changes on the 2012 I-Codes ranged from approximately 9% for the Retail building to approximately 18% for the Mid-rise Apartment building with an average of 11.5% for the commercial/institutional buildings and an average of 9.7% for the residences. The cost impact of the Florida specific code changes on the 2015 I-Codes averaged 5% for the commercial/institutional buildings and **-0.19%** for the residences. The largest cost impact for the prescriptive 2015 Florida specific changes came from proposed code change E6460, the installation of Lightning Protection Systems (LPS). The anticipated cost of the LPS was estimated to add 1-5% to the buildings total cost. Cost data for the central Florida area (Orlando) were used but the resulting cost percentage differences should be roughly the same for other regions.

Future research should focus on the use of the developed models and estimates to evaluate future code changes. In addition, workshops should be conducted to introduce and encourage designers, builders and other code change petitioners to use the models to prospectively evaluate the cost impact of their proposed code changes. In addition, the modeling of other type of buildings should be explored to develop an even more diverse set of building models. Finally, since the 2018 I-Codes will be available by year's end, their cost impact should also be determined.

APPENDIX A

Table 1. Florida Specific Changes to the 2015 I-Codes - Building Cost Impact Analysis					
CODE CHANGE #	2017 FBC-BUILDING CHANGES TO 2015 I-CODES SUMMARY	FBC-BUILDING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
Sub Code:					
CA6430	The intent of the mod is to clarify that snow load or earthquake load do not apply to Florida.		X		
CA6462	Revise Preface Removes the language related to not using snow and earthquake provisions. I have been advised that under certain situation in high rise building may need to be considered.		X		
CA6467	Implement 553.73 (7) (d) FS including Declaratory Statements in Section 202 of updated edition of the FBC (licensed design professionals include registered Interior designer).		X		
CA6498	Change requires, as part of the close out, inspection ensuring that the existing swimming pool bonding system is complete and terminated properly.			X	Increase Cost
E6452	Restores the electrical requirements for underwater luminaires to the national standard in Section 454.1.4.2.3.		X		
E6460	Expands the requirements in Section 2703 for the installation of lightning protection systems (LPS) to certain commercial occupancies and provides exceptions to the new rule.			X	Average cost of a complete LPS is approx.1-5% of total construction cost.
F6409	Change travel distance for Occupancy S-1 from 250' with Sprinkler System to 400' as in 2010 FBC and 2015/5th Edition Florida Fire Prevention Code.		X		
F6797	Carries forward in Section 202 from 2014 FBC definition of Horizontal Exit.		X		
F6898	Carries forward in Section 202 from 2014 FBC definition of Means of Escape.		X		
F6899	Carry forward provisions to allow protection of all openings during threat of storm; with clarifying change. "		X		
F7075	Reinstates language from the 2010 Code that was not included in the 5th edition. This is needed to ensure pool safety barrier requirements are addressed and there are not conflicting code requirements.		X		
R6481-R1	Re-adopts Section 1508.2 from 2014 FBC.		X		
R6482	Adoption from 2014 FBC Florida-specific Section 1917 for lightweight insulation concrete decks.		X		
R6638	Carries forward from 2014 FBC Florida specific code language for the proper installation of roofing systems and components.		X		
R6639	Carries forward from 2014 FBC Florida specific code language for weather protection (Sec 1503).		X		
R6640-R1	To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida's unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.		X		
R6641	Carries forward from 2014 FBC Florida specific code language for roof fire classification (Sec 1505).		X		

Table 1. Florida Specific Changes to the 2015 I-Codes - Building Cost Impact Analysis

CODE CHANGE #	2017 FBC-BUILDING CHANGES TO 2015 I-CODES SUMMARY	FBC-BUILDING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
R6642-R1	Carries forward from 2014 FBC, Florida specific Section 1506 requirements for material specifications and physical characteristics of roofing materials and galvanization specifications for screws, nails and clips.B137		X		
R6643-R1	Carries forward 2014 FBC requirements for the proper installation of roofing systems and component in Section 1507.2.		X		
R6644-R1	Carries forward from 2014 FBC Florida specific code language for clay and concrete tile in Section 1507.3.		X		
R6646	Carries forward from 2014 FBC Florida specific code language for metal roof shingles (Sec 1507.5).		X		
R6647-R1	Carries forward from 2014 FBC Florida specific code language for metal roof panels in Section 1507.4.		X		
R6648-R1	Carries forward from 2014 FBC Florida specific code language for, mineral-surfaced roll roofing in Section 1507.6.		X		
R6649-R1	Carries forward from 2014 FBC Florida specific code language for slate roofing in Section 1507.7.		X		
R6652	Carries forward, from 2014 FBC Florida specific code language for built-up roofs (Sec 1507.10).		X		
R6653	Carries forward from 2014 FBC Florida specific code language for vegetative roofs, roof gardens and landscaped roofs (Sec 1507.16).		X		
R6654	Carries forward from 2014 FBC Florida specific code language for photovoltaic modules-shingles (Sec 1507.17).		X		
R6655-R1	Carries forward from 2014 FBC specific code language for roofing insulation in Section 1508.		X		
R6656	Removed required roofing radiant barrier installation above deck (Sec 1509)."		X		
R6657	Carries forward from 2014 FBC Florida specific code language for construction of rooftop structures.		X		
R6659	Carries forward from 2014 FBC Florida specific code language for materials and methods of application used for recovering or replacing an existing roof covering.		X		
R6660	Carries forward from 2014 FBC Florida specific code language for solar photovoltaic panels and modules (Sec 1512)."		X		
R6693	Carries forward from 2014 FBC Florida specific definition for flashing found throughout chapter 15		X		
R6695	Carries forward from 2014 FBC Florida specific code language for roof flashing (Sec 1503.2).		X		
R6696	Carries forward from 2014 FBC Florida specific code language for roof flashing location (Sec 1503.2.1).		X		
R6698-R1	Carries forward from 2014 FBC Florida specific underlayment requirements and uses Table 1507.1.1 specifying underlayment application and attachment.		X		
R6699	Carries forward from 2014 FBC Florida specific code language for asphalt shingles (Sec 1507.2)		X		
R6700	Carries forward from 2014 FBC Florida specific code language for roof underlayment (Sec 1507.2.3).		X		
R6702	Carries forward from 2014 FBC Florida specific code language for underlayment as listed 1507.1.1 Underlayment Table		X		

Table 1. Florida Specific Changes to the 2015 I-Codes - Building Cost Impact Analysis

CODE CHANGE #	2017 FBC-BUILDING CHANGES TO 2015 I-CODES SUMMARY	FBC-BUILDING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
R6703	Carries forward from 2014 FBC Florida specific code language for roof flashings (Sec 1507.2.9)		X		
R6704	Carries forward from 2014 FBC Florida specific code language for roofing base and cap counter flashing (Sec 1507.2.9.1).		X		
R6705	Carries forward from 2014 FBC Florida specific code language for roofing underlayment installation,(Sec 1507.3.3)		X		
R6706	Carries forward from 2014 FBC Florida specific code language for flashing at the juncture of the roof vertical surfaces (Sec 1507.3.9)		X		
R6707	Carries forward from 2014 FBC Florida specific code language for roofing underlayment to comply with and be installed in accordance with Section 1507.1.1 (Sec 1507.4.5.1).		X		
R6708	Carries forward from 2014 FBC Florida specific code language for roofing underlayment installation in accordance with Sec 1507.1.1 (Sec 1507.5.3).		X		
R6710	Carries forward from 2014 FBC Florida specific code language for roofing underlayment installation in accordance with Sec 1507.1.1 (Sec 1507.6.3).		X		
R6711	Carries forward from 2014 FBC Florida specific code language for roofing underlayment installation in accordance with Sec 1507.1.1 (Sec 1507.7.3).		X		
R6712	Carries forward from 2014 FBC Florida specific code language for roofing underlayment installation in accordance with Sec 1507.1.1 (Sec 1507.8.3).		X		
R6715	Carries forward from 2014 FBC Florida specific code language for roofing underlayment installation in accordance with Sec 1507.1.1 (Sec 1507.9.3).		X		
R6717	Carries forward from 2014 FBC Florida specific code language for sprayed polyurethane foam roofing (Sec 1507.14).		X		
R6718	Carries forward from 2014 FBC Florida specific code language for underlayment (Sec 1507.17.3).		X		
R6720-R1	Changed Section 1511 heading to "Existing Roofing."		X		
R6721	Carries forward from 2014 FBC Florida specific code language that not more than 25 percent of the total roof area or roof section of any existing building or structure shall be repaired, replaced or recovered in any 12-month period unless the entire existing roofing system or roof section is replaced to conform to requirements of this code (Sec 1511.1.1).		X		
R6722	Carries forward from 2014 FBC Florida specific code language for reconstruction of roof flashings (Sec 1511.6).		X		
R6723-R1	Removes code language found in manufacturer's product approval/installation instructions, the Cedar Shake and Shingle Bureau New Roof Construction Manual or RAS 130 from Section 1507.8 Wood Shingles.		X		
R6725-R1	Removes code language found in manufacturer's product approval/installation instructions, the Cedar Shake and Shingle Bureau New Roof Construction Manual or RAS 130 from Section 1507.8 Wood Shingles.		X		
R6730	Adds definition to Section 202 to clarify who is a metal roof covering manufacturer.		X		

Table 1. Florida Specific Changes to the 2015 I-Codes - Building Cost Impact Analysis					
CODE CHANGE #	2017 FBC-BUILDING CHANGES TO 2015 I-CODES SUMMARY	FBC-BUILDING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
R6769	Carries forward from 2014 FBC Florida specific code language for roofing material identification,(Sec 1506.3).		X		
R6783-R1	Requires in Section 1507.4 that metal roofing panels shall be factory or field manufactured in accordance with the manufacturers' Product Approval specifications and limitations of use under an audited quality assurance program approved by the Florida Building Commission for that purpose.		X		
R7076	Updates in Chapter 35, ASTM D 1970 Specification for Self-adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roof		X		
R7082-R1	Implemented changes to Section 1512 to update referenced standards and associated performance criteria, modifies test requirements to more accurately reflect the intent of the code, removes redundant or unnecessary requirements and made editorial changes and grammatical corrections.		X		
S6355	Carries forward in Section 1609.7 from 2014 FBC clarifications on the application of wind loads to garage doors and rolling doors.		X		
S6356	Carries forward in Section 1709.5.2.1 from 2014 FBC clarifications on testing requirements for garage doors and rolling doors.		X		
S6357	Carries forward in Section 1709.5.2.1.1 from 2014 FBC garage door labeling requirements.		X		
S6424	Figure 1609.3(1), 1609.3(2), 1609.3(3) Wind Maps are revised. To be consistent with the 5th Edition (2014) FBC Wind maps to continue to provide for improved resolution for the maps and to implement the Commission plan to update the 5th Edition (2014) Code.		X		
S6537-R1	Update in Chapter 35 of ASTM Standards current and past needed for manufacturers:		X		
S6539	To provide code section referenced in Chapter 35 for AAMA 506 as found in 2014 FBC.		X		
S6540	Incorporates in the code AAMA-711 for self-adhered membrane flashing in wall assemblies and AAMA-714 for fluid applied membrane flashing for exterior wall openings.		X		
S6544-R1	Carries forward from 2014 FBC the Exterior Window and Door Labeling requirements, exceptions, engineering analysis, comparative analysis, operable/non-operable, mullion(s) and safety requirements into Section 1709.5.		X		
S6545	Modification to Section 1709.8 to strengthen current mullion deflection limitation by adding language from AAMA TIR-A11.		X		
S6547	Add standards AAMA 711-13, AAMA 714-12, AAMA 714-15, AAMA 100-12, FMA AAMA 200-12, FMA-WDMA 250-2010, FMA-AAMA-WDMA 300-12 and FMA-AAMA-WDMA 400-13 referenced in Section 1405.4.1.4,to Chapter 35.		X		
S6553	Carries forward from FBCR 2014 and by implication from FBCB 2014, Section 1609.1.3 clarification on the correlation of certain testing protocols with ASCE 7-10.		X		
S6556	Updates structural steel industry documents in Section 2214.3.		X		
S6557	Updates the HVHZ structural steel references in Chapter 35.		X		
S6559	Updates in Section 2214.3 the reference to the RCSC specification, which is referenced in AISC 360-10.		X		

Table 1. Florida Specific Changes to the 2015 I-Codes - Building Cost Impact Analysis

CODE CHANGE #	2017 FBC-BUILDING CHANGES TO 2015 I-CODES SUMMARY	FBC-BUILDING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
S6560	Updates the reference to the RCSC for RCSC—09, Specification for Structural Joints Using High Strength Bolts in Chapter 35, which is referenced in AISC 360-10.		X		
S6567	Add reference standards to Section 2214.3 for steel roof deck and non-composite steel floor deck into the HVHZ standards for steel construction.		X		
S6568	Carries forward from 2014 FBC Florida specific code language clarifying the applicable wind loads for roof overhang soffits (Sec 1609.1).		X		
S6569	Carries forward from 2014 FBC clarification that wind speeds, exposure categories, and opening protection requirements are required to be determined in accordance with the FBCB.		X		
S6575	Carries forward in Section 1609.1.3, 2014 FBC language from Florida Statutes regarding the establishment of wind speed and wind-borne debris region contours locally.		X		
S6585	Reinstates provisions for concrete gable end walls from 2014 FBC in Sections 1909.1 and 1909.2 regarding the design of concrete structures in high wind regions and in Section 1909.3 regarding gable end walls.		X		
S6586	Carries forward from 2014 FBC in Section 2109.1.1 requirements that gable end walls be structurally continuous between points of lateral support.		X		
S6587	Reinstates from 2014 FBC in Section 2212 requirements that gable end walls be structurally continuous between points of lateral support.		X		
S6588	Reinstates in Section 2304.3.4 requirements from 2014 FBC that gable end walls be structurally continuous between points of lateral support.		X		
S6589	Clarifies that the shear values for gypsum board diaphragms in Table 2508.5 are allowable (ASD) values.		X		
S6590	Carries forward from 2014 FBC in Section 2109.1.1 language limiting the use of empirical design of masonry to areas where the V_{ult} wind speed is less than 115 mph.		X		
S6593	Reinstates in Section 2308.2.4 requirements from 2014 FBC that limits on using conventional wood frame construction to areas where the V_{ult} wind speed is less than 115 mph.		X		
S6598-R1	Revises Section 2222.4.4 requirement for the deflection of structural wall panels (siding) and roof panels made of formed metal sheets based on testing that demonstrated that increased deflection had no impact on performance.	X			Decreased cost of new roof and wall construction and metal re-roofing applications
S6612	Corrects an oversight in Section 2201.1 by extending the HVHZ exception to include industrial steel storage racks, which are currently covered in IBC Section 2209.		X		
S6613	Updates structural steel industry documents in Section 2214.3.		X		
S6614	Updates the AWS references in Chapter 35, which are specified in Section 2214.3.		X		
S6615	Updates Section 2214.3 to the latest edition of the NAAMM manual on metal grating.		X		
S6616	Updates the reference to AAMM MBG 531, Metal Grating Manual in Chapter 35.		X		

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CODE CHANGE #	2017 FBC-BUILDING CHANGES TO 2015 I-CODES SUMMARY	FBC-BUILDING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
S6617	Updates and corrects the titles of the steel joist industry references in Section 2214.3.		X		
S6618	Updates in Chapter 35 the Steel Joist Institute (SJI) references, which are specified in Section 2214.3.		X		
S6619	Deletes Section 2215.5 because ribbed bolts, also known as interface body bolts, are no longer in production.		X		
S6620	Corrects the requirements on end support and anchorage of steel joists in Section 2221.6.2. "		X		
S6621	Corrects reference to Section 2214.3 in Section 2222.		X		
S6622	Corrects terms in Section 2214.2 to bring them in alignment with the "cold-formed steel" and "cold-formed steel light frame construction" industry terms used in IBC Section 2210 and 2211.		X		
S6738	Updates standards for cold-formed steel in the HVHZ requirements in Section 2214.3.		X		
S6741	Updates the HVHZ references to the ASTM standards referenced in AISC 360-10 in Section 2214.3.		X		
S6743	Updates in Chapter 35 the HVHZ references to the ASTM standards referenced in AISC 360-10, the structural steel design standard adopted in the 2015 IBC.		X		
S6744	Replaced Section 2214.3 tubular steel reference with the Steel Tube Institute's 2015 HSS Design Manual.		X		
S6747	Updates in Chapter 35 the Steel Tube institute (STI) references, which are specified in Section 2214.3.		X		
S6775	Updates the reference in Section 2214.3 to the ASTM A-525 to ASTM A1003-A1003M.		X		
S6778	Replaces in Section 2214.3 (5), ASTM A 525 that no longer exists with ASTM A1003-A1003M.		X		
S6789-R2	Incorporates AAMA Tech Paper on Comparative Analysis of Sliding Glass and Bi-fold Doors and current AAMA/WDMA/CSA standard in Section 2411.3.2.		X		
S6812-R1	Carries forward from 2014 FBC existing code language to allow use of a custom one-of-a-kind door to demonstrate wind resistance by testing or engineering analysis.		X		
S6815	Carries forward in Section 1709.5.3 from 2014 FBC allowance for interchangeability of exterior door components with properly evaluated products which demonstrate equal or greater structural performance by engineering analysis.		X		
S6826	Requires in Section 2103.4 that exterior masonry walls horizontal joint reinforcement be ladder type, corrosion resistant complying with referenced standards.			X	Cost of joint reinforcement in exterior walls increases 15% to 20% per bundle (500 L.F.).
S6827	Deletes reference in Section 2105.1 the inspection requirements of Chapter 17, which are Reserved; Adds exception to TMS 402 QA program where plan review and inspection are provided by local building department.		X		

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CODE CHANGE #	2017 FBC-BUILDING CHANGES TO 2015 I-CODES SUMMARY	FBC-BUILDING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
S6828	Carries forward,2014 FBC language and updates Section 2107.1 references and provides exception from TMS 402 plan review and inspection requirements where services provided by local building department.		X		
S6829	Carries forward from 2014 FBC in Section 2107.5 Florida specific amendment modifying gamma factors of TMS 402 to account for wind loads as opposed to seismic loads and modifies minimum reinforcement lap length.		X		
S6830	Carries forward from 2014 FBC Section 2107.6 clarification on where lateral ties are needed in pilasters.		X		
S6832	Carries forward from 2014 FBC in Section 2108.1, updates Section reference and provides exception to plan review and inspection requirements of TMS 402 where services provided by local building department.		X		
S6834	Changes reference in Section 2108.1 from Section 2108.3 to Section 2108.4 to account for added section proposed to carry forward Florida specific provisions from existing code.		X		
S6835	Carries forward from 2014 FBC in Section 2108.4 Florida specific amendment modifying gamma factors of TMS 402 to account for wind loads as opposed to seismic loads and modifies minimum reinforcement lap length.		X		
S6837	Carries forward Section 2122.1 from 2014 FBC and clarifies the extent of its application and modifies existing section numbers of referenced standards to comply with changes in the reference document."		X		
S6840	Carries forward Section 2122.2.3 from 2014 FBC and updates the referenced section and adds corrosion protection for horizontal joint reinforcement.			X	Cost of joint reinforcement in exterior walls increases 15-20% per bundle (500 L.F.).
S6841	Updates section references of language from 2014 FBC in Section 2122.5.		X		
S6842	Carries forward Section 2122.7 anchorage requirements from 2014 FBC and updates the referenced section to the latest edition of the adopted standard.		X		
S6843	Carries forward Section 2122.10 from 2014 FBC and updates the referenced section to the latest edition of the adopted standard.		X		
S6844	Retains from 2014 FBC and updates in Chapter 35, ASTM C 90, C 926 and C 1063 consensus standards to the latest edition.		X		
S6914	Revises in Section 1609.7 rooftop wind loading criteria based on new research in ASCE 7-16.		X		
S6917	Revises in Section 1620.6 rooftop wind loading criteria based on new research in ASCE 7-16.		X		
S6939	Revises the prescriptive wood structural panel exception for opening protection in windborne debris regions.			X	Minimal cost increase
S6941-R1	Carries forward from 2014 FBC the option to use impact-resistant covers,, under AMCA 540 for protecting louvers in Section 1609.1.2.1.		X		
S6952	Carries forward from 2014 FBC Section 1609.1.2.2 modification to Wind Zone 4 of ASTM, E-1996		X		

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CODE CHANGE #	2017 FBC-BUILDING CHANGES TO 2015 I-CODES SUMMARY	FBC-BUILDING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
S6954	Carries forward Section 1609.1.2.4.1 from 2014 FBC providing safety factor for testing impact-resistant coverings.		X		
S6955	Carries forward requirement Section 1609.1.2.4.2 from 2014 FBC for labeling of impact-resistant coverings.		X		
S6956	Carries forward in Section 1709.5.8 from 2014 FBC requirements for labeling and installation of impact-resistant coverings		X		
S6957	Carries forward from 2014 FBC Florida specific code language for glazed openings vs. glazing and references ANSI/DASMA 115, TAS 201, 201, 203, and AAMA 506 (Sec 1609.1.2).		X		
S6976-R1	Add provisions for using fiber and WWF in addition to control and contraction joints for concrete slabs-on-ground in Section 1907.2			X	Adds \$5-6 per cyd for microSynthetic fiber and \$16-17 per cyd for Macro Synthetic Fiber and \$11-25 per cyd of concrete depending on slab thickness and WWF gage.
S6978	Updates Chapter 35 to provide a section reference for the standard referenced in proposed new Section 1907.2.		X		
S7000-R2	Modify Section 2305 on testing of joist hangers to include testing of related connectors to clarify the procedure for testing other connectors and adds exceptions to Section 2301.1 and 2303.5.2.		X		
S7001	Adds in Section 2210.3 testing standard for joist hangers and related connectors for cold formed steel construction.		X		
S7023	Carries forward in Section 202 from 2014 FBC modification of definition of habitable space as modified to account for change in AAMA 2100."		X		
S7025	Carries forward in Section 202 from 2014 FBC definition of screen enclosures.		X		
S7031	Carries forward in Section 202 from 2014 FBC definition of sunroom.		X		
S7032	Carries forward 2014 FBC Table 1604.3 Deflection Limits.		X		
S7033	Carries forward from 2014 FBC Table 2002.4 Design Wind Pressures for Screened Enclosures.		X		
S7035	Carries forward from 2014 FBC Table 2002.4A Height adjustment Factors (for screen enclosures).		X		
S7037	Carries forward from 2014 FBC reference to Section 2002.4 for wind loads for screened enclosures,		X		
S7038	Retains from 2014 FBC and updates in Chapter 35, AAF Guide to Aluminum Construction in High Wind Areas.		X		
S7042	Retains from 2014 FBC in Section 2002.6 sunroom design criteria and updates sunroom categories.		X		
S7047	Carries forward and updates changes to AAMA 1402		X		
S7049	Carries forward provisions for aluminum structures from 2014 FBC		X		
S7050	Carries forward 2014 FBC Table 1604.5 risk category of buildings and other structures		X		

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CODE CHANGE #	2017 FBC-BUILDING CHANGES TO 2015 I-CODES SUMMARY	FBC-BUILDING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
S7056	Carries forward in Section 1709.5.8 from 2014 FBC requirements for soffit product approval and labeling requirements.		X		
S7057	Carries forward from 2014 FBC Florida specific code language clarifying design criteria for exterior wall coverings and soffits and requirement to label soffits (Sec 1609.1).		X		
S7059	Carries forward reference for soffit labeling.		X		
S7067	Updates in Chapter 35 previously adopted AAMA/NPEA/NSA 2100—12 standard.		X		
S7069	Carries forward from 2014 FBC in Section 3105 provisions for awnings and canopies.		X		
S7071	Carries forward in Section 202 from 2014 FBC definition of awning.		X		
SP6364-R1	Modifies Section 453.15.5 and adds new wording supported by ASHRAE 62.1 and Mechanical Code Section 403 regulating operating of outside air systems and their respective exhaust systems when spaces are unoccupied.		X		
SP6458	This modification updates and corrects the reference in Chapter 35 to the NFPA 780 - Standard for the Installation of Lightning Protection Systems.		X		
SP6549	Removes from Section 3010.1.3 two occurrences of July 1, 2015 dates, due to a law change.		X		
SP6566	Delete IBC App G in its entirety and mark it reserved. It should not be used by FL communities because the FL Division of Emergency Management developed an FBC-coordinated floodplain management ordinance that is approved by FEMA.		X		
SP6855	Modification is a reference update in Chapter 35 to the FGI Guidelines with new edition and title and address changes:		X		
SP6864	Requires that working machinery with component parts shall be color-coded per ANSI Z535.1.		X		
SP6865	Change incorrect title of Load importance factor which no longer exists in the code and reference ICC 500 in Section 453.9.1.		X		
SP6867	Deletes Section 453.10.2.3 on drainage.		X		
SP6869-R1	Moves deleted Section 453.10.2.3 on drainage to more appropriate Code area.		X		
SP6871	Deletes duplicate portion on walls in Section 453.14.8.2.		X		
SP6872	Clarifies Section 453.14.1 reference as applying to primary egress door.		X		
SP6873	Provides correct title in Section 453.4.6 for ANSI Z535.1, which requires that working machinery with component parts shall be color-coded.		X		
SP6875	Moves Section 453.14.8.1 on impervious surfaces to same area as Section 468.3.5.5 regarding impervious walls to provide easier design for health, safety, and welfare.		X		
SP6876	Specifies impervious floor location in Section 468.3.5.9.		X		
SP6878	Deletes portion of Section 453.10.5.2.		X		
SP6883-R1	Revises Sec 3109 to align with coastal high hazard areas requirements (Zone V) of ASCE 24-14 Flood Resistant Design and Construction (referenced Sec 1612), while retaining specific requirements for CCCL that flow from Ch 161, FS or were requested by DEP.	X			Decrease because RDPs and plan reviewers will not have to each determine

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CODE CHANGE #	2017 FBC-BUILDING CHANGES TO 2015 I-CODES SUMMARY	FBC-BUILDING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
					the more restrictive of CCCL and Flood requirements.
SP6885	Moves portion of the code on ceilings out of Section 453.14.8.3.		X		
SP6886	Moves Section 468.3.5.10 regarding impervious ceiling surfaces to the same area as Section 468.3.5.5 regarding impervious walls.		X		
SP6887-R1	Clarifies and makes editorial modifications to the architectural details for hospitals in Section 449.3.4 to make it clearer and gives a range of acceptable separation of ductwork and provides a construction process detail regarding the construction of fire rated walls and smoke barriers.		X		
SP6889	Added to Section 453.15.3 the same fire extinguisher requirement that is in the Daycare/kindergarten portion of the code (453.21.7) for a residential range in a school.		X		
SP6890	Moves requirements in Section 453.16.4 regarding stall urinals serving as floor drains to the same area as Section 468.3.5.6 regarding floor drains.		X		
SP6891	Requires in Section 468.3.5.6.1 that stall urinals not serve as floor drains.		X		
SP6892	Moves requirements in Section 453.16.9.1 regarding toilet room access to the same area as Section 468.3.5.3 regarding toilet room access.		X		
SP6893	Requires in Section 468.3.5.3.3 that toilet rooms adjacent to food preparation or dining areas shall be completely enclosed,		X		
SP6901	Moves requirements in Section 453.16.9.2 regarding floor drains to the same area as Section 468.3.5.6 regarding floor drains.		X		
SP6902	Specifies location of floor drains in Section 468.3.5.6.2.		X		
SP6903	Removes a conditional phrase in Section 453.16.10 under dousing shower and eye wash.		X		
SP6904	Moves requirements on floor drains and plumbing fixtures in equipment room from Section 453.16.11, to related area.		X		
SP6905	Regulates in Section 468.3.6.6 placement of floor drains and plumbing fixtures in equipment rooms containing air handling machinery.		X		
SP6906	Changes from optional standby circuits to optional standby systems in Section 453.25.5.2.		X		
SP6907	Implement spelling Correction in Section 468.3.2.		X		
SP6910_R1	Retains in Section 453.25.4 the HVAC equipment wind load requirements not addressed in ICC 500.		X		
SP6919	Adds a reference to ICC 500 to Section 453.10.6.		X		
SP6931	Clarify fire alarm requirements in Section 453.7.4 for additions or remodeling of existing school facilities		X		
SP6936	Modified Section 453.17.8 to require GFI receptacles in pre-kindergarten and kindergarten classrooms. "			X	\$250 per receptacle
SP6943	Revises the code to improve understanding of the requirements for air ducts and bans in Section 449.3.6.4.4 the use of fiberglass air ducts in hospitals due to patient safety.		X		
SP6945	Modification revises the code language to remove unnecessary and redundant language from this section in favor of NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, and requires the		X		

Table 1. Florida Specific Changes to the 2015 I-Codes - Building Cost Impact Analysis

CODE CHANGE #	2017 FBC-BUILDING CHANGES TO 2015 I-CODES SUMMARY	FBC-BUILDING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
	fire pump to be connected to the emergency power supply system or have an alternate power source available in accordance with NFPA 20. .				
SP6946	Deletes redundant Sections 449.3.13.2, 449.3.13.3 and 449.3.16, and adds the wireless nurse call to insure that they meet the correct edition and section of UL 1069		X		
SP6947	Adds to Section 449.3.7 requirement for smoke barriers in some locations in hospitals.		X		
SP6950	Deletes 2014 FBC Section 449.4.2.4.1 and renumbers.		X		
SP6953	Deletes redundant Sections 449.3.14.8 and 449.3.14.9 and make clarifications to bring Section 449.3.14 more into line with NFPA 110.		X		
SP6959	Adds Section 449.3.12.2 requiring private operating mode using visual signaling instead of audible signaling, as a requirement for inpatient care areas in the hospital, as permitted and described in NFPA 72.		X		
SP6960-R1	Revises Section 449.4.2 disaster preparedness requirements for hospitals regarding debris protection standards.		X		
SP6962	Modification corrects and clarifies the scoping and codes required for section of 449.		X		
SP6963	Adds requirement in Section 449.3.12.3 for identifying and securing the disconnecting means of the Fire Alarm Control Unit (FACU)."		X		
SP6964	Deletes 2014 FBC Section 449.4.2.7.2 and renumbers remaining Sections.		X		
SP6965	Deletes 2014 FBC Sections 449.4.2.10.1, 449.4.2.10.1.1 and 449.4.2.10.2 and renumbers.		X		
SP6966	Added Sections 451.3.6.5 451.3.6.6 and 451.3.6.7 to HVAC Section 451.3.6.		X		
SP6967	Deletes 2014 FBC Sections 451.3.13.4 and 451.3.13.8 and renumbers remaining Sections.		X		
SP6968	Relocates and slightly modifies Section 451.3 and adds Sections 451.3.4.4, 451.3.4.5 and 451.3.4.6 for smoke barriers, priority walls and ceiling inspection opening necessary to satisfy AHCA requirements.		X		
SP6969	Modification revises the code language to remove unnecessary and redundant language from this section in favor of NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, and requires the fire pump to be connected to the emergency power supply system or have an alternate power source available in accordance with NFPA 20. .		X		
SP6970	Deletes from 2014 FBC operating room designations in Sections 451.3.2 and 451.3.2.1.		X		
SP6971-R1	Modification to correct and clarify the scoping and codes required in Section of 451.1.		X		
SP6986-R1	Deletes redundant sections and revises the missile impact requirements for equipment based on the wind speed areas of the state and exempts existing facilities that are not required to have a emergency power supply system when renovating existing utility systems from having to add an emergency power supply system.		X		
SP6990-R2	Adopts the 2014 edition of The Guidelines for Design and Construction of Residential Health, Care, and Support Facilities as the primary design requirements for skilled nursing homes. Deletes and revises existing requirements as needed to adopt this new standard.		X		

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CODE CHANGE #	2017 FBC-BUILDING CHANGES TO 2015 I-CODES SUMMARY	FBC-BUILDING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
SP6993	Modification corrects and clarifies the scoping and codes required for FBC Section 450.		X		
SP6994	Deletes 2014 FBC Section 450.4.2.4.1 and renumbers remaining Sections.		X		
SP6996	Adds Section 467.2.3 requirement to have bathing facilities in Hospice Facilities		X		
SP6997	Modifies Section 467.2.2.2 to add specification for accessibility reference in Hospice Facilities.		X		
SP7008	Removes hemodialysis rooms from the list of critical care rooms requiring additional receptacles and brings the FBC receptacle requirements in line with national codes.		X		
SP7043	Deletes 2014 FBC Section 450.4.2.10 and renumbers remaining Sections		X		
SP7045	Adds new section for inpatient room dialysis.		X		
SP7051	Add Section 449.3.14.11 to locate the generator remote manual stop.	X			Reduces cost by only having one stop station instead of two.
SP7052	Add Section 450.3.26.10 to locate the generator remote manual stop.	X			Reduces cost by only having one stop station instead of two.
SP7054	Add Section 451.3.13.10 to locate the generator remote manual stop.		X		
SW6496-R1	Modifies Section 454.10.4 to require GFCI protection be provided for replacement of pool pump motors, if not already in place.			X	\$250
SW6509-R1	Defines in Section 454.1.2.3.1 location of depth markers for pool with recessed gutters as on the back wall of the recessed gutter "		X		
SW6511-R1	Modifies Section 454.1.2.4 to clarify code language to prevent accidental wrong color (dark) installation of pool or spa surface materials.		X		
SW6512	Modifies Section 454.1.6.5.3.1.3 to require open-type (rollout) gutters on pools have skid-resistant tile on the leading edge, for safety.		X		
SW6531-R1	Adds requirements to Sections 454.1.4.1 and 454.2.16 for GFCI protection for outlets supplying electrical equipment at new public & private (commercial) swimming pools.		X		
SW6584-R1	Modifies Section 454.1.2.6 to allow installation of water lounges or sunshelves in commercial pools,		X		
SW7014	Eliminates in Section 454.6.5.16.6 unnecessary and excessive UV requirements for lower risk facilities and specifies use for higher risk facilities.	X			Reduces costs for approval variances and equipment for lower risk facilities.
SW7016-R1	Remove language in Section 454.1.3.1.6 sets pool perimeter obstruction allowance at a maximum of 10% of pool deck perimeter or 20 feet, whichever is less, in any one area where water depth is five feet or less. .		X		
SW7058-R1	Modifies definition in Section 454.1.2 for Interactive water features and swimming pool and removes modification definition.		X		
SW7060	Updates in Chapter 35 the APSP-3 and APSP-7 referenced standards to the new editions, as well as corrects title of APSP-6 standard		X		
SW7062	Updates the NSPI 3 standard reference with the new edition title of ANSI/APSP/ICC 3 and updates the APSP 7 standard name as well.		X		

Table 1. Florida Specific Changes to the 2015 I-Codes - Building Cost Impact Analysis					
CODE CHANGE #	2017 FBC-BUILDING CHANGES TO 2015 I-CODES SUMMARY	FBC-BUILDING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
SW7070-R2	Reinstates language from the 2010 FBC needed to ensure certain safety aspects are addressed when resurfacing a public swimming pool and make amends for the removal of the term removing the term "modification from the 2015 FBC.		X		
SW7072	Corrects in Section 454.1.9.6.3 typo from 7 to 7 ft.		X		
SW7073-R1	Modifies Section 454.1.2.4 to require pool floors and walls to be white or light pastel in color with an interior finish coating comprised of a non-pigmented white cementitious binder component together with a sand/aggregate component with a dry Lightness level (L) of 80.0 or greater and a wet Luminous Reflectance Value (Y) of 50.0 or greater.		X		
SW7074-R1	Modifies Section 454.1.9.8.6.3 to allow for UV systems to be installed on the filter return lines as an alternate to the feature return line placement.	X			Could decrease cost

*For prescriptive Code changes only.

APPENDIX B

Table 2. Florida Specific Changes to the 2015 I-Codes- EB Cost Impact Analysis					
CODE CHANGE #	2017 FBC-EB CHANGES TO 2015 I-CODES SUMMARY	FBC-EB COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
Sub Code:					
EN6411	Modify Section 701.2 to prevent Reduction of Energy Efficiency when a building is entirely exempt from the FBC, Energy Efficiency volume.		X		
SW6529-R1	Adds to Section 302.6 requirements for GFCI protection and equipotential bonding at existing swimming pools undergoing repair, replacement, alterations, or relocation.			X	\$250
S6594	Modifies Chapter 17 to add gable end retrofit techniques consistent with 2014 FBC EB.		X		
S6595	Adds new definition for retrofit in Chapter 2 for correlation with proposed new Chapter 17.		X		
S6596	Adds previously existing 2014 FBC charging language in Section 510 to direct the user to Chapter 17 for retrofits.		X		
R6663	Provides current Florida-specific roofing criteria in Section 601.1 for the purpose of consistent code compliant guidance in the design and installation of roof repairs.		X		
R6664	Provides current Florida-specific roofing criteria in Section 606.2 for the purpose of consistent code compliant guidance in the design and installation of roof repairs.		X		
R6665-R1	Change Section 706 heading from Reroofing to Existing Roofing.		X		
R6666-R1	Carry forward 2014 FBC in Section 706 language providing continuity for the proper installation of roofing systems and components.		X		
R7080	Carry over requirements from 2010 FBCEB in Section 502.2 pointing users re-roofing existing buildings to Section 708 on Re-roofing.		X		
P6942-R1	Modifies Sections 810, 909, 1010 and 1107 to allow the use of separate facilities as unisex toilet rooms (and lets these toilet rooms contribute to the required fixture count) in facilities undergoing barrier removal or alterations to help businesses facilitate compliance with the Americans with Disabilities Act.		X		

*For prescriptive Code changes only.

APPENDIX C

Table 3. Florida Specific Changes to the 2015 I-Codes - Energy Cost Impact Analysis					
CODE CHANGE #	2017 FBC-ENERGY CHANGES TO 2015 I-CODES SUMMARY	FBC-ENERGY COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
Sub Code:					
CA6469	Clarifies code on registered design professional and implement FS which requires the Commission to include Declaratory Statements in the updated edition of the FBC		X		
EN6426	Allows equipment efficiency in Table R405.5.2(1) to be based on the proposed design in the simulated performance compliance path.		X		
EN6558	Revision to Section R202 clarifies the types of products that are included in the category of “skylights” and brings the FBC: EC (Residential) in closer alignment with the FBC: Residential.		X		
EN6561	Revision to Section C202 clarifies the types of products that are included in the category of “skylights” and brings the FBC: EC (Commercial) in closer alignment with the FBC: Building.		X		
EN6562	Correct an inconsistency in Table R405.5.2(1) related to skylights.		X		
EN6563	Corrects in Table C407.5.1(1) an inconsistency in the treatment of skylights vs. vertical fenestration between the commercial text and the 2015 IECC commercial performance methodology.		X		
EN6564	Modification to Table R405.5.2(1) to comply with ICC code change proposal RE173-13 which partially changed “glazing area” to “vertical fenestration area” for the 2015 IECC.		X		
EN6573	Raises in Section R402.4.1.2 residential building air leakage rate limit and provides for using air leakage testing standard ANSI/RESNET/ICC 380-2016.	X			Reduces first cost by allowing a small range of leakage rates not requiring mechanical ventilation and may lower ongoing costs by reducing humidity introduced by forced ventilation that needs to be removed.
EN6576	Modifies Section R406.6.1 to require that compliance software tools be approved by the Florida Building Commission before being used.		X		
EN6577	Adds ANSI/RESNET/ICC 380-2016 Standard as residential building air leakage testing reference to Chapter 6 and delete the existing reference.		X		
EN6578	Modifies Section R405.3 to include renumbered Appendix RC.		X		
EN6579	Modify Section R405.7.4 to allow venting skylights in the cross ventilation option.		X		
EN6727	Resolves inconsistency and provides a uniform energy rating methodology in Section R406.4.		X		
EN6728	Adds ANSI/RESNET/ICC 301-2014 and Addendum A-2015 Standards references to Chapter 6.		X		

Table 3. Florida Specific Changes to the 2015 I-Codes - Energy Cost Impact Analysis

CODE CHANGE #	2017 FBC-ENERGY CHANGES TO 2015 I-CODES SUMMARY	FBC-ENERGY COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
EN6764	Updates duct testing requirements in Section R403.2.2 to ANSI/RESNET/ICC 380-2015.		X		
EN6765	Adds to Table R405.5.2(1) requirements of ANSI/RESNET/ICC 380-2015 from Table R405.5.2(2) .		X		
EN6782	Change C405.6.3 to read the same as ASHRAE 90.1-2013 Addendum c 8.4.1 Voltage Drop. The conductors for feeders and branch circuits combined shall be sized for maximum of 5% voltage drop total.	X			Approx. 0.5% construction cost reduction
EN6806	Permit air leakage testing of low-rise R-2 as permitted for commercial by allowing builders to test the entire building as a whole.	X			Increasing compliance options, may reduce costs
EN6820	Modifies air leakage rate in Section R402.4.1.2 from not exceeding 5 to 7 air changes per hour in Climate Zones 1 and 2.		X		
EN6821	Modify air leakage rate from 5 to 7 exchanges for Standard Reference Design in Table R405.5.2(1).		X		
EN6920-R1	Modify air leakage rate from 5 to 7 exchanges for Standard Reference Design in Table R405.5.2(1).		X		
EN6924	Revise Section R405.7.6 to allow for energy STAR certified ceiling fans.		X		
EN6926	Amends in Table R402.1.1 the climate zone 1 fenestration U-factor requirement in Table R402.1.1 to "NR," consistent with the 2015 IECC.		X		
EN6927	Removes from Table R405.5.2(1) excess language in the performance path related to homes not tested for air leakage.		X		
EN6984	Replaces existing Standard with the new American National Standard, but does not change duct testing requirements in Table R402B		X		
EN6998	Sets in Table R405.5.2(1) proposed design non-tested duct leakage Qn for performance compliance calculations.		X		
EN7003	Revises in Section C403.2.12.3 label requirement for Fan efficiency grade (FEG) requirements.		X		
EN7006	Clarifies in Section R403.6 that ventilation design may include methods other than mechanical.		X		
EN7007	Clarifies the "Worst Case" orientation calculation scenario in Section R405.4.2.1 and allows for identical building models to be permitted by documenting that the "Worst Case" requirements have been met.	X			Cost to comply will be reduced by eliminating confusing or redundant calculations.
EN7063	Corrects in Chapter 6 Association information, updates APSP-14 Standard to latest edition, and corrects code section number.		X		
EN7064	Updates the APSP-14 Standard in Chapter 6 to latest edition and corrects title and edition of the APSP-15 Standard.		X		
EN7077	Clarifies in Section R502.1 simulated performance compliance for building additions and adds Energy Rating Index compliance alternative for building additions.		X		
EN7079	Reinstates requirement to send in energy forms under Section R103.1.1.2.1.		X		

*For prescriptive Code changes only.

APPENDIX D

Table 4. Florida Specific Changes to the 2015 I-Codes- Mechanical Cost Impact Analysis					
CODE CHANGE #	2017 FBC-MECHANICAL CHANGES TO 2015 I-CODES SUMMARY	FBC-MECHANICAL COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
Sub Code:					
M6750	Adds Section 601.6 Balanced Return Air based on existing 2014 FBC language.		X		
M7010	Allows in Section 603.7 for an alternative material, foil-faced fiberglass duct in garages that does not compromise fire protection or allow harmful gases to penetrate the dwelling.	X			Reduces cost of installation and materials up to \$1,000 or more.
M7011	Eliminates in Section 606 duplication of Smoke Detectors in both the supply and return side of air distribution systems and other changes to be in compliance with the Florida Fire Code.	X			Cost savings of \$500 - \$2000 per system.
M7022	Incorporates the National Fire Codes as referenced standards as they are referenced in the Florida Fire Code to ensure consistency between codes.		X		

*For prescriptive Code changes only.

APPENDIX E

Table 5. Florida Specific Changes to the 2015 I-Codes- Plumbing Cost Impact Analysis					
CODE CHANGE #	2017 FBC-PLUMBING CHANGES TO 2015 I-CODES SUMMARY	FBC-PLUMBING COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
Sub Code:					
P6667	Replaces Appendix F with modified version which reflects updated industry standards that ensure water efficiency, reduction of nutrient runoff and change technical terms to those that are standard industry terminology.		X		
CA6473	Implements 553.73 (7) (d) FS including Declaratory Statements in the Section 202 of updated edition of the FBC (licensed design professionals include registered Interior designer).		X		
P6421	Reinstates the traditional 5-foot head testing for DWV systems, making it consistent with the Residential Code in Section 312.2.		X		
P6422	Modifies building sewer testing to 5-foot head in Section 312.6, making it consistent with interior DWV testing and with IRC requirements.		X		
P6418	Adds requirements for recessed shower compartments in Section 417.5.2, and provides an exception for shower linings in such.		X		
P6423	Provides options for thermal expansion control devices for water heaters in Section 607.3.		X		
P6416	Restores in Section 614 of the 2010 FBC Plumbing code which regulates private potable water wells.			X	Permit Fee

*For prescriptive Code changes only.

APPENDIX F

Table 6. Florida Specific Changes to the 2015 I-Codes- Fuel Gas Cost Impact Analysis					
CODE CHANGE #	2017 FBC-FUEL GAS CHANGES TO 2015 I-CODES SUMMARY	FBC-FUEL GAS COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
Sub Code:					
CA6470	Implements 553.73 (7) (d) FS including Declaratory Statements in the Section 202 of updated edition of the FBC (licensed design professionals include registered Interior designer).		X		
P6849-R1	Expands FBC-Fuel Gas, Chapter 2, Section 202 definition for Appliance to include those that compresses fuel gases.		X		
P6833	Replace the 2015 ICC base code language with the 2018 ICC base code language in Section 401.10 and add an exception to testing based on materials used in compliance with Section 403.		X		
P6831-R1	Provides exceptions to pipe identification requirements in Section 401.9.		X		
P6851-R1	Modifies Section 404.4 to allow NFPA 7.1.5 Piping Through Foundation Walls.		X		

*For prescriptive Code changes only.

APPENDIX G

Table 7. Florida Specific Changes to the 2015 I-Codes- Residential Cost Impact Analysis					
CODE CHANGE #	2017 FBC-RESIDENTIAL CHANGES TO 2015 I-CODES SUMMARY	FBC-RESIDENTIAL COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
Sub Code:					
CA6468	Implement 553.73 (7) (d) FS including Declaratory Statements in Section R202 of updated edition of the FBC (licensed design professionals include registered Interior designer).		X		
F6799	Delete Tables R302.1(1) and R302.1(2) and add Table R302.1		X		
F6801-R!	Reduces in Section 312.1.1 required distance to 24 inches (914 610 mm) horizontally to the edge of the open side.		X		
F6803	Amends Section R325.5 to clarify the wall height to be not less than 36 inches and not more than 42 inches		X		
F6808	Retains in Section R302.5.2 from 2014 FCBR to allow Class 0 or Class 1 duct board for dwelling/garage penetration.		X		
F6809	Carries forward in Section R311.3.1 from 2014 FBCR Florida specific amendment allowing exterior door to swing over step down.		X		
F6810	Carries forward 2014 FBC language in Section R311.3.2 to allow an outswing door without a landing to minimize water intrusion at exterior doors while allowing outswing doors for better wind design protection.		X		
F6811	Carries forward in Section R311.7.6, from 2014 FBCR, a Florida specific amendment to allow an outswing door without a landing.		X		
F6822-R1	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).	X			Decreases unit cost by \$2000 to \$3000.
F6823	Modifies definition of Fire Separation Distance in Section R202 to include zero lot line.	X			Decreases unit cost by \$2000 to \$3000.
F6852	Clarifies in Section R302.2 that walls per Section R302.1 requirement is for separate walls satisfying the zero clearance from the property line between units and defines townhouse in line with Florida Statute; and deletes exception to requirements for structural independence.		X		
F6856	Modifies definition of townhouse in Section R202 to incorporate Ch. 481 F.S.		X		
F6913	Carries forward in Section 202 from 2014 FBC definition of Means of Escape		X		
F6916	Carries forward in Section R310.4 from 2014 FBC provision allowing protection of openings during threat of storm with clarifying modification.		X		
F7040	Retains in Section R302.1 from 2014 FBCR exception from fire-resistance-rating for screen enclosure walls.		X		
F7041	Retains in Section R302.1 from 2014 FBCR exception for 2-family dwellings from fire-resistance-rating for screen enclosure walls.		X		
M6748	Modification to Section R1602.3 to reintroduce 2014 FBC language on balance return air requirement and exceptions.		X		
M6816	Adds reference to AHU in attics from FBC-EC R403.2.6.		X		

Table 7. Florida Specific Changes to the 2015 I-Codes- Residential Cost Impact Analysis

CODE CHANGE #	2017 FBC-RESIDENTIAL CHANGES TO 2015 I-CODES SUMMARY	FBC-RESIDENTIAL COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
M6819	Modify in Section 303.4 air changes triggering whole house mechanical ventilation to less than 3.	X			Cost reduction if not required to install whole-house mechanical ventilation.
M7015	Exempts in Section R1411.8 the use of locking caps on refrigerant ports on residential outside equipment if the port is inside the cabinet and not generally accessible.	X			Cost savings of up to \$100.
M7017-R1	Specifies in Section 1502.4.1 exhaust ducts of 4" metal with smooth interior finish and constructed of metal having a minimum thickness of 0.0157 inches and allows 4 inches nominal in diameter Schedule 40 PVC when horizontally run beneath the slab."		X		
M7019	Changes in Section R1503.2 the ground clearance for PVC outside pipe from 1" to 8" above grade to allow space for connection of a vent cap or hood when installing a downdraft range vent.	X			May Decrease install cost of downdraft range vent by \$100-\$200 per dwelling
P6419	Adds to Section P2709.2 requirements for recessed shower compartments		X		
P6420	Modifies building sewer testing in Section P2503.4 to 5-foot head		X		
P6854-R1	Adds apparatus that compresses fuel gases to Appliance definition in FBCR Section G2403.		X		
P6857-R1	Provides exceptions to pipe identification requirements in Section G2412.9 (401.9).		X		
P6859-R1	Replace the 2015 ICC base code language with the 2018 ICC base code language in Section G2412(401.10) and add an exception to testing based on materials used in compliance with Section G2414.		X		
R6597	Carries forward fire classification criteria in Section R902 from 2014 FBCR.		X		
R6599	Carries forward in Section R903 from 2014 FBCR weather protection criteria.		X		
R6601	Carries forward in Section 904 from 2014 FBCR provisions for the proper installation of roofing systems and components.		X		
R6604-R1	Carries forward in Section R905.2 from 2014 FBCR asphalt shingles and underlayment criteria.		X		
R6605-R1	Carries forward in Section R905.3 from 2014 FBCR clay and concrete tile criteria.		X		
R6607-R1	Carries forward in Section R905.2 from 2014 FBCR metal shingles and underlayment criteria.		X		
R6608	Modify Section R905.5 from 2014 FBCR to require that underlayment comply and be installed in accordance with Section R905.1.1.		X		
R6609-R1	Carries forward in Section R905.2 from 2014 FBCR Slate and slate-type shingles criteria.		X		

Table 7. Florida Specific Changes to the 2015 I-Codes- Residential Cost Impact Analysis

CODE CHANGE #	2017 FBC-RESIDENTIAL CHANGES TO 2015 I-CODES SUMMARY	FBC-RESIDENTIAL COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
R6626	Adds in R905.9.2.1 from 2014 FCBR requirement that rosin paper shall be used when the membrane is applied directly to a wood deck or cementitious fiber decks.		X		
R6627-R1	Carries forward in Section R905.10 from 2014 FBCR standards and minimum thicknesses shown in Table R905.4.4 for metal roof panels.		X		
R6628	Adds in Section R905.11 from 2014 FBCR Table R301.2(2) and added ASTM D6509 to Table R905.11.2.		X		
R6629	Incorporates in Section R905.12.3 from 2014 FBCR Table R301.2(2).		X		
R6630	Incorporates in Section R905.13.3 from 2014 FBCR Table R301.2(2)3		X		
R6631	Incorporates in Section R905.14.3 from 2014 FBCR Table R301.2(2)3		X		
R6632	Incorporates in Section R905.15.3 from 2014 FBCR Table R301.2(2)3		X		
R6633	Carries forward in Section R905.16 from 2014 FBCR building-integrated Photovoltaic roofing modules/shingles requirements.		X		
R6634	Adds in Section R905.17 from 2014 FBCR rooftop mounted photovoltaic systems design requirements.		X		
R6635	"Removes Section R907 on rooftop-mounted photovoltaic systems		X		
R6636-R1	Added in Section R908 from 2014 FCBR reroofing and recovering requirements.		X		
R6637	Removes Section R909 on rooftop-mounted photovoltaic systems		X		
R6669	Carries forward in Section R903.2 from 2014 FBCR definition of flashing.		X		
R6670	Carries forward in Section R903.2.1 from 2014 FBCR flashing location requirements.		X		
R6671-R1	Adds in Section 905.1.1 from 2014 FBCR underlayment Table 905.1.1.		X		
R6672	Adds in Section R905.2 from 2014 FBCR compliance with RAS-115 as an alternative compliance option for asphalt shingles.		X		
R6673	Adds in Section R905.2 from 2014 FBCR that underlayment to be installed in accordance with Section R905.1.1.		X		
R6674	Adds in Section R905.2.5 from 2010 FBCR alternate method for attachment of asphalt shingles to be exposed from below sheathing.		X		
R6675	Adds in Section R905.2.8 from 2014 FBCR RAS 111 as alternate compliance method for flashing for asphalt shingles.		X		
R6676	Adopts Section R905.2.8.1 from 2014 FBC to specify installation requirements for base and cap counter flashing.		X		
R6678	Carries forward in Section 905.3.8 from 2014 FBCR language on flashing and counterflashing.		X		
R6679	Modify Section R905.4.3 from 2014 FBCR to require that underlayment comply and be installed in accordance with Section R905.1.1.		X		
R6680	Adds in Section R905.5.3 from 2014 FBCR that underlayment to be installed in accordance with Section R905.1.1.		X		
R6681	Adds in Section R905.6.3 from 2014 FBCR that underlayment to be installed in accordance with Section R905.1.1.		X		
R6684	Adds to Section R905.10.5 from 2014 FBCR underlayment installation requirements.		X		
R6685	Adds in Section R905.14.3 from 2014 FBCR compliance with RAS-109 and 109-A as a B597 alternative compliance option for sprayed polyurethane foam roofing.		X		

Table 7. Florida Specific Changes to the 2015 I-Codes- Residential Cost Impact Analysis

CODE CHANGE #	2017 FBC-RESIDENTIAL CHANGES TO 2015 I-CODES SUMMARY	FBC-RESIDENTIAL COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
R6686	Modify Section R905.16.3 from 2014FBCR to require that underlayment comply and be installed in accordance with Section R905.1.1.		X		
R6687-R1	Changes R908 heading to Existing Roofing.		X		
R6688	Added Section R908.1.1 from 2014 FCBR that no more than 25 percent of the total roof area or roof section of any existing building or structure shall be repaired		X		
R6689	Adds in Section R908.6 from 2014 FBCR RAS 111 as alternate compliance method for flashing		X		
R6691-R2	Carries forward in Section R905.7 from 2014 FBCR wood shingles criteria.		X		
R6692-R2	Carries forward in Section R905.7 from 2014 FBCR wood shakes criteria.		X		
R6768	Modifies Section R904.4 to include identification of site manufactured roofing materials.		X		
R6776-R1	Modifies Section 905.4 and 905.5 to insure the metal roof shingles and metal roof panels are manufactured to demonstrate compliance with the structural wind load requirements of the FBC via periodic inspections.		X		
R6779	Add a definition to Section R202 to clarify who is a metal roof covering manufacturer.		X		
R6784-R1	Incorporates in Section 905.10 quality assurance requirements.		X		
R7081	Updates in Chapter 46 ASTM D1970-13 to ASTM D1970-15.		X		
S6358	Carries forward from 2014 FBC garage door wind load Table 301.2.1(4).		X		
S6359	Carries forward in Section R609.3.2 from 2014 FBC garage door labeling requirements.		X		
S6360	Continues in Section R609.4 from FBCR 2014 specific garage door test requirements.		X		
S6425	Deletes in Section 301.2 Figures R301.2(4)A and R301.2(4)B and adds Figure R301.2(4) Wind maps to be consistent with 2014 FBC Wind maps.		X		
S6478	Modifies Section R609.3 to reflect the updated reference to ANSI/WMA 100 standard.		X		
S6508	Updates in Chapter 46 AMD to MWA and AMD 100—2013 to ANSI/WMA 100-2016.		X		
S6535-R2	Updates of ASTM Standards Florida Residential Code Chapter 46 needed for AAMA manufactures.		X		
S6536-R3	Updates AAMA Standard(s) edition(s) in Chapter 46 for Products meeting the Product Approval requirements and manufacturers certifications for Florida Products		X		
S6541	Carries forward in Section R703.4 from 2014 FBCR AAMA Standard(s) and the Flashing Standard(s).		X		
S6548-R2	"Bring forward in Section 609.2 from 2014 FBC the labeling and comparative analysis that is currently in the 5th Edition of the FBCR and language to reflect publication ""AAMA Technical Paper Comparative Analysis of Sliding Glass and Bi-Fold Door Systems""."		X		
S6552	Carries forward in Section R301.2.1.6 in 2014 FBCR that the design pressures determined from ASCE 7 or the FBCB can be multiplied by 0.6 for testing protocols that are based on allowable or nominal wind loads.		X		

Table 7. Florida Specific Changes to the 2015 I-Codes- Residential Cost Impact Analysis

CODE CHANGE #	2017 FBC-RESIDENTIAL CHANGES TO 2015 I-CODES SUMMARY	FBC-RESIDENTIAL COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
S6570	Strengthens deflection limitation in Section R609.8 by adding language from AAMA TIR-A11-04 and TIR-A11-15.		X		
S6600	Reinstates in Section R301.2.1.6 the surface roughness and exposure category definitions from the 2014 FBCR that are consistent with the FBCB and ASCE 7-10.		X		
S6606	Coordinates in Section R301.2.1 the wind design required regions with limitations consistent with the 2014 FBCR.		X		
S6701	Carries forward in Section R401.2 from 2014 FBC the foundation requirements		X		
S6729	Adds in Section R703.1.2 from 2014 FBC the applicable design wind loads for soffits and wall covering.		X		
S6733	Modifies prescriptive fastening Table R703.4 for consistency with 2014 FBCR and removes table entries that permit the use of staples.		X		
S6735	Establishes limits in Section R703.6.3 from 2014 FBCR for prescriptive attachment of wood shake and shingle wall coverings		X		
S6736	Establishes in Section R703.8 from 2014 FCBR limits for prescriptive attachment of masonry veneers.		X		
S6737	Clarifies in Section R703.9 from 2014 FBCR that EIFS needs to be designed or tested for the applicable design wind loads.		X		
S6739-R2	Clarifies in Section R703.11 from 2014 FBCR required design wind pressure rating adjustments for vinyl siding installed over foam plastic sheathing.		X		
S6745	Requires Section R803.2.3 from 2014 FBCR the use of RSRS-01 ring shank roof sheathing nail meeting the specifications in ASTM F 1667 for roof decking attachment.		X		
S6807	Carries forward in Section R202 definition for Decorative Cementitious Finish from 2014 FBC.		X		
S6813-R1	Carries forward in Section R609.2.1 from 2014 FBCR custom (one-of-a-kind) exterior door assemblies testing and approval process.		X		
S6814-R1	Adds provisions in Section R609.9 from 2014 FBCR allowing interchanging of door components.		X		
S6824	Modifies in Section R703.7.4 time allowed between coats of exterior plaster to allow use of ASTM C 926.		X		
S6825	Modifies in Section R703.7.5 curing time for finish coat for two-coat cement plaster to allow application of ASTM C 926.		X		
S6846	Amends Section R606.2.12 to require ladder-type joint reinforcement and adds corrosion protection for joint reinforcement where provided in exterior walls.			X	\$0.16-\$0.20 per lineal foot of wall.
S6850	Updates in Chapter 46 ASTM C 90.		X		
S6862	Adds MAF-97 document from 2014 FBC to Chapter 46		X		
S6863	Carries forward in Section R301.2.1.1 from 2014 FBC provisions in the current code for the construction of masonry residential structures within certain limits.		X		
S6895	Carries forward in Section R606.3.1.1 from 2014 FBCR masonry opening tolerances.		X		
S6896-R1	Carries forward in Section 609 from 2014 FBCR specific amendments adding reference to masonry rough openings; door component interchangeability; and optional exterior door component testing.		X		

Table 7. Florida Specific Changes to the 2015 I-Codes- Residential Cost Impact Analysis					
CODE CHANGE #	2017 FBC-RESIDENTIAL CHANGES TO 2015 I-CODES SUMMARY	FBC-RESIDENTIAL COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
S6897	Carries forward in Section R611 from 2014 FBC provisions adding a section on Impact-Resistant Coverings.		X		
S6940	Revises the prescriptive wood structural panel exception for opening protection in windborne debris regions in Section R301.2.1.2.			X	Minimal cost increase
S6958	Changes glazing to glazed openings and adds TAS 201		X		
S6974	Replaces in Section R609.6 "exterior windows and glass doors" with "glazed openings".		X		
S6977-R1	Adds in Section 506 use of welded wire fabric or synthetic fiber reinforcement for slabs-on-ground			X	Adds \$5-6 per cyd for microSynthetic fiber and \$16-17 per cyd for Macro Synthetic Fiber and \$11-25 per cyd of concrete depending on slab thickness and WWF gage.
S6979	Adds Section 506.2.4.2 to ACI 332-14 in Chapter 46.		X		
S7024	Carries forward modifications of definition of habitable space from 2014 FBC in Section R202 and modifies to refer to definitions now found in base code about screen enclosures and sunrooms.		X		
S7027	Carries forward in Section R202 definition of screen enclosure from 2014 FBC.		X		
S7028	Carries forward in Section R202 modification to sunroom definition from 2014 FBC.		X		
S7039	Retains in Chapter 46 from 2014 FBC reference information on AAF.		X		
S7048-R2	Brings forward from 2014 FBC reference to the AAF Guide to Aluminum Structures in High Wind Areas and additional language to amplify the reference in the current code to Figure 1609C of the FBCB.		X		
S7055	Carries forward in Section R301.9 from 2014 FBC provisions for design of exterior wall coverings and soffits.		X		
SW6530-R1	Adds requirements in Section 4501.16 for GFCI protection for outlets supplying electrical equipment at new private (residential) swimming pools.			X	Increase of up to \$250
SW6991	Updates in Chapter 46 the APSP-3 and APSP-7 referenced standards to the new editions and corrects title of APSP-6.		X		
SW7061	Updates in Section R4501.6.1 the NSPI 3 reference with the new edition title of ANSI/APSP/ICC 3 and APSP 7.		X		

*For prescriptive Code changes only.

APPENDIX H

Table 8. Florida Specific Changes to the 2015 I-Codes- Test Protocol Cost Impact Analysis					
CODE CHANGE #	2017 FBC-TEST PROTOCOL CHANGES TO 2015 I-CODES SUMMARY	FBC-TEST PROTOCOL COST IMPACT			ESTIMATED AMOUNT*
		Decrease	None	Increase	
Sub Code:					
CA6470	Implements 553.73 (7) (d) FS including Declaratory Statements in the Section 202 of updated edition of the FBC (licensed design professionals include registered Interior designer).		X		
R7083-R1	Updates TAS 114 protocol referenced in Section 1.		X		
R7084	Modified and updated the ROOFING APPLICATION STANDARD (RAS) No. 109 in Section 1.		X		
R7085	Updates RAS 115 protocol referenced in Section 1.		X		
R7086	Updates RAS 117 protocol referenced in Section 1.		X		
R7087	Updates RAS 150 protocol referenced in Section 1.		X		
R7089	Updates TAS 100 protocol referenced in Section 1.		X		
R7090-R2	Updates TAS 103 protocol referenced in Section 1.		X		
R7091-R1	Updates TAS 104 protocol referenced in Section 1.		X		
R7092	Updates TAS 107 protocol referenced in Section 1.		X		
R7093-R2	Updates TAS 110 protocol referenced in Section 1.		X		
R7094	Updates TAS 111(A) protocol referenced in Section 1.		X		
R7095-R2	Updates TAS 111(B) protocol referenced in Section 1.		X		
R7096	Updates TAS 111(C) protocol referenced in Section 1.		X		
R7097	Updates TAS 121 protocol referenced in Section 1.		X		
R7098	Updates TAS 124 protocol referenced in Section 1.		X		
R7099	Updates TAS 132 protocol referenced in Section 1.		X		
R7100	Updates TAS 138 protocol referenced in Section 1.		X		
S6611	Revises in Section 5.1.1 the requirement for the deflection of structural wall panels (siding) and roof panels made of formed metal sheets based on testing that demonstrated that increased deflection had no impact on performance.		X		
S7088	Updates TAS 100(A) protocol referenced in Section 1.		X		

*For prescriptive Code changes only.

**APPENDIX I
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 (M.E.P.) 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 Herbert C. 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.

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.