

## **Development of the Compliance Software Tool Assistance Manual for the 7th Edition (2020) Florida Building Code – Energy Conservation**

### **Draft Scope of Work**

Submitted by:  
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#### **Background:**

The Florida Building Commission has requested FSEC to provide a Technical Assistance Manual (TAM) for the 2020 Florida Building Energy Code (FEC) for both residential and commercial buildings. This project reviews and updated the 2017 TAM to make it consistent with the requirements of the 2020 Florida code. Furthermore it updates vendor's compliance software evaluation test suite and expected results, and adds new compliance methods and resources as needed.

#### **Residential Section Scope of Work:**

##### **Task 1: Review Residential Section of the 2017 Florida Code for Prescriptive Methods**

This task conducts thorough reviews of the 2020 Florida code to identify updates that need to be incorporated into the 2020 TAM including new or updated compliance method and associated test suite.

##### **Task 2: Review and update Residential Section of the 2017 Technical Assistance Manual**

This task conducts a comprehensive review of the residential sections of the 2017 Technical Manual, updates each section to meet the requirements of the 2020 Florida and modifies the test cases assumptions and results as needed. The residential section of the 2020 TAM update major effort are summarized below:

- Review and update the TAM residential prescriptive code compliance method Sections:
  - Residential Prescriptive General Requirement (Section 6.1);
  - Residential Prescriptive R-Value Method (Section 6.2);
  - Residential Prescriptive U-Factor Alternative Method (Section 6.3); and
  - Residential Prescriptive Total UA Alternative Method (Section 6.4).
- Review and update the TAM residential performance compliance method Sections:
  - Performance Method (Section 6.6):
- Review and update the TAM Energy Rating Index (ERI) alternative compliance method Sections:
  - Energy Rating Index Alternative Method (Section 6.7):

- Review and update the 2017 TAM appendix sections of the residential code compliance methods including minimum reporting requirements:
  - Appendix R-1 Testing and Reporting Overview;
  - Appendix R-2 Prescriptive R-Value Method;
  - Appendix R-3 Prescriptive U-Factor Alternative Method;
  - Appendix R-4 Prescriptive Total UA Alternative Method;
  - Appendix R-5 Performance Compliance Method;
  - Appendix R-6 Energy Rating Index Alternative Method; and
  - Appendix R-7 through Appendix R-12 as needed.

**Task 3: Review and Update Residential Section of Vendor's Compliance Software Evaluation Materials**

Conduct thorough review of vendor's compliance software evaluation test suite, update input assumptions, and modify the expected results to meet requirements of the 2020 Florida code. Input assumptions review include: opaque envelope, fenestration and skylights, system, domestic hot water, etc., for all required compliance methods. The review includes all existing test suites for residential Prescriptive, Performance, and Energy Rating Index compliance methods, and reporting requirements of the 2020 Florida code compliance.

- Review and update the accompanying software evaluation spreadsheet of the residential prescriptive code compliance method, “Residential Prescriptive Compliance Test 2017.xlsx”. The spreadsheet includes software evaluation results and acceptance criteria for:
  - Residential Prescriptive R-Value Method;
  - Residential Prescriptive U-Factor Alternative Method; and
  - Residential Prescriptive Total UA Alternative Method.
- Review and update the accompanying software evaluation spreadsheets of the residential performance method. The spreadsheets include software evaluation results and acceptance criteria for:
  - ASHRAE Standard 140 Tests (“ASHRAE-Std-140\_Results-Form.xlsx”);
  - 2017-HERS\_Auto Generation Tests (“2017-HERS\_AutoGen\_Results-Form.xlsx”);
  - Florida HERS BESTEST (“FL-HERS\_BESTEST\_results-form.xlsx”);
  - HVAC Tests (“HVACresult\_form.xlsx”);
  - Duct Distribution System Efficiency (DSE) Tests (“DSEresults\_form.xlsx”);
  - Domestic Hot Water System Performance Tests (“2017\_DHW-Results\_form.xlsx”); and
  - Florida e-Ratio Tests (“FL\_eRatio\_results.xlsx”).

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- Review and update the accompanying software evaluation spreadsheet s of the residential Energy Rating Index alternative compliance method. The spreadsheets include software evaluation results and acceptance criteria for:
  - Florida ERI Tests (“2017-Florida\_ERI-Test\_Results-form.xlsx”); and
  - Florida Code ERI Tests (“2017-FLCode\_ERIFromEndUses\_Results-form.xlsx”).

**Residential Section Estimated Budget: \$ 22,000.0**

### **Commercial Section Scope of Work:**

#### **Task 4: Review Commercial Section of the 2020 Florida Code and ASHRAE 90.1-2016**

This task conducts thorough reviews of the 2020 Florida code (IECC 2018) and ASHRAE 90.1-2016 to identify updates that need to be incorporated into the 2020 TAM including new or updated compliance method and associated test suite.

#### **Task 5: Review and Update Commercial Section of the 2017 Technical Assistance Manual**

This task conducts comprehensive review of the commercial sections of the 2017 Technical Manual, and updates each section to meet the requirements of the 2020 Florida code and ASHRAE 90.1-2016. The TAM commercial sections that need review and update include Sections 7.1, 7.2, 7.3, and 7.4. The test suite assumptions and results in the TAM will be reviewed and updated as needed to make them compatible with the 2020 Florida Energy Code and ASHRAE Standard 90.1-2016. Summary of the TAM update efforts include:

- Test suites description and input assumptions in the TAM and accompanying test suite spreadsheet (“*CommercialCodeComplianceTestSuite.xlsx*”);
- Review and update the TAM appendix commercial section including minimum reporting requirements and compliance report forms (Appendix-C).
- Add ASHRAE’s Performance Rating Method – a new compliance method based on the 2016 ASHRAE Standard 90.1 Appendix-G to the 2020 TAM. This effort includes creating a test suite, evaluation method and reporting requirement as needed.
- Also the 2020 TAM updates include various references and cross-references that need to be consistent with the 2020 FEC, 7<sup>th</sup> Edition, and ASHRAE Standard 90.1-2016.

#### **Task 6: Review and Update Commercial Section of Vendor's Compliance Software Evaluation Materials**

This task conducts a thorough review of vendor's compliance software evaluation test suite, updates input assumptions, and modifies the expected results to meet requirements of the 2020 Florida energy code and ASHRAE 90.1-2016 code. Input assumptions review includes: opaque envelope, fenestration and sky lighting, interior and exterior lighting, system, service hot water, electric motors, etc., for all required compliance methods. All existing test suites for the FEC Prescriptive, FEC Total Building Performance, FEC Component Performance Alternative, ASHRAE Prescriptive, ASHRAE Envelope Trade-off Option, and ASHRAE Energy Cost Budget

compliance methods evaluation and reporting requirements of the 2020 Florida code will be reviewed and updated. The software evaluation procedure will add new compliance method ASHRAE's Performance Rating method. This new performance based alternative compliance method is described in ASHRAE Standard 90.1-2016 Appendix-G. The commercial sections of the TAM that need review and update include:

- Performance Based Method Evaluation Procedure and accompanying verification spreadsheet ("*CommercialPerformanceMethodsResults.xls*"). Each of the test cases will be reviewed and updated for *FEC Total Building Performance Method* per the 2020 FEC and for *ASHRAE Energy Cost Budget Method* per ASHRAE Standard 90.1-2016. The performance compliance methods test suite includes: six prototype buildings and the two Florida climate zones for FEC and ASHRAE Standard 90.1-2016;
- Prescriptive Method Evaluation Procedure and accompanying spreadsheet ("*CommercialPrescriptiveMethodsResults.xlsx*"). Each of the test cases will be reviewed and updated for *FEC Total Building Performance Method* per the 2020 FEC and for *ASHRAE Energy Cost Budget Method* per ASHRAE Standard 90.1-2016. The prescriptive compliance methods test suite includes: two prototype buildings and the two Florida climate zones for FEC and ASHRAE Standard 90.1-2016; and
- Envelope Trade-Off Option Method Evaluation Procedure and accompanying spreadsheet ("*CommercialEnvelopeTradeOffMethodResults.xlsx*"). The envelope trade-off compliance option for ASHRAE Standard 90.1-2016 has been replaced with new procedure. We will review and update test case and validation spreadsheet as needed;
- Component Performance Alternative Method Evaluation Procedure and accompanying spreadsheet ("*CommercialComponentPerformanceMethodResults.xlsx*"). The two test cases, test results and evaluation procedure and spreadsheet will be reviewed and updated as needed.
- Software compliance evaluation procedure and spreadsheet will be formulated for ASHRAE's Performance Rating Method as needed.

**Commercial Section Estimated Budget: \$ 32,000**

#### **Task 7: Final Report**

The final report includes the 2017 Florida code Technical Assistance Manual appendices concerning methods and reporting, and associated code compliance software evaluation spreadsheets, and other supplemental data as needed.

**Final Report Estimated Budget: \$ 6000.0**

#### **Proposed Budget and Schedule**

Total estimated budget is **\$ 60,000.0**. Work will be complete by December 30, 2020.

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### **Deliverables**

FSEC will deliver the 2020 Technical Assistance Manual, compliance software evaluation spreadsheets and supplemental data that provides guidance to approval of compliance software tools with the 2020 Florida Building Energy Code for residential and commercial buildings.

**Deliverable** Technical Assistance Manual, compliance software evaluation spreadsheets and supplemental data that provides guidance to approval of compliance software tools with the 2020 Florida Building Energy Code for residential and commercial buildings. – **December 30, 2020.**

### **References:**

2020 Florida Building Code 7<sup>th</sup> Edition – Energy Conservation

2017 Florida Building Code 6<sup>th</sup> Edition – Energy Conservation.

2017 Florida Building Code – Energy Conservation, Energy Simulation Tool Approval Technical Assistance Manual.

ASHRAE. 2013. ANSI/ASHRAE/IES Standard 90.1-2013. Energy Standard for Buildings Except Low-Rise Residential Buildings. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Atlanta, Georgia.

IECC. 2014. 2015 International Energy Conservation Code. International Code Council, Inc. Washington, D.C. 2001.

ASHRAE. 2016. ANSI/ASHRAE/IES Standard 90.1-2016. Energy Standard for Buildings Except Low-Rise Residential Buildings. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Atlanta, Georgia.

IECC. 2018. 2018 International Energy Conservation Code. International Code Council, Inc. Washington, D.C. 2001.