



**HOUSTON  
PUBLIC WORKS**

# **CITY OF HOUSTON'S 2021 CODE UPDATE**

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## **PRESENTATION TO ASHRAE HOUSTON**

**AUGUST 10, 2023**



# HOUSTON PUBLIC WORKS

## PURPOSE

together we create a strong foundation  
for Houston to thrive

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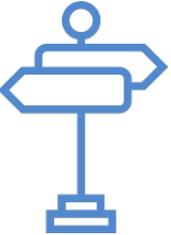


## 5 TO THRIVE VALUES

respect | ownership | communication | integrity | teamwork

# HOUSTON PUBLIC WORKS

**16,000**  
LANE MILES OF  
STREETS



**3,900**  
MILES OF  
STORM DRAINS



**163B**  
GALLONS OF WATER  
TREATED PER YEAR



**2,450**  
TRAFFIC SIGNALS



**2,800**  
MILES OF  
ROADSIDE DITCHES



**5.8M**  
WATERBILLS  
SENT PER YEAR



**467**  
TYPES OF PERMITS



**\$2.7B**  
ANNUAL BUDGET



**4,200**  
EMPLOYEES



# BCE PERMITS BY THE NUMBERS

Commercial Building  
Permits FY22

7,758 building  
permits

Average 31  
permits per day

Residential Building  
Permits FY22

18,001 building  
permits

Average 72  
permits per day

# BCE PERMITS BY THE NUMBERS

Commercial Permits  
2022 – Present

67,902 permits

Average 272  
per day

Residential Permits  
2022 – Present

164,446  
permits

Average 658  
per day

# 2021 BUILDING CODE ADOPTION PROCESS



# 2021 CODE UPDATE PROCESS



# TASK FORCE GROUP/CODE UPDATE PROCESS

## TFG-1 Commercial

12 Community  
Participants  
28 City Staff

23 Meetings

58 Proposals  
Reviewed

## TFG-2 Residential

7 Community  
Participants  
26 City Staff

18 Meetings

33 Proposals  
Reviewed

## TFG-3 Energy Conservation

6 Community  
Participants  
13 City Staff

13 Meetings

52 Proposals  
Reviewed

## TFG-4 Mechanical, Electrical, and Plumbing

17 Community  
Participants  
20 City Staff

11 Meetings

23 Proposals  
Reviewed

# 2021 CODE UPDATE COMMUNITY STAKEHOLDERS

- Air Alliance for Houston
- American Fire Sprinkler Association (AFSA)
- American Fire Systems (AFS)
- American Institute of Architects (AIA)
- American Society of Civil Engineers (ASCE)
- American Society of Plumbing Engineers (ASPE)
- American Society of Sanitary Engineering (ASSE)
- ASHRAE
- Associated Builders & Contractors of Texas
- Associated General Contractors (AGC) - Houston
- Association of Chief Operating Engineers
- Audubon Houston
- Building Commissioning Association (BCxA)
- Building Officials Association of Texas (BOAT)
- Construction Industry Council-Houston Branch (HCIC)
- Construction Specifications Institute (CSI) Houston Chapter
- Greater Houston Builders Association (GHBA)
- Greater Houston Texas Restaurant Association (GHTRA)
- Greentown Labs
- Harris County Flood Control District
- Historic Buildings
- Historic Houston
- Hotel & Lodging Association of Greater Houston (H&LAGH)
- Houston Apartment Association (HAA)
- Houston Archeological and Historical Commission and AIA Historic Resource Committee
- Houston Building Owners & Managers Association (BOMA)
- Houston Business Roundtable (HBR)
- Houston Contractors Association (HCC)
- Houston Galveston Area Council (HGAC)
- Houston Gulf Coast Building & Construction Trades Association (HGCBCTA)
- Houston Habitat
- Houston Housing Collaborative (HHC)
- Independent Electrical Contractor (IEC)
- Institute of Real Estate Management (IREM)
- International Association of Plumbing & Mechanical Officials (IAPMO)
- International Code Council (ICC)
- Mechanical Contractors Association of Houston (MCAA)
- NAIOP, the Commercial Real Estate Development Association
- National Association of Manufacturers (NAM)
- National Electrical Contractors Association (NECA)
- National Fire Sprinkler Association (NFSA)
- National Systems Contractors Association (NSCA)
- New Hope Housing
- Sierra Club
- Society of Fire Protection Engineers (SFPE)
- South Central Partnership for Energy Efficiency as a Resource (SPEER)
- Super Neighborhood Representatives
- Texas Community Watershed Partners
- Texas Institute of Building Design (TIBD)
- Texas Society of Architects
- Texas Water Quality Association (TWQA)
- University of Houston (UH)
- Urban Land Institute (ULI)
- US Green Building Council (USGBC) of Houston (USGBC)
- Water Quality Association (WQA)

# 2021 HOUSTON CONSTRUCTION CODE

2021 Construction Code presentation to TTI Committee scheduled for Aug. 24th

Presentation to City Council for adoption in Sept/Oct

## Construction Code Update Includes:

- 2021 International Building Code
- 2021 International Existing Building Code
- 2021 International Fire Code
- 2021 International Residential Code
- 2021 International Swimming Pool and Spa Code
- 2021 International Energy Conservation Code
- 2021 Uniform Mechanical Code
- 2021 Uniform Plumbing Code
- 2023 National Electrical Code

# **BUILDING CODES 2021 SIGNIFICANT CHANGES**





# “GRANDFATHERING” PROJECTS

1

Will be the same as the current “grandfathering” process for the 2015 amendments

2

Applicable to all projects submitted before 2021 Codes effective date



# HOUSTON ASCE 7 EDITION UPDATE

1

Updates to rain, wind, and tornado loads for more resilient construction

2

Improves roof underlayment in high wind regions and water infiltration in hurricane prone regions

3

Expands the Risk Categories for certain Institutional occupancies and other high-risk occupancies



# WHAT TO EXPECT – 2021 SIGNIFICANT CHANGES – MECHANICAL

## Updates to Louvers



1

New Houston amendment to UMC louver provisions

2

Updates windspeeds for Windborne Debris and Hurricane Prone regions

3

Louvers will need to comply with AMCA 540 or 550

# WHAT TO EXPECT – 2021 SIGNIFICANT CHANGES – MECHANICAL

## Updates to Louvers Cont.

### 315.0 Louvers in Windborne Debris Regions ~~Hurricane Prone Regions~~.

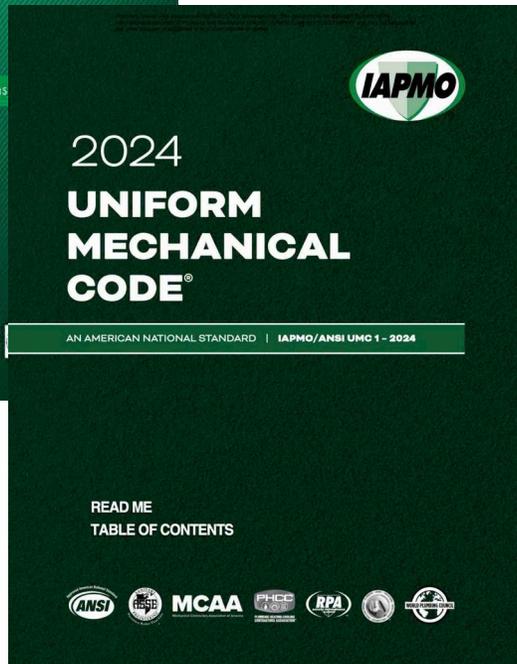
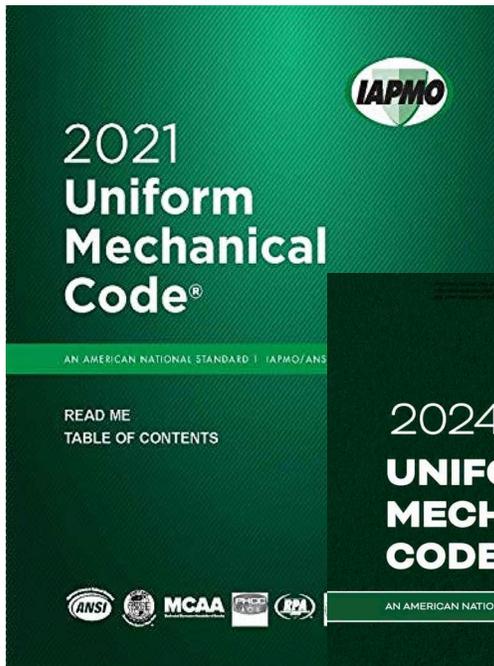
**315.1 General.** Louvers located in areas within hurricane-prone regions that are within 1 mile (2 km) of the coastal mean high water line where the basic wind speed is ~~130~~<sup>140</sup> miles per hour (mi/h) (~~58.1~~<sup>62.6</sup> m/s) or more; or portions of hurricane-prone regions where the basic wind speed is ~~140~~<sup>150</sup> mi/h (~~62.6~~<sup>67.1</sup> m/s) or more; or Hawaii, as described in ASCE 7 shall be tested in accordance with Section 315.1.1 and Section 315.1.2.

**315.1.2 Impact Resistance Test.** Upon request by the Authority Having Jurisdiction, louvers protecting intake and exhaust ventilation ducts that are not fixed in the open position ~~and located within 30 feet (9144 mm) of the grade~~ shall be tested for impact resistance in accordance with AMCA 540.

**315.2 Louvers in Hurricane Prone Regions.** Louvers that protect air intake or exhaust openings located in the Gulf of Mexico coasts where the basic wind speed for Risk Category II buildings is greater than 115 miles per hour (mi/h) (51.4 m/s) shall be tested in accordance with AMCA 550 for resistance to wind-driven rain.

# WHAT TO EXPECT – 2021 SIGNIFICANT CHANGES – MECHANICAL

## A2L Refrigerant Update



1

Updates to 2024 UMC language for A2L Refrigerants

2

Updates ASHRAE Standards 15 and 34 to the latest 2022 editions

3

Ensures compliance with Texas state law for substitute refrigerants

# WHAT TO EXPECT – 2021 SIGNIFICANT CHANGES – MECH/PLUMB

## Unvented Heaters & Composting Toilets



- 1 Removes historic Houston amendments
- 2 Changes occur in both UMC and UPC, as well as IRC
- 3 Heaters and toilets will need to comply with appropriate referenced standards

# WHAT TO EXPECT – 2021 SIGNIFICANT CHANGES – PLUMBING

## Drinking Fountain Updates



- 1 Removes outdated fountain exceptions
- 2 Incorporates 2021 IPC language for fountains
- 3 Allows for a wider range of substitutions

# WHAT TO EXPECT – 2021 SIGNIFICANT CHANGES – ENERGY

## Multifamily Residential Energy Sampling Options

### R402.4.1.4 Sampling options for R-2 multifamily dwelling units.

For buildings with eight or more testing units that must be tested as required by R402.4.1.2 or R402.4.1.3, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit, a middle floor unit, and a unit with the largest testing unit enclosure area. For each tested unit that exceeds the maximum air leakage rate, an additional three units shall be tested, including a mixture of testing unit types and locations. Where buildings have fewer than eight testing units, each testing unit shall be tested.

### R403.3.8 Sampling options for R-2 multifamily dwelling units.

### R403.6.4 Sampling options for R-2 multifamily dwelling units.



# WHAT TO EXPECT – 2021 SIGNIFICANT CHANGES – ENERGY

## Solar-Ready Appendices



1

Houston will continue adoption of Solar-Ready appendix for Residential

2

Will include Solar-Ready appendix for Commercial as an optional appendix

3

Intended to support future solar installs in both commercial and residential

# WHAT TO EXPECT – 2021 SIGNIFICANT CHANGES – ENERGY

## EV Ready Appendices



1

Houston Energy Code will include \*optional\* EV Ready appendix

2

Appendices in both Residential and Commercial Energy Codes

3

Intended to be used as guidelines for future EV installs

# WHAT TO EXPECT – 2021 SIGNIFICANT CHANGES – ENERGY

## C102.3 Information on construction documents

**2021 CODE: C103.2 Information on construction documents.** Construction documents shall be drawn to scale on suitable material. Electronic media documents are permitted to be submitted where approved by the code official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Energy compliance path.
2. Insulation materials and their *R*-values.
3. Fenestration *U*-factors and solar heat gain coefficients (SHGCs).
4. Area-weighted *U*-factor and solar heat gain coefficient (SHGC) calculations.
5. Mechanical system design criteria.
6. Mechanical and service water-heating systems and equipment types, sizes and efficiencies.
7. Economizer description.
8. Equipment and system controls.
9. Fan motor horsepower (hp) and controls.
10. Duct sealing, duct and pipe insulation and location.
11. Lighting fixture schedule with wattage and control narrative.
12. Location of daylight zones on floor plans.
13. Air sealing details, barrier and air sealing details, including the location of the air barrier.

1

1 addition, 1 modification

2

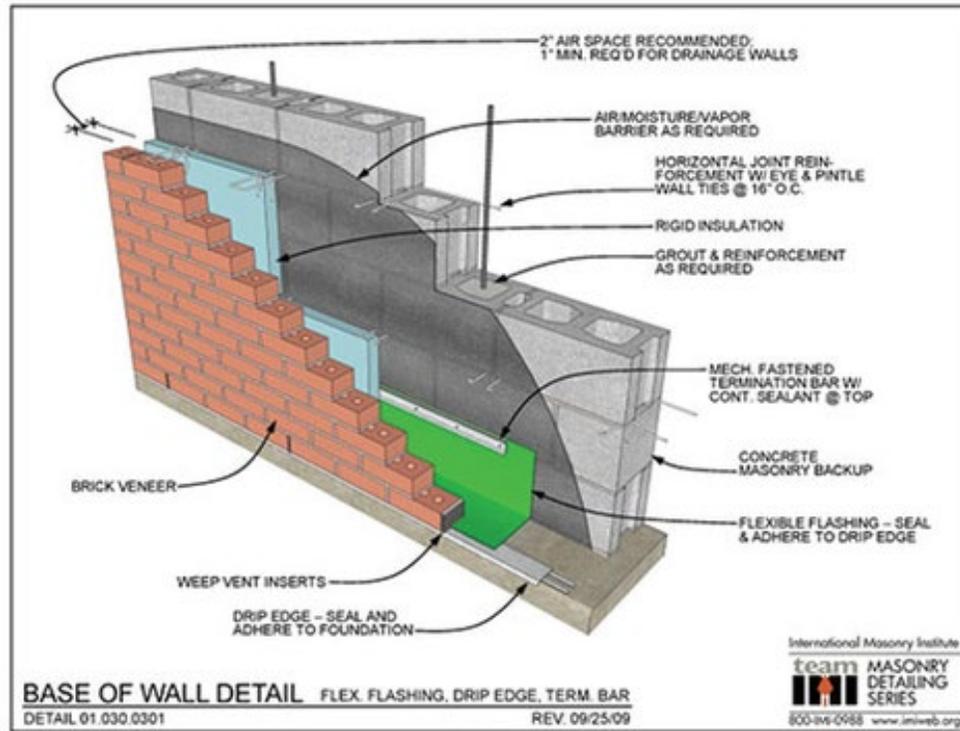
Energy compliance path  
(requirement added)

3

Air sealing barrier & air  
sealing details, including the  
location of the air barrier

# WHAT TO EXPECT – 2021 SIGNIFICANT CHANGES – ENERGY

## C402.5.1.5 Building envelope performance verification



1

Previously no performance  
verification

2

Inspection required

3

Cx report required for design  
professional or 3<sup>rd</sup> party

# WHAT TO EXPECT – 2021 SIGNIFICANT CHANGES - ENERGY

## C403.4.2.3 Automatic Start and Stop

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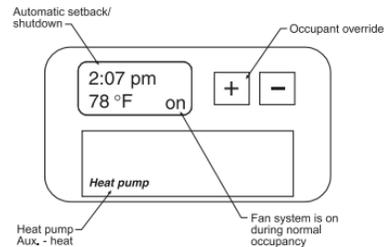
**CHANGE TYPE:** Modification

**CHANGE SUMMARY:** In addition to automatic start controls, HVAC systems with direct digital controls serving individual zones must have automatic stop controls.

**2021 CODE: C403.4.2.3 Automatic start and stop (Mandatory):** Automatic start and stop controls shall be provided for each HVAC system. The automatic start controls shall be configured to automatically adjust the daily start time of the HVAC system in order to bring each space to the desired occupied temperature immediately prior to scheduled occupancy. Automatic stop controls shall be provided for each HVAC system with direct digital control of individual zones. The automatic stop controls shall be configured to reduce the HVAC system's heating temperature setpoint and increase the cooling temperature setpoint by not less than 2°F (-16.6°C) before scheduled unoccupied periods based upon the thermal lag and acceptable drift in space temperature that is within comfort limits.

**CHANGE SIGNIFICANCE:** The 2018 IECC established requirements for automatic start controls. These controls automatically adjust the start time for warm up or cool down of the zone prior to occupancy so that the zone is at the appropriate temperature when it is scheduled to be occupied. Automatic stop controls, sometimes referred to as an optimum stop, are now required for HVAC systems with direct digital controls serving individual zones. The controls must be capable of decreasing the heating temperature setpoint by 2°F and increasing the cooling setpoint by 2°F for some time period before the scheduled unoccupied period where the temperature can drift within the comfort range using the adjusted setpoints. Typically this results in little heating or cooling for 30 to 60 minutes at the end of the occupied period.

This new provision is applicable to both IECC compliance paths.



Automatic start and stop are both required.

**1** Reorganized section from the 2015 IECC

**2** Modification of 2018 IECC

**3** Automatic stop controls ... for each HVAC system with DDC of individual zones

# WHAT TO EXPECT – 2021 SIGNIFICANT CHANGES - ENERGY

## C403.8.3 Fan Efficiency

### C403.4.2.3 Automatic Start and Stop

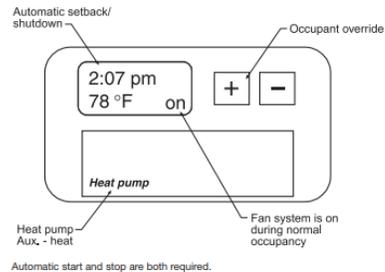
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1

New section from the 2015 IECC (ended at 403.5)

2

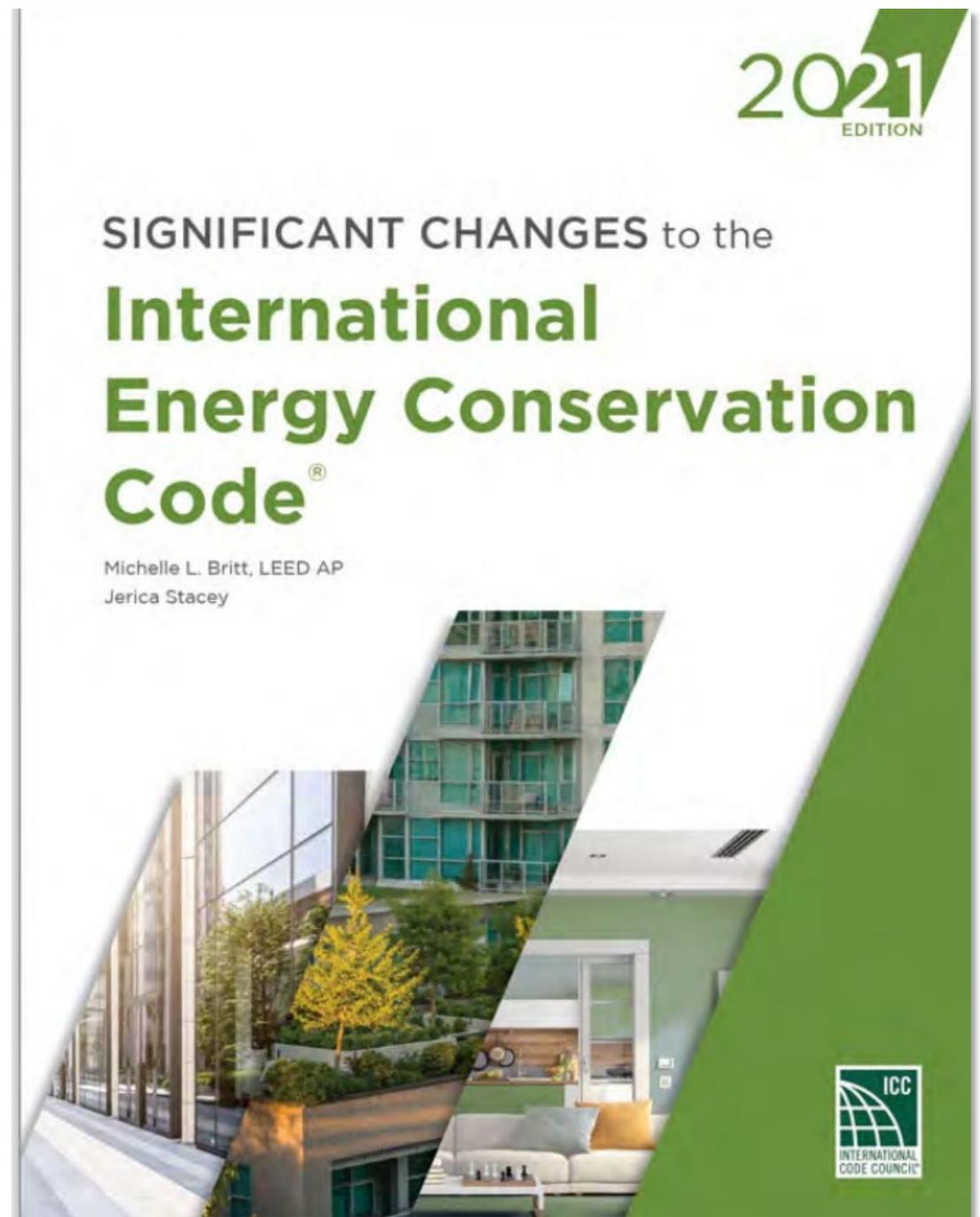
Modification of 2018 IECC

3

Each fan and fan array shall have a fan energy index (FEI) of not less than 1.00....

# MORE ENERGY CHANGES

- **Suggestion: Purchase the book**
- **Plan Review has a copy for all the reviewers**
- **Building Code Enforcement will be trained about these changes.**



# COMCHECK

- Supports the 2021 IECC.
- Inspection Checklist to be completed for plan review including references to drawing sheets with compliance information.

## LATEST RELEASE

[LAUNCH COMCHECK-WEB](#)



DESKTOP VERSION

DESKTOP VERSION/BUILD: 4.1.5.5

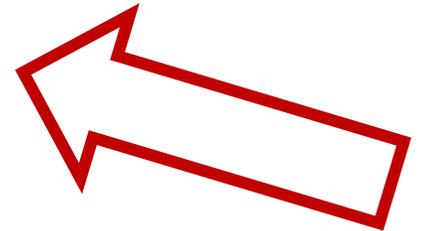
PLATFORM: WINDOWS

RELEASE DATE: MARCH 2, 2022

RELEASE NOTES

WHAT'S NEW:

COMCHECK-WEB JUNE 16, 2022



# BUILDING CODE ENFORCEMENT



For general information email us at:

[HPC-RA@houstontx.gov](mailto:HPC-RA@houstontx.gov)

[Info.CCM@houstontx.gov](mailto:Info.CCM@houstontx.gov)

For more info on the 2021 Code Update:

[www.houstonpermittingcenter.org/construction-code-modernization](http://www.houstonpermittingcenter.org/construction-code-modernization)

[www.houstonpermittingcenter.org/building-code-enforcement/code-development](http://www.houstonpermittingcenter.org/building-code-enforcement/code-development)

# THANK YOU!

