



**Housing and Community
Development Department
(HCDD)**

SOP Number	07-002
SOP Version	5.1
SOP Owner	Kevin Bingham
Effective Date	03/14/2023
Last Revised Date	N/A



City of Houston

Housing and Community Development Department

Minimum Construction Standards for Rehabilitation, Reconstruction and New Construction

Minimum Construction Standards for Rehabilitation, Reconstruction and New Construction

Version Block

Version	Date Adopted	Changes
1.0	6/24/2002	Original Version
2.0	4/5/2011	Updated based on current practice
3.0	5/16/2019	Overhauled
4.0	1/18/2022	Added state and local funding; ADA requirements; and General standards to minimum space, use, and location requirements. Revised Exits under Minimum Space Use and Location and Landscaping under Minimum Standards for Exterior Structures. Updated minimum standards for basic equipment and facilities; Minimum standards for electrical service; Energy conservation requirements; and Minimum standards for interior and exterior structures. Added hazard protocols. Deleted examples of counter-top surfaces.
5.0	04/13/2022	Updated to minimum space, use, and location requirements; Minimum standards for interior structures; and Minimum standards for exterior structures. Replaced 2012 IRC requirements with 2015 IRC requirements.
5.1	03/14/2023	Added Appliances must match in color and brand Added Construction Standards for DR-21 funding (Winter Storm Uri), i.e., Zero Energy Ready Home Guidelines, Concrete Samples for Concrete Pours, Solar Panels, Natural generators, etc. Added Construction Standards for HC-3 Bathroom Added Construction Standards for Treated Wood Fencing Updated Definition Section

Table of Contents

OVERVIEW.....	1
I. Preface.....	2
II. Minimum Space Use and Location Requirements	3
III. Minimum Standards for Basic Equipment and Facilities	4
IV. Minimum Standards for Ventilation	11
V. Minimum Standards for Electrical Service	11
VI. Minimum Standards for Heating Systems.....	14
VII. Energy Conservation.....	15
VIII. Minimum Standards for the Interiors of Structures.....	17
IX. Minimum Standards for Exterior of Structures (General Framing).....	19
X. Minimum Standards for Plumbing Systems	23
XI. Minimum Standards for Potable Water Supply.....	23
XII. Minimum Standards for Connection to Sanitary Sewer	24
XIII. Minimum Resiliency Measures	25
XIV. Minimum Hazard Protocols	25
XV. Minimum Requirements for Manufactured Housing Units (MHU).....	27
XVI. Rights to Alter Design	30
XVII. Definitions	31

OVERVIEW

The standards contained in this document establish the minimum design standards for rehabilitation, reconstruction, and new construction under the City of Houston's (COH) programs that receive assistance through federal funding from U.S. Department of Housing and Urban Development (HUD) Program and any other available local and/or state funding.

These minimum standards apply to all single-family housing units that receive financial assistance from any local, state, or federal funds. Any design standards not included in this document, shall ultimately comply with the City of Houston's adopted residential codes and the funding source contributor's residential construction standards, rules, and regulations.

The following standards shall apply to all reconstruction, new construction and rehabilitation projects. However, in circumstances where existing conditions require replacement with similar or substituted materials or products, those substitutes shall meet minimum standards and submitted for approval by City of Houston Housing and Community Development Department (HCDD) prior to construction or installation.

This document is intended to provide the minimum design standards for rehabilitation, reconstruction, or new construction of single-family housing within the City of Houston financed with local, state, or federal funds. These standards are issued by HCDD and apply to all communities within the incorporated City of Houston. These standards are not intended to reduce or exclude the requirements of any applicable local, county, state, federal building, housing codes, standards, or ordinances which may apply a more stringent requirement. In addition to these standards, construction activities shall also comply with the following as applicable and subject to most stringent requirement:

- The International Residential Code (IRC) 2015 adopted by the City of Houston or the latest edition of the IRC and any applicable code required by the City of Houston¹.
- The International Energy Conservation Code (IECC) 2015 adopted by the City of Houston or the latest edition of the Model Energy Code (MEC) and any applicable code required by the City of Houston¹.
- The Lead Based Paint (LBP) regulations as described in 24 CFR Part 35 for units built before 1978².
- Applicable local, state, and Federal regulations for Asbestos Containing Material (ACM)
- Texas Department of Insurance (TDI) Windstorm Standards
- HUD Uniform Physical Condition Standards (UPCS)³
- HUD CPD Green Building Retrofit Checklist⁴

¹ The City of Houston latest adopted construction and model codes can be found at <https://www.houstonpermittingcenter.org/help/codes>.

² <https://www.ecfr.gov/current/title-24/subtitle-A/part-35?toc=1>

³ [111-Inspection Checklist.xls \(hud.gov\)](#)

⁴ <https://www.hud.gov/sites/dfiles/CPD/documents/CPD-Green-Building-Retrofit-Checklist.pdf>

- Texas Government Code 2306.514⁵ – Construction Requirements for Single Family Affordable Housing
- City of Houston, Texas, Chapter 19 Floodplain Ordinance, March 2018⁶
- City of Houston Contractor Performance and Specification Manual April 2014⁷
- Uniform Federal Accessibility Standards (UFAS)⁸
- UFAS Accessibility Check List⁹
- The requirements from other governing entities such as Homeowners Associations and Local and Federal regulations pertaining to zoning, traffic, drainage, flood plains and fire prevention – National Fire Protection Association (NFPA)
- Americans with Disabilities Act¹⁰
- Zero Energy Home Ready Guidelines¹¹

I. Preface

These standards are designed to include and to expand on the requirements of the HUD Housing Choice Voucher Program and Housing Quality Standards (HQS). Many of the requirements and standards of this document may exceed the requirements of the HQS and are determined necessary to further define the common definitions of “safe, decent, and sanitary” housing; “non-luxury, suitable amenities” housing; and “good quality, reasonably priced” housing, that are affordable to persons and families that are low or moderate income. These standards are also designed to assist in achieving consistency throughout the City of Houston for single-family rehabilitation, reconstruction and new construction residences funded with Federal, state, and/or local funding

Through these standards, sustainable design principles have been incorporated, intended to minimize negative environmental impacts and to promote the health and comfort of the occupants of housing reconstructed to these standards. Included herein are measures to reduce consumption of non-renewable resources, minimize waste, and to create healthy, productive environments. Standard measures have been incorporated herein relating to energy conservation, energy efficiency, water conservation, and indoor air quality. Also, materials and construction methods will emphasize resiliency, high quality, durability, sustainability, and water and mold resistant homes.

These standards assume a knowledgeable inspector will thoroughly inspect all components, systems, and equipment in each home, as referenced in this document. All systems shall be in good working order and condition and capable of being used for the purpose in which they were intended and/or designed. These standards also assume the inspector will take into account any

⁵ https://texas.public.law/statutes/tex.gov/t_code_section_2306.514

⁶ <https://www.houstontx.gov/council/g/chapter19/proposed-revisions-march23.pdf>

⁷ https://www.houstontx.gov/housing/rfp/COH_Contractor_Performance_Manual.pdf

⁸ <https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/ufas#intro>

⁹ <https://www.hudexchange.info/resources/documents/Ufas-Accessibility-Checklist.pdf>

¹⁰ <https://beta.ada.gov/law-and-regs/ada>

¹¹ <https://www.energy.gov/eere/buildings/zero-energy-ready-homes>

extraordinary circumstance of the occupants in the home (e.g., physical disabilities) and reflect a means to address such circumstances for that home.

All newly constructed interior ceilings, walls, and floors must not have any defects such as bulging or leaning, holes, loose surface materials, buckling, missing components or other damage. The roof must be structurally sound and weather resistant. All exterior walls, including foundation walls, must not have any defects such as leaning, buckling, sagging, or defects that may result in the structure not being weather-resistant or that may result in air infiltration or vermin infestation. The condition of all interior and exterior stairs, halls, porches, walkways, etc. must not present a danger of tripping or falling.

For rehabilitation, the scope of work will be determined based on the existing conditions and the repairs/replacement to be performed. Depending on the damage incurred, the scope of work will conform to the minimum standards mentioned in this document. In addition, all construction activities identified in the Scope of Work shall be performed in accordance with all applicable local, state, and federal laws and regulations.

When requested and supported by the homeowner's physician and approved by HCDD, construction activities shall be implemented in accordance with Uniform Federal Accessibility Standards (UFAS).

The following sections apply to the rehabilitation, reconstruction, and new construction of single-family dwellings. The standards are performance standards, for example, specifying units must be habitable and in functional condition with maximum life expectancy. These minimum standards apply to all construction of single-family housing funded through HCDD.

All proposed site-specific and building envelope construction documents shall be reviewed by a Single-Family HRP representative for compliance prior to submission to permitting.

II. Minimum Space Use and Location Requirements

- A.** No newly constructed habitable room, hallway, or bathroom shall have a ceiling height of less than 8 ft. Rehabilitated homes must have ceiling heights that are code compliant.
- B.** The lot or defined site shall be free of debris, garbage or other accumulations of site stored items that create possibilities of infestations. The site shall be generally level, well drained, and accessible.
- C.** All habitable rooms, except kitchens shall have a minimum width of 10 ft.
- D.** Living rooms shall be at least 120 sq. ft. in area with no wall less than 9 ft. in length.
- E.** Bedrooms that are only accessible through another bedroom, shall not count as a separate room.
- F.** All bedrooms must have access to closets for storage of clothing.
- G.** Lot Dimensions

Land use shall follow all City, State and Federal requirements.

- All lots shall be a minimum of 40 ft. by 100 ft. or 4000 sq. ft. in size. Exceptions will be reviewed on a case-by-case basis with approval by HCDD management.

H. Hazardous and Substandard Conditions

These conditions shall include but not limited to:

- Accumulated debris, waste, or garbage either in enclosed areas such as storage buildings or in yard areas.
- Deteriorated and/or irreparable outbuildings, sheds, wells, privies, or other structures that are no longer in use or are unusable by their condition.
- Holes, ditches, exposed meter boxes or other conditions that create a trip hazard excluding drainage ditches that are part of a designed drainage system.
- Rodents, insects, or other infestations; pre-emptive measures shall be taken as necessary such as soil treatment (termite control), removal of nearby overgrown vegetation (vermin) to address such issues.
- Standing water or depressions that hold water.
- Exposed pipes, railings or other installations creating trip hazards.
- Damaged, missing, or deteriorated walkways, steps, and decks that create trip hazards or are otherwise unsafe.
- Stairways or steps with two steps or more, without a functional rail.

I. General Standards

- All single-family homes should incorporate resiliency solutions which may include elevating the first floor of the habitable area, breakaway ground floor walls, installation of reinforced fortified roof systems, use of Energy Star appliances and fixtures and the use of mold and mildew resistant products.

III. Minimum Standards for Basic Equipment and Facilities

A. Kitchen

Each home shall have one kitchen equipped with the following:

- **Kitchen Sink**

The sink shall be stainless steel (16-18 gauge), double bowl and connected to both hot and cold potable water supply lines under pressure and to the sanitary sewer waste line. When installing such components, water supply shut-off valves shall be installed. The sink shall have minimum dimensions of 33 inches long by 22 inches wide by 10 inches deep with sink strainers, and food disposal unit.

**Acceptable kitchen sinks shall be Kohler, Elkay, American Standard, or approved equal.*

- **Oven and Stove or Range**

The kitchen shall contain an exhaust hood, vented thru wall or roof, and a minimum 30-inch-wide gas range, unless otherwise specified by HCDD. The homeowner shall have an option for electrical cook top at no additional cost to the City and the homeowner. The kitchen may contain a microwave integrated with the range hood and the color shall be either black or white, where all appliances match in color and brand.

**Acceptable oven and stove or range shall be LG, GE, Whirlpool, or approved equal Energy Star appliance.*

- **Refrigerator/Freezer**

The kitchen shall contain an Energy Star certified refrigerator/freezer, with a minimum of 18 cubic feet capacity, connected to the power supply, in good working order and capable of supplying the service for which it is intended. A refrigerator water line shall be provided to accommodate any refrigerator upgrades. Color shall be either black or white, where all appliances match in color and brand.

**Acceptable refrigerators/freezers shall be LG, GE, Whirlpool, or approved.*

- **Cabinetry & Counter Space Area**

Cabinetry shall be factory built and pre-finished with plywood sides. Recessed panel doors, drawer fronts, face frames of hardwood construction, and veneer/ply toe kicks. Hardware consists of concealed hinges and side mount drawer hardware. (Soft closer/slides)

Counter tops in the kitchen shall be solid surface with 4" high back splash and side splash if required by plan or design. Waterproof around sink cut out perimeter top, edge, and bottom. Contractor to provide Owner with pre-selected color samples for color selection as shown on Material Selection sheet.

Where and when applicable, every kitchen shall be equipped with a pantry, 36" base cabinets and 36" upper cabinets.

- **Hazardous and Substandard Conditions**

- Lack of adequate food storage, food preparation area, refrigeration, or cooking facilities.
- Spaces that are so small as to be unusable or inadequate for their intended purpose.
- Lack of ability to clean.
- Defective cabinet door function and hardware, shelving condition and securement of overall assembly to floor and wall.

- Damage or water penetration on base cabinetry when extended above the toe plate.
- Use of materials on Countertops that cannot be readily cleaned shall be replaced.

B. Bathroom(s)

When a plan includes two or more bathrooms, provide master bathroom and master closets in separate areas. All master bathrooms shall have a linen closet within or adjacent to the bathroom. At a minimum, home shall contain a bathroom which is equipped with a toilet, vanity and sink, and a shower/bathtub. All plumbing fixtures shall be United States Environmental Protection Agency (USEPA) Water Sense qualified or better. When installing toilets, sinks, or such components, water supply shut-off valves shall be installed. The toilets shall not use more than 1.28 gallons per flush. Toilet throat size will be no less than 2 inches and glazed smooth.

Prior to permitting, the contractor shall coordinate all bathroom designs conforming with a doctor prescribed Verification of Disability (form 14.27).

- In new construction, the standard shower/tub shall be one-piece unit. If panel kit, it shall be Acrylonitrile Butadiene Styrene (ABS) plastic unit sealed with matching color silicone sealant. Shower heads shall have a flow rate no greater than 2 gallons per minute (gpm). Shower wall construction shall be such that grab bars can be added at a later date by installing 2x6 blocking during framing.
- All bathrooms shall have Energy Star rated or equivalent power-vented fans and shall exhaust to the exterior.
- The wall construction adjacent to and behind all toilet walls shall be such that grab bars can be added at a later date by installing 2x6 blocking during framing.
- Vanities shall be factory built and pre-finished with plywood sides and recessed panel doors, drawer fronts, and face frames of hardwood construction. Hardware consists of concealed hinges and side mount drawer hardware. Vanity top with integral sink 1/2" thick solid polymer material adhesively joined with inconspicuous seams, standard edge details with integral or undermount sink. Provide coved back splash and side splashes. Color as *pre-selected by owner* and as indicated on Material Selection sheet.
- At a minimum, each bathroom shall contain one 18" long metal towel bars, a toilet tissue holder, a wall mounted mirror equal to the length of vanity, a medicine cabinet, and vanity with integrated countertop and sink. All selected accessories shall match in color and finish.
- All bathrooms shall have doors with a privacy lock.

- When it applies, the prescribed HC-3 bathroom with a roll-in shower option, the bathroom shall receive ceramic tile flooring, floor to ceiling tile in the shower and ceramic tile wainscoting at 4' above finished floor. Also, as it applies to an HC-3 bathroom with a roll-in shower option on a slab foundation, the contractor shall depress the concrete floor slab, in the areas with drains to receive a sloped mortar bed. The slab should be dropped 3 ½" so that the plumber installs the shower liner and the tile setter floats out the liner and slopes it to the drain. The 3 ½" allows for the thickness of the float, the thin set and the thickness of the tile.

C. Hot Water Supply

Every home shall have supplied water heating equipment (water heater and hot water supply lines) that are free of leaks, connected to the source of fuel or power, and is capable of heating water to be drawn for general usage. A 40-gallon gas water heater shall be the minimum size provided in each home. The homeowner may have an option of electric water heater at no additional cost to the City or the homeowner. All water heaters shall be installed to manufacturer's specifications.

- No water heaters, except point-of-use water heaters, shall be allowed in the toilet rooms or bathrooms, bedrooms or sleeping rooms. No gas water heaters shall be allowed in clothes closets.
- All gas water heaters shall be vented in a safe manner to a chimney or flue leading to the exterior of the home. Paint all penetrating roof vents and jacks to match tile color.
- All water heaters shall be equipped with a pressure/temperature relief valve possessing a full-sized, non-reduced, rigid copper or steel discharge pipe to within 6 inches of the floor. The steel discharge pipe shall not be threaded at the discharge end.
- All water heaters shall be installed on an 18-inch-high metal stand with a pan and include a Polyvinyl Chloride (PVC) drain tube leading to the exterior of the home. If exit point is further than 24 inches, then a rubber hose is preferred, but not required.
- All water heaters shall have internal foam insulation that is a minimum of R-10. Gas water heaters shall have an EF rating of .62 or higher and a recovery efficiency of .75 or better and/or meet Energy Star requirements at the time of installation. Electric water heaters shall be Energy Star 3 or 3.1 rated.
- Where feasible, tank-less water heaters may be installed, with homeowner approval, in accordance with manufacturer's guidelines and sized to provide adequate hot water supply to all fixtures. Gas supply lines and or electrical capacity must be evaluated before installing tank-less water heaters. Before installing, careful consideration should be made regarding supply and water temperature to owners.

- All water heater closets shall be completely sheet rocked, equipped with a fire rated door with threshold and self-closing hinges at the top and bottom. All vents shall have a ceiling mounted flanged tightly secure and caulked.
- **Hazardous and Substandard Conditions**
 - Missing gas shut-off valve.
 - Missing water supply shut-off valve.
 - Combustion air taken from living area except when adequate air exchange meets Standard Building Code Congress International (SBCCI) standards.
 - Missing or dysfunctional Temperature/Pressure-Relief (TPL) valve. TPL drain shall flow at an angle not exceeding horizontal and exhaust flow to exterior of building.
 - Inadequate exhaust pipe, combustion exhaust shall be double walled and skirted at all penetrations.
 - Hot water heater with storage tanks less than 40 gallons.
 - Pipes, nipples, or tank elements that are rusted or corroded.

D. Exits

All exterior doors shall be 36 inches wide and shall be six panel steel or insulated fiberglass doors. Doors should be fire rated where required by code or as approved by HCDD.

Every exit from every home shall comply with the following requirements:

- At a minimum, the exterior doors shall have a Sound Transmission Class (STC) rating of 35.
- All exterior doors shall be equipped with adequate security locks including at least one deadbolt per door. Every exterior door, when closed, shall fit well within its frame.
- Every front exterior door shall have a peephole, door knocker or doorbell.
- Every exterior door, door hinge, and door latch and/or lock, shall be in good working condition.
- All installed doors shall not move to either the open or closed “ghost” position on their own without an applied force.
- Every interior door with direct access to a garage shall have a fire rating of 45 min. with self-closing hinge at the top and bottom.

Each interior door shall be at least 32 inches, unless otherwise noted, or the door provides access to a closet of less than 15 square feet. Interior doors shall be six panel hollow core doors. Other doors for pantry and small closets shall be a minimum of 30 inches wide.

- Every interior door, when closed, shall fit well within its frame.
- Every interior door, door hinge, and door latch and/or lock shall be in good working condition.
- Every water heater closet and furnace doors shall be pre-hung with integrated threshold and self-closing hinges at the top and bottom.

Every habitable room shall have two independent and unobstructed means of egress. This is normally achieved through an entrance door and an egress window.

All above grade egress windows from habitable rooms shall have a net clear opening of 5.7 sq. ft. The minimum net clear opening width dimension shall not be less than 20 inches wide, and the minimum net clear opening height dimension shall not be less than 24 inches wide. *Note, the combination of minimum window width and minimum window height opening size does not meet the 5.7 sq. ft. requirements.*

Where windows are provided as a means of escape or rescue, they shall have a finished sill height of not more than 44 inches above the floor. Egress windows with a finished sill height of more than 44 inches shall have a permanently installed step platform that is in compliance with stair construction standards. Emergency escape and rescue windows with bars, grills, covers or screens, must be releasable or removable from the inside without the use of a key, tool, or force greater than normal operation of the escape and rescue opening. Any impediment to escape or rescue caused by security devices, inadequate openable window size or difficult operating mechanisms shall not be permitted. Occupants of a bedroom must be able to get outside the unit in the event of fire or other emergency requiring quick egress.

E. Stairs, Hallways, Handrails, Guardrails and Ramps

Stairs, hallways, handrails, guardrails and ramps, at a minimum, shall conform to the requirement of the UFAS, and any additional standards required by the City. All newly constructed stairs, interior and exterior stairways, at a minimum, shall comply with the following requirements:

- All stairways and steps of three or more risers shall have at least one handrail. All stairways and steps which are 5 ft. or more in width shall have a handrail on each side.
- All stairs and steps shall have a riser height of not more than 7 ½ inches and a tread depth of not less than 10 inches. Risers and treads cannot be different in size by more than 3/8 of an inch from the top to the bottom of the stairs.
- All handrails shall be installed not less than 34 inches (2-10 inches) not more than 38 inches in height, measured plumb, above the nosing of the stair treads. Handrails adjacent to a wall shall have a space of not less than 1 ½ inches between the wall and the handrail. All handrails shall be turned back into the wall on railing ends. The size of a round railing must be a minimum of 1.25 inches, but not more than 2 inches. Railings must be continuous from the top riser to the bottom riser.
- Porches, balconies or raised floor surfaces, including stairway riser and/or landing, located more than 30 inches above the floor or the grade, shall have guardrails installed that are not less than 36 inches in height. Open guardrails and stair

railings shall have intermediate rails or ornamental pattern such that a sphere 4 inches in diameter cannot pass through.

- Only pressure treated lumber shall be used for stair/ramp construction and shall meet or exceed the requirements of the Prescriptive Residential Wood Deck Construction Guide, Based on the 2015 IRC or the latest adopted IRC by the City of Houston.
- Exposed bent nails in stair/ramp construction, shall not be acceptable.
- All porches, balconies, decks, ramps and all exterior wood surfaces, shall be finished with two coats of Thompson Water Seal or approved equal product.
- Individual stair treads shall be designed for the uniformly distributed load or a 300-pound concentrate load acting over an area of 4 sq. inches, whichever produces the greater stresses.
- All stairways and hallways shall have a minimum width of 3'4", or 40" measured from face of sheetrock to face of sheetrock.

F. Walkways, Driveways, and Entry

All walkways and entry points to the home shall be a minimum of 36 inches wide with an access point from the driveway to the home entrance and/or an access point to the road.

The driveways shall be of reinforced concrete of not less than 3000 pounds per square inch (psi) or, based on homeowner selection and available funding, other all-weather surface, i.e., decomposed granite, shells, crushed limestone, etc. These materials form a hard packed surface for an automobile to drive on. These driveways may be used as access for a vehicle to travel from the road to a concrete parking pad or a suitably sized concrete exit pad that will allow a disabled person to exit and enter his/her vehicle. The exit pad shall be a minimum of 36-inch-wide route that meets UFAS standards for slope and lead to 36-inch-wide entry door on the home. The driveway size shall be adequate for two vehicles to be parked with a minimum size of 420 sq. ft. not to include apron or public right of way area.

G. Smoke Detectors

Smoke detectors are required in accordance with National Fire Protection Association (NFPA) 74. All smoke detectors shall be hardwired and shall have 10-year battery back-up. All Smoke Detectors must be installed in compliance with City of Houston Code requirements in each bedroom.

H. Carbon Monoxide Detectors

Where Carbon Monoxide Detectors are required by code, they shall be hard-wired with 10-year battery back-up, installed per the manufacturer's instructions, typically one per hallway.

IV. Minimum Standards for Ventilation

- A. In general, sufficient ventilation shall be present to ensure adequate air circulation in the home per ASHRAE 62.2 and the most current City of Houston adopted mechanical code at the time of permitting and/or City of Houston plan review.
- B. Every habitable room shall have at least one exterior operable window. All operable windows shall be capable of being easily opened and held in an open position by window hardware.
- C. Bathrooms, including toilet rooms, shall be provided with a mechanical means of ventilation or a window to serve as ventilation. If a continuous exhaust fan is installed, it shall be rated at 20 cubic feet per minute (cfm) or greater and if an intermittent exhaust fan is installed, it shall be rated at 50 cfm or greater. All bathroom fans shall be Energy Star certified and shall be installed on a separate switch from the primary light.
- D. Utility exhaust fans shall be Energy Star certified. If a continuous fan is installed, it shall be greater than or equal to 5 cfm. Intermittent fans shall be greater than or equal to 100 cfm.

All exhaust fans shall exhaust to the exterior of the house, be mechanically fastened, sealed with duct mastic, insulated, and have a mechanical damper.

E. Attic Ventilation

- When using roof vents without soffit vents and without a ceiling vapor barrier, sufficient vents shall be used to provide 1 sq. ft. of free vent area for each 150 sq. ft. of ceiling area.
- When using roof vents without soffit vents with a ceiling vapor barrier, sufficient vents shall be used to provide 1 sq. ft. of free vent area for each 300 sq. ft. of ceiling area.
- When using a combination of roof and soffit vents and no ceiling vapor barrier, sufficient vents shall be used to provide 1 sq. ft. of free vent area for each 300 sq. ft. of ceiling area. Vents shall be installed with no less than 50%, and no more than 80% of the total vent area in the roof near the peak with the balance of vents in the soffit.
- To conserve energy, power roof ventilation systems will be used only as a method of last resort. Roof ventilation should be accomplished through correctly sized gable vents, ridge vents, and soffit vents.

V. Minimum Standards for Electrical Service

A. Minimum Electrical Service

- All electrical work shall be performed by a licensed electrician, and shall comply with local, county, or state requirements having jurisdiction. The panel, service mast, etc. shall be installed to local utility company requirements. Each home, at a minimum, shall have a 200 ampere Arc-Fault panel with a main breaker and 30 available single-pole circuits.

- Service shall be of a three -wire type, with service entry on an approved weather head.
- The service meter and service panel shall be located above the Base Flood Elevation (BFE) with adequate freeboard required by the City¹². As per Texas Government Code §2306.514 Breaker panel is not to exceed 48 inches above the floor.
- All exposed wiring, service lines and feeders, shall be protected and properly shielded in approved conduit.

B. Receptacles

Every habitable room within the home shall contain receptacles required by code but not less than the following:

- At a minimum, 2 separate duplex wall mounted type electric outlets. Placement of such outlets shall be on separate walls.
- Habitable rooms over 120 square feet, shall contain, at a minimum, 3 separate duplex and remote wall type electric outlets.
- All newly installed outlets shall be grounded duplex receptacles or Ground-Fault Circuit Interrupter (GFCI) protected.
- Circuit breakers shall be Arc Fault type.
- Temporary wiring, extension or zip cords shall *not be* used as permanent wiring.
- Minimum wiring gauge shall be 14 Romex on 15-amp circuits with increased wire size as per code.
- As per Texas Government Code §2306.514, Duplex outlets must be installed at least 16 inches from the floor. At the homeowner's request, measure and if approved by the code enforcement department, electrical outlets may be placed between 24 to 30 inches from the floor surface.

A GFCI shall be installed for all electrical outlets used in bathrooms and toilet rooms, all outlets within 6 feet of a water source, excluding designated simplex equipment circuits for clothes washing machines and sump pumps, and outlets located on open porches or breezeways, exterior outlets, outlets located in garages and in non-habitable basements, except those electrical outlets that are dedicated appliance outlets. All kitchen receptacles serving the countertop area shall be GFCI protected. All exterior receptacles shall be covered by a receptacle cover that when a cord is plugged in, the GFCI outlet will stay covered and protected.

All fixtures and wiring shall be adequately installed to ensure safety from fire so far as visible components are observed.

¹²

https://library.municode.com/tx/houston/codes/code_of_ordinances?nodeId=COOR_CH19FL_ARTIIIISTFLHARE_DIV2STHOSPFLHAAR_S19-33BAFLELREHOSPFLHAAR

All wall and/or ceiling type lighting fixtures shall be controlled by a wall switch.

Each receptacle or switch located on an exterior wall shall have a foam seal placed under the cover and shall be of the type approved for exterior use.

All outlets and fixtures shall be properly installed and connected to the source of electric power in a proper manner and shall be in accordance with the electrical code of the city and/or the National Electric Code (N.E.C), as applicable.

All work shall be permitted, inspected, and approved by a City of Houston Enforcement or TREC Inspectors as required by grantor requirements.

All broken and/or missing switch plates and/or receptacle plates shall be replaced.
Install TV J-box with conduit to attic in one location.

Cable/phone prewired in bedrooms, living room, and kitchen and location to be determined by the Program.

Provide exterior WP (weatherproof) electrical convenience outlets installed in accordance with local building codes and National Electrical Code (NEC) requirements. Provide two exterior outlets, one in front and one in back.

Hazardous and Substandard Conditions

These conditions shall include but are not limited to:

- Equipment or wiring which is missing, broken, disconnected, loosely connected, burnt, unsupported, corroded, cracked, split, has evidence of overheating, physical damage, or misuse.
- Device or equipment is dirty, full of debris, infested, etc.
- Frayed wiring is present.
- Circuit breaker, switch, receptacle, fixed equipment, wiring, or cable is not compatible with the phase, voltage, amperage, or other characteristics of the electricity in use.
- Intermittent operation of fixed equipment, switches, outlets, or other devices.
- Flexible cord is used as a permanent wiring method.
- Interior wiring is surface mounted and not conduit. This excludes crawl spaces and other allowable installations where access to wiring is limited.
- Exterior wiring which is exposed to damp conditions, sunlight, or potential damage that is not in conduit.
- Bathroom receptacle, kitchen receptacle located within 6 feet of water source, garage receptacle, or other outdoor receptacle that is not protected by a ground fault interrupting device.

- Polarity is reversed in connections or receptacles.
- Branch circuits, feeder lines, cable size, device rating, circuit breakers, sub-panels, or service panels are inadequate for the load as calculated by the current NEC standard Section 110-14.
- Unlabeled circuit breakers.
- Overhead wires from the street to the electrical service panel shall be no lower than 12 feet above ground and shall not come in contact with tree branches or other obstacles and shall not be reachable from nearby windows or other accessible areas.

C. Lighting

- Every habitable room and every bathroom, including toilet room, laundry room, furnace or utility room, and hallway shall have at least one ceiling or wall-type electric light fixture, controlled by a wall switch.
- At least one light shall be installed at each exterior door operated by an interior switch that is within reach of the door.
- Provide one porcelain receptacle light fixture in attic switched at attic entrance.
- Habitable rooms, except kitchens, shall have 2 working duplex receptacles or a single wall-type electrical outlet and a permanently installed lighting source.
- Energy efficient fixtures that meet Energy Star ratings shall be used. Light-Emitting Diode (LED) lighting shall be installed in all new homes.
- Recessed lights shall be Insulated Can and Air-Tight (ICAT).
- All closet lights shall be covered with no exposed bulbs.
- **Hazardous and Substandard Conditions**
 These conditions typically identified in the departments rehab or Tier II program shall include but not limited to:
 - Missing or dysfunctional overhead or other switch operated lighting in each interior room.
 - Missing or dysfunctional lighting at each exterior door operated by an interior switch that is within reach of the door.

- D. Energy Star rated ceiling fans shall be installed in general living areas, living room and all bedrooms, and shall be installed to manufacturer's requirements.

VI. Minimum Standards for Heating Systems

A. Heating and Cooling System

All heating and cooling systems shall be capable of safely and adequately heating and cooling all living space. Capacity of the systems shall be sized in accordance with all local, state and grantor codes, ordinance and requirement.

B. Requirements for Heating and/or Cooling Systems

- Every heating system burning liquid or gaseous fuels shall be vented in a safe manner to a chimney or flue leading to the exterior of the home. The heating system chimney and/or flue shall be of such design to assure proper draft and shall be adequately supported.
- No heating system source burning liquid or gaseous fuels shall be located in any habitable room, bathroom, toilet room, storage closet, and sealed attic space.
- Every fuel burning appliance, liquid or gaseous fuels, shall have adequate combustion air and ventilation air. All liquid furnaces will have sealed combustion with combustion air brought in from the exterior of the house and installed in accordance with manufacturer's guidelines. Combustion air for gas furnaces shall be in accordance with 2015 or the latest IRC adopted by the City of Houston.
- Every heat duct, steam pipe and hot water pipe, shall be free of leaks and shall function such that an adequate amount of heat is delivered where intended. All duct joints must be sealed with mastic or any other acceptable product. All ducts must be sealed. All steam piping and hot water piping must be installed with an approved material.
- Every seal between any of the sections of the heating source(s) shall be air-tight so that noxious gases and fumes will not escape into the home.
- Minimum requirements for forced air furnaces, when installed, will be no less than a 92% Annual Fuel Utilization Efficiency (AFUE). Also, install a digital programmable thermostat. Condensate lines will drain to a floor drain or have a condensate pump installed and piped to discharge. All furnace ducts shall be equipped with an air filter clean out location that has a tight-fitting cover installed over it.
- Central heat/air conditioning (A/C) units shall be gas or electric systems and the air conditioning unit shall be at a minimum of 16 SEER rating. All units shall be installed, when feasible, on either the north or east side of the home or in an area that will provide shade for the unit.
**Acceptable package units shall be Trane Lennox, Carrier, or approved equal.*
- Venting and combustion air must be installed in accordance with manufacturer's requirements.

VII. Energy Conservation

- A. All newly constructed structures, at a minimum, shall comply with the Environmental Protection Agency (EPA) Energy Star New Home Requirements¹³.
- B. All rehabilitated homes to the maximum extent feasible shall be compliant with the HUD CPD Green building Retrofit Checklist¹⁴.

¹³ http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_v3_guidelines

¹⁴ <https://www.hud.gov/sites/dfiles/CPD/documents/CPD-Green-Building-Retrofit-Checklist.pdf>

- C. Under the DR-21 program (URI), all rehabilitated homes to the maximum extent feasible shall be compliant with the Zero Energy Ready Homes Guidelines. These measures include, but are not limited to, the following:
- The provision of insulation at various locations and at the following recommended resistance factors (R-values). Insulation shall be primarily made from fiber glass when available.
 - Ceilings – R-38 or as close as possible to these requirements where sloped ceilings exist.
 - Attic space – R-38 blown in or spray foam
 - Walls - R-15 batt insulation
 - Crawl Spaces (floors) – R-19 (closed cell foam insulation)
 - Floor Joists – R-19 (closed cell foam insulation)
 - Closed cell Foam to the meet R Value or Noise Values as required by the adopted local code and HCDD Environmental Review Procedures #21-016.
 - Exterior walls are to be provided with insulation and the minimum R-factor shall be R-15. In addition, an air infiltration barrier, such as Tyvek or approved equal, shall be installed on all exterior walls. The installation of fan-fold foam or foam sheathing may be added to increase household R-ratings.
 - When siding is being placed on exterior walls, such exterior walls are to be provided with insulation and at the recommended resistance factor (R-value) of R-15. In addition, an air infiltration barrier, such as Tyvek or approved equal, shall be installed on all exterior walls.
 - The installation of fan-fold foam or foam sheathing may be added to increase household R-ratings.
 - The installation of weather stripping at all exterior doors, windows, ground-entry basement doors, etc. is required. Doors shall be 6-panel metal clad insulated door, Energy Star rated for Climate Zone 2. Door jams shall be sealed, and thresholds shall be caulked.
 - The provision of caulking around exterior doors and windows at the foundation/sill plate union, and at other air infiltration areas.
 - All windows shall be Energy Star certified. All windows are single-hung, double pane, low-E, argon, or krypton filled, insulated, white vinyl or equal. All windows shall have a U-Value of less than or equal to 0.35 and Solar Heat Gain Coefficient (SHGC) of less than or equal to 0.25. All windows shall receive window screens and all bathroom and kitchen windows and windows within 1 foot of any door, shall be tempered.
 - At a minimum, windows must be current Energy Star rated for Climate Zone 2. All windows shall have the window jamb sealed. Where Historic Preservation requirements will restrict the installation of vinyl or aluminum windows, the standards are written to come as close as possible to achieving Energy Star requirements.
 - All heat ducts and hot water or steam heat distribution piping shall be insulated or otherwise protected from heat loss where such ducts or piping runs are located in unheated spaces. Similarly, distribution piping for general use hot water shall

also be protected from heat loss where such piping is located in unheated spaces. All water distribution piping shall be protected from freezing. All ducts and piping shall be free of leaks.

- No scuttle hole attic accesses are allowed. All homes shall have pull downstairs with a weight rating of 300 lbs.
- Attic stair units shall be an insulated manufactures design with weather stripping around the perimeter.

D. Hazardous and Substandard Conditions

These conditions shall include, but not limited to:

- Air incursion from open holes or seams in exterior walls, windows, or doors.
- Open seams in window casements, door casements or other installations that create air leaks resulting in heat loss or gain.
- Missing caulk or putty in windows.
- Missing weather stripping or other seal at exterior doors.
- Exposed plumbing systems that present freeze hazards or heat loss to hot water pipes.
- Inadequate insulation in ceiling.

VIII. Minimum Standards for the Interiors of Structures

A. Floors, Walls, Ceilings, Doors and Windows

- All subfloors shall be 1 1/8" tongue and groove solid and continuous plywood, without liberal movement or bounce, free from rot and deterioration and free from defects.
 - OSB subflooring is not acceptable for use.
 - **Acceptable products shall be Advantech, Plytanium STURD-I-FLOOR, or approved equal.*
- All flooring shall be free from trip hazards with a minimum of seams spaced at logical locations such as doorways and matched to the existing floor.
- All finished flooring shall be 1/8" thick and glued down over a self-leveling float over a fluid applied vapor barrier.
- Floor finishes shall be slip resistant when wet and shall be sealed around their edges with silicone sealant. Any flooring material that permits water to seep into the sub flooring over 1/8" thick underlayment floor is unacceptable. Provide vinyl plank flooring, minimum 0.12 inches thick in living, dining, kitchen, bathrooms, and utility rooms. Sealed kick plate shall be installed around vanities and cabinets in bathrooms and kitchens.
- Carpets shall be free from all defects such as tainting, bare patches, and so on. At a minimum, provide carpet of 28 ounce/square yard with a carpet pad 7/16 inch with 8 lb. density.

- Interior wall surfaces shall be free from chipped, cracking, or peeling paint. All such loose paint shall be completely removed, and bare wood surfaces primed. All primed surfaces shall be properly painted with a 2-coat minimum.
- Interior walls shall be smooth and comply with UPCS standards.
- Provide minimum 4-inch interior walls and 6-inch plumbing walls.
- Rounded sheetrock edges shall be provided as a standard option; however, at the request of the homeowner, straight edges may be provided at no additional cost to the City or the homeowner.
- Provide minimum 2 1/4-inch paint grade solid casing around doors and windows.
- Every bathroom and/or toilet room, kitchen, and utility room floor surface shall be constructed such that they are impervious to water and can easily be kept in a clean and sanitary condition by the owner.
- Provide washer/dryer hookups.
- All interior doors shall be capable of affording the privacy for which they are intended.
- All bedrooms shall be a minimum of 100 square feet plus a closet. Minimum furniture wall in master bedroom shall be 12 feet and minimum diagonal measurement of bedroom room shall be 11 feet. Minimum 5 feet wide by 2 feet deep closet required in each bedroom and maximum of 18 square feet. Walk-in closet in master bedroom shall be minimum of 25 square feet.
- All paint, stains, varnishes, lacquers, and other finishes shall be durable with low levels of Volatile Organic Compounds (VOCs) paint finishes and installed as required by the manufacturer. Minimum Satin finish on all walls and ceilings, no flat paint.
- All windows shall meet or exceed the minimum requirements for STE ratings as required by location
- All windows shall have a U-value of less than or equal to 0.35 and an SHGC of less than or equal to 0.25 and meet energy star 3.0 requirements and flashed with butyl tape.
- All bedroom escape windows shall meet or exceed the most current City of Houston adopted code and all windows shall have tempered glass at all kitchens, bathrooms and adjacent exit, and closet doors within the code required distance.

B. Hazardous and Substandard Conditions

These conditions shall include, but are not limited to:

- Damaged, rotted, or deteriorated subfloor surfaces.
- Torn, missing, worn, burned, or otherwise damaged floor coverings that create a tripping hazard or unsanitary condition.
- Missing baseboard, shoe mold, or sealant that creates an unsanitary condition.
- Sealed or blocked windows including windows which have been painted shut, windows which are not operational, or windows which will not function as a variable fire exit such as windows with burglar bars which cannot be opened readily from the inside.
- Windows that do not lock or locks that do not function with ease.
- Any exterior door which is not insulated, sealed, or painted, and which does not have a functioning lockable deadbolt.

IX. Minimum Standards for Exterior of Structures (General Framing)

A. Texas Government Code Section 2306.514. Construction Requirements for Single Family Affordable Housing

§ 2306.514. CONSTRUCTION REQUIREMENTS FOR SINGLE FAMILY AFFORDABLE HOUSING – In the event of a conflict of between TGC 2306.514 and other programmatic guidance, the more stringent requirements shall apply.

(a) If a person is awarded state or federal funds by the State of Texas to construct single family affordable housing for individuals and families of low and very low income, the affordable housing identified on the person's funding application must be constructed so that:

(1) at least one entrance door, whether located at the front, side, or back of the building:

(A) is on an accessible route served by a ramp or no-step entrance; and

(B) all means of ingress/egress area minimum of 36-inch in width;

(2) on the first floor of the building:

(A) each pass-through interior door is at least 32-inches wide, unless the door provides access only to a closet of less than 15 square feet in area;

(B) each hallway has a width of at least 40 inches and is level, with ramped or beveled changes at each door threshold;

(C) each bathroom wall is reinforced for potential installation of grab bars;

(D) each electrical panel or breaker box, light switch, or thermostat is not higher than 48 inches above the floor;

(E) each electrical plug or other receptacle is at least 16 inches above the floor; and

(3) each breaker box is located inside the building on the first floor.

Added by Acts 1999, 76th Leg., Ch. 1581, § 1, eff. Sept. 1, 1999.

Last modified: August 10, 2007

B. Foundations, Exterior Walls, Roofs, Soffits and Fascia

- Every foundation, exterior wall, roof, soffit, and fascia shall be made weather resistant.
- Products for exterior walls, roofs, soffits, and fascia shall be installed in accordance with the manufacturer's guidelines.
- For pier and beam foundations elevated between 0 feet to 3 feet above grade, skirting shall be installed.
- For pier and beam foundations elevated between 0 feet to 3 feet above grade, where required insulation is installed, the contractor shall provide and install treated plywood, Hardie plank or an approved equal product, approved by HCDD, as an underpin, caulked at the perimeters, to keep insulation in place, to provide moisture protection, and to provide insect and rodent protection.

- For pier and beam foundations elevated between 0 feet to 3 feet above grade, termite shields shall be installed at all piers and grade beams, if applicable.
- Composite or Ultraviolet radiation (UV) resilient vinyl materials shall be used in the construction of all skirting materials.
- All building foundation type and other supporting structures shall be designed and sealed by a licensed Professional Engineer (PE) registered in the State of Texas.
- All foundation types shall be designed in accordance with 2015 IRC or the latest IRC adopted by the City of Houston and in accordance with City of Houston building codes and requirements.
- ~~Unless otherwise noted, all concrete slab on grade foundations shall be post tension slabs. During the concrete pour, the contractor shall provide 3 concrete samples, per truck for maximum 6". Each sample (per truck) shall be labelled as follows.~~
 - ~~1. Truck 1 – Initial Pour, Intermediate Pour, Final Pour~~
 - ~~2. Truck 2 – Initial Pour, Intermediate Pour, Final Pour~~
 - ~~3. Truck 3 – Initial Pour, Intermediate Pour, Final Pour~~
- All new construction shall meet or exceed Windstorm requirements per City of Houston new construction standards with a basic windspeed requirement of 139 MPH with 3 sec gusts per 2015 IRC or the latest IRC adopted by the City of Houston.
- Concrete shall be a minimum 3000 Pounds per Square Inch (PSI) with a 28-day cure.
- If applicable to the scope of work, foundation leveling shall be done in such a manner as to be permanent and shall be completed before other work begins. Prior to the work performed, a signed and sealed structural engineer's report on the condition of the foundation shall be required to submit to HCDD and at the completion of the work.
- Only pressure treated lumber may be used for pier and beam foundations.
- If the City of Houston's environmental Tier II site-specific review indicates noise attenuation is required, the dwelling must meet the federal requirement not to exceed more than 45 decibels (dB) for interior sound. There must be a Noise Certification or Sound Testing performed if noise attenuation is required.
- Roofing shall be installed in accordance with the manufacturer's requirements. Provide 30-year architectural shingles over 30 lbs. felt.
- All new roof decking shall be 5/8" CDX/ APA rated plywood sheathing and all joints shall be taped with Roof Deck Seam Tape or approved equal.
- All replaced decking shall be of a type that is compatible with the existing decking, thus making the roof subsurface smooth and free from defects. Oriented Strand Board (OSB) decking will not be acceptable.
- All wall studs, ceiling joist, and rafters shall be #2 Southern Yellow Pine and as called for by the structural engineer of record. No finger joint material will be allowed. Stud walls and rafters shall be a maximum of 16 inches "on-center".
- All exterior sheathing shall be 7/16 OSB applied with recommended engineered nailing pattern.
- All roof jacks shall be led and painted to match the roof shingles.
- Under the DR-21 (Winter storm Program), all new construction shall be equipped with Tesla Solar Panels or an approved equal product on a newly constructed roof system.

- Under the DR-21 (Winter storm Program), all new construction shall be equipped with a natural gas Generac generator or approved equal product.
- All exterior walls shall be a minimum of 4 inches thick unless otherwise noted.
- Cement board sidings on homes elevated above 3.0 feet, exterior walls shall have ½-inch plywood or OSB using 6d galvanized nails or better.
- The final grade must have proper slopes away from house with a minimum 6" slab exposure and must be level with all flat work at a minimum.
- Grading below elevated structure shall provide positive drainage away from house footprint and prevent pooling under the house.
- Provide a minimum of 2 trees with a caliper of 2 inches as approved by the City.

C. Landscaping, Lawn Areas, and Trees

- Lawn shall be consistent with comparable units and sodded with St. Augustine sod (grass) as described below.
 - All areas around the housing structure shall have sod at least 20 feet from slab to the left and right, or to side property lines, and rear of house. Front yard of house shall have full sod.
 - Sod (grass) shall be installed as necessary to establish consistency with comparable units and properly rolled to eliminate uneven and rutted surfaces.
 - All concrete remnants and construction debris shall be removed.
 - Lawn shall be appropriately mowed and trimmed at the time of inspection in rehab, reconstruction, and new construction.
 - Provide and Install Trees
 - A minimum of one tree will be required in the front yard of each single -family unit and be properly located on the site.
 - New trees required shall be 25-gallon size trees or larger and shall be appropriately planted and watered to ensure sustainability.
 - Existing trees too close to the structure or threaten the structure shall be trimmed or must be removed.
 - Generally, trees that require trimming shall have the branches cut back to the main trunk.
 - Existing trees that could damage an adjacent structure above or below the foundation shall be removed.
 - Existing trees that present a safety hazard because electrical wiring runs through them shall be trimmed or the trees shall be removed.
 - Contractors shall provide irrigation and care of sod and trees until transfer of custody of home to homeowners.
- Siding, soffit, and fascia shall be fiber cement siding.
- 1 1/8" plywood will be required for subfloor surfaces on all elevated homes.
- **Hazardous and Substandard Conditions**
 - These conditions shall include but are not limited to:

- Unsupported beams, sills or joints that have no support or inadequate support.
- Water draining and/or pooling under foundation area.
 - Ground contact of untreated wooden structure; or
 - Several slab cracks that create or threaten structural or other systems such as plumbing.

D. Drainage

- All rainwater shall be conveyed and drained away from every roof so as not to cause wetness or dampness in the structure. No roof drainage systems shall be connected to a sanitary sewer.
- Finished Grade at house foundation shall provide positive drainage away from structure and shall start a minimum of 6 inches below finish floor at slab on grade or a minimum of 6 inches below pier structure for elevated floor.
- Nowhere on the property shall there be standing water that causes a public health hazard. Run-off shall not encroach on adjacent property to create a hazard or drainage issue.
- The property shall have a minimum drainage to drain water from the foundation of the house per IRC 2015 or latest IRC adopted by the City of Houston.

E. Windows, Exterior Doors and Egress

- Every window and exterior door shall be tight fitting within their frames, be pest rodent-proof, insect-proof and be weatherproof such that water and surface drainage is prevented from entering the dwelling. In addition, the following requirements shall also be met:
 - All exterior doors and windows shall be equipped with security locks. Doors shall be fire rated as required by code.
 - Every window sash shall be fully equipped with glass windowpanes which are without cracks or holes, shall use Energy Star windows rated for Climate Zone 2, shall fit tightly within its frame, and be secured in a manner consistent with the window design. All window jambs will be sealed, and Energy Star rated for Climate Zone 2.
 - Storm doors shall also be equipped with a self-closing device.
 - Every exterior door, when closed, shall fit properly within its frame, and shall have door hinges and security locks or latches. All exterior doors will be no less than metal clad insulated, foam filled, 6-panel doors. All jambs shall be painted and sealed. Thresholds will be zero step entry clearance and sealed.
 - Window sizes in living and master bedrooms shall have a minimum glazing of 30 sq. ft and maximum of 45 sq. ft. Dining rooms and bedroom windows shall have a maximum glazing of 30 sq. ft, kitchen windows shall have a maximum glazing of 15 sq. ft, and bathroom windows shall have a maximum glazing of 9 sq. ft.
 - The total window area that can be opened in every habitable room shall be equal to at least 50 percent of the minimum window area size.

Mailbox & House Numbers

- Every dwelling unit shall have a mailbox which meets United States Postal Service (USPS) standards. Mailboxes shall be accessible to the mail carrier, convenient to inhabitants, & handicapped accessible.
- A minimum 3" high address numbers visible from the street for all first responders and all City and Independent agencies

X. Minimum Standards for Plumbing Systems

A. All plumbing systems shall be capable of safely and adequately providing a water supply and wastewater disposal for all plumbing fixtures. Each plumbing system shall comply with the following requirements.

- All plumbing systems and plumbing system components shall be free of leaks. Any type of pipe allowed by the plumbing code shall be allowed in accordance with any local, county or state requirements having jurisdiction.
- All plumbing system piping shall be of adequate size to deliver water to plumbing fixtures and to convey wastewater from plumbing fixtures, including proper slope of wastewater piping as designed by the fixture manufacturer. All piping materials shall be in accordance with the City's specifications.
- All plumbing fixtures shall be in good condition, free of cracks and defects, and capable of being used for the purpose in which they were intended.
- The plumbing system shall be vented in a manner that allows the wastewater system to function at atmospheric pressure and prevents the siphoning of water from fixtures. Venting by mechanical vents is accepted as an alternative to exterior atmospheric venting.
- All fixtures that discharge wastewater shall contain, or be discharged through, a trap that prevents the entry of sewer gas into the dwelling.
- All plumbing system, piping and fixtures, shall be installed in a manner that prevents the system or any component of the system, from freezing.
- All plumbing fixtures and water connections shall be installed in such a way as to prevent the backflow of water from the system into the plumbing system's water source. Provide Water Sense qualified or better plumbing fixtures.
- All faucets shall have aerators that restrict water flow to less than 2 gallon per minute (gpm). Provide elongated toilets which shall only use a maximum of 1.28 gallons per flush (gpf). Faucets shall be free from leaks or drips and shall shut-off completely.
- Valves shall be installed with the valve in the upright position and full port ball-valve shall be used.

XI. Minimum Standards for Potable Water Supply

A. Every dwelling shall be connected to an approved, by the jurisdiction having authority, potable water source.

- B.** All potable water fixtures and equipment shall be installed in such a manner as to make it impossible for used, unclean, polluted, contaminated water, mixtures, or substances to enter any portion of the potable water system piping. All equipment and fixtures shall be installed with air gaps (traps) to prevent back siphonage. All outlets with hose threads, except those serving clothes washing machine, shall have a vacuum breaker for use with the application. No water piping supplied by a private water supply system shall be connected to any other source of water supply without the approval of the jurisdiction having authority over the installation.
- C.** The following shut-off valves will be installed:
- One owner's shut-off at the meter or supply source;
 - One shut-off at each toilet;
 - One shut-off each for hot and cold water at each sink/lavatory;
 - One supply side shut-off at each water heater; and
 - At least two exterior faucets shall be installed, and all faucets shall be freeze protected or insulated to a minimum R- value of 3.5.
- D.** All unused wells on the property shall be abandoned and plugged-in accordance with any city or state requirements having jurisdiction. All cisterns shall be drained and filled, and if applicable, in accordance with any city or state requirements having jurisdiction.
- E. Hazardous and Substandard Conditions**
These conditions shall include but not limited to:
- Lack of continuous sanitary water supply, where ground wells are used, this source shall be approved for drinking, or a secondary source of drinking water shall be available.
 - Deteriorated, corroded broken, or otherwise worn water supply.
 - Evidence of leaks, either continuous or intermittent, of water supply lines.
 - Missing or dysfunctional shut-off valves.
 - Lack of fully functioning faucets at each sink/lavatory, bathtub/shower, and at least two exterior hose bibs.

XII. Minimum Standards for Connection to Sanitary Sewer

- A.** Every dwelling shall be connected to an approved, by the jurisdiction having authority, sanitary sewer system or properly operating septic system.
- B. Hazardous and Substandard Conditions.**
These conditions shall include but are not limited to:
- Lack of continuously functioning sanitary wastewater disposal system.
 - Missing, dysfunctional, or nonexistent sanitary facilities including a functioning toilet in a separate room designed for such purposes.

- The lack of at least one sink and or lavatory for hygiene and at least one sink for kitchen purposes each providing a continuous flow of both hot and cold water.
- The lack of at least one functional bathing facility.
- Evidence of leaks, either continuous or intermittent, of wastewater supply lines.
- Missing or blocked vent pipes or sewer odors.

XIII. Minimum Resiliency Measures

At a minimum, the following resiliency measures shall be incorporated:

- A.** Elevate the structures above the floodplain in accordance with the City of Houston ordinances or the requirements set forth by HUD or the GLO, whichever is most restrictive. This measure takes the entire structure out of the hazard zone, thus minimizing or eliminating future flood risk for these homes. All reconstruction and new construction homes on this program will be built to meet the City’s Chapter 19 Ordinance requiring 2 feet of freeboard above the 500-year flood event Elevation. Rehabilitated homes that are substantially damaged or substantially improved will be elevated, where feasible and practical, to meet this elevation requirement as well.
- B.** Where feasible and requested by the homeowner, ground level mechanicals such as HVAC Condenser Units, Water Heaters, and Furnaces 2 feet above the 500-year flood event height, per flood certificate, to protect them from future flooding and will minimize remedial costs from future events. These mechanicals are often the most expensive non-structural components of the home, so it is prudent to address them, where feasible, as a resiliency measure.
- C.** During the course of Initial Site Inspections (ISI), the inspector will examine the site for apparent drainage issues and question the homeowner to document any reported site drainage issues. These issues can be addressed as part of the scope of work.

XIV. Minimum Hazard Protocols

A. Mold

For program homes that will receive rehabilitation, HCDD will test for mold under the following circumstances:

- Initial on-site interview with the homeowner, indicates a known or suspected mold presence in the home.
- Visual presence of mold is noted during the initial home inspection.
- Mold odor is detected during the initial home inspection.
- Upon completion of the mold or asbestos investigation, a report will be provided an inspection report.

a. Mold Testing

The City reserves the right to require the contractor to provide necessary inspections and clearances from a certified Mold Assessor for mold hazard remediation. The Mold Assessor will conduct air sampling inside and outside the home to assess the level of mold spores. This testing is non-destructive and typically completed in one to two hours. Moisture testing may also be required in some circumstances and this testing is also non-destructive. Samples collected are sent to an approved laboratory for analysis, then the Mold Assessor produces a Mold Assessment Report.

b. Mold Remediation (if required)

If mold impact is found in the home, HCDD will add mold remediation to the rehabilitation scope of work. The assigned builder will engage a Texas-licensed mold professional to address the mold during the course of the construction project. The clearance letter and fees are part of the scope of services secured by HCDD unless otherwise noted as the responsibility of the General Contractor.

c. Lead Based Paint

For program homes that will receive rehabilitation, lead based paint attesting will occur under for all homes constructed prior to 1978.

The City reserves the right to require the contractor to provide necessary inspections and clearances from a certified Lead Based Paint (LBP) assessor for lead hazard remediation. Also, the City may require work to be performed by another contractor through its Lead Hazard Reduction Program. An LBP assessor will perform an inspection, risk assessment protocol, and provide clearance.

d. Lead Based Paint Remediation (if required)

The City reserves the right to require the contractor to provide necessary inspections and clearances for a certified Lead Based Paint (LBP) assessor for LBP hazard remediation. If LBP is detected in the home, HCDD will add LBP remediation to the rehabilitation scope of work. The assigned builder will engage a Texas-licensed LBP abatement professional to address the LBP during the construction project.

e. General Contractors Instructions

Before regular construction can begin, HCDD will notify the General Contractor (GC) of the homeowner moveout date and give the earliest date to start abatement work. The GC and their abatement contractor are to schedule directly with the environmental company whose inspection report is attached to the bid package. All abatement activities and fees are the responsibility of the GC, except the clearance letter, if

applicable. The clearance letter and fees are part of the scope of services secured by HCDD unless otherwise noted as the responsibility of the GC.

B. Asbestos-Containing Materials (ACM)

a. ACM Screening

HCDD will utilize GIS mapping to follow National Emission Standards for Hazardous Air Pollutants (NESHAP)¹⁵ to determine if a home is subject to testing for program homes that will receive rehabilitation or re-construction.

b. ACM Testing

The City reserves the right to require the contractor to provide necessary inspections and clearances from a certified ACM assessor for Asbestos hazard remediation. The ACM assessor will perform an inspection, risk assessment protocol, and provide clearance.

c. ACM Remediation (if required)

If ACM is detected in the home, HCDD will add ACM remediation to the rehabilitation scope of work or will include the abatement scope for homes that will be demolished and reconstructed. The assigned builder will engage a Texas-licensed ACM abatement professional to address the ACM during the construction project.

d. General Contractors Instructions

Before regular construction can begin, HCDD will notify the General Contractor (GC) of the homeowner moveout date and give the earliest date to start abatement work. The GC and their abatement contractor must submit the required 10-Day notification to the state and schedule directly with the environmental company whose inspection report was attached to the bid package. *NOTE: The GC will be identified as the "Facility Owner" on the 10-Day notification. All abatement activities and fees are the responsibility of the GC, including ARU fees, except for the clearance letter.* The clearance letter and fees are part of the scope of services secured by HCDD.

XV. Minimum Requirements for Manufactured Housing Units (MHU)

Construction standards for new Manufactured Housing Units (MHUs) are set by the National Manufactured Housing Construction and Safety Standards act of 1974¹⁶, the Texas

¹⁵ <https://www.epa.gov/stationary-sources-air-pollution/national-emission-standards-hazardous-air-pollutants-neshap-8>

¹⁶ <https://www.govinfo.gov/link/uscode/42/5401>

Manufactured Housing Standards Act (Article 5221F)¹⁷, and HUD Code Standards 3280¹⁸ and 3282¹⁹.

During the installation process, the MHU is placed on its installation location as indicated on the site inspection drawing; blocked, leveled, and anchored; utilities connected; and outfitted with proper skirting, stairs, ramps, and landings. The MHU should be made ready for occupancy by testing all appliances. The lot should be cleaned and have all extraneous material removed.

All MHUs are installed to the same standards including all applicable federal, state, and local laws or regulations, as well as the manufacturer's installation instructions. In the case of conflicting requirements, the most stringent, specific, and definitive rule will be followed. Any deviation from the approved site location must be approved in advance by the City of Houston.

A. Site Usage Permits

All permits required to install an MHU shall be identified and obtained.

B. Nominal Site Grading

Grading below MHU shall provide positive drainage MHU footprint and prevent pooling under the unit. Grading shall be consistent with comparable units and shall be sodded with St. Augustine sod as described below.

- All areas around the housing structure shall have sod at least 20 feet from slab to the left and right, or to side property lines, and rear of house and front yard shall have full sod.
- Contractors shall provide irrigation and care of sod and trees until transfer of custody of home to homeowners.

C. Nowhere on the property shall there be standing water that causes a public health hazard. Run-off shall not encroach on adjacent property to create a hazard or drainage issue.

D. Power, Water, and Sewer Connections

All excavations shall be performed in accordance with the local requirements. Utility line installation is measured at the external point of the MHU closest to the utility connection for each utility. All utility service connections shall be provided in accordance with the local ordinance requirements and manufacturer specifications.

E. All MHUs shall be installed on a permanent foundation.

¹⁷ <https://www.tdhca.state.tx.us/mh/docs/Law-20010901-20030531.pdf>

¹⁸ <https://www.ecfr.gov/current/title-24/part-3280>

¹⁹ <https://www.ecfr.gov/current/title-24/part-3282>

F. All MHUs will be tied down through the installation of approved tie downs adequate to meet federal, state, and local requirements.

G. All road transport accessories such as wheels, trucks, and hitching devices shall be removed to make installation permanent.

H. Power Poles with Meter Loop

Furnish and install, power pole and meter loop with appropriately sized service. Install an overhead electric assembly. The assembly shall be appropriately sized for the MHU scheduled to be installed with a weatherproof, rain-tight meter box containing the main circuit breaker. All components shall be installed in accordance with the NEC and local codes. All conduit connections on the meter pole must be watertight.

I. Power Pedestals

Power pedestals shall be provided when required to place a power meter. This requires approval prior to installation from the City of Houston.

J. Install and Test Heating, Ventilation, and Air Conditioning (HVAC)

The HVAC system shall be installed in compliance with manufacturer's specifications. Prior to reporting the unit as ready for occupancy and requesting a City of Houston acceptance inspection, the heat and air conditioning units shall be operated for 30 minutes to ensure they are properly functioning as intended. Installation of the HVAC unit shall be considered part of the basic unit installation.

K. If approved by the homeowner, the code enforcement department, and if applicable; Homeowners Association, the HVAC system may be elevated as a resiliency measure.

L. For pier and beam foundations elevated between 0 feet to 3 feet above grade, skirting shall be installed in accordance with appropriate codes and as required by the local and neighborhood regulations. Composite or UV resilient vinyl materials shall be used in the construction of all skirting materials.

M. If skirting is not required by code or neighborhood regulations, skirting is optional at homeowner's discretion.

N. Steps, Platform Stairs, and Ramps

Install steps and a deck/landing at each entrance to the MHU unless the work order directs the installation of platform stairs or ramp. When constructing ramps, the UFAS shall apply.

O. Removal of equipment, excess materials and debris

The site shall be free of all excess equipment, materials, and debris and the MHU has to be appropriately cleaned prior to declaring the MHU to be ready for occupancy.

P. Treated wood fencing

All perimeter/ privacy fencing, as called for on the construction documents shall be constructed of cedar wood. All vertical 4x4 posts shall not exceed 6 feet on center (o.c.).

There shall be a 1/10 cedar rot board, attached to the front of the post with a chamfered edge to prevent ponding. There shall be a 2x4 intermediate horizontal board, between posts to act as picket nailer, and there shall be a continuous 2x4 top post, also to act as picket nailer. See diagram

Q. Keys

A minimum of 2 sets of keys shall be provided for each MHU.

R. MHUs slated for demolition shall be destroyed and disposed of in accordance with applicable standards. Additionally, all household waste shall be disposed of in accordance with federal, state, and local environmental regulations.

S. Hazardous and Substandard Conditions

These conditions shall include but are not limited to:

- A MHU that is not permanently situated on a permanent foundation.
- A MHU that is not adequately tied down or affixed by an approved tied down system.
- A MHU that has not had its wheels, truck, and hitch removed.

XVI. Rights to Alter Design

The City of Houston reserves the right to alter plans to accommodate site specific design or elements to accommodate end user for accessibility or any other requirements.

XVII. Definitions

- A. **American Disabilities Act (29 CFR Part 8 Subpart C):** The Americans with Disabilities Act of 1990 (ADA) prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, state, and local government services, public accommodations, commercial facilities, and transportation. It also mandates the establishment of telecommunications device for the deaf (TDD)/telephone relay services.
- B. **APA:** American Plywood Association
- C. **CDX:** Veneer plywood which is manufactured by gluing and pressing together sheets of wood.
- D. **Egress:** A permanent and unobstructed means of exiting from the home in an emergency escape or rescue situation.
- E. **Energy Star Rated:** Includes all systems, components, equipment, fixtures, and appliances that meet strict energy efficiency performance criteria established, as a joint effort, by the federal Environmental Protection Agency, the U.S. Department of Energy and the U.S. Department of Housing and Urban Development and that carry the Energy Star label as evidence of meeting this criterion.
- F. **Fair Housing Act (24CFR§100.25):** Federal law that prohibits discrimination by direct providers of housing, such as landlords and real estate companies as well as other entities, such as municipalities, banks or other lending institutions and insurance companies whose discriminatory practices make housing unavailable to persons because of race or color, religion, sex, national origin, family status or disability.
- G. **Ground Cover:** Suitable material applied to the ground to prevent erosion of the soil and includes concrete, flagstone, gravel, asphalt, grass, or other form of landscaping.
- H. **Habitable Space (Room):** Space (rooms) within the home for living, sleeping, eating, or cooking. Bathrooms, toilet rooms, closets, halls, storage or utility spaces, and similar areas (rooms) are not considered habitable spaces (rooms).
- I. **Homeowner:** The applicant and/or co-applicant who has been determined by the HCDD to have legal ownership interest in the property
- J. **Pest:** Any mouse, rat, bed bug, flea, wasp, hornet, cockroach, or other undesirable fauna.
- K. **PVC:** Polyvinyl Chloride used for electrical insulation, films, and pipes.
- L. **R-value:** tells how well a type of insulation can keep heat from leaving or entering your home.
- M. **Sewage System:** The City sanitary sewer system or a private sewage disposal system approved by the City.

- N. Single Family Unit:** A one- to four-family residence detached or attached to other housing structures.
- O. Specifications:** Minimum acceptable grades and types of materials to be used and to provide the basis for how materials and equipment shall be installed.
- P. TREC Inspector:** a real estate inspector licensed by the Texas Real Estate Commission to perform an inspection of a property.
- Q. UFAS:** Uniform Federal Accessibility Standards
- R. Workmanship:** Refers to the quality of the work performed.
- S. HC-1 HC-2 HC-3 bathroom:** Refers to level of physically challenged amenities as defined in the City of Houston document 14.27 also known as the Verification of Disability, which is signed or prescribed by a doctor during the “intake process”.
- T. Rehabilitation of Substantially damaged homes:** Refers to the damage of any origin sustained by a structure whereby the cost of restoring the structure to it’s before damage condition would equal or exceed 50 percent of the market value or replacement cost of the structure before the damage occurred. (Note: The cost of the repairs must include all costs necessary to fully repair the structure to its “before damage” condition.)
- U. Substantial Improved** means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement.
- V. Rehabilitation of Non-substantially damaged homes;** means any reconstruction, rehabilitation, addition, or other improvement of a structure’s cost DOES NOT equals or exceed 50 percent of the market value of the structure before the "start of construction" of the improvement. For the purposes of determining substantial improvement, market value pertains only to the structure in question. It does not pertain to the land, landscaping or detached accessory structures on the property. Any value resulting from the location of the property should be attributed to the value of the land, not the building.