ORDINANCE NO. 20130606-055

AN ORDINANCE REPEALING AND REPLACING ARTICLE 11 OF CITY CODE CHAPTER 25-12 TO ADOPT THE 2012 EDITION OF THE INTERNATIONAL RESIDENTIAL CODE FOR ONE- AND TWO-FAMILY DWELLINGS AND LOCAL AMENDMENTS.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

PART 1. Article 11 of Chapter 25-12 (*Residential Code*) is repealed and a new Article 11 is adopted to read as follows:

ARTICLE 11. RESIDENTIAL CODE

§ 25-12-241 RESIDENTIAL CODE.

(A) The International Residential Code for One- and Two-Family *Dwellings*, 2012 Edition, published by the International Code Council, Inc. (2012 International Residential Code) is adopted and incorporated into this section with the deletions and amendments in Subsections (B) and (C) and Section 25-12-243 (*Local Amendments to the International Code*).

(B) The following provisions of the 2012 International Residential Code are deleted. All subsections contained within a deleted section or subsection are also deleted, even if not specifically listed below.

Section R101.2	Section R109.1.3	Part IX
Section R103	Section R110.3	Part VI
Section R104.4	Section R112	Part VII
Section R105.2	Table R301.2 (1)	Part VIII
Section R105.3.1.1	Section R301.2.4	
Section R105.3.2	Section R314	
Section R105.5	Section R315	
Section R106.1.3	Section R320	
Section R106.4	Section R322	
Section R109.1.1	Section M2201.6	

(C) The definitions of "Building, Existing" and "Height, Building" in Section R202 (*Definitions*) of the 2012 International Residential Code are deleted.

(D) The city clerk shall file a copy of the 2012 International Residential Code with the official ordinances of the City.

§ 25-12-242 CITATIONS TO THE RESIDENTIAL CODE.

In the City Code, "Residential Code" means the 2012 International Residential Code adopted by Section 25-12-241 (*Residential Code*).

§ 25-12-243 LOCAL AMENDMENTS TO THE RESIDENTIAL CODE.

The following provisions are local amendments to the 2012 International Residential Code. Each provision in this section is a substitute for an identically numbered provision deleted by Section 25-12-241(B) or (C) or an addition to the Residential Code.

R101.2 Scope. The provisions of the *International Residential Code for One- and Two-family Dwellings* apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of:

1. detached one- and two-family dwellings and townhouses not more than three stories above grade plane in height with a separate means of egress and their accessory structures; and

2. owner-occupied lodging houses and their accessory structures, provided that the lodging house is not more than three stories above grade plane in height and has a separate means of egress, no more than six guestrooms, and a fire sprinkler system in accordance with Section P2904.

R101.2.1 Electrical. The provisions of the Electrical Code shall apply to the installation of electrical systems, including alterations, repairs, replacement, equipment, fixtures fittings and appurtenances thereto. 90 days, except electrical

R101.2.2 Gas. The provisions of the International Fuel Gas Code and the Plumbing Code shall apply to the installation of gas piping from the point of delivery, gas appliances and related accessories as covered in this code. The Plumbing Code supersedes the International Fuel Gas Code to the extent of conflict. These requirements apply to gas piping systems extending from the point of delivery to the inlet connections of appliances and the installation and operation of residential and commercial gas appliances and related accessories.

R101.2.3 Plumbing. The provisions of the International Plumbing Code and the Plumbing Code shall apply to the installation, alteration, repairs and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewage system and all aspects of a medical gas system. The Plumbing Code supersedes the International Plumbing Code to the extent of conflict. The provisions of the International Private Sewage Disposal Code and the

Plumbing Code shall apply to private sewage disposal systems. The Plumbing Code supersedes the International Private Sewage Code to the extent of conflict.

Exception: The design and installation of residential fire sprinkler system shall be in accordance with NFPA 13D or section P2904 of the International Residential Code.

R101.4.2 Mechanical. The provisions of the International Residential Code shall apply to the installation, alterations, repairs and replacement of mechanical systems, including equipment, appliances, fixtures, fittings and/or appurtenances, including ventilating, heating, cooling, air conditioning and refrigeration systems and other energy related systems in one and two family dwellings and town houses.

R101.2.4 Energy efficiency inspection. Inspections shall be made to determine compliance with the energy efficiency requirements of the Energy Code, as adopted by Chapter 25-12, Article 12 *(Energy Code)*, and shall include, but not be limited to, inspections for: envelope insulation R and U values, fenestration U value, duct system R value, and HVAC and water-heating equipment efficiency.

R103.0 Qualified Inspectors. An inspector who performs inspections under this code must possess the necessary qualifications required under Section R103.1, R103.2, R103.3, and R103.4.

R103.1 Residential Combination Inspector Supervisor.

1. A Residential Combination Inspection Supervisor must:
   a. Be an employee of the City;
   b. Maintain a current plumbing inspector license issued by the Texas State Board of Plumbing Examiners;
   c. Maintain a current certification as a Residential Mechanical Inspector under the certification program established by the International Code Council or International Association of Plumbing and Mechanical Officials;
   d. Maintain a current certification as an Residential Energy Inspector under the certification program established by the International Code Council;
   e. Maintain a current certification as a Residential Building Inspector under the certification program established by the International Code Council; and
   f. Have at least ten years of experience as a Texas Licensed Plumber, at least three years of which must be in a responsible supervisory capacity.
2. Five years of inspection experience may be substituted for five years of craft experience required in Subsection l(f), above.

R103.2 Residential Combination Inspector.

1. Residential Combination Inspector must:

   a. Be an employee of the City;

   b. maintain a current plumbing inspector license issued by the Texas State Board of Plumbing Examiners;

   c. Maintain a current certification as a Residential Mechanical Inspector under the certification program established by the International Code Council or the International Association of Plumbing and Mechanical Officials;

   d. Maintain a current certification as an Residential Energy Inspector under the certification program established by the International Code Council; and

   e. Maintain a current certification as a Residential Building Inspector under the certification program established by the International Code Council.

R103.4 A person hired by the City as a residential combination inspector after the effective date of this Code must become a Licensed Plumbing Inspector by the Texas State Board of Plumbing Examiners within one year after the date of employment. All required certifications to be obtained within a one-year period after the Texas State Plumbing Inspectors license is obtained

R104.4 Inspections. The *building official* is authorized to make all required inspections or to accept reports of inspection by *approved agencies, registered design professionals* or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such *approved* agency or by the responsible individual. The *building official* is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority. Where special conditions exist, the *building official* is authorized to require additional *construction documents* to be prepared by a *registered design professional* such as but not limited to: building envelope survey, impervious coverage survey for a project within 5% of the maximum allowable impervious cover, building height survey, finish floor elevations, foundation report and flood elevation certificate. All surveys shall be performed by a Texas registered professional surveyor.

R104.10.1 Areas prone to flooding. The City Council shall hear and decide requests for variances to any provision related to areas prone to flooding in accordance with Appendix G, Section G105 (*Variances*) of the Building Code.

R105.1.1 Separate permit. A separate permit must be obtained for each building or structure.

R105.1.3 Persons authorized to obtain permits for mechanical work. Except as otherwise provided in Section R105 (*Permits*), only an air conditioning and refrigeration contractor licensed by the State of Texas to perform mechanical work and registered with the City may obtain a permit required by the Residential Code to perform mechanical work.

R105.2 Work exempt from permit. A *permit* is not required for activities listed in Subsections R105.2.1 or R105.2.2 of this section. Exemption from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this *jurisdiction*.

1. Building:

a. One-story detached *accessory structures* used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 200 square feet (18.58 m^2), does not create a habitable space and contains no plumbing or is located within flood hazard areas provided they are not located within a flood hazard area.

b. Fences not over 7 feet (1829 mm) high provided it is not located within a flood hazard area.

c. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or located within a flood hazard area provided they are not located within a flood hazard area.

d. Water tanks supported directly upon *grade* if the capacity does not exceed 5,000 gallons and the ratio of height to diameter or width does not exceed 2 to 1 or located within a flood hazard area provided they are not located within a flood hazard area.

e. Sidewalks and driveways that are not located in a right-of-way.

f. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.

g. Prefabricated swimming pools that are less than 24 inches (610 mm) deep.

h. Swings and other playground equipment.

i. Window awnings supported by an exterior wall which do not project more than 54inches (1372 mm) from the exterior wall and do not require additional support.

j. Decks not exceeding 200 square feet (18.58m2) in area, that are not more than 30 inches (762 mm) above *grade* at any point, are not attached to a *dwelling* and do not

serve a door or located within a flood hazard area provided they are not located within a flood hazard area.

k. Repairs to gypsum board limited to a maximum of 32 sq. ft. that is not part of a fire-resistance-rated wall, a shear assembly or a tub and shower surround.

l. Replacement of asphalt roof shingles.

2. Mechanical:

a. Portable heating *appliances*.

b. Portable ventilation *appliances*.

c. Portable cooling units.

d. Steam, hot- or chilled-water piping within any heating or cooling *equipment* regulated by this code.

e. Replacement of any minor part that does not alter approval of *equipment* or make such *equipment* unsafe.

f. Portable evaporative coolers.

g. Self-contained refrigeration systems containing 10 pounds (4.54 kg) or less of refrigerant or that are actuated by motors of 1 horsepower (746 W) or less.

h. Portable-fuel-cell *appliances* that are not connected to a fixed piping system and are not interconnected to a power grid.

i. Replacement of three or less supply or return duct runs.

R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures. For applications for reconstruction, rehabilitation, addition or other improvement of existing buildings or structures located in an area prone to flooding as established by Table R301.2(1) (*Climatic and Geographic Design Criteria*), the building official shall examine or cause to be examined the construction documents and shall prepare a finding with regard to the value of the proposed work. If the work is a substantial improvement as defined in Section R202 (*Definitions*), the proposed work shall comply with Section R322 (*Flood-Resistant Construction*) of this Code and Appendix G (*Flood-Resistant Construction*) of the Building Code.

R105.5 Time Limitation on Application; Permit Expiration and Reactivation. Time limits on permit applications and requirements for permit expiration and reactivation, including an enhanced fee for expired permits, are set forth in Chapter 25-12, Article 13 (*Administration of Technical Codes*).

R105.9 Homestead Permit. A person who is not licensed to perform electrical, mechanical and plumbing work may perform electrical, mechanical and plumbing work within a residence owned by the person if the requirements of this section are met.

1. The residence is the person's homestead.
2. The work does not include electrical, mechanical and plumbing work that involves (1) the main electric service; (2) reclaiming and charging a ducted heating and air-conditioning system containing refrigerant; or (3) natural gas plumbing systems.
3. The residence is the person's principal residence.
4. The person has not secured a homestead permit for another residence within the prior 24 month period.
5. The person must have owned and occupied the property as of January 1 of the tax year in which the person applies for a homestead permit.
6. A person must obtain a homestead permit and pay required permit fees before beginning any electrical, mechanical, or plumbing work. A person must apply for a homestead permit in person and must file an affidavit stating that the location at which the work is to be done is the person's homestead.
7. A person who has obtained a homestead permit may not allow or cause any person to perform electrical, mechanical, or plumbing work under the permit. The building official may suspend or revoke a homestead permit if work done under the permit is performed by anyone other than the person who obtained the permit.
8. A person may not transfer a permit to another person.
9. A person performing electrical, mechanical, or plumbing work under a homestead permit shall present a picture identification to verify that the person is authorized to perform work under the homestead permit when requested by the building official or his designee.
10. A homestead permit shall not be issued for electrical, mechanical, or plumbing work on a mobile, modular or manufactured home unless the homeowner owns the land on which the mobile, modular or manufactured home is located. A homestead permit shall not be issued if the mobile, modular or manufactured home is located in a mobile home park, mobile home community or other commercial premises.

R105.10 Registration. A plumber, air conditioning and refrigeration contractor, and irrigator shall register with the City before performing any work regulated by the Residential Code. A registration fee, authorized by separate ordinance, shall be paid when a license is presented for initial registration, after a license suspension, or after

license expiration. A new fee is not required for the renewal of a license before expiration.

R106.1.3 Information for construction in flood hazard areas. For buildings and structures located in whole or in part in flood hazard areas as established by Table R301.2(1) (*Climatic and Geographic Design Criteria*), construction documents shall include:

1. Delineation of flood hazard areas, 25-year floodplain boundaries and flood zones, and the design flood elevation, as appropriate;
2. The elevation of the proposed lowest floor, including basement; in areas of shallow flooding (AO zones), the height of the proposed lowest floor, including basement, above the highest adjacent grade; and
3. If design flood elevations are not included on the community's ultimate conditions floodplain models and maps or the Flood Insurance Rate Map (FIRM), the building official and the applicant shall obtain and reasonably utilize any design flood elevation and floodway data available from other sources.

R106.4 Amended construction documents. Work shall be installed in accordance with the approved construction documents, and any changes made during construction that are not in compliance with the approved construction documents shall be resubmitted for approval as an amended set of construction documents. Construction documents may not be amended to add additional square footage unless the applicant obtains approval of a new permit from the building official.

R109.1.1 Foundation and footing inspection. Inspection of the foundation and footings shall be made after poles or piers are set or trenches or *basement* areas are excavated and any required forms erected and any required reinforcing steel is in place and supported prior to the placing of concrete. The foundation inspection shall include excavations for thickened slabs intended for the support of bearing walls, partitions, structural supports, or *equipment* and special requirements for wood foundations. The foundation and footing inspection must be performed by a *registered design professional* for all permitted structures.

Exception:

1. An uncovered deck built independent of another structure not more than 4 feet from the top of the decking measured vertically to the floor or *grade* at any point within 36 inches horizontally and less than 200 square feet in floor area and built in accordance to prescriptive methods of this code.

2. Repairs to a foundation limited to a maximum of 32 sq. ft. and no damage to reinforcement or beams have occurred.

R109.1.3 Floodplain inspections. For construction in flood hazard areas as established by Table R301.2(1) *(Climatic and Geographic Design Criteria)*, prior to placement of the lowest floor, including basement, and prior to further vertical construction, the building official shall require submission of documentation, prepared and sealed by a Texas *registered design professional*, of the elevation of the lowest floor, including basement, required in Section R322 (*Flood-Resistant Construction*).

R109.1.3.1 Flood hazard documentation. The following documentation shall be prepared and sealed by a Texas *registered design professional* and submitted to the building official for construction in flood hazard areas:

1. The elevation of the lowest floor, including basement, as required by the lowest floor elevation inspection in Section R109.1.3 (*Floodplain Inspections*).
2. For fully enclosed areas below the design flood elevation where provisions to allow for the automatic entry and exit of floodwaters do not meet the minimum requirements in Section 2.6.1.1 of American Society of Civil Engineers (ASCE) ASCE 24 *Flood Resistant Design and Construction*, construction documents shall include a statement that the design will provide for equalization of hydrostatic flood forces in accordance with the provisions of Section 2.6.1.2 of ASCE 24 *Flood Resistant Design and Construction.*

R109.1.7 Layout Inspection. A layout inspection shall be made after the permanent location of the structure is established and foundation forms and or piers have been erected and are in place, but before any concrete is placed. The layout inspection must be performed by a surveyor registered in the State of Texas. The surveyor will provide an as-built survey with all new and existing improvements, legal boundaries, easements, encroachments, lot size square footage and all required dimensions.

R109.1.8 Framing pre-inspection. The framing pre-inspection shall be conducted by a *registered design professional* or an ICC certified building inspector. The city approved Residential Framing Checklist shall be used. The city Residential Frame Checklist will require the signature and license or registration number of the person performing the inspection. The checklist will be provided as verification of compliance for all new construction.

R109.1.9 Wallboard inspection. The wallboard inspection for new construction shall be conducted by a *registered design professional* or an ICC certified building inspector for other than new construction the wallboard inspection may be performed by a *registered*

design professional or an ICC certified building inspector. The inspector must verify that wallboard fastened to walls and ceilings complies with the Residential Code.

R109.1.10 Required documentation. The permit holder must provide the following documents on-site in a weather-tight container when the plumbing top out, mechanical rough, and framing inspection are conducted:

1. Approved plans;
2. Copy of the survey;
3. Foundation report; and
4. City Residential Framing Checklist.

R109.11 Special Inspections Program.

1. The building official may establish by rule an inspection program for the installation of certain mechanical and plumbing *appliances* in individually owned and occupied dwellings within the zoning jurisdiction of the City. Under the program, the building official shall inspect work performed for one out of five of the applications submitted on electrical *appliances*.

2. The special inspection program may apply to the following:

a. Water heaters not exceeding 100 gallons with a maximum of 75,000 BTU's or instantaneous water heaters;

b. Installation of HVAC equipment, with or without ductwork, in a building or section of a building that was previously not served by an HVAC system;

c. Replacement of a complete existing central heat and air system with or without ductwork;

d. Replacement or the addition to an existing unit of four or more supply and return duct runs;

e. Replacement of any existing gas appliance;

f. Replacement of any existing self-contained packaged units.

g. Replacement of retrofit windows and doors.

R110.3 Certificate issued. After the building official inspects the building or structure and finds no violations of the provisions of the Residential Code or other applicable laws enforced by the building official, the building official shall issue a certificate of occupancy, which shall contain the following:

1. the building permit number;

2. the address of the structure;

3. the name and address of the owner;

4. a description of that portion of the structure for which the certificate is issued;

5. a statement that the described portion of the structure has been inspected for compliance with the requirements of the Residential Code;

6. the name of the building official; and a special stipulation or condition of the building permit.

SECTION R112
APPEALS AND VARIANCES

R112.1. Appeal of a building official determination. Appeals shall be allowed only where specifically authorized by other provisions of the City Code If a right of appeal is established by City Code, the following requirements apply:

1. The Building and Fire Code Board of Appeals shall hear an appeal of an order, decision, or determination of the building official under the Residential Code relating to the Residential or Fire Code.

2. The Mechanical, Plumbing, and Solar Board shall hear an appeal of an order, decision, or determination of the building official under the Residential Code relating to mechanical, plumbing, and solar issues in accordance with Section 104 (*Private Sewage Systems*) of the Plumbing Code.

R112.2. Variances from flood plain management regulations. The City Council shall hear and decide a request for a variance from the flood plain regulations of this Code. The decision of the City Council shall comply with the provisions of Appendix Section G105 of the Building Code.

R113.5 Criminal Offense. A person who violates the Residential Code commits an offense. An offense under this section is a Class C misdemeanor punishable as provided in Section 1-1-99 (*Offenses; General Penalty*).

SECTION R115
AREAS PRONE TO FLOODING

A building or structure constructed under the Residential Code is subject to Section R322 (*Flood-Resistant Construction*) of this Code and Appendix G (*Flood-Resistant Construction*) of the Building Code.

SECTION R202
DEFINITIONS

25-YEAR FLOOD PLAIN. The greater of the following two areas:

1. an area within a flood plain subject to a four percent or greater chance of flooding in any year (25-year flood); or
2. an area with a flood plain subject to a four percent or greater chance of flooding in any year (25-year flood) based on projected full development in accordance with the City of Austin Drainage Criteria Manual.

AQUATIC VESSEL. Any vessel, permanent or temporary, intended for swimming, bathing, or wading and that is designed and manufactured to be connected to a circulation system. Portable vessels 12 inches or less in designed water depth which are drained and filled daily are not considered aquatic vessels. For purposes of this code, the term is used to identify all the types of vessels governed by this code, including: swimming pools, aquatic facilities, spas and hot tubs, and related equipment. Such vessels are either used in a residential application or in a public application.

BASE FLOOD. A flood having a one percent chance of being equaled or exceeded in any given year (100-year flood).

BASE FLOOD ELEVATION. The elevation of the base flood, including wave height, relative to the National Geodetic Vertical Datum (NGVD), North American Vertical Datum (NAVD) or other datum specified on the Flood Insurance Rate Map (FIRM).

BUILDING, EXISTING. A building erected before the adoption of this Code or for which a legal building permit has been issued.

> **Exception:** For purposes of flood plain management, an existing building is a building erected for which the start of construction commenced before September 2, 1981.

DESIGN FLOOD. The flood associated with an area with a flood plain subject to a one percent or greater chance of flooding in any year (100-year flood) based on projected full development in accordance with the City of Austin Drainage Criteria Manual.

DESIGN FLOOD ELEVATION. The elevation of the design flood relative to the City of Austin vertical datum standard.

DRY FLOODPROOFING. A combination of design modifications that result in a building or structure, including the attendant utility and sanitary facilities, being water tight with walls substantially impermeable to the passage of water and with structural components having the capacity to resist loads as identified in ASCE 7.

EXISTING CONSTRUCTION. A building or structure erected before the adoption of this Code or for which a legal building permit has been issued.

> **Exception:** For purposes of flood plain management, existing construction is a building or and structure for which the start of construction commenced before September 2, 1981. Existing construction is also referred to as existing structure.

FLOOD or FLOODING. A general and temporary condition of partial or complete inundation of normally dry land from:

1. the overflow of inland waters; or
2. the unusual and rapid accumulation or runoff of surface waters from any source.

FLOOD DAMAGE-RESISTANT MATERIALS. Any construction material capable of withstanding direct and prolonged contact with floodwaters without sustaining any damage that requires more than cosmetic repair.

FLOOD HAZARD AREA. The greater of the following two areas:

1. an area within a flood plain subject to a one percent or greater chance of flooding in any year (100-year flood); or
2. an area with a flood plain subject to a one percent or greater chance of flooding in any year (100-year flood) based on projected full development in accordance with the City of Austin Drainage Criteria Manual.

FLOOD INSURANCE RATE MAP (FIRM). An official map of a community on which the Federal Emergency Management Agency (FEMA) has delineated both the special flood hazard areas and the risk premium zones applicable to the community.

FLOOD INSURANCE STUDY. The official report provided by the Federal Emergency Management Agency containing the Flood Insurance Rate Map (FIRM), the Flood Boundary Map, the water surface elevation of the base flood, and supporting technical data.

FLOODWAY. The channel of the river, creek, or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. An area with a flood plain subject to a four percent or greater chance of flooding in any year (25-year flood) based on projected full development in accordance with the City of Austin Drainage Criteria Manual.

HEIGHT, BUILDING. Building height has the meaning established in Section 25-1-21 (*Definitions*) of the City Code.

NEW CONSTRUCTION. Structures for which the start of construction commenced on or after September 2, 1981, and includes subsequent improvements to such structures and improvements to all existing construction.

REGULATORY FLOOD DATUM (RFD) has the meaning assigned in Section 1612 (*Flood Loads*) of the Building Code.

SPECIAL FLOOD HAZARD AREA. The land area subject to flood hazards and shown on a Flood Insurance Rate Map or other flood hazard map as Zone A, AE, A1-30, A99, AR, AO, AH, V, VO, VE or V1-30.

START OF CONSTRUCTION. The date of permit issuance for new construction and substantial improvements to existing structures provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement or other improvement is within 180 days after the date of permit issuance. The actual start of construction means the first placement of permanent construction of a building (including a manufactured home) on a site, such as the pouring of a slab or footings, installation of pilings or construction of columns. Permanent construction does not include land preparation (such as clearing, excavation, grading or filling), the installation of streets or walkways, excavation for a basement, footings, piers or foundations, the erection of temporary forms or the installation of accessory buildings such as garages or sheds not occupied as dwelling units or not part of the main building. For a substantial improvement, the actual "start of construction" means the first alteration of any wall, ceiling, floor or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

SUBSTANTIAL DAMAGE. Damage of any origin sustained by a structure for which the cost of restoring the structure to its pre-damaged condition equals or exceeds 50 percent of the market value of the structure before the damage occurred.

SUBSTANTIAL IMPROVEMENT. For the purpose of determining compliance with the flood hazard management provisions of this code, any repair, alteration,

reconstruction, rehabilitation, addition or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started or, if the structure has been damaged and is being restored, before the damage occurred. The cost used in the substantial improvement determination shall be the cumulative cost of all previous improvements for a specific building or structure occurring during the immediate 10-year period. If the structure has sustained substantial damage, any repairs are considered substantial improvement regardless of the actual repair work performed. The term does not, however, include either of the following:

1. any project for improvement of a building required to correct existing health, sanitary or safety code violations identified by the building official and that are the minimum necessary to assure safe living conditions; or

2. any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure; for the purpose of this exclusion, a historic building is a building that is:

   2.1. listed or preliminarily determined to be eligible for listing in the National Register of Historic Places;

   2.2. determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or

   2.3. designated as historic under a State of Texas or local historic preservation program that is approved by the Department of Interior.

W-1 SPACES and W-2 SPACES have the meaning assigned in Appendix G (*Flood-Resistant Construction*).

TABLE R301.2(1)
CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

			Subject to Damage From							
Ground Snow Load	Wind Speed	Seismic Design Category	Weathering	Frost Line Depth	Termite	Winter Design Temp	Ice Barrier Underlayment Required	Flood Hazard	Air Freezing Index	Mean Average Temp
5	90	A	Negligible	0	Yes	28	No	Construction Commenced after 9/2/1981	50	65

R301.2.4 Floodplain construction. Buildings and structures constructed in whole or in part in flood hazard areas (including A Zones) as established in Table R301.2(1)

(*Climatic and Geographic Design Criteria*) shall be designed and constructed in accordance with Section R322 (*Flood-Resistant Construction*).

Exception: Buildings and structures located in whole or in part in identified 25-year floodplain as established by future conditions floodplain models and maps shall be designed and constructed as stipulated in the Section R322(*Flood-Resistant Construction*).

SECTION R314
SMOKE ALARMS

R314.1 Smoke detection and notification. All smoke alarms shall be listed and labeled in accordance with UL 217 and installed in accordance with the provisions of this code and the household fire warning *equipment* provisions of NFPA 72.

R314.2 Smoke detection systems. Household fire alarm systems installed in accordance with NFPA 72 that include smoke alarms, or a combination of smoke detector and audible notification device installed as required by this section for smoke alarms, shall be permitted. The household fire alarm system shall provide the same level of smoke detection and alarm as required by this section for smoke alarms. Where a household fire warning system is installed using a combination of smoke detector and audible notification device(s), it shall become a permanent fixture of the occupancy and owned by the homeowner. The system shall be monitored by an *approved* supervising station and be maintained in accordance with NFPA 72.

Exception: Where smoke alarms are provided meeting the requirements of Section R314.4.

R314.3 Location. Smoke alarms shall be installed in the following locations:

1. In each sleeping room;
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms;
3. On each additional *story* of the *dwelling*, including *basements* and habitable attics, but not including crawl spaces and uninhabitable *attics*; and
4. In *dwellings* or *dwelling units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level, provided that the lower level is less than one full *story* below the upper level.

R314.3.1 Alterations, repairs and additions. When *alterations*, repairs or *additions* requiring a *permit* occur, or when one or more sleeping rooms are added or created in

existing *dwellings*, the individual *dwelling unit* shall be equipped with smoke alarms located as required for new *dwellings*.

Exceptions:

1. Work involving the exterior surfaces of *dwellings*, such as the replacement of roofing or siding, or the *addition* or replacement of windows or doors, or the *addition* of a porch or deck, are exempt from the requirements of this section.

2. Installation, *alteration* or repairs of plumbing or mechanical systems requires the installation of smoke alarms, which may be allowed to be solely battery powered and located outside each separate sleeping area in the immediate vicinity of the bedrooms.

R314.4 Power source. Smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

Exceptions:

1. Smoke alarms shall be permitted to be battery operated when installed in buildings without commercial power.

2. Hard wiring of smoke alarms in existing areas shall not be required where the *alterations* or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an *attic*, crawl space or *basement* available which could provide access for hard wiring without the removal of interior finishes.

R314.5 Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit in accordance with Section R314.3, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

Exception: Interconnection of smoke alarms in existing areas shall not be required where alterations or repairs do not result in removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for interconnection without the removal of interior finishes. each separate sleeping area in the immediate vicinity of the bedrooms in *dwelling units* within which fuel-fired *appliances* are installed and in dwelling units that have attached garages.

SECTION R315 CARBON MONOXIDE ALARMS

315.1 Carbon monoxide alarms. Carbon monoxide alarms shall be installed in new buildings in accordance with Sections 315.1.1 through 315.1.7 Carbon monoxide alarms shall be installed in existing buildings in accordance with Section 315.1.8

315.1.1 Where required. Carbon monoxide alarms shall be provided in *dwellings* in the locations specified in 315.1.2 where any of the conditions in Sections 315.1.1.1 through 315.1.1.3 exist.

315.1.1.1 Fuel-burning appliances and fuel burning fireplaces. Carbon monoxide alarms shall be provided in *dwelling units* that contain a fuel-burning appliance or a fuel burning fireplace.

315.1.1.2 Forced air furnaces. Carbon monoxide alarms shall be provided in *dwelling units* served by a fuel-burning, forced air furnace.

315.1.1.3 Garages. Carbon monoxide alarms shall be provided in *dwelling units* with attached garages.

Exceptions:

a. Carbon monoxide alarms shall not be required if there are no communicating openings between the garage and the *dwelling unit*; or

b. Carbon monoxides alarms shall not be required in *dwelling unit's* located more than one story above or below a garage.

315.1.2 Locations. Where required by Section 315.1.1, carbon monoxide alarms shall be installed in the locations specified in Sections 315.1.2.1.

315.1.2.1 *Dwelling units.* Carbon monoxide alarms shall be installed in dwelling units outside of each separate sleeping area in the immediate vicinity of the bedrooms. Where a fuel-burning appliance is located within a bedroom or its attached bathroom, a carbon monoxide alarm shall be installed within the bedroom.

315.1.3 Power source. Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than that required for overcurrent protection.

Exception: Where installed in buildings without commercial power, battery powered carbon monoxide alarms shall be an acceptable alternative.

315.1.4 Listings. Carbon monoxide alarms shall be listed in accordance with UL 2034.

315.1.5 Combination alarms. Combination carbon monoxide/smoke alarms shall be an acceptable alternative to carbon monoxide alarms. Combination carbon monoxide/smoke alarms shall be listed in accordance with UL 2034 and UL 217.

315.1.6 Carbon monoxide detection systems. Carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide alarms and shall comply with Sections 315.1.6.1 through 315.1.6.3

315.1.6.1 General. Carbon monoxide detection systems shall comply with NFPA 720. Carbon monoxide detectors shall be listed in accordance with UL 2075.

315.1.6.2 Locations. Carbon monoxide detectors shall be installed in the locations specified in Section 315.1.2. These locations supersede the locations specified in NFPA 720.

315.1.6.3 Combination detectors. Combination carbon monoxide/smoke detectors installed in carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide detectors, provided they are listed in accordance with UL 2075 and UL 268.

315.1.7 Maintenance. Carbon monoxide alarms and carbon monoxide detection systems shall be maintained in accordance with NFPA 720. Carbon monoxide alarms and carbon monoxide detectors that become inoperable or begin producing end-of-life signals shall be replaced.

315.1.8 Carbon monoxide alarms. Where work requiring a building permit, or work performed on a fuel gas system, gas appliance or gas fixture in an existing *dwelling or dwelling unit* shall be provided with carbon monoxide alarms in accordance with Section 315.1, except that the carbon monoxide alarms shall be allowed to be solely battery powered.

Exception: Work involving the exterior surfaces of *dwellings*, such as the replacement of roofing or siding, or the *addition* or replacement of windows or doors, or the *addition* of a porch or deck, are exempt from the requirements of this section.

SECTION R320
ACCESSIBILITY

R320.1 Accessible bathrooms within dwelling units. If a water closet room or bathroom is provided on the first story of a dwelling unit, the water closet room or bathroom must have a minimum clear opening of at least 30 inches (762 mm).

R320.2 Wall reinforcement in bathrooms. If a water closet room or bathroom is provided on the first story of a dwelling unit, the water closet room or bathroom must contain a toilet and a lavatory and have reinforced walls that meet the following standards:

1. lateral two-inch (51 mm) by six-inch (152 mm) or larger nominal wood blocking must be installed flush with stud edges of bathroom walls; and
2. The centerline of the blocking must be 34 inches (836 mm) from and parallel to the interior floor level.

Exceptions:

1. Blocking is not required in the portion of the water closet room or bathroom wall located directly behind the lavatory

2. If more than one water closet room or bathroom is provided on the first floor of a dwelling unit, only one water closet room or bathroom is required to meet the blocking standards in this section.

SECTION R322
FLOOD-RESISTANT CONSTRUCTION

R322.1 General. Within a flood hazard area, all new construction of buildings, additions and alterations to buildings and structures, structures and portions of buildings and structures, including substantial improvements and restoration of substantial damage to buildings and structures, shall be designed and constructed to resist the effects of flood hazards and flood loads. All aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

> **Exception**: Buildings and structures located in whole or in part in a 25-year floodplain as established in Table R301.2(1) (*Climatic and Geographic Design Criteria*) shall be designed and constructed as stipulated in the Building Code.

R322.1.2 Structural systems. All structural systems of all buildings and structures shall be designed, connected and anchored to resist flotation, collapse or permanent lateral movement due to structural loads and stresses from flooding equal to the design flood elevation.

R322.1.3 Flood-resistant construction. All buildings and structures erected in areas prone to flooding shall be constructed by methods and practices that minimize flood damage.

R322.1.4 Establishing the design flood elevation. The design flood elevation shall be used to define areas prone to flooding, and shall describe, at a minimum, the base flood elevation at the depth of peak elevation of flooding considering the ultimate development of the watershed which has a 1 percent (100-year flood) or greater chance of being equaled or exceeded in any given year.

R322.1.4.1 Determination of design flood elevations. If design flood elevations are not specified, the building official is authorized to require the applicant to:

1. Obtain and reasonably use data available from a federal, state or other source; or
2. Determine the design flood elevation in accordance with accepted hydrologic and hydraulic engineering practices used to define special flood hazard areas. Determinations shall be undertaken by a professional engineer registered with the State of Texas who shall document that the technical methods used reflect currently accepted engineering practice. Studies, analyses and computations shall be submitted in sufficient detail to allow thorough review and approval.

R322.1.4.2 Determination of impacts. In riverine flood hazard areas where design flood elevations are specified but floodways have not been designated, the applicant shall demonstrate that the effect of the proposed buildings and structures on design flood elevations, including fill, when combined with all other existing and anticipated flood hazard area encroachments, will not increase the design flood elevation at any point within the jurisdiction.

R322.1.5 Lowest floor. The lowest floor shall be the floor of the lowest enclosed area, including basement, but excluding any unfinished flood-resistant enclosure that is useable solely for vehicle parking, building access or limited storage, provided that such enclosure is not built so as to render the building or structure in violation of this section.

> **Exception:** An unfinished flood-resistant enclosure used solely for storage of property, materials, or equipment that constitutes a safety hazard when contacted by flood waters is included when determining the lowest floor.

R322.1.6 Protection of mechanical and electrical systems. Electrical systems, equipment and components, and heating, ventilating, air conditioning and plumbing appliances, plumbing fixtures, duct systems, and other service equipment shall be located a minimum of one foot above the design flood elevation. If replaced as part of a substantial improvement, electrical systems, equipment and components, and heating, ventilating, air conditioning, and plumbing appliances, plumbing fixtures, duct systems, and other service equipment shall meet the requirements of this section. Systems, fixtures, and equipment and components shall not be mounted on or penetrate through walls intended to break away under flood loads.

Exception: Electrical systems, equipment and components, and heating, ventilating, air conditioning and plumbing appliances, plumbing fixtures, duct systems, and other service equipment are not required to be located a minimum of one foot above the design flood elevation provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation in compliance with the flood-resistant construction requirements of the Building Code. Electrical wiring systems are permitted to be located below the design flood elevation provided they conform to the provisions of the electrical part of this code for wet locations.

R322.1.8 Flood-resistant materials. Building materials used below the regulatory flood datum shall comply with the following:

1. All wood, including floor sheathing, shall be pressure-preservative-treated in accordance with AWPA U1 for the species, product, preservative and end use or be the decay-resistant heartwood of redwood, black locust or cedars. Preservatives shall be listed in Section 4 of AWPA U1.
2. Materials and installation methods used for flooring and interior and exterior walls and wall coverings shall conform to the provisions of FEMA/FIA-TB-2

R322.1.9 Manufactured housing. New or replacement manufactured housing shall be elevated in accordance with Section R322.2(*Flood hazard areas (including A Zones)*) and the anchor and tie-down requirements of Sections AE604 (*Anchorage Installations*) and AE605 (*Ties, Materials and Installation*) of Appendix E (*Manufactured Housing Used as Dwellings*) shall apply. The foundation and anchorage of manufactured housing to be located in identified 25-year floodplain shall be designed and constructed in accordance with the applicable provisions in the Building Code.

R322.1.10 As-built elevation documentation. A *registered design professional* with the state of Texas shall prepare and seal documentation of the elevations specified in Section R322.2 (*Establishment of flood hazard areas (including A Zones)*

R322.2 Establishment of flood hazard areas (including A Zones).

1. Flood hazard areas include each of the following:
   a. The flood hazard areas identified by the Federal Emergency Management Agency in that certain scientific and engineering report entitled, "The Flood Insurance Study for Austin, Texas," dated September 26, 2008, with accompanying Flood Insurance Rate Maps and Flood Boundary-Floodway

Maps (FIRM and FBFM) and related supporting data along with any amendments or revisions thereto; and

b. The 100-year and 25-year floodplains based on projected full development as specified in the Austin City Code and Drainage Criteria Manual.

2. All buildings and structures constructed in whole or in part in a flood hazard area must be designed and constructed in accordance with Sections R322.2.1 (*Elevation requirements*) and R322.2.3 (*Foundation design and construction*).

R322.2.1 Elevation requirements.

1. Buildings and structures shall have the lowest floors elevated a minimum of one foot above the design flood elevation.
2. A minimum freeboard of one (1) foot shall be added where the design flood elevation or other elevation requirements are specified.
3. In areas of shallow flooding (AO Zones), buildings and structures shall have the lowest floor (including basement) elevated at least as high above the highest adjacent grade as the depth number specified in feet (mm) on the FIRM plus one foot, or at least 2 feet (610 mm) if a depth number is not specified.
4. Basement floors that are below grade on all sides shall be elevated a minimum of one foot above the design flood elevation.

   Exception: Enclosed areas below the design flood elevation, including basements whose floors are not below grade on all sides, shall meet the requirements of Section R322.2.2 (*Enclosed area below design flood elevation*).

R322.2.2 Enclosed area below design flood elevation. Enclosed areas, including crawl spaces, that are below the regulatory flood datum shall:

1. Be used solely for parking of vehicles, building access or storage, such storage excluding any property, material, or equipment which may constitute a safety hazard when contacted by flood waters.
2. Be provided with flood openings that meet the following criteria:

   a. There shall be a minimum of two openings on different sides of each enclosed area; if a building has more than one enclosed area below the design flood elevation, each area shall have openings on exterior walls.

   b. The total net area of all openings shall be at least 1 square inch (645 mm^2) for each square foot (0.093 m^2) of enclosed area, or the openings shall be designed and the construction documents shall include a statement that the design and installation

will provide for equalization of hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwaters.

c. The bottom of each opening shall be 1 foot (305 mm) or less above the adjacent ground level.

d. Openings shall be at least 3 inches (76 mm) in diameter.

e. Any louvers, screens or other opening covers shall allow the automatic flow of floodwaters into and out of the enclosed area.

f. Openings installed in doors and windows, that meet requirements 2.1 through 2.5, are acceptable; however, doors and windows without installed openings do not meet the requirements of this section.

R322.2.3 Provisions of Safe Refuge.

1. Buildings or structures constructed in the flood hazard area where the ground surface is below the design flood elevation, or where flood water velocities at the building may exceed five feet per second, shall be provided with an enclosed refuge space one (1) foot or more above the design flood elevation of sufficient area to provide for the occupancy load with a minimum of 12 square feet per person. The refuge space shall be provided to an exterior platform and stairway not less than three feet wide.
2. Existing buildings and structures in flood hazard areas that are enlarged, extended, or altered, or where a change of use or occupancy is made, shall conform to the requirements of Subsection 1.
3. A floor level or portion of a building or structure that is lower than one (1) foot above the design flood elevation, regardless of the structure or space classification, shall not be used for a residential use, or for storage of any property, materials, or equipment that might constitute a safety hazard when contacted by flood waters.

R322.2.4 Means of Egress. Normal access to the building shall be by direct connection with an area that is a minimum of one (1) foot above the design flood elevation, unless otherwise approved by the building official.

R322.2.5 Foundation design and construction. Foundation walls for all buildings and structures erected in flood hazard areas shall meet the requirements of Chapter 4 (*Foundations*).

Exception: Unless designed in accordance with Section R404 (*Foundation and Retaining Walls*), the following requirements apply:

1. The unsupported height of 6-inch (152 mm) plain masonry walls shall be no more than 3 feet (914 mm).

2. The unsupported height of 8-inch (203 mm) plain masonry walls shall be no more than 4 feet (1219 mm).

3. The unsupported height of 8-inch (203 mm) reinforced masonry walls shall be no more than 8 feet (2438 mm).

4. For the purpose of this exception, unsupported height is the distance from the finished grade of the under-floor space and the top of the wall.

Section R324
Retrofit Windows

R324.1 Retrofit windows for emergency escape and rescue openings. Retrofit Window – A window unit installed inside a pre-existing window opening where the pre-existing window is imploded and removed with minimum to no removal of existing exterior and interior finish.

R324.2 All egress windows shall be installed as per section R310 of the adopted *Residential Code.*

Exceptions:

1. Retrofit windows shall meet all of the following conditions:

   a. Retrofit windows for required egress in sleeping rooms shall be installed to achieve the maximum allowable free opening in that space.

   b. Emergency escape and rescue openings shall have a minimum net clear opening of 5 square feet.

   c. The minimum net clear opening height shall be 22 inches.

   d. The minimum net clear opening width shall be 18 inches.

   e. Where emergency escape and rescue openings are provided they shall have a sill height of not more than 48 inches measured from the finished floor to the bottom of the clear opening.

   f. Smoke alarms shall be provided as required for new dwellings per the adopted Residential Code.

   g. Glazing requirements shall be met as per the adopted Residential Code.

   h. Carbon monoxide alarms shall be provided as per the adopted Residential Code.

   i. Shall comply with the adopted Energy Code.

2. For existing windows that do not comply with any existing code and exist in one of the following conditions brick, rock, stucco or where structurally the opening cannot be modified. Retrofit windows shall meet all of the following conditions:

   a. Retrofit windows for required egress in sleeping rooms shall be installed to achieve the maximum allowable free opening in that space.

   b. Smoke alarms shall be provided as required for new dwellings per the adopted Residential Code.

   c. Glazing requirements shall be met as per the adopted Residential Code.

   d. Carbon monoxide alarms shall be provided as per the adopted Residential Code.

   e. Shall comply with the adopted Energy Code.

   f. When brick, rock or stucco do not exist and the opening can be structurally modified, the windows shall comply with all the applicable requirements of the adopted Residential Code.

SECTION 1007
BARRIER REQUIREMENTS

R1007.1 General. The provisions of this section shall apply to the design of barriers for aquatic vessels. These design controls are intended to provide protection against the potential drowning and near drowning by restricting access to such vessels. These requirements provide an integrated level of protection against potential drowning through the use of physical barriers and warning devices.

Exceptions:

1. Spas and hot tubs with a lockable safety cover that complies with ASTM F 1346.
2. Swimming pools with a powered safety cover that complies with ASTM F 1346.

R1007.2 Outdoor Swimming Pools. All outdoor aquatic vessels and indoor swimming pools shall be surrounded by a barrier that complies with Sections 305.2.1 through 305.7.

R1007.2.1 Barrier height and clearances. Barrier heights and clearances shall be in accordance with all of the following:

1. The top of the barrier shall be not less than 48 inches above grade where measured on the side of the barrier that faces away from the aquatic vessel. Such height shall exist

around the entire perimeter of the vessel and for a distance of three (3) feet where measured horizontally from the required barrier.

2. The vertical clearance between grade and the bottom of the barrier shall not exceed 2 inches for grade surfaces that are not solid, such as grass or gravel, where measured on the side of the barrier that faces away from the vessel.

3. The vertical clearance between a surface below the barrier to solid surface, such as concrete, and the bottom of the required barrier shall not exceed 4 inches where measured on the side of the required barrier that faces away from the vessel.

4. Where the top of the vessel structure is above grade, the barrier shall be installed on grade or shall be mounted on top of the vessel structure. Where the barrier is mounted on the top of the vessel structure, the vertical clearance between the top of the vessel and the bottom of the barrier shall not exceed 4 inches.

R1007.2.2 Openings. Openings in the barrier shall not allow passage of a 4 inch diameter sphere.

R1007.2.3 Solid barrier surfaces. Solid barriers that do not have openings shall not contain indentations or protrusions that form handholds and footholds, except for normal construction tolerances and tooled masonry joints.

R1007.2.4 Mesh restraining barrier/fence. Mesh fences other than chain link fences in accordance with Section 305.2.7, shall be certified to meet ASTM F-2286 and installed in accordance with the manufacturer's instructions and shall comply with the following:

1. The bottom of the mesh restraining fence shall be not more than 1 inch above the deck or installed surface or grade.

2. The maximum vertical clearance from the bottom of the mesh fence and the solid surface shall not permit the fence to be lifted more than four inches from grade or decking.

3. The fence shall be designed and constructed so that it does not allow passage of a 4-inch sphere under any mesh panel. The maximum vertical clearance from the bottom of the mesh fence and the solid surface shall not be more than four (4) inches from grade or decking.

4. An attachment device shall attach each barrier section at a height not lower than 45 inches (1143 mm) above grade. Common attachment devices include, but are not limited to, devices that provide the security equal to or greater than that of a hook-and-eye-type latch incorporating a spring-actuated retaining lever such as a safety gate hook.

5. Where a hinged gate is used with a mesh barrier, the gate shall comply with Section 305.3.

6. Patio deck sleeves such as vertical post receptacles which are placed inside the patio surface shall be of a nonconductive material.

7. Mesh fences shall not be used on top of on ground residential pools.

R1007.2.5 Closely spaced horizontal members. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the aquatic vessel side of the fence. Spacing between vertical members shall not exceed 1.75 inches in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1.75 inches in width.

R1007.2.6 Widely spaced horizontal members. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches or more, spacing between vertical members shall not exceed 4 inches. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1.75 inches in width.

R1007.2.7 Chain link dimensions. Maximum mesh size for chain link fences shall be a 2.25-inch square, unless the fence has slats fastened at the top or the bottom which reduce the openings to not more than 1.75-inches.

R1007.2.8 Diagonal members. Where the barrier is composed of diagonal members, the maximum opening formed by the diagonal members shall be no more than 1.75 inches. The angle of diagonal members shall not be greater than 45 degrees from vertical.

R1007.2.9 Clear Zone. There shall be a clear zone of not less than 36 inches around the exterior of the barrier and around any permanent structures or equipment such as pumps, filters and heaters that can be used to climb the barrier.

R1007.2.10 Poolside Barrier Setbacks. The aquatic vessel side of the required barrier shall be not less than twenty (20) inches from the water's edge.

R1007.3 Gates. Access gates shall comply with the requirements of Sections 305.3.1 through 305.3.3 and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outward away from the vessel and shall be self-closing and have a self-latching device.

R1007.3.1 Utility or Service Gates. Gates not intended for pedestrian use, such as utility or service gates, shall remain locked when not in use.

R1007.3.2 Double or multiple gates. Double gates or multiple gates shall have at least one leaf secured in place and the adjacent leaf shall be secured with a self-latching device. The gate and barrier shall not have openings larger than 1/2 inch within 18 inches of the latch release mechanism. The self-latching device shall comply with the requirements of Section 305.3.3.

R1007.3.3 Latches. Where the release mechanism of the self-latching device is located less than 54 inches from grade, the release mechanism shall be located on the vessel side of the gate at least 3 inches below the top of the gate, and the gate and barrier shall not have openings greater than 1/2 inch within 18 inches of the release mechanism.

R1007.4 Structure wall as a barrier. Where a wall of a dwelling or structure serves as part of the barrier, doors and operable windows with a sill height of less than 48 inches, that provide direct access to the aquatic vessel through the wall, shall be equipped with one or more of the following:

1. An alarm that produces an audible warning when the door or its screen or window, is opened. The alarm shall be listed and labeled as a water hazard entrance alarm in accordance with UL 2017. In dwellings or structures not required to be accessible units, Type A units or Type B units, the deactivation switch shall be located 54 inches or more above the threshold of the door. In dwellings or structures required to be accessible units, Type A units or Type B units, the deactivation switch shall be located not greater than 54 inches (1372 mm) and not less than 48 inches (1219 mm) above the threshold of the door.
2. A safety cover that is listed and labeled in accordance with ASTM F1346.
3. An approved means of protection, such as self-closing doors with self-latching devices, provided that the degree of protection afforded is not less than the protection afforded by Items 1 or 2.

R1007.5 Pool structure as a barrier. Where an on ground residential pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, the following shall apply:

1. An on ground pool wall, itself, shall be permitted to be the barrier where the pool structure is on grade and the wall is at least 48 inches above grade for the entire perimeter of the pool and complies with the requirements of Section 305.2.
2. Where the means of access is a ladder or steps, the ladder or steps shall be capable of being secured, locked or removed to prevent access or the ladder or steps shall be surrounded by a barrier that meets the requirements of this section.

3. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4 inch-diameter sphere.
4. The barrier shall be installed in accordance with the manufacturer's instructions.

R1007.6 Natural barriers. In the case where the vessel area abuts the edge of a lake or other natural body of water, public access is not permitted or allowed along the shoreline, and required barriers extend to and beyond the water's edge a minimum of 18 inches, a barrier is not required between the natural body of water shoreline and the vessel.

R1007.7 Natural topography. Natural topography that prevents direct access to the aquatic vessel area shall include but not be limited to mountains and natural rock formations. A natural barrier approved by the governing body shall be acceptable provided that the degree of protection is not less than the protection afforded by the requirements of Sections 305.2 through 305.5.

M1307.6 Requirements for floodplain areas.

M1307.6.1 Installation of heating, air conditioning and ventilation equipment. Heating, air conditioning, and ventilation equipment shall be installed above the RFD. The equipment may be located in a W-1 or W-2 space with direct access from a location above the RFD if approved as a modification by the building official.

M1307.6.2 Heating systems with gas or oil-fired furnace. A heating system that uses a gas or oil-fired furnace shall have a float-operated automatic control valve installed in the fuel supply line that is set to operate if flood waters reach an elevation equal to the floor level of the space where the furnace equipment is installed. A manually operated gas valve that can be operated from a location above the RFD shall be provided in the fuel supply line to serve as a supplementary safety device for fuel cutoff.

M1307.6.3 Anchoring of heating equipment and tanks. Heating equipment and fuel storage tanks shall be securely anchored to a foundation pad of sufficient mass to overcome buoyancy and prevent movement that could damage the fuel line supply. As an alternative means of protection, elevation of the heating equipment and fuel storage tanks above the RFD is permitted. A fuel line shall be attached to a furnace by flexible swing-type couplings. Heating equipment and fuel storage tanks shall be vented to an elevation of at least three feet above the RFD. For a system installed in a W-1 or W-2 space, the air supply for combustion shall be furnished, if required, at a height of at least three feet above the RFD.

M1307.6.4 Ductwork. Ductwork for a warm-air heating system located below the RFD shall have an emergency opening for internal flooding and drainage of ducts. Each opening shall have a cover with a gravity operator for closure during normal operation.

Ductwork passing through a watertight wall or floor below the RFD shall have a shutoff valve to isolate the piping system in the event of a flood. An electric heating system, if used in a flood hazard area, shall be installed in accordance with the Electrical Code.

M1307.6.5 Installation of an air conditioning and ventilation system below the RFD. An air conditioning and ventilation system located below the RFD shall be installed in a W-1 or W-2 space. Installation, piping, ductwork connections, and safety features shall comply with the requirements for heating systems.

M1307.6.6 Automatic shutoff valve for fuel supply lines. A fuel supply line that originates outside of a W-1 or W-2 space or passes through an area that floods shall be equipped with an automatic shutoff valve to prevent loss of fuel. The wall opening shall be flood-proofed by using an embedded collar, sleeve, water stop, or other means approved by the building official.

M1601.1.3 Protection of ducts. If a nonmetallic plenum is protected from the weather, the plenum shall be attached to a coil or furnace with a hard cast system. If a nonmetallic plenum is exposed to the weather, the plenum shall be attached to a coil or furnace with a waterproof hard cast system or its equivalent.

M1601.1.4 Attachment of ducts. A duct shall be cut flush with the top side of ceiling materials or with the back side of wall materials and held in place with a one inch by one inch 26 gauge steel metal angle assembly attached to the duct on all four sides. A grill assembly shall be attached to the angle assembly in accordance with the product listing and shall be airtight.

M1601.1.4.1 Materials. A flexible duct shall be attached to an approved adapter bucket in accordance with the product listing. Each bucket shall be firmly attached to a joist, stud, or grid with one inch by one inch 26 gauge steel angles on at least two sides of the bucket.

M1703.3.1 Size of opening. This section applies only to an existing system. Where communicating with the outdoors by means of a single opening or duct, the opening or duct shall have a free area of at least one square inch per 3,000 Btu/h (0.413 mm^2/W) of total input rating of all appliances in the space, but not smaller than the vent flow area. A duct shall be of the same minimum cross-sectional area as the required free area of the opening to which it connects. The minimum cross-sectional dimension of a rectangular air duct shall be three inches (76 mm).

M2201.6 Flood-resistant installation. In areas prone to flooding as established by Table R301.2(1) (*Climatic and Geographic Design Criteria*), tanks shall be installed a minimum of one foot above the design flood elevation established in Section R323

(*Elevators and Platform Lifts*) or may be installed below grade in accordance with Section M2201.3 (*Underground Tanks*), anchored to prevent flotation, collapse and lateral movement under conditions of the design flood and be designed, constructed and installed to prevent, without necessity of devices which may be easily avoided (e.g. locks, seals requiring tightening after each access to the tank, etc.), intrusion of floodwaters into the tank or escape of oil into the environment. Site plans including underground tanks placed in flood hazard areas shall be certified by a Texas registered engineer attesting to the requirements of this section.

PART 2. This ordinance takes effect on September 16, 2013.

PASSED AND APPROVED

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§
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June 6, 2013

Lee Leffingwell
Mayor

APPROVED:

Karen M. Kennard
City Attorney

ATTEST:

Jannette S. Goodall
City Clerk