

purposes shall comply with all applicable requirements associated with such potential multipurpose. Structures containing multiple occupancy groups shall comply with Section 508. Where a structure is proposed for a purpose that is not specifically listed in this section such structure shall be classified in the occupancy it most nearly resembles based on the fire safety and relative hazard. Occupied roofs shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard involved, and shall comply with Section 503.1.4.

1. Assembly (see Section 303): Groups A-1, A-2, A-3, A-4 and A-5.
2. Business (see Section 304): Group B.
3. Educational (see Section 305): Group E.
4. Factory and Industrial (see Section 306): Groups F-1 and F-2.
5. High Hazard (see Section 307): Groups H-1, H-2, H-3, H-4 and H-5.
6. Institutional (see Section 308): Groups I-1, I-2, I-3 and I-4.
7. Mercantile (see Section 309): Group M.
8. Residential (see Section 310): Groups R-1, R-2, R-3 and R-4.
9. Storage (see Section 311): Groups S-1 and S-2.
10. Utility and Miscellaneous (see Section 312): Group U.

302.2 Use designation. Occupancy groups contain subordinate uses having similar hazards and risks to building occupants. Uses include, but are not limited to, those functional designations listed within the occupancy group descriptions in 302.1. Certain uses require specific limitations and controls in accordance with the provisions of Chapter 4 and elsewhere in this code.

Occupied Roofs



During the previous code cycle, there were several proposed changes to the Florida Building Code that dealt with occupied roofs. However, all of the proposed changes were disapproved by the General Committee. The proponents of all of those proposals then came together to develop one public comment to address this important issue. The resulting changes can be read below.

Building departments are seeing more and more roofs being occupied. The purpose of this code change is to

provide some direction to the code official in dealing with the uses of occupied roofs. The code defines a story as “that portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above.” While some previous code change proposals addressed the question of whether or not an occupied roof would add to the number of stories, it was the opinion of the submitters of the public comment that the code already addresses when a portion of the building is considered a story as indicated in the definition of Story. An uncovered roof deck is clearly not a story, because there is no floor or roof above.

In the previous section regarding Occupancy and Use, it was discussed that language was added to the 7th Edition of the *Florida Building Code* in order to establish the fact that occupied roofs shall be classified as an occupancy. In section 302.1 *Occupancy classification*, the following sentence was added:

Occupied roofs shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard involved, and shall comply with Section 503.1.4.

Section 503.1.4 *Occupied roofs*, has been added to the building code in order to provide direction as to where the occupancies can be located. If the building is not provided with fire sprinklers, the use cannot be located on the roof unless it is permitted on the story directly below. For example, an occupied roof used for a gathering of people on top of an office building or Type VB Construction without fire sprinklers would be limited to the roof of a one-story building. However, under the first exception, if the building is provided with fire sprinklers, there is no limitation as to where the occupied roof is permitted to be located. It is intended that the fire sprinklers will provide protection from the story below the occupied roof. The second exception in 503.1.4 correlates this section with the exception to Section 903.2.1.6, which allows assembly occupancies on the roof of Type I or II open parking garages without sprinklers on all the floors below.

During the discussions of the public commentary period, some contributors expressed the concern that if an uncovered occupied roof had walls or screens surrounding it, for all intents and purposes, the occupied roof area functions as a story from a firefighting perspective, even though it technically does not meet the definition of a story. The second paragraph of Section 503.1.4 is intended to reduce the height of any barriers or obstacles around the occupied roof area, so it does not function as a story. The exception is intended to allow abutting penthouses, towers, domes, spires, and cupolas that comply with Section 1510 to exceed the 48” height limit. Note that other rooftop structures in Section 1510 such as mechanical equipment screens and “bulkheads” are intentionally not included in the exception, since they were the source of the concern. The specified rooftop structures are generally limited in extent as related to the occupied roof, so their walls were not judged to be a major obstacle. Occupied roofs will still need a means

of egress and an accessible route. The purpose of this code change is to clarify whether occupied roofs have an occupancy classification and where they can be located.

You can read the additions and modifications to the code below. All changes have been underlined:

SECTION 503

GENERAL BUILDING HEIGHT AND AREA LIMITATIONS

503.1.4 Occupied roofs. A roof level or portion thereof shall be permitted to be used as an occupied roof provided the occupancy of the roof is an occupancy that is permitted by Table 504.4 for the story immediately below the roof. The area of the occupied roofs shall not be included in the building area as regulated by Section 506.

Exceptions:

1. The occupancy located on an occupied roof shall not be limited to the occupancies allowed on the story immediately below the roof where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and occupant notification in accordance with Section 907.5 is provided in the area of the occupied roof.

2. Assembly occupancies shall be permitted on roofs of open parking garages of Type I or Type II construction, in accordance with the exception to 903.2.1.6.

Elements or structures enclosing the occupied roof areas shall not extend more than 48 inches (1220 mm) above the surface of the occupied roof.

Exception: Penthouses constructed in accordance with Section 1510.2 and towers, domes, spires, and cupolas constructed in accordance with Section 1510.5.

Exterior Elevated Flooring Systems



In the 7th Edition of the *Florida Building Code, Building*, modifications were made in order to accommodate exterior elevated flooring systems. Exterior elevated

flooring systems are increasingly seen on rooftops and other exterior locations. The systems are used to create space typically used for assembly occupancies such as restaurants, bars, nightclubs, and gathering places. Previous versions of the *Florida Building Code, Building* did not adequately address such systems.

In the past, an exterior flooring system was treated as a roof and overly restrictive provisions were applied. Modifications in the 7th Edition *Florida Building Code, Building* take into consideration the fact that an exterior elevated flooring system is not a roof, but is a floor created on a rooftop or other supporting structure. The changes to the *Florida Building Code, Building* continue to treat the systems as a roof by attaching the support pedestals to the roof surface. However, considerable research has shown that these systems, due to their air-permeability, react to wind forces differently than the typical rooftop.

The application of current literature and the use of wind tunnel testing coupled with new provisions on air-permeable cladding in ASCE 7-16 allow more economical construction of these popular systems with no reduction in safety. Additionally, there is reason to believe that these modifications will likely result in savings to property owners who desire to turn rooftops and other exterior spaces into useable areas. Finally, these changes will help to ensure the health, safety, and welfare of members of the public as they address a system not adequately addressed by previous versions of the building code.

The changes made to the *Florida Building Code, Building* with regard to exterior elevated flooring systems are found in several sections of the code. Please keep in mind that these changes are not intended to provide instructions on the specific design of exterior elevated flooring systems, but to provide guidance for the design and installation of the systems.

The following definitions have been added Chapter 2 – Definitions of the 7th Edition *Florida Building Code, Building*. The changes have been underlined.

SECTION 201

GENERAL

ACCESSORY COMPONENTS. Components used in the installation of pedestals and pedestrian deck panels or pavers of the exterior elevated flooring system. Accessory components are made of either plastic, metal, or other approved materials. Accessory components may be used to provide lateral bracing of the pedestals, to provide vertical support, for leveling the pedestal, to restrain the pedestrian deck panels or pavers to the top of the pedestal, or for other system requirements.

EXTERIOR ELEVATED FLOORING SYSTEM. An assembly installed over a roof assembly or other exterior supporting structure consisting of a walking surface of pedestrian deck panels or pavers mounted on pedestals using other accessory components, mechanical fasteners or adhesives as required by the manufacturer's installation instructions for attaching pedestrian deck panels or pavers

to pedestals and other accessory components. Exterior elevated flooring systems may have pedestals attached to the roof or other supporting structure or pedestals installed independently of the roof or supporting structure with the restraint of the pavers at the perimeter and discontinuous edges. Exterior elevated flooring systems are not part of the roof assembly.

Attached systems. Attached systems are those where pedestals are attached to the roof or other supporting structure by mechanical fasteners, adhesives or both.

Independent systems. Independent systems are those where pedestals are not attached to the roof but rest on the roof or other supporting structure.

PEDESTAL. A fixed or adjustable-height support column composed of a support base, a vertical structural element and a load-bearing top cap surface.

PEDESTRIAN DECK PANELS OR PAVERS. Pedestrian deck panels or pavers for this section are manufactured from materials such as naturally durable wood, ceramic, stone or concrete suitable for exterior applications.

The following additions were made to Chapter 31 – Special Construction in the 7th Edition of the *Florida Building Code, Building*. The underlined text indicates the modifications from the 6th Edition of the building code.

SECTION 3101

GENERAL

3101.1 Scope. The provisions of this chapter shall govern special building construction including membrane structures, temporary structures, *pedestrian walkways* and tunnels, automatic *vehicular gates*, *awnings*, and *canopies*, *marquees*, signs, towers and antennas, and exterior elevated flooring systems.

SECTION 3115

EXTERIOR ELEVATED FLOORING SYSTEMS

3115.1 Scope. This section applies to exterior elevated flooring systems installed over roof assemblies or other exterior supporting structures, such as an exterior deck. Each exterior elevated flooring system consists of pedestrian deck panels or pavers supported by pedestals placed directly on roof assemblies or other exterior supporting structures, to provide a level walking surfaces. Pedestals may be adjustable or a fixed height. The pedestals need not be mechanically or adhesively attached to the supporting structure. The exterior elevated flooring system comprised of the pedestrian deck panels or pavers and pedestals shall be restrained on all sides and along any raps and walkway areas against horizontal and vertical movement using a perimeter-restraining system.

3115.1.1 Attached exterior elevated flooring systems. Attached systems shall be designed and constructed as a roofing system in accordance with Chapter 15 of this code.

3115.1.2 Independent exterior elevated flooring systems. Independent systems shall comply with the provisions of Section 3115.

3115.2 Materials information submitted with permit application. In addition to other information required to accompany the permit application, product-specific information shall be provided as follows:

3115.2.1 Pedestrian deck panels or pavers. Documentation describing the weight, dimensions and specifications, and the manufacturing process of the materials. Specifications for materials shall include required material strength properties used in analysis or reference to appropriate tests used to determine paver load capacity.

3115.2.2 Pedestals. Documentation describing materials, dimensions, specifications and manufacturer's installation instructions. Specifications shall include the allowable axial compression capacity of the pedestal.

3115.2.3 Fasteners. Documentation describing mechanical fastener and adhesives as applicable. A statement shall be provided regarding whether or not the fasteners are commonly available or are proprietary.

3115.2.4 Plastics for outdoor exposure HVHZ. Plastics for outdoor exposure in the HVHZ shall comply with *Florida Building Code, Building* Section 2615.2.

3115.2.5 Packaging and identification. A description of the method of packaging and identification of pedestrian deck panel or pavers, pedestals and accessory components. Identification provisions shall include the manufacturer's name, the product name and a copy of the installation instructions as packaged with the product.

3115.3 Product approval and manufacturer's installation instructions.

3115.3.1 Product approval. Exterior elevated flooring systems shall have Florida product approval or local product approval.

3115.3.2 Manufacturer's installation instructions. Manufacturer's installation instructions shall include information on the protection of the roof surface during installation, procedures for removing pavers to facilitate reroofing, roofing repairs, and roofing maintenance. In addition to the copy of the manufacturer's installation instructions submitted with the permit application, the manufacturer's installation instructions shall be kept on the job site and made available to inspection personnel.

3115.4 Structural requirements for exterior elevated flooring systems.

3115.4.1 General. Exterior elevated flooring

systems shall withstand the applicable uniform loads of Florida Building Code, Building Table 1607.1, the applicable load combinations and other applicable loads contained in the Florida Building Code, Building, Chapter 16. Independent systems shall not be permitted in the HVHZ.

3115.4.2 Pedestrian deck panels or pavers.

Where analysis of panels or pavers is not consistent with codified material design procedures, testing for uniform load and concentrated load capacities shall be performed in accordance with ASTM E2322 and CISCA Recommended Test Procedures for Access Floors achieving a load capacity three (3) times the axial load capacity designated in the specifications.

3115.4.3 Pedestals. Where analysis of the pedestals is not consistent with codified material design procedures, testing for axial load capacity shall be performed in accordance with CISCA Recommended Test Procedures for Access Floors, 2016, Section 5 achieving a load capacity three (3) times the axial load capacity designated specifications.

3115.4.4 Wind resistance. Wind resistance of independent exterior elevated flooring systems shall be determined by wind tunnel testing in accordance with ASCE 7 Chapter 31 and Section 30.1.5 where applicable. Testing shall be conducted, and the data analyzed by a registered design professional. Exterior elevated flooring systems shall be evaluated by a registered design professional to withstand application wind loads as specified in ASCE 7 Chapters 26 through 30, as applicable, as well as combined load effects of other applicable gravity loads in the Florida Building Code, Building, Chapter 16, such as live and dead loads.

3115.4.5 Deflection. Pedestrian deck panels or pavers shall meet the deflection requirement of floor members in Table 1604.3 and Section 1616.3.1 in the HVHZ.

3115.5 Substrate requirements for exterior elevated flooring systems.

3115.5.1 Bearing capacity. Pedestal support surface or roofing membrane shall be able to support a concentrated surface load of 40 psi (6.89kPa) under the pedestal base.

3115.5.2 Drainage. The substrate immediately below the pedestals shall provide positive drainage.

3115.5.3 Analysis. Load effects on structural members and their connections that provide support for independent exterior elevated flooring systems shall be determined by methods of structural analysis that take into account equilibrium, general stability, geometric compatibility and both short- and long-term material properties. Roof structures that provide support for exterior elevated flooring systems shall be checked for deflection in accordance with Section 1604.3.6 or Section 1616 for buildings sited in the

HVHZ. Roof structures shall be checked in accordance with Section 1611 for ponding. The design shall account for concentrated loads of the pedestals.

3115.6 Accessibility. Accessibility shall comply with the Florida Building Code, Accessibility.

Motor Vehicle Related Occupancies



The following changes to the Florida Building Code have been made to reflect the changes found between the 2015 IBC and the 2018 IBC.

This code change relocates all of the general requirements that apply to motor-vehicle related occupancies into the general section, Section 406.1, and also provides in the beginning of Section 406 directions as to what sections apply to private garages and carports, open and enclosed parking garages, motor fuel-dispensing facilities, and repair garages.

The general global requirements are:

1. *Automatic garage door openers and vehicular gates (originally in Section 406.3.6)* – This equipment is not required to be installed, but where provided in any occupancy, minimum safeguards should be provided. UL 325 is applicable for certifying products for use in both residential and commercial applications, and addresses fire, shock, and entrapment hazards. The reference to Section 3110 provides the user with direction to the use of automatic vehicular gates, where provided.
2. *Clear height (originally in Sections 406.3.2, 406.4.1, and 406.5.4.1)* – A minimum clear height should be provided in any occupancy for people and vehicles.
3. *Accessible parking spaces* – This provides a link to the requirements in Chapter 11 for accessible parking spaces, where provided.
4. *Floor surface (originally in Sections 406.3.3, 406.3.5, 406.4.5, and 406.8.3)* – Where vehicles are parked, the floor surface should be both noncombustible and nonabsorbent. Motor Fuel-Dispensing Facilities and Repair garages have unique floor surface requirements.
5. *Sleeping rooms (originally in Sections 406.3.4.2 and 406.4.8)* – In all motor vehicle related occupancies,

no openings directly into a sleeping room should be permitted due to the production of carbon monoxide by the vehicles.

6. *Fuel dispensing (originally in Section 406.5.11)* – In all motor vehicle related occupancies, except for motor fuel dispensing facilities, the dispensing of fuel should not be permitted.

7. *Electric vehicle charging stations* – The installation of electric vehicle charging stations is rapidly increasing. This new provision provides minimum requirements to provide minimum safeguards for the installation of these stations, where provided in any motor vehicle related occupancy.

8. *Mixed uses (originally in Sections 406.4.6, 406.5.3, and 406.8.1)* - Mixed occupancy requirements are applied to Open parking, Enclosed parking, and Repair Garages. The general requirement for open and enclosed parking garages in Section 406.4.6 references Section 508.1, whereas the requirement specifically for Open parking garages in Section 406.5.3 references several additional sections. Private Garages has its own specific mixed use requirement. Motor-Fuel dispensaries direct the user to the IFC and Sections 407.1 and 407.2. A combined requirement clarifies the application.

9. *Equipment and appliances* – Sections 304.3 and 304.3.1 of the IMC provide specific requirements for the installation of equipment and appliances in any motor vehicle related occupancy. Section 304.3.1 of the IMC has additional exceptions for the installation of fuel-fired appliances in parking garages than Section 406.4.7 of the IBC. This new requirement correlates the IBC with the IMC.

10. *Hydrogen-generating appliances and refueling systems* - This new provision would provide minimum requirements to provide minimum safeguards for the installation of these appliances and systems, where provided in any motor vehicle related occupancy. Specific requirements, including ventilation, are provided in Chapter 7 of the IFGC for the installation of hydrogen-generating appliances and refueling systems.

You can read the additions and modifications to section 406.1 through 406.1.9.3. The changes to the code have been underlined:

SECTION 406

MOTOR-VEHICLE-RELATED OCCUPANCIES

406.1 General. All motor-vehicle-related occupancies shall comply with Sections 406.1.1 through 406.1.9.3. Private garages and carports shall also comply with Section 406.3. Open public parking garages shall also comply with Sections 406.4 and 406.5. Enclosed public parking garages shall also comply with Sections 406.4 and 406.6. Motor fuel-dispensing facilities shall also comply with Section 406.7. Repair garages shall also comply with Section 406.8.

406.1.1 Automatic garage door openers and vehicular gates. Where provided, automatic garage

door openers shall be listed and labeled in accordance with UL 325. Where provided, automatic vehicular gates shall comply with Section 3110.

406.1.2 Clear height. The clear height of each floor level in vehicle and pedestrian traffic areas shall be not less than 7 feet (2134 mm). Canopies under which fuels are dispensed shall have a clear height in accordance with Section 406.7.2.

Exception: A lower clear height is permitted for a parking tier in mechanical-access *open parking garages* where approved by the *building official*.

406.1.3 Accessible parking spaces. Where parking is provided, accessible parking spaces shall be provided in accordance with Chapter 11.

406.1.4 Floor surfaces. Floor surfaces shall be of concrete or similar approved noncombustible and nonabsorbent materials. The area of floor used for the parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway. The surface of vehicle fueling pads in motor fuel-dispensing facilities shall be in accordance with Section 406.7.1.

Exceptions:

1. Asphalt parking surfaces shall be permitted at ground level for public parking garages and private carports.
2. Floors of Group S-2 parking garages shall not be required to have a sloped surface.
3. Slip-resistant, nonabsorbent, interior floor finishes having a critical radiant flux not more than 0.45 W/cm², as determined by ASTM E 648 or NFPA 253, shall be permitted in repair garages.

406.1.5 Sleeping rooms. Openings between a motor vehicle-related occupancy and a room used for sleeping purposes shall not be permitted.

406.1.6 Fuel dispensing. The dispensing of fuel shall only be permitted in motor fuel dispensing facilities in accordance with Section 406.7.

406.1.7 Electric vehicle charging stations. Electric vehicle charging stations shall be installed in accordance with NFPA 70. Electric vehicle charging system equipment shall be listed and labeled in accordance with UL 2202. Electric vehicle supply equipment shall be listed and labeled in accordance with UL 2594. Accessibility to electric vehicle charging stations shall be provided in accordance with Chapter 11.

406.1.8 Mixed occupancies and separation. Mixed uses shall be allowed in the same building as public parking garages and repair garages in accordance with 508.1. Mixed uses in the same building as an open parking garage are subject to

Sections 402.4.2.3, 406.5.11, 508.1, 510.3, 510.4 and 510.7.

406.1.9 Equipment and appliances. Equipment and appliances shall be installed in accordance with Sections 406.1.9.1 through 406.1.9.3 and the Florida Building Code Mechanical, Florida Building Code Fuel Gas and NFPA 70.

406.1.9.1 Elevation of ignition sources. Equipment and appliances having an ignition source and located in hazardous locations and public garages, private garages, repair garages, automotive motor fuel-dispensing facilities and parking garages shall be elevated such that the source of ignition is not less than 18 inches (457 mm) above the floor surface on which the equipment or appliance rests. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

Exception: Elevation of the ignition source is not required for appliances that are listed as flammable vapor ignition resistant.

406.1.9.1.1 Parking garages. Connection of a parking garage with any room in which there is a fuel-fired appliance shall be by means of a vestibule providing a two-doorway separation, except that a single door is permitted where the sources of ignition in the appliance are elevated in accordance with Section 406.1.1.1.

Exception: This section shall not apply to appliance installations complying with Sections 406.1.9.2 or 406.1.9.3.

406.1.9.2 Public garages. Appliances located in public garages, motor fueling-dispensing facilities, repair garages or other areas frequented by motor vehicles, shall be installed not less than 8 feet (2438 mm) above the floor. Where motor vehicles are capable of passing under an appliance, the appliance shall be installed at the clearances required by the appliance manufacturer and not less than 1 foot (305 mm) higher than the tallest vehicle garage door opening.

Exception: The requirements of this section shall not apply where the appliances are protected from motor vehicle impact and installed in accordance with Section 406.1.9.1 and NFPA 30A.

406.1.9.3 Private garages. Appliances located in private garages and carports shall be installed with a minimum clearance of 6 feet (1829 mm) above the floor.

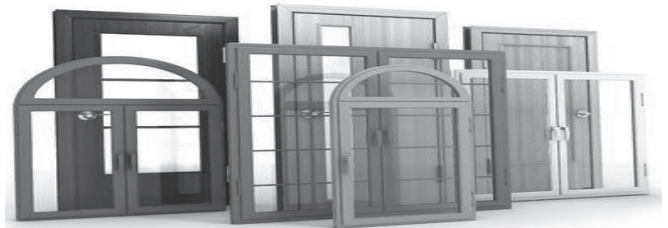
Exception: The requirements of this

section shall not apply where the appliances are protected from motor vehicle impact and installed in accordance with Section 406.1.9.1.

review questions...

1. If a building permit was not closed by a previous owner of a property, which of the following actions may a local enforcement agency take against an arm's-length purchaser of that same property?
 - a. Deny issuance of a building permit to the purchaser
 - b. Issue a notice of violation to the purchaser
 - c. Issue a fine to the purchaser
 - d. None of the above
2. According to *3115.5.3 Analysis*, load effects on structural members and their connections that provide support for independent exterior elevated flooring systems shall be determined by methods of structural analysis that take into account which of the following?
 - a. Equilibrium
 - b. General stability
 - c. Geometric compatibility
 - d. All of the above

Anchorage



This change to the Florida Building Code brings back a code section that was inadvertently left out of the 2014 and 2017 Florida Building Codes. During the code change process for the 5th Edition 2014 code cycle, there were many code sections that were not proposed to continue to be brought forward and were not included in the 5th Edition or the 6th Edition codes. This anchorage section is needed in the Building Code as it still remains in the Residential Code. This section is necessary for consistency with similar language in Section R609.7.2.1.

Additionally, section 1710 *Anchorage* has a reasonable and substantial connection with the health, safety, and welfare of the general public. It provides safety and welfare of the general public by strengthening window and door installation requirements. This section also strengthens the building code because it clarifies proper installation of windows and doors.

Please find the new Section 1710 *Anchorage* below. The additions to the building code have been underlined:

SECTION 1710

ANCHORAGE

1710.1 Anchorage methods. The methods cited in this section apply only to anchorage of window and door assemblies to the main windforce-resisting system.

1710.2 Anchoring requirements. Window and door assemblies shall be anchored in accordance with the published manufacturer's recommendations to achieve the design pressure specified. Substitute anchoring systems used for substrates not specified by the fenestration manufacturer shall provide equal or greater anchoring performance as demonstrated by accepted engineering practice.

1710.3 Masonry, concrete or other structural substrate. Where the wood shim or buck thickness is less than 1 ½ inches (38mm), window and door assemblies shall be anchored through the main frame or by jamb clip or subframe system, in accordance with the manufacturer's published installation instructions. Anchors shall be securely fastened directly into the masonry, concrete or other structural substrate material. Unless otherwise tested, bucks shall fully support the window or door frame. Shims shall be made from materials capable of sustaining applicable loads, located and applied in a thickness capable of sustaining applicable loads. Anchors shall be provided to transfer load from the window or door frame to the rough opening substrate.

Where the wood buck thickness is 1 ½ inches (38 mm) or greater, the buck shall be securely fastened to transfer load to the masonry, concrete or other structural substrate and the buck shall fully support the window or door frame. Window and door assemblies shall be anchored through the main frame or by jamb clip or subframe system or through the flange to the secured wood buck in accordance with the manufacturer's published installation instructions. Unless otherwise tested, bucks shall fully support the window or door. Shims shall be made from materials capable of sustaining applicable loads, located and applied in a thickness capable of sustaining applicable loads. Anchors shall be provided to transfer load from the window or door frame assembly to the secured wood buck.

1710.4 Wood or other approved framing materials. Where the framing material is wood or other approved framing material, window and door assemblies shall be anchored through the main frame or by jamb clip or subframe system or through the flange in accordance with the manufacturer's published installation instructions. Shims shall be made from materials capable of sustaining applicable loads, located and applied in a thickness capable of sustaining applicable loads. Anchors shall be provided to transfer load from the window or door frame to the rough opening substrate.

Delayed Action Closers

In previous versions of the Florida Building Code, the FBC has been silent regarding delayed action closers. This code change includes a definition as well as requirements for where delayed action closers may be installed.

The functionality of a delayed action closer is commonly required and/or desired for closers installed on doors. For example, delayed action closers are frequently used in schools to allow a teacher to lead a group of students from one area of the building to another. A door with a delayed action closer allows the teacher with a group of students to pass through the door before it closes, helping to keep the group intact.



Unlike automatic-closing doors which are commonly held in an open position, self-closing doors which are not automatic-closing doors are normally in a closed position unless being used. Thus, in a fire situation, the doors within the scope of this proposal would be closed except when being used and during the relatively brief delay caused by the delayed action closer.

Delayed action closers are not required or prohibited by the code. However, this code change provides appropriate guidance where delayed action closers are installed.

For reference, here is the FBC definition of self-closing:

SELF-CLOSING. As applied to a *fire door* or other opening protective, means equipped with a device that will ensure closing after having been opened.

You can read the additions to the 7th Edition of the Florida Building Code regarding delayed action closers below. The changes have been underlined:

SECTION 201

GENERAL

DELAYED ACTION CLOSER. Self-closing device that incorporates a delay prior to the initiation of closing. Delayed action closers are mechanical devices with an adjustable delay.

SECTION 716

OPENING PROTECTIVES

716.5.9.3 Delayed action closers. Doors required to be self-closing and not required to be automatic closing shall be permitted to be equipped with delayed action closers.

Heavy Timber

This modification to the *Florida Building Code, Building* takes the details for heavy timber construction out of Chapter 6 and consolidates them in Chapter 23. These modifications appear in the 2018 IBC. They do not change the technical requirements for heavy timber, but improve their usability. The IBC General Code Development Committee made the following statement regarding these changes:

“The proposal provides necessary consolidation and eliminates duplicative text between Chapters 6 and 23. The revised table is sorely needed to help the users of the code.... The new organization provides better logic for the requirements.”

The reason behind the reorganization and consolidation of heavy timber provisions is to promote better compliance and better enforcement of the building code, and therefore positively affect the safety and welfare of the general public. Additionally, this reorganization and consolidation of heavy timber provisions in one location will improve the usability and application of the building code.

Finally, another goal of this code change (and similar changes to heavy timber terminology in other chapters) is to use the term “Type IV” or “Section 602.4” when the provisions are referring to the type of construction for the building, and “heavy timber complying with Section 2304.11” when the provisions are referring to a heavy timber element located in a building of any construction type. This, and related changes, are not intended to make technical changes to the code but rather to make the current requirements easier to apply.

The cross laminated timber product standard was approved in the 2015 IBC in addition to a code change allowing this material to be utilized for the construction of 2 hour exterior walls in type IV-HT construction.

Cross Laminated Timber (CLT) has been manufactured for over 30 years in Europe and has just recently caught hold on the American Continent where some major structures are under way in Canada, and some smaller buildings are being built in the US. In Europe, buildings of 8 to 10 stories and above are regularly using cross laminated timber. The following link gives examples of CLT buildings throughout North America: <https://www.thinkwood.com/news/tall-timber-trends-higher-across-north-america>

Because of the high level of carbon sequestration and low embodied energy, it is anticipated there will be a renewed interest in the use of the type IV heavy timber as a type of construction. One bit of feedback the American Wood Council received after Cross Laminated Timber was approved in the 2015 IBC was the observation from one building department that the heavy timber and type IV provisions are confusing, sometimes redundant and spread across different sections of the building code.

This code change is an attempt to address that concern

without making any change. Currently type IV construction and heavy timber requirements are found in Sections 602.4 and 2304.11 of the IBC. The cleanup and reorganization of those sections is part one of this effort. The second part of this effort is the identification and update of many references to type IV construction and heavy timber found throughout the code.

In order to pare down Section 602.4, only the provisions specific to type IV construction remain, along with a list of the types of materials found in heavy timber and the reference to the requirements of those materials in Section 2304.11. Requirements specific to type IV remain in 602.4.

Section 2304.11 can best be described as “all things heavy timber”. Heavy timber structural elements have long been referenced throughout other parts of the code where a specific heavy timber structural element is detailed for use incorporated in another type of construction. The most general example of this is Table 601 Foot Note C allowing the use of heavy timber roof construction in place of one hour fire-resistance rated roof construction in types IB, II, IIIA, and VA construction. The design professional may detail heavy timber as the roof structure and assembly for these different types of construction and they are treated as building elements, but the type of construction for the overall structure does not change from the type IB, II, IIIA, or VA.

Heavy timber requirements removed from Section 602.4 are combined and organized with the existing content of Section 2304. Table 602.4 has been moved and renamed Table 2304.11. It is updated with information placing a description of the elements that are applicable for a given size timber element based on whether the element supports roof loads and floor loads or only roof loads. Specific footnotes about the size and protection of spaced truss elements and reduction of roof beam width for sprinklers are noted where applicable.

The non-size related detailing provisions for framing members and connections (columns, floor framing and roof framing) are coalesced into Sections 2304.11.1.1, 2304.11.1.2 and 2304.11.1.3. All of the information in table 2304.11 and the following sections are organized so that the most pertinent information for most designs is found first.

Finally, some of the detailing provisions for traditional heavy timber are identified as such and relocated later in each section while some other information that is archaic and better replaced by reference is removed. A good example of this is the removal of the requirement for the anchorage of “every monitor and every sawtooth construction” to the main roof construction in Section 2304.11.1.3. New Section 2304.11.1.3 requires roof girders and alternate roof beams to be anchored to their supports as required by Chapter 16.

Finally, Sections 2304.11.2 through 2304.11.4 contain pertinent thickness and detailing requirements for walls, roof, and floor deck construction.

The following table gives a more detailed description of where specific requirements have been moved.

Location in 6th Edition	Location in 7th Edition	Comments
602.4 Type IV	602.4 (same location)	Modified to direct users to the new section on heavy timber details. This section still retains the essentials for Type IV construction.
Table 602.4	Table 2304.11	Additional content has been added describing the thickness of structural elements based on loading and configuration from 602.4.3 through 602.4.5.
602.4.1 Fire-retardant treated wood in exterior walls, and 602.4.2 Cross-laminated timber in exterior walls	602.4.1 and 602.4.2 (same location)	Thickness of wall assembly has been added from 602.4.8.2 item 2.
602.4.3 Columns	2304.11, Table 2304.11, and Section 2304.11.1.1	Requirements have been combined with the previous Section 2304.11.1 <i>Columns</i> . Dimensions have been added in the new Table 2304.11.
602.4.4 Floor Framing	2304.11, Table 2304.11	
602.4.5 Roof Framing	2304.11, Table 2304.11	
602.4.6 Floors	2304.11.3	
602.4.6.1 Sawn or glued-laminated plank floors	2304.11.3.2	The end of Section 2304.11.3.2 comes from the previous Section 2304.11.2
602.4.6.2 Cross-laminated timber floors	2304.11.3.1	
602.4.7 Roofs	2304.11.4 and subsections 2304.11.4.1 and 2304.11.4.2	The provisions of previous Section 2304.11.5 are folded into these new Sections.
602.4.8 Partitions and walls and subsections 602.4.8.1 Interior walls and partitions and 602.4.8.2 Exterior walls	602 for exterior wall thickness in Type IV; heavy timber in 2304.11.2, 2304.11.2.1, and 2304.11.2.2	Essentials for a Type IV building have been kept in 602.4. Essentials for heavy timber have been moved to Section 2304.11.2.
602.4.9 Exterior structural members	602.4.3	Unchanged, but references the new heavy timber section.
2304.11 Heavy timber construction	2304.11 (same location)	Modified to become charging language for all heavy timber, not just Type IV construction. Also adds charging language for Table 2304.11.
2304.11.1 Columns	2304.11.1.1	New Section 2304.11.1.1 combines previous Sections 2304.11.1 and 2304.11.1.1. This updates the text to be more design focused while retaining traditional details.
2304.11.1.1 Column connections	2304.11.1.1	Incorporated in 2304.11.1.
2304.11.2 Floor framing	2304.11.1.2	Modifies text to make lesser-used methods a permitted option.
2304.11.3 Roof framing	2304.11.1.3	Modifies text to refer to design for all forces, not just uplift. Archaic language has been deleted.
2304.11.4 Floor decks	2304.11.3.2	Previous text appears at the end of the new section with the hardware choices updated. This section incorporates requirements for floors that were moved from Chapter 6.
2304.11.5 Roof decks	2304.11.4	Previous text appears at the end of new section and updates language to reflect current methods and to include consideration of all forces.

You can view the changes to the 7th Edition of the Florida Building Code regarding heavy timber below. The changes have been underlined:



SECTION 602

CONSTRUCTION CLASSIFICATION

602.4 Type IV. Type IV construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid wood, laminated wood, heavy timber (HT) or structural composite lumber (SCL) without concealed spaces. The minimum dimensions for permitted materials including solid timber, glued-laminated timber, structural composite lumber (SCL) and cross-laminated timber and details of Type IV construction shall comply with the provisions of this section and Section 2304.11. Exterior walls complying with Section 602.4.1 or 602.4.2 shall be permitted. Interior walls and partitions not less than 1-hour fire-resistance rating or heavy timber complying with Section 2304.11.2.2 shall be permitted.

TABLE 601

FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame ^l (see Section 202)	3 ^a	2 ^a	1	0	1	0	HT	1	0
Bearing walls									
Exterior ^{e, f}	3	2	1	0	2	2	2	1	0
Interior	3 ^a	2 ^a	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions	See Table 602								
Exterior									
Nonbearing walls and partitions	0	0	0	0	0	0	See Section 2304.11.2	0	0
Interior ^d									
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1 ½ ^b	1 ^{b,c}	1 ^{b,c}	0 ^c	1 ^{b,c}	0	HT	1 ^{b,c}	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed where a 1-hour or less fire-resistance rating is required.

d. Not less than the fire-resistance rating required by other sections of this code.

e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).

f. Not less than the fire-resistance rating as referenced in Section 704.10.

602.4.1 Fire-retardant-treated wood in exterior walls. *Fire-retardant-treated wood framing and sheathing* complying with Section 2303.2 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less.

602.4.2 Cross-laminated timber in exterior walls. *Cross-laminated timber* complying with Section 2023.1.4 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less, provided the exterior surface of the cross-laminated timber is protected by one of the following:

1. *Fire-retardant-treated wood* sheathing complying with Section 2303.2 and not less than $1\frac{5}{32}$ inch (12 mm) thick;
2. *Gypsum board* not less than $\frac{1}{2}$ inch (12.7 mm) thick; or
3. A noncombustible material.

602.4.3 Exterior structural members. Where a horizontal separation of 20 feet (6096 mm) or more is provided, wood columns and arches conforming to heavy timber sizes complying with Section 2304.11 shall be permitted to be used externally.

SECTION 2304

GENERAL CONSTRUCTION REQUIREMENTS

2304.11 Heavy timber construction. Where a structure, portion thereof or individual structural elements are required to be of heavy timber by provision of this code, the building elements therein shall comply with the applicable provisions of Sections 2304.11.1 through 2304.11.4. Minimum dimensions of heavy timber shall comply as applicable in Table 2304.11 based on roofs or floors supported and the configuration of each structural element, or as applicable in Sections 2304.11.2 through 2304.11.4. Lumber decking shall also be in accordance with Section 2304.9.

2304.11.1 Details of heavy timber structural members. Heavy timber structural members shall be detailed and constructed in accordance with Sections 2304.11.1.1 through 2304.11.1.3.

2304.11.1.1 Columns. Minimum dimensions of columns shall be in accordance with Table 2304.11. Columns shall be continuous or superimposed throughout all stories and connected in an approved manner. Girders and beams at column connections shall be closely fitted around columns and adjoining ends shall be cross tied to each other, or intertied by caps or ties, to transfer horizontal loads across joints. Wood bolsters shall not be placed on tops of columns unless the columns support roof loads only. Where traditional heavy timber detailing is used, connections shall be permitted to be by means of reinforced concrete or metal caps with brackets, or shall be connected by properly designed steel or iron caps, with pintles and base plates, or by

timber splice plates affixed to the columns by metal connectors housed within the contact faces, or by other approved methods.

2304.11.1.2 Floor framing. Minimum dimensions of floor framing shall be in accordance with Table 2304.11. Approved wall plate boxes or hangers shall be provided where wood beams, girders or trusses rest on masonry or concrete walls. Where intermediate beams are used to support a floor, they shall rest on top of girders, or shall be supported by an approved metal hanger into which the ends of the beams shall be closely fitted. Where traditional heavy timber detailing is used, these connections shall be permitted to be supported by ledgers or blocks securely fastened to side of the girders.

2304.11.1.3 Roof framing. Minimum dimensions of roof framing shall be in accordance with Table 2304.11. Every roof girder and at least every alternate roof beam shall be anchored to its supporting member; forces shall be as required in Chapter 16.

2304.11.2 Partitions and walls. Partitions and walls shall comply with Section 2304.11.2.1 or 2304.11.2.2.

2304.11.2.1 Exterior walls. Exterior walls shall be permitted to be *cross-laminated timber* meeting the requirements of Section 2303.1.4.

2304.11.2.2 Interior walls and partitions. Interior walls and partitions shall be of solid wood construction formed by not less than two layers of 1-inch (25 mm) matched boards or laminated construction 4 inches (102 mm) thick, or of 1-hour fire-resistance-rated construction.

2304.11.3 Floors. Floors shall be without concealed spaces. Wood floors shall be constructed in accordance with Section 2304.11.3.1 or 2304.11.3.2.

2304.11.3.1 Cross-laminated timber floors. *Cross-laminated timber* shall be not less than 4 inches (102 mm) in actual thickness. *Cross-laminated timber* shall be continuous from support to support and mechanically fastened to one another. *Cross-laminated timber* shall be permitted to be connected to walls without a shrinkage gap providing swelling or shrinking is considered in the design. Corbelling or masonry walls under the floor shall be permitted to be used.

2304.11.3.2 Sawn or glued-laminated plank floors. Sawn or glued-laminated plank floors shall be one of the following:

1. Sawn or glued-laminated planks, splined or tongue-and-groove, of not less than 3 inches (76 mm) nominal in thickness covered with 1-inch (25 mm) nominal dimension tongue-and-groove flooring, laid crosswise or

diagonally, $1\frac{15}{32}$ -inch (12 mm) wood structural panel or $\frac{1}{2}$ -inch (12.7 mm) particleboard.

- Planks not less than 4 inches (102 mm) nominal in width set on edge close together and well spiked and covered with 1-inch (25 mm) nominal dimension flooring or $1\frac{15}{32}$ -inch (12 mm) wood structural panel or $\frac{1}{2}$ -inch (12.7 mm) particleboard.

The lumber shall be laid so that no continuous line of joints will occur except at points of support. Floors shall not extend closer than $\frac{1}{2}$ inch (12.7 mm) to walls. Such $\frac{1}{2}$ -inch (12.7 mm) space shall be covered by a molding fastened to the wall and so arranged that it will not obstruct the swelling or shrinkage movements of the floor. Corbelling of masonry walls under the floor shall be permitted to be used in place of molding.

2304.11.4 Roof decks. Roofs shall be without concealed spaces and roof decks shall be constructed in accordance with Section 2304.11.4.1 or 2304.11.4.2. Other types of decking shall be permitted to be used where equivalent fire resistance and structural properties are being provided. Where

supported by a wall, roof decks shall be anchored to walls to resist forces determined in accordance with Chapter 16. Such anchors shall consist of steel bolts, lags, screws or approved hardware of sufficient strength to resist prescribed forces.

2304.11.4.1 Cross-laminated timber roofs.

Cross-laminated timber roofs shall be not less than 3 inches (76 mm) in actual thickness and shall be continuous from support to support and mechanically fastened to one another.

2304.11.4.2 Sawn, wood structural panel or glued-laminated plank roofs. Sawn, wood structural panel or glued-laminated plank roofs shall be one of the following:

- Sawn or glued laminated, splined or tongue-and-groove plank, not less than 2 inches (51 mm) nominal in thickness.
- $1\frac{1}{8}$ -inch-thick (29 mm) wood structural panel (exterior glue).
- Planks not less than 3 inches (76 mm) nominal in width, set on edge close together and laid as required for floors.

TABLE 2304.11

MINIMUM DIMENSIONS OF HEAVY TIMBER STRUCTURAL MEMBERS

		MINIMUM NOMINAL SOLID SAWN SIZE		MINIMUM GLUED-LAMINATED NET SIZE		MINIMUM STRUCTURAL COMPOSITE LUMBER NET SIZE	
		Width (inches)	Depth (inches)	Width (inches)	Depth (inches)	Width (inches)	Depth (inches)
SUPPORTING	HEAVY TIMBER STRUCTURAL ELEMENTS						
Floor loads only or combined floor and roof loads	Columns; Framed sawn or glued-laminated timber arches that spring from the floor line;	8	8	6 $\frac{3}{4}$	8 $\frac{1}{4}$	7	7 $\frac{1}{2}$
	Framed timber trusses						
	Wood beams and girders	6	10	5	10 $\frac{1}{2}$	5 $\frac{1}{4}$	9 $\frac{1}{2}$
Roof loads only	Columns (roof and ceiling loads); Lower half of: wood-frame or glued-laminated arches that spring from the floor line or from grade	6	8	5	8 $\frac{1}{4}$	5 $\frac{1}{4}$	7 $\frac{1}{2}$
	Upper half of: wood-frame or glued-laminated arches that spring from the floor line or from grade	6	6	5	6	5 $\frac{1}{4}$	5 $\frac{1}{2}$
	Framed timber trusses and other roof framing; ^a Framed or glued-laminated arches that spring from the top of walls or wall abutments	4 ^b	6	3 ^b	6 $\frac{7}{8}$	3 $\frac{1}{2}$ ^b	5 $\frac{1}{2}$

For SI: 1 inch = 25.4 mm.

a. Spaced members shall be permitted to be composed of two or more pieces not less than 3 inches (76 mm) nominal in thickness where blocked solidly throughout their intervening spaces or where spaces are tightly closed by a continuous wood cover plate of not less than 2 inches (51 mm) nominal in thickness secured to the underside of the members. Splice plates shall be not less than 3 inches (76 mm) nominal in thickness.

b. Where protected by approved automatic sprinklers under the roof deck, framing members shall be not less than 3 inches (76 mm) nominal in width.



review questions...

3. Section 1710 was left out of which editions of the Florida Building Code?
 - a. 4th Edition
 - b. 5th Edition
 - c. 6th Edition
 - d. Both b and c

4. Where a horizontal separation of _____ or more is provided, wood columns and arches conforming to heavy timber sizes complying with Section 2304.11 shall be permitted to be used externally.
 - a. 18 feet
 - b. 15 feet
 - c. 20 feet
 - d. 10 feet

5. Interior walls and partitions shall be of solid wood construction formed by not less than two layers of 1-inch (25 mm) matched boards or laminated construction _____ thick, or of 1-hour fire-resistance-rated construction.
 - a. 3 inches
 - b. 4 inches
 - c. 2.5 inches
 - d. 1.75 inches

Conclusion

This concludes the course *Florida Building Code 7th Edition: Advanced Course*. Please keep in mind that this course does not cover all of the changes from the 6th Edition of the Florida Building Code to the 7th Edition of the Florida Building Code. We have designed this course to cover some of the significant changes, but we highly encourage building professionals to explore the resources provided by the Florida Building Commission to learn about additional changes. These resources include access to the free, PDF Versions of the Building Code as well as materials related to the 2020 Update, including tracking charts. The 7th Edition of the Building Code is slated to go into effect on 12/31/2020. You can visit the Florida Building Commission's website here for more details: <https://floridabuilding.org/c/default.aspx>.

Thank you for joining us, and we hope that you enjoyed this course. See you next time!

Review Question Answers

- 1. If a building permit was not closed by a previous owner of a property, which of the following actions may a local enforcement agency take against an arm's-length purchaser of that same property?**
- Deny issuance of a building permit to the purchaser
 - Issue a notice of violation to the purchaser
 - Issue a fine to the purchaser
 - None of the above**

Explanation: Pursuant to Section 553.79(16), Florida Statutes, a local enforcement agency may not deny issuance of a building permit to; issue a notice of violation to; or fine, penalize, sanction, or assess fees against an arm's-length purchaser of a property for value solely because a building permit applied for by a previous owner of the property was not closed. The local enforcement agency shall maintain all rights and remedies against the property owner and contractor listed on the permit.

- 2. According to 3115.5.3 Analysis, load effects on structural members and their connections that provide support for independent exterior elevated flooring systems shall be determined by methods of structural analysis that take into account which of the following?**
- Equilibrium
 - General stability
 - Geometric compatibility
 - All of the above**

Explanation: 3115.5.3 Analysis. Load effects on structural members and their connections that provide support for independent exterior elevated flooring systems shall be determined by methods of structural analysis that take into account equilibrium, general stability, geometric compatibility and both short- and long-term material properties. Roof structures that provide support for exterior elevated flooring systems shall be checked for deflection in accordance with Section 1604.3.6 or Section 1616 for buildings sited in the HVHZ. Roof structures shall be checked in accordance with Section 1611 for ponding. The design shall account for concentrated loads of the pedestals.

- 3. Section 1710 was left out of which editions of the Florida Building Code?**
- 4th Edition
 - 5th Edition
 - 6th Edition
 - Both b and c**

Explanation: During the code change process for the 5th Edition 2014 code cycle, there were many code sections that were not proposed to continue to be brought forward and were not included in the 5th Edition or the 6th Edition codes.

- 4. Where a horizontal separation of _____ or more is provided, wood columns and arches conforming to heavy timber sizes complying with Section 2304.11 shall be permitted to be used externally.**
- 18 feet
 - 15 feet
 - 20 feet**
 - 10 feet

Explanation: 602.4.3 Exterior structural members. Where a horizontal separation of 20 feet (6096 mm) or more is provided, wood columns and arches conforming to heavy timber sizes complying with Section 2304.11 shall be permitted to be used externally.

- 5. Interior walls and partitions shall be of solid wood construction formed by not less than two layers of 1-inch (25 mm) matched boards or laminated construction _____ thick, or of 1-hour fire-resistance-rated construction.**
- 3 inches
 - 4 inches**
 - 2.5 inches
 - 1.75 inches

Explanation: 2304.11.2.2 Interior walls and partitions. Interior walls and partitions shall be of solid wood construction formed by not less than two layers of 1-inch (25 mm) matched boards or laminated construction 4 inches (102 mm) thick, or of 1-hour fire-resistance-rated construction.

Florida Building Code 7th Edition: Advanced Course

Final Exam

- 1. A local enforcement agency may close a building permit ___ years after the issuance of the permit, even in the absence of a final inspection, if the local enforcement agency determines that no apparent safety hazard exists.**
 - a. 3 years
 - b. 4 years
 - c. 5 years
 - d. 6 years
- 2. True or false? If a contractor other than the original contractor listed on the permit is hired by the property owner to close the permit, such contractor is not liable for any defects in the work performed by the original contractor and is only liable for the work that he or she performs.**
 - a. True
 - b. False
- 3. True or false? The area of occupied roofs shall be included in the total building area as regulated by Section 506.**
 - a. True
 - b. False
- 4. A roof off of a private office would be classified as which of the following?**
 - a. Group A-1
 - b. Group B
 - c. Group U
 - d. Group A-2
- 5. A roof above a restaurant would be classified as which of the following?**
 - a. Group M
 - b. Group U
 - c. Group A-2
 - d. Group B
- 6. Occupied roofs shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazard involved, and shall comply with _____.**
 - a. Chapter 10
 - b. Section 503.1.4
 - c. Section 508
 - d. Chapter 4
- 7. Assembly occupancies shall be permitted on roofs of open parking garages of Type ___ construction, in accordance with the exception to 903.2.1.6.**
 - a. Type I
 - b. Type II
 - c. Type III
 - d. Type I or Type II
- 8. Elements or structures enclosing the occupied roof areas shall not extend more than ___ inches above the surface of the occupied roof.**
 - a. 120 inches
 - b. 96 inches
 - c. 60 inches
 - d. 48 inches
- 9. According to 3115.5.1 Bearing capacity, pedestal support surface or roofing membrane shall be able to support a concentrated surface load of ___ psi (6.89kPa) under the pedestal base.**
 - a. 20 psi
 - b. 30 psi
 - c. 40 psi
 - d. 50 kPa
- 10. According to 3115.4.2 Pedestrian deck panels or pavers, where analysis of panels or pavers is not consistent with codified material design procedures, testing for uniform load and concentrated load capacities shall be performed... achieving a load capacity _____ times the axial load capacity designated in the specifications.**
 - a. two
 - b. three
 - c. four
 - d. five
- 11. The clear height of each floor level in vehicle and pedestrian traffic areas shall be not less than _____.**
 - a. 4 feet
 - b. 5 feet
 - c. 6 feet
 - d. 7 feet

- 12. Appliances located in public garages, motor fueling-dispensing facilities, repair garages or other areas frequented by motor vehicles, shall be installed not less than _____ above the floor.**
- 8 feet
 - 7 feet
 - 6 feet
 - 5 feet
- 13. Appliances located in private garages and carports shall be installed with a minimum clearance of _____ above the floor.**
- 6 feet
 - 5 feet
 - 4 feet
 - 3 feet
- 14. Where the wood shim or buck thickness is less than _____, window and door assemblies shall be anchored through the main frame or by jamb clip or subframe system, in accordance with the manufacturer's published installation instructions.**
- 2 ½ inches
 - 1 ½ inches
 - 1 ¾ inches
 - 1 ⅞ inches
- 15. Where the wood buck thickness is 1 ½ inches (38 mm) or greater, the buck shall be securely fastened to transfer load to which of the following?**
- The masonry
 - Concrete
 - Other structural substrate
 - Any of the above
- 16. Which of the following is the FBC definition of "self-closing"?**
- Doors required to be self-closing and not required to be automatic closing shall be permitted to be equipped with delayed action closers.
 - Delayed action closing device that incorporates a delay prior to the initiation of closing.
 - As applied to a fire door or other opening protective, means equipped with a device that will ensure closing after having been opened.
 - None of the above
- 17. Cross-laminated timber roofs shall be not less than _____ in actual thickness and shall be continuous from support to support and mechanically fastened to one another.**
- 1 inch
 - 1.5 inches
 - 2.25 inches
 - 3 inches
- 18. True or false? Regarding cross-laminated timber flooring, the cross-laminated timber shall be permitted to be connected to walls without a shrinkage gap providing swelling or shrinking is considered in the design.**
- True
 - False
- 19. Fire-retardant-treated wood framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies not less than _____ in thickness.**
- 6 inches
 - 5 inches
 - 4 inches
 - 3 inches
- 20. Cross-laminated timber complying with Section 2023.1.4 shall be permitted within exterior wall assemblies.... provided the exterior surface of the cross-laminated timber is protected by which of the following?**
- Fire-retardant-treated wood sheathing complying with Section 2303.2 and not less than 15/32 inch (12 mm) thick
 - Gypsum board not less than ½ inch (12.7 mm) thick
 - A noncombustible material
 - Any of the above