

# Construction Code Communicator



State of New Jersey  
 Chris Christie, Governor  
 Kim Guadagno, Lt. Governor

Department of Community Affairs  
 Charles A. Richman, Commissioner

Volume 29, Number 3

Fall 2017

## Landings for IRC Stairways

The Code Assistance Unit has received multiple questions regarding landings for stairways. In most cases, the question relates to a stairway leading from a deck. For background, please review Sections R311.7.6, Landings for stairways, and R311.7.7, Stairway walking surface, of the 2015 International Residential Code (IRC).

The question is: Can the landing at the bottom of an exterior stairway be the ground or a gravel surface?

The answer is: Yes. The code does not regulate the type of material to be used at the landing for an exterior stairway. The code does not prohibit the ground or gravel surface serving as the landing as long as, at the time of final inspection, it complies with the required dimensions of Section R311.7.6 and the slope of Section R311.7.7.

Please note that the Uniform Construction Code (UCC) is not a maintenance code. It would be the homeowner's responsibility to maintain the landing.

Source: Rob Austin  
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## Sprinkler Protection of Mattresses or Upholstered Furniture Manufacturing, Sales and Storage Occupancies

Recently, the Code Assistance Unit has been receiving calls about reviewing plans for self-storage units that may be storing mattresses or upholstered furniture. Yes, we're talking about those metal structures where you can store your stuff. In some proposed buildings, designers are planning to install fire walls every 2,500 square feet so they do not have to install fire sprinkler systems. The 2015 International Building Code (IBC) does have thresholds for fire sprinklers in occupancies that have mattresses or upholstered furniture. Specifically, Group F-1 and Group S-1 have 2,500 square foot occupancy thresholds while Group M has a 5,000 square foot occupancy threshold.

The International Codes Council issued "IFC Interpretation 20-14" for the 2012 edition of the International Fire Code (IFC) referencing Section 903.2.9 of the IBC. This interpretation basically explains that, regardless of how much upholstered furniture and/or mattresses is actually stored, if one mattress is there, the entire occupancy needs to be sprinklered when the occupancy is over 2,500 square feet.

The Department respectfully disagrees with the IFC Interpretation 20-14 determination. Since the adoption of the 2015 IBC, we have been informing designers that the upholstered furniture and/or mattresses actually stored needed to be over 2,500 square feet. The IFC Committee's reason statement supports this by stating, "The proposal was modified to provide a reasonable threshold that would not penalize occupancies with very small amounts of such materials."

The 2015 IBC should be enforced as follows: When more than 2,500 square feet of mattresses or upholstered furniture are stored or used for manufacturing, the entire occupancy needs to be sprinklered. When a mercantile use displays more than 5,000 square feet of mattresses or upholstered furniture, the entire occupancy needs to be sprinklered.

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## Exit Access Stairs and Rehab

Exit Access Stairways (EAS) are a new concept that entered the International Building Code (IBC) in the 2015 edition. An EAS is defined as, "a stairway with the exit access portion of the means of egress system" and the specific requirements can be found at Section 1019. Upon review of this section, there are set parameters in which an EAS may be used as a means of egress. In new construction, this is easy to do; that is not the case in an existing building.

The Code Assistance Unit has received questions regarding an EAS in an existing building and whether a reference to Section 1019 will be incorporated into the Rehabilitation Subcode (N.J.A.C. 5:23-6). In short, it's not happening – for now. The existing building stock hasn't dealt with this new type of egress stair, and without knowing all the existing conditions of the building, especially in relation to the egress components, it would be difficult to implement. The specific requirements of Section 1019 necessitate a look at the whole building, which is not how the Rehabilitation Subcode works; N.J.A.C. 5:23-6 allows you to "put on your horse-blinders" to the rest of the building and focus on the immediate scope of the project.

Taking a look at New Building Elements, Basic Requirements (as triggered by Reconstruction), and Change of Use sections, Section 1019 was purposefully left out to avoid misapplication. Speaking of the Basic Requirements, an EAS could potentially be in conflict with the vertical opening protection requirements in the applicable [use] group.

To be more specific, N.J.A.C. 5:23-6.9(a)8ii states, "[Newly created] exit stairways in buildings subject to the building subcode shall comply with Sections 1022 and 1028." When applying Section 1022.1, it states, "Exits shall comply with Sections 1022 through 1027 and the applicable requirements of Sections 1003 through 1015. An exit shall not be used for any purpose that interferes with its function as a means of egress." There is no reference to Section 1019. In the case of change of use to a higher hazard category, N.J.A.C. 5:23-6.31(c)2 does not reference Section 1019 either.

As you can see, we deliberately do not include an EAS for existing buildings. A local code official may consider a variation to allow for its use. In reviewing such an application, the construction official must ensure that the egress conditions of Section 1019 are met or that equivalent protection is provided, whatever that may consist of.

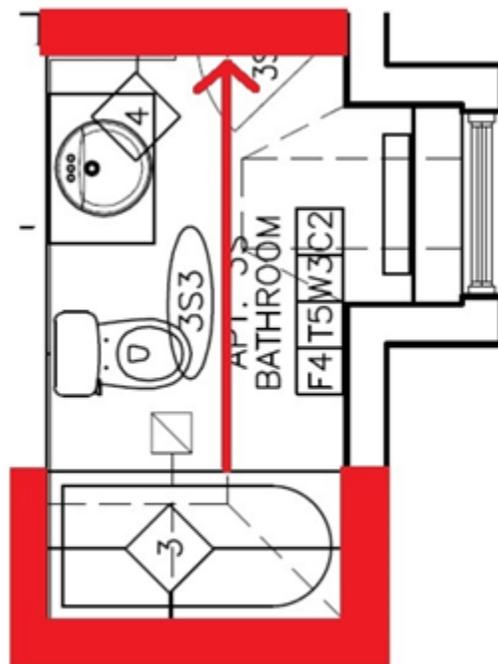
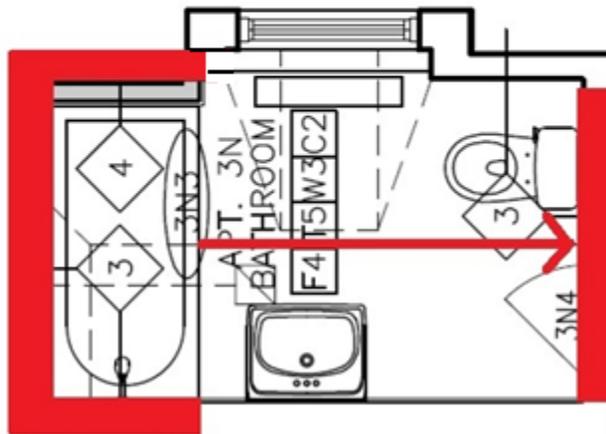
Source: Rob Austin  
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### Safety Glazing for Wet Locations

As code officials, we sometimes read provisions the way we wish they were written rather than the way they are actually written. That seems to be the case with the safety glazing provisions related to wet surfaces found in Section 2406.4.5 of the 2015 International Building Code. (Note that this section is duplicated in Section R308.4.5 of the 2015 International Residential Code.) The code specifically states that the need for safety glazing is for glazing that is a part of, or that faces, an enclosure of a bathtub, shower, hot tub, sauna, spa, whirlpool, or swimming pool. This means that glazing within walls that are not part of the enclosure and are not facing the above-mentioned fixtures or facilities do not need safety glazing. This principle is further reinforced in the exception to 2406.4.5 which indicates that the need for safety glazing is determined by projecting a horizontal straight line from the water's edge. Any glazing that is less than 60 inches above the walking surface and within a sixty-inch straight line from the water's edge would need safety glazing. Any glazing in the areas shown in red in the figures below would need safety glazing. For walls that are perpendicular to the water's edge, not all glazing would need to be safety glazing. Any areas not in red would not need to be. While we may wish that it said something different, the code only addresses forward falls. The code does not address falling out of the tub and teetering sideways. Maybe it should, but it doesn't.

**2406.4.5 of IBC/2015 = glazing less than 60in above standing surface located in "RED" walls must be safety glazed.**

*(same as Section R308.4.5 of IRC/2015)*



**(arrow in RED depicts straight line 60 or less inches)**

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### Replacement of a Water Heater and the Plumbing Subcode Technical Section

It has come to the Department's attention that some municipalities are not accepting the Plumbing Subcode Technical Section (F130) form for the replacement of a water heater. Instead, the municipality is requiring that a Mechanical Inspection Technical Section (F145) form be submitted. As per N.J.A.C. 5:23-3.4(d)1., the plumbing subcode official shall have responsibility for the provisions of the code, except electrical, for the installation and replacement of heating or cooling equipment, including water heaters, in existing R-3 and R-5 structures, when no mechanical inspector is assigned. In keeping with this, and in the interest of public service, municipalities should accept a properly signed and sealed Plumbing Subcode Technical Section for the replacement of a water heater.

Source: Code Assistance Unit  
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### Soil Erosion and Sediment Control (SESC) Act – Prior Approvals

It has been brought to the Department’s attention that some municipalities are disregarding the Soil Erosion and Sediment Control Act as a prior approval. This article is written as a reminder that effective implementation of the Act depends upon cooperation between municipalities and the appropriate Soil Conservation District.

At N.J.S.A. 4:24-41(g), the Soil Erosion and Sediment Control Act defines “Project” as “any disturbance of more than 5,000 square feet of the surface area of land (1) for the accommodation of construction for which the State Uniform Construction Code would require a construction permit, except that the construction of a single-family dwelling unit shall not be deemed a “project” under this act unless such unit is part of a proposed subdivision, site plan, conditional use, zoning variance, planned development or construction permit application involving two or more such single-family units, (2) for the demolition of one or more structures, (3) for the construction of a parking lot, (4) for the construction of a public facility, (5) for the operation of any mining or quarrying activity, or (6) for the clearing or grading of any land for other than agricultural or horticultural purposes.”

If a project requires a permit through the Uniform Construction Code (UCC) *and* the soil disturbance meets the definition of “project” given above, a prior approval by the Soil Conservation District is required. **A construction permit should not be issued unless a soil erosion and sediment control plan has been certified by the Soil Conservation District.** In addition, no certificate of occupancy should be issued upon completion of the project without a report of compliance from the soil conservation district. In municipalities that have a soil erosion and sediment control ordinance approved by the State Soil Conservation Committee, the required prior plan certificate and reports of compliance must be issued by the responsible municipal official. A Temporary Certificate of Occupancy may be issued only if a Report of Compliance or Report of Compliance with Conditions has been issued by the soil conservation district.

It is necessary that construction officials follow the requirements of the SESC Act. Any project not in compliance with this law that is brought to the Department’s attention by a soil conservation district will be handled through the Office of Regulatory Affairs, (609) 984-7672.

#### Resources

Contact the appropriate soil conservation district to determine whether a project is covered by the SESC Act or for any additional information. Contact information is available online at <http://www.nj.gov/agriculture/divisions/anr/pdf/soilconservationdistricts2017.pdf>.

UCC Bulletin 91-2 addresses compliance with requirements of the SESC Act, and is available online at [http://www.nj.gov/dca/divisions/codes/publications/pdf\\_bulletins/b\\_91\\_2.pdf](http://www.nj.gov/dca/divisions/codes/publications/pdf_bulletins/b_91_2.pdf).

Answers to frequently asked questions can be found at <http://www.nj.gov/agriculture/divisions/anr/news/faq.html>.

Further information may be obtained from:  
State Soil Conservation Committee  
New Jersey Department of Agriculture  
Post Office Box 330  
Trenton, New Jersey 08625-0330  
Telephone: (609) 292-5540  
Fax: (609) 633-7229

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## Stories Above Grade Plane

As you should know, stories of a building are counted when they are above grade plane. This is in accordance with Section 504.4, Number of stories, of the 2015 International Building Code (IBC). This section states, “The maximum number of stories of a building shall not exceed the limits specified in Table 504.4.” This table is entitled, “Allowable Number of Stories Above Grade Plane.”

The question remains: how do you know whether or not the story is above grade plane? To figure this out, one must review the definitions in Section 202. Here, we start with:

**STORY ABOVE GRADE PLANE** - Any **story** having its finished floor surface entirely above **grade plane**, or in which the finished surface of the floor next above is:

1. More than 6 feet above grade plane; or
2. More than 12 feet above the finished ground level at any point.

As you can see, this term has two other defined terms that have to be included to get the full meaning of “Story Above Grade Plane.” Please note that any italicized word(s) in the International Building Code is a tip to the user to review Section 202 for the definitions. In this case, “Story” and “Grade Plane” are both italicized. These terms are defined as:

**GRADE PLANE** - A reference plane representing the average of finished ground level adjoining the building at exterior walls. Where the finished ground level slopes away from the exterior walls, the reference plane shall be established by the lowest points within the area between the building and the lot line or, where the lot line is more than 6 feet from the building, between the building and a point 6 feet from the building.

**STORY** - That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above (see “Basement,” “Building height,” “Grade plane” and “Mezzanine”). A story is measured as the vertical distance from top to top of two successive tiers of beams or finished floor surfaces and, for the topmost story, from the top of the floor finish to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.

Once you read all the definitions together, you can now see how many stories the building is. (If you have a Commentary book, please see figure 202(7) on page 2-13.) Exceptions to this would be: (1) basements not considered a story above grade; (2) mezzanines; (3) habitable attics in Group R-5; and (5) the applicable provisions of Section 510.

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## Flood Resistant Materials Usage Revisited – Update

*(originally printed in the Spring/Summer 2014 edition)*

The 2014 Spring/Summer CCC contained a similar article regarding the permitted materials used for flood resistance based on the 2009 International Residential Code (IRC). With the adoption of the 2015 IRC, Section R322.1.8 has been revised. The section used to have two criteria that had to be met, but now there is only one: FEMA’s Technical Bulletin #2 (TB-2). In other words, item #1 from the 2009 IRC was deleted and item #2, TB-2, became the only item required in the 2015 IRC.

However, the logic of height application has not changed. As stated in the previous article, when combining R322.2.1 of the 2015 IRC and NJ Department of Environmental Protection (DEP)’s regulations at N.J.A.C. 7:13, TB-2 is to be applied to all items below the design flood elevation (DFE). The DFE is the base flood elevation (BFE) and at least one additional foot per DEP regulations. In the event that a municipality has adopted a “freeboard” greater than one foot, then the DFE becomes the BFE plus freeboard.

References:

- 2014 S/S CCC - <http://www.nj.gov/dca/divisions/codes/publications/ccs.html>
- R322 of 2015 - [http://codes.iccsafe.org/app/book/toc/2015/New\\_Jersey/residential/index.html](http://codes.iccsafe.org/app/book/toc/2015/New_Jersey/residential/index.html)
- FEMA TB-2 - <https://www.fema.gov/media-library/assets/documents/2655>

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**2015 I-Code Flood Hazard Construction – DEP Revisions – Update **

*(originally published in the Fall 2015 edition)*

Previous editions of the International Building Code and Residential Code (IBC and IRC, respectively) adopted by New Jersey differed in flood resistant standards regarding Coastal A flood zones. With the adoption of the 2015 edition of these codes on September 21, 2015, the Coastal A flood zone is one and the same regardless of whether the project is under the IBC or the IRC. The 2015 IRC has now aligned its Coastal A flood zone requirements with the V flood zone requirements (this was already the case in previous editions of the IBC). In short, whether using the 2015 IBC or IRC, a foundation in a Coastal A flood zone is required to meet the same requirements as a V zone.

The rule applies to new construction and those property owners whose properties were “substantially damaged/improved.” A structure is considered substantially damaged if the cost of restoration equals or exceeds 50 percent of the market value of the structure prior to the damage; this determination is made by the local floodplain administrator. Substantially improved means improvement(s) of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement.

Keeping in mind that DEP’s existing rules already contain a mandatory 1-foot freeboard\*, which is maintained within NJAC 7:13, and applies to the lowest floor of the home or building, the question remains, how does this interface with the Uniform Construction Code (UCC), NJAC 5:23? The quick answer is to see your local floodplain administrator as he or she will let you know the elevation and the flood zone applicable to the home or building in question. Under the UCC, this is handled through the prior approval process. Previously, the DEP rules only used “lowest floor” and the UCC, by means of referenced model codes and standards, used this term and “lowest supporting horizontal structural member”. This has been remedied with DEP’s July 17, 2017 adoption of revisions to the Flood Hazard Area Control Act rules. “Lowest floor” now includes a reference to lowest horizontal structural member (see NJAC 7:13-1.2 at [http://www.nj.gov/dep/rules/rules/njac7\\_13.pdf](http://www.nj.gov/dep/rules/rules/njac7_13.pdf) for definition of Lowest Floor). In short, the revisions harmonize NJAC 7:13 and the Uniform Construction Code, NJAC 5:23, regarding this issue and should minimize confusion when applying the two sets of rules. Provided below is the boiled-down version of the interaction between the rules.

\* Note – Freeboard is a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. (<http://www.fema.gov/freeboard>)

Combining DEP’s newly-revised rules and the UCC’s existing requirements allows for the determination of the Design Flood Elevation (DFE). The breakdown of the elevation requirements in a flood zone per the 2015 IBC and IRC is as below.

		IRC <sup>a</sup>	IBC <sup>b</sup>			
			Cat 1	Cat 2	Cat 3	Cat 4
A zone	Elevation of the lowest floor <sup>c</sup>	BFE +1 ft	BFE +1 ft	BFE +1 ft	BFE +1 ft	BFE +2 ft
Coastal A zone and V zone	Elevation of the bottom of lowest supporting horizontal structural member of lowest floor <sup>c</sup>	BFE +1 ft	BFE +1 ft	BFE +1 ft	BFE +2 ft	BFE +2 ft

a – Per Sections R309.3/IRC and R322.2.2/IRC and Section 1.5.2/ASCE 24, attached and detached enclosed areas used solely for parking of vehicles, building access or storage may be below the BFE.

b – Category classifications are from Table 1-1 of the ASCE 24-14 (see attached).

c – Minimum elevations are based on the model codes adopted by NJAC 5:23, in combination with NJAC 7:13; municipalities may adopt local ordinances for greater freeboard which increases the DFE.

There actually are three entities involved in the enforcement of requirements for elevation of structures in identified flood hazard areas:

- The local floodplain administrator is responsible for the enforcement of the municipal flood ordinance. These ordinances are adopted as a condition of the municipality’s participation in the National Flood Insurance Program. (It should be noted that municipalities may choose to adopt requirements for higher elevations.) DEP provides a model flood ordinance at: <http://www.nj.gov/dep/floodcontrol/modelord.htm>.
- DEP is responsible for enforcement of the State’s Flood Hazard Area Control Act rules, NJAC 7:13. Under NJAC 7:13, if a home or building is being raised or reconstructed in the original footprint, DEP’s “permit by rule” allows construction to proceed without a separate review or approval from DEP. This same rule allows for an increase in the footprint of up to 300 square feet under the permit by rule provisions, which is helpful in terms of additional steps or ramps necessary to access elevated buildings. Other construction in a flood hazard area requires approval from DEP.
- The local construction official is responsible for enforcement of the UCC, including the elevation requirements described above.

*(continued on next page)*

(2015 I-Code Flood Hazard Construction – DEP Revisions – Update)

ASCE 24-14 Table 1-1, Flood Design Class of Buildings and Structures

Category	Use or Occupancy of Buildings and Structures
1	Buildings and structures that normally are unoccupied and pose minimal risk to the public or minimal disruption to the community should they be damaged or fail due to flooding. Flood Design Class 1 includes: (1) temporary structures that are in place for less than 180 days; (2) accessory storage buildings and minor storage facilities (does not include commercial storage facilities); (3) small structures used for parking of vehicles; and (4) certain agricultural structures. [Note (a)]
2	Buildings and structures that pose a moderate risk to the public or moderate disruption to the community should they be damaged or fail due to flooding, except those listed as Flood Design Classes 1, 3, and 4. Flood Design Class 2 includes the vast majority of buildings and structures that are not specifically assigned another Flood Design Class, including most residential, commercial, and industrial buildings
3	Buildings and structures that pose a high risk to the public or significant disruption to the community should they be damaged, be unable to perform their intended functions after flooding, or fail due to flooding. Flood Design Class 3 includes: (1) buildings and structures in which a large number of persons may assemble in one place, such as theaters, lecture halls, concert halls, and religious institutions with large areas used for worship; (2) museums; (3) community centers and other recreational facilities; (4) athletic facilities with seating for spectators; (5) elementary schools, secondary schools, and buildings with college or adult education classrooms; (6) jails, correctional facilities, and detention facilities; (7) healthcare facilities not having surgery or emergency treatment capabilities; (8) care facilities where residents have limited mobility or ability, including nursing homes but not including care facilities for five or fewer persons; (9) preschool and child care facilities not located in one- and two-family dwellings; (10) buildings and structures associated with power generating stations, water and sewage treatment plants, telecommunication facilities, and other utilities which, if their operations were interrupted by a flood, would cause significant disruption in day-to-day life or significant economic losses in a community; and (11) buildings and other structures not included in Flood Design Class 4 (including but not limited to facilities that manufacture, process, handle, store, use, or dispose of such substances as hazardous fuels, hazardous chemicals, hazardous waste, or explosives) containing toxic or explosive substances where the quantity of the material exceeds a threshold quantity established by the authority having jurisdiction and is sufficient to pose a threat to the public if released. [Note (b)]
4	Buildings and structures that contain essential facilities and services necessary for emergency response and recovery, or that pose a substantial risk to the community at large in the event of failure, disruption of function, or damage by flooding. Flood Design Class 4 includes: (1) hospitals and health care facilities having surgery or emergency treatment facilities; (2) fire, rescue, ambulance, and police stations and emergency vehicle garages; (3) designated emergency shelters; (4) designated emergency preparedness, communication, and operation centers and other facilities required for emergency response; (5) power generating stations and other public utility facilities required in emergencies; (6) critical aviation facilities such as control towers, air traffic control centers, and hangars for aircraft used in emergency response; (7) ancillary structures such as communication towers, electrical substations, fuel or water storage tanks, or other structures necessary to allow continued functioning of a Flood Design Class 4 facility during and after an emergency; and (8) buildings and other structures (including, but not limited to, facilities that manufacture, process, handle, store, use, or dispose of such substances as hazardous fuels, hazardous chemicals, or hazardous waste) containing sufficient quantities of highly toxic substances where the quantity of the material exceeds a threshold quantity established by the authority having jurisdiction and is sufficient to pose a threat to the public if released. [Note (b)]

Note (a) - Certain agricultural structures may be exempt from some of the provisions of this standard; see ASCE 24-14 Section C1.4.3.  
 Note (b) - Buildings and other structures containing toxic, highly toxic, or explosive substances shall be eligible for assignment to a lower Flood Design Class if it can be demonstrated to the satisfaction of the authority having jurisdiction by a hazard assessment as described in ASCE 7-10 Section 1.5.3 of Minimum Design Loads for Buildings and Other Structures that a release of the substances is commensurate with the risk associated with that Flood Design Class.

Source: Code Assistance Unit  
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The Construction Code Communicator is an online publication of the New Jersey Department of Community Affairs' Division of Codes and Standards. It is typically published four times a year.

Copies may be read or downloaded from the division's website at: [www.nj.gov/dca/divisions/codes](http://www.nj.gov/dca/divisions/codes).

Please direct any comments or suggestions to the NJDCA, Division of Codes and Standards, Attention: Code Development Unit, PO Box 802, Trenton, NJ 08625-0802 or [codeassist@dca.nj.gov](mailto:codeassist@dca.nj.gov).

## Ceiling Heights in Existing Homes

Are you really allowed to finish a basement for habitable purposes even if the ceiling is below 7-feet? The short answer is yes.

All projects undertaken in existing buildings, including homes of Group R-5, are required to start the construction code journey by visiting the Rehabilitation Subcode, N.J.A.C. 5:23-6, first. There, it will state what portions of new code apply based on the scope of the project. Since the “finishing of a basement” is an Alteration per N.J.A.C. 5:23-6, sections 6.2 (scope of project), 6.6 (alteration), 6.8 (materials and methods) and 6.9 (new building elements) are applicable.

If this were new construction, Section R305.1, Minimum Height, of the International Residential Code/2015 would require a minimum ceiling height of 7-feet for habitable space, hallways and portions of basements containing these spaces. In considering basements, it is important to note that exception #3 permits new basements containing habitable space to have beams, girders, ducts or other obstructions to project to within 6 feet 4 inches of the finished floor.

However, this article is for existing basements, and Section R305.1 is not listed at N.J.A.C. 5:23-6.8(h) as a material and method, nor is it listed as a basic requirement within N.J.A.C. 5:23-6.27 by means of N.J.A.C. 5:23-6.6(h). This means that an existing basement at, for example, 6’7” could be finished with a ceiling at or near this height. I say “near” because there would have to be some allowance for building materials to fur/stud-out the ceiling for finished materials. This is also why I make note of exception #3 from Section R305.1, as there may be some instances where the space may be in compliance with the new code when finishing the basement.

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## Reconstruction Definition and De Minimis Example

For those of you trying to apply the definition of reconstruction to a project, let’s start with its basic definition. As per N.J.A.C. 5:23-6.3, a reconstruction means “any project where the extent and nature of the work is such that the work area cannot be occupied while the work is in progress and where a new certificate of occupancy is required before the work area can be reoccupied. Reconstruction may include repair, renovation, alteration or any combination thereof. Reconstruction shall not include projects comprised only of floor finish replacement, painting or wallpapering, or the replacement of equipment or furnishings. Asbestos hazard abatement and lead hazard abatement projects shall not be classified as reconstruction solely because occupancy of the work area is not permitted.”

Within this definition, another defined term is used: work area. This term is defined as, “any entire use, primary function space, or tenancy comprising all or part of a reconstruction project as delineated on the approved permit application and/or plans.”

For example, if the entire home is non-habitable while the project takes place, it is essentially a reconstruction project. However, gutting a kitchen and possibly other rooms while maintaining a place to sleep (could be the living room) and a microwave to “cook” would not be a reconstruction, but most likely an alteration.

And last but not least, the term de minimis. Yes, N.J.A.C. 5:23-6.2(b)2i uses this in relation to a replacement structure, but it is not defined. A simple way to explain this is to apply it to taking a home down to the foundation. Obviously, the foundation is being preserved to be reutilized with the replacement home meeting new code. The design professional would certify that the existing foundation can be used for the new home installed (above).

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## Horizontal Building Separation Allowance

Section 510.2, Horizontal building separation allowance, of the 2015 International Building Code (IBC) permits a building to be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories, and type of construction where the listed six conditions are met. In the previously referenced New Jersey edition, the 2009 IBC, there were seven conditions to be met; this was the same for the 2012 IBC, which New Jersey never adopted.

*(continued on next page)*

*(Horizontal Building Separation Allowance)*

The 2015 IBC “lost” condition #2 as indicated by a “←” in the margin to demonstrate that it was deleted. As a reference, in the 2009 IBC, condition #2 stated, “The building below the horizontal assembly is no more than one story above grade plane.” To find out why this condition was deleted, we would need to consult the “archived” International Code Council’s (ICC) code development cycles at

<https://www.iccsafe.org/codes-tech-support/codes/code-development/code-development-archives/>.

Since the condition was removed from the 2012 IBC, researching the 2012/2014 cycle provides the answer at the change listed at G133-12. Here are the proponents’ reasoning statements, which obviously were good enough for the change to be approved for the 2015 IBC:

- (Klein) Item #2 of Section 510.2 is an antiquated section of the Code that was a carryover from the legacy 1997 UBC Section 311.2.2.1, “Group S, Division 3 with Group A, Division 3; Group B, Group M or R, Division 1 Occupancy above”. Under this section of the UBC the occupancies permitted below the 3 hour fire rated horizontal separation (i.e. parking garage, B, M and A-3 occupancies) were not required to be sprinklered. In the 2009 IBC, we revised the requirements under this Section of Code to require the building below the 3 hour fire rated horizontal separation to be sprinklered per Section 903.3.1.1 (NFPA 13) (See 2012 IBC Section 510.2(6)). Therefore, to limit the building under Section 510.2 that is of Type 1A Construction Type and sprinklered makes no sense anymore, and limits the use of this section of Code in major urban renewal areas of the US.

From a life safety/fire protection standpoint, permitting the Type 1A portion under the 3 hour horizontal separation to go to any number of stories, is an equal or better type of construction that is permitted by this section of code under Section 510.2(7) [of the 2012 IBC]. Section 510.2(7) permits the building(s) above the Type IA portion to be a maximum height in feet not to exceed the height limits set forth in Section 503 for the “...building having the smaller allowable height as measured from the grade plane...”. Therefore, a project built under Section 510.2 can presently have above the Type IA portion an R-2 occupancy, sprinklered per NFPA 13R, 4 story, Type 5A, maximum of 60’ above grade plane (or an R-2 occupancy, sprinklered per NFPA 13, 4 story, Type 5A, maximum of 70’ above grade plane). However, *if Item #2 is deleted, then as the Type IA portion is increased in its number of stories above grade plane, the portion above is still limited by Item #7’s height limitation [of the 2012 IBC] and its “height footprint” is being reduced.* The net effect is that because this section of the Code will not permit more stories for the Type IA Construction Type, sprinklered portion of the project, the net effect is the reduction of the height of the portion of the project that is of a lesser construction type that is above the Type IA portion. Therefore, from a life safety/fire protection standpoint, we have an equal or better code requirement that is more flexible to provide for the needs of our urban needs to bring people back into our major cities to live and work.

- (Thompson) Section 510.2 of the IBC has requirements to allow buildings with certain occupancies to be constructed with mixed construction types by using what is commonly referred to as pedestal construction where a building of a lesser type of construction is permitted to be built on top of a building of Type IA construction and the different types of construction are allowed to be considered separate buildings. This method of construction is allowed provided specific criteria are met including the installation of a 3 hour horizontal assembly that acts as a de facto “fire wall” separating the two buildings from vertical fire exposure (Item 1) and by limiting the total building height to the maximum height permitted in Table 503 for the lesser construction type (Item 7). However, the present code limits the height of the Type IA portion of the building below the 3 hour horizontal assembly to a single story above grade plane (Item 2).

Type IA is the most stringent construction type in the IBC from a fire resistance and noncombustibility point of view. According to Table 503, except for Group H-1 and H-2 occupancies, all other occupancies in buildings of Type IA construction are permitted to be of unlimited height and area due to the inherent fire safety provided by the most fire resistive construction type. However, Item 2 in Section 510.2 limits the Type IA building serving as the base of the pedestal construction to one story in height. *This code change proposes to delete the one story limitation for the Type IA building portion of the pedestal construction. This will allow the Type IA building serving as the base of the pedestal construction to be multiple stories while still maintaining the total building height limit in Item 7 of Section 510.2 [of the 2012 IBC] which is based on the construction type of the lesser type of construction built on top of the Type IA pedestal.* This makes good sense since the more stories of Type IA construction allowed above the grade plane, the less potential stories of combustible construction with less fire resistance there will be in the building above.

Hopefully the italicized/underlined text above sheds some light on why this provision was deleted.

Source: Rob Austin  
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## Reliable Power Source for Fire Pumps

Is the electrical service from a utility company a reliable power source for fire pumps?

To analyze whether the electrical service is reliable as per the codes, it is important to look at New Jersey's grid system, not the rest of the United States. Some parts of the power grid in North America have one power plant and one transmission network for half of the state or province that it services. Also, some areas have limited fire department response times and utility intervention. In New Jersey, there are multiple grid loops for power plants and transmission networks, and the response time for the fire and utility intervention is less than half an hour.

In order to determine whether there is a reliable power source, some terms referring to the grid will need to be defined.

**Electric power transmission** is the bulk movement of electrical energy from a generating site, such as a **power plant**, to an **electrical substation**. The interconnected lines which facilitate this movement are known as a transmission network. This is distinct from the local wiring between high-voltage substations and customers, which is typically referred to as **electric power distribution**.

A **power station** also referred to as a **power plant** or **powerhouse** and sometimes **generating station** or **generating plant**, is an industrial facility for the generation of electric power.

A **substation** is a part of an electrical generation, transmission, and distribution system. Substations transform voltage from high to low, or the reverse, or perform any of several other important functions. Between the generating station and electric power distribution, electric power may flow through several substations at different voltage levels.

**Electric power distribution** is the final stage in the delivery of electric power; it carries electricity from the transmission system to individual consumers. Distribution substations connect to the transmission system and lower the transmission voltage to medium voltage to the primary distribution lines that carry this medium voltage power to distribution transformers located near the customer's premises. This is distinct from the high-voltage transmission substations and distribution to the customers' local service wiring.

(Source: Wikipedia: the free encyclopedia.)

The 2014 National Electrical Code Article 695 and 2013 edition of NFPA 20 are the codes and standards which reference reliable power sources for fire pumps.

The related sections in the 2014 National Electrical Code are:

- 695.3(A) **Individual Sources** states "Where reliable, and where capable of carrying indefinitely the sum of the locked-rotor current of the fire pump motor(s) and the pressure maintenance pump motor(s) and the full-load current of the associated fire pump accessory equipment when connected to this power supply, the power source for an electric motor driven fire pump shall be one or more of the following."
  - 695.3(A)(1) **Electrical Utility Service Connection** states, "a fire pump shall be permitted to be supplied by a separate service, or from a connection located ahead of and not within the same cabinet, enclosure, vertical switchgear section, or vertical switchboard section as the service disconnecting means. The connection shall be located and arranged so as to minimize the possibility of damage by fire from within the premises and from exposing hazards. A tap ahead of the service disconnecting means shall comply with 230.82(5). The service equipment shall comply with the labeling requirements in 230.2 and the location requirements in 230.72(B).

The National Electrical Code does not define reliable power source, so we have to look at the 2013 edition of NFPA 20 and its Annex A for an explanation of reliable power source. Annex A is explanatory material, not code, and does not address the electrical utility or fire response.

- 9.2 **Normal Power**
- 9.2.1 Provided with a normal source of power. (per the National Electrical Code)
- 9.2.2(1) Service dedicated for the fire pump. (per the National Electrical Code)

NFPA 20/2013 Section 9.3 **Alternate Power** specifically Section **9.3.2 Other Sources**, refers you to Annex A, A.9.3.2 "A reliable power source should possess the following characteristics."

*(continued on next page)*

(Reliable Power Source for Fire Pumps)

- **9.3.2\* Other Sources.** *Except for an arrangement described in 9.3.3, at least one alternate source of power shall be provided where the **normal source is not reliable.***
  - A.9.3.2, (1) *The source **power plant** has not experienced any shutdowns longer than 4 continuous hours in the year prior to plan submittal. NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, requires special undertakings (i.e., fire watches) when a water-based fire protection system is taken out of service for longer than 4 hours. If the normal source power plant has been intentionally shut down for longer than 4 hours in the past, it is reasonable to require a backup source of power.*
    - There may be power plants down for refueling or refitting for a year or more with no interruption of power. There are enough power plants and standby power plants available to go online in less than an hour of a shutdown of another power plant. This is not a concern for reliability for the power source in New Jersey.
  - A.9.3.2, (2) *The standard is not intended to require that the normal source of power be infallible to deem the power reliable NFPA 20 does not intend to require a back-up source of power for every installation using an electric motor-driven fire pump.*
  - A.9.3.2, (3) *The first thing a fire chief does when arriving at a sprinklered building that is on fire is to connect the pumper to the fire department connection, then, if warranted, he/she calls the electric utility to cut power to prevent electrocution of the fire personal. Regardless of whether there are overhead or underground supplies this is done. If needed for safety, the chief may request the electric utility distribution along the street to be turned off. Fire equipment is not an issue and response time for utility intervention is reasonable. If the one or two pieces of fire equipment for that area are on the scene of a fire or mutual aid is over an hour away the chief may need to keep the fire pump working. How a fire chief needs or chooses to address a fire does not make the power source unreliable. The electric utility distribution along the street is more of a concern to the fire personnel than the 50 feet or less of service drop.*
  - A.9.3.2(4) *If the installation for the fire pump meets the Article 695 of the National Electrical Code it will meet this requirement.*

It is the Department's opinion that utility services in New Jersey are a reliable power source.

Sources: Michael E. Whalen      Kenneth W. Verbos  
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## Lighting System Replacements

The Alteration and Reconstruction sections of the Rehabilitation Subcode contain requirements when the scope of the project is the total replacement of a building lighting system. As per N.J.A.C. 5:23-6.6(e) and 6.7(e), commercial buildings would be required to comply with Section 9.1.2, lighting alterations, of the ASHRAE Standard 90.1-2013.

There have been questions regarding what this section of the ASHRAE Standard means when it states "the automatic shutoff requirements of Section 9.4.1.1." For those of you who are familiar with Section 9.4.1.1, it contains a smattering of interior lighting control requirements and options (e.g. letters a through i). Note that Section 9.1.2 scopes only the automatic shutOFF requirements. This means that only the "OFF" provisions of Section 9.4.1.1 apply when meeting Section 9.1.2. To be specific, letters g, h and I would be required (automatic partial OFF, automatic full OFF and scheduled shutoff, respectively).

Hopefully this is helpful to those who are dealing with total replacement lighting systems in a commercial building. As a reference, a "lighting system" is defined by the commercial energy code as "a group of luminaires circuited or controlled to perform a specific function."

Source: Rob Austin  
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## Building Cavity Usage – Energy

For those of you who are designing, installing, reviewing, or inspecting HVAC systems in one- and two-family dwellings, or multi-family dwellings three stories or less in height, please be aware of a difference between sections in the code. Spoiler alert – the more restrictive section applies.

Consider the International Residential Code/2015 (IRC/2015) having a split personality. In this case, Chapter 16 and Chapter 11 are having an argument over how to use cavities created in the building.

Chapter 16 of the IRC/2015, by means of Section M1601.1.1, Above-ground duct systems, Item 7.1, says, “I do not allow for stud wall cavities and the spaces between solid floor joists to be used as plenums for supply air.”

“Not so fast,” says Chapter 11 of the IRC/2015. “My Section N1103.3.5, Building cavities, states that building framing cavities shall not be used as ducts or plenums for supply or return. And, our friend, the International Energy Conservation Code/2015, agrees with me at Section R403.3.5, Building cavities (mandatory).”

To put this argument to rest, the more restrictive requirement at Section N1103.3.5 is to be applied. This means building framing cavities cannot be used as a supply duct/plenum nor can they be used as a return duct/plenum.

On a more serious note, this change first appeared in the 2012 edition of the codes. It's based on EC109-09/10, <https://cdn-web.iccsafe.org/wp-content/uploads/IECC1.pdf>, which became code text for the 2012 edition. The text remained for 2015 and remains for 2018. The code change is included below to better show the rationale for the change in the energy conservation provisions.

### **EC109–09/10**

#### **403.2.3; IRC N1103.2.3**

**Proponent:** Ronald Majette, representing US Department of Energy

**THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.**

#### **PART I – IECC**

**Revise as follows:**

**403.2.3 Building cavities.** Building framing cavities shall not be used as ~~supply ducts~~ or plenums.

#### **PART II – IRC BUILDING/ENERGY**

**Revise as follows:**

**N1103.2.3 Building cavities.** Building framing cavities shall not be used as ~~supply-ducts~~ or plenums.

**Reason:** It is difficult to effectively use building framing cavities within the building envelope due to insulation requirements for the ducts and the thermal envelope and the difficulty in sealing them against air leakage. This is the basis for the current requirement in the code for supply ducts. Other than a lower temperature in return ducts their negative pressure in relation to the outside environment can and will draw unconditioned air into the HVAC system, increasing loads on the HVAC equipment and inducing building infiltration/exfiltration unless the cavities can be effectively sealed. Just as cavities are not allowed for supply due in part to the difficulty in sealing they should also be precluded from being used as part of the return air duct system.

**Cost Impact:** The code change proposal may increase or decrease the cost of construction depending on the builder's choices with regard to duct system design, construction and location compared to previous expenses involved with framing, enclosing, and sealing building cavities as part of the duct system.

Source: Rob Austin  
Code Assistance Unit  
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## **Board of Examiners of Electrical Contractors FAQs**

As a reminder, the Division of Consumer Affairs (“other DCA”) within the Department of Law and Public Safety licenses electrical contractors. Their website offers “frequently asked questions” at <http://www.njconsumeraffairs.gov/elec/Pages/FAQ.aspx>. The following are two questions that the Code Assistance Unit gets often that this website answers:

#9 - Does New Jersey offer a "low voltage" electrical license, or any other category of "limited" electrical license, as an alternative to meeting the qualifications needed to obtain an electrical contractor's license?

*(continued on next page)*

*(Board of Examiners of Electrical Contractors FAQs)*

No. The electrical contractor license is the only category of electrical license available in New Jersey.

Anyone interested in performing any type of electrical work in New Jersey should fully familiarize themselves with N.J.S.A. 45:5A-18 "Exempt work or construction". There you will find details regarding "Electrical work or construction which...shall not be included within the business of electrical contracting so as to require the securing of a business permit...". Generally speaking, unless the electrical work you are interested in performing is covered within this section, an electrical contractor's license is required. Of particular note is N.J.S.A. 45:5A-18(j) "Any work with a potential of less than 10 volts". Again, generally speaking, electrical work with a potential of 10 or more volts is not exempt from licensing requirements.

#10 - What is a limited telecommunications wiring exemption and how do I obtain an application?

In essence, any work other than wiring for voice and/or data transmission is not within the permissible scope of work for the holder of a limited telecommunications wiring exemption. A limited telecommunications wiring exemption should never be construed as authorization to perform what is often erroneously referred to as "low voltage" electrical work.

Pursuant to N.J.A.C. 13:31-4.1(b), "telecommunications wiring" means wiring within a premises, either inside or outside a building for voice and/or data transmission at voltage(s) compatible with the system being installed and connected to an F.C.C.-recognized communication network at the point of connection provided by the public utility providing communication services to the customer. It shall also include the interconnection of data wiring between computers and/or terminals.

The applicable Statutes may also be found on this website. For example, by clicking on Laws and Regulations and then selecting Electrical Contractor Statutes (<http://www.njconsumeraffairs.gov/Statutes/electricalcontractorlaw.pdf>), one can find NJSA 45:5A-18. This is where it provides exemptions to the licensing law, such as a homeowner doing work in their home. To get an official interpretation of these rules and regulations, you may contact the Board's office at (973) 504-6410 or send an email at [askconsumeraffairs@dca.lps.state.nj.us](mailto:askconsumeraffairs@dca.lps.state.nj.us).

Source: Code Assistance Unit  
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### **Bulletin 95-1A through D Updates**

Bulletin 95-1, which is divided into four separate bulletins (95-1A, 1B, 1C, and 1D), has been updated. Each bulletin deals with either the installation or the removal/abandonment of certain types of tanks. The bulletins can be found online at: <http://www.nj.gov/dca/divisions/codes/resources/bulletins.html>. This article provides a brief overview of the changes made to each bulletin.

Bulletin 95-1A, which addresses the installation of residential heating oil tanks and other heating oil tanks under 2,001 gallons, corrects the outdated references to the Mechanical Subcode and the International Residential Code (IRC). It also provides updated information on cathodic protection systems and provides additional resources for corrosion protection.

Bulletin 95-1B addresses when residential heating oil tanks and other heating oil tanks under 2,001 gallons need to be abandoned or removed, who is responsible for inspection, and how tanks are to be abandoned or removed. This bulletin has been revised to reflect current regulations and to address comments from the Department of Environmental Protection (DEP). Most notably, the Bulletin contains the provisions for how to abandon heating oil tanks from the International Fire Code (IFC), the American Petroleum Institute (API), and the National Fire Protection Association (NFPA) 30, in accordance with N.J.A.C. 5:23-3.6. The revisions also cite N.J.A.C. 5:23-3.4, which gives the fire subcode official responsibility for both plan review and inspections.

Revisions to Bulletin 95-1C, regarding the installation of underground storage tanks regulated by DEP, update references to DEP's rules. The revisions also update the required checklist for the installation of underground storage tanks regulated by DEP to clarify and to align the checklist with current regulations.

Bulletin 95-1D, which addresses the abandonment or removal of underground storage tanks regulated by DEP, has been revised to reflect DEP's current rules and practices. The checklist for the closure of underground storage tanks regulated by DEP was also revised to update references to NFPA 30 and the American Petroleum Institute's Bulletin 1604.

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### NJ Licensed HVACR Contractor and Electrical Work

There seems to be some confusion as to what electrical work a New Jersey Licensed HVACR contractor can perform when replacing mechanical refrigeration equipment (condensing unit), whether residential or commercial. This would also apply to heating equipment.

Based on N.J.A.C. 13:32A, State Board of Examiners of Heating, Ventilating, Air Conditioning, and Refrigeration Contractors, N.J.A.C. 13:32A-1.2, Definitions, item 10 states: "In replacement cases only, the connection of the wiring from an equipment service disconnect box of adequate size to accommodate pneumatic and/or direct digital controls and control piping of automatic oil, gas, coal burning, or any other product of combustion equipment, mechanical refrigeration equipment, gasoline, or diesel oil dispensing equipment previously dedicated to that equipment, as long as:

- i. The heating or cooling capacity of each piece of equipment is 25 tons or less;
- ii. The voltage of the system is 240 volts or less; and
- iii. The connection of the wiring is performed according to all relevant provisions in the Uniform Construction Code."

Please note that the definition of "Replacement" means a change of equipment with the same type or similar equipment.

A New Jersey Licensed HVACR contractor can connect the wiring from the replacement equipment to the equipment service disconnect box for replacements **only**. There is nothing in the regulations that states whether the equipment is single phase or three phase, so either would be permitted to be connected to the disconnect box for replacements. The disconnect box cannot be changed or replaced by the HVACR contractor. The disconnect box must be replaced by a New Jersey Licensed Electrical contractor.

An electrical technical section and inspection would be required for the replacement. The HVACR contractor is permitted to sign the electrical technical section as an exempt applicant. The HVACR contractor should also seal the technical section with their HVACR seal.

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