Construction Code Communicator

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Philip D. Murphy, Governor

Department of Community Affairs
Jacquelyn A. Suárez, Acting Commissioner

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Printing Updates to the Uniform Construction Code

As you know by now, the Uniform Construction Code, N.J.A.C. 5:23, is now an online-only publication. Hard copy UCC books are no longer available.

That said, we understand a lot of people are dedicated to their blue books and want to maintain a paper copy on their own terms and have asked about the most efficient way to keep their books up to date. Long story short: you will have to print the updated pages. Now, this may seem complicated, but we have a few helpful tricks up our sleeves.

The online copy of the UCC and UCC Act are available online at the following link: https://www.nj.gov/dca/divisions/codes/codreg/ucc.html. In addition, the Code Assistance/Development Unit creates Transmittals of the Rule Changes on a quarterly basis; these are the same as the cover sheets that used to come with your blue book supplements. This lists the exact sections that have been updated and is a valuable tool in determining which sections of your book need to be reprinted and replaced. These transmittals are available at this link: https://www.nj.gov/dca/divisions/codes/publications/updates.html.

Of course, the fastest way to do this is to simply use the link to the UCC above, click into the subchapter you need, and reprint the necessary pages, typically based on subsection as noted in the Transmittal/Update. Please keep in mind – you may need to do some scrolling to figure out which pages you need. This can also be done by accessing the online versions of the UCC through LexisNexis (https://www.state.nj.us/oal/rules/accessp/). On this website, you can open an individual section and print just that section. Though this section-by-section approach may not be as accessible to read, some (myself included) find it convenient to print from.

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For example, if there were hypothetically a change in N.J.A.C. 5:23-6.2 on July 17, 2023, you could go to the LexisNexis page, select N.J.A.C. 5:23-6.2 from the drop-down menu, and print just that section. Then, you take the old 6.2 out of your blue book and place the updated version therein.

Please remember, if you choose to do this, your physical copy will only ever be as accurate as you are in your printings, so it is imperative that you ensure you are remaining fully up to date. Because of this, the online version of the UCC will always be the most accurate, and thus the primary version of the Code. That has always been the case, even with paper supplements, but it bears repeating!

Source: Marie Daniels
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UCC Summary of Rule Changes - Summer 2023 Update

July 17, 2023, *New Jersey Register*
N.J.A.C. 5:23-3.20 – Mechanical Subcode – This Notice of Administrative Correction amends the mechanical subcode by removing an incorrect section number and inserting the current and appropriate reference.
→ *for more information, please see "Jul 17, 2023" row at*
https://www.nj.gov/dca/divisions/codes/codreg/rule_proposals_adoptions.html

August 21, 2023, *New Jersey Register*
N.J.A.C. 5:23-6.2 – Rehabilitation Subcode – This Notice of Administrative Correction amends an error in the text of N.J.A.C. 5:23-6.2(c). This error is in reference to the date of adoption of the national model codes that was not inserted into the appropriate location within the text of the adoption.
→ *for more information, please see "Aug 21, 2023" row at*
https://www.nj.gov/dca/divisions/codes/codreg/rule_proposals_adoptions.html

September 5, 2023, *New Jersey Register*
N.J.A.C. 5:23-6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 11.4, and 12.12 – This Notice of Administrative Corrections updates Standard A117.1 throughout the Rehabilitation Subcode to the appropriate heading.
→ *for more information, please see "Sep 05, 2023" row at*
https://www.nj.gov/dca/divisions/codes/codreg/rule_proposals_adoptions.html

September 18, 2023, *New Jersey Register*
N.J.A.C. 5:23-2.38 – This Notice of Administrative Correction amends N.J.A.C. 5:23-2.38(b) by removing an incorrect reference to the Barrier Free Recreation Standards and inserting the appropriate reference.
→ *for more information, please see "Sep 18, 2023" row at*
https://www.nj.gov/dca/divisions/codes/codreg/rule_proposals_adoptions.html

September 18, 2023, *New Jersey Register*
N.J.A.C. 5:23-1.4, 2.36, and 3.14 – This adoption incorporates the requirements at P.L.2021, c.171, the law that requires electric vehicle supply/service equipment (EVSE) and make-ready parking spaces be designated as a permitted accessory use in all zoning or use districts and establishes associated installation and parking requirements related to EVSE throughout the State.
→ *for more information, please see "Sep 19, 2022" row at*
https://www.nj.gov/dca/divisions/codes/codreg/rule_proposals_adoptions.html

Bulletins - https://nj.gov/dca/divisions/codes/resources/bulletins.html
• **22-1, Energy Subcode Compliance** – Revised

Source: Code Development Unit
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Periodic Inspections Under the Uniform Construction Code – 2023 Update

The purpose of this article is to clear up confusion surrounding the periodic testing, or inspection, or testing *and* inspection, of cross-connections/backflow preventers and swimming pools/spas/hot tubs. This article's target audience is Plumbing and Electrical Subcode Officials, Construction Officials and Technical Assistants.

When we speak of an inspection prefaced by the word, "periodic", or "on-going" or "maintenance" under the UCC, we are speaking about the routine and regularly occurring inspection of equipment that creates a significant potential hazard to public health and safety.

These inspections are not to be confused with inspections carried out during the progress of work on a construction project for which a Construction Permit has or should have been issued.

Equipment such as elevator devices, high pressure boilers, pressure vessels, refrigeration systems, cross connections/backflow preventers, sprinklers/standpipes, smoke control systems in open wells, underground storage tanks, swimming pools/spas/hot tubs, fire alarms, LP Gas Tanks, and other hazardous uses/places of assembly may be considered equipment creating (or signaling) a significant potential hazard to public health and safety. This list should be familiar to you; it is the listing of items whose inclusion in a construction project must be declared during the permitting process on the Construction Permit Application under section IV –

Does or will your building contain any of the following?

In the instance of elevators devices, cross connections/backflow preventers and swimming pools, spas and/or hot tubs, that periodic …or maintenance…or on-going inspection is **your** responsibility under the UCC.

Do not, however, be confused by that declaration during the permitting process. While it will enable your office to identify and track *additional* items requiring on-going inspections, do not infer from their reference in that portion of the Construction Permit Application (CPA) that a Construction Permit should be issued to conduct these on-going inspections; it should not.

When these items are installed as a part of a construction project, at the conclusion of that project, in addition to a Certificate of Occupancy or Approval issued, a Certificate of Compliance is also issued for the elevator, cross-connection/backflow preventer or swimming pool/spa/hot tub device. That Certificate of Compliance will reflect an expiration date. The approach of that expiration date should signal the need to conduct a periodic inspection.

To ensure successful Periodic Inspection management, this is what your office should be doing:

• Build and/or maintain your registry, i.e., inventory of devices requiring periodic inspection by using the On-going Inspections log (UCC-L730) and completing one On-going Inspection Control Card (UCC-F290) for each device following Municipal Procedure 7.1.1.

Maintain the On-going Inspections log and tickler file. Devices constructed/installed on Permits issued *before* the municipality's creation of the registry must also be identified and added to the registry. *Additional* devices are identified and added to the registry through the declaration of those devices on the Construction Permit Application's section IV.

• Monitor on-going inspections by:
Reviewing the tickler file, identifying inspections required, and ensuring the appropriate subcode official is aware of those required inspections.

• Schedule and perform inspections and/or ensure required testing has been done by obtaining a copy of the testing certification.

• Collect the fee, complete the paperwork, prepare and distribute a Certificate of Compliance, and file the required and resulting documents in the central filing system.

This is what your office should not be doing:

• Do not issue Construction Permits for the purpose of conducting on-going inspections.

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(Periodic Inspections Under the Uniform Construction Code – 2023 Update)

Since this article was originally published in 2010, there are a few updates to note. Bulletins 99-1 and 99-2 have since been reviewed and clarification has been added where appropriate. Further, procedures 5.1.1, 7.1.1, 7.2.2, and 7.2.3 of the Municipal Procedures Manual have been revised to incorporate that clarity. And finally, a model Annual Pool/Spa/Hot Tub Inspection Notice, and a model Testing of Backflow Preventer Annual Reminder was added to the Codes and Standards Information and Permits NJ Document Library folders for ready access by those licensed Construction and Subcode Officials and Technical Assistants wishing to make use of those models.

Source: Code Assistance Unit
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Minor Work… or Not?!

We are all familiar with N.J.A.C. 5:23-2.17A, Minor Work, and the application process:

- Work may start prior to submitting and receiving permits as long as you have notified the local before such work begins.
- There is only a final inspection per discipline required and only on what is visible at the time of such inspection, and the certificate of approval shall so indicate.
- Inspections shall be performed within three business days of the request for inspection.

How do we know if the work being performed truly qualifies as Minor Work? If all aspects of each discipline fall under Minor Work as described in N.J.A.C. 5:23-2.17A(c), then the whole submission is Minor Work in nature. However, if **ANY** aspect of the project falls outside the Minor Work description, then the entire submission is no longer Minor Work, and a full permit application is required. It would then require compliance with all requirements laid out in N.J.A.C. 5:23-2.15 and N.J.A.C. 5:23-2.15A, as applicable, as well as all necessary inspections per N.J.A.C. 5:23-2.18.

For example, from a plumbing subcode perspective, how does finishing a basement and adding a bathroom in (1) an existing home and (2) an existing business fit into Minor Work? N.J.A.C. 5:23-2.17A(c)2 would allow for the installation of the new fixtures in a one- and two-family dwelling only and not with the business use. Furthermore, N.J.A.C. 5:23-2.17A(c)1ii would allow for non-structural building alteration work in a home, and not a business. The trivial would be electrical at N.J.A.C. 5:23-2.17A(c)4, where, to remain under Minor Work, one would be limited to the installation of five or fewer outlets in a home, and not a business. If all aspects remain under Minor Work, only final inspections are required per each discipline. However, if one aspect is triggered above Minor Work, all necessary inspections are required per N.J.A.C. 5:23-2.18, including rough inspections along with the final inspections for each discipline.

Source: Anthony Menafro
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Updated NJDEP Flood Elevations

As we await further guidance from NJDEP, here's the quick and dirty on the updated Flood Hazard Area Control Act Rules (FHACA). As you all know, floodplain management is a prior approval for a UCC permit application, and one should see their local floodplain administrator for the applicable flood zone and elevation to the home or building in question. The added elevations overlap the baseline elevations on that national level via ASCE 24-2014 (via the 2021 I-codes) and NJDEP elevations prevail as the ultimate minimum. Note that, per the local model ordinance, https://dep.nj.gov/wlm/drec/flood-engineering/ordinances/, there may even be a higher minimum elevation than NJDEP, hence why it is so important to start with the local floodplain administrator.

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(Updated NJDEP Flood Elevations)

That being said, the July 17, 2023 changes within N.J.A.C. 7:13 relate to fluvial flood hazard areas (i.e. A zone) only; tidal flood hazard areas (Coastal A and V zones) are business as usual and the Fall 2022 article https://www.nj.gov/dca/divisions/codes/publications/pdf_ccc/CCC_Fall_2022.pdf (pages 19 and 20) remains relevant for buildings in these areas. If you need help differentiating between the two flood hazard areas, again, seek the local floodplain administrator and see N.J.A.C. 7:13-1.2 for the definition of "flood hazard area."

Okay, now I'm going to whisk you back to elementary school, where we leaned basic arithmetic and fun saying such as "Please Excuse My Dear Aunt Sally" to understand the order of a math equation. Thankfully, for NJDEP's new rules, one only needs to know the "Aunt" part, as in addition.

So, let's start with the original base flood elevations (BFE), ASCE 24, Table 2-1 for "regular" A zone (and Table 4-1 for Coastal A and V zones, which are outside the scope of this article). The table below does ***not*** incorporate the elevations of NJDEP or a local ordinance. The Categories (Cat) are based on Table 1-1 of ASCE-24 and example are provided just below the table.

		IRC (Cat 2)	IBC			
			Cat 1	Cat 2	Cat 3	Cat 4
A zone (Table 2-1)	Elevation of the lowest floor	BFE + 1 ft	BFE	BFE +1 ft	BFE +1 ft	BFE +2 ft
Coastal A zone and V zone (Table 4-1)	Elevation of the bottom of lowest supporting horizontal structural member of lowest floor	BFE + 1 ft	BFE	BFE +1 ft	BFE +2 ft	BFE +2 ft

(All elevations above will be modified by N.J.A.C. 7:13 or the local floodplain ordinance. Grayed area applies to Tidal Flood Hazard Areas, which is being provided for a reference starting point but is not applied to Fluvial Flood Hazard Areas.)

1 – Accessory storage buildings and minor storage facilities (non-commercial);
2 – Most residential, commercial, and industrial buildings;
3 – Assembly, schools, non-surgical healthcare facilities; and
4 – Hospitals and emergency services buildings.

The above is now the start of your Addition equation for fluvial flood hazard areas, and it serves as the baseline upon which we build. The best way to demonstrate this is with an example.

- N.J.A.C. 7:13-12.5(i)1 states that one may construct a new one- or two-family home where the lowest floor is set at least one foot above the "flood hazard area design flood elevation" and no lower than the elevation required under the Uniform Construction Code (UCC), N.J.A.C. 5:23.

  Note: the UCC elevation should always be met as N.J.A.C. 7:13 will be equal to or above.

- N.J.A.C. 7:13-3.4(e) essentially defines a "flood hazard area design flood elevation" (DFE) to be equal to three feet above the FEMA 100-year flood elevation.

  Note: the new FHACA rules at N.J.A.C. 7:13-3.2 define the DFE as the higher of the above or DEP's DFE+2 (in cases where DEP flood mapping is available).

  Also, if no FEMA or DEP flood mapping is available, applicants for DEP permits must calculate the flood elevation based on future precipitation amounts anticipated for the year 2100 (as shown in tables in N.J.A.C. 7:13-3.6).

→ Insert the 2nd bullet into the 1st and it now says the home is required to have the lowest floor set at four (4) feet (or possibly higher if a DEP flood map is available). Yes, the 3 feet from Section 3.4(e) is "aunted," I mean, added to the 1 foot from Section 12.5(i) equaling 4 feet (or more).

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(Updated NJDEP Flood Elevations)

- This would overwrite IRC "BFE +1 ft" from the ASCE table to make the DFE elevation at least BFE + 4 ft.

More information will be coming, either via this Communicator or DEP's own Communicator, https://dep.nj.gov/wlm/drec/flood-engineering/, so please stay tuned.

Source: Rob Austin
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New Jersey's Model Statewide Municipal EV Ordinance & Incentives – Update

Let's start off by humming a little tune by little Huey Lewis and the News called, "Back in Time," which just so happens to be the theme of this article. So, let's go back in time and review pages 11 and 12 of the Fall 2021 CCC article provided by Maria Connolly (Office of Local Planning Services, NJDCA) and Peg Hanna (Monitoring & Mobile Services, NJDEP) alerting you to the Model Municipal Electrical Vehicle (EV) Ordinance and how it applies throughout the state. The original article can be found through the following link, https://www.nj.gov/dca/divisions/codes/publications/pdf_ccc/CCC_Fall_2021.pdf.

As the law required, P.L.2021, c.171, the ordinance has added to the Uniform Construction Code and the Residential Site Improvement Standards at N.J.A.C. 5:23-2.36 and N.J.A.C. 5:21-4.14, respectively, on September 18, 2023. Yes, this rule languished for almost a year and was finally adopted in these two codes, but even so, the application at the municipal level remains the same, via the zoning and planning boards.

For a refresher, the law requires that Electric Vehicle Supply/Service Equipment ("EVSE" or "charging stations") and Make-Ready parking spaces be designated as a permitted accessory use in all zoning or use districts and establishes associated installation and parking requirements related to EVSE in New Jersey's 564 municipalities. To implement this, the law requires that DCA publish a Model Statewide Municipal EV Ordinance on its website. The model ordinance is required to include the installation and parking requirements detailed in the law, as well as address installation, sightline, and setback requirements and other health- and safety-related specifications for EVSE and Make-Ready parking spaces.

For municipalities with existing EV ordinances, the statewide ordinance will supersede those requirements. Municipalities don't technically need to adopt the ordinance because the legislation says, "The model land use ordinance published by the Commissioner of Community Affairs shall be effective in each municipality." However, municipalities may want to add an ordinance number so they can fit the EV ordinance into their existing ordinances, or add cross-references, and EVSE and Make Ready parking spaces to the permitted accessory uses in each of the municipality's zones. They may also want to add their own penalties, the locations of the publicly accessible, municipally owned EVSE parking spaces, and usage fees for the municipally owned EVSE.

The most significant requirement of the ordinance's mandatory provisions is that EVSE and Make-Ready parking spaces be treated just like any other permitted accessory use, whether the EVSE or Make-Ready parking spaces are included with a site plan application for a new development or added to an already existing building or development. This addresses inconsistencies throughout the state on how municipalities and their building and zoning departments handle charging station installation. The EV ordinance also includes specific requirements for existing buildings and developments. For example, the application for a zoning permit for the charging station must conform with conditions of previous approvals.

To learn more about the Statewide EV Municipal Ordinance, visit the Division of Local Planning Services Website at https://www.nj.gov/dca/dlps/home/modelEVordinance.shtml.

Source: Rob Austin
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Daycare Facilities - Use & Occupancy Classification and Prior Use

All building designs start with a use group classification, but sometimes these classifications can be challenging, especially when it comes to daycare facilities. In general, there are two primary use group classifications, which are Educational Group E and Institutional Group I-4. However, according to Chapter 3, Occupancy Classification and Use, of the 2021 International Building Code (IBC), if certain defined terms and variables apply, the use group classification may change. For reference, the following terms are from Chapter 2, Definitions, of the 2021 IBC, NJ edition:

> **Custodial Care**. Assistance with day-to-day living tasks; such as assistance with cooking, taking medication, bathing, using toilet facilities and other tasks of daily living. Custodial care includes persons receiving care who have the ability to respond to emergency situations and evacuate at a slower rate and/or who have mental and psychiatric complications.
> **Dwelling Unit.** A single unit providing complete, independent living facilities for one or more persons living as a single housekeeping unit, including permanent provisions for living, sleeping, cooking and sanitation.
> **Medical Care**. Care involving medical or surgical procedures, nursing or for psychiatric purposes.
> **Personal Care Service**. The care of persons who do not require medical care. Personal care involves responsibility for the safety of the persons while inside the building.
> **Religious worship, place of**. A building or portion thereof intended for the performance of religious services.

The table below provides a side-by-side comparison for the use group classification of daycare facilities.

	A-3 (2021 IBC, Sections 305.2.1 and 308.5.2)	**E** (2021 IBC, Section 305.2)	**I-4** (2021 IBC, Section 308.5)	**R-3 or R-5** (2021 IBC, Section 305.2.3)	**R-3 or R-5** (2021 IBC, Section 308.5.4)
Location	***** Rooms or spaces within places of religious worship during a religious function. (e.g., cry rooms and similar areas.)	Educational facility	Adult daycare; or child daycare (In a place other than the home of the person cared for.)	Within a single-family dwelling; or within a dwelling unit of a two-family dwelling.	
Number of occupants cared for.	Occupant load is based on Section 1004.	More than 5 children	More than 5 persons	5 or fewer children	5 or fewer persons
Ages of occupants cared for.	Any age.	Older than 2-1/2 years of age.	Any age.	Older than 2-1/2 years of age.	Any age.
Type of Care	Educational, supervision, or personal care services	Educational, supervision, or personal care services	Custodial care	Educational, supervision, or personal care services	Custodial care
Length of Stay	Fewer than 24hrs. per day.				

***** If childcare areas are used at times that are other than during a religious function, such as during the week, then those room(s) or space(s) must be classified under a different use group, which would result in a mixed-use building.

For all other use groups: Where a day care facility has no more than five children receiving care at any one time (Section 305.2.2), or no more than five persons that receive custodial care in a facility other than a dwelling unit (Section 308.5.3), the classification of the main occupancy may extend to the day care use. In both cases, the limited number of occupants requiring care services doesn't warrant classification as a separate and distinct occupancy from that of the major use.

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(Daycare Facilities - Use & Occupancy Classification and Prior Use)

Prior Use Letter: It should be noted that an application for daycare licensure requires a letter from the local construction department that identifies the "prior use" of an existing structure. In this case, it is advised that the owner contact the Authority Having Jurisdiction (AHJ), also known as the local Construction Official, who can use one of the "sample letters" from the "Child Care Center Environmental Requirements" page located on the Department's website at https://www.nj.gov/dca/divisions/codes/alerts/childcare.html**.**

For additional guidance, please see the following two Construction Code Communicator (CCC) articles from Winter 2006: https://www.nj.gov/dca/divisions/codes/publications/pdf_ccc/2006_v18.pdf

- **Emergency Rule Regarding Day-Care Centers** (Note: see #3 Winter, Pg. 4)
- **Child-Care Centers** (Note: see #3 Winter, Pg. 5 - This article covers the Prior Use letter.)

Source: Keith Makai
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Automatic Sprinklers and Group S-2 Open Parking Garages

As the old saying goes, "if it ain't broke, don't fix it." With this in mind, let's look at Table 903.2.13, Additional Required Protection Systems, which originated in the adoption of the 2000 International Building Code (IBC) and founded by provisions in the 1996 BOCA National Building Code. The table reference number has changed over the years, but the intent has remained the same. The current amendment remains at N.J.A.C. 5:23-3.14 and amends Chapter 9, Fire Protection and Life Safety Systems, of the 2021 IBC.

Lately, we have gotten questions about this table and possible conflict(s). It should be noted that Section/Table 903.2.13 does not conflict but rather compliments the twelve subsections before it. Sections 903.2.1 through 12 are sprinkler installations specific to function and fire area, while Section 903.2.13 applies to three occupancy classifications for general area. However, there appears to be concern regarding footnote a., located at the bottom of the table that states, "*a. Exception-Open parking structures in accordance with Section 406.5.*"

Here's the issue: When New Jersey adopted the 2021 IBC, Section 903.2.10, Group S-2 parking garages, it was updated to add a new condition for an open parking garage, which reads as follows:

> 903.2.10 Group S-2 parking garages. An automatic sprinkler system shall be provided throughout buildings classified as parking garages where any of the following conditions exists:
> …
> 3. Where the fire area of the open parking garage in accordance with Section 406.5 exceeds 48,000 square feet (4460 m2).

Prior to adding condition number 3 (noted above), footnote a. of Table 903.2.13 stood alone and served as an exception to Section 903.2.13 for the additional requirements for the need to install an automatic sprinkler system in an S-2, Open parking structures and pointed to the general construction standards at Section 406.5. This remains true, as footnote a. merely exempts the code user from following Section/Table 903.2.13 but does not eliminate the need to follow Section 903.2.10.

In other words, when it comes to the installation of an automatic sprinkler system for an open parking garage, Section 903.2.10, Condition # 3, is applicable, and per footnote a. of Table 903.2.13, Section 903.2.13 is not applicable.

Source: Keith Makai
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Frost Depth

There seems to be some confusion when interpreting Section R403.1.4, Minimum depth, and Section R403.1.4.1, Frost protection, of the 2021 International Residential Code.

In general, buildings must not be founded on or within frozen ground. This requirement prevents damage to the exterior walls and other walls bearing on the frozen soil due to the volume changes (frost heave) that occur during freezing and thawing.

Section R403.1.4 states that exterior footings are to be placed not less than 12 inches below undisturbed ground surface. Section R403.1.4.1 contains four acceptable methods of protecting the footings and foundations from frost. One method is to extend the footing below the frost line depth established by Table R301.2, Climatic and Geographic Design Criteria, where NJ is divided into two zones for frost line depth:

- "SNJ" which consists of Monmouth and Burlington Counties and all counties to the south and the minimum depth is 30 inches.
- "NNJ" which consists of Mercer and Middlesex Counties and all counties to the north and the minimum depth 36 inches.

The exception to Section R403.1.4.1 for frost protection would be freestanding buildings meeting ALL the following conditions below:

1. Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to, agricultural buildings, temporary buildings and minor storage facilities.
2. Area of 600 square feet or less for light-frame construction, or 400 square feet or less for other than light-frame construction.
3. Eave height of 10 feet or less.

So, if you meet all three of the conditions above, the footings will only have to meet the provisions in Section R403.1.4 for minimum depth of 12 inches below undisturbed ground surface. However, if the structure meets one of the two exceptions in Section R403.1.4, then footings would not be required at all.

The reason for this article boils down to this question: Where a footing must be protected from frost in accordance with Section R403.1.4.1, how far must the footing extend below the frost line? The answer is that the code does ***not*** specify any additional depth required beyond the frost line measurement. Many are misinterpreting these sections and stating the footing must extend 12 inches below the frost line depth. For example, if the frost line established is 3 ft, then the minimum depth of 12 inches has already been met and the bottom of the footing must simply extend below the frost line.

Source: Adam Matthews
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No Dim Bulbs Here: Rehab Lighting Systems

The title of this article makes me think of one of my favorite jokes… light travels faster than sound; this is why some people appear bright until you hear them speak!

And I'm sure some of you reading may have thought this about me, it's fine, I'm a middle child with very thick skin. But it should be known, my siblings are my best friends as they helped sculpt me into the person writing this article. So professionally, say what you will about what we do here, but there is always thought behind any code provision we put forth and update.

(Continued on next page)

(No Dim Bulbs Here: Rehab Lighting Systems)

For example, when it comes to the renovation, alteration or reconstruction project where lighting is involved, one should review N.J.A.C. 5:23-6.5(e)14, 6.6(e)21 and 6.7(e)18 for energy conservation. Each section states the following:

> The total replacement of a building lighting system or a newly installed building lighting system shall meet Section R404 (N1104) of the residential energy code or Section 9.1.2 of the commercial energy code, as applicable. (A "lighting system" is defined by the commercial energy code as a "group of luminaires circuited or controlled to perform a specific function.")
>
> Exception: The total replacement of a lighting system within a room, space or tenancy shall be required to meet Section 9.1.2 for the room, space or tenancy only.

Looks simple enough, right? Well, some have questioned the ASHRAE 90.1-2019 link to Section 9.1.2, Lighting Alterations. Wait… what dim bulb aligned a Rehab Renovation criterion with something titled Alterations? Well, that was me. But one should know, Alteration in ASHRAE (per Section 3.2) includes replacements, ala a Rehab Renovation criterion.

So yes, it is important to note that definitions may have multiple meanings, and in this case, scoping a Rehab Renovation to an ASHRAE Alteration does actually work. Hopefully, with this explanation, my bulb appears to burn a little brighter.

Source: Rob Austin
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ASHRAE 90.1-2019: Only for "Commercial" Buildings 

As noted at N.J.A.C. 5:23-2.15(f)1vi, calculations showing compliance with the energy subcode are to be submitted for all new buildings and for additions to existing buildings. These calculations are to be signed and sealed by the design professional, with the exception of calculations for class 3 structures, which may be submitted by the heating, ventilation, air conditioning, and refrigeration contractor.

When it comes to what we like to call "commercial buildings," those that are ***not*** a residential building three stories or fewer in height (i.e., low-rise residential), compliance must be in accordance with the Energy Subcode and the 2019 ASHRAE Standard 90.1.

> Note: Do not use the commercial portion of the International Energy Conservation Code (IECC-C) because it is deleted per N.J.A.C. 5:23-3.18.

Compliance for commercial buildings may be demonstrated in one of two ways:

> 1. COMPLIANCE WITH traditional CALCULATIONS (very much like the calculations for low-rise residential buildings mentioned above. However, the applicant must also provide information on the type of lighting installed and its usage.
>
> 2. COMPLIANCE WITH COMCHECK SOFTWARE: Software program calculations, http://www.energycodes.gov, that pass the 2016 ASHRAE 90.1.

The short of this article is to provide a tip for 1 and 2 above: For building thermal envelope, use Tables 5.5-4 and 5.5-5, as applicable, for a starting point in your calculations (see below).

(Continued on next page)

(ASHRAE 90.1-2019: Only for "Commercial" Buildings)

Table 5.5-4
Building Envelope* Requirements for Climate Zone 4 (A,B,C)

	Nonresidential		*Residential*		Semiheated	
***Opaque* Elements**	**Assembly Maximum**	**Insulation Min. *R-Value***	**Assembly Maximum**	**Insulation Min. *R-Value***	**Assembly Maximum**	**Insulation Min. *R-Value***
Roofs						
Insulation entirely above deck	U-0.032	R-30 c.i.	U-0.032	R-30 c.i.	U-0.093	R-10 c.i.
Metal building[a]	U-0.037	R-19 + R-11 *Ls* or R-25 + R-8 *Ls*	U-0.037	R-19 + R-11 *Ls* or R-25 + R-8 *Ls*	U-0.082	R-19
Attic and other	U-0.021	R-49	U-0.021	R-49	U-0.034	R-30
Walls, above Grade						
Mass	U-0.104	R-9.5 c.i.	U-0.090	R-11.4 c.i.	U-0.580	NR
Metal building	U-0.060	R-0 + R-15.8 c.i.	U-0.050	R-0 + R-19 c.i.	U-0.162	R-13
Steel-framed	U-0.064	R-13 + R-7.5 c.i.	U-0.064	R-13 + R-7.5 c.i	U-0.124	R-13
Wood-framed and other	U-0.064	R-13 + R-3.8 c.i. or R-20	U-0.064	R-13 + R-3.8 c.i. or R-20	U-0.089	R-13
Wall, below Grade						
Below-grade wall	C-0.119	R-7.5 c.i.	C-0.092	R-10 c.i.	C-1.140	NR
Floors						
Mass	U-0.057	R-14.6 c.i.	U-0.051	R-16.7 c.i.	U-0.107	R-6.3 c.i.
Steel joist	U-0.038	R-30	U-0.038	R-30	U-0.052	R-19
Wood-framed and other	U-0.033	R-30	U-0.033	R-30	U-0.051	R-19
Slab-on-Grade Floors						
Unheated	F-0.520	R-15 for 24 in.	F-0.520	R-15 for 24 in.	F-0.730	NR
Heated	F-0.843	R-20 for 24 in.	F-0.688	R-20 for 48 in.	F-0.900	R-10 for 24 in.
Opaque Doors						
Swinging	U-0.370		U-0.370		U-0.370	
Nonswinging	U-0.310		U-0.310		U-0.360	

Fenestration	**Assembly Max. U**	**Assembly Max. *SHGC***	**Assembly Min. *VT/SHGC***	**Assembly Max. U**	**Assembly Max. SHGC**	**Assembly Min. *VT/SHGC***	**Assembly Max. U**	**Assembly Max. *SHGC***	**Assembly Min. *VT/SHGC***
Vertical Fenestration, 0% to 40% of *Wall*									
Fixed	0.36	0.36	1.10 (for all types)	0.36	0.36	1.10 (for all types)	0.50	NR (for all types)	NR (for all types)
Operable	0.45	0.33		0.45	0.33		0.65		
Entrance door	0.63	0.33		0.63	0.33		0.77		
Skylight, 0% to 3% of *Roof*									
All types	0.50	0.40	NR	0.50	0.40	NR	0.75	NR	NR

* The following definitions apply: c.i. = *continuous insulation* (see Section 3.2), FC = filled cavity (see Section A2.3.2.5), *Ls* = *liner system* (see Section A2.3.2.4), NR = no (insulation) requirement.

a. When using the *R-value* compliance method for *metal building roofs*, a thermal spacer block is required (see Section A2.3.2).

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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.

(ASHRAE 90.1-2019: Only for "Commercial" Buildings)

Table 5.5-5
Building Envelope* Requirements for Climate Zone 5 (A,B,C)

	Nonresidential		*Residential*		Semiheated	
***Opaque* Elements**	**Assembly Maximum**	**Insulation Min. *R-Value***	**Assembly Maximum**	**Insulation Min. *R-Value***	**Assembly Maximum**	**Insulation Min. *R-Value***
Roofs						
Insulation entirely above deck	U-0.032	R-30 c.i.	U-0.032	R-30 c.i.	U-0.063	R-15 c.i.
Metal building[a]	U-0.037	R-19 + R-11 *Ls* or R-25 + R-8 *Ls*	U-0.037	R-19 + R-11 *Ls* or R-25 + R-8 *Ls*	U-0.082	R-19
Attic and other	U-0.021	R-49	U-0.021	R-49	U-0.034	R-30
Walls, above grade						
Mass	U-0.090	R-11.4 c.i.	U-0.080	R-13.3 c.i.	U-0.151[b]	R-5.7 c.i.[b]
Metal building	U-0.050	R-0 + R-19 c.i.	U-0.050	R-0 + R-19 c.i.	U-0.094	R-0 + R-9.8 c.i.
Steel-framed	U-0.055	R-13 + R-10 c.i.	U-0.055	R-13 + R-10 c.i.	U-0.084	R-13+R-3.8 c.i.
Wood-framed and other	U-0.051	R-13 + R-7.5 c.i. or R-19 + R-5 c.i.	U-0.051	R-13 + R-7.5 c.i. or R-19 + R-5 c.i.	U-0.089	R-13
Wall, below Grade						
Below-grade wall	C-0.119	R-7.5 c.i.	C-0.092	R-10 c.i.	C-1.140	NR
Floors						
Mass	U-0.057	R-14.6 c.i.	U-0.051	R-16.7 c.i.	U-0.107	R-6.3 c.i.
Steel joist	U-0.038	R-30	U-0.038	R-30	U-0.052	R-19
Wood-framed and other	U-0.033	R-30	U-0.033	R-30	U-0.051	R-19
Slab-on-Grade Floors						
Unheated	F-0.520	R-15 for 24 in	F-0.510	R-20 for 24 in.	F-0.730	NR
Heated	F-0.688	R-20 for 48 in.	F-0.688	R-20 for 48 in.	F-0.900	R-10 for 24 in.
Opaque Doors						
Swinging	U-0.370		U-0.370		U-0.370	
Nonswinging	U-0.310		U-0.310		U-0.360	

Fenestration	**Assembly Max. U**	**Assembly Max. *SHGC***	**Assembly Min. *VT/SHGC***	**Assembly Max. U**	**Assembly Max. SHGC**	**Assembly Min. *VT/SHGC***	**Assembly Max. U**	**Assembly Max. *SHGC***	**Assembly Min. *VT/SHGC***
Vertical Fenestration, 0% to 40% of *Wall*									
Fixed	0.36	0.38	1.10 (for all types)	0.36	0.38	1.10 (for all types)	0.50	NR (for all types)	NR (for all types)
Operable	0.45	0.33		0.45	0.33		0.65		
Entrance door	0.63	0.33		0.63	0.33		0.77		
Skylight, 0% to 3% of *Roof*									
All types	0.50	0.40	NR	0.50	0.40	NR	0.75	NR	NR

* The following definitions apply: c.i. = *continuous insulation* (see Section 3.2), FC = filled cavity (see Section A2.3.2.5), *Ls* = *liner system* (see Section A2.3.2.4, NR = no (insulation) requirement.

a. When using the *R-value* compliance method for *metal building roofs*, a thermal spacer block is required (see Section A2.3.2).

b. Exception to Section 5.5.3.2 applies for *mass walls* above *grade*.

Source: Rob Austin
Code Assistance/Development Unit
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Raise the Roof – Energy Subcode

By now, I'm assuming you are all aware that the 2021 International Energy Conservation Code (IECC) lists the ceiling building thermal envelope value at R-60 in Table R402.1.3, Insulation and Fenestration Requirements by Component. Yes, this a decent jump in insulation for the ceiling compared to the former energy subcode, 2018 IECC, but there are ways to deal with this increase. Here are two ways:

1. REScheck: As mentioned in Bulletin 22-1, the REScheck computer software is based on Section R402.1.5, Total UA alternative, and starts with the prescriptive values of Table 402.1.3 and allows you to trade-off insulation values. Technically, REScheck evaluates a design so that the total building thermal envelope UA (sum of U-factor times assembly area) is less than or equal to the total UA resulting from using the U-factors in Table R402.1.2 (multiplied by the same assembly area as in the proposed building); this will demonstrate that the building is in compliance with Table R402.1.3. In short, you may see more insulation elsewhere (walls, floors) or better performing windows to compensate for a ceiling R-value less than R-60.

2. Extended Wall Framing/Raised-Heel Trusses (prescriptive): Section R402.2.1, Ceilings with attic spaces, and Section R402.2.2, Ceilings without attic spaces, both contain an exception, if you will, to the Prescriptive Packages from Bulletin 22-1 for the ceiling building thermal envelope value. Here you will find:

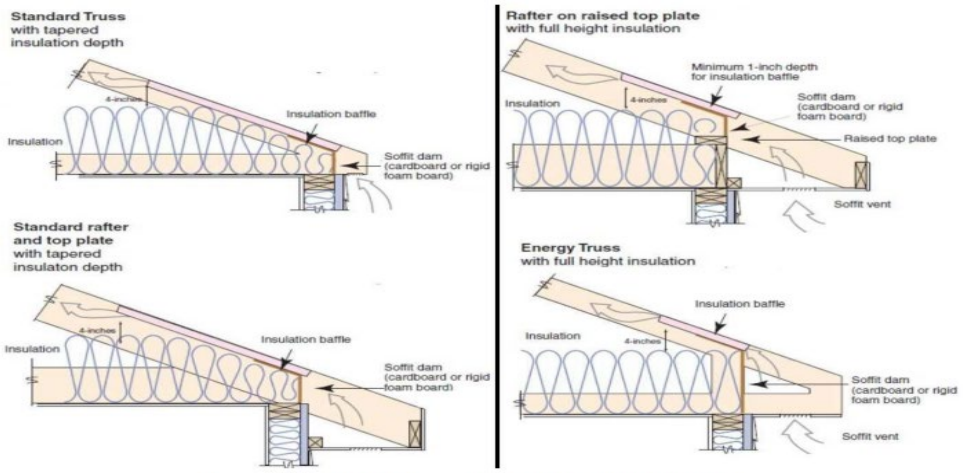
(Continued on next page)

(Raise the Roof – Energy Subcode)

a. Ceilings with attic spaces - Where Table R402.1.3 would require R-60 insulation in the ceiling, installing R-49 over 100 percent of the ceiling area requiring insulation shall be deemed to satisfy the requirement for R-60 insulation wherever the full height of uncompressed R-49 insulation extends over the wall top plate at the eaves.

b. Ceilings without attic spaces - Where Table R402.1.3 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section R402.1.3 shall be limited to 500 square feet or 20 percent of the total insulated ceiling area, whichever is less.

These two “exceptions” (a. and b. above) do not apply to the U-factor alternative approach in Section R402.1.2 and the total UA alternative in Section R402.1.5, as the REScheck program (or hand calculations; if you went that route) already allow you to trade-off between components.



Diagrams courtesy of USDOE’s Building America Solution Center (https://basc.pnnl.gov)

Source: Adam Matthews
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NM Cable and EV Charger Installations

One of the more frequent questions we get in the Code Assistance Unit relates to the use of Non-metallic sheath (NM) cable for EV chargers. Specifically, the use of #6 CU on a 48-amp load.

There appears to be a significant portion of code officials with a difference in opinions on how we should apply the requirements found in Article 625 of the National Electrical Code (NEC), with continuous load designation and NM cable.

First let’s start with Article 625; Article 625.41 **requires** the overcurrent protection device (OCPD) to be sized for “continuous duty,” thus applying a factor of 125% to the full load of the equipment. “Continuous Duty” is a term used to alert installers that considerations must be made to help dissipate excessive heat when a substantially constant load is present for an indefinitely long period of time. This increase is a “cushion” to help the circuit components deal with this heat. There is NO additional current on this circuit.

(Continued on next page)

(NM Cable and EV Charger Installations)

Article 625.42, however, states: “Electric vehicle charging loads shall be considered to be continuous loads for the purpose of this article." A review of the Code Making Panel notes shows their primary intent is that this continuous load designation is limited to this article and shall not extend to service calculations (Review 220.83. There is no 125% factor for continuous load).

Neither article requires the conductors to adhere to this increase. This may be because the “continuous load” or “continuous duty” designation is intended for the protection of devices and not conductors. Exception #1 to Article 210.19A(1), appears to support this, but because Article 625.41 explicitly requires us to apply the 125% factor, this exception cannot be applied.

So, let’s assume for the sake of this article that we interpret the code to read that the conditions for continuous loads apply to the conductors as well.

Table 310.16 of the 2020 NEC shows 6 AWG having an ampacity of 55 amps at 60°C (See 334.80 for ampacity limitations). "Ampacity," as defined by the NEC, is *“The maximum current, in amperes, that a conductor can carry continuously under the conditions of use without exceeding its temperature rating.” B*ased upon table #6, NM can safely carry 55 amps WITHOUT exceeding the temperature rating of the conductor at 60°C. Considering most devices and OCPD’s have dual rated lugs with temperature limitations of 60°C/75°C, limiting the ampacity to 55 amps or less will inherently limit the temperature of any device to be well within its listed operating temperature. Which means, applying the 125% to a conductor which is already limited by 60°C does nothing more to protect the equipment or the conductors in the circuit.

In the 2020 NEC, a change to Article 334.80 was made from “allowable ampacity” to just “ampacity." This change seems to imply that the ampacity safely carried by NM cable is dictated by the actual load and not OCPD. Furthermore, the provisions of Article 240.4 for applications under 800 amps do not exclude NM cable.

Therefore, the opinion of the Code Assistance Unit is that #6 NM cable should be permitted to be utilized for EV chargers with loads not exceeding 48 amps.

Source: Scott Borsos
Code Assistance Unit
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Wiring Methods and the Rehabilitation Subcode

To be, or not to be, that is the question! Well, not really, but one question the Code Assistance Unit often receives is why Article 110.8, Wiring Methods, of the electrical subcode is deleted from the Materials and Methods section of the Rehabilitation Subcode, N.J.A.C. 5:23-6.8(d), and what impact that may have on acceptable wiring methods?

This deletion has existed since the initial adoption of the Rehabilitation Subcode in 1998. In looking through some of the historical notes regarding the development of the Rehabilitation Code, we were able to determine why this section was deleted. In short, it’s because it was found to be redundant.

Specifically, because all of Chapter 3, Wiring Methods and Materials, is included within the electrical Materials and Methods, there is no situation where improper methods and materials could be utilized. This same logic was used in the initial justification for deleting Article 110.8 and is why it's vital to read sections within the UCC in their entirety.

These sections are not meant to be isolated and taken out of context; rather, the entire electrical Materials and Methods section must be taken into consideration. This is true even when looking at just one piece.

Source: Scott Borsos
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Pool Heaters, Relief Valves and Solar Covers 

The summer season may be in our rearview, but some questions still remain... Do pool heaters require relief valves, and who is responsible to verify a solar pool cover on site at final inspection? These answers can be found in the 2021 IRC and IMC.

The citations are as follows; IRC M2006.1, “Pool and spa heaters shall be installed in accordance with the manufacturer's installation instructions.”

> * Commentary: This section addresses specialized types of water heaters used with swimming pools, recreational or therapeutic spas and hot tubs. Pool and spa heaters are similar in design to hot water boilers. Usually, these heaters are of the water-tube type, are open non-pressurized systems and are designed for either indoor or outdoor installation. *

The commentary is important because it states that these heaters are usually open non-pressurized systems. It is a clear distinction which shows that a pool heater is USUALLY not a closed system and that it is NOT a pressure vessel. This means that pressure relief valves are typically not required, unless specifically called for by the manufacturer.

IMC 916.1 states that “pool and spa heaters shall be installed in accordance with the manufacturer's instructions.”

> * Commentary: This section addresses specialized types of water heaters used with swimming pools, recreational or therapeutic spas and hot tubs. **Pool and spa heaters are specialized water heaters similar in design to hot water boilers.** Typically, these heaters are of the watertube type and are designed for either indoor or outdoor installation*. In this commentary, it states that these heaters are specialized water heaters similar in design to hot water boilers but fails to mention that they are also typically open non-pressurized systems. These systems are usually not closed, so pressure relief is typically not an issue, unless specifically called for by the manufacturer. Pool heaters have flow switches and temperature limiters that protect the system already, so relief valves are not necessary unless specified by the manufacturer. *

Solar covers for Groups R-3 and R-5 fall under 2021 IECC, Section R403.10.3 and 2021 IRC, Section 1103.10.3, respectively, and the responsibility for plan review and inspection is the Electrical Subcode. In other use groups, 2019 ASHRAE 90.1, Section 7.4.5.2 calls for the responsibility to be “as applicable” for plan review and inspection. This should correlate to the Electrical Subcode as called out in the R-3/R-5 use group as the Electrical Subcode will always visit the site for inspection due to the electrical connections to the pool heater.

Source: Anthony Menafro
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Additions in a Flood Zone – Update to an Update 

This originated in the Summer 2016 edition of the Construction Code Communicator (CCC), and an update was issued within the Winter 2017 edition of the CCC. The short answer still remains, for permit applicants who would like to install an addition to their existing home in a flood zone, check with the local floodplain administrator per their regulations under N.J.A.C. 7:13. Lastly, the previous article made reference to a small exception which permitted up 400 ft^2 to be added to a non-substantially improved home at its current elevation; this is no longer permitted and actually changed sometime between publication of the 2016 and 2017 articles.

Source: Rob Austin
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Condenser Relocations Due to Zoning Requirements 

We have been hearing about direct replacements of HVAC systems that are in violation of current zoning ordinances, even though the condenser had been in the same location "for the past twenty years!"

This is a very difficult situation to be in as these replacements fall under Minor Work per N.J.A.C. 5:23-2.17A(c)3 and the replacement is performed before the permit application is even submitted to the local Code Enforcement Department; therefore, you may not even know that a zoning application may be required in some localities. While the discomfort of not having heat or air conditioning may be an issue, the undue financial burden of having to relocate your condenser to a new location after the replacement has been performed can be even worse.

I would suggest that while you are calling the local Code Enforcement Department to alert them that you are starting a Minor Work replacement, as is required prior to starting the work, ask them if there is a requirement that you submit a zoning application. There are issues such as flood zones, visual and/or set back requirements, nuisance locations, etc., that may cause the condenser to be relocated. So, please be cognizant of these situations. In addition, for the local Code Enforcement Departments, please have this discussion with your zoning boards so that you may be able to help the applicants in your jurisdictions. This may help to keep the process as painless as possible because surprises like these are never fun.

Source: Anthony Menafro
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