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To All Members of the Roofing Metal Heating Associates (RMHA), Area Roofing Contractors, Roofing Material Distributors, or Manufacturer Representatives of Roofing Materials:

The RMHA is launching a program to forward electronic issues of the Trade News, longer written articles that cannot be published in the Trade News, and Pictures of roofing system installations via email.

The RMHA hopes the information helps roofing industry professionals learn about the roofing industry and how other roofing professionals approach installations. Furthermore, we invite you to share this information with others within the roofing industry who may find the information useful.

There are no charges to receive the information, and you don't have to be a member; however, whether you are a roofing contractor, material distributor, or a manufacturer's representative, we hope you may consider membership in the future.

We also hope that area Roofing Contractors, Distributors, or Company Representatives will submit photos of roofing system installations to share with others within the roofing industry.

If you are interested in receiving the Picture Reports, contact me via email or call my cell phone

Regards,
Charlie McGarvey, RMHA Director/Contributing Editor
Roof Surveys and Informational Services
Cell – 610-587-1384
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1) Building Codes

To understand anything, you must start from the beginning and understanding building codes is no different. Originally, three separate regional building code organizations covered the United States.

The east-northeast-northern midwest section of the country was covered by building codes developed by the Building Officials and Code Administrators, or the B.O.C.A. Building Codes. They published their codes as the *"National Building Code".*

The southern sections of the country were covered by building codes developed by the Southern Building Code Conference International, as the S.B.C.C. Building Codes. They published their codes as the *"Standard Building Code".*

The western section of the country was covered by building codes developed by the International Conference of Building Officials, as the I.C.B.O. Building Codes. They published their codes as the *"Uniform Building Code".*

Because building codes varied across the country, architects, engineers, contractors, and building owners found it confusing to build nationwide. What could be allowed in one region of the country was not allowed in another. To end the confusion, the three different building code agencies joined together in the 1990's to develop a single nationwide building code. The single organization became known as the International Code Council or the I.C.C., and it published its first complete building code series in 2000.

Today, the International Code Council develops nationwide building codes, commonly called the I-codes. The organization comprises thousands of construction professionals nationwide, including architects, engineers, code officials, building envelope experts, and construction industry associations.

Every three years, they publish a series of 15 codebooks on building construction and safety, of which Pennsylvania has adopted 9 and New Jersey 8.

Within the roofing industry, there are four relevant code books: the International Building Code (IBC) for commercial projects; the International Residential Code (IRC) for defined residential projects; the International Existing Building Code (IEBC), and the International Energy Conservation Code (IECC), both include separate sections for commercial and residential projects.

The code books do not have the force of law until they are adopted by a state, city, or local municipal government. Generally, the codes will be adopted by individual states. When adopted by a state, the codes will be renamed to include the state's name or as the state's Uniform Construction Code.

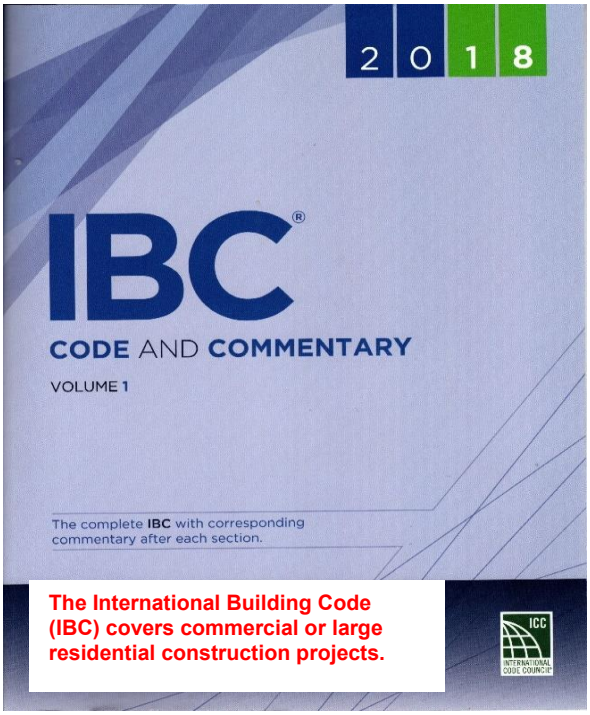
For example, in Pennsylvania, when adopted, the ICC code series is commonly referred to as the Pennsylvania Building Codes or, more technically correct, the Pennsylvania Uniform Construction Code. The same applies to New Jersey. When a specific I-code is adopted by a state, it may be adopted as a complete code, with sections deleted, modified, or state-specific amendments.

Once an I-code has been adopted by a state, with or without changes or amendments, it has statewide legal force. Any city or municipality within a state that adopts the finalized state code version may enforce the code; however, it may not change it, but may add amendments unique to its jurisdiction.

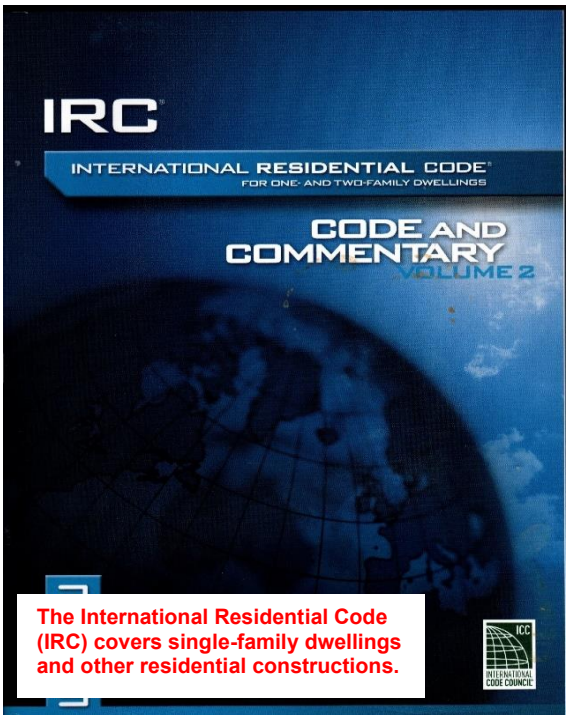
Code enforcement may be handled by a state-approved agency, city, or municipality within the state, provided the state code has been adopted. Once adopted, its name will change from the state building code to the name of the city or municipality. For example, upon adoption in Philadelphia, the Pennsylvania Uniform Construction Code will be renamed the Philadelphia Building Construction and Occupancy Code, with any additional amendments specific to Philadelphia adopted.

Thus, across the United States, most state, city, and municipal building codes begin with the International Code Series. IBC Chapter 15 covers roofing; IRC Chapter 9 covers roofing; IEBC Chapter 7, Alterations Level 1, covers roofing; and the IECC energy code includes separate commercial and residential sections that cover roofing.

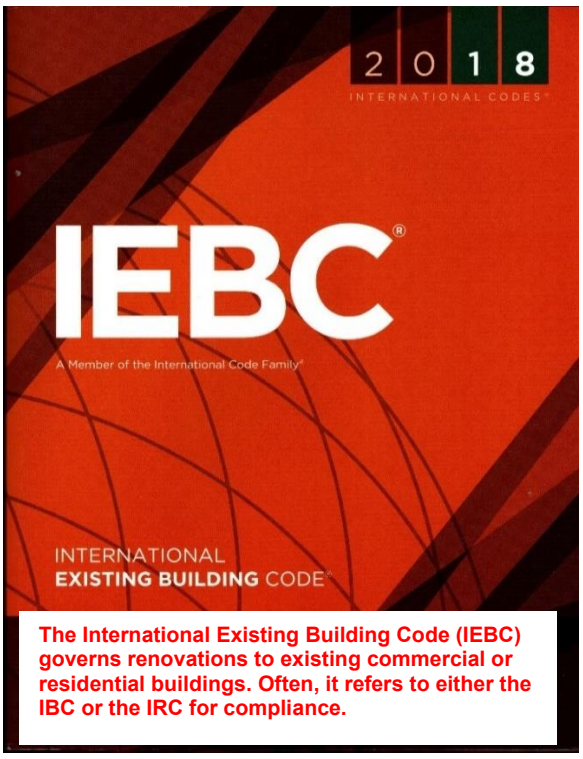
You can order any codebook in electronic or hard-copy format directly from the ICC bookstore, but a fee applies. However, if you go online and complete a search for either the New Jersey or Pennsylvania Uniform Construction Codes-Up Codes, you will have electronic access to any of the code books adopted by either state without a charge.



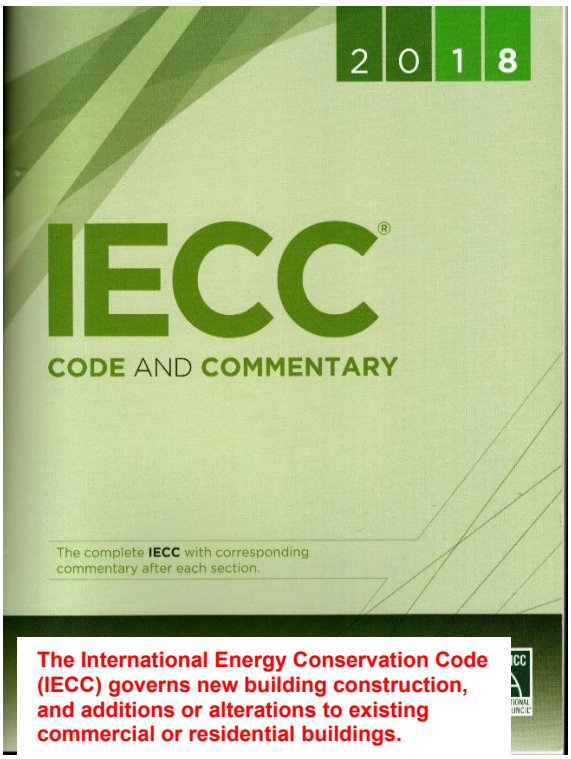
The International Building Code (IBC) covers commercial or large residential construction projects.



The International Residential Code (IRC) covers single-family dwellings and other residential constructions.



The International Existing Building Code (IEBC) governs renovations to existing commercial or residential buildings. Often, it refers to either the IBC or the IRC for compliance.



The International Energy Conservation Code (IECC) governs new building construction, and additions or alterations to existing commercial or residential buildings.

Note: Pennsylvania has moved from the 2018 ICC Code Series to the 2021 ICC Code Series as of January 1, 2026, with local municipalities having an additional 6 months to fully adopt by July 1, 2026. New Jersey began enforcing the 2021 ICC Code Series as of March 6, 2023.

2) Building Code Amendments

- Philadelphia Building Construction and Occupancy Code Amendments

Amendments to a statewide adopted building code can be added by a city or municipality, but they will be jurisdiction-specific.

Two amendments to the Philadelphia Code, not part of the statewide Pennsylvania Uniform Construction Code, that pertain to roofing systems include: testing existing roofing materials for *Asbestos* and *Reflectance* requirements for roofing membranes. The amendments are unique to Philadelphia unless they have also been specifically adopted by another city or municipality.

1) Asbestos Testing

The City of Philadelphia, License and Inspections, will not approve a permit application for the partial or complete demolition of a building if an Asbestos Inspection Report is not attached. Because a roof replacement (tear-off) is considered a partial demolition project, the materials must be tested for asbestos. If found, the project will be handled as an asbestos abatement, which will require additional permits and the removal of the materials by a licensed, trained asbestos removal contractor.

In Philadelphia, asbestos testing is not required for buildings constructed after 1980, for any residence with 3 or fewer dwelling units, or for projects under $50,000.00.

However, federal asbestos removal standards from the E.P.A., air quality control, and O.S.H.A. worker safety regulations still apply at all times.

Note: Attached on Pages 4 and 5 is an example of an asbestos testing inspection report that was submitted to Philadelphia License & Inspections during the permit process for a roof replacement (tear-off). It is incomplete because several pages are omitted for brevity.

2) Building Code Amendments

- Philadelphia Building Construction and Occupancy Code Amendments

An example of an asbestos testing report.

City of Philadelphia - Department of Public Health
Air Management Services, 2nd Fl. Asbestos Control Unit
321 University Ave. Philadelphia, PA 19104

Asbestos Inspection Report

Office Use Only | Date Received L&I: | Date Received AMS: | Date Inspected | Inspector No.

1. Name of Building / Property: | Address

2. Name of Building / Property Owner: | Address | Phone No.

3. Name of Philadelphia Certified Investigator: | Certification No. | Contact Information / Email / Phone No.

L&I Commercial Activity No. (Former Business Privilege License No.) | Business Tax ID No.

4. Name of Philadelphia Licensed Laboratory: | License No. | Phone No.

5. Scope of Work: (Insert or attach a complete description of the portion of the subject property inspected and the anticipated work that will result in the disturbance of the identified Asbestos Containing Materials (ACMs) (e.g. demolition, asbestos abatement, and / or renovation activities.)

conducted a limited survey for asbestos containing roofing materials as directed by the client. The survey was confined to the roof for replacement activities.

6. ☐ Property has been declared to be in imminent danger (ID) of failure or collapse by the City of Philadelphia Department of Licenses & Inspections. **Attached is a copy of the L&I Notice of Violation declaring the property I.D. **Note: INVESTIGATOR MUST BE ON SITE DURING DEMOLITION!**

7. (ACMs) identified? ☐ Yes (List Below) ☑ No (explain) Laboratory results did not identify any asbestos containing materials

8. Suspected ACM's sampled? ☑ Yes (attached are copies of the laboratory chain of custody and bulk sample results.) ☐ No (Why?)

9. List all identified ACM's located in the planned renovation/demolition areas. Damaged ACM must be listed and then repaired or removed prior to renovation. You (Investigator) must label all ACM that may be left in the work area. (Attached are add'tl sheets)

Location	Description	Type (Code 1)	Amount Square	Amount Linear	Condition (Code 2)	Action (Code 3)

Code 1
FRI - Friable
NF1 - Non-Friable, Cat. 1
NF2 - Non-Friable, Cat. 2

Code 2
DD - Deteriorated or Delaminated
ND - Non-Damaged

Code 3
REM - Removal necessary prior to Demo/Reno
NRN - No removal necessary, label ACM
REP - Repair & Label ACM, removal not necessary

10. I hereby certify that the foregoing statements are true and the information contained in this report is true. This certification is made subject to the penalties set forth in 18 PA. C.S. S4904 relating to unsworn falsification to authorities. Furthermore I certify that the inspection, sampling, and labeling requirements of section X of the Asbestos Control Regulation (ACR) have been met. The building owner has been notified of the ACR requirements and given a copy of this report. If the inspection has revealed ACM which will be disturbed by the proposed work or if it has revealed ACM in bad condition, the building owner has been notified to remove or repair the ACM in accordance with the ACR prior to renovation or demolition activity.

11. Signature of Certified Asbestos Investigator: | Date: | Signature of Building Owner: | Date:

2) Building Code Amendments

- Philadelphia Building Construction and Occupancy Code Amendments

EMSL Order:
Customer ID:
Customer PO:
Project ID:

Attention:
Phone:
Fax:
Received Date:
Analysis Date:
Collected Date:
Project:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
Roof 2-Shingle 042201601-0001	Exterior - Roof 2 - Roofing Material	Black Fibrous Homogeneous	5% Cellulose	95% Non-fibrous (Other)	None Detected
Roof 2-Mastic 042201601-0001A	Exterior - Roof 2 - Roofing Material	Black Non-Fibrous Homogeneous	5% Cellulose	95% Non-fibrous (Other)	None Detected
Roof 2-Shingle 2 042201601-0001B	Exterior - Roof 2 - Roofing Material	Black Fibrous Homogeneous	4% Synthetic	96% Non-fibrous (Other)	None Detected
Roof 2-Tar Felt 042201601-0001C	Exterior - Roof 2 - Roofing Material	Black Fibrous Homogeneous	5% Glass	95% Non-fibrous (Other)	None Detected
Roof 2-Insulation 042201601-0001D	Exterior - Roof 2 - Roofing Material	Brown Fibrous Homogeneous	70% Cellulose	30% Non-fibrous (Other)	None Detected
Roof 3-Shingle 042201601-0002	Exterior - Roof 3 - Roofing Material	White Fibrous Homogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
Roof 3-Shingle2 042201601-0002A	Exterior - Roof 3 - Roofing Material	Black Fibrous Homogeneous	10% Synthetic	90% Non-fibrous (Other)	None Detected
Roof 3-Tar Felt 042201601-0002B	Exterior - Roof 3 - Roofing Material	Black Fibrous Homogeneous	30% Glass	70% Non-fibrous (Other)	None Detected
Roof 3-Mastic 042201601-0002C	Exterior - Roof 3 - Roofing Material	Black Fibrous Homogeneous	5% Cellulose	95% Non-fibrous (Other)	None Detected
Roof 3-Insulation 042201601-0002D	Exterior - Roof 3 - Roofing Material	Brown Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (Other)	None Detected
Roof 4-Roofing 042201601-0003	Exterior - Roof 4 - Roofing Material	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
Roof 4-Mastic 042201601-0003A	Exterior - Roof 4 - Roofing Material	Brown Fibrous Homogeneous	3% Glass	97% Non-fibrous (Other)	None Detected

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2) Building Code Amendments

- Philadelphia Building Construction and Occupancy Code Amendments

2) Reflectance

Reflectance is the ability of the surface of a roofing membrane to reflect sunlight. There are two benefits in large cities for requiring dark-colored surfaces, such as a roofing membrane on a low-slope roof, to be changed to a white or light-colored surface to reflect sunlight.

1) If a building lacks sufficient roof insulation, the heat of sunlight absorbed by a dark-colored roofing membrane will be transferred to the building's interior. Thus, during the summer, more energy will be required to run air-conditioning equipment.

2) Any sunlight absorbed into a dark surface during a hot summer day, such as on the surface of a low-slope roofing membrane will slowly be released at night into the surrounding air. In large urban cities, the released heat is known as the “Heat Island Effect”. This increases evening and nighttime energy costs to cool a building and also makes the surrounding outside heated air very uncomfortable for residents of the city.

When a reflectance code section is adopted as part of a national or local building code, its primary purpose is to reduce building cooling energy costs, with a secondary benefit of cooling nighttime summer air in urban environments to improve resident comfort.

Within the IBC, IRC, or IECC code sections for roofing, or in any amendments adopted in the Pennsylvania Uniform Construction Code, are there requirements that the surface of a low-slope roofing membrane achieve a Reflectance rating in Pennsylvania.

Note - IECC (energy code) Section C402.3 requires high Reflectance and Emittance values for roofing systems in Climate Zones 1, 2, and 3. Most of Pennsylvania is in Climate Zone 5, but southeastern Pennsylvania and all of New Jersey are in Climate Zone 4. Thus, this code section does not apply in either state’s Uniform Construction Code.

However, Philadelphia construction codes require a low-slope roofing membrane (2’/12”) to have a high reflectance rating (e.g., white or light-colored) for both new commercial and residential buildings and also for reroofing projects.

- Philadelphia Commercial Code, Chapter 15 - Section 1504.9
“Roof Coverings over conditioned spaces on low slope roofs (2”/12”) on newly constructed buildings, and additions to existing buildings, shall be Energy Star-rated as highly reflective”.

- Philadelphia Commercial Code, Chapter 15 - Section 1511.1- Reroofing
“Materials and methods of application used for recovering or replacing an existing roof covering shall comply with the requirements of Chapter 15.

- Philadelphia Residential Code, Chapter 9 - Section R905.17
“Roof Coverings over conditioned spaces on low slope roofs (2”/12”) on newly constructed buildings, and additions to existing buildings, shall be Energy Star-rated as highly reflective”.

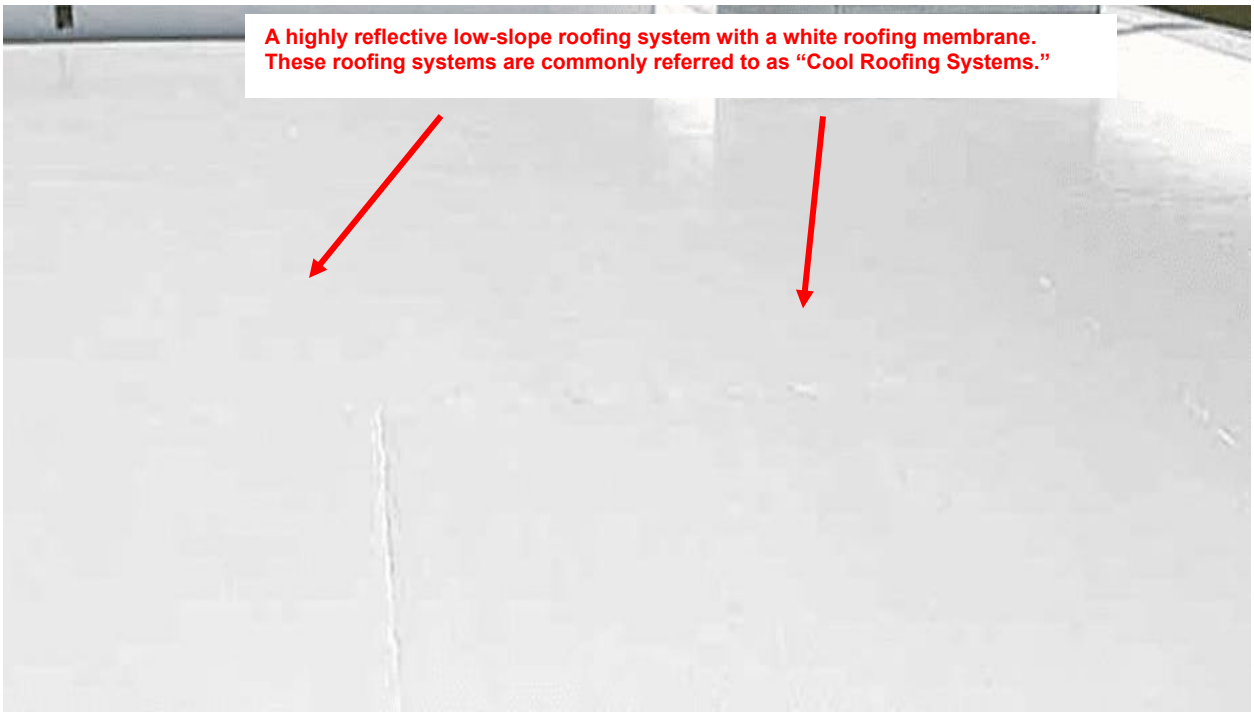
- Philadelphia Residential Code, Chapter 9 - Section R908.1 - Reroofing
“Materials and methods of application used for recovering or replacing an existing roof covering shall comply with the requirements of Chapter 9.

The only problem with these code sections is the Energy Star rating requirements. Energy Star is a designation of a material or product energy savings developed by the Environmental Protection Agency (EPA). However, since June 1, 2022, Energy Star ratings have been discontinued for roof coatings, membranes, or general roofing products.

2) Building Code Amendments

- Philadelphia Building Construction and Occupancy Code Amendments

Reflectance

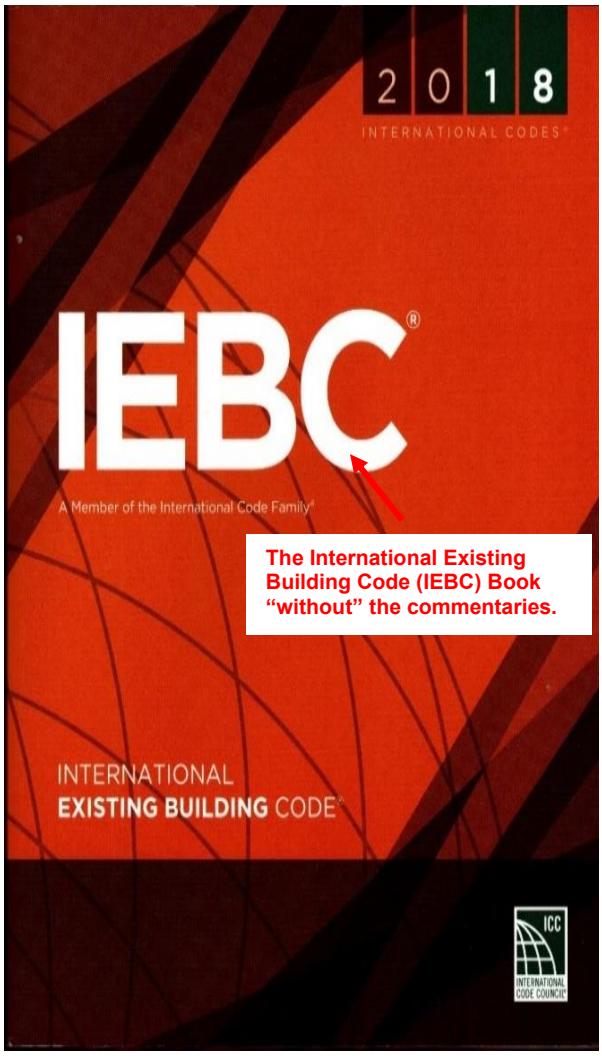


3) Building Code Interpretations

Regardless of which building code book you use for a specific purpose, disagreements or interpretations about a code section wording may arise between code enforcement officials and contractors, licensed professionals such as architects or engineers, and residential or commercial building owners.

When this occurs, a local code official will generally first review the applicable code section and then assess its intent. His investigation typically begins by reviewing the commentaries on the section of the building code in question. Commentary code wording describes in very simple words an understandable meaning of a code section that might be vague or so technically written in an adopted code book that its exact meaning is hard to interpret.

While all code books can be ordered or reviewed online, the code commentaries are separate code books that contain both the code sections and, below each code section, a written commentary on the development or a general understanding of the code section. The ICC commentaries are not adopted as part of the Pennsylvania Uniform Construction Code; only the codebooks are. As such, the commentaries have no legal enforcement authority, and local code enforcement officials are not actually required to use them for code interpretation.



3) Building Code Interpretations

The 2018 International Building Code (IBC) Book and Commentaries. Commentaries are not part of adopted building codes.

Commentary Symbol

[BG] 1510.8.5 Flagpoles. Flagpoles and similar structures shall not be required to be constructed of noncombustible materials and shall not be limited in height or number.

This section exempts flagpoles from the rooftop height and construction limitations that apply to most other rooftop structures.

[BG] 1510.9 Structural fire resistance. The structural frame and roof construction supporting loads imposed upon the roof by any rooftop structure shall comply with the requirements of Table 601. The fire-resistance reduction permitted by Table 601, Note a, shall not apply to roofs containing rooftop structures.

This section is a reminder to verify compliance with Table 601 for roofs that support the additional load of a rooftop structure. Furthermore, it clarifies that the reduction permitted in Table 601, Note a, is not applicable where the roof supports a rooftop structure.

SECTION 1511
REROOFING

1511.1 General. Materials and methods of application used for recovering or replacing an existing roof covering shall comply with the requirements of Chapter 15.

Exceptions:

1. *Roof replacement* or *roof recover* of existing low-slope roof coverings shall not be required to meet the minimum design slope requirement of one-quarter unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide positive roof drainage.
2. Recovering or replacing an existing roof covering shall not be required to meet the requirement for secondary (emergency overflow) drains or scuppers in Section 1503.4 for roofs that provide for positive roof drainage. For the purposes of this exception, existing secondary drainage or scupper systems required in accordance with this code shall not be removed unless they are replaced by secondary drains or scuppers designed and installed in accordance with Section 1503.4.

Code Section

This section simply states that when a roof is replaced or recovered, it must comply with Chapter 15 for the materials and methods used with exceptions for low-sloped roofs as well as a waiver of the secondary drainage provision when reroofing an existing building where the roof drains properly. This section does not mandate that the entire roof be replaced but simply that the portion being replaced complies with Chapter 15.

For low-sloped roofs, the exception indicates that reroofing (i.e., recovering or replacement) is not required to meet the $^1/_4$:12 minimum slope requirement of Section 1507, provided that the roof has positive drainage. The term "positive drainage" is defined as the drainage condition in which consideration has been made for all loading deflections of the roof deck, and additional roof slope has been provided to ensure drainage of the roof area within 48 hours of rainfall.

1511.2 Structural and construction loads. Structural roof components shall be capable of supporting the roof-covering system and the material and equipment loads that will be encountered during installation of the system.

The structural integrity of the roof must be maintained during reroofing operations, which can significantly contribute to the loading of the roof due to workers and material being present during this period of time. The roof support system must be able to structurally support all additional layers of roof covering material.

1511.3 Roof replacement. *Roof replacement* shall include the removal of all existing layers of roof coverings down to the roof deck.

Exception: Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.

The term "Roof replacement" is defined in Chapter 2. When removing roof coverings, it can be difficult, if not impossible, to remove an existing layer of adhered ice barrier membrane without damaging or replacing the roof deck. The exception accounts for this condition by allowing an existing adhered ice barrier membrane to remain in place and be covered with a new ice barrier membrane as required in Section 1507, followed by the installation of the new primary roof-covering material.

1511.3.1 Roof recover. The installation of a new roof covering over an existing roof covering shall be permitted where any of the following conditions occur:

1. Where the new roof covering is installed in accordance with the roof covering manufacturer's approved instructions.
2. Complete and separate roofing systems, such as standing-seam metal roof panel systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
3. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1511.4.
4. The application of a new protective roof coating over an existing protective roof coating, metal roof panel, built-up roof, spray polyurethane foam roofing system, metal roof shingles, mineral-surfaced roll roofing, modified bitumen roofing or thermoset and thermoplastic single-ply roofing shall be permitted without tear off of existing roof coverings.

The term "Roof recover" is defined in Chapter 2 and this section identifies conditions where a recover is permitted. Item 2 states that new roofing systems that are designed to transmit all roof loads directly to the

Commentaries are written directly below the code section.

3) Building Code Interpretations

Although Philadelphia and the surrounding municipalities have adopted the same Pennsylvania Uniform Construction Code books, Philadelphia has issued two roofing system installation code interpretations that may differ significantly from those of the surrounding municipalities or counties.

The first concerns roof replacements (tear-offs), the installation of new, thicker R-30 roof insulation, and the existing low-flashing issues; the second concerns removing the top layer of an insulated low-slope roofing system without installing new R-30 roof insulation.

1) The IECC (energy code), adopted as part of the Pennsylvania Uniform Construction Code, requires all new insulated low-slope building constructions in Climate Zone 4; i.e., Southeastern Pennsylvania and all of New Jersey, to have a minimum R-30 roof insulation value. And, whenever an existing insulated low-slope roofing system is removed as part of a roof replacement (tear-off), the new insulation must also achieve an R-30.

   While different roof insulations have different R-values, to meet this requirement during a roof replacement requires insulation to have a minimum thickness of 5.2” to as thick as 8”. To use these thicknesses of insulation during a roof replacement, existing buildings may have flashings that are too low and would be covered with the new, thicker insulation.

   To stop this problem from occurring, Philadelphia has interpreted a definition of “Technically Infeasible” found within the IEBC (existing building code), that when low flashings are encountered during a roof replacement project, the thicker R-30 roof insulation requirement does not have to be met, but the new insulation value cannot be less than the existing insulation R-value.

   Some municipalities and counties outside of Philadelphia agree with the Philadelphia code interpretation, and if you encounter low-flashings during a roofing system replacement, you will not have to meet R-30 insulation requirements. However, there are other municipalities and counties outside of Philadelphia that disagree. If you are completing a roof replacement in one of these jurisdictions, the building owner may have the price of the reroofing project significantly increased, doubled or tripled as HVAC units will have to be lifted and new support curbs installed; roof access doors relocated or replaced; masonry through-wall flashings installed; clerestory windows removed and reconstructed; parapet walls raised; etc.; to meet the R-30 insulation requirements

If you are submitting a proposal for a roof replacement in which R-30 insulation is required to be installed and there are low flashings, you should contact the local building code enforcement office to obtain the correct code interpretation in that jurisdiction before submitting a bid.

Note: To obtain a single statewide interpretation of a code section when there are jurisdictional differences in interpretation, generally starts with a code appeal to the local municipality, city, or county Code Compliance Board of Appeals. Eventually, the appeal could be brought before a state’s Uniform Construction Code Appeals Board for a statewide interpretation of the code. Whatever their decision is would then be binding statewide. However, depending on which side of the issue you agree with, whatever the final decision may cause more problems statewide than the appeal was worth.

3) Building Code Interpretations

Department of
Licenses and Inspections
City of Philadelphia

Reference Code(s):
International Building Code
International Energy Conservation Code

In situations where roof insulation thickness increases for greater R-value computations would be detrimental to the existing safety and structural features of the building, such compliance may be considered *technically infeasible* per 2018 IEBC Chapter 2, which states:

- **TECHNICALLY INFEASIBLE.** An alteration of a facility that has little likelihood of being accomplished because the existing structural conditions require the removal or alteration of a load-bearing member that is an essential part of the structural frame, or because other existing physical or site constraints prohibit modification or addition of elements, spaces or features which are in full and strict compliance with the minimum requirements for new construction and which are necessary to provide accessibility.

At this time, the Department considers the items listed below as acceptable "existing physical or site constraints" that would be prohibitive, and therefore *technically infeasible*, to increasing for roof insulation thickness for higher R-value computations:

- Parapet heights and associated flashing limitations,
- Equipment curbs,
- Window sills, and
- Door thresholds

"Technically Infeasible" is defined in the adopted IEBC book definition section. The definition is used in Philadelphia to grant code relief for low flashings and R-30 insulation requirements during Roof Replacement (tear-off) projects.

In these situations of *technical infeasibility*, *roof replacement* work that includes removal and replacement of existing insulation "substrate" shall be permitted to install new insulation entirely above deck of a minimum R-value no less than that which existed prior to the alteration per IECC Section C503.1. This exception shall be limited to *alterations* only. Any work on existing buildings that constitute a *change of occupancy* and there is an increase in demand for fossil fuel or electrical energy shall comply with all provisions of IECC Section C505 and shall not be eligible to cite *technical infeasibility* as identified above.

Answer:

Yes – in general *roof replacements* that include removal of all existing insulation entirely above the roof deck must install new above roof deck insulation that meets the minimum R-value requirements of the IECC as applicable to new construction.

As an exception, *roof replacement* work that encounters existing physical or site constraints that would constitute *technically infeasible* conditions, limited to those listed previously, shall be permitted to install new above roof deck insulation that meets or exceeds the R-value requirements of the existing insulation prior to *alteration*.

3) <u>Building Code Interpretations</u>

2) The IBC (commercial code) and the IRC (residential code) both require roof replacements (tear-offs) when any of several conditions exist. The two most common reasons include: when there are two or more roofing systems on a building or the existing roofing system is not considered a suitable substrate, e.g., water-saturated, for a roof recovery (go-over). Once a tear-off is required for a low-slope-insulated roofing system, the R-30 insulation code requirement must be considered.

There are low-slope insulated roofing systems, such as ballasted and mechanically fastened systems, whose membrane is not attached to the insulation substrate. The membrane is either loose-laid and covered with ballast stone or only fastened in the seams with screws and attachment plates, so the center of the membrane sheet is unadhered. If there is only one roofing system on a building, and an investigation has found the insulation under the roofing membrane to be in good condition, should you install a new roofing system over an unadhered roofing membrane, or should you remove the membrane and then install a new roofing system over the existing insulation substrate?

Philadelphia has issued a code interpretation that a roofing system membrane can be removed from over roof insulation, and as long as the insulation is not being removed, and it is a suitable substrate for a new roofing system membrane, the insulation can remain as the new roofing system's substrate. Thus, new R-30 roof insulation is not required.

<u>Note</u>: This code interpretation would only apply if there is one roofing system on the building and the existing insulation is a suitable substrate, as reroofing code sections in both the IBC and IRC clearly states that when a roof replacement (tear-off) is necessary, all roofing materials, including any existing roof insulation must be removed to the roof deck. This requirement allows an inspection of the roof deck for decay before another roofing system would be installed on the building.

But, building code jurisdictions outside of Philadelphia may have a different code interpretation, that if a low-slope roofing system's membrane is removed from a roof insulation substrate for any reason, even if there is only one roofing system on the building and the insulation is a suitable substrate for a new roofing system recovery (go-over), the project is still considered a roof replacement (tear-off), and the insulation substrate must also be removed. Thus, the installation of new R-30 roof insulation must be considered.

If you are submitting a proposal for a roof recovery (go-over) with only one roofing system on the building and wondering if you should or should not leave a low-slope unadhered roofing system membrane over an existing insulation substrate in place, or remove it and then install a new roofing system, you should contact the local building code enforcement office to obtain the correct code interpretation for that jurisdiction before submitting a bid.

<u>Note</u>*:* To obtain a single statewide interpretation of a code section when there are jurisdictional differences in interpretation*,* generally starts with a code appeal to the local municipality, city, or county Code Compliance Board of Appeals. Eventually, the appeal could be brought before a state's Uniform Construction Code Appeals Board for a statewide interpretation of the code. Whatever their decision is would then be binding statewide. However, depending on which side of the issue you agree with, whatever the final decision may cause more problems statewide than the appeal was worth.

3) Building Code Interpretations

Department of
Licenses and Inspections
City of Philadelphia

Reference Code(s):
International Building Code
International Energy Conservation Code

FAQ:

I am replacing the existing roof covering of a low-slope roof assembly that has existing rigid-insulation entirely above a cast-in-place concrete roof deck. Does the existing insulation now need to meet new 2018 IECC requirements for R- or U-value because the roof covering is being replaced?

Background:

Changing the roof covering of an existing roof assembly which involves the removal of existing roof coverings is considered a *roof replacement*. Alternatively, installing a new roof covering above an existing roof membrane is a *roof recover* – this FAQ pertains to roof replacement only.

Roof replacement is defined under both IBC Section 202 and IECC Section 202 as follows (underline added for emphasis):

- **ROOF REPLACEMENT.** The process of removing the existing *roof covering*, repairing any damaged substrate and installing a new *roof covering*.

When such work is proposed, IBC Section 1511.3 and IEBC 705.3 requires the complete removal of the existing roof coverings. Such removal includes all existing layers of roof coverings to such an extent that the roof "deck" is exposed. Thiswill ensure any new roof covering installation occurs on a structurally sound and appropriate surface otherwise known as the roof "substrate". IBC Section 1511.3 reads:

- **1511.3 Roof replacement.** *Roof replacement* shall include the removal of all existing layers of roof coverings down to the roof deck

The "substrate" identified above may or may not be existing above-deck insulating system. Where such "substrate" is damaged during the process of removal of the existing roof covering then, as the definition of roof replacement states, repairs must be made to ensure adequate support of any new roof covering.

To ensure proper insulation is provided when a roof replacement occurs, IECC Sections C503.1 and C503.3, which regulate alterations in general and roof replacements respectively, must be met and read:

- **C503.1 General.** […] *Alterations* shall be such that the existing *building* or structure is not less conforming to the provisions of this code than the existing *building* or structure was prior to the *alteration*. […].

- **C503.3.1 Roof replacement.** *Roof replacements* shall comply with Section C402.1.3, C402.1.4, C402.1.5 or C407 where the existing roof assembly is part of the *building thermal envelope* and contains insulation entirely above the roof deck.

The definition of *roof replacement* and the Department's interpretation of IBC Section 1511.3, as described above, therefore do not require the removal of existing undamaged substrate. As such, IECC Section C503.3.1 would only apply to work where existing insulation entirely above the roof deck, acting as the "substrate," is removed or damaged and must be replaced during the *roof replacement* process. The new insulation installed to replace existing insulation entirely above the roof deck removed during the *roof replacement* work must now comply with IECC Chapter 4 [CE] requirements as would be applied to new construction – specifically more restrictive R-value requirements.

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