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2020 DIGITAL: SAFETY, INNOVATION & SUSTAINABILITY CONFERENCE

INTRODUCING THE RESIDENTIAL PROVISIONS OF THE 2020 NYCECC

PRESENTED BY

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PRESENTATION DESCRIPTION

This presentation reviews the changes to the residential provisions of the 2016 NYC Energy Conservation Code. This course includes a summary of the substantive changes that will be made in the move from the IECC 2015 to the IECC 2018, the changes made by the New York State Fire Prevention and Building Code Council, the changes made to align with NYSERDA's NYStretch Energy Code-2020, and the local provisions adopted by the NYC Department of Buildings.

AGENDA

1. Code revision and committee process
2. Code revision impact and timeline
3. New provisions adopted from the 2020 ECCCNYS
4. New provisions adopted from the NYSERDA NYStretch Energy Code – 2020
5. New provisions adopted from the NYC Department of Buildings and Advisory Committees
6. Resource & Form Updates
7. Future codes and legislation

Code Revision & Committee Process

DEVELOPMENT OF THE 2020 NYCECC

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NYCECC REVISION PROCESS

- NYS Executive Law: Building & Construction Codes
  - Carve out for municipalities with populations greater than 1 million
- NYS Energy Law: Energy Codes
  - Allows a municipality to have their own code if more stringent than State's code
  - NYC LL 85 of 2009 effective July 1, 2010 established NYC's first Energy code

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NYCECC REVISION PROCESS

- Local Law 32 of 2018
  - DOB must adopt provisions that “bring this code up to date with the most recent model stretch code published by the New York State Energy Research and Development Authority”
  - NYStretch Energy Code- 2020, published in July, 2019, targeted an aggregate energy reduction of 20% compared to ASHRAE 90.1-2013.
    - DOB staff participated in the development of the NYStretch Energy Code- 2020

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NYCECC COMMITTEE PROCESS

- The Energy Code development is supported by two Advisory Committees
  - Two committees: Commercial, Residential
  - Committee members are selected from an open call
- DOB staff proposed changes, Committee members submitted changes for debate (77 Res., 260 Com.)
- Proposed bill includes changes approved by Commissioner La Rocca

Code Revision Impact & Timeline of Adoption

OVERALL IMPACT OF THE 2020 NYCECC

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CHANGES TO THE BASE CODE

- NY State voted to adopt in September and further amended in December 2019
  - 2018 IECC
  - ASHRAE 90.1-2016
- NYC Adopted
  - The NY State Energy Conservation Construction Code
  - Portions of the NYSERDA NYStretch Energy Code 2020
  - Local changes from the DOB Energy Code Committee process
  - Legacy changes from the NYCECC that should be preserved

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OVERVIEW OF THE CHANGES

- Net effect of adopting the 2018 IECC/ASHRAE:
  - Commercial building efficiency increases by about 8%
  - Residential efficiency increases by about 2%
- Net effect of adopting the NYStretch Energy Code 2020:
  - Commercial building efficiency increases by about 5% more than the State code (approximately 13% more than ASHRAE 90.1-2013)
  - Residential efficiency increases by about 19% more than the 2016 NYCECC

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EFFECTIVE DATE

- The NYCECC became effective on May 12, 2020
- DOB issued Buildings Bulletin 002-2020, clarification on when 2020 NYCECC applies to projects
- 2016 ECC may apply if filed prior to May 12, 2020
  - Applications must be "complete" and include the following:
    - Architectural, Structural, Lighting, Energy Analysis
  - Mechanical/Boiler DOB NOW projects OK to file later
    - Approval will not occur until all disciplines reviewed/approved for Energy

NYCECC RESOURCE UPDATES

- Updated Forms
  - TR-8 Form
  - EN-1 Form
- Rules 5000-01, 5000-02, 101-07
- COMcheck (desktop only) & REScheck (desktop & web) – 2020 NYCECC Specific
- Bulletins 007-2020, 008-2020, 009-2020

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NYCECC RESOURCE UPDATES

- Supporting Documents How-to Guide
- Training Modules (in process)
- Available for purchase from ICC
- The integrated Code is available on our website:
  - https://www1.nyc.gov/site/buildings/codes/energy-conservation-code.page

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New Provisions

ADOPTED FROM THE 2020 ECCCNYS

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CHANGES FROM THE 2018 IECC

- Changes in Residential
  - Energy Rating Index scores allow for inclusion of on-site renewables when the envelope is based on IECC 2015 (2016 NYCECC)

New Provisions

ADOPTED FROM THE NYSERDA NYSTRETCH ENERGY CODE – 2020

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CHANGES FROM THE NYSTRETCH CODE

- Major changes for Residential Code
  - All ducts required to be located within conditioned space

Photo Source: US Department of Energy

CHANGES FROM THE NYSTRETCH CODE

- Major changes for Residential Code
  - Requires balanced mechanical ventilation OR
  - Energy or heat recovery ventilation (ERV/HRV) system
  - Design must show supply/exhaust fans, duct work, ERV/HRV
  - Verification testing of ventilation system

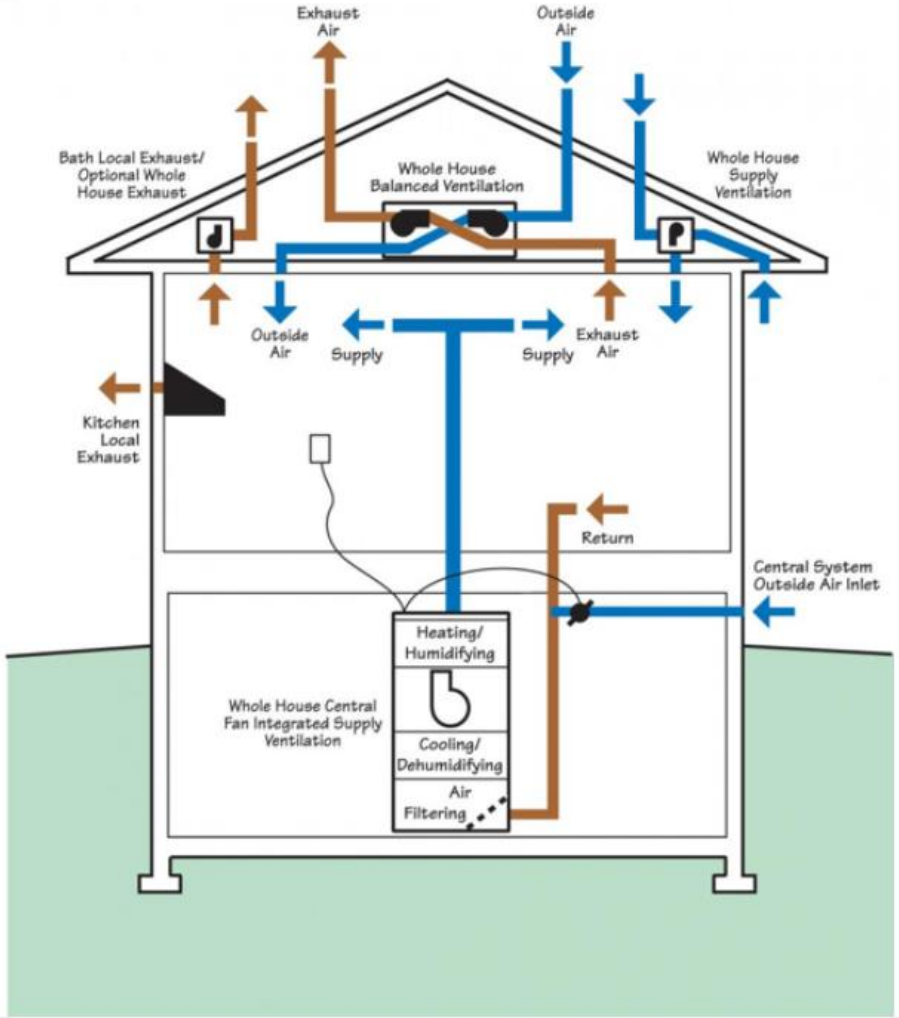

Figure 1. Examples of whole-house and local ventilation systems.

Photo Source: US Department of Energy

CHANGES FROM THE NYSTRETCH CODE

- Major changes for Residential Code
  - Adds hot water supply piping requirements to reduce energy loss
  - One of four required options: pipe volume method, pipe length method, drain water heat recovery, OR demand recirculation pump

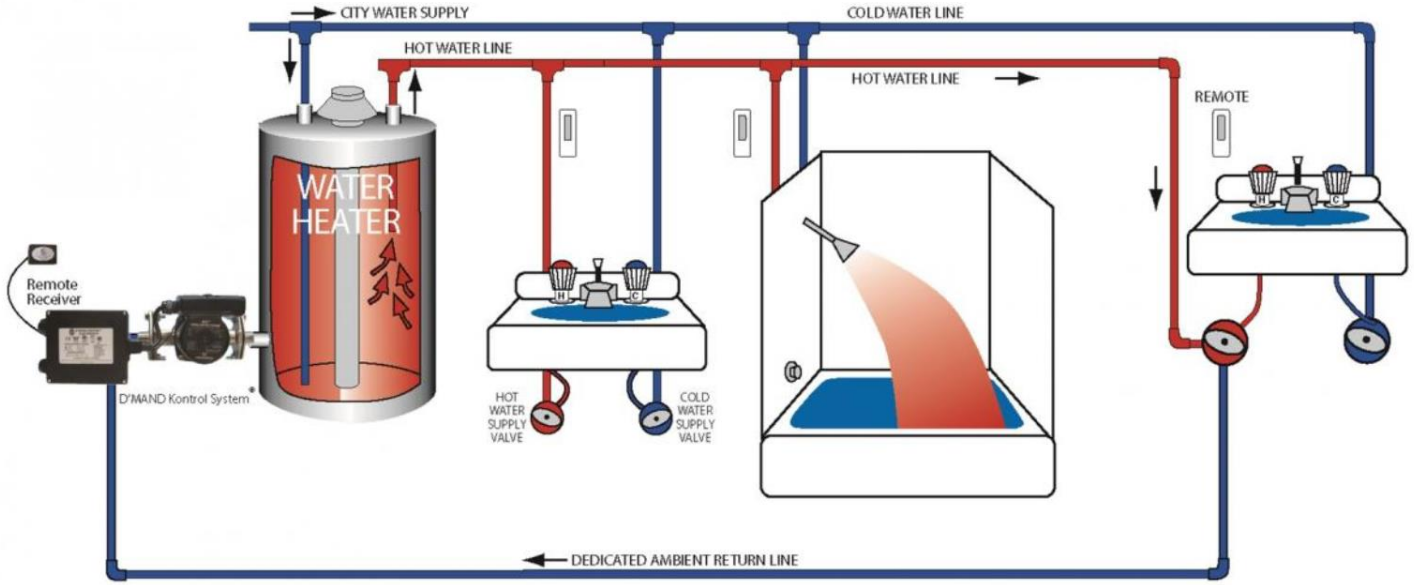

Photo Source: US Department of Energy

CHANGES FROM THE NYSTRETCH CODE

- Major changes for Residential Code
  - Adds hot water supply piping
  - Reduces the ERI Score to 50 from 54 (62 in 2020 ECCCNYS)
  - Removed Solar-Ready Requirements
    - Building Code (LL92/94) now require solar or green roof on all new construction and roof replacements

Photo Source: US Department of Energy

CHANGES FROM THE NYSTRETCH CODE

- Major changes for Residential Code
  - Electric Vehicle Ready requirements for parking located on a building site – includes accessory garages
    - Either 208/240V 40-amp outlet OR
    - Panel capacity and conduit for future installation of outlet
  - Common parking areas require 5% of parking spaces to be EV ready
  - Alterations trigger requirements when parking is created or exists on building site and panel capacity is increased

Photo Source: US Department of Energy

New Provisions

ADOPTED FROM THE NYC DEPARTMENT OF BUILDINGS & ENERGY CODE ADVISORY COMMITTEES

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CHANGES FROM THE CITY

- Single-family homes > 3 stories are considered commercial buildings
- NYC added the following requirements for these buildings
  - Permanent certificate
  - Air leakage testing
  - Balanced ventilation or Energy Recovery

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CHANGES FROM THE CITY

- Changes to Residential Provisions
  - Require documenting certain linear/point thermal bridges in the envelope
  - Align piping insulation requirements between residential and commercial provisions

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NEW THERMAL BRIDGE DOCUMENTATION

- What is a thermal bridge?
  - Highly conductive material that interrupts insulation
  - Area of high heat transfer
  - Greatly affects thermal performance of building envelope
  - The Code doesn't consider the effects of most thermal bridging outside of assemblies
- Why require documentation but no performance requirements?
  - This is a big change for the design community
  - First step (2020 NYCECC) is to require identification of the thermal bridges
  - Next step (2022 NYCECC) is to require that the thermal bridges are calculated correctly in the building assemblies

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NEW THERMAL BRIDGE DOCUMENTATION

(continued)

- What types of projects need to provide this documentation?
  - All new buildings – both commercial and residential
  - All additions to buildings – both commercial and residential
  - Any alteration where the building envelope is part of the scope of work – both commercial and residential

NEW THERMAL BRIDGE DOCUMENTATION

- New requirement: Document 3 types of thermal bridging on plans
- Clear Field Assemblies, Linear and Point Source

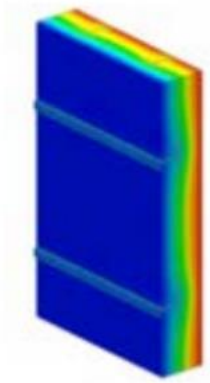


Figure 6: Example clear field assembly

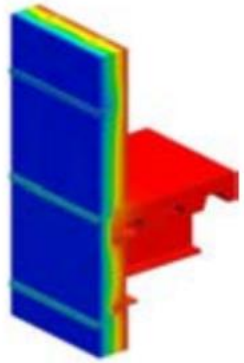


Figure 7: Example linear transmittance of a floor slab detail

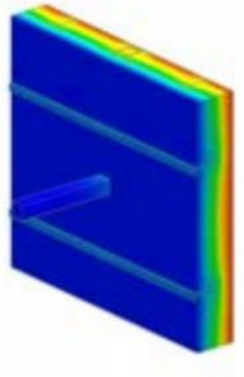


Figure 8: Example point transmittance of a beam penetration detail

NEW THERMAL BRIDGE DOCUMENTATION

- Clear Field Assemblies

1. Clear field thermal bridges are taken into account in the assembly types found in ASHRAE 90.1 Appendix A
2. Assemblies not taking U-factors from ASHRAE Appendix A must be noted as such in the drawings
3. Examples include brick ties, cladding, studs

NEW THERMAL BRIDGE DOCUMENTATION

- Point Thermal Bridges

1. Must be noted as thermal bridge on the drawings - Only when a single point of 12 in^2 or greater (8 in^2 or greater in residential) penetrates the insulation
2. These are not areas associated with HVAC or electrical areas within the building envelope
3. An example is structural beam penetration through insulation

NEW THERMAL BRIDGE DOCUMENTATION

- Linear Thermal Bridges

1. The linear thermal bridges listed in the corresponding table (Table R402.6 or Table C402.6) must be documented in a table including the following items:
   A. Linear thermal bridge type
   B. Total length of each bridge throughout entire thermal envelope
   C. Identification of a relevant detail showing a cross-section through the thermal bridge
   D. Ψ-value for each thermal bridge

NEW THERMAL BRIDGE DOCUMENTATION

- Linear Thermal Bridges *(continued)*

2. The Ψ-value is listed in Table C402.6 or R402.6, but alternate values may be used with proper analysis (i.e. THERM)

3. Examples include shelf angles, slab edges, balconies, parapets, window interfaces

NEW THERMAL BRIDGE DOCUMENTATION

Example Documentation for Linear Thermal Bridge

Linear Thermal Bridge Type	Total Length	Detail Location	Ψ-value
Balcony	260 feet	A-450	0.50
Fenestration Perimeter	1074 feet	A-452	0.32
Shelf Angle	83 feet	A-500	0.41

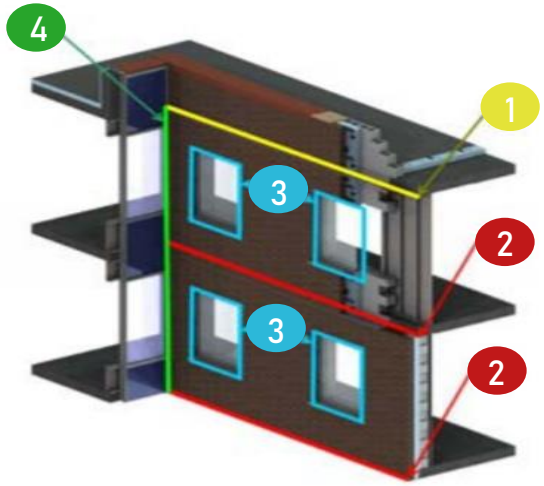
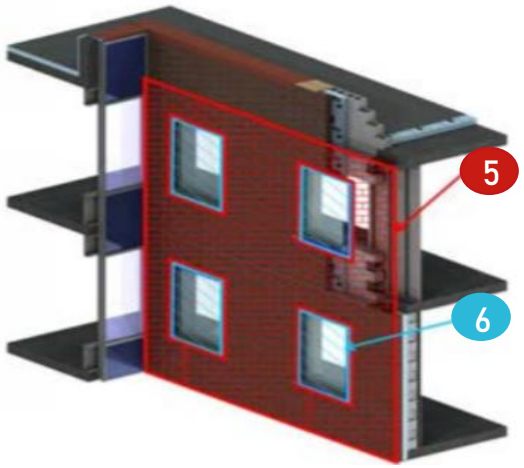


Figure 9: Example building length and area takeoffs

1. Parapet Length
2. Slab Lengths
3. Wall to Window Transition Lengths
4. Corner Length
5. Opaque Brick Wall Ar
6. Glazing Area



Resource & Form Updates

TO ALIGN WITH THE 2020 NYCECC

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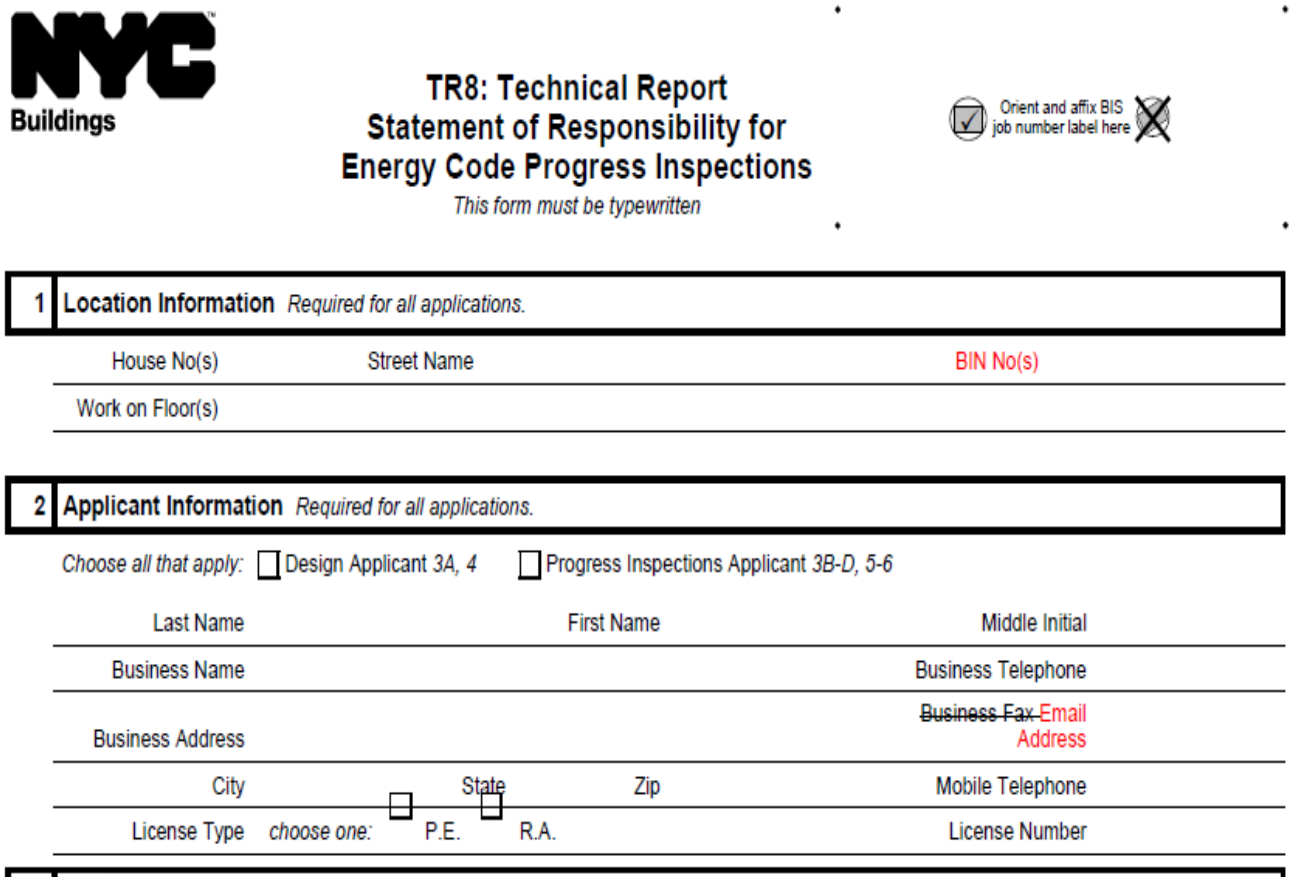
FORM CHANGES: TR8 TECHNICAL REPORT

Changes to TR8 Form (Admin)



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TR8: Technical Report
Statement of Responsibility for
Energy Code Progress Inspections
This form must be typewritten

Orient and affix BIS job number label here

1 Location Information *Required for all applications.*

House No(s) | Street Name | BIN No(s)

Work on Floor(s)

2 Applicant Information *Required for all applications.*

Choose all that apply: ☐ Design Applicant *3A, 4* ☐ Progress Inspections Applicant *3B-D, 5-6*

Last Name | First Name | Middle Initial

Business Name | Business Telephone

Business Address | ~~Business Fax~~ Email Address

City | State | Zip | Mobile Telephone

License Type *choose one:* ☐ P.E. ☐ R.A. | License Number

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FORM CHANGES: TR8 TECHNICAL REPORT

Changes to TR8 Form (Envelope)

- Remove loading dock weather seals
- Add new inspection, 'Air barrier continuity plan testing'

Y	N	Progress Inspections	Table Reference in 1RCNY §5000-01(h) (1)and (2)
☐	☐	Protection of exposed foundation insulation	(IA1), (IIA1)
☐	☐	Insulation placement and *R*-values	(IA2), (IIA2)
☐	☐	Fenestration and door *U*-factor and product ratings	(IA3), (IIA3)
☐	☐	Fenestration air leakage	(IA4), (IIA4)
☐	☐	Fenestration areas	(IA5), (IIA5)
☐	☐	Air ~~sealing and insulation—visual~~ barrier — visual inspection	(IA6), (IIA6)
☐	☐	Air ~~sealing and insulation—testing~~ barrier — testing	(IA7), (IIA7)
☐	☐	~~Loading dock weather seals~~	~~(IIA8)~~
☐	☐	Air barrier continuity plan testing	(IIA8)
☐	☐	Vestibules	(IIA9)

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FORM CHANGES: TR8 TECHNICAL REPORT

Changes to TR8 Form (HVAC)

- Add new inspection for mandatory residential ventilation
- Desegregate piping requirements and duct requirements
- Service water heating piping design now in IB5/IIB5
- Duct leakage testing no longer stand-alone testing requirement

☐ ☐	Fireplaces	(IB1), (IIB1)
☐ ☐	Ventilation and air distribution system	(IB2)
☐ ☐	Shutoff dampers	(IIB2)
☐ ☐	HVAC-R and service water heating equipment	(IB3), (IIB3)
☐ ☐	HVAC-R and service water heating system controls	(IB4), (IIB4)
☐ ☐	HVAC-R and service water piping design and insulation ~~and sealing~~	(IB5), (IIB5)
☐ ☐	Duct leakage testing, insulation and design	(IB6), (IIB6)

FORM CHANGES: TR8 TECHNICAL REPORT

Changes to TR8 Form (lighting/power)

- Change wording of 'electrical energy consumption' to incorporate all metering requirements
- Elevators lumped together with electrical motor inspection
- Remove solar ready and replace with electric vehicle ready

☐ ☐	~~Electrical energy consumption~~ Metering	(IC1), (IIC1)
☐ ☐	Lighting in dwelling units	(IIC2)
☐ ☐	Interior lighting power	(IC2), (IIC3)
☐ ☐	Exterior lighting power	(IIC4)
☐ ☐	Lighting controls	(IIC5)
☐ ☐	Electrical motors and elevators	(IIC6)
☐ ☐	Maintenance information	(ID1), (IID1)
☐ ☐	Permanent certificate	(ID2)
☐ ☐	~~Solar ready~~ Electric vehicle service equipment requirements	(ID3)

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The NYCECC of the Future

OTHER LEGISLATION AFFECTING THE ENERGY CODE

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NYCECC OF THE FUTURE

- Local Law 32 of 2018
  - Mandates that we adopt the next version of the NYStretch Code, if it exists, in 2022
  - Requires that the 2025 Code set absolute limits on energy consumption in buildings 25,000 sq. ft. and greater, based on a to-be-determined metric (such as energy use intensity, or EUI, or carbon)

NYCECC OF THE FUTURE

- Local Law 97 of 2019
  - Sets Greenhouse Gas emission caps on existing buildings beginning in 2024
  - Caps will reduce over time to require deep-energy retrofits of all buildings 25,000 sq. ft. and greater, based on their occupancy
- Future legislation is expected to target net-zero performance for all new buildings by 2030

THANK YOU!

For further technical questions, email
energycode@buildings.nyc.gov

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