

NYCECC ADMINISTRATIVE OVERVIEW

2011 New York City Energy Conservation Code
Effective December 28, 2010



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We also wish to acknowledge the support of Mayor Bloomberg and the New York City Council who created PlaNYC 2030, with a goal of reducing New York City's carbon emissions by 30% by 2030, from 2005 levels.

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This training module was developed by:

Viridian | Energy &
Environmental, LLC

Welcome to the New York City Department of Buildings Energy Code Training Modules!

This **ADMINISTRATIVE OVERVIEW** Module addresses:

- ❑ Current Laws, Rules, and Bulletins related to the 2011 NYCECC;
- ❑ Applicability of the 2011 NYCECC;
- ❑ Methods of Compliance;
- ❑ NYC DOB Energy Code Submission Requirements; and
- ❑ NYC DOB Progress Inspection Requirements.

This module provides an overview of the use and applicability of the 2011 NYCECC. Technical issues related to NYCECC compliance, plus additional examples of NYCECC documentation, are included within the Envelope, HVAC (1&2), Lighting, and Residential Energy Code Training Modules in this series.

- The **ADMINISTRATIVE OVERVIEW** Module has been divided into a number of smaller sub-topics. These can be accessed either in-sequence or out-of-sequence through links in the Main Menu slide.
- Each sub-topic begins with a brief overview of the issues to be reviewed, and many end with a set of summary questions.
- Many of the sub-topics are organized in a Q & A format. Code-related questions are posed at the top of a slide, with answers provided below, or in the following sequence of slides.



The **NYC Buildings** logo takes you to the NYCECC 2011 Training Modules home page.



The **Menu** icon takes you to the main menu page within each module.



The **Attention** icon brings up Callouts with key points and additional information.



The **Links** icon takes you to related DOB web pages or other resources.



The **Documentation** icon addresses DOB documentation issues and requirements.



The **Inspection** icon addresses DOB Progress Inspection issues and requirements.



The **Code Reference** icon refers to relevant Code sections.





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The slides are enhanced with special icons that will help to focus on key points, or serve as links to external resources. The Attention icon brings up Callouts (like this one) with key points and additional information.



The **Documentation** icon add



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The main menu slide is interactive; clicking on each line item will take you to the respective sub-module. Use this feature to navigate throughout the presentation. The menu icon at the bottom right corner of each slide will always bring the you back to the main menu slide.



In this section you will learn about:

- ❑ What's driving the recent changes to the NYCECC;
- ❑ Key changes and additions in the 2011 NYCECC;
- ❑ Current NYC Local Laws affecting Energy Code compliance; and
- ❑ Current Rules and Bulletins affecting Energy Code compliance.

City-wide Focus on Energy and Greenhouse Gas (GHG) Reductions

- Mayor Bloomberg's PlaNYC (2007) 
 - ▶ Targets 30% Reductions in GHG by 2030
 - ▶ Local Laws were enacted, including: 
 - » LL 84 of 2009 – Benchmarking Energy & Water Use
 - » LL 85 of 2009 – Established the 2009 NYCECC
 - » **LL1 of 2011 – Established the current 2011 NYCECC**
 - » LL 87 of 2009 – Audits & Retro-Commissioning
 - » LL 88 of 2009 – Lighting Upgrades / Sub-meters



Federal Mandates

- American Recovery & Reinvestment Act (ARRA) Funding
 - ▶ Requires States to enact Energy Codes equivalent to IECC 2009 and ANSI/ASHRAE/IESNA 90.1-2007
 - ▶ Requires States to achieve 90% Energy Code compliance by 2017



ARRA
American Recovery and Reinvestment Act of 2009

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Federal Mandates

- American Recovery & Reinvestment Act (ARRA) Funding
 - ▶ Requires States to enact Energy Codes equivalent to IECC 2009 and ANSI/ASHRAE/IESNA 90.1-2007
 - ▶ Requires States to achieve 90% Energy Code compliance by 2017

In receiving ARRA funding, New York State agreed to meet the federal mandate of achieving Energy Code compliance in 90% of new and renovated building space by 2017.



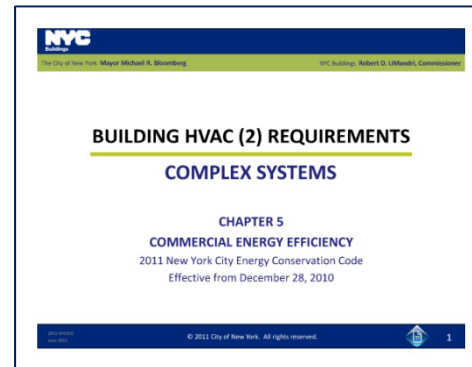
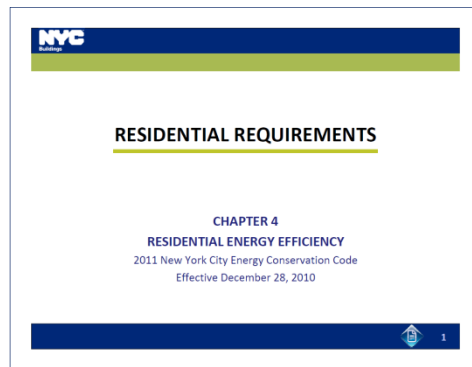
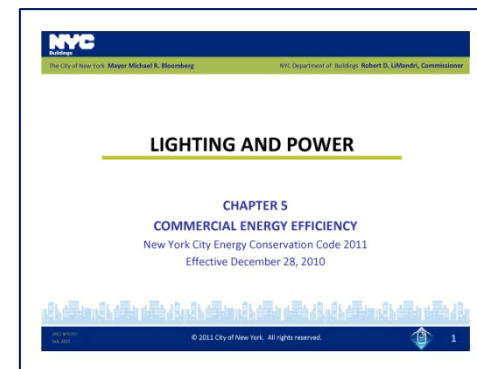
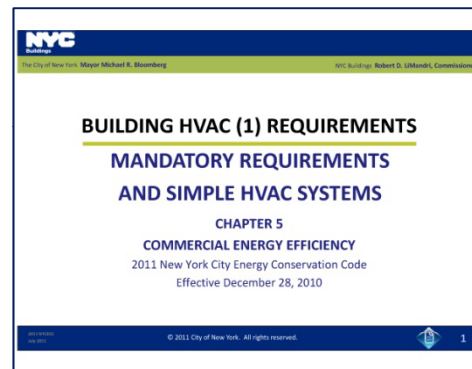
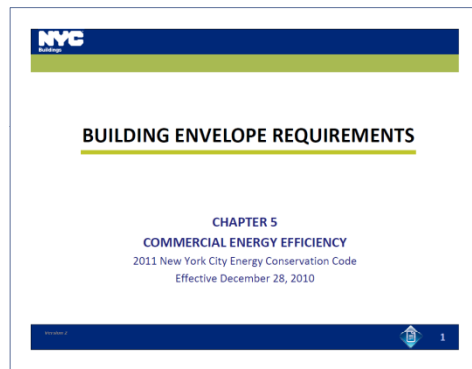
Simplified, Streamlined & More Comprehensive

- ❑ **ALL** new buildings, renovations, alterations & repairs are required to comply
- ❑ Climate zone classifications are simplified
 - ▶ Single zone for all NYC boroughs, both residential & commercial (Zone 4A)
- ❑ Commercial building definition (Group R) expanded
 - ▶ Now includes Group R-3 over 3 stories
- ❑ Commercial projects can use ASHRAE 90.1-2007 as an alternative path to NYCECC Chapter 5, though it must be used for **ALL** disciplines:
 - ▶ Envelope, Mechanical Systems, Service Water Heating, Electric Power & Lighting
 - ▶ Chapters 1, 2, 3, & 6 of the NYCECC apply in either approach



Simplified, Streamlined & More Comprehensive

- Additional topic-specific updates are addressed in the following DOB NYCECC training modules:



Local Law 1 of 2011



- ❑ Establishes the **2011 NYCECC** based on the **2010 ECCCNY**
- ❑ Went into effect December 28, 2010

Local Law 85 of 2009 (superseded in entirety by LL1/2011)

- ❑ Established the **2009 NYCECC** based on the **2007 ECCCNY**
- ❑ Removed exemptions for envelope additions, alterations and repairs that affect less than 50% of a system
- ❑ Established NYCECC documentation requirements
- ❑ Went into effect July 1, 2010



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Energy Conservation Construction
Code of New York State

Local Law 85 of 2009 (superseded in entirety by LL1/2011)

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Local Law 48 of 2010



- ❑ Amends Section 505 of the NYCECC
- ❑ Adds Appendix A amending ASHRAE 90.1/2007, Section 9
 - ▶ Shutoff-only occupancy sensors now required for:
 - » Classrooms (excluding shop, laboratory, or preschool classrooms)
 - » Conference/meeting rooms
 - » Employee lunch and break rooms
 - » Offices smaller than 200 SF (unless the offices have lighting controlled with photo-sensor)

1 RCNY §5000-01



- ❑ Defines Energy Code submission procedures
- ❑ Defines the requirements for project progress inspections in the construction drawings

1 RCNY §101-07



- ❑ Requirement that owner retain progress inspector(s)
- ❑ Defines general sampling rate of inspections
 - ▶ **15%** of each relevant construction item in the scope of work, unless otherwise noted in 1 RCNY §5000-01, or required by progress inspector
- ❑ Defines authority and responsibilities of the progress inspector
- ❑ Addresses additional Energy Code verification issues

These issues include:

- Phased inspection for temporary certificates of occupancy;
- Phased inspection controls; and
- Lighting power densities.



Buildings Bulletin 2010–031

- Outlines conditions under which an addition, alteration, renovation, or repair to an **HVAC or service hot water system** may not be required to comply with the Energy Code.

Buildings Bulletin 2010–032

- Outlines conditions under which an addition, alteration, renovation, or repair to a **lighting or electrical power system, or control equipment**, may not be required to comply with the Energy Code.

Buildings Bulletin 2011–015

- Outlines conditions under which an addition, alteration, renovation, or repair to a **building envelope** may not be required to comply with the Energy Code.



Photo: Comstock / Jupiter Images

In this section you will learn about:

- DOB terminology related to NYCECC applicability, including:
 - ▶ Differences among Code, Rules, and Bulletins
 - ▶ Differences between Exemptions and Exceptions
 - ▶ Differences in applicability for New Construction, Additions, Alterations, Renovations, and Repairs
- Applicable Chapters of the NYCECC for different building types

The Code:

- ❑ The NYCECC is law.
- ❑ It applies to all buildings, new and existing, unless explicitly stated otherwise.

Rules:

- ❑ Rules are prepared by the DOB to implement the Code.
- ❑ Rules must go through a formal administrative public comment process.
- ❑ Rules have the force of law.

Bulletins:

- ❑ Bulletins are issued by the DOB, in part to clarify interpretations of the codes.
- ❑ They may change more frequently than laws or rules.

The DOB website is always updated to reflect all changes to laws, rules and bulletins. Check the website frequently.

Exemptions:

- ❑ Exemptions define specific building types or building elements that are not required to meet the Code, and are addressed in the PW1 form when they constitute the entire application.
- ❑ The following are the **only** allowed exemptions to the NYCECC:
 - ▶ Historic buildings (per NYCECC 101.4.2, §5000-01)
 - » National-or State-designated historic buildings
 - » Buildings certified as contributing buildings within a National or State historic district
 - » Buildings certified as eligible for the designations above
 - » City level certification does not qualify for exemptions
 - ▶ The envelopes of low-energy buildings (buildings with peak design rate of energy use <3.4Btu/h/SF, or unconditioned buildings)
 - ▶ Temporary buildings under §28-111 and §BC 3203
 - ▶ The following work types, which are categorized as not affecting energy use:
 - » FA (fire alarm), FP (fire suppression in a range hood), SD (standpipe), SP (sprinklers), FS (fuel storage), EQ (construction equipment), CC (curb cut), OT/BPP (Builder's Pavement Plan), OT/FPP (Fire Protection Plan)



Exceptions:

- ❑ Exceptions are conditions under which specific provisions of the Code may not be required.
 - ▶ Many exceptions are defined under Chapter 4 and Chapter 5 NYCECC . These types of exceptions typically define NYCECC “alternates”; i.e., a system requirement may not be required if other alternative measures are incorporated.

- ❑ Exceptions specifically applicable to Alterations are defined in Chapter 1 NYCECC §101.4.3
 - ▶ These apply only if they do not result in increased energy use of the building.

- ❑ Clarifications of potential exceptions in additions, alterations/renovations, and repairs are provided in Building Bulletins 2010–031, 2010-032, and 2011–015



Exemptions, exceptions and other conditions relieved from compliance by Section NYCECC 101.4.3 must be identified in the submitted Energy Analysis, with citations to Code, 1 RCNY §5000-01 and/or Bulletins provided.

2. Code Applicability

New Buildings

- ❑ All must comply via Prescriptive or Performance-Based Approaches (see topic 3 of this module)
- ❑ Only exemption is for envelope in low-energy/unconditioned buildings

Additions

- ❑ Must comply as a stand-alone addition or with the building as a single entity

Alterations / Renovations

- ❑ Only applies to scope of alteration work; unaltered portions are not required to comply
- ❑ Some exceptions may apply (per Bulletins)

Repairs

- ❑ Technically applies even if a permit is not required (e.g., window or roof replacements or repairs)



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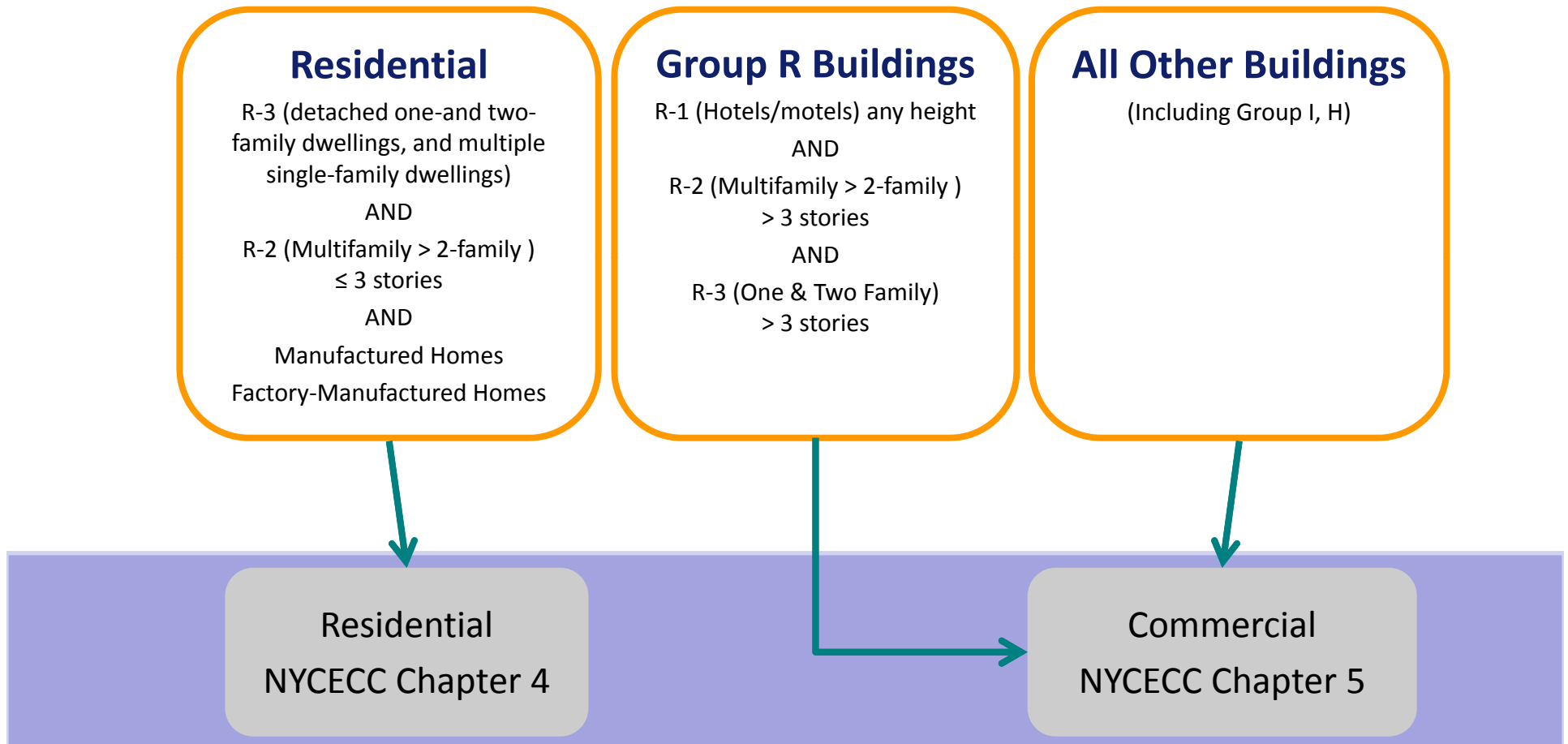
For example, where an alteration, renovation or repair involves replacement of over 50% of the existing luminaires, the entire scope of work must meet the current NYCECC lighting provisions, as applicable.

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Code: 2010 New York Energy Conservation Construction Code

169 E. 99th Street Report.pdf - Adobe Acrobat

Component	Assembly	Concrete Density	Construction Details	Gross Area	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor
1 Building									
2 Roof 1	Non-Wood Joist/Rafter/Truss								
3 Skylight 1	Metal Frame, Double Pane			6112 ft ²	40.0	0.0	0.033		
4 Exterior Wall 1	Solid Concrete:8" Thickness	Medium Weight	Glazing: Tinted	112 ft ²			0.500	0.80	
5 Door 1	Glass		Furring: Metal	6000 ft ²	11.0	10.0	0.065		
6 Window 1	Metal Frame, Double Pane with Low-E		Type: Entrance	42 ft ²			0.500	0.30	0.00
7 Window 2	Metal Frame, Double Pane		Glazing: Tinted	1500 ft ²			0.600	0.63	0.00
8 Door 2	Insulated Metal		Glazing: Clear	56 ft ²			0.700	0.72	0.00
9 Door 3	Insulated Metal		Non-Swinging	288 ft ²			0.140		
10 Exterior Wall 2	Solid Concrete:8" Thickness	Medium Weight	Swinging	40 ft ²			0.200		
11 Exterior Wall 3	Solid Concrete:8" Thickness	Medium Weight	Furring: Metal	6000 ft ²	11.0	10.0	0.065		
12 Exterior Wall 4	Steel-Framed, 24" o.c.	Medium Weight	Furring: Metal	6000 ft ²	11.0	10.0	0.065		
13 Floor 1	Slab-On-Grade:Unheated		Insulation: Vertical, 2 ft	180 ft ²	19.0	0.0	0.094		

Envelope PASSES: Design 2% better than Code

Envelope +2% Interior Lighting +14% Exterior Lighting +44%

COMcheck Software Version 3.8.1
Envelope Compliance Certificate

2010 New York Energy Conservation Construction Code

Section 1: Project Information

Project Type: New Construction
Project Title: 169 E. 99th Street
Construction Size: 169 E. 99th Street
New York, NY

Section 2: General Information

Building Location (for weather stat): New York, New York
Climate Code: ASHRAE 90.1-2005
Building Type for Envelope Requirements: Non-Residential
Vertical Glazing % Wall Area Pct: 2%
Skylight Glazing % Roof Area Pct: 2%

Section 3: Requirements Checklist

Envelope PASSES: Design 2% better than Code

Climate-Specific Requirements:

Component Name/Description	Spec. New #1	Code Allowance	Cost \$/sq ft	Req'd \$/sq ft	Project \$/sq ft	Budget \$/sq ft
Roof 1: Non-Wood Joist/Rafter/Truss	112	112	0.0	0.000	0.000	0.000
Skylight 1: Metal Frame, Double Pane, Tinted, SHGC 0.40	112	112	0.000	0.000	0.000	0.000
Exterior Wall 1: Solid Concrete 8" Thickness, Medium Density	6000	6000	0.000	0.000	0.000	0.000
Furring: Metal	6000	6000	0.000	0.000	0.000	0.000
Door 1: Glass, Entrance Door, SHGC 0.30	42	42	0.000	0.000	0.000	0.000
Window 1: Metal Frame, Double Pane with Low-E, Tinted, SHGC 0.30	42	42	0.000	0.000	0.000	0.000
Window 2: Metal Frame, Double Pane, Clear, SHGC 0.72	1500	1500	0.000	0.000	0.000	0.000
Door 2: Insulated Metal, Non-Swinging	56	56	0.000	0.000	0.000	0.000
Door 3: Insulated Metal, Swinging	288	288	0.000	0.000	0.000	0.000
Exterior Wall 2: Solid Concrete 8" Thickness, Medium Density	6000	6000	0.000	0.000	0.000	0.000
Furring: Metal	6000	6000	0.000	0.000	0.000	0.000
Exterior Wall 3: Steel-Framed, 24" o.c.	6000	6000	0.000	0.000	0.000	0.000
Furring: Metal	6000	6000	0.000	0.000	0.000	0.000
Floor 1: Slab-On-Grade, Unheated, Vertical 2 ft	180	180	0.000	0.000	0.000	0.000

All Budget Values are based on software default assumptions ONLY and are not code requirements.

Air Leakage, Component Certification, and Vapor Retarder: Require results.

1. All joints and penetrations are checked against weather stripping or alternative sealing.

2. Windows, doors, and skylights are checked against leakage requirements.

Project Title: 169 E. 99th Street
Data Location: C:\Documents and Settings\jacob@nycecc.com\Documents\COMcheck\169 E. 99th Street
Report Date: 7/11/11

In this section you will learn about:

- ❑ Mandatory Provisions of the NYCECC;
- ❑ Prescriptive Versus Performance-based Compliance Paths; and
- ❑ Using the ANSI/ASHRAE/IESNA Standard 90.1-2007 Instead of NYCECC Chapter 5.

3. Methods of Compliance

Mandatory Requirements

May include design features & construction practices

NOT subject to Trade-offs



Prescriptive or Performance Targets

Minimum criteria apply at the component, system, or whole building level

Trade-offs allowed, depending on compliance path

Requirements Common to all Compliance Paths

**Compliance Paths:
Prescriptive / Trade-off /
Performance-based**

3. Methods of Compliance

Mandatory Requirements

May include design features & construction practices

NOT subject to

Requirements to all Compliance



Prescriptive or Performance Targets

Minimum criteria apply at the component, system, or whole building level

Allowed, depending on compliance path

**Compliance Paths:
Prescriptive / Trade-off / Performance-based**

It is important to understand the basic structure of the Energy Code.

Mandatory requirements are defined throughout Chapters 4 and 5 of the NYCECC, and are not subject to any type of Trade-off.

Additional NYCECC provisions can be satisfied through Prescriptive compliance, Trade-offs, or a Performance-based approach.

The following slides describe each type of NYCECC provision in more detail.





Residential (NYCECC Chapter 4)

- ❑ Air Sealing
 - ▶ Air tightness of the envelope shall be verified by either:
 - » Building testing (e.g. blower door), or
 - » Visual inspections during construction
- ❑ Systems
 - ▶ Programmable thermostats per dwelling unit
- ❑ Lighting and Electrical
 - ▶ At least 50% of lamps in permanently installed fixtures shall be high-efficacy
 - ▶ Separately meter individual dwelling units

Envelope (NYCECC Chapter 5)

- ❑ Air Leakage
 - ▶ Includes provisions for:
 - » Maximum allowable leakage of window, storefront, curtainwall, and door assemblies
 - » Continuous air barriers
 - » Outdoor air intakes and exhaust openings
 - » Loading dock weatherseals
 - » Vestibules
 - » Recessed lighting





Electrical Power / Lighting (NYCECC Chapter 5)

- ❑ Lighting Controls
 - ▶ Areas enclosed by walls or floor-to-ceiling partitions must have at least one manual control
 - ▶ Areas required to have a manual control shall also allow the occupant to reduce the connected lighting load by at least 50%
- ❑ Exit Signs
 - ▶ Internally illuminated exit signs shall not exceed 5 watts per side
- ❑ Electrical Energy Consumption
 - ▶ Residential buildings shall make provisions to separately meter individual dwellings

HVAC (NYCECC Chapter 5)

- ❑ Provisions for all systems include:
 - ▶ Minimum Heating & Air Conditioning equipment efficiencies
 - ▶ Thermostatic controls, including setback capabilities
 - ▶ Pipe insulation and duct insulation/sealing
 - ▶ When specific building conditions exist:
 - » Demand Control ventilation
 - » Energy Recovery ventilation systems



3. Methods of Compliance

Options:

2011 NYCECC offers three compliance methods:

1. Prescriptive

- ▶ Through summary tables and other listed provisions

2. Trade-off

- ▶ For envelope assemblies through U-Factor approach or REScheck /COMcheck

3. Performance-based

- ▶ Through energy modeling

Code also allows use of the ANSI/ASHRAE/IESNA 90.1-2007 standard (“ASHRAE 90.1”) as an alternative to NYCECC Chapter 5

- ▶ ASHRAE 90.1 also offers Prescriptive, Trade-off & Performance Paths

Pros

- Typically the simplest approach to demonstrate compliance

Cons

- Lack of flexibility - Each space, assembly or piece of equipment must meet or exceed the prescribed criteria
- The level of stringency of some prescriptive criteria may create design challenges
 - ▶ Example:
Prescribed Interior Lighting Power densities (based on Building Area Type) may be challenging for projects with a high percentage of conference rooms or other specialty spaces with higher lighting requirements.

Interior Lighting Power Allowances	
Lighting Power Density	
Building Area Type	(W/ft ²)
Convention Center	1.2
Dining: Cafeteria /Fast Food	1.4
Gymnasium	1.1
Office	1.0
Retail	1.5
Parking Garage	0.3

Partial Listing of prescriptive interior lighting power allowances

(from NYCECC Table 502.5.2)

Pros

- ❑ Level of Effort: Simple to Moderate
- ❑ Prerequisites:
 - ▶ Window to Wall area Ratio $\leq 40\%$
 - ▶ Skylight to Roof area Ratio $\leq 3\%$
- ❑ Compliance is demonstrated through a U-Factor-based “Total UA” approach
 - ▶ Weighted average value per component type is allowed
 - » Example: Non-compliance in one roof assembly can be compensated for by using more insulation in another roof assembly
- ❑ If REScheck or COMcheck is used, Trade-offs can be performed among different envelope components (roofs, walls, fenestration)

Cons

- ❑ U-Factor calculations can become complex in some assembly types, such as metal buildings

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The “UA” approach involves multiplying the U-Factor of a building assembly (such as a wall or roof type) by the area of that assembly. When multiple assemblies are used in a project, a weighted average of the “UA” of each assembly type can be calculated to demonstrate overall compliance with the NYCECC.

Cons

- ❑ U-Factor calculations can become complex for metal buildings

There are some limitations to the Trade-off approach. In residential construction, an applicant cannot exceed maximum allowed U-factors for vertical fenestration (0.48) or skylights (0.75) in Zone 4.

169 E. 99th Street.cck - COMcheck 3.8.1 Code: 2010 New York Energy Conservation Construction Code

File Edit View Options Code Help

Project Envelope Interior Lighting Exterior Lighting Mechanical

Roof Skylight Ext. Wall Window Door Basement Floor

	Component	Assembly	Concrete Density	Construction Details	Gross Area or Slab Perimeter	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor
Building										
1	Roof 1	Insulation Entirely Above Deck			6112 ft2		15.0	0.063		
2	Skylight 1	Metal Frame, Double Pane		Glazing: Tinted	112 ft2			0.500	0.80	
3	Exterior Wall 1	Solid Concrete:8" Thickness	Medium Weight	Furring: Metal	6000 ft2	13.0	10.0	0.059		
4	Door 1	Glass		Type: Entrance	42 ft2			0.750	0.45	0.00
5	Window 1	Metal Frame with Thermal Break:Double...		Glazing: Clear	1500 ft2			0.410	0.31	0.00
6	Window 2	Metal Frame with Thermal Break:Double...		Glazing: Clear	56 ft2			0.460	0.31	0.00
7	Door 2	Insulated Metal		Non-Swinging	288 ft2			0.500		
8	Door 3	Insulated Metal		Swinging	40 ft2			0.420		
9	Exterior Wall 2	Solid Concrete:8" Thickness	Medium Weight	Furring: Metal	6000 ft2	13.0	10.0	0.059		
10	Exterior Wall 3	Solid Concrete:8" Thickness	Medium Weight	Furring: Metal	6000 ft2	13.0	10.0	0.059		
11	Exterior Wall 4	Steel-Framed, 24" o.c.			1000 ft2	13.0	10.0	0.052		
12	Floor 1	Slab-On-Grade:Unheated		Insulation: None	180 ft					

Envelope PASSES: Design 4% better than Code

Envelope **+4%** Interior Lighting **+14%** Exterior Lighting **+44%**

Click the Assembly fields to display a list of assembly choices.



In this non-residential COMcheck example, the roof insulation R-Value is below the prescriptive requirement of R-20; however overall envelope compliance has been achieved through improved performance of the exterior walls, windows, and doors.

Approach:

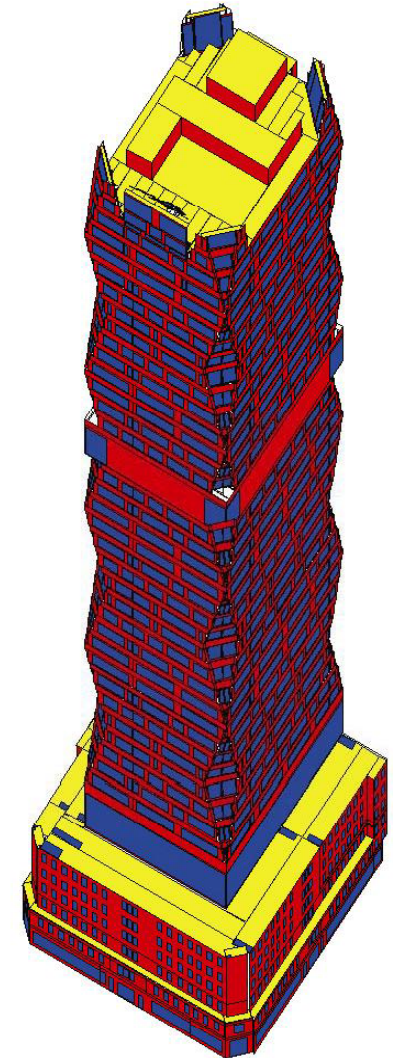
- Energy Modeling, per Section NYCECC 506 or the Energy Cost Budget Method from ASHRAE 90.1, is used to demonstrate that:

Total Annual Energy Cost of the Proposed Building Design

is less than or equal to

Total Annual Energy Cost of the Budget Building Design

- For residential buildings, the Simulated Performance Alternative (Section NYCECC 404) can potentially be used, but must be approved in advance by the DOB Commissioner.
 - ▶ Home energy software programs must also be approved by both the Secretary of State of New York State and the DOB Commissioner. (DOE2-based software has such approval.)

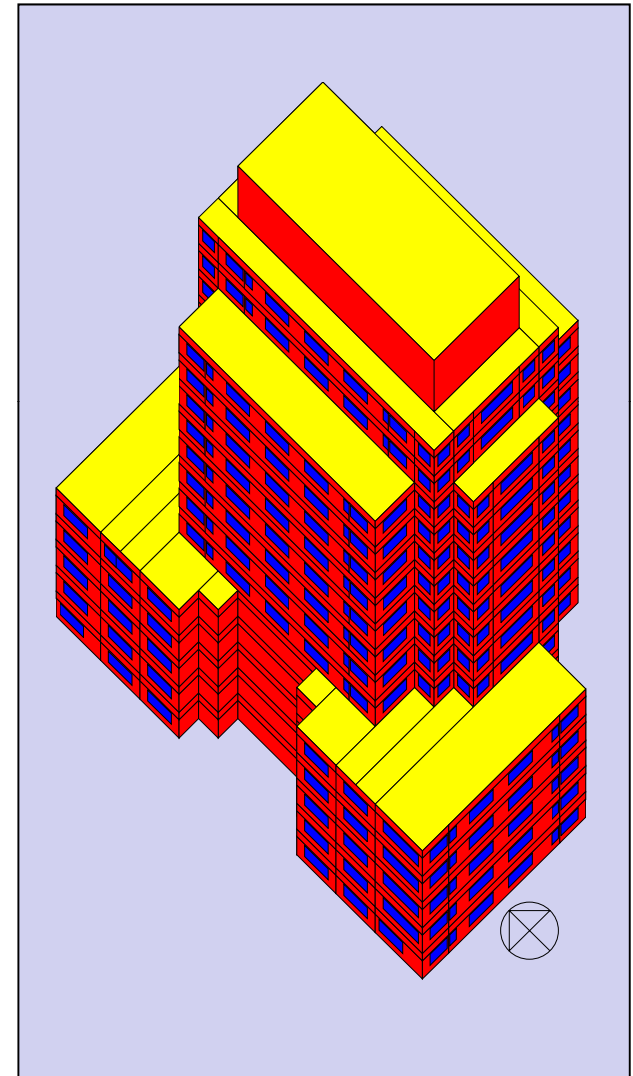


Pros

- ❑ The most flexible approach
 - ▶ Aspects of the design which do not meet Prescriptive criteria (other than Mandatory provisions) can be Traded-off against measures that exceed Code criteria

Cons

- ❑ Level of effort is high, with associated costs
- ❑ The learning curve for energy modeling is steep
 - ▶ Modeling is often performed by consulting engineers or specialized consultants





Sample Scenarios

- ❑ Fenestration area exceeds 40% of wall or 3% of roof
- ❑ Project exceeds prescriptive interior Lighting Power Densities
- ❑ Project is making Trade-offs among disciplines (e.g., envelope, lighting, HVAC)
- ❑ Project is pursuing a LEED rating, and requires energy modeling
- ❑ Project is pursuing energy-efficiency rebates (e.g., NYSERDA, Con Edison), and requires energy modeling for those programs





Applicability:

- ASHRAE 90.1 is an approved alternative to Chapter 5 of the NYCECC
- If used, **ASHRAE 90.1 must be followed and applied in its entirety**
 - ▶ Applicants cannot mix compliance of one discipline in the NYCECC with another discipline in ASHRAE-90.1
- Prescriptive, Trade-off, or Performance-based paths can be used





Potential Reasons to Use ASHRAE 90.1:

- A space-by-space lighting approach is allowed
 - ▶ May result in higher lighting power density allowances versus the Building Area method of the NYCECC
- Skylight requirements are more lenient
 - ▶ Area can be up to 5% to stay in Prescriptive / Trade-off method instead of 3% in NYCECC
 - ▶ U-Factor requirements are more lenient for commercial buildings
- Shading devices in ASHRAE have more options – partial opaque materials and multiple Projection Factors
- ASHRAE 90.1 is more commonly used than the NYCECC for performance-based modeling
- Programs such as LEED, NYSERDA rebates, and federal tax credits are based on ASHRAE 90.1





More Extensive Mandatory Provisions:

- Power, Section 8.4, has maximum voltage drop requirements for main feeders (2%) and branch circuits (3%)

ASHRAE 90.1 does include some provisions that are not included in the NYCECC. If an applicant uses ASHRAE 90.1 for compliance, they must meet all provisions of the standard, including mandatory provisions.

One key mandatory provision in 90.1 involves maximum voltage drops for main feeders and branch circuits. These requirements may result in heavier-gauge feeders, which could add significant costs to certain project types.



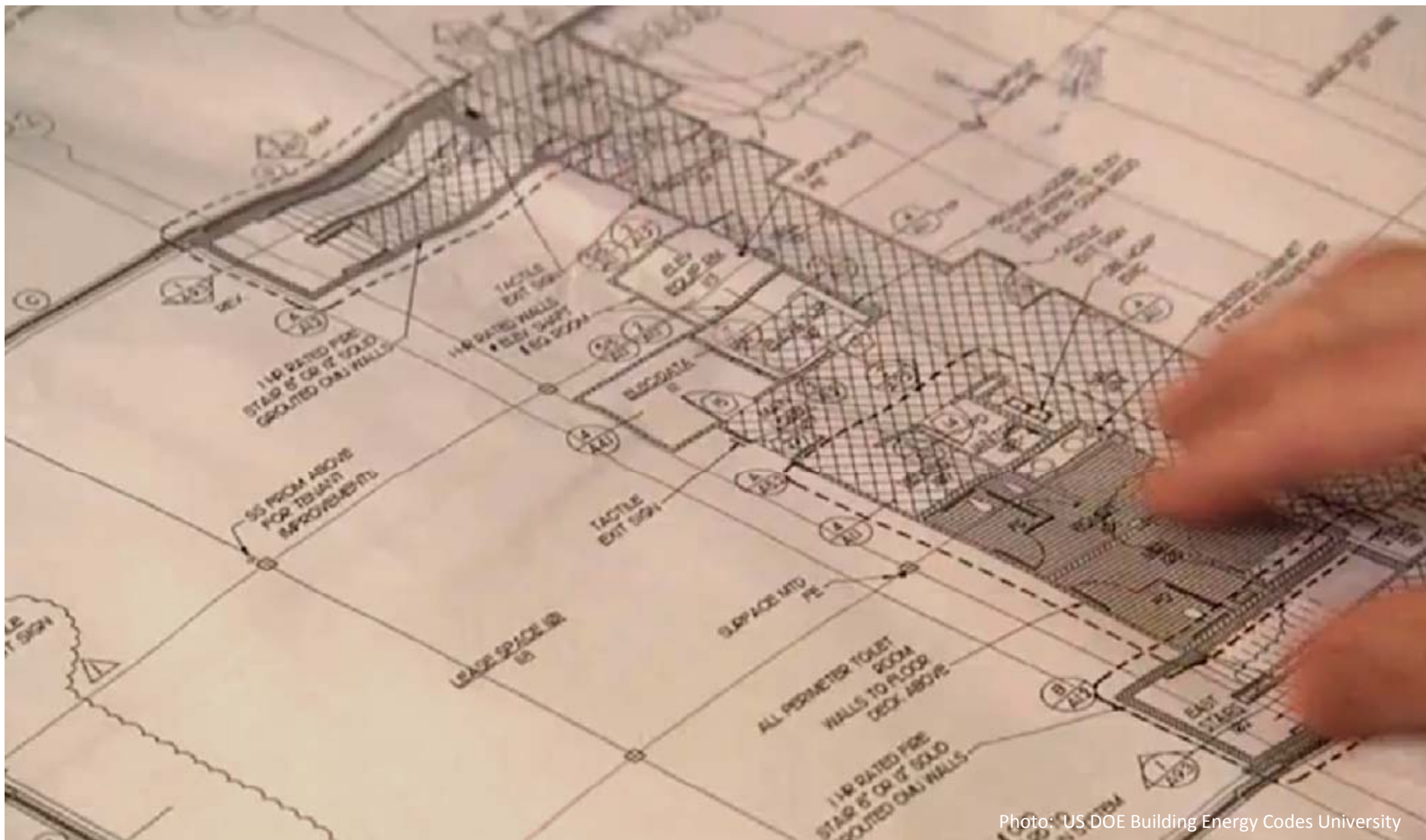


Photo: US DOE Building Energy Codes University

In this section you will learn about:

- Requirements for NYCECC Submissions, including:
 - ▶ Professional Statement and Owner Statement;
 - ▶ Energy Analysis; and
 - ▶ Supporting documentation.

- Requirements for NYCECC-related Progress Inspections





Per 1 RCNY §5000-01:

- ❑ Professional Statement
- ❑ Owner Statement
- ❑ Energy Analysis
- ❑ Supporting Documentation, including requirement for progress inspections in drawings





Professional Statement

- ❑ Completed under **Section 10** of Form **PW1**
 - ▶ Declares either compliance with, or exemption from, the NYCECC

Owner Statement

- ❑ Completed under **Section 26** of Form **PW1**
 - ▶ Declares that the Owner does not knowingly authorize work that fails to comply



4. Submissions & Inspections

NYC
Buildings

PW1: Plan / Work Application
Must be typewritten.

Orient and affix B&B job number label here

1 Location Information *Required for all applications.*

House No(s)	Street Name				
Borough	Block	Lot	BIN	C.B. No.	

10 NYCECC Compliance *New York City Energy Conservation Code*

To the best of my knowledge, belief and professional judgment, all work under this application is in compliance with the NYCECC*

Energy analysis is on another job number: _____

Yes No

This application is, or is part of, a project that utilizes trade-offs among different major systems

This application utilizes trade-offs within a single major system

To the best of my knowledge, belief and professional judgment, all work under this application is exempt from the NYCECC* in accordance with one of the following: *Choose one*

The work is an alteration of a State or National historic building.

The scope of work is entirely in a "low-energy building" and is limited to the building envelope.

The scope of work does not affect the energy use of the building.

This is a post-approval amendment and exempt under a prior edition of the energy code. See statement of exemption on attached drawings.

* Note: Exceptions to Section ECC 101.4.3 are NOT exemptions. For exceptions, check compliance statement and use the Energy Analysis.

5 Job/Project Types *Choose one and provide specified associated information.*

<input type="checkbox"/> Alteration Type 1 6A-E, 8B-C, 9-10, 13C-F, 14 & 18-20, 22, PW1A, PD1, select all that apply: <input type="checkbox"/> Change in Exits <input type="checkbox"/> Change in Number of Stories <input type="checkbox"/> Change in Number of Dwelling Units <input type="checkbox"/> Change in Occupancy / Use <input type="checkbox"/> Change inconsistent with current Cert. of Occup.	<input type="checkbox"/> Alteration Type 1, OT: "No Work" 8C, 9-10 & 12, 13C-F, 14, 18-19, 22, PW1A, PD1 <input type="checkbox"/> Alteration Type 2 5A, 6A-D, 8A-B, 9-10, & 13C-E, 14, 20, 22 <input type="checkbox"/> Alteration Type 3 5A, 6B-F, 8C, 9-10, 13C-E, 22 <input type="checkbox"/> New Building 6A-E, 8F-3, 9A-C, 9L, 10, 12, 13A-E (13B: 2008 Code only), 14, 18-20, PW1A, PD1	<input type="checkbox"/> Full Demolition 6B, 8D, 9B-D, & 13D-E, 14, 21A, 22 <input type="checkbox"/> Sign 5A, 6B-D, 9B, 22-23 <input type="checkbox"/> Subdivision 9B, 12A-B <input type="checkbox"/> Condominium <input type="checkbox"/> Improved 17 <input type="checkbox"/> SA Directive 14 acceptance requested? <input type="checkbox"/> Yes <input type="checkbox"/> No
---	---	---

6 Work Types *Select all that apply but no more than allowed by job and filing type. "OT" required on all NB and Alteration 1 initial applications.*

8A <input type="checkbox"/> BL - Boiler PW1C <input type="checkbox"/> FA - Fire Alarm <input type="checkbox"/> FB - Fuel Burning PW1C 8B <input type="checkbox"/> EQ - Construction Equipment 15	<input type="checkbox"/> FS - Fuel Storage PW1C <input type="checkbox"/> FP - Fire Suppression <input type="checkbox"/> MH - Mechanical 8C <input type="checkbox"/> OT/GC - General Construction	<input type="checkbox"/> PL - Plumbing PW1B <input type="checkbox"/> SD - Standpipe PW1B <input type="checkbox"/> SP - Sprinkler PW1B 8D <input type="checkbox"/> OT - Other, describe:	8E <input type="checkbox"/> CC - Curb Cut 16 8F <input type="checkbox"/> OT/ANT - Antenna <input type="checkbox"/> OT/BPP - Builders Pavement Plan 8D <input type="checkbox"/> OT/PPP - Fire Protection Plan <input type="checkbox"/> OT/MAR - Marquee 8E, 26B
---	---	--	--

01/11



4. Submissions & Inspections



PW1

PAGE 5

26 Property Owner's Statements and Signatures

Falsification of any statement is a misdemeanor and is punishable by a fine or imprisonment, or both. It is unlawful to give to a city employee, or for a city employee to accept, any benefit, monetary or otherwise, either as a gratuity for properly performing the job or in exchange for special consideration. Violation is punishable by imprisonment or fine or both. I understand that if I am found after hearing to have knowingly or negligently made a false statement or to have knowingly or negligently falsified or allowed to be falsified any certificate, form, signed statement, application, report or certification of the correction of a violation required under the provisions of this code or of a rule of any agency, I may be barred from filing further applications or documents with the Department. Furthermore, I understand that I am responsible for insuring that a final inspection be performed when the permitted work is complete, and that a satisfactory report of final inspection be submitted, along with all required submittal documents, so that the NYC Department of Buildings may issue a letter of completion or certificate of occupancy within the time prescribed by law.

- Owner type: Individual DCAS HHC NYCHA
 Partnership DOE HPD NYS
 Corporation 26A Other Government
 Condo Unit Owner or Co-Op Tenant-shareholder 26A

Is the owner a non-profit organization? Yes No

Name (please print): _____

Relationship to Owner: _____

Business Name/Agency: _____

Street Address: _____

City: _____

State: _____

Zip: _____

Telephone Number: _____

Fax: _____

E-Mail Address: _____

I have authorized the applicant to file this application for the work specified herein and all future amendments. I will not knowingly authorize any work that is not in compliance with the New York City Energy Conservation Code (NYCECC).

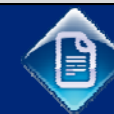
Change in number of dwelling units
 Change in Occupancy / Use
 New Building 64-E, 6F-3, 64-C, 9L, 10, 12, 13A-F
 Other (13B, 2008 Code only, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100)

Yes No

6 Work Types Select all that apply but no more than allowed by job and filing type. *OT* required on all NB and Alteration 1 initial applications.

8A <input type="checkbox"/> BL - Boiler PW1C	<input type="checkbox"/> FS - Fuel Storage PW1C	<input type="checkbox"/> PL - Plumbing PW1B	8E <input type="checkbox"/> CC - Curb Cut 16
<input type="checkbox"/> FA - Fire Alarm	<input type="checkbox"/> FP - Fire Suppression	<input type="checkbox"/> SD - Standpipe PW1B	8F <input type="checkbox"/> OT/ANT - Antenna
<input type="checkbox"/> FB - Fuel Burning PW1C	<input type="checkbox"/> MH - Mechanical	<input type="checkbox"/> SP - Sprinkler PW1B	<input type="checkbox"/> OT/BPP - Builders Pavement Plan 8D
8B <input type="checkbox"/> EQ - Construction Equipment 15	8C <input type="checkbox"/> OT/GC - General Construction	8D <input type="checkbox"/> OT - Other, describe:	<input type="checkbox"/> OT/FPP - Fire Protection Plan
			<input type="checkbox"/> OT/MAR - Marquee 8E, 26B

01/11



Related Applications

- ❑ In section 11 of the PW1 form, all applicants must indicate all applications related to the to the project or, if an application has not yet been filed, the name of the applicant or the applicant's firm and discipline for any anticipated, related applications.



This is important for projects that file multiple applications, such as:

- ▶ A separate foundations package, earlier in the project.
- ▶ Later lighting and HVAC packages.

Separate applications can include the part Energy Analysis of just their respective system in their drawings, such as the insulation values associated with foundation work, **but only if they are all filed under one application number.**



Per 1 RCNY §5000-01:

- ❑ Tabular Analysis
- ❑ REScheck or COMcheck software
- ❑ Energy Modeling
- ❑ Alternative Formats



Option 1: Tabular Analysis

- The Tabular Analysis compares proposed values of each NYCECC-regulated item in the scope of work with the respective prescriptive values required by the Code.
 - ▶ Applicable to New Buildings, Additions, or Alterations
 - ▶ Demonstrates Prescriptive Compliance
 - ▶ Can be used with either NYCECC or ASHRAE 90.1

4. Submissions & Inspections Examples of Tabular Analysis for Commercial Building Alterations

ITEM DESCRIPTION	PROPOSED DESIGN VALUE	CODE PRESCRIPTIVE VALUE AND CITATION	SUPPORTING DOCUMENTATION
BUILDING ENVELOPE			
Replace roof membrane and add insulation SRR = 2.2%	Roof Type 1: 4" XPS (R -20) continuous insulation above deck	Minimum R-20 continuous insulation NYCECC Table 502.2(1)	Roof Type 1: A-106 (Roof Plan) A-402 (Wall Sections) 6-8/A-603 (Roof Details)
Replace existing windows w/new aluminum framed windows, Floors 2 - 4 WWR = 32% PF = 0	Window Type A: U = 0.46, SHGC = 0.29, Air leakage ≤ 0.10 cfm/SF Window Types B + C: U = 0.41, SHGC = 0.31, Air leakage ≤ 0.30 cfm/SF Window Type D: U = 0.41, SHGC = 0.23, Air leakage ≤ 0.30 cfm/SF	Window Types A-D: Maximum U-Factor = 0.55 Maximum SHGC = 0.40 NYCECC Table 502.3 Maximum Air Leakage = 0.3 cfm/SF NYCECC 502.4.1	Window Types A-D: A-301-302 (Elevations) A-501 (Schedules)
Renovate interior side of exterior walls around new window openings – repair/replace gwb	N/A - No change proposed to existing 3 ½" metal stud furring walls which are completely filled with fiberglass batts (estimated R-3.1/inch).	NYCECC 101.4.3 Exception 3 – Alterations, renovations, or repairs to roof/ceiling, wall, or floor cavities which are insulated to full depth with insulation having a minimal nominal value of R-3.0/inch.	A-102-104 (Floor Plans) 1-2/A-305 (Interior Elevations)



4. Submissions & Inspections Examples of Tabular Analysis for Commercial Building Alterations

ITEM DESCRIPTION	PROPOSED DESIGN VALUE	CODE PRESCRIPTIVE VALUE AND CITATION	SUPPORTING DOCUMENTATION
BUILDING ENVELOPE			
Replace roof membrane and add insulation SRR = 2.2%	Roof Type 1: 4" XPS (R -20) continuous insulation above deck	<p>Applicants must include reference to the applicable Supporting Documentation for EACH item within the Tabular Analysis.</p>	Roof Type 1: A-106 (Roof Plan) A-402 (Wall Sections) 6-8/A-603 (Roof Details)
Replace existing windows w/new aluminum framed windows, Floors 2 - 4 WWR = 32% PF = 0	<p>Window Type A: U = 0.46, SHGC = 0.29, Air leakage ≤ 0.10 cfm/SF</p> <p>Window Types B + C: U = 0.41, SHGC = 0.31, Air leakage ≤ 0.30 cfm/SF</p> <p>Window Type D: U = 0.41, SHGC = 0.23, Air leakage ≤ 0.30 cfm/SF</p>		<p>Maximum SHGC = 0.40 NYCECC Table 502.3</p> <p>Maximum Air Leakage = 0.3 cfm/SF NYCECC 502.4.1</p>
Renovate interior side of exterior walls around new window openings – repair/replace gwb	N/A - No change proposed to existing 3 ½" metal stud furring walls which are completely filled with fiberglass batts (estimated R-3.1/inch).	NYCECC 101.4.3 Exception 3 – Alterations, renovations, or repairs to roof/ceiling, wall, or floor cavities which are insulated to full depth with insulation having a minimal nominal value of R-3.0/inch.	A-102-104 (Floor Plans) 1-2/A-305 (Interior Elevations)


Option 2: REScheck or COMcheck submissions

- ❑ REScheck and COMcheck software, available for free from the US Department of Energy, can be used to prepare Energy Code compliance calculations.
 - ▶ Demonstrates Prescriptive Compliance
OR
Allows Trade-Offs among different envelope assemblies (roofs, walls, glazings, etc.)
 - ▶ Only ECCCNY-2010 REScheck forms are permitted (not IECC)
 - ▶ Only ECCCNY-2010 or ASHRAE-90.1, 2007 COMcheck forms are permitted (not IECC)

Option 2: REScheck or COMcheck submissions (continued)

- ❑ COMcheck is applicable to New Buildings, Additions, or Alterations.
 - ▶ Additions can be submitted as stand-alone projects, or within a whole-building assessment
 - ▶ Alterations can only be assessed under the ASHRAE 90.1-2007 compliance path, not under the 2010 ECCCNY path
 - ▶ Alterations can be submitted using one of two options:
 - » As a stand-alone alteration, which applies only to the work being altered. The COMcheck assessment shall be based on the “alteration” option.
 - » In a whole-building assessment, using as-built values for the project’s unaltered portions.

- ❑ REScheck is applicable to New Buildings or Additions/Alterations.
 - ▶ Additions can be submitted as stand-alone projects, or within a whole-building assessment
 - ▶ Alterations cannot be submitted as stand-alone projects in REScheck – they must be part of a whole-building assessment, using as-built values for the unaltered portions of the project

- ❑ Downloads: <http://www.energycodes.gov/software.stm> 

4. Submissions & Inspections

Envelope Case Study Building_JA.cck - COMcheck 3.8.1 Code: 2010 New York Energy Conservation Construction Code

File Edit View Options Code Help

Project Envelope Interior Lighting Exterior Lighting Mechanical

Roof Skylight Ext. Wall Window Door Basement Floor

Component	Assembly	Concrete Density	Construction Details	Gross Area	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	SHGC	Projection Factor
Building									
1	Roof Type A	Insulation Entirely Above Deck		9776 ft2		20.0	0.048		
2	Window 4 - Skylight	Metal Frame with Thermal Break:Double Pane with Low-E	Glazing: Tinted	113 ft2			0.600	0.20	
3	Floor Type A	Slab-On-Grade:Unheated	Insulation: None	400 ft					
4	Abv-Grade Wall Assembly Type A	Concrete Block:12", Partially Grouted, Cells Empty	Medium Weight	5437 ft2	0.0	10.0	0.076		
5	Windows 1-2	Metal Frame with Thermal Break:Double Pane with Low-E	Glazing: Clear	220 ft2			0.410	0.31	0.00
6	Windows 1-2 - w/overhang	Metal Frame with Thermal Break:Double Pane with Low-E	Glazing: Clear	46 ft2			0.410	0.31	0.33
7	Windows 3A-3D - Storefront	Metal Frame Curtain Wall/Storefront:Double Pane with Low-E	Glazing: Clear	160 ft2			0.490	0.32	0.00
8	Windows 3A-3D - Storefront,ovhg.	Metal Frame Curtain Wall/Storefront:Double Pane with Low-E	Glazing: Clear	82 ft2			0.490	0.32	0.28
9	Door A - Ext Dbl Glass Door	Glass (> 50% glazing):Metal Frame	Type: Entrance	122 ft2			0.620	0.26	0.00
10	Door B - Insulated Hollow Metal	Insulated Metal	Swinging	72 ft2			0.420		
11	Door C - Roll-up Overhead	Insulated Metal	Non-Swinging	80 ft2			0.440		
12	Abv-Grade Wall Assembly Type B	Steel-Framed, 16" o.c.		5592 ft2	13.0	7.5	0.064		
13	Windows 1-2	Metal Frame with Thermal Break:Double Pane with Low-E	Glazing: Clear	62 ft2			0.410	0.31	0.00
14	Windows 1-2 - w/overhang	Metal Frame with Thermal Break:Double Pane with Low-E	Glazing: Clear	46 ft2			0.410	0.31	0.33
15	Windows 3A-3D - Storefront	Metal Frame Curtain Wall/Storefront:Double Pane with Low-E	Glazing: Clear	1267 ft2			0.490	0.32	0.00
16	Windows 3A-3D - Storefront,ovhg.	Metal Frame Curtain Wall/Storefront:Double Pane with Low-E	Glazing: Clear	635 ft2			0.490	0.32	0.28

Envelope PASSES: Design 3

Envelope +3% Interior Lighting +14% Exterior Lighting +49%



All Wall Types, Roof Types, Fenestration Types, and Door Types in the COMcheck analysis should use the same nomenclature as those shown in the Supporting Documentation (Drawings & Schedules).



4. Submissions & Inspections



COMcheck Software Version 3.8.0
Envelope Compliance Certificate

2010 New York Energy Conservation Construction Code

Section 1: Project Information

Project Type: **New Construction**

Project Title :

Construction Site:

Owner/Agent:

Designer/Contractor:

Section 2: General Information

Building Location (for weather data): **New York, New York**
 Climate Zone: **4a**
 Vertical Glazing / Wall Area Pct.: **24%**
 Skylight Glazing / Roof Area Pct.: **1%**

Activity Type(s)	Floor Area
Floor 01 (Office)	9322
Floor 02 (Office)	9322
Floor 01 (Dining: Cafeteria/Fast Food)	637
Floor 01 (Retail)	815

Section 3: Requirements Checklist

Envelope PASSES: Design 1% better than code.

Climate-Specific Requirements:

Component Name/Description	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor ^(a)
Roof Type A: Insulation Entirely Above Deck	9776	---	20.0	0.048	0.048
Window 4 - Skylight: Vinyl Frame: Double Pane with Low-E, Tinted, SHGC 0.40	113	---	---	0.600	0.600
Floor Type A: Slab-On-Grade Unheated	400	---	---	---	---
Abv-Grade Wall Assembly Type A: Concrete Block: 12", Partially Grouted, Cells Empty, Medium Density, Furring: Metal	5437	11.0	10.0	0.082	0.104
Window 1 - Framed: Metal Frame with Thermal Break: Double Pane with Low-E, Clear, SHGC 0.40	292	---	---	0.550	0.550
Window 10 - Storefront: Metal Frame Curtain Wall/Storefront: Double Pane with Low-E, Clear, SHGC 0.40	160	---	---	0.550	0.500
Window 10 - Storefront: Metal Frame Curtain Wall/Storefront: Double Pane with Low-E, Tinted, SHGC 0.20	82	---	---	0.550	0.500
Door 5 - Ext Dbl Glass Door: Glass (> 50% glazing): Metal Frame, Entrance Door, SHGC 0.40	48	---	---	0.850	0.850
Door 6 - Ext Sing Glass Door: Glass (> 50% glazing): Metal Frame, Entrance Door, SHGC 0.40	24	---	---	0.850	0.850
Door 7: Insulated Metal, Swinging	24	---	---	0.700	0.700
Door 7: Insulated Metal, Swinging	24	---	---	0.700	0.700
Door 8 - Roll-up Overhead: Uninsulated Single-Layer Metal, Non-Swinging	69	---	---	0.500	0.500
Abv-Grade Wall Assembly Type B: Steel-Framed, 16" o.c.	5592	13.0	7.5	0.084	0.084
Window 1 - Framed: Metal Frame with Thermal Break: Double Pane with Low-E, Clear, SHGC 0.40	108	---	---	0.550	0.550

Project Title:
Data filename: F:\Iridian\NYC-DOB\TrainingModule\SampleProject.cck

Report date: 02/04/11
Page 1 of 2

Window 10 - Storefront: Metal Frame Curtain Wall/Storefront: Double Pane with Low-E, Clear, SHGC 0.40	1267	---	---	0.550	0.500
Window 10 - Storefront: Metal Frame Curtain Wall/Storefront: Double Pane with Low-E, Tinted, SHGC 0.20	635	---	---	0.550	0.500

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.

Air Leakage, Component Certification, and Vapor Retarder Requirements:

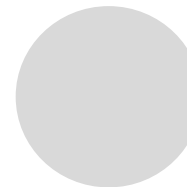
- 1. All joints and penetrations are caulked, gasketed, weather-stripped, or otherwise sealed.
- 2. Windows, doors, and skylights certified as meeting leakage requirements.
- 3. Component R-values & U-factors labeled as certified.

Section 4: Compliance Statement

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed envelope system has been designed to meet the 2010 New York Energy Conservation Construction Code requirements in COMcheck Version 3.8.0 and to comply with the mandatory requirements in the Requirements Checklist.

When a Registered Design Professional has stamped and signed this page, they are attesting that to the best of his/her knowledge, belief, and professional judgment, such plans or specifications are in compliance with this Code.

Name - Title _____ Signature _____ Date _____



Project Title:
Data filename: F:\Iridian\NYC-DOB\TrainingModule\SampleProject.cck

Report date: 02/04/11
Page 2 of 2



4. Submissions & Inspections



COMcheck Software Version 3.8.0

Envelope Compliance Certificate

Window 10 - Storefront: Metal Frame Curtain Wall/Storefront:Double Pane with Low-E, Clear, SHGC 0.40	1267	---	---	0.560	0.500
Window 10 - Storefront: Metal Frame Curtain Wall/Storefront:Double Pane with Low-E, Tinted, SHGC 0.20	635	---	---	0.560	0.500

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.

Air Leakage, Component Certification, and Vapor Retarder Requirements:

- 1. All joints and penetrations are caulked, gasketed, weather-stripped, or otherwise sealed.
 - 2. Windows, doors, and skylights certified as meeting leakage requirements.
- U-factors labeled as certified.

Compliance Statement

The proposed envelope design represented in this document is consistent with the building plans, specifications and drawings submitted with this permit application. The proposed envelope system has been designed to meet the 2010 New York City Building Code requirements in COMcheck Version 3.8.0 and to comply with the mandatory requirements in the 2010 International Energy Conservation Code.

I, the undersigned Professional, have stamped and signed this page, they are attesting that to the best of his/her knowledge, belief, and opinion, the plans or specifications are in compliance with this Code.

Signature

Date

A. Sign and seal the sheet with the Energy Analysis only at the Title Block when:



- A lead professional signs and seals for the entire project.
- All applications related to the project share one application number, include the respective parts of the Energy Analysis in the discipline drawings, and the partial Energy Analysis represents the work of only that discipline.
- All applications related to the project have different application numbers, present all parts of the Energy Analysis in the initial application as required, but each part is located on a separate drawing sheet with only the work of that discipline.

B. Sign and seal each part of the Energy Analysis on the partial Energy Analysis, and **do not sign** at the Title Block, when:

- All applications related to the project have different application numbers, present all parts of the Energy Analysis in the initial application as required, and all parts on one sheet; and
- No other work may be included on the sheet.



Option 3: Energy Cost Budget Worksheet

- Either NYCECC Section 506 or the Energy Cost Budget Method of ASHRAE 90.1, 2007 can be used to demonstrate compliance.
 - ▶ Applicable to New Buildings, Additions, or Alterations
 - ▶ Requires computer energy modeling, using software programs approved by the Secretary of State of New York State and the NYC Commissioner of Buildings (e.g., DOE-2.1E, VisualDOE, Energy Plus, eQuest)
 - ▶ Compliance is demonstrated using the **EN1** form 
 - ▶ If changes occur during project execution, then energy model must be updated to as-built condition and the results must be submitted in **EN2** form and certified by progress inspector 



EN1: Energy Cost Budget Worksheet
Must be typewritten.

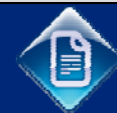
Do Not Submit Separately.
Must be incorporated in the drawing set.

Energy Model Inputs		
<i>NYS approved energy model software: DOE-2.1E</i>		
Envelope	Proposed Design Input	Budget (Standard Design) Input
Above-grade wall U-factor	0.102 Btu/h-ft ² -F	0.124 Btu/h-ft ² -F
Below-grade wall U-factor	0.107 Btu/h-ft ² -F	0.107 Btu/h-ft ² -F
Roof construction U-factor	0.047 Btu/h-ft ² -F	0.063 Btu/h-ft ² -F
Exterior floor U-factor	0.88	0.88
Slab-on-grade construction (yes/no)	yes	yes
Window-to-gross wall ratio	58.8%	50%
Average fenestration assembly U-factor	0.43 Btu/h-ft ² -F typical, 1.1 storefront, 0.453 ave	0.46 Btu/h-ft ² -F
Average fenestration assembly SHGC	0.31 typical, 0.73 storefront, 0.325 average	0.39 north, 0.25 other orientations
Fixed shading devices (yes/no)	no	no
Automated movable shading devices (yes/no)	no	no

Heating, Ventilating & Air Conditioning		
Refrigeration equipment type	Water-cooled packaged DX units, efficiency ranges from 0.93-1.01 kW/ton	Water cooled, centrifugal chiller, efficiency = 0.576 kW/ton
Heating equipment type		
Demand controlled ventilation (yes/no)		
Economizer type (air or water)		
Domestic hot water heating source		



In the case of an NYCECC-related audit, applicants may be asked to submit the calculations used to determine the averaged performance values entered in the EN1.





EN1 : Energy Cost Budget Worksheet

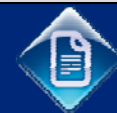
Do Not Submit Separately. Must be incorporated in the drawing set.

Energy Cost Budget Conformance	Proposed Design Output	Budget (Standard Design) Output
Annual Regulated Energy Cost (\$)	1,458,109	1,477,272
Annual Regulated Energy Use (BTU/GSF)	44,161	48,006
Annual Regulated Energy Cost Per Sq. Ft. (\$/GSF)	2.31	2.34

Energy Model Output Breakdown		
Energy Use Breakdown	Proposed Design Output (% BTU/yr)	Budget (Standard Design) Output (% BTU/yr)
Heating	24.2%	32.9
Cooling	13.9%	7.7
Heat rejection	3.9%	2.4%
Fans	8.9%	8.6%
Pumps	1.2%	2.2%
Lighting	19.3%	19.4%
Unregulated loads (e.g., plug loads, elevators, escalators, kitchen, process equipment, exterior lighting)	28.5%	26.9%
Total	100%	100%



The overall regulated annual energy use and annual energy cost of the Proposed and Budget building designs are summarized at the end of the EN1 form. As this example illustrates, if the Proposed Design cost is less than the Budget Design cost, the project passes.



Responsibility by Discipline

- Different registered design professionals may sign and seal their respective parts of the Energy Analysis report.
 - ▶ Applies **only** if Prescriptive compliance (or Trade-off within Envelope) is used
 - ▶ If all systems are filed under the same application number, each registered design professional can include his or her part of the Energy Analysis in their respective CDs
 - ▶ If multiple application numbers are filed, all parts of the Energy Analysis must be filed in the **initial application** for the project, except:
 - » Foundation and earthwork permits – a Tabular Analysis can be submitted just for this work

Lead Professional

- Where whole-building analysis is used, a Lead Professional must be identified.
 - ▶ Applies to all situations where Trade-offs between disciplines (envelope, mechanical/service water heating, lighting/power) are used
 - ▶ Lead Professional must sign and stamp the entire Energy Analysis
 - » Can be a registered design professional other than the architect/engineer of record

Updates to a previously approved analysis are required when:

- ❑ Design changes are made to one or more NYCECC-regulated elements.
 - ▶ Applies even if the project still complies overall
 - ▶ Energy Analysis & Supporting Documentation resubmitted prior to construction via PAA
- ❑ Design changes result in one or more disciplines failing Prescriptive criteria.
 - ▶ Requires whole building Energy Analysis from a Lead Professional
 - ▶ Construction may be stopped pending a PAA submission with revised Energy Analysis
- ❑ Construction-phase changes made to one or more NYCECC-regulated elements.
 - ▶ Applies even if the project still complies overall (exception: lower lighting power densities)
 - ▶ A signed and sealed as-built Energy Analysis is required prior to sign-off
 - » Can be stamped by separate design professionals, if Prescriptive compliance was achieved
 - ▶ Needs to be coordinated with EN2 form signed by the Progress Inspectors

Updates to a previously approved analysis are required when:

- ❑ Design changes are made to one or more NYCECC-regulated elements.
 - ▶ Applies even if the project still complies overall
 - ▶ Energy Analysis & Supporting Documentation resubmitted prior to construction via PAA
- ❑ Design changes result in one or more disciplines failing Prescriptive criteria.
 - ▶ Requires whole building Energy Analysis from a Lead Professional
 - ▶ Construction may be Energy Analysis
- ❑ Construction-phase changes to regulated elements.
 - ▶ Applies even if the project complies (e.g. floor area ratios, densities)
 - ▶ A signed and sealed as-built EA is required
 - » Can be stamped by seal of the original preparer
 - ▶ Needs to be coordinated with the original preparer

A signed and sealed Energy Analysis (EA) may be submitted during construction via a Post-Approval Amendment (PAA). This would typically be done to demonstrate that the EA is consistent with construction changes encountered during a job, as verified by the Progress Inspections. If no other changes are made after the revised EA is submitted, it suffices, and there is a place in the EN2 form to document this condition.

An as-built EA is performed if, at the end of construction, the construction is inconsistent with the last-approved EA. At that point the revision is professionally certified; i.e. it is not submitted as a PAA and is not approved by the Department. It is simply filed with the EN2. The revision must be signed and sealed by the original preparer of the EA.



Per 1 RCNY §5000-01

- Supporting Documentation is defined for:
 - ▶ Envelope
 - ▶ Mechanical / Service Water Heating
 - ▶ Electrical (including Lighting)
 - ▶ Progress Inspections

Supporting Documentation is required to:

- Verify the values submitted in the Energy Analysis
- Verify that mandatory requirements of the NYCECC are met
- Provide a listing and description of the applicable progress inspections required based on the scope of work of the project



4. Submissions & Inspections

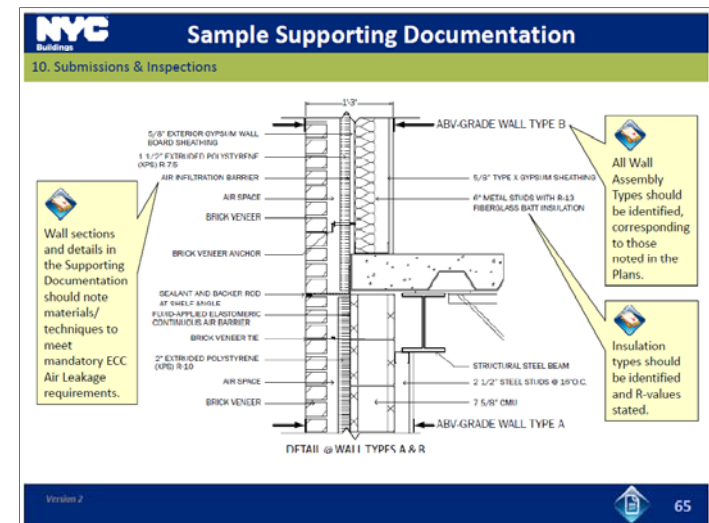
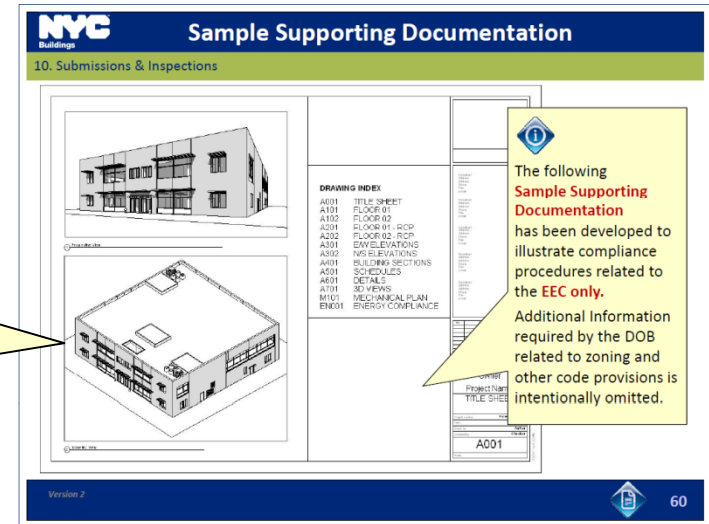
Examples Provided by Discipline

- ❑ Sample Supporting Documentation is provided in each of the following DOB NYCECC Training Modules:
 - ▶ Residential
 - ▶ Envelope
 - ▶ Lighting
 - ▶ HVAC 1 & 2

- ❑ The Sample Supporting Documentation demonstrates the type of information that should be provided via:
 - ▶ Plans, Elevations, Sections, Details
 - ▶ Schedules
 - ▶ Drawing Notes

- ❑ Emphasis is placed on comprehensiveness, coordination, and clarity

These sample drawings are provided at full size in the NYC DOB ECC Building Envelope module.



Per 1 RCNY §5000-01

- Progress Inspections are defined for both Residential & Commercial structures in the following categories:
 - ▶ Envelope Inspections
 - ▶ Mechanical and Plumbing Inspections (Residential)
 - ▶ Mechanical and Service Water Heating Inspections (Commercial)
 - ▶ Electric Power and Lighting Systems
 - ▶ Other (Maintenance information, Permanent Certificate for Residential)

Progress Inspections are required to:

- Verify the measures submitted in the Energy Analysis & Supporting Documentation are incorporated into the construction.

Verification

- Through DOB **TR8** form  and **EN2** form 

Types

- Visual inspections in most instances
 - ▶ Timing and frequency of inspections must be coordinated with contractors
- Testing of some systems required
 - ▶ Residential Examples:
 - » Whole building air sealing & insulation (blower door testing option)
 - » Outdoor air intake & exhaust dampers
 - » Programmable thermostats
 - » Duct leakage (where air handling equipment or ductwork is in unconditioned space)
 - ▶ Commercial Examples:
 - » HVAC and service hot water system controls
 - » Lighting controls

Extent

- ❑ Per 1 RCNY §101-07, at least **15%** of each relevant construction item
 - ▶ Per §5000-01, items such as ductwork leakage (residential) or HVAC controls (commercial) require a higher inspection rate (typically 20 -25%)
- ❑ Per §101-07, not less than one of each relevant construction item



Qualifications

- Defined in 1 RCNY §101-07
 - ▶ Primary Inspector or Inspection Supervisor
 - » Residential & Commercial:
Registered Design Professional of Record for the work
 - » Residential:
Registered design professional with min. 5 years experience in Energy Code systems for buildings
 - » Commercial:
Registered design professional with min. 5 years experience in Energy Code systems for buildings and min. 3 years experience for the system type to be inspected
 - ▶ Supplemental Inspector
 - » Residential & Commercial:
Under direct supervision of the Inspection Supervisor
 - » Residential & Commercial:
Min. 3 years experience in inspection/construction observation of buildings for Energy Code-regulated systems (commercial inspectors must have experience with commercial buildings)

Qualifications

- Defined in 1 RCNY §101-07
 - ▶ Primary Inspector or Inspection Supervisor
 - » Residential & Commercial:
Registered Design Professional of Record for the work
 - » Residential:
Registered design professional with min. 5 years experience in Energy Code systems for buildings
 - » Commercial:
Registered design professional with min. 3 years experience for buildings and min. 3 years experience for commercial buildings
 - ▶ Supplemental Inspector
 - » Residential & Commercial:
Under direct supervision of the Inspection Supervisor
 - » Residential & Commercial:
Min. 3 years experience in inspection/construction observation of buildings for Energy Code-regulated systems (commercial inspectors must have experience with commercial buildings)

The supplemental inspector must work under the direct supervision of the Primary Inspector or inspector supervisor, as defined in §101-07).

or

4. Submissions & Inspections

Sample Supporting Documentation

	Inspection/Test	Frequency (minimum)	Reference Standard (See NYCECC Chapter 10) or Other Criteria	NYCECC or Other Citation
IIA	Envelope Inspections			
IIA1	Protection of exposed foundation insulation: Insulation shall be visually inspected to verify proper protection where applied to the exterior of basement or cellar walls, crawl-space walls and/or the perimeter of slab-on-grade floors.	As required during foundation work and prior to backfill	Approved construction documents	303.2.1
IIA2	Insulation placement and R-values: Installed insulation for each component of the conditioned space envelope and at junctions between components shall be visually inspected to ensure that the R-values are marked, that such R-values conform to the R-values identified in the construction documents and that the insulation is properly installed. Certifications for unmarked insulation shall be similarly visually inspected.	As required to verify continuous enclosure while walls, ceilings and floors are open	Approved construction documents	303.1, 303.1.1, 303.1.2, 502.1, 502.2
IIA3	Fenestration values and product ratings for U-factors and SHGC values: U-factors and SHGC values of installed fenestration shall be visually inspected for conformance with the U-factors and SHGC values identified in the construction drawings by verifying the manufacturer's NFRC labels or, where not labeled, using the ratings in NYCECC Tables 102.1.3(1), (2) and (3). Where ASHRAE 90.1 is used, visible light transmittance values shall also be verified.	As required during installation	Approved construction documents; NFRC 100, NFRC 200, Tables 102.1.3	303.1, 303.1.3; 502.3
IIA4	Fenestration and door assembly product ratings for air leakage: Windows, skylights and sliding or swinging door assemblies, except site-built windows, skylights and/or doors, shall be visually inspected to verify that installed assemblies are listed and labeled by the manufacturer to the referenced standard.	As required during installation	NFRC 400, AAMA/WDMA101/I.S.2, AAMA/WDMA101/I.S.2/NAFS-02; ASTM E283	502.3
IIA5	Fenestration areas: Dimensions of windows			
IIA6	Sealing: Openings and penetrations in the b inspected to verify that they are properly se			
IIA7	Projection factors: Where the Energy Analy permanently attached shading devices shall			



A Progress Inspections Table must be included in the Supporting Documentation drawings, noting all applicable inspections to be performed based on the scope of work, plus Reference Standards and NYCECC Citations. The design applicant must also include contract language requiring the contractor to identify time in the construction schedule for the progress inspections.



NYC Buildings

**TR8: Technical Report
Statement of Responsibility for
Energy Code Progress Inspections**

This form must be typewritten

1 Location Information *Required for all applications.*

House No(s) Street Name

3 Energy Code Progress Inspection <i>Required for applications where Energy Code Compliance Progress Inspection is marked Yes on TR1</i>					
3A ← Identification of Requirement			3B Identification of Responsibilities	3C Certificate of Complete Inspections / Tests	3D Withdraw Responsibilities
Y	N	Progress Inspections	Table Reference in 1RCNY §5000-01(h) (1) and (2)	Initial & Date	Initial & Date
<input type="checkbox"/>	<input type="checkbox"/>	Protection of foundation insulation	(IA1), (IIA1)		
<input type="checkbox"/>	<input type="checkbox"/>	Insulation placement and R values	(IA2), (IIA2)		
<input type="checkbox"/>	<input type="checkbox"/>	Fenestration thermal values and ratings	(IA3), (IIA3)		
<input type="checkbox"/>	<input type="checkbox"/>	Fenestration ratings for air leakage	(IA4), (IIA4)		
<input type="checkbox"/>	<input type="checkbox"/>	Fenestration areas	(IA5), (IIA5)		
<input type="checkbox"/>	<input type="checkbox"/>	Air sealing and insulation — visual	(IA6), (IIA6)		
<input type="checkbox"/>	<input type="checkbox"/>	Air sealing and insulation — testing	(IA7)		
<input type="checkbox"/>	<input type="checkbox"/>	Projection factors	(IIA7)		
<input type="checkbox"/>	<input type="checkbox"/>	Loading deck weather seals	(IIA8)		
<input type="checkbox"/>	<input type="checkbox"/>	Vestibules	(IIA9)		
<input type="checkbox"/>	<input type="checkbox"/>	Fireplaces	(IB1), (IIB1)		

<input type="checkbox"/>	Lighting controls	(IC5)		
<input type="checkbox"/>	Exit signs	(IC6)		
<input type="checkbox"/>	Tandem wiring	(IC7)		
<input type="checkbox"/>	Electrical motors	(IC8)		
<input type="checkbox"/>	Maintenance information	(ID1), (IID1)		
<input type="checkbox"/>	Permanent certificate	(ID2)		

01/11

NYC
Buildings

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

1 Location Information *Required for all applications.*
House No(s) Street Name

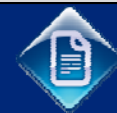
The applicant (R.A. or P.E.) defines the required progress inspections by checking “Y” or “N” in the left-hand column under section 3 of the TR8 form.

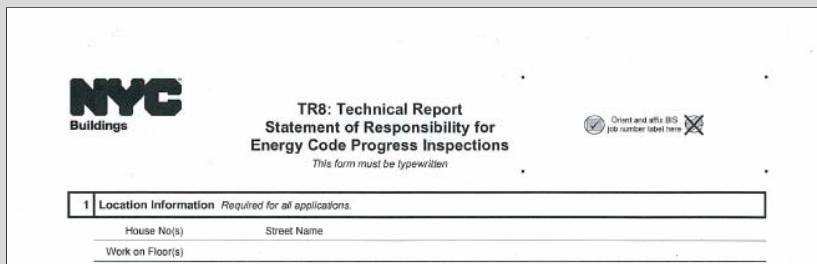
3 Energy Code Progress Inspections <i>Required for applications where Energy Code Compliance Progress Inspection is marked Yes on TR1</i>			3B Identification of Responsibilities	3C Certificate of Complete Inspections / Tests	3D Withdraw Responsibilities
Y	N	Progress Inspections	Table Reference in 1RCNY §5000-01(h) (1) and (2)	Initial & Date	Initial & Date
<input type="checkbox"/>	<input type="checkbox"/>	Protection of foundation insulation	(IA1), (IIA1)		
<input type="checkbox"/>	<input type="checkbox"/>	Insulation placement and R values	(IA2), (IIA2)		
<input type="checkbox"/>	<input type="checkbox"/>	Fenestration thermal values and ratings	(IA3), (IIA3)		
<input type="checkbox"/>	<input type="checkbox"/>	Fenestration ratings for air leakage	(IA4), (IIA4)		
<input type="checkbox"/>	<input type="checkbox"/>	Fenestration areas	(IA5), (IIA5)		
<input type="checkbox"/>	<input type="checkbox"/>	Air sealing and insulation — visual	(IA6), (IIA6)		
<input type="checkbox"/>	<input type="checkbox"/>	Air sealing and insulation — testing	(IA7)		
<input type="checkbox"/>	<input type="checkbox"/>	Projection factors	(IIA7)		
<input type="checkbox"/>	<input type="checkbox"/>	Loading deck weather seals	(IIA8)		
<input type="checkbox"/>	<input type="checkbox"/>	Vestibules	(IIA9)		
<input type="checkbox"/>	<input type="checkbox"/>	Fireplaces	(IB1), (IIB1)		

Prior to Permit, the designated Progress Inspector must initial and date each inspection they will be responsible for, and sign/seal under section 5 of the TR8 form. If multiple Progress Inspectors are involved in a project, each one must submit a signed/sealed TR8 for their scope of inspection services.

<input type="checkbox"/>	Lighting controls	(IC5)		
<input type="checkbox"/>	Exit signs	(IC6)		
<input type="checkbox"/>	Tandem wiring	(IC7)		
<input type="checkbox"/>	Electrical motors	(IC8)		
<input type="checkbox"/>	Maintenance information	(ID1), (IID1)		
<input type="checkbox"/>	Permanent certificate	(ID2)		

01/11





6 Inspection Applicant's Certification of Completion

I have completed the items specified herein and certify the following (check one only):

- All work performed substantially conforms to approved construction documents and has been performed in accordance with applicable provisions of the New York City Energy Conservation Code and other designated rules and regulations.
- All work performed substantially conforms to approved construction documents and has been performed in accordance with applicable provisions of the New York City Energy Conservation Code and other designated rules and regulations, except as indicated in the attached report.

I am aware of the additional sanctions imposed on false filings by §28-211.1.2 of the Administrative Code.

Withdrawal of Applicant: I am withdrawing responsibility for the items of progress inspections and/or tests indicated herein and herewith submit the results or status of the work performed to date.

Name (please print) _____

Signature _____

Date _____

P.E. / R.A. Seal (apply seal, then sign and date over seal)

01/11

NYC
Buildings

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

1 Location Information *Required for all applications.*

House No(s) _____ Street Name _____
Work on Floor(s) _____

6 Inspection Applicant's Certification of Completion

- I have completed the items specified herein and certify the following (check one only):
- All work performed substantially conforms to approved construction documents and has been performed in accordance with applicable provisions of the New York City Energy Conservation Code and other designated rules and regulations.
 - All work performed substantially conforms to approved construction documents and has been performed in accordance with applicable provisions of the New York City Energy Conservation Code and other designated rules and regulations report.

I am aware of the additional sanctions imposed on false filings by §28-211.1.2 of the Administrative Code.

- Withdrawal of Applicant:** I am withdrawing responsibility for the items of progress inspection the results or status of the work performed to date.

Name (please print) _____

Signature _____

Date _____

P.E. / R.A. Seal *(apply seal, then sign and date over seal)*

Upon completion of the applicable inspections, the Progress Inspector initials and dates each inspection performed (column 3C). Any inspections assigned to the Progress Inspector that are not performed are addressed through column 3D (withdraw responsibilities). Final signatures and seals are provided in section 6 of the TR8 form.

4. Submissions & Inspections

Per NYC Administrative Code §28-116.2.3

- A record of all inspections shall be kept by the person performing the inspection.
 - ▶ The commissioner can require inspection reports to be filed with the department.
 - ▶ Records of inspections shall be maintained for a period of six years after sign-off, or for such other period of time as the commissioner may require
 - ▶ Records of inspections shall be made available to the DOB upon request

EN2 Form

- This DOB form is signed by the progress inspector, certifying that the values in either the last approved Energy Analysis or the as-built Energy Analysis represent values in the constructed building.



While a specific format is not stated, inspection records can include:

- ▶ Logs, reports, meeting minutes
- ▶ Photographs
- ▶ Annotated Drawings

4. Submissions & Inspections

Example EN2 Form

NYC Buildings

EN2: As Built Energy Analysis

This form must be typewritten and submitted in person to the Certificate of Occupancy Division's Borough Office where energy analysis was reviewed.

Orient and affix BIS (job number label here)

1 Progress Inspector Information *Required for all applications.*

Last Name	First Name	Middle Initial
Business Name	Business Telephone	
Business Address	Business Fax	
City	State	Zip
License Type choose one: <input type="checkbox"/> P.E. <input type="checkbox"/> R.A.:	License Number	

2 Location Information *Required for all applications.*

3 As Built Information *P.E./R.A. responsible for progress inspections, choose one below and sign/seal.*

- The as-built conditions of the completed building conform to the originally approved energy analysis and do not require a revised energy analysis.
- The energy analysis has been revised according to one of the statements below:
 - Attached is a revised energy analysis, prepared, signed and sealed by the registered design professional who prepared the previously submitted and approved energy analysis. The as-built conditions of the completed building conform to this revised energy analysis.
 - The last revised energy analysis was submitted and approved as a post approval amendment on _____ (date). The as-built conditions of the completed building conform to this revised energy analysis.

sealed and submitted thru.

Name (please print) _____

Signature _____ Date _____

P.E. / R.A. Seal (apply seal, then sign and date over seal)

01/11

The Progress Inspectors and design applicants will need to coordinate to ensure that the as-built conditions and approved Energy Analysis are consistent. An as-built Energy Analysis update may be required.





6. Resources

The resources below have been referenced in this module

Resource	Link 
Local Law 1 of 2011	http://www.nyc.gov/html/dob/downloads/pdf/ll1of2011.pdf
Local Law 48 of 2010	http://www.nyc.gov/html/dob/downloads/pdf/ll48of2010.pdf
1 RCNY §5000-01	http://www.nyc.gov/html/dob/downloads/rules/1_RCNY_5000-01.pdf
1 RCNY §101-07	http://www.nyc.gov/html/dob/downloads/rules/1_RCNY_101-07.pdf
Buildings Bulletins	http://www.nyc.gov/html/dob/html/reference/buildings_bulletin.shtml
EN1 and EN2 Forms	http://www.nyc.gov/html/dob/html/forms/forms_energy.shtml
TR8 Form	http://www.nyc.gov/html/dob/downloads/pdf/tr8.pdf
REScheck/COMcheck	http://www.energycodes.gov/software.stm
PlaNYC	http://www.nyc.gov/html/planyc2030/html/home/home.shtml



Questions on the NYCECC can be submitted to the DOB at:



EnergyCode@buildings.nyc.gov



12. Resources

Company or Individual	Slide Numbers
Samantha Modell	70

