



Complying with the Energy Conservation Construction Code of New York State

Presentation to Manhattan Industry
July 11, 2007



What is the Energy Code?

- **NYS mandate for 30 years, to be enforced by local jurisdictions**
- **Modeled after the International Codes – similar occupancies to our new Construction Codes (Local Law 33/2007)**
- **The ECCCNY and the IECC reference ASHRAE 90.1 regarding energy conservation**
- **Residential chapters: 1- and 2-family dwellings and residential buildings under four stories**
- **Commercial chapters: All other buildings, including residential buildings four stories and higher**
- **New and existing construction**



ECCCNYS & plaNYC 2030

- NYS regulation requires NYC enforcement of the Energy Code.
- Buildings account for 39% of all energy and 71% of all electricity consumed in the US (DoE, 2004), and 79% of all carbon emissions in NYC (NYC Carbon Inventory, 2007)
- Non-industrial buildings in NYC account for 69% of all carbon emissions
- Compliance with ECCCNYS dovetails well with the Mayor's PLANYC 2030 initiative to reduce emissions and achieve cleaner air.



Filing requirements

Current

- Applicable to all NB (New Building) applications.

- Professional Statement:

“To the best of my knowledge, belief and professional judgment, these plans and specifications are in compliance with the Energy Conservation Construction Code of New York State.”

New Phase 1 – Sept. 2007

- Applicable to all NB (New Building) and ALT1 applications.

- Professional Statement.

- Energy Analysis summary sheets in initial application drawing set. Signed and sealed by the professional[s] who produced them.

- Can be in the form of ResChek, ComChek, prescriptive package worksheets, trade-off worksheets as provided on Department of State website

www.dos.state.ny.us/code/energycode/nyenergycode.htm

- Additional documents to support Energy Analysis.

New Phase 2 - Nov. 2007

- Addition of applicable ALT2 and ALT3 applications.

- Professional Statement on PW-1



Energy Analysis: Residential

- 1) REScheck (page 1 only): U.S. Department of Energy (available on both State and Federal websites)
- 2) Residential Prescriptive Worksheet (1 page)
- 3) Residential Trade-Off Worksheet (2 pages)

All are free and available on New York State website:
www.dos.state.ny.us/code/energycode/nyenergycode.htm

REScheck is also available for free on the DoE website, but make sure you get the New York State version:
www.energycodes.gov/





REScheck Software Version 4.0.1
Compliance Certificate

Project Title: abc
Report Date: 06/09/07
Data filename: Untitled.rck

Energy Code: New York State Energy Conservation
Construction Code
Location: Richmond County, New York
Construction Type: Detached 1 or 2 Family
Heating Type: Non-Electric
Glazing Area Percentage: 28%
Heating Degree Days: 4910

Construction Site:
def
Richmond, NY
Permit # 56555565

Owner/Agent:

Designer/Contractor:

Compliance: Passes Median UA: 937 Your Home UA: 644 → 31.3% Better Than Code (UA)

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Glazing or Door U-Factor	UA
Ceiling 1: Flat Ceiling or Scissor Truss:	4000	0.0	35.0		100
Wall 1: Wood Frame, 16" o.c.:	3100	0.0	13.0		214
Window 1: Metal Frame with Thermal Break/Double Pane with Low-E:	800			0.100	80
Door 1: Glass:	54			0.100	5
Door 2: Solid:	21			0.025	1
Basement Wall 1: Masonry Block with Integral Insulation: Wall height: 5.0' Depth below grade: 7.0' Insulation depth: 5.0'	4000	0.0	9.0		244
Furnace 1: Forced Hot Air: 75 AFUE					
Air Conditioner 1: Electric Central Air: 13 SEER					
Boiler 1: Gas-Fired Steam: 75 AFUE					

The proposed building represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed systems have been designed to meet the New York State Energy Conservation Construction Code requirements. When a Registered Design Professional has stamped and signed this page, they are attesting that to the best of their knowledge, belief, and professional judgment, such plans or specifications are in compliance with this Code.

Name - Title _____ Signature _____ Date _____

abc



Residential Prescriptive Package Worksheet

For Compliance with the
2002 New York State Energy Conservation Construction Code

Builder Name: _____ Date: _____
 Builder Address: _____
 Building Address: _____
 Description: _____ Package #: _____ Zone #: _____
 Submitted By: _____ Phone #: _____

PROPOSED	REQUIRED																														
<p>Glazing Area</p> <p>100% $\frac{\text{Glazing Area}}{\text{Gross Wall Area}} = \frac{\text{Proposed Glazing Area}}{\text{Proposed Glazing Area}}$ %</p> <p>Maximum Glazing Area _____ %</p>																															
<p>R-Value</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Description</th> <th style="width: 30%;">Comments</th> <th style="width: 40%;">Proposed R-Value</th> </tr> </thead> <tbody> <tr><td>Ceiling</td><td></td><td>R-</td></tr> <tr><td>Wall</td><td></td><td>R-</td></tr> <tr><td>Floor Over Unconditioned Space</td><td></td><td>R-</td></tr> <tr><td>Floor Over Outside Air</td><td></td><td>R-</td></tr> <tr><td>Basement Wall</td><td></td><td>R-</td></tr> <tr><td>Slab Floor</td><td><input type="checkbox"/> Heated <input type="checkbox"/> Unheated</td><td>R-</td></tr> <tr><td>Crawl Space Wall</td><td></td><td>R-</td></tr> <tr><td> </td><td></td><td></td></tr> <tr><td> </td><td></td><td></td></tr> </tbody> </table>		Description	Comments	Proposed R-Value	Ceiling		R-	Wall		R-	Floor Over Unconditioned Space		R-	Floor Over Outside Air		R-	Basement Wall		R-	Slab Floor	<input type="checkbox"/> Heated <input type="checkbox"/> Unheated	R-	Crawl Space Wall		R-						
Description	Comments	Proposed R-Value																													
Ceiling		R-																													
Wall		R-																													
Floor Over Unconditioned Space		R-																													
Floor Over Outside Air		R-																													
Basement Wall		R-																													
Slab Floor	<input type="checkbox"/> Heated <input type="checkbox"/> Unheated	R-																													
Crawl Space Wall		R-																													
<p>U-Factor</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Description</th> <th style="width: 30%;">Comments</th> <th style="width: 40%;">Proposed U-Factor</th> </tr> </thead> <tbody> <tr><td>Glazing</td><td></td><td>U-</td></tr> <tr><td>Door</td><td></td><td>U-</td></tr> <tr><td> </td><td></td><td></td></tr> <tr><td> </td><td></td><td></td></tr> </tbody> </table>		Description	Comments	Proposed U-Factor	Glazing		U-	Door		U-																					
Description	Comments	Proposed U-Factor																													
Glazing		U-																													
Door		U-																													
<p>Equipment Efficiency (This section may be left blank if Normal is selected on the right.)</p> <p> Heating _____ Efficiency AFUE/HSFP _____ Make & Model Number _____ Cooling _____ Efficiency SEER _____ Make & Model Number _____ </p>																															
<p> <input type="checkbox"/> Normal <input type="checkbox"/> High Heating <input type="checkbox"/> High Cooling <input type="checkbox"/> High Heating & Cooling </p>																															

Statement of Compliance: The proposed building design represented in these documents is consistent with the building plans, specifications, and other calculations submitted with the permit application. The proposed building has been designed to meet the requirements of the New York State Energy Conservation Construction Code.

Builder/Designer _____ Company Name _____ Date _____





Residential Trade-Off Worksheet Envelope

2002 New York State Energy Conservation Construction Code

Sheet 1

Builder Name: _____ Date: _____
 Building Address: _____
 Building Address: _____
 Project Description: _____ Zone #: _____
 Submitted By: _____ Phone #: _____

PROPOSED	REQUIRED
----------	----------

U-factors and R-values can be found in Tables 1-10
Ceilings, Skylights, and Floors Over Outside Air

Description	Insulation R-value	U-factor	x Area	= UA
Ceiling				
Floor Over Outside Air				
Skylight				
Ceilings: Total Area				

Required U-factor	x Area	= UA

Walls, Windows, and Doors

Description	Insulation R-value	U-factor	x Area	= UA
Wall				
Window				
Door				
Sliding Glass Door				
Walls: Total Area				

Required U-factor	x Area	= UA

Floors and Foundations

Description	Insul - Depth	Insulation R-value	U-factor	x Area	= UA
Floor Over Unconditioned					
Basement Wall					
Unfinished Slab	in				
Heated Slab	in				
Crawl Wall	in				

Required U-factor	x Area	= UA

Total Proposed UA

Total Required UA

Total Proposed UA must be less than or equal to the Total Required UA

Statement of Compliance: The proposed building design represented in these documents is consistent with the building plans, specifications, and other calculations submitted with the permit application. The proposed building has been designed to meet the requirements of the 2002 New York State Energy Conservation Construction Code.

Builder/Designer: _____ Company Name: _____ Date: _____

New York State Department of State Code Enforcement



Energy Analysis: Commercial

- 1) **COMcheck (3 pages only): U.S. Department of Energy (available on both State and Federal websites)**
- 2) **Commercial Prescriptive Worksheet (7 pages)**

**All are free and available on New York State website:
www.dos.state.ny.us/code/energycode/nyenergycode.htm**

**COMcheck is also available for free on the DoE website, but make sure you get the New York State version:
www.energycodes.gov/**





Generated by COMcheck-Web Software
Envelope Compliance Certificate

New York State Energy Conservation Construction Code

Report Date: 11/5/23

Section 1: Project Information

Project Title: 9-story residential

Construction Site:	Owner/Agent:	Designer/Contractor:
485 West 87th Street New York, New York 10024 Permit No. 123456789 Permit Date: To be determined		

Section 2: General Information

Building Location (for weather data):	New York, New York
Climate Zone:	3B
Heating Degree Days (base 65 degrees F):	4919
Cooling Degree Days (base 65 degrees F):	874
Project Type:	New Construction
Vertical Glazing / Wall Area Pct:	2%

<u>Building Type</u>	<u>Floor Area</u>
Other	4000

Section 3: Requirements Checklist

Envelope PASSES: Design 20% 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
Roof 1: Structural Slab	4000	---	30.0	0.032	0.063
Ext. Wall 1: Solid Concrete or Masonry LE 6in., Furring: None	30600	---	13.0	0.057	0.101
Window 1: Metal Frame, Double Pane, Clear, SHGC 1.00	540	---	---	2.000	0.835
Door 1: Air Lock Entry	42	---	---	2.000	0.157
Door 2: Solid	21	---	---	2.000	0.157
Int. Wall 2: Solid Concrete or Masonry LE 6in., Furring: None	27108	---	13.0	0.055	0.157
Basement Wall 1: Solid Concrete or Masonry LE 6in., Furring: Wood, Wall H: 10.0, Depth S.G. 9.0	4000	7.0	7.0	0.071	0.122
Floor 1: Concrete Floor (over unconditioned space)	4000	---	19.0	0.045	0.064

(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.
- 4. Insulation installed according to manufacturer's instructions, in substantial contact with the surface being insulated, and in a manner that achieves the rated R-value without compressing the insulation.
- 5. Fireplaces installed with tight fitting non-combustible fireplace doors.
- 6. Stair, elevator shaft vents, and other dampers integral to the building envelope are equipped with motorized dampers.

9-story residential



Generated by COMcheck-Web Software
Lighting Application Worksheet

New York State Energy Conservation Construction Code

Report Date:

Section 1: Allowed Lighting Power Calculation

	A	B	C	D
		Floor Area	Allowed Watts / ft ²	Allowed Watts
Other		40000	0.8	24000
			Total Allowed Watts =	24000

Section 2: Actual Lighting Power Calculation

	A	B	C	D	E
Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	Lamps/ Fixture	# of Fixtures	Fixture Watt.	(C X D)	
Compact Fluorescent 1: Rooms, Entry: Twin Tube 60W / Electronic	2	3	20	60	
Linear Fluorescent 1: Bath: 22in. T5 14W / Electronic	1	12	14	168	
Incandescent 1: Rooms: 40W	2	250	80	16400	
				Total Actual Watts =	16628

Section 3: Compliance Calculation

If the Total Allowed Watts minus the Total Actual Watts is greater than or equal to zero, the building complies.

Total Allowed Watts =	24000
Total Actual Watts =	16628
Project Compliance =	5372

Lighting PASSES: Design 22% better than code.

9-story residential



Generated by COMcheck-Web Software
Mechanical Compliance Certificate

New York State Energy Conservation Construction Code

Report Date: 11/05/25

Section 1: Project Information

Project Title: 9-story residential

Construction Site:

485 West 87th Street
New York, New York 10024
Permit No. 123456789
Permit Date: To be determined

Owner/Agent:

Designer/Contractor:

Section 2: General Information

Building Location (for weather data): New York, New York
Climate Zone: 50b
Heating Degree Days (base 65 degrees F): 4950
Cooling Degree Days (base 65 degrees F): 874
Project Type: New Construction

Section 3: Mechanical Systems List

Quantity: System Type & Description

- | Quantity | System Type & Description |
|----------|---|
| 1 | HVAC System 1: Heating: Central Furnace, Unknown / Single Zone |
| 1 | HVAC Plant 1: Heating: Hot Water Boiler, Capacity >=300 - <900 kBTu/h, Oil, with Waterloop Heatpump |
| 1 | Water Heater 1: Service Water Heater w/ Circulation Pump |

Section 4: Requirements Checklist

Requirements Specific To: HVAC System 1 :

None

Requirements Specific To: HVAC Plant 1 :

- 1. Equipment minimum efficiency: Boiler Thermal Efficiency >= 78% @
- 2. Newly purchased heating equipment meets the efficiency requirements - used equipment must meet 65% @ maximum capacity
- 3. Loop temperature controlled with 20 degrees F deadband where neither cooling lowestload cooler nor boiler can operate
- 4. Two-position valve on each heat pump having total heat pump system power > 10hp

Requirements Specific To: Water Heater 1 :

- 1. 1-in. pipe insulation on circulation systems
- 2. Automatic on/off control required for circulating systems

Generic Requirements: Must be met by all systems to which the requirement is applicable:

- 1. Load calculations per 2001 ASHRAE Fundamentals
- 2. Plant equipment and system capacity no greater than needed to meet loads
 - Exception: Standby equipment automatically off when primary system is operating
 - Exception: Multiple units controlled to sequence operation as a function of load
- 3. Minimum one temperature control device per system
- 4. Minimum one humidity control device per installed humidification/dehumidification system
- 5. Automatic Controls: Setback to 55 degrees F (heat) and 65 degrees F (cool); 7-day clock, 2-hour occupant override, 10-hour backup

ECCC of New York State Envelope Compliance Certificate

ALL INFORMATION MUST BE PROVIDED TO ENERGY CONSERVATION

Section 1 - Project Information

Project Name		Permit #	
Address		Date	
Owner/Agent	Telephone	Checked By	
Documentation Author	Telephone	Date	

Please Department Use Only

Section 2 - General Information

Building Floor Area	sq ft.		
Window-Wall Ratio (WWR)	Gross Fenestration Area	sq Gross Exterior-Wall Area	ft ² x 100 = Design WWR
Project Description:	<input type="checkbox"/> New Construction	<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration
	<input type="checkbox"/> Unconditioned Shell		

Section 3 - Requirements Checklist

Envelope Requirements	Check	Notes
- Component R-values and U-factors are labeled as certified	<input type="checkbox"/>	
- Vapor retarders installed	<input type="checkbox"/>	
- All joints and penetrations are caulked, gasketed, or weatherstripped	<input type="checkbox"/>	
- or otherwise sealed	<input type="checkbox"/>	
- Loading docks have proper weather seals	<input type="checkbox"/>	
- Windows, doors, and skylights certified as meeting leakage requirements	<input type="checkbox"/>	
- Major entries and exits have enclosed vestibule	<input type="checkbox"/>	
- Recessed lighting fixtures are IC rated or properly sealed	<input type="checkbox"/>	

Description	Climate-Specific Requirements	
	Proposed R-Value	Minimum R-Value
Wall Type 1		
Wall Type 2		
Wall Type 3		
Roof Type 1		
Roof Type 2		
Floor Type 1		
Floor Type 2		
Slab		

Description	Climate-Specific Requirements	
	Proposed U-Factor	Maximum U-Factor
Window 1		
Window 2		
Window 3		
Door 1		
Door 2		

Description	Climate-Specific Requirements	
	Proposed SHGC	Maximum SHGC
Window 1	Y / N / SF	
Window 2	Y / N / SF	
Window 3	Y / N / SF	

SF = Projection Factor

Skylights less than 5% of the Total Roof Area:	% of Roof
Skylight type: ___ curb, glass ___ curb, plastic ___ no curb	
Skylight 1	
Skylight 2	

Section 4 - Compliance Statement

The proposed envelope design represented in these documents 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 2002 Energy Conservation Construction Code.

Owner/Owner Representative - Name	Signature	Date

Mechanical Compliance Certificate for Complex Systems for the 2002 ECCO of NYS (Cont'd)

Section 3 - Requirements Checklist

Requirements	Check Items	Notes
Hydronic Systems Control (cont'd)		
• Hydronic systems \geq 600 bbl/hp have:	<input type="checkbox"/>	
- reset controls for supply water temperature or	<input type="checkbox"/>	
- mechanical or electrical adjustable-speed pump drive(s) or	<input type="checkbox"/>	
- multiple-stage pumps or	<input type="checkbox"/>	
- other system controls that reduce pump flow by at least 50% based on load (calculations required)	<input type="checkbox"/>	
Heat Rejection Equipment Fan Speed Control		
• Fans \geq 7.5 hp must have speed control	<input type="checkbox"/>	
Exception: Heat rejection devices included as an integral part of the equipment listed in Tables 603.5.2(1) through 603.5.2(4).		
Exhaust Air Energy Recovery		
• Fan systems \geq 5,000 cfm with minimum OA supply \geq 75% must have energy recovery system	<input type="checkbox"/>	
Exceptions:		
- systems exhausting toxic fumes		
- Type I Commercial kitchen hoods		
- other largest exhaust source <75% of design OA		
- systems requiring dehumidification		
- systems employing CO ₂ control		
Exhaust Hoods		
• Kitchen hoods >5,000 cfm must use \geq 50% of makeup air from unconditioned source	<input type="checkbox"/>	
• Fume hood systems with exhaust rate >15,000 cfm must include one of the following:		
1. Variable air volume exhaust and supply system	<input type="checkbox"/>	
2. Direct makeup air supply \geq 75% exhaust rate	<input type="checkbox"/>	
3. Heat recovery system to precondition makeup air	<input type="checkbox"/>	
Fireplaces		
• Fireplaces must be installed with tight-fitting fireplace doors to control infiltration losses	<input type="checkbox"/>	
Duct Construction		
• Duct insulation meets minimum R-values		
- Ducts in unconditioned spaces R-value _____ (R-5 min.)		
- Ducts outside the building R-value _____ (R-5 min.)		
• Ducts sealed	<input type="checkbox"/>	
- joints and seams on ductwork fastened and sealed per UL 181A or B (no duct tape as primary sealant)	<input type="checkbox"/>	
- systems with \geq 3" eq sealed in accordance with SMACNA Leakage Class (CL) < 6.0	<input type="checkbox"/>	
Hydronic Heating Systems		
• Pipe insulation: - Min. thickness required: _____ inches		
- Min. thickness proposed: _____ inches		
• Retired efficiency method: (loop reset/variable flow) (circle one)		
Water-Heating Systems		
(Electric CHW = 5 kW input maximum)		
• Heat traps in individual buildings	<input type="checkbox"/>	
• Pipe insulation on inlet/outlet pipes _____ in. thickness	<input type="checkbox"/>	
• Recirculating System: (Y/N) (circle one)	<input type="checkbox"/>	
- Pipes insulated _____ in. thickness	<input type="checkbox"/>	
- Automatic time-switch control	<input type="checkbox"/>	
HVAC System Completion		
• Balancing devices in accordance with IMC 603.15	<input type="checkbox"/>	
• Balancing and pressure test connections on all hydronic terminal devices	<input type="checkbox"/>	
• O & M manual(s) provided to building owner	<input type="checkbox"/>	

Section 4 - Compliance Statement

The proposed mechanical design represented in these documents is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical system has been designed to meet the 2002 ECCO of NYS.

Owner/Owner Representative - Name	Signature	Date

Energy Modeling

- On complex buildings there may be a need to perform energy modeling as codified under Section 11 of ASHRAE 90.1-1999.
- The use of the Energy Cost Budget Worksheet [EC-1] requires many design inputs and outputs from the energy modeling to report on this type of analysis, allowing among all components of the building *except* exterior lighting.



Energy Cost Budget Worksheet



EC1: Energy Cost Budget Worksheet

Must be typewritten.

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

1 Location Information <i>Required for all applications.</i>					
House No(s)		Street Name			
Borough	Block	Lot	BIN	CB No.	
Work on Floor(s)			Apt/Condo No(s)		

2 Applicant Information <i>Required for all applications.</i>					
Last Name		First Name		Middle Initial	
Business Name			Business Telephone		
Business Address				Business Fax	
City	State	Zip	Mobile Telephone		
E-Mail			License Number		

Energy Model Inputs		
<i>NYS approved energy model software:</i>		
Envelope	Proposed Design Input	Budget (Standard Design) Input
Above-grade wall U-factor		
Below-grade wall U-factor		
Roof construction U-factor		
Exterior floor U-factor		
Slab-on-grade construction (yes/no)		
Window-to-gross wall ratio		
Average fenestration assembly U-factor		
Average fenestration assembly SHGC		
Fixed shading devices (yes/no)		
Automated movable shading devices (yes/no)		
Lighting		
Average ambient lighting power density (W/SF)		
Lighting occupant sensor controls (yes/no)		
Automatic daylighting controls (yes/no)		
Exterior lighting power (tradable surfaces) (kW)		
Exterior lighting power (non-tradable surfaces) (kW)		
Heating, Ventilating & Air Conditioning		
Refrigeration equipment type		
Heating equipment type		
Demand controlled ventilation (yes/no)		
Economizer type (air or water)		
Domestic hot water heating source		

EC1 PAGE 2

Unregulated Energy	Proposed Design Input	Budget (Standard Design) Input
Average Receptacle equipment power density (W/SF)		
Average Unregulated lighting power density (W/SF)		
Other process loads		

Energy Cost Budget Conformance	Proposed Design Output	Budget (Standard Design) Output
Annual Regulated Energy Cost (\$)		
Annual Regulated Energy Use (BTU/GSF)		
Annual Regulated Energy Cost Per Sq. Ft. (\$/GSF)		

Energy Model Output Breakdown		
Energy Use Breakdown	Proposed Design Output (% BTU/yr)	Budget (Standard Design) Output (% BTU/yr)
Heating		
Cooling		
Heat rejection		
Fans		
Pumps		
Lighting		
Unregulated loads (e.g., plug loads, elevators, escalators, kitchen, process equipment, exterior lighting)		
Total	100%	100%

Falsification of any statement is a misdemeanor under § 26-124 of the NYC Administrative Building Code 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.

Name (please print)	
Signature	Date
P.E. / R.A. Seal <i>(apply seal, then sign and date over seal)</i>	