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SECTION 1: ABOUT

The Energy Analysis describes how a project complies with the New York City Energy Conservation Code (NYCECC). It identifies the strategy or compliance path taken by the design team and the ECC chapter or the ASHRAE standard used for design. An Energy Analysis is not required if the project is exempt.

The Energy Analysis must represent the entire project, including a building’s envelope, HVAC, service water heating, lighting and electrical power systems as applicable to the scope of the project work. The Energy Analysis may be in one of the formats below. Other formats may be used if approved in advance by the Secretary of State of New York State, where required and the Buildings Commissioner.

- REScheck
- COMcheck
- DOE2-based energy modeling software, using Form EN1 for reporting to the Department
- Energy Code Tabular Analysis (pdf)

Applicants must key the identifying terms used in the energy analysis to the construction drawings, so that each wall type, window type, HVAC unit, lighting fixture, etc., can be clearly linked to their location in the drawings. Applicants must also provide sheet numbers, signaling where the supporting documentation for each line item in the energy analysis can be found. This can be done either through a column in the tabular analysis format or in notes section relating to the COMcheck, REScheck or EN1 form in the drawings.

For more information and requirements regarding REScheck, COMcheck and DOE2 software, see the Additional Information page.

SECTION 2: RESIDENTIAL BUILDINGS (ECC CHAPTER 4)

The NYCECC defines residential buildings as one-, two-, three- and multiple-family dwellings three stories or less. All residential buildings four stories and above are categorized as a commercial building.

New Residential Buildings

You may use one of the below forms when doing an energy analysis for a new residential building. See the Additional Information page for more information.

1. REScheck Software: Can be used to demonstrate compliance with the NYCECC when doing an analysis for a new residential building. When using REScheck, you must complete all the checkboxes on all the pages of the form as shown in Figure 1 in the Appendix.

2. Tabular Analysis: Can be used to demonstrate compliance with the NYCECC when doing an analysis for a new residential building, as shown in Figure 2 in the
Appendix and described in the Residential Additions and Alterations section below.

**Residential Additions and Alterations**

You may use one of the below forms when doing an energy analysis for an addition or alteration to a residential building. See the [Additional Information](#) page for more information.

1. **REScheck Software**: Can be used to demonstrate compliance with the NYCECC when doing an analysis for a residential addition or alteration when a whole building analysis is being performed. When using REScheck, you must complete all the checkboxes on all the pages of the form, as shown in Figure 1 in the Appendix.

   *Note: The applicant should be prepared to prove all the values used to represent the existing building.*

2. **Tabular Analysis**: Can be used to demonstrate compliance with the NYCECC when doing an analysis for a residential addition or alteration, as shown in Figure 2 in the Appendix. You must comply entirely with the prescriptive values in the NYCECC, no performance calculations will be accepted and in the heading title you must include “Energy Analysis,” the project’s occupancy (residential or mixed), the scope of work and the climate zone. In the four columns below, you must also include each scope of work item, the proposed energy value for each item, the energy value prescribed for each item by the NYCECC with the relevant citation and the drawing number(s) where supporting documentation may be found.

   For an optional method to present the tabular analysis, see the residential building sections of the [Energy Code Tabular Analysis](#) table. Complete the lines that apply to your project and delete those rows that do not apply to your project.

   *Note: One tabular prescriptive analysis may be used for both the residential and commercial occupancies in a mixed occupancy project.*

**Mixed Occupancy with a Residential Section**

When a proposed project has a mixed occupancy, each occupancy must be considered separately and separate energy analyses must be performed demonstrating how the occupancies will comply with Chapters 4 and 5 of the NYCECC, respectively, Section ECC 101.4.6 of the NYCECC. For a residential building with commercial space, this can be accomplished by simply adding a tabular analysis for the commercial space to REScheck or by performing an entire analysis for both the residential and commercial spaces through a single tabular analysis.
The NYCECC defines commercial buildings as any building that is not a residential building. This includes one-, two- or multiple-family dwellings four stories or higher, which are called Group R Buildings in ECC Chapter 5 for envelope purposes as well as all other occupancy types, regardless of number of stories.

Commercial projects must use either Chapter 5 of the NYCECC or ASHRAE 90.1 for compliance. You must decide which code all disciplines will use for their project.

**New Commercial Buildings**

You may use one of the below formats when doing an energy analysis for a new commercial building. See the [Additional Information](#) page for more information.

1. **COMcheck**: Can be used to demonstrate compliance with the NYCECC when doing an analysis for a new commercial building. When using COMcheck, you must complete all the checkboxes on all the pages of the form, as shown in Figure 3 in the Appendix.

2. **DOE2-Based Energy Modeling Software**: Can be used to demonstrate compliance with the NYCECC when doing an analysis for a new commercial building. The analysis must be reported on the Energy Cost Budget Worksheet (EN1 Form), as shown in Figure 7 in the Appendix. You may use either Section ECC 506 of the NYCECC or Chapter 11 in ASHRAE 90.1 and energy modeling based on the DOE2 program.

3. **Tabular Analysis**: Can be used to demonstrate compliance with the NYCECC when doing an analysis for a new commercial building, as shown in Figure 8 of the Appendix and described in in the Commercial Additions and Alterations section below.

*Note: The COMcheck Lighting Application Worksheet, as shown in Figure 5B in the Appendix, may be submitted at the discretion of the applicant to demonstrate how the lighting portion of the design will comply with the NYCECC.*

**Commercial Additions and Alterations**

You may use one of the following formats when doing an energy analysis for an addition or alteration to a commercial building. See the [Additional Information](#) page for more information.

1. **COMcheck Software for the Energy Conservation Construction Code of New York State or ASHRAE 90.1**: Can be used to demonstrate compliance with the NYCECC when doing an analysis for an alteration or addition to a commercial building. You must use whichever form was used for the design and you must complete all the checkboxes on all the pages of the form, as
shown in Figures 3 through 6 in the Appendix – apply them as they seem fit to the scope of work for examples of the COMcheck report elements. The COMcheck report must state that the project type is an addition or alteration where applicable.

COMcheck may only be used when a whole building analysis is being performed, including both the existing building and addition/alteration. You should be prepared to prove the values used to represent the existing building.

2. **DOE2-Based Energy Modeling Software:** Can be used to demonstrate compliance with the NYCECC when doing an analysis for an alteration or addition to a commercial building. The analysis must be reported on the Energy Cost Budget Worksheet (EN1 Form). You must use energy modeling when such software is designed to model commercial additions or alterations as applicable and reports such project type. See Figure 7 in the Appendix for an example of a completed form.

3. **Tabular Analysis:** Can be used to demonstrate compliance with the NYCECC when doing an analysis for an alteration or addition to a commercial building, as shown in Figure 8 in the Appendix. You must comply entirely with the prescriptive values in the NYCECC, no performance calculations will be accepted unless the COMcheck Lighting Application Worksheet is submitted with trade-offs within lighting only. In the heading title you must include “Energy Analysis,” the project’s occupancy (commercial), the scope of work, the climate zone and the standard used (Chapter 5 or ASHRAE 90.1). In the four columns below, you must also include each scope of work item, the proposed energy value for each item, the energy value prescribed for each item by the NYCECC with the relevant citation and the drawing number(s) where supporting documentation may be found.

   *Note: The COMcheck Lighting Application Worksheet, as shown in Figure 5B in the Appendix, may be submitted at the discretion of the applicant to demonstrate how the lighting portion of the design will comply with the NYCECC.*

For an optional method to present the tabular analysis, see the commercial building sections of the **Energy Code Tabular Analysis** table. Complete the lines that apply to your project and delete those rows that do not apply to your project.
SECTION 4: PRESENTATION OF ENERGY ANALYSIS

The energy analysis must be included on a drawing or drawings within the construction drawing set.

Projects Filed Under One Application Number with No Discipline Trade-Offs

When all disciplines are filed under one application number and there are no trade-offs among disciplines, each element of the energy analysis may be submitted with the related drawings.

For example, if you are using COMcheck, the envelope report may be included in the architectural set, the mechanical report with the mechanical set or the lighting report with the electrical or energy drawings (or architectural or mechanical drawings, as applicable); or the entire energy analysis may also be submitted with the initial filing of the project.

Projects Filed Under Separate Application Numbers

When disciplines are filed under separate application numbers, the energy analysis elements for all disciplines must be submitted together in the initial filing for the project.

Discipline Trade-Offs

When trade-offs are used among disciplines, the energy analysis must be included in the initial filing for the project and signed and sealed by the lead professional.

Foundation Permits

When a foundation permit is filed separately for a new building, the foundation drawings must include a tabular analysis and details showing foundation insulation. Additionally, the next filing for the entire project must include the entire energy analysis, including the foundation.

Signing and Sealing

When multiple applicants are permitted to sign and seal their parts of the energy analysis (as above in this section) and all parts of the energy analysis are presented on one sheet (or more as required) with each professional signing and sealing his or her respective report, there should be no seal and signature on the title block of the sheet and it must bear the EN discipline designator.

Each report may be placed on a separate sheet bearing the EN discipline designator, and each professional should then sign and seal his or her respective sheet at the title block only or the lead professionals should sign and seal at the title block.
**SUBSECTION 4.1: REGISTERED DESIGN PROFESSIONAL RESPONSIBILITY**

**Lead Professional**

When trade-offs among disciplines are used, a single professional, identified as the lead professional, must sign and seal the entire energy analysis.

For example, a building design utilizes a glass curtain wall that underperforms the prescriptive requirements in the NYCECC for the envelope, but this is mitigated with the lighting and mechanical systems that exceed NYCECC efficiency requirements. Because the envelope will not pass the compliance test, the project must undergo energy modeling using a DOE2-based program in order to demonstrate that the overall project will not use any more energy than a building of similar occupancy, mass, height, etc., and meets all the other prescriptive requirements of the NYCECC without trade-offs. Consequently, one professional must take responsibility for the entire energy analysis by signing and sealing the energy analysis drawing(s).

**Respective Professional Responsibility**

When trade-offs are not used among disciplines registered design professionals may sign and seal their respective parts of the energy analysis. See Section 4: Presentation of Energy Analysis” above for information on where to sign and seal the drawing(s).

**Registered Design Professional, Other than the Design Applicant of Record**

Registered design professionals other than the design applicant(s) of record may sign and seal the energy analysis, provided that such professional(s) file a PW1 form as a subsequent filing to the initial filing for the project. For the work type, such registered design professionals should check “OT” and indicate “EN” or “E” on the line following.

**SUBSECTION 4.2: APPLICATIONS THAT ARE NOT EXEMPT BUT MAY NOT NEED TO COMPLY WITH THE NYCECC**

When you must check on the PW1 form that the application complies with the NYCECC (see the Professional Statement page for more information) but the scope includes exempt items, items that may be exemptions under Section ECC 101.4.3 of the NYCECC or you deem items as not required to comply with the NYCECC, Section ECC 101.4.3 of the NYCECC, then you should list these items in the energy analysis and then address them there. We recommend listing them in the tabular analysis, as it is the best and easiest format for this situation in most cases. In such case, where appropriate and applicable, the applicant may indicate “NA” in the proposed value column and “NA” in the prescriptive value column and provide the citation where applicable as indicated above.

For example, if you are adding an unconditioned garage accessory to a one-family residence, where the roof, walls, windows and slab-on-grade of the garage are exempt...
from thermal requirements of the NYCECC but the lighting must comply, you must check that the application complies in section 10 of the PW1 form. Then in the energy analysis on line 1, indicate “new roof, new walls and new floor” for the scope of work item, a proposed value of “NA” and a prescriptive value of “NA” and cite the exemption that allows no insulation (§ECC 101.5.2). On line 2, indicate “install two lighting fixtures” for the scope of work item, indicate a prescriptive value of 0.3W/SF and cite the code section prescribing the lighting requirements for this U occupancy (ECC Table 505.5.2).

Note: In cases where Section 10 of the PW1 form must be checked for compliance, but when the energy analysis shows no compliance is necessary, the TR8 will automatically be triggered as a required item. See the Professional Statement page and Information About Forms page for more information on how to address this form in such circumstances.
SECTION 5: APPENDIX

FIGURE 1: SAMPLE RESCHECK COMPLIANCE CERTIFICATE

Notes:

1. Roof, Skylight, Wall, Window, Door and Foundation Types in Energy Analysis should be carried over to construction drawings for clear identification.

2. Provide sheet numbers where each line item is supported in the construction drawings.

Supporting Documentation Reference:

Roof Type 1: A104.01
Exterior Wall Types A and B: A301.01
Doors A and B: A401.01
Windows 1-5: A401.01
**FIGURE 2: TABULAR ANALYSIS**

Applicants must include reference to the applicable Supporting Documentation for EACH item within the Tabular Analysis.

<table>
<thead>
<tr>
<th>ITEM DESCRIPTION</th>
<th>PROPOSED DESIGN VALUE</th>
<th>CODE PRESCRIPTIVE VALUE AND CITATION</th>
<th>SUPPORTING DOCUMENTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BUILDING ENVELOPE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace roof shingles and sheathing, add insulation to attic</td>
<td>Roof Type 1: R-38 fiberglass insulation in wood ceiling joists below vented attic space</td>
<td>Minimum R-38 ceiling insulation NYCECC Table 402.1.1</td>
<td>Roof Type 1: A-100 (Roof Plan) A-402 (Wall Sections) 7/A-603 (Roof Eave Detail)</td>
</tr>
<tr>
<td>Replace existing windows w/new wood framed windows, Floors 2 - 4</td>
<td>Window Type 1 +2 +3: U = 0.31 Air leakage 0.30 cfm/SF</td>
<td>Window Types A-D: Maximum U-Factor = 0.35 NYCECC Table 402.1.1 Maximum Air Leakage = 0.3 cfm/SF NYCECC 402.4.4</td>
<td>Window Types A-D: A-301-302 (Elevations) A-501 (Schedules)</td>
</tr>
<tr>
<td>Renovate interior side of exterior walls around new window openings – repair/replace gwb</td>
<td>No change proposed to existing 3 ½” wood stud walls which are completely filled with fiberglass batts (estimated R-8.1/inch).</td>
<td>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.</td>
<td>A-102-104 (Floor Plans) 1-2/A-305 (Interior Elevations)</td>
</tr>
</tbody>
</table>
Supporting Documentation Reference:

- Roof Type 1: A601.01
- Wall Types 1-5: A401.01
- Doors A and B: A501.01
- Windows 1-8: A501.01
- Foundation Type 1: S201.01
- Basement Wall Type 1: S201.01, A402.01
- Progress Inspections for Envelope: A601.01
Supporting Documentation Reference:

AHU #1 - #5: M701.01
Controls Narrative: M604.01
Typical duct insulation and sealing: M602.01
Progress Inspections for Mechanical: M801.01
Supporting Documentation Reference

Interior lighting layouts, Floors B-3: E101.01 – E104.01
Exterior lighting layouts: E106.01
Lighting Fixture Legend: E601.01
Lighting Controls Narratives: E602.01
Progress Inspections: E801.01
FIGURE 5B: COMCHECK INTERIOR LIGHTING APPLICATION WORKSHEET

<table>
<thead>
<tr>
<th>Lighting Power Allowances (LPA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Interior Lighting Requirements</td>
</tr>
</tbody>
</table>

**Sample COMcheck:**
- Compare the Allowed Watts with the Proposed Watts

**Allowed Watts**

<table>
<thead>
<tr>
<th>Section 2: Interior Lighting and Power Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Area Category</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>School/University 82282</td>
</tr>
</tbody>
</table>

**Section 3: Interior Lighting Fixture Schedule**

<table>
<thead>
<tr>
<th><strong>A</strong> Fixture ID / Description / Lamp / Wattage Per Lamp / Ballast</th>
<th><strong>B</strong> Lamps / Fixtures</th>
<th><strong>C</strong> # of Fixtures</th>
<th><strong>D</strong> Total Watt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear fluorescent 1. Other / Electronic</td>
<td>2</td>
<td>85</td>
<td>6052</td>
</tr>
<tr>
<td>Linear fluorescent 2. Other / Electronic</td>
<td>1</td>
<td>5</td>
<td>34</td>
</tr>
<tr>
<td>Linear fluorescent 3. Other / Electronic</td>
<td>1</td>
<td>24</td>
<td>34</td>
</tr>
<tr>
<td>Linear fluorescent 4. Other / Electronic</td>
<td>1</td>
<td>14</td>
<td>29</td>
</tr>
<tr>
<td>Linear fluorescent 5. Other / Electronic</td>
<td>1</td>
<td>10</td>
<td>68</td>
</tr>
<tr>
<td>Linear fluorescent 6. Other / Electronic</td>
<td>1</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>Linear fluorescent 7. Other / Electronic</td>
<td>2</td>
<td>7</td>
<td>57</td>
</tr>
<tr>
<td>Linear fluorescent 8. Other / Electronic</td>
<td>1</td>
<td>24</td>
<td>99</td>
</tr>
<tr>
<td>Linear fluorescent 9. Other / Electronic</td>
<td>2</td>
<td>2</td>
<td>57</td>
</tr>
<tr>
<td>Linear fluorescent 10. Other / Electronic</td>
<td>2</td>
<td>2</td>
<td>68</td>
</tr>
<tr>
<td>Linear fluorescent 11. Other / Electronic</td>
<td>1</td>
<td>7</td>
<td>34</td>
</tr>
<tr>
<td>Linear fluorescent 12. Other / Electronic</td>
<td>1</td>
<td>24</td>
<td>57</td>
</tr>
<tr>
<td>Linear fluorescent 13. Other / Electronic</td>
<td>1</td>
<td>17</td>
<td>34</td>
</tr>
<tr>
<td>Linear fluorescent 14. Other / Electronic</td>
<td>1</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Linear fluorescent 15. Other / Electronic</td>
<td>1</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Linear fluorescent 16. Other / Electronic</td>
<td>1</td>
<td>31</td>
<td>34</td>
</tr>
<tr>
<td>Linear fluorescent 22. 40&quot; T5 30W / Electronic</td>
<td>1</td>
<td>20</td>
<td>34</td>
</tr>
<tr>
<td>Linear fluorescent 23. 40&quot; T5 30W / Electronic</td>
<td>2</td>
<td>1</td>
<td>57</td>
</tr>
<tr>
<td>Linear fluorescent 24. 40&quot; T5 30W / Electronic</td>
<td>1</td>
<td>12</td>
<td>34</td>
</tr>
<tr>
<td>Linear fluorescent 25. 20&quot; T5 30W / Electronic</td>
<td>1</td>
<td>23</td>
<td>28</td>
</tr>
</tbody>
</table>

Total Proposed Watts = 14356

**Progress Inspectors:** Check areas and compare against the submitted schedule for a minimum of 15%.
Supporting Documentation Reference

Exterior lighting elevations: A601.01 – A604.01
Exterior lighting layouts: A606.01
Lighting Fixture Legend: A601.01
Lighting Controls Narratives: A602.01
Progress Inspections: EN102.01
FIGURE 7: ENERGY MODELING, EN1 FORM

Sample EN1 – Envelope Input

Envelope inputs

Energy Model Inputs
NYS approved energy model software: DOE-2.2

Proposed Design Input

Budget (Standard Design) Input

Above-grade wall U-factor
0.102 Btu/h-ft²-F
0.124 Btu/h-ft²-F

Below-grade wall U-factor
0.107 Btu/h-ft²-F
0.107 Btu/h-ft²-F

Roof construction U-factor
0.047 Btu/h-ft²-F
0.063 Btu/h-ft²-F

Exterior floor U-factor
0.89
0.89

Dielon-grade construction (yes/no)
yes
95

Window-to-gross wall ratio
58.8%
100%

Average fenestration assembly U-factor
0.43 Btu/h-ft²-F typical, 1.1 zonefront, 0.453 ave
0.46 Btu/h-ft²-F

Average fenestration assembly SHGC
0.31 typical, 0.72 zonefront, 0.332 average
0.36 north, 0.26 other orientations

Fixed shading devices (yes/no)
no
0

Automated movable shading devices (yes/no)
no
0

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

Sample EN1 – Results

4. Submissions & Inspections

Energy Cost Budget Conformance
Annual Regulated Energy Cost ($)
4,463.10
1,477.272

Annual Regulated Energy Use (BTU/yr)
44,61
48,006

Annual Regulated Energy Cost Per Sq. M. (€)
2.51
2.34

Energy Model Output Breakdown

Proposed Design Output

Budget (Standard Design) Output

Heating
34.2%
32.9

Cooling
13.3%
7.7

Total reheat
5.3%
2.4%

Fan
8.9%
8.8%

Pumps
1.7%
2.0%

Lighting
19.3%
18.4%

Unregulated loads (e.g., plug loads, elevators, escalators, kitchen, process equipment, exterior lighting)
28.1%
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.
Doors A – G: A501.01
Curtain wall Types #1-20: A601.01 – A625.01
Foundation Wall Types 1-4: A701.01, S501.01 – S504.01
Boilers 1, 2: M501.01, M801.01
AHU #1 – #6: M502.01 – M505.01, M801.01
Controls Narratives: M802.01
Interior Lighting Layouts: E101.01 – E125.01
Exterior Lighting Layouts and Elevations: E130.01 – E136.01
Lighting Legends: E801.01
Lighting Controls and Narratives: E002.01

---

**FIGURE 8: TABULAR ANALYSIS**

<table>
<thead>
<tr>
<th>ITEM DESCRIPTION</th>
<th>PROPOSED DESIGN VALUE</th>
<th>CODE PRESCRIPTIVE VALUE AND CITATION</th>
<th>SUPPORTING DOCUMENTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace roof membrane and add insulation</td>
<td>Roof Type 1: 4&quot; XPS (R +20) continuous insulation above deck</td>
<td>Roof Types 1: A-006 (Roof Mem) A-002 (Wall Sections) 6/4-A-603 (Roof Details)</td>
<td></td>
</tr>
<tr>
<td>Replace existing windows w/new aluminum framed windows,</td>
<td>Window Type A1: U = 0.46, SHGC = 0.29, Air leakage a 0.60 cfm/ft²</td>
<td>Window Types A-D: A-001-502 (Elevations) A-001 (Schedules)</td>
<td></td>
</tr>
<tr>
<td>, Proors z - a</td>
<td>Window Types B - C: U = 0.46, SHGC = 0.31, Air leakage a 0.30 cfm/ft²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WWR = 32%</td>
<td>Window Type D: U = 0.41, SHGC = 0.23, Air leakage a 0.30 cfm/ft²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FF = 0</td>
<td>NYCECC 302.2</td>
<td>NR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NYCECC 302.4.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renovate interior side of</td>
<td>N/A - No change proposed to existing 3&quot; metal stud framing walls which are completely filled with fiberglass batts (estimated R-3.1/inch).</td>
<td>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-3.5/inch.</td>
<td></td>
</tr>
<tr>
<td>exterior walls around new window openings –</td>
<td></td>
<td>A-002-104 (Floor Plants) 1-2/4-305 (Interior Elevations)</td>
<td></td>
</tr>
</tbody>
</table>