Nebraska Commercial Energy Code Compliance Report for the 2009 International Energy Conservation Code

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Contents

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- Danielle Jensen, Nebraska Energy Office
- Energy Code Compliance Sub-Committee of the Nebraska Energy Codes Collaborative
- Tim Hemsath, AIA, Associate Professor, College of Architecture, University of Nebraska-Lincoln
- Bradley Cory, Doctoral Student, School of Architecture Engineering and Construction, University of Nebraska Lincoln
- College of Architecture, University of Nebraska-Lincoln students who participated in the study.

Section 1.0 Introduction

The Nebraska Energy Office (NEO) commissioned Britt/Makela Group, Inc. (BMG) to assess compliance with the commercial provisions of the 2009 International Energy Conservation Code (IECC). The goals of the project were to:

- Assess compliance rates for projects that represented typical commercial construction in Nebraska
- Collect information on energy code compliance issues that could be used to establish a framework for future energy code implementation programs in the state.

The Energy Code Compliance subcommittee of the Nebraska Energy Codes Collaborative was instrumental in guiding the development of the parameters of the project. At their recommendation, NEO also contracted with the University of Nebraska (UNL) College of Architecture and Construction Management to provide interested students to collect data on energy code compliance in the field. In addition, a project coordinator was hired by UNL to oversee the onsite scheduling and data collection and to act as a liaison between the students, BMG and NEO. Using students in the architecture and construction management programs offered students a unique opportunity to better understand the energy code and how it is typically applied in the field. This collaborative model could be replicated in other states to provide a low cost method of implementing a compliance study.

The U.S. Department of Energy's (DOE) 90% Energy Code Compliance Methodology was used to guide the compliance study. Modifications were made to the methodology to fit the study into a prescribed time frame. The students were trained on the energy code and how to collect data using the data collection tool; the project coordinator contacted the jurisdictions to arrange commercial buildings for the study and scheduled the data collection performed by the students. DOE's Score and Store tool was used to analyze compliance with the energy code for each building in the study. Compliance was also determined for each jurisdiction and for the state as a whole. A qualitative analysis was conducted as part of the study to gather information on the processes used by the jurisdictions to enforce the energy code. The information collected in both the quantitative and qualitative analyses was used to inform recommendations for increasing compliance with the energy code.

The report that follows provides detailed information on the methodology and findings of the study as well as recommendations for increasing compliance with the commercial provisions of the 2009 IECC.

Section 2.0 Methodology

The methodology used for the compliance study followed the DOE 90% Compliance Methodology with modifications. The modifications were instituted to ensure the timely collection of building data.

Section 2.1 Building Parameters

The commercial buildings selected as part of this study were representative of the majority of commercial construction in Nebraska[1]. The study focused on construction that was considered low-rise commercial construction (i.e., no more than two-stories in height) and that used single zone HVAC equipment to provide space conditioning. These building parameters were selected to increase the success rate of the data collection process. Limiting the study to typical construction ensured that an accurate representation of building stock was analyzed and the exclusion of complex HVAC systems (e.g., buildings with large built up multi-zone systems) required less expertise by the students collecting data in the field.

The resulting sample consisted of 15 different occupancy types (Table 1) with the majority being education and retail.

Occupancy Type	Number
Office/Warehouse Storage	3
Warehouse/Storage	3
Education	6
Other Fire Station Fire Station Car Dealership Animal Hospital Powder Coat Facility institutional	7
Residential	4
Office	4
Restaurant	1
Healthcare	2
Hotel	2
Retail	6
Total	**38**

Table 1. Occupancy Type

Section 2.2 Sample Selection

Sample sizes and selection were determined using the DOE 90% Compliance State Sample Generator and were based on the size of the county and number of new construction sites. The sample selection

[1] Jurisdictions were asked to provide buildings that represented typical construction and that were in a phase of construction that could be reviewed in the field. The buildings that were selected often represented those projects that were available for review at the time of the study and may not have accurately represented typical construction.

was focused on the Lincoln/Omaha area as this represented the majority of the construction in the state. Limiting the selection to a concentrated area also helped keep travel to a minimum, reducing data collection costs. Table 2 includes the final sample size by county used in the study.

County	Sample Size
Douglas County	9
Sarpy County	2
Lancaster County	14
Buffalo County	3
Hall County	4
Box Butte County	2
Washington County	1
Merrick County	1
Keith County	1
Wayne County	1
State Total	**38**

Table 2. Sample Selection by County

Section 2.3 Data Collection Checklist

A modified version of the DOE 90% Compliance Data Collection Tool was used as the data collection checklist for this study (Appendix A). The DOE 90% Compliance Data Collection Tool reflects all of the energy code provisions that can be reviewed either during the plan review process or in the field. Each measure on the checklist is assigned a tier number that is a designation of the potential impact of energy use on the project; the lower the tier, the greater the impact. For example, a provision included in tier one has a greater impact on efficiency than a provision in tier three. The checklist used as part of this study was modified to only include Tier 1 and 2 conservation features and not Tier 3. Tier 3 features were typically found on built-up mechanical systems and multi-zone systems which were outside the scope of this study.

Section 2.4 Data Collection Team

UNL College of Architecture and Construction Management students were used to collect data in the field. A project coordinator was hired by UNL to manage the data collection process. Tasks involved with this position included scheduling jurisdictions for the study and coordinating with the students to ensure that a team was available to visit the jurisdiction to collect data. The project coordinator also served as the liaison between the data collection team, BMG and NEO.

Using architecture and construction management students for data collection is unique to energy code compliance studies. Involvement in the process provided an opportunity for the students to not only be exposed to the commercial energy code in the classroom, but to have firsthand experience in how the code is implemented in the field as well.

The contribution to this study made by the College of Architecture cannot be overstated. The project coordinator and students who participated in this program were able to coordinate with the jurisdictions to successfully collect data while representing NEO in a professional manner.

Section 2.5 Data Collection Team Training

BMG developed a two-and-a-half day training program that was focused on providing an overview of the commercial provisions of the 2009 IECC. The program also instructed the students on the proper use of the data collection checklist. The final half–day was taught onsite in the field using the data collection checklist.

Section 2.5.1 2009 IECC for Commercial Buildings Training

The course provided an overview of the following sections of the 2009 IECC:

- Scope and Application
- Building Envelope
- HVAC Systems
- Service Water Heating
- Building Lighting System

Training on the HVAC section focused on provisions that impact single zone unitary heating and cooling systems to best fit the scope of this study.

Section 2.5.2 Data Collection Form Training

BMG used training materials developed by DOE's Building Energy Codes Program (BECP) to instruct on the use of the data collection checklist. The presentation was modified to better match Nebraska's climate zone as well as the Tier 1 and Tier 2 features included on the modified checklist. Training also addressed how to read a COM*check* submittal for use in the data collection process. BMG used the COM*check* Plan Review Guide along with a commercial case study developed by BECP to instruct the students on how to complete the data collection checklist.

Finally, BMG developed a data collection protocol for use in the study. The goal of the protocol was to provide guidance to the student on the data collection process. The protocol not only addressed issues related to interacting with the building departments, but also instructed students on where to find energy code related information on the building plans and specifications. The protocol is included in Appendix C.

Section 2.5.3 Onsite Data Collection Training

A half-day data collection session was held in the field to demonstrate to students how to collect data at the construction site. A project under construction on the UNL campus was selected for the training session. Students toured the project and recorded data using the data collection checklist. The project served as a "real world" example of the type of projects that the students could encounter as part of the study and provided guidance on how to complete the form based on the information viewed onsite.

Section 2.6 Data Collection

As referenced above, the onsite coordinator was responsible for contacting the jurisdictions selected as part of the sample and scheduling the onsite visit. Two criteria were used to determine if the jurisdiction was a viable choice for the study:

1. The jurisdiction had commercial building projects available to review, and
2. The jurisdiction was willing to participate in the study.

A portion of the jurisdictions selected for study in the original sample were not used because there were no commercial building projects available. In this case, other jurisdictions were selected until the total sample was complete. Each jurisdiction was asked to make the building plans available to the data collection team and to select projects that were under construction in a phase that could be reviewed in the field (e.g., at rough-in or insulation).

Section 2.6.1 Data Collection Process

The data collection process developed for the project had two components:

1. The building plans and energy code documentation were first reviewed by the student at the building department and the data collection checklist completed. The Qualitative Survey (Section 2.2) was administered as part of the visit with the building department.
2. The building was then visited and data was collected on the Tier 1 and Tier 2 efficiency features that were installed at the time of the site visit.

The data collection process was followed when possible; in some cases, however, the data collection team gathered all of the data during the onsite visit. In addition to completing the checklist, the data collection team was asked to take pictures of the projects that could be used to answer questions concerning compliance with a particular energy efficiency feature. Students were also asked to collect copies of the COMcheck documentation, when available, for future use. The data collection team gathered information on all of the energy features that were observable in the field. For energy code features that had either not been installed or were installed and inaccessible, the "Non-Observable" option on the data checklist was selected. For example, lighting systems were typically deemed "Non-Observable" as the buildings were not at a stage where the final lighting systems had been installed.

Once the data checklists were complete, the onsite coordinator was responsible for assembling the forms, pictures and any additional information from the data collection team and storing them electronically for access by BMG. BMG reviewed the checklists for thoroughness and to ensure that the checklists were complete.

Section 2.7 Data Analysis

BMG used the DOE Score and Store tool to determine compliance rates for each of the buildings, each jurisdiction and for the state as whole. The data collection checklists were also reviewed to glean information on issues with energy code compliance that were identified as part of the data collection process. COM*check* models were developed when the COMcheck documentation was accessible to the data collection team.

Section 3.0 Analysis

A quantitative and qualitative analysis was conducted on a sample of 38 commercial buildings throughout 11 jurisdictions in Nebraska.

Section 3.1 Quantitative Analysis

The quantitative analysis conducted as part of this study produced commercial energy code compliance rates for each building included in the study as well as compliance rates for the jurisdiction and for the state of Nebraska. In addition, average compliance rates based on occupancy were also calculated to determine if there were differences in compliance between occupancy types.

Compliance rates were generated using DOE Score and Store methodology, as presented in the *Measuring State Energy Code Compliance* report. Compliance was determined by using both the information gathered in the field on energy efficient components that were observable and, when not observable, the information collected from the building plans and documentation. COM*check* submittals, when available, were also used to complete the checklists. When no additional documentation was obtainable, it was assumed that the building used the prescriptive approach to comply with the IECC and therefore, the building was compared against the prescriptive requirements checklist.

Overall building compliance was positive. The statewide compliance rate was 83.2% and jurisdiction compliance ranged from 43.9% to 97.2%. Jurisdictions Four, Five, and Nine are jurisdictions not actively checking for compliance, relying instead on engineers and architects to confirm compliance. Jurisdiction Five has the lowest overall compliance score of 43.9%. Jurisdictions Four and Nine, however, both exceed the statewide compliance score.

Comment [JS1]: Area is fine, I just changed it to better match what we say below.

Section 3.1.1 Building Occupancy Compliance Rates

Building or project level compliance rates were generated as a first step in determining jurisdiction and statewide compliance rates. Area weighted compliance rates, identified in Table 3, were then generated for each occupancy type to determine if there were issues for a particular occupancy type that could be addressed through energy code support programs. For occupancy types that included at least two buildings, the compliance rate ranged from a low of 63.83% for office/warehouse storage to a high of 98.93% for warehouse/storage.

Occupancy Type	Weighted Average Compliance Rate
Office/Warehouse Storage	63.83%
Warehouse/Storage	98.93%
Education/School	93.47%
Other (Fire Station)	91.40%
Other (Fire Station)	86.60%
Other(Powder Coat Facility)	9.10%
Other (Car Dealership)	28.10%
Other (Animal Hospital)	88.00%
Other (Institutional)	100.00%
Other (Matress Factory)	90.40%
High-rise Residential	90.20%
Retail/Mercantile	89.00%
Healthcare	93.36%
Restaurant	96.20%
Office	83.30%
Lodging, hotel/motel	83.57%

Table 3. Compliance Rates by Occupancy Type

Section 3.1.2 Jurisdiction Compliance Rates

Compliance rates were calculated for each of the ten jurisdictions that were visited as part of the study (Table 4) using the DOE Score and Store software. Compliance rates ranged from 43.9% to 97.2%, with the low score of 43.9% coming from a jurisdiction with a jurisdiction with four buildings sampled, 97.2%, coming from only one building sampled and the high score. Compliance rates for jurisdictions that had at least 2 commercial buildings sampled ranged from a low of 43.9% to a high of 92.7%. The two jurisdictions with the largest sample sizes representing 53% of the total sample had compliance rates of 87.5% and 88.1%, both of which are in line with the statewide compliance rate of 82.3%.

Compliance rates were lowest in jurisdictions where either the code was not being enforced or where the energy code compliance documentation was not present during the review and the Prescriptive requirements of the code were assumed per the DOE 90% Compliance Methodology.

Jurisdiction Number	Occupancy Type	Floor Area (Ft^2)	Compliance Rate	Area Compliance Score
Jurisdiction One	Office/Warehouse Storage	15,040.00	63.00%	
	Office/Warehouse storage	11,712.00	58.10%	61.00%
Jurisdiction Two	Education/School	12,275.00	97.20%	97.20%
Jurisdiction Three	Other (Fire Station)	20,000.00	91.40%	91.40%
Jurisdiction Four	Other (Fire Station)	18,400.00	86.6%	86.60%
Jurisdiction Five	Other (Powder Coat Facility)	27,500.00	9.10%	
	Warehouse/Storage	12,131.00	89.40%	
	Other (Car Dealership)	66,500.00	28.10%	
	Highrise Residential	26,100.00	96.20%	43.90%
Jurisdiction Six	Retail/Mercantile and Warehouse/Storage	16,225.00	81.20%	
	Other (Animal Hospital)	9,570.00	88.00%	
	Office and Healthcare	12,078.00	95.80%	87.60%
Jurisdiction Seven	Restaurant	6,000.00	96.20%	
	Office	9,676.00	78.10%	
	Education Center	12,453.00	93.90%	
	High-rise Residential	185,246.00	90.70%	
	Office Warehouse/Storage	4,200.00	82.80%	
	Healthcare	15,776.00	91.50%	
	Education/School	56,651.00	96.60%	
	Retail/Mercantile	18,658.00	96.30%	
	Office	7,616.00	93.20%	
	Office	9,676.00	67.20%	
	Highrise Residential	65,000.00	77.90%	
	Warehouse/Storage	157,400.00	100.00%	
	High-rise Residential	100,000.00	95.70%	
	Other (Mattress Factory)	8,000.00	90.40%	87.50%
Jurisdiction Eight	Education/School	66,000.00	94.20%	
	Lodging, hotel/motel	60,000.00	75.60%	
	Other (Institutional)	120,436.00	100.00%	
	Retail/Mercantile	10,000.00	72.10%	
	Office	77,000.00	85.00%	
	Education/School	102,000.00	89.90%	
	Retail/Mercantile	12,000.00	94.70%	
	Retail/Mercantile	12,000.00	94.50%	88.10%
Jurisdiction Nine	Education	95,000.00	94.40%	94.40%
Jurisdiction Ten	Retail/Mercantile	5,000.00	94.00%	
	Lodging/ Hotel/Motel	53,000.00	92.60%	92.70%
Jurisdiction Eleven	Warehouse	20,000.00	96.30%	96.30%

Table 4. Compliance Rates by Occupancy Type and Jurisdiction

Section 3.1.3 Statewide Compliance Rate

A statewide compliance rate was generated based on th11e 38 buildings in 11 jurisdictions studied in Nebraska. Using the DOE Score and Store tool, the statewide compliance rate was determined to be 83.2%.

Section 3.2 Qualitative Analysis

As part of the data collection process, students were asked to administer a qualitative survey when visiting the building department to determine common issues and concerns throughout the building community. Out of the 10 communities studied, the most common issues seemed to be a lack of training in the both the building department and among the building communities, as well as a lack of a standard method for conducting plan reviews and inspections.

Jurisdictions were queried to determine who conducts the plan review for energy code compliance. Three of the nine jurisdictions responded that they either had not adopted the IECC or were currently not enforcing the code. In jurisdictions that have adopted and are enforcing the energy code, in-house staff reviewed the energy code documentation. One of the jurisdictions relied on an architect or engineer stamp to determine compliance with the code and another jurisdiction responded that if the wall insulation meets the prescriptive requirements, the jurisdiction does not require COM*check* to document compliance. A similar question was asked for inspection; jurisdictions that have adopted and are enforcing the energy code use in-house staff for inspection.

Jurisdictions were also asked the average amount of time typically allocated for energy code plan review. The answers ranged from 10 minutes to 4 hours. A similar question was asked for time spent for inspection and responses ranged from 30 minutes to "depends on the project."

Another survey question asked the jurisdiction to describe their process for reviewing the plans for energy code compliance. One jurisdiction uses a typical plan review process where they make sure codes adopted by the jurisdiction are reflected in the plans and then ensure that the plans comply with the adopted codes; plan review comments are sent back to the permit applicant if necessary. Another jurisdiction reviews the plans in phases based on where the building is in the construction process. A similar question was asked for field inspection and only two jurisdictions responded. One jurisdiction uses the field inspection checklist included in COMcheck as a guide while the other jurisdiction does not have a set process for the inspection for energy.

Section 3.3 Overall Findings

The data collection checklists were reviewed to identify common issues with energy code compliance and to recognize good practices throughout the jurisdictions.

Table 5 provides an overview of the common issues found during the plan review and inspection portion of the study.

Section	Common Issues
Plan Review and Energy Code Documentation	**Documentation.** Energy code documentation was lacking on the majority of the submittals reviewed during the study. Of the 38 buildings included in

	the study, only 8 COMcheck runs were reviewed in addition to one prescriptive ASHRAE 90.1-2010 envelope submittal. However, a portion of the buildings missing documentation were only reviewed in the field so it is possible that additional COMcheck runs were submitted for plan review. **Building Envelope.** There was limited information about insulation R-values and fenestration efficiency (U-factor and SHGC) on the building plans. **HVAC.** No HVAC load calculations were included in the plans and documentation. HVAC load calculations are important to ensure that the systems are sized properly. **Lighting.** Several of the projects checklists included comments that indicated lack of information on the lighting plans to determine the proposed lighting power density and also to determine if the lighting controls complied with the code.
Onsite Envelope	**Fenestration.** There were no National Fenestration Rating Council (NFRC) certificates present for site-built windows in any of the projects where a curtain wall or store front glazing was installed. **Insulation.** Insulation installed in some of the metal building projects did not meet the minimum R-value requirements in the IECC.
Onsite HVAC	**Economizers.** Economizers were not installed on a portion of the cooling equipment in buildings where it was required.
Onsite Lighting	**Daylighting.** Lighting in daylit zones were routinely controlled with the general lighting controls instead of separate controls. **Automatic Lighting Controls**. Automatic lighting controls in buildings greater than 5,000 ft^2 were not present on a portion of buildings.

Table 5. Common Issues with Commercial Energy Code Compliance

Several examples of good compliant building practices were also found during the plan review and onsite visits. Table 6 provides examples of compliant installations found during the study.

Envelope	**Window U-factor.** Manufactured windows installed in commercial projects were all labeled with NFRC labels and consistently had U-factors at 0.35 or lower. **Insulation.** The quality of metal building insulation installation was code compliant in many cases.
HVAC	**Duct Sealing.** Pictures provided for each of the projects showed good examples of duct sealing that complied with the code. **Duct Insulation.** Ducts were routinely insulated to code compliant levels. **Thermostats.** Thermostats were typically checked as compliant on the

	checklists.
Lighting	**Lighting Controls**. Occupancy sensors were installed in several buildings that count for the bi-level lighting controls and automatic shut-off requirement. **Exterior Lighting Controls.** Many of the projects included exterior lighting controls to turn lights off during daylight hours.

Table 6. Examples of Good Building Practice for Compliance with the Energy Code

Section 4.0 Recommendations

The following recommendations were developed to address specific compliance related issues found during the compliance study.

Section 4.1 Focused Training

Focused training should be developed to increase the competency and knowledge of the commercial design, building and enforcement industries. Increased familiarity with energy code related topics will lead to increased compliance with the energy code. The following targeted training sessions are recommended to increase compliance with the code:

- Building Envelope – This training should target commercial building designers and the enforcement personnel that review architectural plans with the goal being improved compliance with the building envelope provisions of the energy code. Documenting compliance with the energy code, using either the prescriptive approach or COMcheck, should be a component of the training with topics focused on preparing compliance documentation, ensuring that energy efficiency information is contained on the building plans and including the necessary information in the specification book. Examples of best practice documentation should be developed as a basis for the class. Best practice building components, including metal building insulation practices, should also be presented during the training to help advance current practice.

- HVAC System – The goal of this targeted training should be to better understand the requirements for HVAC systems covered in the IECC. The target audiences for this include HVAC designers and installers as well as plan review and inspection staff responsible for reviewing HVAC plans for compliance with the IECC. One element of the training should focus on educating attendees on the different types of commercial heating and cooling systems and controls. Documenting the systems for energy code compliance, including a review of the information that should be included on the mechanical plans, should be another segment. Using COMcheck to document compliance should be integrated into the training as well.

- Lighting Systems – A half-day overview of the lighting requirements of the IECC would benefit lighting designers, the design community, lighting and control providers and enforcement

personnel who review plans and inspect for lighting compliance. The session should incorporate case studies to demonstrate how the lighting requirements apply to real world projects. Available lighting technology and lighting controls should be covered along with hands-on activities that require the class participants to design a lighting control system for a typical commercial project.

- Complying with the NFRC Requirements for Site-Built Windows – Energy code compliance for site-built windows is arguably the least complied with provision in the commercial energy code. Windows in commercial buildings can have a large impact on energy use for most commercial projects. A training session on the NFRC rating process should be deployed in Nebraska targeting those that specify fenestration in buildings and enforcement personnel that plan review and inspect windows for compliance with the energy code. Representatives from NFRC should be brought in to teach the sessions.

- Preparing Documentation for Compliance with the Energy Code – This training should be focused on those responsible for documenting compliance with the energy code. Case studies should be developed to demonstrate best practice. Hands-on problems should be incorporated into the training that would require the class participant to prepare compliance documentation using either the prescriptive approach or COMcheck.

Section 4.2 Process Enhancements and Tools

- Ongoing Assessment – Jurisdictions should be encouraged to institute self-assessment programs geared toward improving compliance with the energy code. The assessment could focus on building systems and not the whole building. For example, a small sample of building plans can be reviewed after the project has gone through the plan review stage to determine if all of the energy code features are included in the project. The project can then be reviewed onsite to determine if all of the features have been installed per code. Self-assessment will help a jurisdiction increase compliance rates with the code by providing a periodic self-check. As an option, the jurisdiction can invite a third party to perform an assessment and make recommendations for changes to the enforcement process if needed.

- Development of Prescriptive Compliance Forms – Currently, the IECC includes prescriptive requirements for all of the regulated building end uses but does not provide forms to assist in documenting compliance with the code. Prescriptive forms can be developed and provided to the jurisdictions to hand out to designers that want to comply with the prescriptive requirements of the energy code, but do not have a method to do so.

- Plan Review and Inspection Forms – Forms should be developed that can be used as a standardized tool for assessing compliance with the energy code. The forms can be used by the plan reviewer and then passed to the inspector to be used in the field. This transfer of information will increase consistency of enforcement and compliance with the energy code.

The data collection form used by this project is an example of tool that can be used for both plan review and inspection.

- Guide for Compliance with the IECC for Simple Commercial Buildings – BMG, under contract with the Institute for Market Transformation, developed a guide for demonstrating compliance with the commercial provisions of the 2009 IECC for buildings that fall within the parameter of this study. The guide could be distributed electronically to the building, design and enforcement industries to assist them in better understanding how to apply the energy code.

- Provide Third Party Enforcement Resources for Jurisdictions – A third party plan review and inspection program can be developed by NEO to provide options for jurisdictions that are currently not enforcing the energy code. As with other special inspector programs, a jurisdiction can require that the plans be reviewed by a third party energy plan reviewer and have the project inspected by a third party inspector. This would lead to better compliance with the energy code in these jurisdictions. Funding for third party would come from the building owner.

Appendix A. Data collection checklists

Nebraska Commercial Building Data Collection Checklist
2009 International Energy Conservation Code (Simple)

Building ID:_____ Climate Zone: _____

Date:_____ Name of Evaluator(s): _____

Building Contact: Name:_____ Phone:_____ Email:_____

Building Name & Address:_____ Conditioned Floor Area:___ ft^2

State:_____ County:_____ Jurisdiction:_____

Compliance Approach (check all that apply): ☐ Prescriptive ☐ Trade-Off ☐ Performance

Compliance Software (if used):_____ Green/Above-Code Program: _____

Building Use: ☐ Office ☐ Retail/Mercantile ☐ Warehouse/Storage ☐ Education/School ☐ Lodging/Hotel/Motel

☐ Restaurant/Dining/Fast Food ☐ Public Assembly/Religious ☐ Healthcare ☐ High-Rise Residential ☐ Other

Building Ownership: ☐ State-owned ☐ Local government-owned ☐ National account ☐ Speculative ☐ Private ☐ Other

Project Type: ☐ New Building ☐ Existing Building Addition ☐ Existing Building Renovation Valuation (If Renovation): $_____

2009 IECC Section #	Plan Review	Complies	Comments/Assumptions
103.2 [PR1]1	Plans and/or specifications provide all information with which compliance can be determined for the building envelope and document where exceptions to the standard are claimed.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
103.2 [PR2]1	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

2009 IECC Section #	Plan Review	Complies	Comments/Assumptions
103.2 [PR3]1	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the service water heating systems and equipment and document where exceptions to the standard are claimed.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
103.2 [PR4]1	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior and exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
103.2 [PR8]1	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the exterior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior and exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions: _____

2009 IECC Section #	Footing / Foundation Inspection	Verified Value	Complies	Comments/Assumptions
502.2.4 [FO1]1	Below-grade wall insulation R-value.	R-	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.2 [FO2]1	Below-grade wall insulation installed per manufacturer's instructions.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.2.6 [FO3]1	Slab edge insulation R-value.	R- ☐ Unheated ☐ Heated	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.2 [FO4]1	Slab edge insulation installed per manufacturer's instructions.	___ft	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.2.6 [FO5]1	Slab edge insulation depth/length.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions: _____

2009 IECC Section #	Framing / Rough-In Inspection	Verified Value	Complies	Comments/Assumptions
502.3.2 [FR8][1]	Vertical fenestration U-Factor.	U-	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.3.2 [FR9][1]	Skylight fenestration U-Factor.	U-	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.3.2 [FR10][1]	Vertical fenestration SHGC value.	SHGC:	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.3.2 [FR11][1]	Skylight SHGC value.	SHGC:	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.1.3 [FR13][1]	Fenestration products are certified as to performance. Labels or certificates provided.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.1.3 [FR12][2]	Fenestration products rated in accordance with NFRC.		☐ Complies ☐ Does Not Comply ☐ Not Observable	

			☐ Not Applicable	
502.3.2, 502.4.1, 502.4.2 [FR14][2]	U-factor of opaque doors associated with the building thermal envelope meets requirements.	U- ☐ Swinging ☐ Nonswinging	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions: _____

Building ID:____

2009 IECC Section #	Plumbing Rough-In Inspection	Complies	Comments/Assumptions
504.5 [PL1][2]	Service hot-water piping systems insulated. Where piping is installed in or under a slab, verification may need to occur during Foundation Inspection.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
504.6 [PL3][1]	Automatic time switches installed to automatically switch off the recirculating hot-water system or heat trace.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions: _____

Building ID:___

2009 IECC Section #	Mechanical Rough-In Inspection	Verified Value	Complies	Comments/Assumptions
503.2.3 [ME1][2]	HVAC equipment efficiency verified.	Efficiency:	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.5.1 [ME6][1]	Demand control ventilation provided for spaces >500 ft2 and >40 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control or design airflow >3,000 cfm.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.7 [ME8][2]	HVAC ducts and plenums insulated.	R-	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.8 [ME9][2]	HVAC piping insulation thickness.	___in	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.7.1 [ME10][2]	Ducts and plenums sealed based on static pressure and location.		☐ Complies ☐ Does Not Comply	

2009 IECC Section #	Mechanical Rough-In Inspection	Verified Value	Complies	Comments/Assumptions
			☐ Not Observable ☐ Not Applicable	
503.3.1, 503.4.1 [ME12][1]	Air economizers provided where required, meet the requirements for design capacity, control signal, and high-limit shut-off and integrated economizer control.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.4.5, 503.2.4.4 [ME13][2]	Return air and outdoor air dampers meet minimum airleakage requirements.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.3.1 [ME14][1]	Means provided to relieve excess outside air during economizer operation.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.4.5 [ME17] [1]	Zone controls can limit simultaneous heating and cooling and sequence heating and cooling to each zone.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.6 [ME30][1]	Exhaust air energy recovery on systems ≥ 5,000 cfm and 70% of design supply air.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
504.2	Service water heating equipment meets		☐ Complies	

2009 IECC Section #	Mechanical Rough-In Inspection	Verified Value	Complies	Comments/Assumptions
[ME36][2]	efficiency requirements.		☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions: _____

Building ID:____

2009 IECC Section #	Rough-In Electrical Inspection	Complies	Comments/Assumptions
505.2.2.2 [EL1][2]	Automatic lighting control to shut off all building lighting installed in buildings >5,000 ft^2	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.2 [EL2][2]	Independent lighting control installed per approved lighting plans and all manual control readily accessible and visible to occupants.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.2.2.1 [EL10iecc] [1]	Lighting controls installed to uniformly reduce the lighting load by at least 50%.	☐ Complies ☐ Does Not Comply ☐ Not Observable	

		☐ Not Applicable	
505.2.2.3 [EL11iecc][2]	Daylighting zones provided with individual controls that control the lights independent of general area lighting.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.2.4 [EL3][2]	Automatic lighting controls for exterior lighting installed.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.2.3 [EL4][1]	Verify separate lighting control devices for specific uses installed per approved lighting plans.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.4 [EL6][1]	Exit signs do not exceed 5 watts per face.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.6.1 [EL7][1]	Exterior grounds lighting over 100 W provides >60 lm/W unless on motion sensor or fixture is exempt from scope of code or from external LPD.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions:

Building ID:___

2009 IECC Section #	Insulation Inspection	Verified Value	Complies	Comments/Assumptions
502.4.3 [IN1] [1]	All sources of air leakage in the building thermal envelope are sealed, caulked, gasketed, weather stripped or wrapped with moisture vapor-permeable wrapping material to minimize air leakage.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.2.1 [IN2] **1**	Roof insulation R-value. For some roof systems, verification may need to occur during Framing Inspection.	R- ☐ Above deck ☐ Metal ☐ Attic	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.2 [IN3] **1**	Roof insulation installed per manufacturer's instructions.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.2.3 [IN6] **1**	Above-grade wall insulation R-value.	R- ☐ Mass ☐ Metal ☐ Steel ☐ Wood	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.2 [IN7] **1**	Above-grade wall insulation installed per manufacturer's instructions.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.2.5 [IN8] [1]	Floor insulation R-value.	R- ☐ Mass	☐ Complies	

2009 IECC Section #	Insulation Inspection	Verified Value	Complies	Comments/Assumptions
		☐ Steel ☐ Wood	☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.2 [IN9][2]	Floor insulation installed per manufacturer's instructions.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.1.1 303.1.1.1 [IN10][2]	Building envelope insulation is labeled with R-value or insulation certificate providing R-value and other relevant data.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.2.1 [IN14][2]	Exterior insulation is protected from damage with a protective material. Verification for exposed foundation insulation may need to occur during Foundation Inspection		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions: _____

Building ID:___

2009 IECC Section #	Final Inspection	Complies	Comments/Assumptions
502.4.6 [FI1] [1]	Weatherseals installed on all loading dock cargo doors in all zones.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.4.1 [FI2]2	Heating and cooling to each zone is controlled by a thermostat control.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.4.2 [FI3]2	Thermostatic controls have a 5 °F deadband.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
504.5 [FI19iecc]2	Insulate automatic circulating hot water systems and 1st eight feet of non-circulating systems without integral heat traps.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
504.7.3 [FI14]2	Pool covers are provided for heated pools and pools heated to >90 ºF have a cover >=R-12	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.5 [FI18]1	Interior installed lamp and fixture lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

505.5 [FI19]1	Exterior lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than nor equal to allowed watts.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments: _____

Evaluator Assessment

Please provide a general description of what was discovered during the onsite evaluation, and a professional estimate of what you feel the compliance rating should be, regardless of the individual metrics scored above. Include your assessment of the most impactful energy requirements for this particular building.

_____

Nebraska Commercial Building Data Collection Checklist

2009 International Energy Conservation Code (Complex)

Building ID:_____ Climate Zone: _____

Date:_____ Name of Evaluator(s): _____

Building Contact: Name:_____ Phone:_____ Email:_____

Building Name & Address:_____ Conditioned Floor Area: _____ ft^2

State:_____ County:_____ Jurisdiction:_____

Compliance Approach (check all that apply): ☐ Prescriptive ☐ Trade-Off ☐ Performance

Compliance Software (if used):_____ Green/Above-Code Program: _____

Building Use: ☐ Office ☐ Retail/Mercantile ☐ Warehouse/Storage ☐ Education/School ☐ Lodging/Hotel/Motel

☐ Restaurant/Dining/Fast Food ☐ Public Assembly/Religious ☐ Healthcare ☐ High-Rise Residential ☐ Other

Building Ownership: ☐ State-owned ☐ Local government-owned ☐ National account ☐ Speculative ☐ Private ☐ Other

Project Type: ☐ New Building ☐ Existing Building Addition ☐ Existing Building Renovation Valuation (If Renovation): $_____

2009 IECC Section #	Plan Review	Complies	Comments/Assumptions

2009 IECC Section #	Plan Review	Complies	Comments/Assumptions
103.2 [PR1][1]	Plans and/or specifications provide all information with which compliance can be determined for the **building envelope** and document where exceptions to the standard are claimed.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
103.2 [PR2][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the **mechanical systems and equipment** and document where exceptions to the standard are claimed.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
103.2 [PR3][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the **service water heating systems and equipment** and document where exceptions to the standard are claimed.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
103.2 [PR4][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the **lighting and electrical systems and equipment** and document where exceptions to the standard are claimed. Information provided should include interior and exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
103.2 [PR8][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the exterior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior and exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions: _____

Building ID:____

2009 IECC Section #	Footing / Foundation Inspection	Verified Value	Complies	Comments/Assumptions
502.2.4 [FO1]1	Below-grade wall insulation R-value.	R-	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.2 [FO2]1	Below-grade wall insulation installed per manufacturer's instructions.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.2.6 [FO3]1	Slab edge insulation R-value.	R- ☐ Unheated ☐ Heated	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.2 [FO4]1	Slab edge insulation installed per manufacturer's instructions.	___ft	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.2.6 [FO5]1	Slab edge insulation depth/length.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions: _____

Building ID:____

2009 IECC Section #	Framing / Rough-In Inspection	Verified Value	Complies	Comments/Assumptions
502.3.2 [FR8][1]	Vertical fenestration U-Factor.	U-	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.3.2 [FR9][1]	Skylight fenestration U-Factor.	U-	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.3.2 [FR10][1]	Vertical fenestration SHGC value.	SHGC:	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.3.2 [FR11][1]	Skylight SHGC value.	SHGC:	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.1.3 [FR13][1]	Fenestration products are certified as to performance. Labels or certificates provided.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.1.3 [FR12][2]	Fenestration products rated in accordance with NFRC.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.3.2, 502.4.1, 502.4.2 [FR14][2]	U-factor of opaque doors associated with the building thermal envelope meets requirements.	U- ☐ Swinging ☐ Nonswinging	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions: _____

Building ID:____

2009 IECC Section #	Plumbing Rough-In Inspection	Complies	Comments/Assumptions
504.5 [PL1][2]	Service hot-water piping systems insulated. Where piping is installed in or under a slab, verification may need to occur during Foundation Inspection.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
504.6 [PL3][1]	Automatic time switches installed to automatically switch off the recirculating hot-water system or heat trace.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions: _____

Building ID:____

2009 IECC Section #	Mechanical Rough-In Inspection	Verified Value	Complies	Comments/Assumptions
503.2.3 [ME1][2]	HVAC equipment efficiency verified.	Efficiency:	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.5.1 [ME6][1]	Demand control ventilation provided for spaces >500 ft2 and >40 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control or design airflow >3,000 cfm.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.7 [ME8][2]	HVAC ducts and plenums insulated.	R-	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.8 [ME9][2]	HVAC piping insulation thickness.	___in	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.7.1 [ME10][2]	Ducts and plenums sealed based on static pressure and location.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

2009 IECC Section #	Mechanical Rough-In Inspection	Verified Value	Complies	Comments/Assumptions
503.3.1, 503.4.1 [ME12][1]	Air economizers provided where required, meet the requirements for design capacity, control signal, and high-limit shut-off and integrated economizer control.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.4.5, 503.2.4.4 [ME13][2]	Return air and outdoor air dampers meet minimum air leakage requirements.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.3.1 [ME14][1]	Means provided to relieve excess outside air during economizer operation.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.4.5 [ME17] [1]	Zone controls can limit simultaneous heating and cooling and sequence heating and cooling to each zone.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.4.3.1 [ME50][2]	Three-pipe hydronic systems using a common return for hot and chilled water are not used.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.4.3.2 [ME51][2]	Two-pipe hydronic systems using a common distribution system have controls to allow a deadband >=15 ºF, allow operation in one mode for at least 4 hours before changeover, and have rest controls to limit heating and cooling supply temperature to <=30 ºF.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.4.3.3 [ME18][2]	Hydronic heat pump systems connected to a common water loop meet heat rejection and heat addition requirements.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.10.1 [ME52][2]	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.10.2 [ME21][2]	HVAC fan motors not larger than the first available motor size greater than the bhp.	bhp:	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.4.2	VAV fan motors >=10 hp to be driven by variable	☐ VSD	☐ Complies	

2009 IECC Section #	Mechanical Rough-In Inspection	Verified Value	Complies	Comments/Assumptions
[ME22][2]	speed drive, have a vane-axial fan with variable pitch blades, or have controls or devices to limit fan motor demand.	☐ Vane axial fan ☐ Other	☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.4.2 [ME24][2]	Reset static pressure setpoint for DDC controlled VAV boxes reporting to central controller based on the zones requiring the most pressure.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.6 [ME30][1]	Exhaust air energy recovery on systems ≥ 5,000 cfm and 70% of design supply air.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.4.4 [ME35][1]	Hot gas bypass on cooling systems limited to: ≤240 kBtu/h – 50% >240 kBtu/h – 25%		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
504.2 [ME36][2]	Service water heating equipment meets efficiency requirements.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions: _____

Building ID:____

2009 IECC Section #	Rough-In Electrical Inspection	Complies	Comments/Assumptions
505.2.2.2 [EL1][2]	Automatic lighting control to shut off all building lighting installed in buildings >5,000 ft^2	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.2 [EL2][2]	Independent lighting control installed per approved lighting plans and all manual control readily accessible and visible to occupants.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.2.2.1 [EL10iecc][1]	Lighting controls installed to uniformly reduce the lighting load by at least 50%.	☐ Complies ☐ Does Not Comply	

		☐ Not Observable ☐ Not Applicable	
505.2.2.3 [EL11iecc][2]	Daylighting zones provided with individual controls that control the lights independent of general area lighting.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.2.4 [EL3][2]	Automatic lighting controls for exterior lighting installed.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.2.3 [EL4] [1]	Verify separate lighting control devices for specific uses installed per approved lighting plans.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.4 [EL6] [1]	Exit signs do not exceed 5 watts per face.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.6.1 [EL7] [1]	Exterior grounds lighting over 100 W provides >60 lm/W unless on motion sensor or fixture is exempt from scope of code or from external LPD.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions:

Building ID:____

2009 IECC Section #	Insulation Inspection	Verified Value	Complies	Comments/Assumptions
502.4.3 [IN1] [1]	All sources of air leakage in the building thermal envelope are sealed, caulked, gasketed, weather stripped or wrapped with moisture vapor-permeable wrapping material to minimize air leakage.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.2.1 [IN2] [1]	Roof insulation R-value. For some roof systems, verification may need to occur during Framing Inspection.	R- ☐ Above deck ☐ Metal ☐ Attic	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

2009 IECC Section #	Insulation Inspection	Verified Value	Complies	Comments/Assumptions
303.2 [IN3] [1]	Roof insulation installed per manufacturer's instructions.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.2.3 [IN6] [1]	Above-grade wall insulation R-value.	R- ☐ Mass ☐ Metal ☐ Steel ☐ Wood	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.2 [IN7] [1]	Above-grade wall insulation installed per manufacturer's instructions.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
502.2.5 [IN8][1]	Floor insulation R-value.	R- ☐ Mass ☐ Steel ☐ Wood	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.2 [IN9][2]	Floor insulation installed per manufacturer's instructions.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.1.1 303.1.1.1 [IN10][2]	Building envelope insulation is labeled with R-value or insulation certificate providing R-value and other relevant data.		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
303.2.1 [IN14][2]	Exterior insulation is protected from damage with a protective material. Verification for exposed foundation insulation may need to occur during Foundation Inspection		☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions: _____

Building ID:____

2009 IECC Section #	Final Inspection	Complies	Comments/Assumptions

502.4.6 [FI1][1]	Weatherseals installed on all loading dock cargo doors in all zones.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.4.1 [FI2][2]	Heating and cooling to each zone is controlled by a thermostat control.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
503.2.4.2 [FI3][2]	Thermostatic controls have a 5 °F deadband.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
504.5 [FI19iecc][2]	Insulate automatic circulating hot water systems and 1st eight feet of non-circulating systems without integral heat traps.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
504.7.3 [FI14][2]	Pool covers are provided for heated pools and pools heated to >90 ºF have a cover >=R-12	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.5 [FI18][1]	Interior installed lamp and fixture lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
505.5 [FI19][1]	Exterior lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than nor equal to allowed watts.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments: _____

Evaluator Assessment

Please provide a general description of what was discovered during the onsite evaluation, and a professional estimate of what you feel the compliance rating should be, regardless of the individual metrics scored above. Include your assessment of the most impactful energy requirements for this particular building.

_____

Appendix B. Protocol

Energy Code Compliance Evaluation Protocol

The following guidance will ensure a successful energy code evaluation for commercial buildings.

Plan Review

Please provide ___ sets of commercial building plans for typical commercial construction in your jurisdiction. The following guidance should be used in selecting the projects:

1. Projects selected should be new buildings.
2. Projects should also be "simple buildings". Simple buildings are defined as:
    a. No more than two wall types (e.g. CMU block and metal stud wall)
    b. No more than one roof type (e.g. all roof deck with insulation on top)
    c. No more than one floor type (e.g. all slab on grade)
    d. Single zone HVAC systems (e.g. roof top gas/electric or heat pump systems, split system heating and cooling systems, ductless or mini-split systems, etc.)
3. Projects selected should be in a stage of construction where energy code features are installed and can be viewed. This could be at rough-in for mechanical, electrical, and plumbing or preferably at the insulation stage.
4. Projects selected should be typical construction for the jurisdiction. For example if the majority of the submittals are office, retail and warehouse select projects that correspond to these projects.
5. Projects selected should have **complete energy code documentation** based on the 2009 IECC and plans available for review. This will provide an accurate evaluation of the project.

Field Inspection

Each of the projects reviewed during the plan review data collection process will be reviewed in the field. Based on the size of the project the review could take up to one hour per building. During the review the data collected on the checklist will be reviewed in the field when possible.

Appendix C. Final Data

Score and Store Data provided electronically

Appendix D. Training materials

Power Point training materials provided electronically