2013 Nonresidential Energy Standards Overview

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Goals of this Course

- Identify/clarify the major changes in the 2013 Energy Standards for nonresidential newly constructed buildings, additions, and alterations ***(in sequential order of §)***
- Simplify compliance and enforcement for the 2013 changes during:
  - The plan review process (Plans Examiners)
    - ✓ Identify what to look for on the compliance forms and building plans
  - The field inspection process (Field Inspectors)
    - ✓ Identify which building components and forms to verify

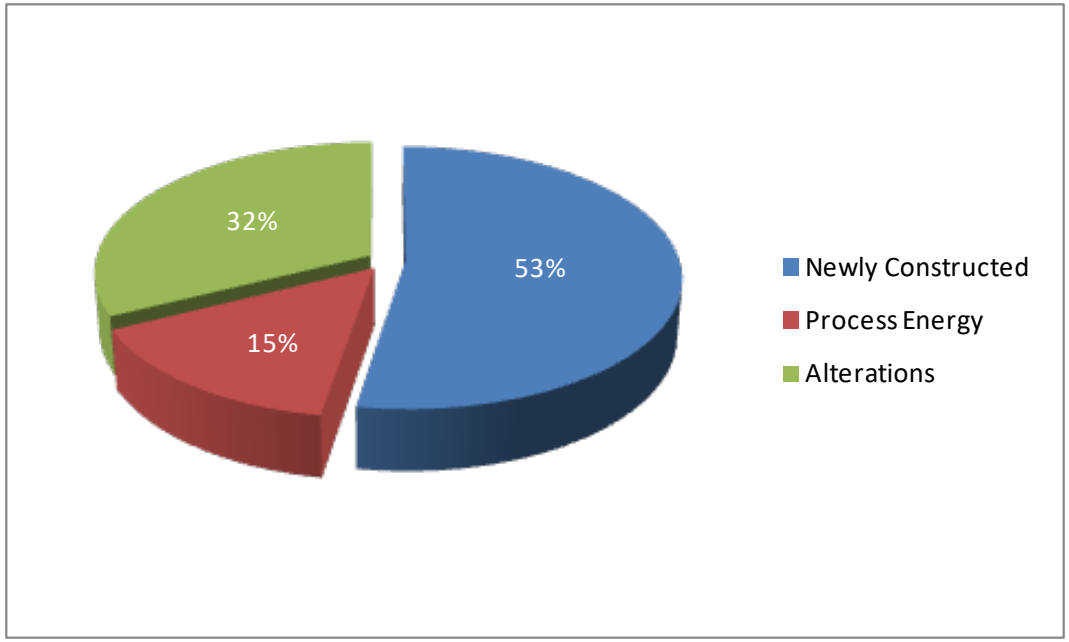
QUESTIONS…

- **Question sessions**
  - 30 minutes before lunch
  - 30 minutes before end
    - Raise hand to ask question
- **All other questions**
  - Type into Q and A box at anytime
    - List of Q and A from webinar will be posted online

Let's discuss the 2013 Building Energy Efficiency Standards

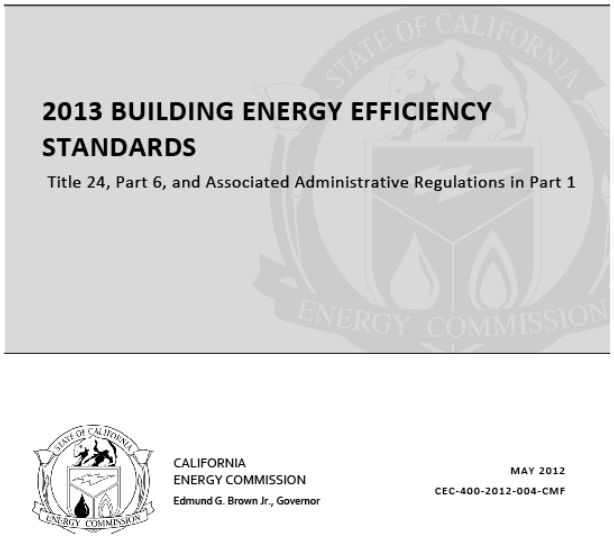
2013 Nonresidential Energy Savings

- **Overall, 30% "better" than 2008 Standards**
- **2013 Nonres. Standards will save:**
  - 372 GWH/yr
  - 6.7 Mtherms/yr
  - 84 MW (first year)

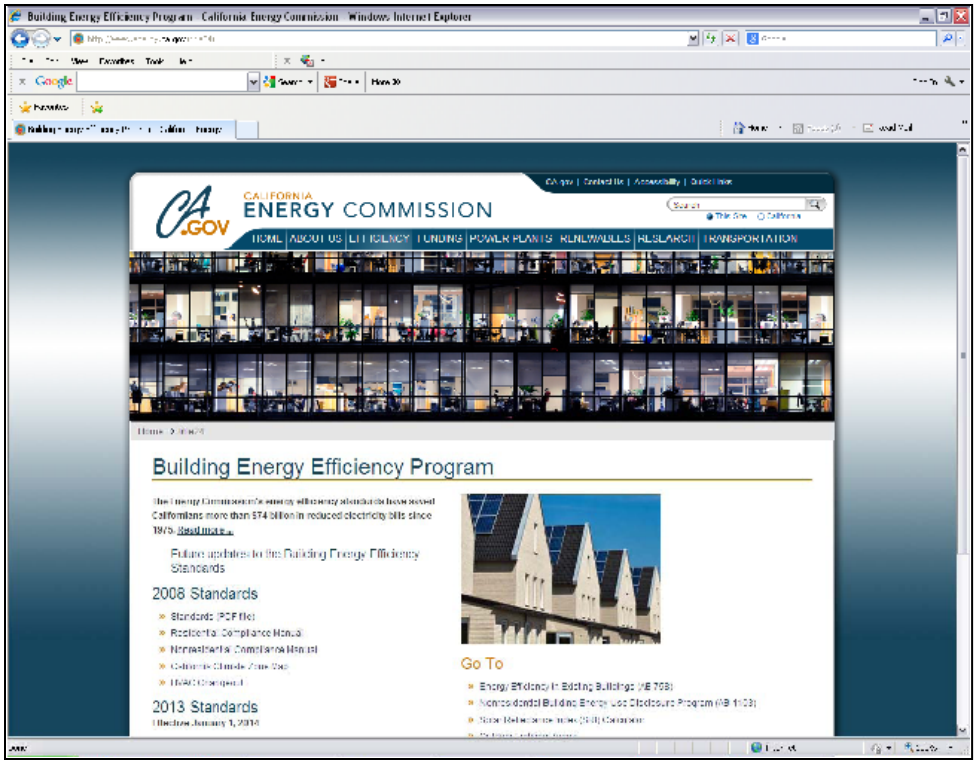


2013 Building Energy Efficiency Standards

- **Effective on July 1, 2014**
  - Building permit applications submitted on or after this date
- **Larger projects in plan review may be affected:**
  - Need to resubmit if permits pulled on/after effective date



2013 Documents



- Building Energy Efficiency Standards
- Nonresidential Compliance Manual
- Reference Appendices
- All docs. available online at:

  www.energy.ca.gov/title24

Summary of Major Changes

- **Section #s** *(see cheat sheet handout)*
- **Forms nomenclature**
  - MECH-1C → NRCC-MCH-01
  - LTG-2A → NRCA-LTI-02-A
- **Building Commissioning**
- **Solar Zone ready reqs.**
- **Covered Processes**
- **Field Technician Certification**
  - Acceptance Testing
- **Compliance Form Registration**
  - Effective 1/1/2015

** See summary of changes handout*

Let's talk about the changes to the Administrative Regulations §10-103

Signatures, Registration, Technician Certification

2008 – *§10-103(a)1, 3, 4, 5*

- Designer/Builder and Doc. Author signatures req. on Certificate of Compliance (-1C forms)
- Contractor/Installer signature req. of Certificate of Installation (-INST)
- Field Technician and Contractor signatures req. on Certificate of Acceptance (-A forms)
- HERS Rater signature req. on Certificate of Field verification and diagnostic testing (HERS)

2013 – *§10-103(a)1, 3, 4, 5*

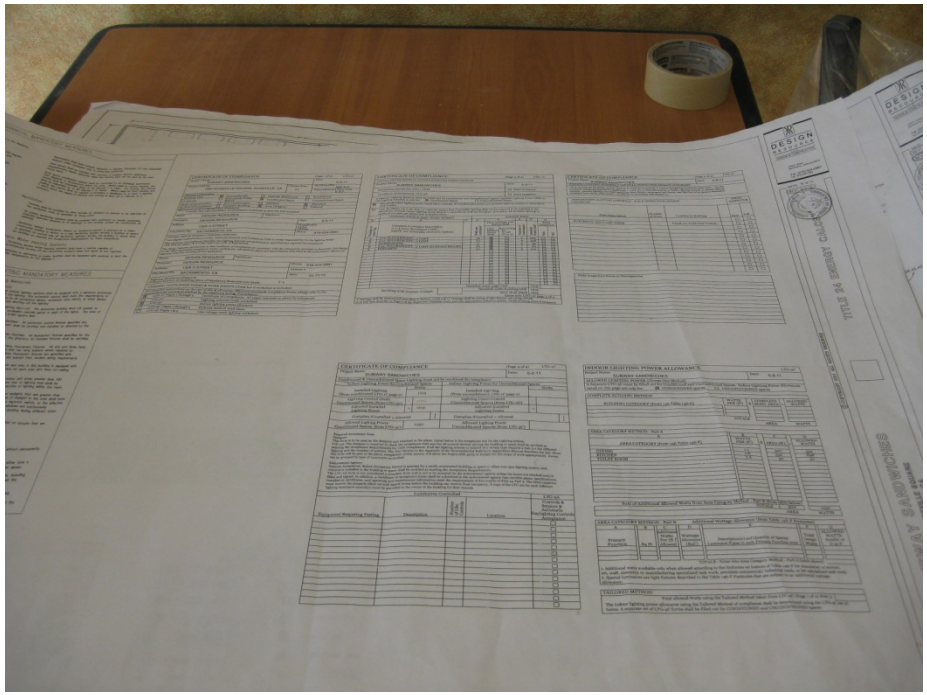
- Doc. Author signature on Certificate of:
  - Installation (NRCI)
  - Acceptance (NRCA)
  - Field verification and diagnostic testing (NRCV)
- Registration req. for ALL forms effective 1/1/15
  - Contingent upon approval of nonres. data registry

Signatures, Registration, Technician Certification *cont.*

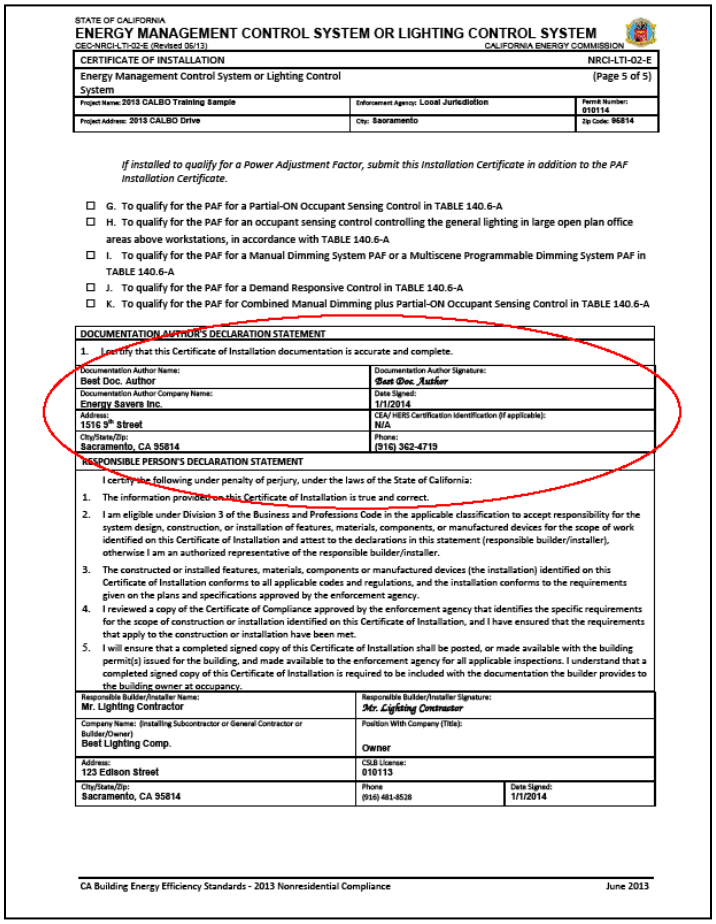
- **New Acceptance Test Technician Certification Provider (ATTCP) reqs. in §10-103-A and §10-103-B**
- **Field Technician must be trained and certified by ATTCP to conduct acceptance testing**
  - Employer (contractor) training also req.
  - Applicable to Mechanical Acceptance Testing
  - Applicable to Lighting Acceptance Testing
- **Effective when thresholds in Standards are met**
- **Info. available at:** http://www.energy.ca.gov/title24/2013standards/provider_cert/

§10-103 and the Plans Examiner

- **Still verify required Certificate of Compliance on plans**
  - NRCC-ENV forms
  - NRCC-MCH forms
  - NRCC-LTI forms
- **Verify <u>all</u> NRCCs are registered with a nonres. data registry starting 1/1/15**



§10-103 and the Field Inspector



STATE OF CALIFORNIA
ENERGY MANAGEMENT CONTROL SYSTEM OR LIGHTING CONTROL SYSTEM
CEC-NRCI-LTI-02-E (Revised 05/13) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF INSTALLATION		NRCI-LTI-02-E
Energy Management Control System or Lighting Control System		(Page 5 of 5)
Project Name: 2013 CALBO Training Sample	Enforcement Agency: Local Jurisdiction	Permit Number: 010114
Project Address: 2013 CALBO Drive	City: Sacramento	Zip Code: 86814

If installed to qualify for a Power Adjustment Factor, submit this Installation Certificate in addition to the PAF Installation Certificate.

- ☐ G. To qualify for the PAF for a Partial-ON Occupant Sensing Control in TABLE 140.6-A
- ☐ H. To qualify for the PAF for an occupant sensing control controlling the general lighting in large open plan office areas above workstations, in accordance with TABLE 140.6-A
- ☐ I. To qualify for the PAF for a Manual Dimming System PAF or a Multiscene Programmable Dimming System PAF in TABLE 140.6-A
- ☐ J. To qualify for the PAF for a Demand Responsive Control in TABLE 140.6-A
- ☐ K. To qualify for the PAF for Combined Manual Dimming plus Partial-ON Occupant Sensing Control in TABLE 140.6-A

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Installation documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Best Doc. Author	*Best Doc. Author*
Documentation Author Company Name:	Date Signed:
Energy Savers Inc.	1/1/2014
Address:	CEA/ HERS Certification Identification (If applicable):
1516 9th Street	N/A
City/State/Zip:	Phone:
Sacramento, CA 95814	(916) 362-4719

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I will ensure that a completed signed copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Mr. Lighting Contractor	*Mr. Lighting Contractor*	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Best Lighting Comp.	Owner	
Address:	CSLB License:	
123 Edison Street	010113	
City/State/Zip:	Phone	Date Signed:
Sacramento, CA 95814	(916) 481-8528	1/1/2014

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2013

- **At Final, verify Doc. Author signature on Certificate of:**
  - Installation (NRCI)
  - Acceptance (NRCA)
  - Field Verification and Diagnostic Testing (NRCV)
- **Verify LTI and MCH NRCA forms are signed by certified Field Technician when req.**
- **Verify <u>all</u> forms are registered with nonres. data registry starting 1/1/15**

Let's talk about the changes to the Energy Standards – Mandatory Measures

Which § are the Mandatory Measures?

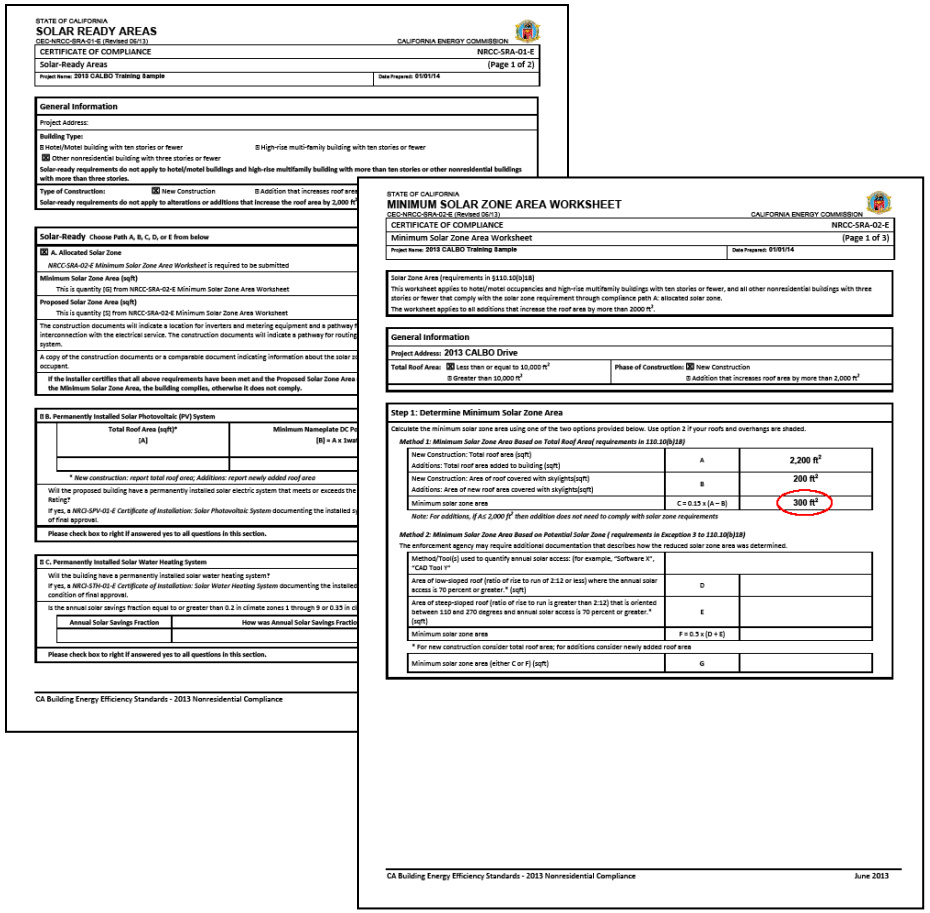
2008 Standards	2013 Standards
• §110 – §119 (all bldgs.)	• §110.10 (Solar ready)
• §116 – §118 (Env)	• §120.6 (Covered processes)
• §120 – §122 (Mech)	• §120.7 (Mand. Insulation)
• §126 (Refrig. Warehouses)	• §120.8 (Bldg. Commissioning)
• §130 – §131 (Indoor LTG)	• §130.4 (LTI Inst. Cert.)
• § in TABLE 100-A	• §130.5 (Elect. Power Systems)
	• § in TABLE 100.0-A

Solar Ready

- **New Mandatory measures in §110.10**
- **Applicable to hotel/motel and high-rise multi-family buildings ≤ 10 stories; and all other nonres. buildings ≤ 3 stories**
- **Requirements for:**
  - Solar zone (location and area)
  - Orientation and Shading
  - Interconnection pathways
  - Structural Design Loads
  - Main electrical service panel

§110.10 and the Plans Examiner

- **NRCC-SRA-01 form**
  - ➢ Ident. if meeting solar zone reqs. or exception
- **NRCC-SRA-02 form**
  - ➢ Solar zone worksheet req. if not exempt
- **Verify specs. on plans**



STATE OF CALIFORNIA
SOLAR READY AREAS
CEC-NRCC-SRA-01-E (Revised 06/13)
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE
NRCC-SRA-01-E
Solar-Ready Areas
(Page 1 of 2)
Project Name: 2013 CALBO Training Sample
Date Prepared: 01/01/14

General Information
Project Address:
Building Type:
☐ Hotel/Motel building with ten stories or fewer
☐ High-rise multi-family building with ten stories or fewer
☒ Other nonresidential building with three stories or fewer
Solar-ready requirements do not apply to hotel/motel buildings and high-rise multifamily building with more than ten stories or other nonresidential buildings with more than three stories.
Type of Construction: ☒ New Construction ☐ Addition that increases roof area
Solar-ready requirements do not apply to alterations or additions that increase the roof area by 2,000 ft²

Solar-Ready Choose Path A, B, C, D, or E from below
☒ A. Allocated Solar Zone
NRCC-SRA-02-E Minimum Solar Zone Area Worksheet is required to be submitted
Minimum Solar Zone Area (sqft)
This is quantity [G] from NRCC-SRA-02-E Minimum Solar Zone Area Worksheet
Proposed Solar Zone Area (sqft)
This is quantity [G] from NRCC-SRA-02-E Minimum Solar Zone Area Worksheet
The construction documents will indicate a location for inverters and metering equipment and a pathway for interconnection with the electrical service. The construction documents will indicate a pathway for routing system.
A copy of the construction documents or a comparable document indicating information about the solar occupant.
If the installer certifies that all above requirements have been met and the Proposed Solar Zone Area the Minimum Solar Zone Area, the building complies, otherwise it does not comply.

☐ B. Permanently Installed Solar Photovoltaic (PV) System
Total Roof Area (sqft)* [A]
Minimum Nameplate DC Pv [B] = A x
* New construction: report total roof area; Additions: report newly added roof area
Will the proposed building have a permanently installed solar electric system that meets or exceeds the Rating?
If yes, a NRCI-SPV-01-E Certificate of Installation: Solar Photovoltaic System documenting the installed s of final approval.
Please check box to right if answered yes to all questions in this section.

☐ C. Permanently Installed Solar Water Heating System
Will the building have a permanently installed solar water heating system?
If yes, a NRCI-STH-01-E Certificate of Installation: Solar Water Heating System documenting the installe condition of final approval.
Is the annual solar savings fraction equal to or greater than 0.2 in climate zones 1 through 9 or 0.35 in
Annual Solar Savings Fraction
How was Annual Solar Savings Fractio
Please check box to right if answered yes to all questions in this section.

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance

STATE OF CALIFORNIA
MINIMUM SOLAR ZONE AREA WORKSHEET
CEC-NRCC-SRA-02-E (Revised 06/13)
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE
NRCC-SRA-02-E
Minimum Solar Zone Area Worksheet
(Page 1 of 3)
Project Name: 2013 CALBO Training Sample
Date Prepared: 01/01/14

Solar Zone Area (requirements in §110.10(b)1B)
This worksheet applies to hotel/motel occupancies and high-rise multifamily buildings with ten stories or fewer, and all other nonresidential buildings with three stories or fewer that comply with the solar zone requirement through compliance path A: allocated solar zone.
The worksheet applies to all additions that increase the roof area by more than 2000 ft².

General Information
Project Address: 2013 CALBO Drive
Total Roof Area: ☒ Less than or equal to 10,000 ft² ☐ Greater than 10,000 ft²
Phase of Construction: ☒ New Construction ☐ Addition that increases roof area by more than 2,000 ft²

Step 1: Determine Minimum Solar Zone Area
Calculate the minimum solar zone area using one of the two options provided below. Use option 2 if your roofs and overhangs are shaded.
Method 1: Minimum Solar Zone Area Based on Total Roof Area(requirements in 110.10(b)1B)

New Construction: Total roof area (sqft) Additions: Total roof area added to building (sqft)	A	2,200 ft²
New Construction: Area of roof covered with skylights(sqft) Additions: Area of new roof area covered with skylights(sqft)	B	200 ft²
Minimum solar zone area	C = 0.15 x (A – B)	300 ft²

Note: For additions, if As 2,000 ft² then addition does not need to comply with solar zone requirements

Method 2: Minimum Solar Zone Area Based on Potential Solar Zone (requirements in Exception 3 to 110.10(b)1B)
The enforcement agency may require additional documentation that describes how the reduced solar zone area was determined.

Method/Tool(s) used to quantify annual solar access: (for example, "Software X", "CAD Tool Y"		
Area of low-sloped roof (ratio of rise to run of 2:12 or less) where the annual solar access is 70 percent or greater.* (sqft)	D	
Area of steep-sloped roof (ratio of rise to run is greater than 2:12) that is oriented between 110 and 270 degrees and annual solar access is 70 percent or greater.* (sqft)	E	
Minimum solar zone area	F = 0.3 x (D + E)	

* For new construction consider total roof area; for additions consider newly added roof area

Minimum solar zone area (either C or F) (sqft)	G	

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance
June 2013

§110.10 and the Field Inspector

- **Verify at Final**
  - Refer to NRCC-SRA for method of compliance
    - Solar zone (unobstructed)
    - Thermostats and high efficacy lighting (exception)
- **Verify if solar installed**
  - NRCI-SPV form
  - NRCI-STH form (H_2O heating)

** Forms must be registered starting 1/1/15*

MECH Acceptance Testing

2008 – §125

- Testing mandatory if equip. installed for:
  - Outdoor air ventilation
  - Air economizers
  - Demand controls vent.
  - Supply fan variable flow cont.
  - Thermal energy storage
- Indentified as "MECH-A"

2013 – *§120.5*

- New tests added for:
  - Supply air temp. reset cont.
  - Water cooled chillers w/condenser reset controls
  - EMCS
- Identified as "NRCA-MCH"
- Must be performed by Certified Mechanical Acceptance Test Technician (CMATT)

§120.5 and the Plans Examiner

- **Still verify req. Acceptance Tests on NRCC-MCH-01**
  - NRCA-MCH-16A (supply air reset)
  - NRCA-MCH-17A (chiller condenser reset)
  - NRCA-MCH-18A (ECMS)
- **Form must be incorporated onto plans**

STATE OF CALIFORNIA
MECHANICAL SYSTEMS
CEC-NRCC-MCH-01-E (Revised 06/13)
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-01-E
Mechanical Systems	(Page 2 of 4)
Project Name: 2013 CALBO Training Sample	Date Prepared: 01/01/14

MECHANICAL HVAC ACCEPTANCE FORMS (check box for required forms)

Designer:
This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for HVAC systems. The designer is required to check the applicable boxes for all acceptance tests that apply and list all equipment that requires an acceptance test. All equipment of the same type that requires a test, list the equipment description and the number of systems.

Installing Contractor:
The contractor who installed the equipment is responsible to either conduct the acceptance test them self or have a qualified entity run the test for them. If more than one person has responsibility for the acceptance testing, each person shall sign and submit the Certificate of Acceptance applicable to the portion of the construction or installation for which they are responsible. The following tests require a

Enforcement Agency:
Plancheck – The NRCC-MCH-01-E form is not considered a completed form and is not to be accepted by the building department unless the correct boxes are checked.
Inspector - Before occupancy permit is granted all newly installed process systems must be tested to ensure proper operations.

Test Description: Equipment Requiring Testing or Verification	# of units	MCH-12A Fault Detection & Diagnostics for DX Units	MCH-13A Automatic Fault Detection & Diagnostics for Air & Zone	MCH-14A Distributed Energy Storage DX AC Systems	MCH-15A Thermal Energy Storage (TES) Systems	MCH-16A Supply Air Temperature Reset Controls	MCH-17A Condenser Water Reset Controls	MCH-18A ECMS
Reset Controls	5	☐	☐	☐	☐	☒	☐	☐
Chillers	10	☐	☐	☐	☐	☐	☒	☐
ECMS	2	☐	☐	☐	☐	☐	☐	☒
		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
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		☐	☐	☐	☐	☐	☐	☐

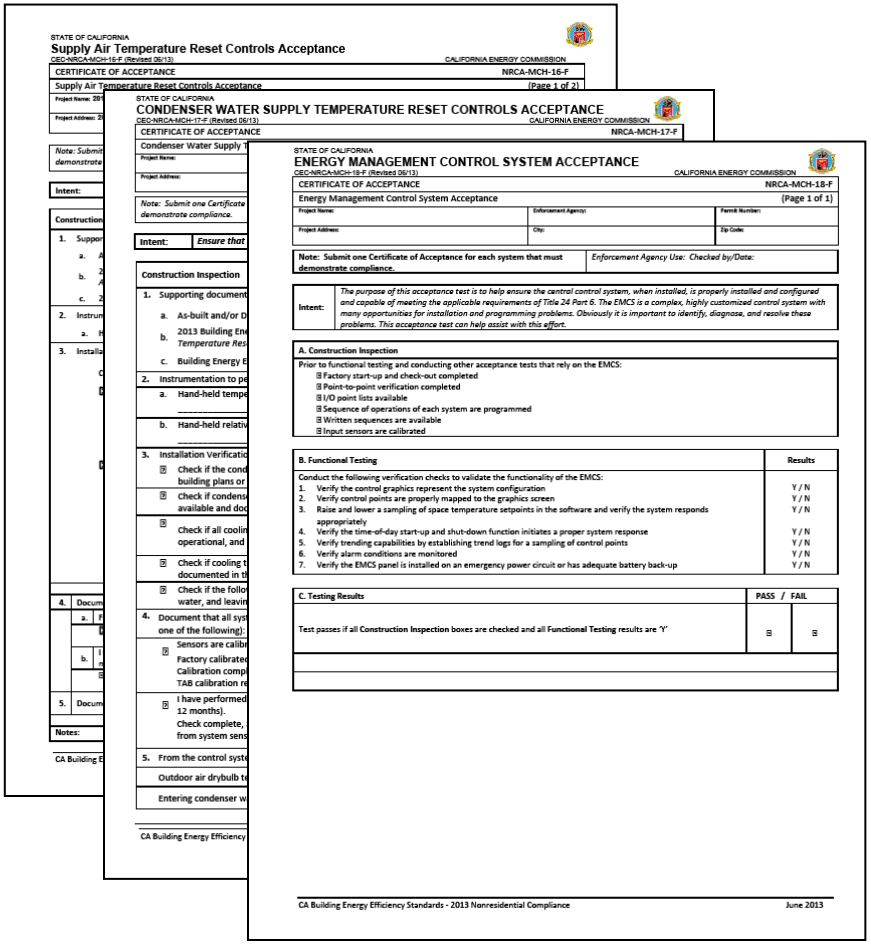
CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance — June 2013

** Form must be registered starting 1/1/15*

§120.5 and the Plans Examiner *cont.*

- **All HVAC units/controls and req. acceptance test must be verified on the NRCC-MCH-01 form**
- **Frequently req. test include:**
  - Outdoor air ventilation (NRCA-MCH-02)
  - Single zone unitary A/C and HP controls (NRCA-MCH-03)
  - Duct leakage (NRCA-MCH-04)
  - Economizer controls (NRCA-MCH-05)
  - DCV (NRCA-MCH-06)

§120.5 and the Field Inspector



STATE OF CALIFORNIA
Supply Air Temperature Reset Controls Acceptance
CEC-NRCA-MCH-16-F (Revised 06/13) CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF ACCEPTANCE NRCA-MCH-16-F
Supply Air Temperature Reset Controls Acceptance (Page 1 of 2)

STATE OF CALIFORNIA
CONDENSER WATER SUPPLY TEMPERATURE RESET CONTROLS ACCEPTANCE
CEC-NRCA-MCH-17-F (Revised 06/13) CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF ACCEPTANCE NRCA-MCH-17-F

STATE OF CALIFORNIA
ENERGY MANAGEMENT CONTROL SYSTEM ACCEPTANCE
CEC-NRCA-MCH-18-F (Revised 06/13) CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF ACCEPTANCE NRCA-MCH-18-F
Energy Management Control System Acceptance (Page 1 of 1)

Project Name: | Enforcement Agency: | Permit Number:
Project Address: | City: | Zip Code:

Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance. | Enforcement Agency Use: Checked by/Date:

Intent: *The purpose of this acceptance test is to help ensure the central control system, when installed, is properly installed and configured and capable of meeting the applicable requirements of Title 24 Part 6. The EMCS is a complex, highly customized control system with many opportunities for installation and programming problems. Obviously it is important to identify, diagnose, and resolve these problems. This acceptance test can help assist with this effort.*

A. Construction Inspection

Prior to functional testing and conducting other acceptance tests that rely on the EMCS:
- ☐ Factory start-up and check-out completed
- ☐ Point-to-point verification completed
- ☐ I/O point lists available
- ☐ Sequence of operations of each system are programmed
- ☐ Written sequences are available
- ☐ Input sensors are calibrated

B. Functional Testing	Results
Conduct the following verification checks to validate the functionality of the EMCS:	
1. Verify the control graphics represent the system configuration	Y / N
2. Verify control points are properly mapped to the graphics screen	Y / N
3. Raise and lower a sampling of space temperature setpoints in the software and verify the system responds appropriately	Y / N
4. Verify the time-of-day start-up and shut-down function initiates a proper system response	Y / N
5. Verify trending capabilities by establishing trend logs for a sampling of control points	Y / N
6. Verify alarm conditions are monitored	Y / N
7. Verify the EMCS panel is installed on an emergency power circuit or has adequate battery back-up	Y / N

C. Testing Results	PASS	FAIL
Test passes if all Construction Inspection boxes are checked and all Functional Testing results are 'Y'	☐	☐

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2013

- **At Final, still verify req. Acceptance forms**
  - Refer to NRCC-MCH-01 form
- **Verify Acceptance testing is performed by CMATT when required**
  - Identify signature in Declaration Statement
- **Verify all Acceptance forms are registered starting 1/1/15**

§120.5 and the Field Inspector *cont.*

- **Occupancy permit shall not be issued until all req. Acceptance tests/forms are verified**
  - Refer to NRCC-MCH-01 form
- **When ATTCPs are interim approved, CMATT will be req. for only 8 tests**
  - Listed in §10-103-B
- **CMATT testing will be req. for ALL acceptance tests once ATTCPs are fully approved**
  - Check website for approved ATTCPs

Covered Processes

2008 – *§126*

- Requirements for refrigerated warehouses ≥ 3,000 ft^2:
  - Insulation (walls, roof, etc.)
  - Evaporators
  - Condensers
  - Compressors

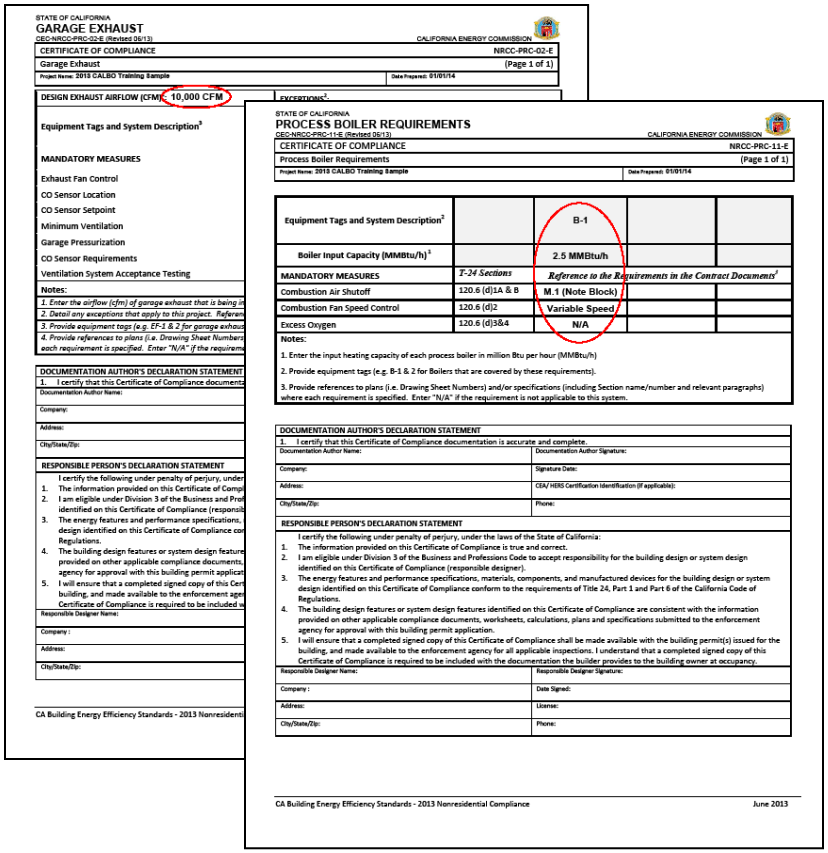
2013 – *§120.6*

- Refrigerated warehouse reqs. updated
  - Acceptance testing req.
- Covered processes added:
  - Commercial refrigeration
  - Enclosed parking garages
  - Process boilers
  - Compressed air systems

Covered Processes *cont.*

- **Commercial refrigeration reqs. in §120.6(b)**
  - Applicable to retail food stores with CFA ≥ 8,000 ft^2 that have refrigeration
- **Enclosed parking garages reqs. in §120.6(c)**
  - Applicable if total design exhaust rate ≥ 10,000 CFM
  - Acceptance testing req. for ventilation
- **Process boiler reqs. in §120.6(d)**
  - Applicability based on boiler capacity (Btu/h)
- **Compressed air system reqs. in §120.6(e)**
  - Applicable to compressors with HP ≥ 25
  - Acceptance testing req. for compressor and controls

§120.6 and the Plans Examiner



STATE OF CALIFORNIA
GARAGE EXHAUST
CEC-NRCC-PRC-02-E (Revised 06/13)
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE
NRCC-PRC-02-E
Garage Exhaust
(Page 1 of 1)
Project Name: 2013 CALBO Training Sample
Date Prepared: 01/01/14
DESIGN EXHAUST AIRFLOW (CFM): 10,000 CFM
Equipment Tags and System Description[3]
MANDATORY MEASURES
Exhaust Fan Control
CO Sensor Location
CO Sensor Setpoint
Minimum Ventilation
Garage Pressurization
CO Sensor Requirements
Ventilation System Acceptance Testing
Notes:
1. Enter the airflow (cfm) of garage exhaust that is being in
2. Detail any exceptions that apply to this project. Referen
3. Provide equipment tags (e.g. EF-1 & 2 for garage exhaus
4. Provide references to plans (i.e. Drawing Sheet Numbers
each requirement is specified. Enter "N/A" if the requirem
DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
1. I certify that this Certificate of Compliance document
Documentation Author Name:
Company:
Address:
City/State/Zip:
RESPONSIBLE PERSON'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under
1. The information provided on this Certificate of Compl
2. I am eligible under Division 3 of the Business and Prof
identified on this Certificate of Compliance (responsib
3. The energy features and performance specifications,
design identified on this Certificate of Compliance cor
Regulations.
4. The building design features or system design feature
provided on other applicable compliance documents,
agency for approval with this building permit applicat
5. I will ensure that a completed signed copy of this Cert
building, and made available to the enforcement age
Certificate of Compliance is required to be included w
Responsible Designer Name:
Company :
Address:
City/State/Zip:
CA Building Energy Efficiency Standards - 2013 Nonresidenti

STATE OF CALIFORNIA
PROCESS BOILER REQUIREMENTS
CEC-NRCC-PRC-11-E (Revised 06/13)
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE
NRCC-PRC-11-E
Process Boiler Requirements
(Page 1 of 1)
Project Name: 2013 CALBO Training Sample
Date Prepared: 01/01/14

Equipment Tags and System Description[2]		B-1		
Boiler Input Capacity (MMBtu/h)[1]		2.5 MMBtu/h		
MANDATORY MEASURES	T-24 Sections	Reference to the Requirements in the Contract Documents[3]		
Combustion Air Shutoff	120.6 (d)1A & B	M.1 (Note Block)		
Combustion Fan Speed Control	120.6 (d)2	Variable Speed		
Excess Oxygen	120.6 (d)3&4	N/A		

Notes:
1. Enter the input heating capacity of each process boiler in million Btu per hour (MMBtu/h)
2. Provide equipment tags (e.g. B-1 & 2 for Boilers that are covered by these requirements).
3. Provide references to plans (i.e. Drawing Sheet Numbers) and/or specifications (including Section name/number and relevant paragraphs) where each requirement is specified. Enter "N/A" if the requirement is not applicable to this system.

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
1. I certify that this Certificate of Compliance documentation is accurate and complete.
Documentation Author Name:
Documentation Author Signature:
Company:
Signature Date:
Address:
CEA/ HERS Certification Identification (if applicable):
City/State/Zip:
Phone:
RESPONSIBLE PERSON'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.
Responsible Designer Name:
Responsible Designer Signature:
Company :
Date Signed:
Address:
License:
City/State/Zip:
Phone:
CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance
June 2013

- **Verify applicable Certificate of Compliance on plans**
  - NRCC-PRC-02 (Garages)
  - NRCC-PRC-05 (Comm. Refrig.)
  - NRCC-PRC-10 (Comp. Air Sys.)
  - NRCC-PRC-11 (Boilers)
- **Verify specifications match the plans (mechanical schedules, note blocks, etc.)**

** Forms must be registered starting 1/1/15*

§120.6 and the Plans Examiner *cont.*

- **Other NRCC forms req. for covered processes**
  - NRCC-PRC-01 (req. for all projects)
    - Identifies which forms will be required for project
  - NRCC-PRC-06
    - Req. for all refrigerated warehouses
  - NRCC-PRC-07
    - Req. for refrigerated warehouses ≥ 3,000 ft^2
  - NRCC-PRC-08
    - Req. when sum of multiple warehouses ≥ 3,000 ft^2 and served by same refrigeration system

§120.6 and the Field Inspector

- **Verify at Final applicable Certificate of Acceptance**
  - ➢ Refer to NRCC-PRC-01
    - NRCA-PRC-01 (Comp. Air Systems)
    - NRCA-PRC-03 (Garages)
    - NRCA-PRC-04 through -08 (Refrigerated Warehouses)
- **Forms must be registered beginning 1/1/15**

§120.6 and the Field Inspector *cont.*

- **NRCA forms req. for covered processes (refrigerated warehouses)**
  - NRCA-PRC-04 (evaporator fan motor controls)
  - NRCA-PRC-05 (evaporative condenser controls)
  - NRCA-PRC-06 (air-cooled condenser controls)
  - NRCA-PRC-07 (variable speed compressor)
  - NRCA-PRC-08 (electric resistance underslab heating)

** Acceptance testing for covered processes will not req. a CMATT*

Insulation

- **New mandatory insulation reqs. in §120.7**
- **Maximum U-factor for roofs/ceilings**
  - Incl. metal buildings and wood framed
- **Maximum U-factor for walls**
  - Incl. metal buildings and framed, light and heavy mass, wood framed, and spandrel panels and glass curtain walls
- **Maximum U-factor for floors and soffits**
  - Incl. raised mass floors

§120.7 and the Plans Examiner

- **Still verify U-factor on NRCC-ENV-01** *(Section B)*
  - Envelope Details
  - Must meet or be below mandatory maximum values
- **Still verify R-values on building plans**
  - Structural/Architectural Plans

STATE OF CALIFORNIA
ENVELOPE COMPONENT APPROACH
CEC-NRCC-ENV-01-E (Revised 06/13) — CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE — NRCC-ENV-01-E
Envelope Component Approach — (Page 1 of 3)
Project Name: 2013 CALBO Training Sample — Date Prepared: 01/01/14

A. GENERAL INFORMATION

1	Project Location:	2013 CALBO Drive	6	Compliance Method:	☒ Component ☐ Unconditioned (file Affidavit)
2	CA City and Zip Code:	Sacramento, 95814	7	Building Front Orientation (deg or cardinal):	North
3	Climate Zone:	12	8	Permitted Scope of Work	☒New Construction ☐ Addition ☐ Alteration
4	Total Conditioned Floor Area:	2,000 ft²	9	Building Type(s)	☒ Nonresidential ☐ High-Rise Residential ☐ Hotel/Motel Guest Room
5	☐ Schools (Public School) ☐ Relocatable Public School Bldg. ☐ Conditioned Spaces ☐ Unconditioned Spaces ☐ Skylight Area for Large Enclosed Space ≥ 5000 ft² (If checked include the NRCC-ENV-04-E with submittal)				

B. ENVELOPE DETAILS – Framed

1 Tag/ID	2 Assembly Type	3 Frame Material	4 Frame Depth	5 Frame Spacing	6 Appendix JA4 Reference	7 Cavity R-value	8 Continuous Insulation R-value	9 Proposed U-Factor	10 Required U-Factor From Tables, B, C, D	11 Comments
1	Celing	Wood	2 X 4	16 in.	4.2.1	R-38	R-0	0.026	0.039	
2	Walls	Wood	2 X 6	16 in.	4.3.1	R-19	R-4	0.074	0.059	
3										

C. ENVELOPE DETAILS – Non-framed

1 Tag/ID	2 Assembly Type	3 Assembly Materials	4 Thickness (inches)	5 Interior or Core Insulation R-value	6 Continuous Insulation R-value	7 Appendix JA4 Reference	8 Proposed U-Factor	9 Required U-Factor from Tables, B, C, D	10 Comments

D. ENVELOPE DETAILS – Mass

1 Tag/ID	2 Mass Type	3 Density (lb/ft³)	4 Mass Thickness (inches)	5 Furring Strip Thickness (inches)	6 Interior Insulation R-value	7 Exterior Insulation R-value	8 Appendix JA4 Reference	9 Proposed Insulation U-factor	10 Required U-Factor from Tables, B, C, D	11 Comments

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance — June 2013

** Can req. a note block on structural/architectural plans*

§120.7 and the Field Inspector

- **Verify installed R-values:**
  - Still verify wall and raised floor insulation at Insulation Stage
  - Still verify ceiling insulation at Final
  - Values must meet or exceed NRCC-ENV-01 form
- **Verify R-values on NRCI-ENV-01 form**
  - Must be registered starting 1/1/15

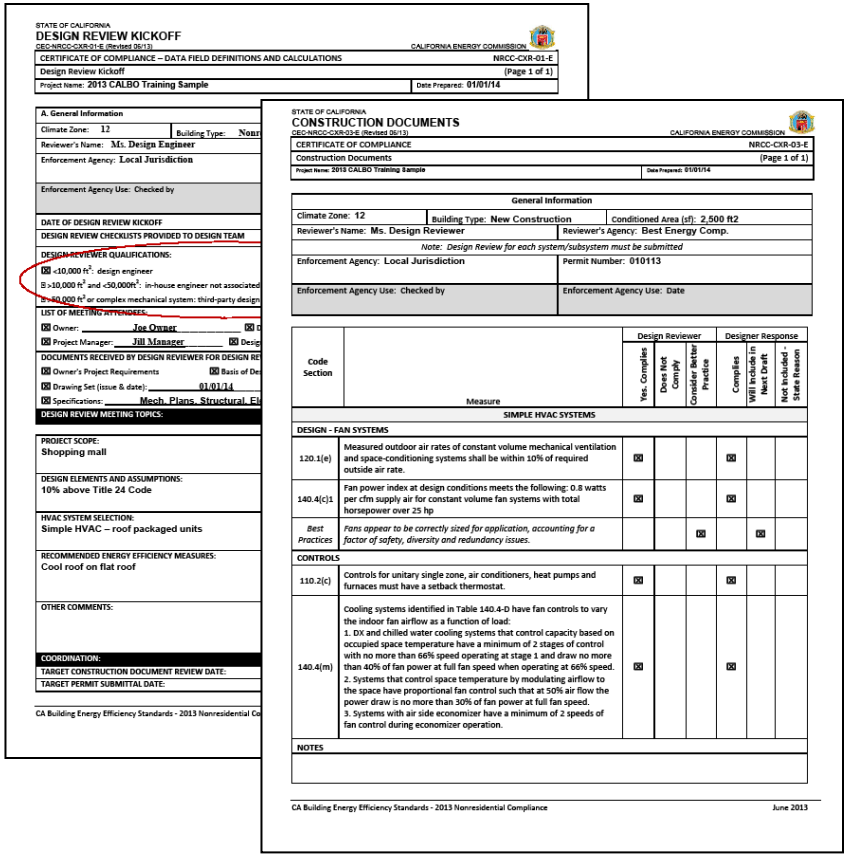
Building Commissioning

- **New mandatory commissioning reqs. in §120.8**
- **Applicable to all nonresidential buildings**
  - Buildings < 10,000 ft^2 only have to meet subsections (d) and (e)
- **Requirements for:**
  - Owner's Project Requirements (OPR)
  - Basis of Design (BOD)
  - Design Phase Design Review
  - Commissioning Documents on Plans
  - Commissioning Plan
  - Functional Testing
  - Documentation and Training
  - Commissioning Report

Building Commissioning *cont.*

- **Design reviewer is responsible for verifying that forms, plans, etc. comply with §120.8**
  - Review may be completed by:
    - Design engineer for buildings < 10,000 ft^2
    - An in-house engineer not associated with the project, or a third party design engineer for buildings between 10,000 ft^2 and 50,000 ft^2
    - A third party design engineer for buildings > 50,000 ft^2, or buildings with complex mechanical systems

§120.8 and the Plans Examiner



STATE OF CALIFORNIA
DESIGN REVIEW KICKOFF
CEC-NRCC-CXR-01-E (Revised 05/13) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE – DATA FIELD DEFINITIONS AND CALCULATIONS NRCC-CXR-01-E
Design Review Kickoff (Page 1 of 1)
Project Name: 2013 CALBO Training Sample Date Prepared: 01/01/14

A. General Information
Climate Zone: 12 Building Type: Nonr
Reviewer's Name: Ms. Design Engineer
Enforcement Agency: Local Jurisdiction
Enforcement Agency Use: Checked by
DATE OF DESIGN REVIEW KICKOFF
DESIGN REVIEW CHECKLISTS PROVIDED TO DESIGN TEAM
DESIGN REVIEWER QUALIFICATIONS:
☒ <10,000 ft²: design engineer
☐ >10,000 ft² and <50,000ft²: in-house engineer not associated
☐ >50,000 ft² or complex mechanical system: third-party design
LIST OF MEETING ATTENDEES:
☒ Owner: Joe Owner ☒ D
☒ Project Manager: Jill Manager ☒ Desig
DOCUMENTS RECEIVED BY DESIGN REVIEWER FOR DESIGN RE
☒ Owner's Project Requirements ☒ Basis of De
☒ Drawing Set (issue & date): 01/01/14
☒ Specifications: Mech, Plans, Structural, El
DESIGN REVIEW MEETING TOPICS:
PROJECT SCOPE: Shopping mall
DESIGN ELEMENTS AND ASSUMPTIONS: 10% above Title 24 Code
HVAC SYSTEM SELECTION: Simple HVAC – roof packaged units
RECOMMENDED ENERGY EFFICIENCY MEASURES: Cool roof on flat roof
OTHER COMMENTS:
COORDINATION:
TARGET CONSTRUCTION DOCUMENT REVIEW DATE:
TARGET PERMIT SUBMITTAL DATE:
CA Building Energy Efficiency Standards - 2013 Nonresidential Co

STATE OF CALIFORNIA
CONSTRUCTION DOCUMENTS
CEC-NRCC-CXR-03-E (Revised 05/13) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-CXR-03-E
Construction Documents (Page 1 of 1)
Project Name: 2013 CALBO Training Sample Date Prepared: 01/01/14

General Information
Climate Zone: 12 Building Type: New Construction Conditioned Area (sf): 2,500 ft2
Reviewer's Name: Ms. Design Reviewer Reviewer's Agency: Best Energy Comp.
Note: Design Review for each system/subsystem must be submitted
Enforcement Agency: Local Jurisdiction Permit Number: 010113
Enforcement Agency Use: Checked by Enforcement Agency Use: Date

Code Section	Measure	Design Reviewer: Yes, Complies	Design Reviewer: Does Not Comply	Design Reviewer: Consider Better Practice	Designer Response: Complies	Designer Response: Will Include in Next Draft	Designer Response: Not Included State Reason
	SIMPLE HVAC SYSTEMS						
DESIGN - FAN SYSTEMS							
120.1(e)	Measured outdoor air rates of constant volume mechanical ventilation and space-conditioning systems shall be within 10% of required outside air rate.	☒			☒		
140.4(c)1	Fan power index at design conditions meets the following: 0.8 watts per cfm supply air for constant volume fan systems with total horsepower over 25 hp	☒			☒		
Best Practices	*Fans appear to be correctly sized for application, accounting for a factor of safety, diversity and redundancy issues.*			☒		☒	
CONTROLS							
110.2(c)	Controls for unitary single zone, air conditioners, heat pumps and furnaces must have a setback thermostat.	☒			☒		
140.4(m)	Cooling systems identified in Table 140.4-D have fan controls to vary the indoor fan airflow as a function of load: 1. DX and chilled water cooling systems that control capacity based on occupied space temperature have a minimum of 2 stages of control with no more than 66% speed operating at stage 1 and draw no more than 40% of fan power at full fan speed when operating at 66% speed. 2. Systems that control space temperature by modulating airflow to the space have proportional fan control such that at 50% air flow the power draw is no more than 30% of fan power at full fan speed. 3. Systems with air side economizer have a minimum of 2 speeds of fan control during economizer operation.	☒			☒		
NOTES							

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2013

- **Verify applicable Certificate of Compliance on plans**
  - NRCC-CXR-01
  - NRCC-CXR-02
  - NRCC-CXR-03 (simple HVAC)
  - NRCC-CXR-04 (complex HVAC)
  - NRCC-CXR-05
- **Verify qualifications of design reviewer**

** Form must be registered starting 1/1/15*

Lighting – Multi-Level

2008 – *§131(b)*

- Multi-level lighting controls req. for:
  - Enclosed spaces ≥ 100 ft^2; and
  - Have a lighting load > 0.8 W/ft^2
- One control step between 30% and 70%
- Uniform illuminance with dimmers, A/B switching, etc.

2013 – *§130.1(b)*

- Multi-level lighting controls req. for
  - Enclosed space ≥ 100 ft^2; and
  - Have a lighting load > 0.5 W/ft^2
- Control steps and uniform illuminance dependent on luminaire type
  - In accordance with TABLE 130.1-A

Lighting – Shut-OFF

2008 – *§131(d)*

- Shut-off controls req. for every floor
- Can be achieved with:
  - Occupancy sensors
  - Automatic time-switch
  - Countdown timer switch
  - Etc.

2013 – *§130.1(c)*

- Countdown time switches prohibited (some exceptions)
- Occupant sensors that shut off all lighting req. in specific areas
- Occupant sensors with partial ON/OFF controls req. in specific areas
- Captive key cards req. in hotel/motel guest rooms

Lighting – Acceptance/Installation Cert.

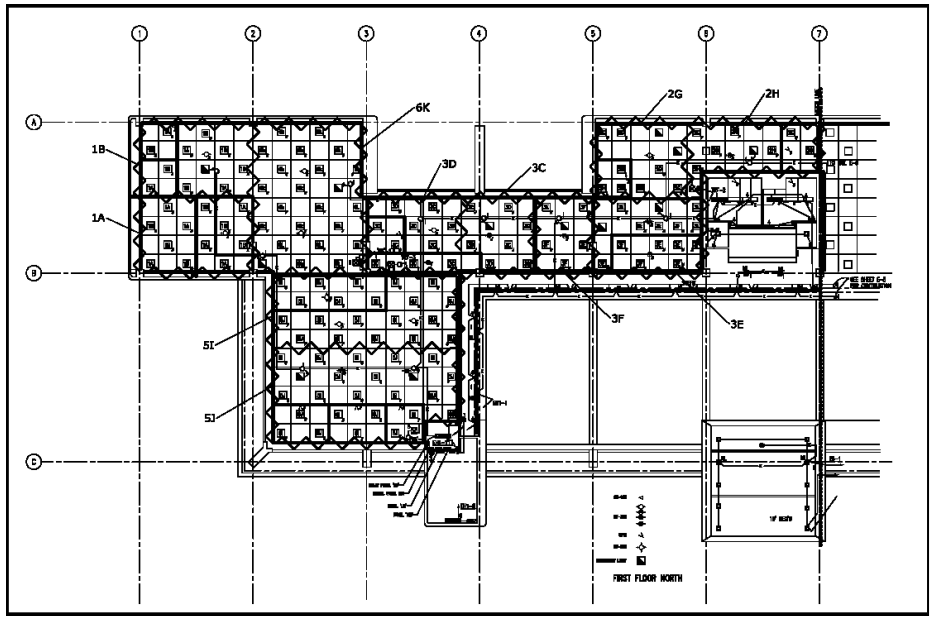
2008 – *§134*	2013 – *§130.4*
• Testing mandatory if controls/systems installed for: ➢ Multi-level controls ➢ Shut-off controls ➢ Daylighting controls ➢ Automatic daylighting controls • Identified as "LTG-A"	• Identified as "NRCA-LTI" ➢ Must be performed by Certified Lighting Controls Acceptance Test Technician (CLCATT) • New Certificate(s) of Installation req. ➢ Identified as "NRCI-LTI" ➢ Completed by installing contractor

Lighting – Installation Cert.

cont.

- **Certificate of Installation required for (NRCC-LTI-01):**
  - EMCS or lighting control system (NRCI-LTI-02)
  - Track lighting current limiter or supplementary overcurrent protection panel (NRCI-LTI-03)
  - Two interlocked lighting systems (NRCI-LTI-04)
  - Power Adjustment Factors (NRCI-LTI-05)
  - Videoconference studio lighting (NRCI-LTI-06)
- **All forms must be registered starting 1/1/15**

§130.1, §130.4 and the Plans Examiner



- **Still verify multi-level and shut-OFF controls on electrical plans:**
  - More spaces may req. multi-level controls (> 0.5 W/ft^2)
  - Many spaces will req. occupant sensors
    - All lighting
    - Partial ON/OFF
- **Refer to NRCC-LTI-02 as mandatory note block**

§130.1, §130.4 and the Field Inspector

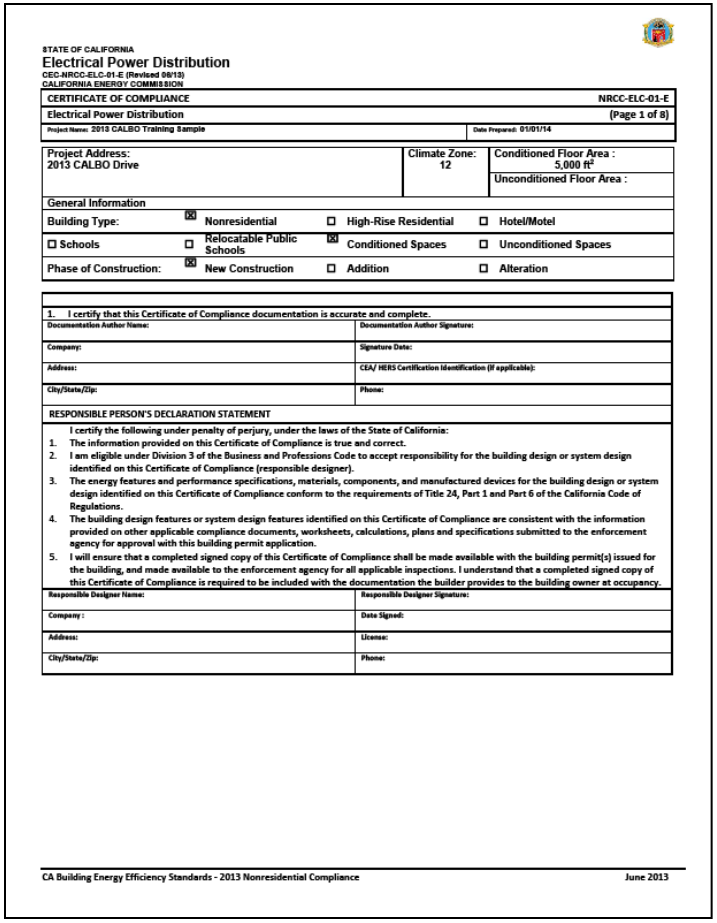
- **At Final verify:**
  - Multi-level lighting controls installed in accordance with TABLE 130.1-A
  - Shut-OFF controls installed to comply with completely OFF, or Partial ON/OFF requirements
- **Verify req. NRCI-LTI forms**
- **Verify req. NRCA-LTI forms**
  - Must be signed my CLCATT when req.

** Refer to NRCA-LTI-02*

Electrical Power Distribution

- **New mandatory requirements in §130.5**
- **Requirements for:**
  - Service metering
    - TABLE 130.5-A
  - Disaggregation of electrical circuits
    - TABLE 130.5-B
  - Voltage Drop
  - 120-Volt Receptacles
  - Demand Responsive controls
  - EMCS

§130.5 and the Plans Examiner



STATE OF CALIFORNIA
Electrical Power Distribution
CEC-NRCC-ELC-01-E (Revised 09/13)
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-01-E
Electrical Power Distribution	(Page 1 of 8)
Project Name: 2013 CALBO Training Sample	Date Prepared: 01/01/14

Project Address: 2013 CALBO Drive	Climate Zone: 12	Conditioned Floor Area : 5,000 ft²
		Unconditioned Floor Area :

General Information

Building Type:	☒ Nonresidential	☐ High-Rise Residential	☐ Hotel/Motel	
☐ Schools	☐ Relocatable Public Schools	☒ Conditioned Spaces	☐ Unconditioned Spaces	
Phase of Construction:	☒ New Construction	☐ Addition	☐ Alteration	

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (If applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

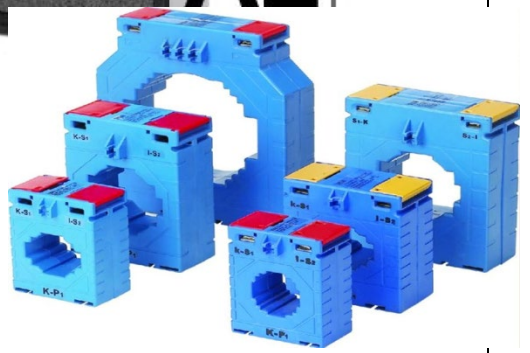
Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2013

- **Verify specifications on NRCC-ELC-01 form**
  - Service metering
  - Disaggregation of circuits
  - Voltage drop
  - 120 volt receptacles
- **Form must be on plans**
- **Must be registered starting 1/1/15**

§130.5 and the Field Inspector

- **Verify at Final**
  - Elect. services are metered
  - Switchboards, panels, etc. are disaggregated
  - Feeder and branch circuit size
  - 120 volt receptacles when req.
- **Use NRCC-ELC-01 as inspector checklist**



Let's talk about the changes to the Energy Standards – Prescriptive Measures (New construction)

Cool Roofs, Fenestration, etc.

2008 – *§143(a)*

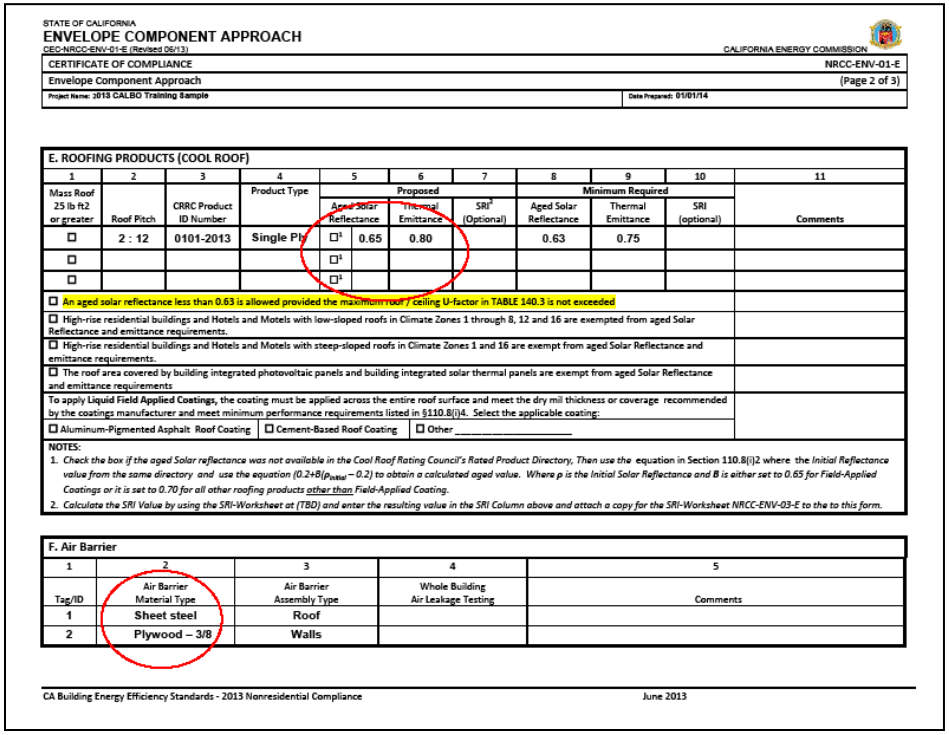
- Cool roof reqs. dependent on:
  - Slope
  - Climate zone
  - Density (lb/ft^2)
- Windows/skylights must meet U-factor and SHGC reqs.
- Reqs. in TABLE 143-A through 143-C

2013 – *§140.3(a)*

- Cool roofs:
  - Density criteria removed
  - Solar reflectance trade-off in TABLE 140.3
- Windows/skylights
  - Must meet min. VT reqs.
- New air barrier reqs.
  - Approved materials in TABLE 140.3-A
- Reqs. in TABLE 140.3-B through 140.3-D

§140.3 and the Plans Examiner

- **Verify specifications on NRCC-ENV-01**
  - Cool Roofs *(Section E)*
  - Air barrier *(Section F)*
  - Windows/skylights *(Section G)*
- **Must match building plans**
  - Footnotes on structural/architectural plans
  - Window Schedule



STATE OF CALIFORNIA
ENVELOPE COMPONENT APPROACH
CEC-NRCC-ENV-01-E (Revised 06/13)
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ENV-01-E
Envelope Component Approach	(Page 2 of 3)
Project Name: 2013 CALBO Training Sample	Date Prepared: 01/01/14

E. ROOFING PRODUCTS (COOL ROOF)

1	2	3	4	5	6	7	8	9	10	11
Mass Roof 25 lb ft2 or greater	Roof Pitch	CRRC Product ID Number	Product Type	Proposed Aged Solar Reflectance	Proposed Thermal Emittance	Proposed SRI[2] (Optional)	Minimum Required Aged Solar Reflectance	Minimum Required Thermal Emittance	Minimum Required SRI (optional)	Comments
☐	2 : 12	0101-2013	Single Ply	☐[1] 0.65	0.80		0.63	0.75		
☐				☐[1]						
☐				☐[1]						

☐ An aged solar reflectance less than 0.63 is allowed provided the maximum roof / ceiling U-factor in TABLE 140.3 is not exceeded

☐ High-rise residential buildings and Hotels and Motels with low-sloped roofs in Climate Zones 1 through 8, 12 and 16 are exempted from aged Solar Reflectance and emittance requirements.

☐ High-rise residential buildings and Hotels and Motels with steep-sloped roofs in Climate Zones 1 and 16 are exempt from aged Solar Reflectance and emittance requirements.

☐ The roof area covered by building integrated photovoltaic panels and building integrated solar thermal panels are exempt from aged Solar Reflectance and emittance requirements

To apply Liquid Field Applied Coatings, the coating must be applied across the entire roof surface and meet the dry mil thickness or coverage recommended by the coatings manufacturer and meet minimum performance requirements listed in §110.8(i)4. Select the applicable coating:

☐ Aluminum-Pigmented Asphalt Roof Coating ☐ Cement-Based Roof Coating ☐ Other _____

NOTES:
1. *Check the box if the aged Solar reflectance was not available in the Cool Roof Rating Council's Rated Product Directory, Then use the* equation in Section 110.8(i)2 where the *Initial Reflectance value from the same directory and use the equation* $(0.2+B(\rho_{Initial}-0.2)$ *to obtain a calculated aged value. Where* ρ *is the Initial Solar Reflectance and B is either set to 0.65 for Field-Applied Coatings or it is set to 0.70 for all other roofing products other than Field-Applied Coating.*
2. *Calculate the SRI Value by using the SRI-Worksheet at (TBD) and enter the resulting value in the SRI Column above and attach a copy for the SRI-Worksheet NRCC-ENV-03-E to the to this form.*

F. Air Barrier

1	2	3	4	5
Tag/ID	Air Barrier Material Type	Air Barrier Assembly Type	Whole Building Air Leakage Testing	Comments
1	Sheet steel	Roof		
2	Plywood – 3/8	Walls		

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2013

** Form must be registered starting 1/1/15*

§140.3 and the Plans Examiner *cont.*

- **Other Prescriptive NRCC-ENV forms:**
  - NRCC-ENV-02
    - Fenestration area worksheet
  - NRCC-ENV-03
    - Solar reflectance index (SRI) worksheet
  - NRCC-ENV-04
    - Skylight area worksheet – §140.3(c)
  - NRCC-ENV-05
    - Fenestration default values (§110.6) label
  - NRCC-ENV-06
    - Area weighted average worksheet

§140.3 and the Field Inspector

- **At Rough Frame verify:**
  - Cool roof efficiencies
    - CRRC product label
  - Window/skylight efficiencies
    - NFRC label/certificate
  - Installed continuous air barrier for exterior walls, roofs, ceilings, and raised floors
- **All values must match NRCC-ENV-01 form**

§140.3 and the Field Inspector *cont.*

- **NRCA-ENV-02 form is req. for <u>site-built</u> fenestration**
  - ➢ Field technician verifies U-factor, SHGC, and VT using
    - NFRC label/certificate if certified

      OR
    - NRCC-ENV-05 form if default values were used

** NOTE: Field technician certification is <u>not</u> req. for NRCA-ENV testing*

HVAC

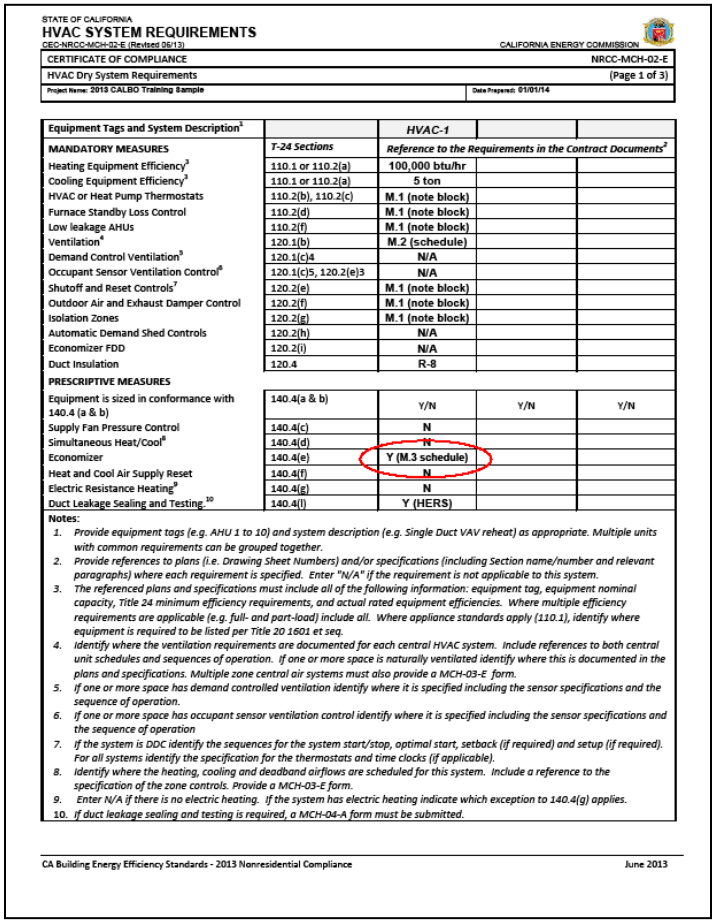
2008 – *§144*

- Loads calcs./sizing
- Economizers req. when fan capacity > 2,500 cfm, and HVAC capacity > 75,000 Btu/hr
- Air-cooled chillers limited to 100 tons when water plant capacity > 300 tons
- Duct leakage testing

2013 – *§140.4*

- Economizer reqs. updated
  - Req. when HVAC capacity > 54,000 Btu/hr
  - Fan capacity criteria removed
  - Economizer trade-offs revised in TABLE 140.4-A
  - Performance reqs. for economizers > 45,000 Btu/hr
- Air-cooled chiller limitation lifted to 300 tons regardless of water plant size

§140.4 and the Plans Examiner



STATE OF CALIFORNIA
HVAC SYSTEM REQUIREMENTS
CEC-NRCC-MCH-02-E (Revised 05/13) — CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-02-E
HVAC Dry System Requirements	(Page 1 of 3)
Project Name: 2013 CALBO Training Sample	Date Prepared: 01/01/14

Equipment Tags and System Description[1]		HVAC-1		
MANDATORY MEASURES	*T-24 Sections*	*Reference to the Requirements in the Contract Documents[2]*		
Heating Equipment Efficiency[3]	110.1 or 110.2(a)	100,000 btu/hr		
Cooling Equipment Efficiency[3]	110.1 or 110.2(a)	5 ton		
HVAC or Heat Pump Thermostats	110.2(b), 110.2(c)	M.1 (note block)		
Furnace Standby Loss Control	110.2(d)	M.1 (note block)		
Low leakage AHUs	110.2(f)	M.1 (note block)		
Ventilation[4]	120.1(b)	M.2 (schedule)		
Demand Control Ventilation[5]	120.1(c)4	N/A		
Occupant Sensor Ventilation Control[6]	120.1(c)5, 120.2(e)3	N/A		
Shutoff and Reset Controls[7]	120.2(e)	M.1 (note block)		
Outdoor Air and Exhaust Damper Control	120.2(f)	M.1 (note block)		
Isolation Zones	120.2(g)	M.1 (note block)		
Automatic Demand Shed Controls	120.2(h)	N/A		
Economizer FDD	120.2(i)	N/A		
Duct Insulation	120.4	R-8		
PRESCRIPTIVE MEASURES				
Equipment is sized in conformance with 140.4 (a & b)	140.4(a & b)	Y/N	Y/N	Y/N
Supply Fan Pressure Control	140.4(c)	N		
Simultaneous Heat/Cool[8]	140.4(d)	N		
Economizer	140.4(e)	Y (M.3 schedule)		
Heat and Cool Air Supply Reset	140.4(f)	N		
Electric Resistance Heating[9]	140.4(g)	N		
Duct Leakage Sealing and Testing.[10]	140.4(l)	Y (HERS)		

Notes:
1. *Provide equipment tags (e.g. AHU 1 to 10) and system description (e.g. Single Duct VAV reheat) as appropriate. Multiple units with common requirements can be grouped together.*
2. *Provide references to plans (i.e. Drawing Sheet Numbers) and/or specifications (including Section name/number and relevant paragraphs) where each requirement is specified. Enter "N/A" if the requirement is not applicable to this system.*
3. *The referenced plans and specifications must include all of the following information: equipment tag, equipment nominal capacity, Title 24 minimum efficiency requirements, and actual rated equipment efficiencies. Where multiple efficiency requirements are applicable (e.g. full- and part-load) include all. Where appliance standards apply (110.1), identify where equipment is required to be listed per Title 20 1601 et seq.*
4. *Identify where the ventilation requirements are documented for each central HVAC system. Include references to both central unit schedules and sequences of operation. If one or more space is naturally ventilated identify where this is documented in the plans and specifications. Multiple zone central air systems must also provide a MCH-03-E form.*
5. *If one or more space has demand controlled ventilation identify where it is specified including the sensor specifications and the sequence of operation.*
6. *If one or more space has occupant sensor ventilation control identify where it is specified including the sensor specifications and the sequence of operation*
7. *If the system is DDC identify the sequences for the system start/stop, optimal start, setback (if required) and setup (if required). For all systems identify the specification for the thermostats and time clocks (if applicable).*
8. *Identify where the heating, cooling and deadband airflows are scheduled for this system. Include a reference to the specification of the zone controls. Provide a MCH-03-E form.*
9. *Enter N/A if there is no electric heating. If the system has electric heating indicate which exception to 140.4(g) applies.*
10. *If duct leakage sealing and testing is required, a MCH-04-A form must be submitted.*

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance — June 2013

- **Verify on NRCC-MCH-02**
  - Specifications for economizers when req. *(Page 1)*
  - Specifications for air-cooled chillers when applicable *(Page 2)*
  - Form should cite building plans reference
    - Mechanical schedule, note block, etc.
- **Forms must be registered starting 1/1/15**

§140.4 and the Plans Examiner *cont.*

- **Other Prescriptive NRCC-MCH forms:**
  - NRCC-MCH-01
    - Identifies req. NRCC and NRCA forms
  - NRCC-MCH-03
    - Ventilation and reheat
  - NRCC-MCH-05
    - Packaged, single zone units
  - NRCC-MCH-06
    - Maximum cycles worksheet

§140.4 and the Field Inspector

- **At Final verify**
  - ➢ Economizer installed when req.
    - ▪ Economizer is certified to CEC when > 45,000 Btu/hr
    - ▪ NRCA-MCH-05 form
      - ✓ Must be signed by CMATT when req.
      - ✓ Must be registered starting 1/1/15
  - ➢ Air-cooled chiller capacity does not exceed 300 tons

§140.4 and the Plans Examiner *cont.*

- **Required NRCA-MCH forms/testing must be verified before final occupancy permit is issued**
  - Refer to NRCC-MCH-01 form
- **Frequently req. test include:**
  - Outdoor air ventilation (NRCA-MCH-02)
  - Single zone unitary A/C and HP controls (NRCA-MCH-03)
  - Duct leakage (NRCA-MCH-04) – *does not req. CMATT*
    - NRCV-MCH-04 req. (HERS rater test)
  - DCV (NRCA-MCH-06)

Lighting

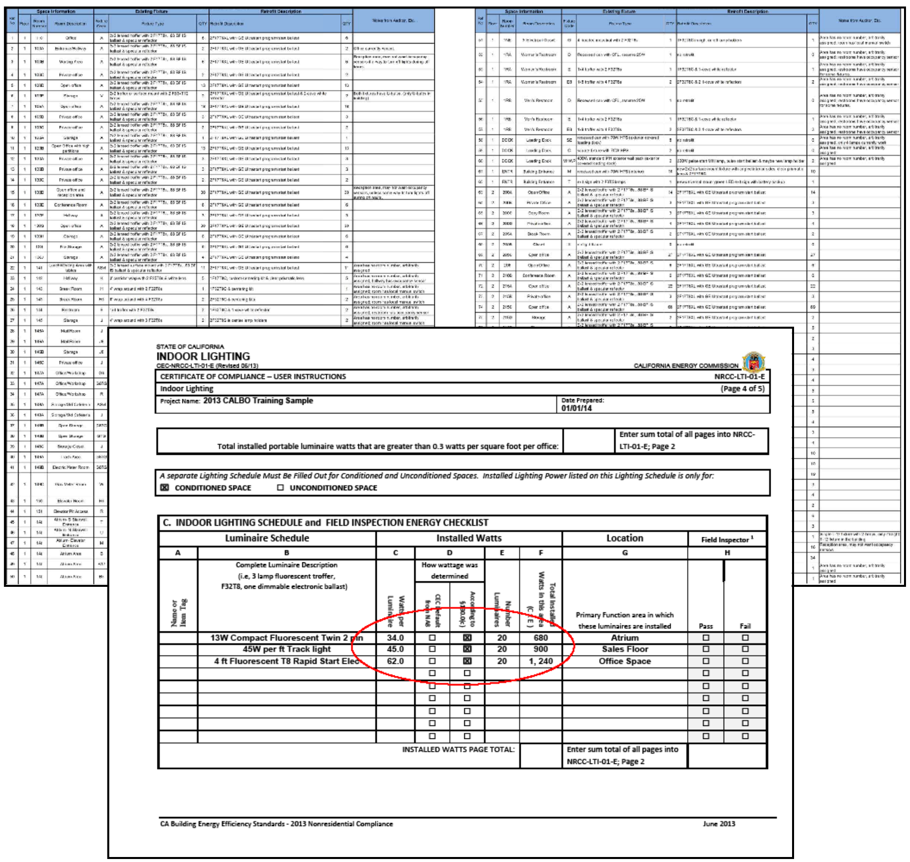
2008 – *§146*

- Allowed lighting power density (watts/ft^2)
  - Complete building method
  - Area category method
  - Tailored method
  - TABLES 146-E through G
- Power adjustment factor (PAF)
  - Reduces proposed watts/ft^2 with lighting controls
  - TABLE 146-C

2013 – *§140.6*

- Allowed watts/ft^2
  - TABLES 140.6-B through D
  - No major changes for complete building and area category method values
  - Tailored method values changed and determined by general illumination level (Lux)
- PAFs updated
  - TABLE 140.6-A

§140.6 and the Plans Examiner



STATE OF CALIFORNIA
INDOOR LIGHTING
CEC-NRCC-LTI-01-E (Revised 06/13)
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE – USER INSTRUCTIONS
NRCC-LTI-01-E
Indoor Lighting
(Page 4 of 5)
Project Name: 2013 CALBO Training Sample
Date Prepared: 01/01/14

Total installed portable luminaire watts that are greater than 0.3 watts per square foot per office:
Enter sum total of all pages into NRCC-LTI-01-E; Page 2

A separate Lighting Schedule Must Be Filled Out for Conditioned and Unconditioned Spaces. Installed Lighting Power listed on this Lighting Schedule is only for:
☒ CONDITIONED SPACE ☐ UNCONDITIONED SPACE

C. INDOOR LIGHTING SCHEDULE and FIELD INSPECTION ENERGY CHECKLIST

Luminaire Schedule		Installed Watts					Location	Field Inspector[1]	
A	B	C	D		E	F	G	H	
Name or Item Tag	Complete Luminaire Description (i.e, 3 lamp fluorescent troffer, F32T8, one dimmable electronic ballast)	Watts per Luminaire	How wattage was determined: CEC Default from NA8	According to §130.0(c)	Number of Luminaires	Total Installed Watts in this area (C x E)	Primary Function area in which these luminaires are installed	Pass	Fail
	13W Compact Fluorescent Twin 2 pin	34.0	☐	☒	20	680	Atrium	☐	☐
	45W per ft Track light	45.0	☐	☒	20	900	Sales Floor	☐	☐
	4 ft Fluorescent T8 Rapid Start Elec	62.0	☐	☒	20	1, 240	Office Space	☐	☐
			☐	☐				☐	☐
			☐	☐				☐	☐
			☐	☐				☐	☐
			☐	☐				☐	☐
			☐	☐				☐	☐
			☐	☐				☐	☐
	INSTALLED WATTS PAGE TOTAL:						Enter sum total of all pages into NRCC-LTI-01-E; Page 2		

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance — June 2013

- **Still verify proposed watts/ft² on NRCC-LTI-01 form**
  - ➢ Values should match lighting schedule on electrical plans
- **Verify PAF control credits on NRCC-LTI-02**
- **NRCC-LTI-03 req. when complete building or area category method used**
- **NRCC-LTI-04 req. when tailored method used**

** Forms must be registered starting 1/1/15*

§140.6 and the Field Inspector

- **At Rough Frame verify**
  - Installed watts/ft^2
  - Shall not exceed values on NRCC-LTI-01 form
- **If PAF controls credits were used**
  - Verify controls are installed
  - Simplify with NRCI-LTI-05

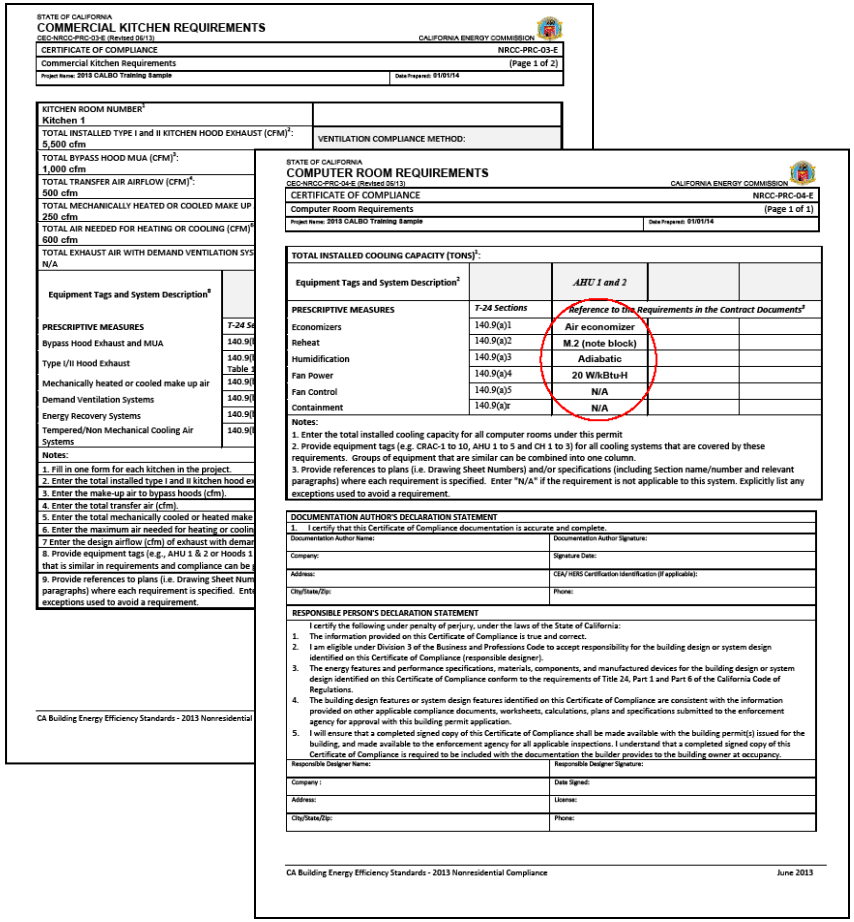
§140.6 and the Field Inspector *cont.*

- **All req. NRCI-LTI forms must be verified**
  - Refer to NRCC-LTI-01 (use as checklist)
  - Completed by installing contractor
- **All req. NRCA-LTI forms must be verified**
  - Refer to NRCC-LTI-01 (use as checklist)
  - Must be performed by CLCATT when required
- **All forms must be registered beginning 1/1/15**

Covered Processes

- **New prescriptive requirements in §140.9**
- **Computer room reqs. in §140.9(a)**
  - Economizers
  - Reheat, humidification, fan power consumption and controls, containment
- **Commercial kitchen reqs. in §140.9(b)**
  - Applicable to Type I and Type II kitchen hoods with total exhaust airflow rate > 5,000 cfm
  - Maximum exhaust rates in TABLE 140.9-A
  - Acceptance testing req. for exhaust rate
- **Laboratory exhaust reqs. in §140.9(c)**
  - Applicable when min. circulation rate is ≤ 10 ACH

§140.9 and the Plans Examiner



STATE OF CALIFORNIA
COMMERCIAL KITCHEN REQUIREMENTS
CEC-NRCC-PRC-03-E (Revised 05/13) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-PRC-03-E
Commercial Kitchen Requirements	(Page 1 of 2)
Project Name: 2013 CALBO Training Sample	Date Prepared: 01/01/14

KITCHEN ROOM NUMBER[1]	
Kitchen 1	
TOTAL INSTALLED TYPE I and II KITCHEN HOOD EXHAUST (CFM)[2]: 5,500 cfm	VENTILATION COMPLIANCE METHOD:
TOTAL BYPASS HOOD MUA (CFM)[3]: 1,000 cfm	
TOTAL TRANSFER AIR AIRFLOW (CFM)[4]: 500 cfm	
TOTAL MECHANICALLY HEATED OR COOLED MAKE UP 250 cfm	
TOTAL AIR NEEDED FOR HEATING OR COOLING (CFM)[5] 600 cfm	
TOTAL EXHAUST AIR WITH DEMAND VENTILATION SYS N/A	

Equipment Tags and System Description[6]	
PRESCRIPTIVE MEASURES	T-24 Se
Bypass Hood Exhaust and MUA	140.9(
Type I/II Hood Exhaust	140.9(Table 1
Mechanically heated or cooled make up air	140.9(
Demand Ventilation Systems	140.9(
Energy Recovery Systems	140.9(
Tempered/Non Mechanical Cooling Air Systems	140.9(

Notes:
1. Fill in one form for each kitchen in the project.
2. Enter the total installed type I and II kitchen hood ex
3. Enter the make-up air to bypass hoods (cfm).
4. Enter the total transfer air (cfm).
5. Enter the total mechanically cooled or heated make
6. Enter the maximum air needed for heating or coolin
7 Enter the design airflow (cfm) of exhaust with dema
8. Provide equipment tags (e.g., AHU 1 & 2 or Hoods 1 that is similar in requirements and compliance can be
9. Provide references to plans (i.e. Drawing Sheet Num paragraphs) where each requirement is specified. Ent exceptions used to avoid a requirement.

CA Building Energy Efficiency Standards - 2013 Nonresidential

STATE OF CALIFORNIA
COMPUTER ROOM REQUIREMENTS
CEC-NRCC-PRC-04-E (Revised 05/13) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-PRC-04-E
Computer Room Requirements	(Page 1 of 1)
Project Name: 2013 CALBO Training Sample	Date Prepared: 01/01/14

TOTAL INSTALLED COOLING CAPACITY (TONS)[1]:

Equipment Tags and System Description[2]		AHU 1 and 2		
PRESCRIPTIVE MEASURES	T-24 Sections	Reference to the Requirements in the Contract Documents[3]		
Economizers	140.9(a)1	Air economizer		
Reheat	140.9(a)2	M.2 (note block)		
Humidification	140.9(a)3	Adiabatic		
Fan Power	140.9(a)4	20 W/kBtu+H		
Fan Control	140.9(a)5	N/A		
Containment	140.9(a)x	N/A		

Notes:
1. Enter the total installed cooling capacity for all computer rooms under this permit
2. Provide equipment tags (e.g. CRAC-1 to 10, AHU 1 to 5 and CH 1 to 3) for all cooling systems that are covered by these requirements. Groups of equipment that are similar can be combined into one column.
3. Provide references to plans (i.e. Drawing Sheet Numbers) and/or specifications (including Section name/number and relevant paragraphs) where each requirement is specified. Enter "N/A" if the requirement is not applicable to this system. Explicitly list any exceptions used to avoid a requirement.

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (If applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under the laws of the State of California:
1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	Responsible Designer Signature:
Company:	Date Signed:
Address:	License:
City/State/Zip:	Phone:

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance June 2013

- **Verify applicable Certificate of Compliance on plans**
  - NRCC-PRC-03 (Kitchens)
  - NRCC-PRC-04 (Computer rooms)
  - NRCC-PRC-09 (Laboratory)
- **Verify specifications match the plans (mechanical schedules, note blocks, etc.)**

§140.9 and the Field Inspector

- **Verify at Final**
  - Installed cooling system for computer rooms meets economizer and design reqs.
  - Installed exhaust hoods in commercial kitchens meet exhaust reqs. when applicable
    - NRCA-PRC-02 form req.
  - Installed exhaust system for laboratories meets exhaust reqs. when applicable

Let's talk about the changes to the Energy Standards – Alterations (Prescriptive Approach)

Fenestration

2008 – *§149(b)1A*

- Replacement and added fenestration must:
  - Meet U-Factor and SHGC reqs. in §143
  - Meet 40% total and west facing area reqs. when glazing is added
    - Exempt from SHGC req. when less than 150 ft^2 of glazing is replaced
    - Exempt from SHGC req. when 50 ft^2 of glazing or less is added

2013 – *§141.0(b)2A*

- Replacement and added fenestration must:
  - Meet U-factor and SHGC reqs. in TABLE 141.0-A
  - Meet VT reqs. in §140.3
    - Exempt from SHGC and VT reqs. when less than 150 ft^2 of glazing is replaced
    - Exempt from SHGC and VT when 50 ft^2 of glazing or less if added

§141.0(b)2A and the Permit Process

- **Verify at permit on NRCC-ENV-01**
  - Verify efficiency values and glazing area meet reqs.
- **Verify at Final**
  - Replaced/added fen. meets values/areas on NRCC-ENV-01
  - NRCI-ENV-01 form
  - NRCA-ENV-02 req. if site-built fenestration installed

Re-roofs

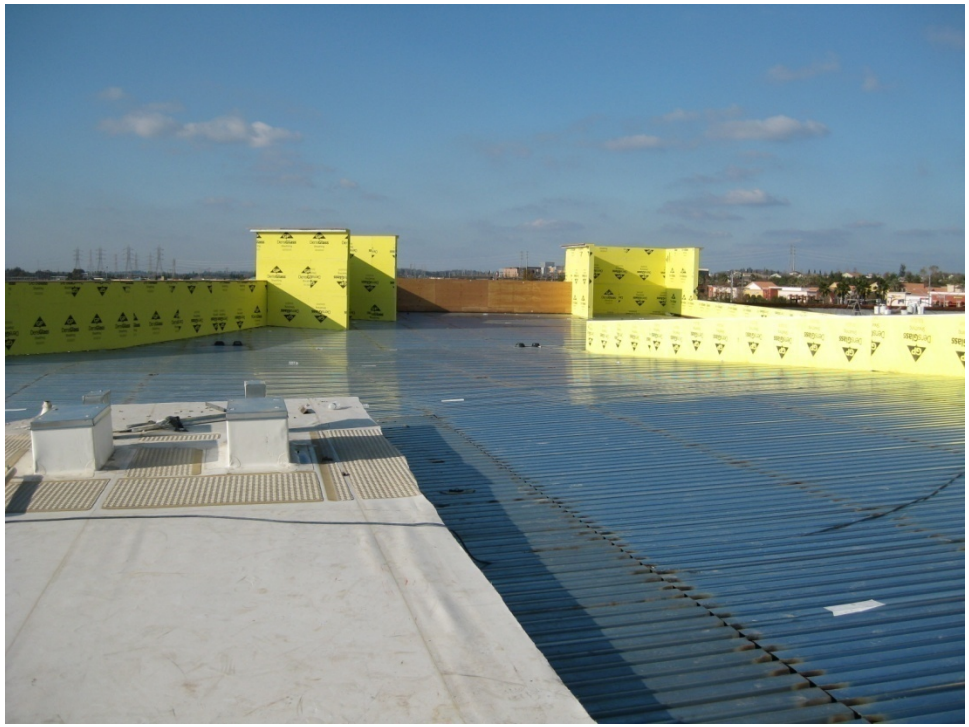
2008 – *§149(b)1B*

- When more than 50% or 2,000 ft^2 replaced (whichever is less), must be cool roof
  - Same as prescriptive reqs. for both low-sloped and steep-sloped roofs (new const.)
  - Roof insulation alternative in TABLE 149-A

2013 – *§141.0(b)2B*

- Same threshold criteria
  - Same efficiency reqs. as prescriptive reqs. for new construction
  - Remember that density criteria was removed
- Solar reflectance trade-off in TABLE 141.0-B

§141.0(b)2B and the Permit Process



- **Verify at permit on NRCC-ENV-01** *(Section E)*
  - Verify SR and TE values meet requirements
  - Verify if alternative is used
- **Verify at Final**
  - Installed cool roof values meet or exceed NRCC-ENV-01
    - *(CRRC product label)*
  - Verify NRCI-ENV-02

HVAC Alterations

2008 – §149(b)1C, D, E

- Reqs. for
  - New space conditioning systems
  - Duct alterations
  - HVAC changeouts
    - Duct leakage testing
    - Acceptance testing
- MECH-1C-ALT from

2013 – *§141.0(b)2C, D, E*

- Reqs./criteria for all HVAC alterations did not change
- Acceptance testing will need to be performed by a CMATT when req.
- Forms will need to be registered starting 1/1/15
- NRCC-MCH-ALT form under development

§141.0(b)2C, D, E and the Permit Process

- **Verify at permit on NRCC-MCH-ALT**
  - Should verify HVAC type and req. Acceptance tests
- **Verify at Final:**
  - NRCA-MCH-02 (new systems)
  - NRCA-MCH-04 and NRCV-MCH-04 (duct leakage)
  - NRCA-MCH-05 (economizers)
    - NRCA forms must be signed my CMATT when req.

** Forms must be registered starting 1/1/15*

Lighting Alterations

2008 – *§149(b)1I*

- Must meet mandatory and prescriptive reqs. for alterations:
  - That increase the lighting load (watts/ft^2)
  - Where 50% or more of the lighting fixtures are replaced, removed, or re-installed
- Must meet mandatory reqs. for wiring alterations

2013 – *§141.0(b)2I*

- Lighting system alterations must meet reqs. in TABLE 141.0-E
  - Threshold criteria of 10% for altered fixtures
- Luminaire modifications-in-place must meet reqs. in TABLE 141.0-F
  - Threshold criteria of 40 luminaires for altered fixtures
- Acceptance test by CLCATT

§141.0(b)2I and the Permit Process

- **Verify at permit req. Certificate of Compliance**
  - NRCC-LTI-01 (all alt.)
  - NRCC-LTI-02 (mandatory)
  - NRCC-LTI-03 (watts/ft^2)
  - Must match specs. on electrical plans
- **Verify at Final req. NRCI and NRCA forms**
  - NRCI-LTI-05 (PAF)
  - NRCA-LTI-02 (Controls)

For more information

- **2013 Standards Website at:**
  - http://www.energy.ca.gov/title24/2013standards/index.html
- **CEC training (ICC Chapters)**
  - Contact Energy Standards Hotline at: Title24@energy.ca.gov
- **Utility training**
  - http://www.energy.ca.gov/title24/training/
- **HERS training (Building Departments)**
  - http://www.energy.ca.gov/HERS/providers.html
- **Ace Web Toolkit**
  - http://energydesignresources.com/resources/software-tools/ace-tools.aspx