

# 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)
    - $\checkmark$  Identify what to look for on the compliance forms and building plans
  - > The field inspection process (Field Inspectors)
    - $\checkmark$  Identify which building components and forms to verify



- 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



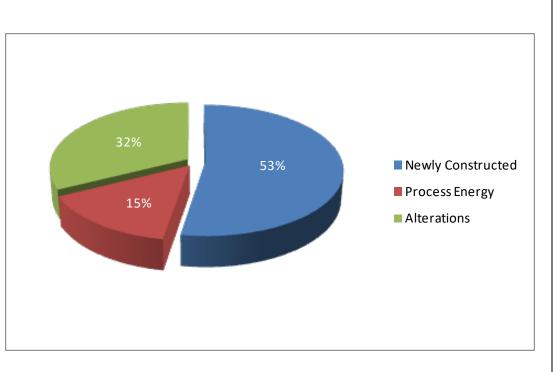


# Let's discuss the 2013 Building Energy Efficiency Standards



# 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)

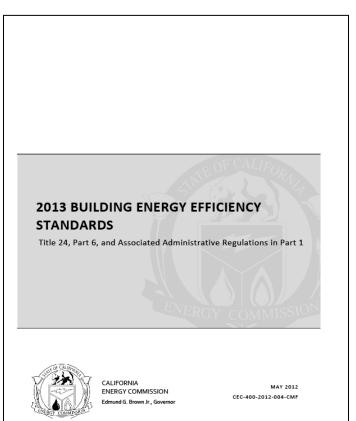




# 2013 Building Energy Efficiency Standards

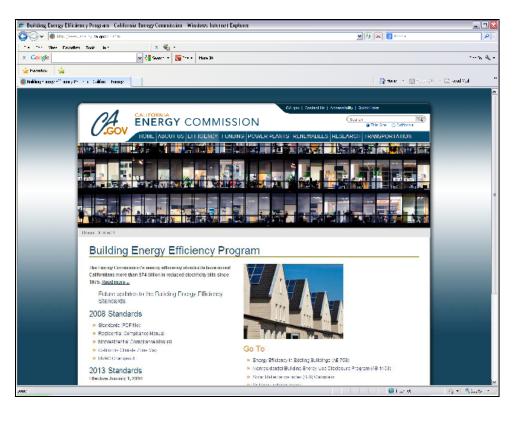
#### • Effective on July 1, 2014

- 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
  - $\geq$  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



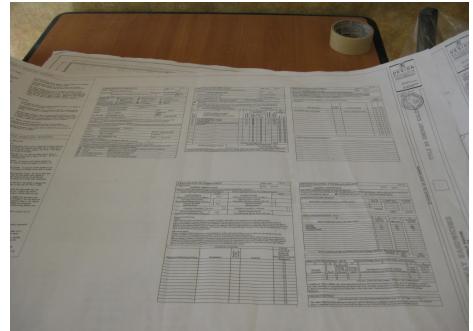
#### Signatures, Registration, Technician Certification cont.

- 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: <u>http://www.energy.ca.gov/title24/2013standards/provider\_cert/</u>



# §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





#### CALIFORNIA ENERGY COMMISSION

#### §10-103 and the Field Inspector

STATE OF CALIFORNIA ENERGY MANAGEMENT CONTROL SYST DEC-NRCH.TH02+E (Revised 05/13)		
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: Looal Jurisdiction	Permit Number: 010114
Project Address: 2013 CALBO Drive	Cty: Saoramento	Zip Code: 95814

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

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance

🛛 K. To qualify for the PAF for Combined Manual Dimming plus Partial-ON Occupant Sensing Control in TABLE 140.6-A

	UMENTATION AUTHOR'S DECLARATION STATEMENT		
1.	Leasting that this Certificate of Installation documentation	is accurate and complete.	
Doors	mentation Author Name:	Documentation Author Signatu	
Bes	t Doc. Author	Best Doc. Author	
Docs	mentation Author Company Name:	Date Slaned:	
	rav Savers Inc.	1/1/2014	
Add		CEA/ HERS Certification Identif	ication (If applicable):
151	6 9 <sup>th</sup> Street	N/A	
	State/Zip:	Phone:	
	ramento, CA 95814	(916) 362-4719	
RES	PONSIBLE PERSON'S DECLARATION STATEMENT		
	I certify the following under penalty of perjury, under the		
1.	The information provided on this Certificate of Installation	in is true and correct.	
2.	I am eligible under Division 3 of the Business and Profess system design, construction, or installation of features, n identified on this Certificate of Installation and attest to otherwise I am an authorized representative of the respo	naterials, components, or manuf the declarations in this statemen	actured devices for the scope of work
	The constructed or installed features, materials, compon Certificate of Installation conforms to all applicable code given on the plans and specifications approved by the en	s and regulations, and the install forcement agency.	ation conforms to the requirements
	Certificate of Installation conforms to all applicable code given on the plans and specifications approved by the en I reviewed a copy of the Certificate of Compliance appro for the scope of construction or installation identified on	s and regulations, and the install forcement agency. ved by the enforcement agency i this Certificate of Installation, a	ation conforms to the requirements
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4.	Certificate of Installation conforms to all applicable code given on the plasma and specifications approved by the en I reviewed a copy of the Certificate of Compliance appro- for the scope of construction or installation identified on that apply to the construction or installation have been I will ensure that a completed signed copy of this Certific permit[2] issued for the building, and made available to completed signed copy of this Certificate of Installation in	s and regulations, and the install forcement agency. ved by the enforcement agency is this Certificate of Installation, a net. ate of Installation shall be poste he enforcement agency for all a	ation conforms to the requirements that identifies the specific requirements nd I have ensured that the requirements d, or made available with the building pplicable inspections. I understand that :
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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**

- §110 §119 (all bldgs.)
- §116 §118 (Env)
- \$120 \$122 (Mech)
- §126 (Refrig. Warehouses)
- §130 §131 (Indoor LTG)
- § in TABLE 100-A

#### 2013 Standards

- §110.10 (Solar ready)
- §120.6 (Covered processes)
- §120.7 (Mand. Insulation)
- §120.8 (Bldg. Commissioning)
- §130.4 (LTI Inst. Cert.)
- §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-BRA-014E (Revised 06/13)					
CERTIFICATE OF COMPLIANCE	NRCC-SRA-01-E				
Solar-Ready Areas	(Page 1 of 2)				
Project Nome: 2013 CALBO Training Sample	Date Prepared: 01/01/14				
General Information					
Project Address:					
Building Type: B Hotel/Motel building with ten stories or fewer B High-rise multi-family built	ing 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	ith more than ten stories or other nonresidential buildings				
with more than three stories.					
Type of Construction: IN New Construction II Addition that increases roo					200
Solar-ready requirements do not apply to alterations or additions that increase the roof area by 2,4		A WORKSHEET			
	CEC-NRCC-BRA-02-E (Revised 06/13) CERTIFICATE OF COMPLIANCE			CALIFORNIA ENERGY COMMISSION NRCC-SRA-	0.5
Solar-Ready Choose Path A, B, C, D, or E from below	Minimum Solar Zone Area Worksheet			(Page 1	
	Minimum Solar Zone Area Worksheet Project Name 2013 CALBO Training Sample			(Page 1 Preparet: 01/01/14	. of 3)
X A. Allocated Solar Zone	Artisti name: 2019 CALEO Training Sample		Dele	Constraint and a little	
NRCC-SRA-02-E Minimum Solor Zone Area Worksheet is required to be submitted					_
Minimum Solar Zone Area (sqft)	Solar Zone Area (requirements in §110.10(b)18)				
This is quantity (6) from NRCC-SRA-02-E Minimum Solar Zone Area Worksheet	This worksheet applies to hotel/motel occupancie stories or fewer that comply with the solar zone n			Il other nonresidential buildings with three	•
Proposed Solar Zone Area (sqft)	The worksheet applies to all additions that increase				
This is quantity (5) from NRCE-SRA-02-E Minimum Solar Zone Area Worksheet					
The construction documents will indicate a location for inverters and metering equipment and a path interconnection with the electrical service. The construction documents will indicate a pathway for n	story f				_
system.	General miorination				
A copy of the construction documents or a comparable document indicating information about the s	Project Address: 2013 CALBO Drive				
occupant.	Total Roof Area: 🔀 Less then or equal to 10,000	π <sup>2</sup> Phase of Construct	lon: 🗵 New Constructi	on	
If the installer certifies that all above requirements have been met and the Proposed Solar Zone	B Greater than 10,000 tt <sup>2</sup>		Addition that incl	reases roof area by more than 2,000 ft <sup>2</sup>	
the Minimum Solar Zone Area, the building compiles, otherwise it does not comply.					
					_
II B. Permanently Installed Solar Photovoltaic (PV) System	Step 1: Determine Minimum Solar Zone	Area			
Total Roof Area (sqft)* Minimum Nameplate	C Pe Calculate the minimum solar zone area using one	of the two options provided below. Use opti	ion 2 if your roofs and o	verhangs are shaded.	
[A] [B] = A:	1wal Method 1: Minimum Solar Zone Area Based or	Total Roof Area( requirements in 110.10(b	(18)		
	New Construction: Total roof area (sqft)			1	1
	Additions: Total roof area added to buildin	(sqft)	A	2,200 ft <sup>2</sup>	
* New construction: report total roof area; Additions: report newly added roof area	New Construction: Area of roof covered wi	h skylights(sqft)		200 ft <sup>2</sup>	11
Will the proposed building have a permanently installed solar electric system that meets or excess	the Additions: Area of new roof area covered w	ith skylights(sqft)	•	$\sim$	
Rating?	Minimum solar zone area		C=0.15 x (A - B)	300 ft <sup>2</sup>	11
If yes, a NRCI-SPV-02-E Certificate of Installation: Solar Photovoltaic System documenting the insta	ed sy Note: For additions, if A≤ 2,000 ft <sup>2</sup> then add	tion does not need to comply with solar zon	e requirements	$\sim$	·
of final approval.					
Please check box to right if answered yes to all questions in this section.	Method 2: Minimum Solar Zone Area Based on				
	The enforcement agency may require additions		duced solar zone area wi	as determined.	.
E C. Permanently installed Solar Water Heating System	Method/Tool(s) used to quantify annual so "CAD Tool Y"	ar access: (for example, "Software X",			
Will the building have a permanently installed solar water heating system?	Area of low-sloped roof (ratio of rise to run	a had a second stars the second star			4
If yes, a NRCI-57H-02-E Certificate of Installation: Solar Water Heating System documenting the in:	alled Area of low-sloped roof (ratio of rise to run access is 70 percent or greater.* (soft)	or 2.12 or less) where the annual solar	D		
condition of final approval.	Area of stand-signal read intig of size to a	n is creater than 2:12) that is oriented			1
is the annual solar savings fraction equal to or greater than 0.2 in climate zones 1 through 9 or 0.3	in ci between 110 and 270 degrees and annual :				
Annual Solar Savings Fraction How was Annual Solar Savings F					1 1
	Minimum solar zone area		F = 0.5 x (D + E)		
Please check box to right if answered yes to all questions in this section.	* For new construction consider total roof	rea; for additions consider newly added roo	ofarea		_
evenue creak box to right if answered yes to all questions in this section.	Minimum solar zone area (either C or F) (so	r.)	G		
			-		1
CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance					



# §110.10 and the Field Inspector



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

- 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)



### **MECH Acceptance Testing**

#### $2008 - \S{125}$

- 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)



#### CALIFORNIA ENERGY COMMISSION

### §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

Contractor         Construction           of theme 2013 CALED Training Bampia         Construction           ECHANICAL HVAC ACCEPTANCE FORMS (check box for required forms)         Signer:           Signer:         of the 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 applicable to be used by the designer and that any other requires an acceptance test. All equipment of the same type that requires a test. Bit the equipment description and the number of system talling Contractor:           contractor who installed the equipment is responsible to either conduct the acceptance test for HVAC systems. The designer is required to check the applicable boxes for all applicable to either conducts the acceptance test of them set of a system talling Contractor:           contractor who installed the equipment is responsible to either conduct the acceptance test of them set of the construction or installation for which they are response following tests require a test person shall sign and submit the Certificate of Acceptance applicable to the portion of the construction or installation for which they are response following tests require a construction or installation for which they are response following tests require a following tests require a form is not considered a completed form and is not to be accepted by the building department unless the correct boxes are checked description           forement Agency:         Test Description         MCH-13A         MCH-13A         MCH-13A	Mechanical Syste Project Name: 2013 CAL		NCE						NRCC-MCH-0						
ECHANICAL HVAC ACCEPTANCE FORMS (check box for required forms)         igner:         igner:         igno:         igno:       igno:       igno:	Project Name: 2013 CAL	ams							(Page 2 of						
signer:         open 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 sptance tests that apply and list all equipment that requires an acceptance test. All equipment of the same type that requires a test. But the equipment description and the number of system tables for all sptance tests that apply and list all equipment is responsible to either conduct the acceptance test that seques and used by the building department unless the correct bases are checked.         Form is to be 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 response following tests require a biotecoment Agency:         Match and the acceptance acceptance test be accepted by the building department unless the correct bases are checked.           Test Description         MCH-12A         MCH-13A         MCH-14A		BO Trainin	g Sample				Date Prepared: 01/01	/14							
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\* 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 CALIFORM	emperature Reset Controls	Acceptance	
CECINICA-MCH-16-		CALIFORNA ENERGY COMMISSION NRCA-MCH-16-F	
	perature Reset Controls Acceptance	(Page 1 of 2)	
Froject Name: 201 Froject Addreas: 21	STATE OF CALIFORNIA CONDENSER WATER SU CEC-NRCA-MCH-17-F (Revised 06/13) CERTIFICATE OF ACCEPTANCE		
	Condenser Water Supply T		
Note: Submit demonstrate	Project Name:	BTATE OF CALIFORNIA ENERGY MANAGEMENT CONTROL SYSTEM ACCEPTANCE CEEVRCAMACH 19F (Revised 08/13) CALIFORNIA ENERGY CI	
Intent:	Progent reserves.	CERTIFICATE OF ACCEPTANCE	NRCA-MCH-18-F
	Note: Submit one Certificate	Energy Management Control System Acceptance Project Nores Frider Nores	(Page 1 of 1)
Construction	demonstrate compliance.		
1. Suppor	Intent: Ensure that	Project Address: City: Zip Code:	
a. A		Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.	
b. 4	Construction Inspection		
c. 2 2. Instrum	<ol> <li>Supporting document         <ul> <li>As-built and/or D</li> </ul> </li> </ol>	The purpose of this acceptance star is to help ensure the antral control system, when installed, is properly installed in a capable of measure (the applicable measurements of The 24 Parts 7. The ENCP is a complex, highly customized many opportunities for installation and programming problems. Obviously it is important to identify, diagnase, an problems. This acceptance sets on help access the with help fort.	control system with
a. H	b. 2013 Building Ene Temperature Res		
3. Installa		A. Construction Inspection	
	c. Building Energy E	Prior to functional testing and conducting other acceptance tests that rely on the EMCS: If Factory start-up and check-out completed	
	2. Instrumentation to pe	B Point-to-point verification completed	
	a. Hand-held tempe	B I/O point lists available	
	b. Hand-held relativ	B Sequence of operations of each system are programmed B Written sequences are available B Input sensors are calibrated	
C	<ol> <li>Installation Verificatio</li> <li>Check if the cond</li> </ol>	B. Functional Testing	Results
	building plans or	Conduct the following verification checks to validate the functionality of the EMCS: 1. Verify the control graphics represent the system configuration	Y/N
	Check if condense available and doc	Verify the control graphics represent to a space control in graphics screen     Raise and lower a sampling of space temperature setpoints in the software and verify the system responds	Y/N Y/N
	Check if all coolin	appropriately	
	operational, and	<ol> <li>Verify the time-of-day start-up and shut-down function initiates a proper system response</li> <li>Verify trending capabilities by establishing trend logs for a sampling of control points</li> </ol>	Y/N Y/N
	,	6. Verify alarm conditions are monitored	Y/N
	Check if cooling t documented in the second seco	7. Verify the EMCS panel is installed on an emergency power circuit or has adequate battery back-up	Y/N
4. Docum	Check if the follor water, and leavin	C. Testing Results	PASS / FAIL
a. F	4. Document that all syst one of the following): Sensors are calibr	Test passes if all Construction Impection boxes are checked and all Functional Testing results are 't'	8 8
b. n	Factory calibrated		
B	Calibration compl TAB calibration re		
_	_ I have performed		
5. Docum	2 12 months).		
	Check complete,		
Notes:	from system sens		
CA Building E	5. From the control syste		
	Outdoor air drybulb te		
	Entering condenser w		
	CA Building Energy Efficiency		
		CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance	June 2013
		en enimilie nine BA enimetry artification - 2019 contraction combinance	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<sup>2</sup>:

➢ 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<sup>2</sup> that have refrigeration
- Enclosed parking garages reqs. in §120.6(c)
  - > Applicable if total design exhaust rate  $\geq$  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  $\ge$  25
  - Acceptance testing req. for compressor and controls



#### §120.6 and the Plans Examiner

Grange Default         (Page 1 of 1)           DESIGN DEMANDST MARLOW (SML 10, 400 CFM         Intermed 1995/14           DESIGN DEMANDST MARLOW (SML 10, 400 CFM         Intermed 1995/14           Equipment Tags and System Description <sup>1</sup> Intermed 1995/14           MANDATORY MEASURES         Schemic Status (Sml 10, 400 CFM           Colsmon Seption         Schemic Status (Sml 10, 400 CFM           Garage Description <sup>1</sup> Schemic Status (Sml 10, 400 CFM           Garage Tessing (Sml 10, 400 CFM         Schemic Status (Sml 10, 400 CFM           Garage Tessing (Sml 10, 400 CFM         Schemic Status (Sml 10, 400 CFM           Garage Tessing (Sml 10, 400 CFM         Schemic Status (Sml 10, 400 CFM           Garage Tessing (Sml 10, 400 CFM         Schemic Status (Sml 10, 400 CFM           Garage Tessing (Sml 10, 400 CFM         Schemic Status (Sml 10, 400 CFM           Schemic Status (Sml 10, 400 CFM         Schemic Status (Sml 10, 400 CFM           Colsmon Septiont         Schemic Status (Sml 10, 400 CFM           Maintermont Vestilization (Sml 10, 400 CFM         Schemic Status (Sml 10, 400 CFM           Schemic Status (Sml 10, 400 CFM         Schemic Status (Sml 10, 400 CFM           Schemic Status (Sml 10, 400 CFM         Schemic Status (Sml 10, 400 CFM           Schemic Status (Sml 10, 400 CFM         Schemic Status (Sml 10, 400 CFM           Schemic Status	CERTIFICATE OF COMPLIANCE		NRCC-PRC-I	02-E			
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\* Forms must be registered starting 1/1/15

• 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.)



# §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  $\geq$  3,000 ft<sup>2</sup>
- ≻ NRCC-PRC-08
  - Req. when sum of multiple warehouses ≥ 3,000 ft<sup>2</sup> and served by same refrigeration system



#### CALIFORNIA ENERGY COMMISSION

## §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 <u>not</u> req. a CMATT



#### Insulation

- New mandatory insulation reqs. in <u>§120.7</u>
- 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

CERTIN	ICATE OF O	OMPLIANCE											NRCC-ENV-01												
nvelo	pe Compon	ent Approa	ch										(Page 1 of												
roject Na	ne: 2013 CALE	IO Training 8a	mple							D	nte Prepared: 01	1/01/14													
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\* Can req. a note block on structural/architectural plans



#### CALIFORNIA ENERGY COMMISSION

# §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<sup>2</sup> 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<sup>2</sup>
- An in-house engineer not associated with the project, or a third party design engineer for buildings between 10,000 ft<sup>2</sup> and 50,000 ft<sup>2</sup>
- A third party design engineer for buildings > 50,000 ft<sup>2</sup>, or buildings with complex mechanical systems



#### §120.8 and the Plans Examiner

ign Review Kickoff ect Name: 2013 CALBO Training Sample										
st Name: 2013 CALBO Training Sample			(Page 1 of 1)							
			Date Prepared: 01/01/14							
	STATE OF CA									
ieneral Information		UCTION DOC	IMENTS							12
nate Zone: 12 Building Type: Nonr	CEC-NRCC-C)	R-03-E (Revised 05/13)	SMENTS			CAL	FORNIA	ENERGY	COMMISS	
iewer's Name: Ms. Design Engineer		E OF COMPLIANCE								CXR-03
orcement Agency: Local Jurisdiction		Construction Documents (Page 1 of : Project Neme: 2013 CALBO Training Sample Dee Project Vision 2013 CALBO Training Sample								
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<10,000 ft <sup>2</sup> : design engineer	Enforceme	nt Agency: Local	Jurisdiction	Permit Nur	ber: 0101	13				
10,000 ft <sup>2</sup> and <50,000ft <sup>2</sup> : in-house engineer not associated										
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nple HVAC – roof packaged units	Best		correctly sized for application, accou	nting for a		1	100	1	100	1
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			ards - 2013 Nonresidential Compliance							June 20

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

• 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



# Lighting – Multi-Level

#### **2008** – §131(b)

- Multi-level lighting controls req. for:
  - ▶ Enclosed spaces  $\geq 100$  ft<sup>2</sup>; and
  - Have a lighting load > 0.8 W/ft<sup>2</sup>
- 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  $\geq 100$  ft<sup>2</sup>; and
  - Have a lighting load > 0.5 W/ft<sup>2</sup>
- 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
  - $\succ$  Etc.

- 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

- Testing mandatory if controls/systems installed for:
  - Multi-level controls
  - Shut-off controls
  - Daylighting controls
  - Automatic daylighting controls
- Identified as "LTG-A"

#### 2013 - \$130.4

- 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

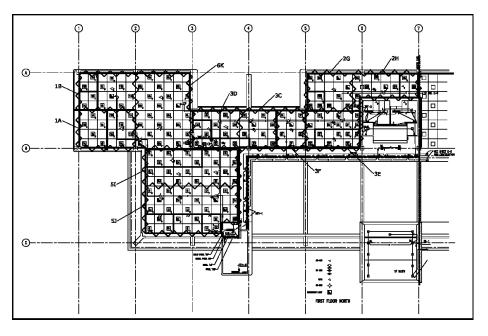


#### Lighting – Installation Cert. cont.

- 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. multilevel controls (> 0.5 W/ft<sup>2</sup>)
  - 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.





# **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

CERTIFICATE OF COMPLIAN	CE					NRCC-ELC-01-E					
Electrical Power Distributio						(Page 1 of 8)					
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Project Address: 2013 CALBO Drive			-	Climate Zo 12	ne:	Conditioned Floor Area : 5,000 ft <sup>2</sup> Unconditioned Floor Area :					
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C Schools		Relocatable Public Schools	X	Conditioned Spaces	0	Unconditioned Spaces					
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June 2013

CA Building Energy Efficiency Standards - 2013 Nonresidential Compliance

• Verify specifications on NRCC-ELC-01 form

- Service metering
- Disaggregation of circuits
- Voltage drop
- $\geq$  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
  - $\geq$  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<sup>2</sup>)
- 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 CALIFORNA ENVELOPE COMPONENT APPROACH DEGNROCENV-16 (Revead Gr13)	
CERTIFICATE OF COMPLIANCE	NRCC-ENV-01-E
Envelope Component Approach	(Page 2 of 3)
Project Nerve: 2013 CALBO Training 8ample	Data Prepared: 01/01/14

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or greater	Roof Pitch	ID Number		Reflect	ance Em	Emittance (Optional) Reflectance Emittance (				(optional)	Comments
	2 : 12	0101-2013	Single Pl		0.65	0.80		0.63	0.75		
				<b>D</b> <sup>1</sup>							
An aged	solar reflectan	ce less than 0.63 i	s allowed provided	d the max	mum root /	ceiling U-fa	actor in TABL	E 140.3 is not exce	eded		
High-rise	residential bu	ildings and Hotels	and Motels with I	ow-slope	d roofs in Cli	imate Zone:	s 1 through 8,	12 and 16 are ex	empted from age	d Solar	
		requirements.		•							
		ildings and Hotels	and Motels with s	teep-slop	ed roofs in (	Climate Zon	nes 1 and 16 a	re exempt from a	ged Solar Reflect	ance and	
	equirements.										
	area covered t ce requiremen		ted photovoltaic p	panels and	d building int	tegrated so	lar thermal p	anels are exempt	from aged Solar	Reflectance	
			oating must be ap	united acro	or the entir	a mod such	one and meet	the doursel thicks		recommended	
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\* 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

CERTIFICATE OF COMPLIANCE				NRCC-MCH-02-E
IVAC Dry System Requirements				(Page 1 of 3)
roject Name: 2013 CALBO Training Sample		1	Date Prepared: 01/01/14	
Equipment Tags and System Description <sup>1</sup>		HVAC-1		
MANDATORY MEASURES	T-24 Sections	Reference to the R	equirements in the C	ontract Documents <sup>2</sup>
Heating Equipment Efficiency <sup>3</sup>	110.1 or 110.2(a)	100.000 btu/hr	·	
Cooling Equipment Efficiency <sup>3</sup>	110.1 or 110.2(a)	5 ton		
HVAC or Heat Pump Thermostats	110.2(b), 110.2(c)	M.1 (note block)		
urnace Standby Loss Control	110.2(d)	M.1 (note block)		
Low leakage AHUs	110.2(f)	M.1 (note block)		
Ventilation <sup>4</sup>	120.1(b)	M.2 (schedule)		
Demand Control Ventilation <sup>5</sup>	120.1(c)4	N/A		
Occupant Sensor Ventilation Control®	120.1(c)5, 120.2(e)3	N/A		
Shutoff and Reset Controls <sup>7</sup>	120.2(e)	M.1 (note block)		
Dutdoor Air and Exhaust Damper Control	120.2(f)	M.1 (note block)		
solation Zones	120.2(g)	M.1 (note block)		
Automatic Demand Shed Controls Economizer FDD	120.2(h)	N/A		
Economizer FDD Duct Insulation	120.2(i) 120.4	N/A R-8		
	120.4	K-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 <sup>6</sup>	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 <sup>9</sup> Duct Leakage Sealing and Testing. <sup>10</sup>	140.4(g)	N Y (HERS)		
Duct Leakage Sealing and Testing." Notes:	140.4(l)	Y (HERS)		I
<ol> <li>Provide equipment tags (e.g. AHU L to 2) with common requirements can be group paragraphs; where each requirements.</li> <li>The referenced plans and specifications capacity, Title 24 minimum efficiency re requirements are applicable (e.g. full- ar equipment is required to be listed per Ti l. Identify where the ventilation requireme unit schedules and sequences of operation plans and specifications. Multiple zone c. 5. If one or more space has demand contro sequence of operation.</li> </ol>	ped together. 5 heet Numbers) and/or: specified. Enter "N/A" if must include all of the fol quirements, and actual ra id part-load) include all. lie 20 1601 et seq. Ints are documented for e on. If one or more space entral air systems must a	specifications (incluid the requirement is no lowing information: e ted equipment efficie Where appliance star where appliance star each central HVAC sys is naturally ventilatee tso provide a MCH-03 where it is specified in	ing Section name/nur t applicable to this sy quipment tag, equip incies. Where multip idards apply (110.1), idards apply (110.1), item. Include referen i identify where this i I-E form. Luding the sensor spin	nber and relevant stem. ment nominal le efficiency identify where ces to both central s documented in the ecifications and the

• 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

- $\succ$  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<sup>2</sup>)
  - Complete building method
  - Area category method
  - Tailored method
  - ➤ TABLES 146-E through G
- Power adjustment factor (PAF)
  - Reduces proposed watts/ft<sup>2</sup>
     with lighting controls
  - ≻ TABLE 146-C

#### 2013 - \$140.6

- Allowed watts/ft<sup>2</sup>
  - ➤ 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

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

 Still verify proposed watts/ft<sup>2</sup> 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



# §140.6 and the Field Inspector

#### • At Rough Frame verify

- ➢ Installed watts/ft<sup>2</sup>
- 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  $\leq 10$  ACH



#### §140.9 and the Plans Examiner

ITATE OF CALIFORNA COMMERCIAL KITCHEN REQUIRI ISONRCOPRCODE (Revised 08/13)	EMENTS				<b>20</b>							
CERTIFICATE OF COMPLIANCE			CALIFORNIA EN	NRCC-PRC-	3-E							
Commercial Kitchen Requirements				(Page 1	of 2)							
Project Nerve: 2013 CALBO Training Sample			Date Preparet: 01/01/14									
			I		_							
KITCHEN ROOM NUMBER <sup>1</sup> Kitchen 1												
TOTAL INSTALLED TYPE I and II KITCHEN HOOD 5,500 cfm	D EXHAUST	(CFM) <sup>2</sup> :	VENTILATION COMPLIANCE METHOD:									
TOTAL BYPASS HOOD MUA (CFM) <sup>3</sup> : 1,000 cfm			DF CALIFORNIA					<i>.</i>				
TOTAL TRANSFER AIR AIRFLOW (CFM) <sup>4</sup> : 500 cfm		CEC-NR	PUTER ROOM REQUIREMEN	NTS			CALIFORNIA ENERG					
TOTAL MECHANICALLY HEATED OR COOLED N	AAKE LID		IFICATE OF COMPLIANCE					NRCC-PRC-04-E				
250 cfm			uter Room Requirements				Date Preparet: 01/01/14	(Page 1 of 1)				
TOTAL AIR NEEDED FOR HEATING OR COOLING	G (CFM) <sup>6</sup>	Project N	The 2018 CALLOU framing sample				Des repaire o Do D'la					
TOTAL EXHAUST AIR WITH DEMAND VENTILAT	TION SYS	TOTA	L INSTALLED COOLING CAPACITY (TON	s) <sup>1</sup> :	-							
Equipment Tags and System Description <sup>8</sup>			ipment Tags and System Description <sup>2</sup>		AHU 1							
		PRES	CRIPTIVE MEASURES	T-24 Sections	Reference	e to the Re	quirements in the Cont	ract Documents <sup>3</sup>				
PRESCRIPTIVE MEASURES	T-24 Se	Econ	omizers	140.9(a)1	Air econ	omizer						
Bypass Hood Exhaust and MUA	140.9(1	Rehe	at	140.9(a)2	M.2 (note	block)	1					
	140.9(1		dification	140.9(a)3	Adiab		1					
Type I/II Hood Exhaust	Table 1	Fan P	owar	140.9(a)4	20 W/k		1					
Mechanically heated or cooled make up air	140.9(1			140.9(a)5	20 W/K		/					
Demand Ventilation Systems	140.9(1		ontrol		N	· /						
Energy Recovery Systems	140.9(1		ainment	140.9(a)r	N//	A						
Tempered/Non Mechanical Cooling Air	140.90	Note										
Systems			ter the total installed cooling capacity fo wide equipment tags (e.g. CRAC-1 to 10				ems that are covered b	these				
Notes:			rements. Groups of equipment that are				end dat are covered b	- Cheste				
1. Fill in one form for each kitchen in the proje		3. Pro	wide references to plans (i.e. Drawing S	heet Numbers) and	/or specificatio	ns (includin						
2. Enter the total installed type I and II kitcher			graphs) where each requirement is speci	fied. Enter "N/A" i	f the requireme	nt is not ap	plicable to this system.	Explicitly list any				
3. Enter the make-up air to bypass hoods (cfm	ı).	excep	ptions used to avoid a requirement.									
<ol> <li>Enter the total transfer air (cfm).</li> <li>Enter the total mechanically cooled or heat</li> </ol>	ed make	DOCU	MENTATION AUTHOR'S DECLARATION STA	TEMENT								
<ol> <li>Enter the total mechanically cooled of near</li> <li>Enter the maximum air needed for heating</li> </ol>		1. 1	certify that this Certificate of Compliance do		ate and complete							
7 Enter the design airflow (cfm) of exhaust wit		Docume	intation Author Name:		Documentation A	ocumentation Author Signature:						
8. Provide equipment tags (e.g., AHU 1 & 2 or		Comper	w:		Signature Date:	Sgneture Dete:						
that is similar in requirements and compliance		Address	¢		CEA/ HERS Certific	CEA/ HERS Certification Identification (If applicable):						
<ol> <li>Provide references to plans (i.e. Drawing Sh paragraphs) where each requirement is specific</li> </ol>	leet Num	Chuffsta	-		Phone:							
exceptions used to avoid a requirement.	iea. criu	Cityrste	Be/Zip:		Phone:	THOME						
		RESP	DNSIBLE PERSON'S DECLARATION STATEME	NT								
		1	certify the following under penalty of perjur	y, under the laws of	he State of Calife	rnia:						
			he information provided on this Certificate am eligible under Division 3 of the Business			a la la cara da cara d	ha huilding danian an auto	an desire				
			dentified on this Certificate of Compliance (r			and intervention of	ne oanonig aesign or syste					
		3. 1	The energy features and performance specifi	cations, materials, co	mponents, and m							
			design identified on this Certificate of Compl Regulations.	ance conform to the	requirements of	Title 24, Part	: 1 and Part 6 of the Califo	nia Code of				
		4. 1	The building design features or system design	n features identified	in this Certificate	of Complian	ce are consistent with the	information				
CA Building Energy Efficiency Standards - 2013 Nonro	and description (		provided on other applicable compliance doo	uments, worksheets	calculations, plan	ns and specif	fications submitted to the	enforcement				
a benefity encoded and the set of the	candiciticitati		gency for approval with this building permit will ensure that a completed signed gooy of	application.			his with the building same	intel insured for the				
			will ensure that a completed signed copy of suilding, and made available to the enforcen									
			Certificate of Compliance is required to be in	cluded with the docu	mentation the bu	ilder provide	es to the building owner at	occupancy.				
		Compet	sible Designer Name:		Responsible Desig	ner Signature:						
		Addres			Date Signed: License:							
		City/St	to Piec		Phone:							
		cng/St			-none:							
		CA FII	ding Energy Efficiency Standards - 2013 Non	residential Compliant				June 2013				
		GA 201			-			AUR 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.)



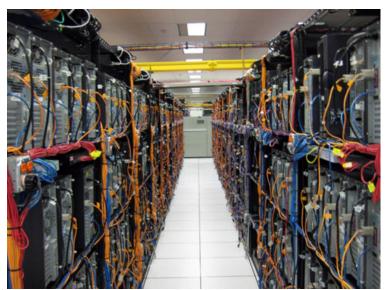
## §140.9 and the Field Inspector

#### • 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

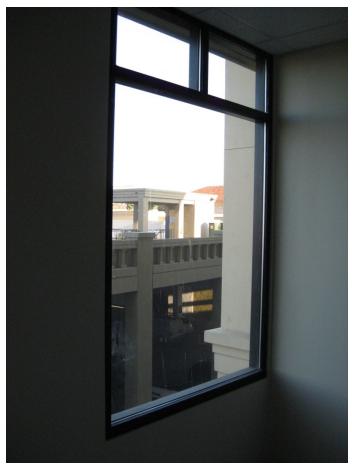
- Replacement and added fenestration must:
  - Meet U-Factor and SHGC reqs. in §143
  - Meet 40% total and west facing area reqs. when glazing is added
    - Exempt from SHGC req. when less than 150 ft<sup>2</sup> of glazing is replaced
    - Exempt from SHGC req. when 50 ft<sup>2</sup> of glazing or 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<sup>2</sup> of glazing is replaced
    - Exempt from SHGC and VT when 50 ft<sup>2</sup> 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<sup>2</sup> replaced (whichever is less), must be cool roof
  - Same as prescriptive reqs. for both low-sloped and steepsloped 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)11

- Must meet mandatory and prescriptive reqs. for alterations:
  - That increase the lighting load (watts/ft<sup>2</sup>)
  - 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-inplace 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/ft²)
  - 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: <u>Title24@energy.ca.gov</u>

• 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