

# BLUEPRINT

California Energy Commission  
Efficiency Division

## In This Issue

- » Are You Ready for January 1, 2017?
- » 2016 Mandatory Measures Summary Now Available
- » New Project Status Report Available!
- » Dynamic Compliance Documents for 2016 Residential Non-HERS Projects
- » Residential Early Adopters
- » Master Plan Permit Applications
- » Online Resource Center
- » Lighting ATTCP Training Approved for 2016
- » 2016 High Efficacy Requirements for Ceiling Recessed and Enclosed Luminaires
- » Deep-Dimming Fluorescent Lamp Ballast Efficiency Standards
- » Overlapping Requirements for Residential Hot Water Pipe Insulation
- » New Mechanical ATTCP
- » ATTCP and HERS Reference Cards Now Available
- » Q&A
  - 2016 Nonresidential Lighting Alterations
  - 2016 Residential Water Heating Options

## Are You Ready for January 1, 2017?

The *2016 Building Energy Efficiency Standards* (Energy Standards) go into effect January 1, 2017. Many great resources are already available to help with implementation, including:

- » **2016 Residential and Nonresidential Compliance Manuals**
- » **2016 Compliance Software**
- » **2016 Mandatory Measures Summary**
- » **Online Resource Center**

## 2016 Mandatory Measures Summary Now Available

The California Energy Commission (Energy Commission) has just released the **2016 Low-Rise Residential Mandatory Measures Summary**. The Mandatory Measures Summary is a tool designed to quickly identify mandatory measures at the design phase. This tool is not a compliance document and is not required to be registered with a Home Energy Rating System (HERS) provider. Designers may incorporate this summary into building plans to specify the mandatory measures.

## New Project Status Report Available!

The Energy Commission has developed the Project Status Report for residential compliance documents. This report summarizes the status of all compliance documents for a given project, including the Certificates of Compliance (CF1R), Installation (CF2R), and Verification (CF3R). The Project Status Report is available for any project that is registered with an approved HERS Provider.

Enforcement agencies can access the Project Status Report directly through the HERS registries. This provides enforcement agencies the opportunity, at their discretion, to verify the completion of the CF1R, CF2R, and CF3R documents via the web. To determine if a project is ready for a final inspection, both the “Overall” and “HERS Compliance Documents” status should be marked “complete.” If the project is marked complete, this indicates that all of the compliance documents have been completed and signed. Currently, CalCERTS and CHEERS registries have this report available.

Alternatively, this report, like all compliance documents, can be printed for submission. Enforcement agencies can request that applicants submit a printed report for final inspection. This tool can reduce the amount of documents submitted to the enforcement agency, and assist with compliance verification.

CalCERTS and CHEERS contact information is as follows:

CalCERTS may be reached at:

Phone: (877) 437-7787

Email: [Tech@calcerts.com](mailto:Tech@calcerts.com)

Website: [www.calcerts.com](http://www.calcerts.com)

CHEERS may be reached at:

Phone: (800) 424-3377

Email: [adminsupport@CHEERS.org](mailto:adminsupport@CHEERS.org)

Website: [www.CHEERS.org](http://www.CHEERS.org)

ENERGY  
STANDARDS

HOTLINE

Available to help with  
Energy Standards  
(Title 24, Part 6) questions.



EMAIL

[title24@energy.ca.gov](mailto:title24@energy.ca.gov)



CALL

800-772-3300

Toll free in CA

916-654-5106

Outside CA

HOURS

8 a.m. – 12 p.m. and  
1 p.m. – 4:30 p.m.

## Dynamic Compliance Documents for 2016 Residential Non-HERS Projects

Five dynamic compliance documents are now available for some of the most common residential addition and alteration projects that do not require HERS verification. Contractors and homeowners may use these new CF1Rs and CF2Rs to demonstrate compliance with the 2016 Energy Standards. Many projects will need only three printed pages because they contain only project-specific information. The dynamic features include:

- » Embedded instructions – hover over the cells or blue question mark icons to view them.
- » Only the necessary tables are generated based on selections made in Table A.
- » The ability to add or delete table rows as needed.

These **dynamic compliance documents** are available for download.

## Residential Early Adopters

Builders who would like to demonstrate compliance for residential buildings according to the 2016 Energy Standards, before the January 1, 2017, effective date, may do so at the enforcement agency's discretion. Enforcement agencies allowing early adoption should:

- » Accept, review, and approve plans and unregistered CF1Rs until a HERS Provider is approved for the 2016 Energy Standards by the Energy Commission.
- » Ensure that the residential **computer compliance software** used is approved by the Energy Commission for demonstrating compliance with the 2016 Energy Standards.
- » Confirm that CF1Rs are registered before a permit is finalized or a Certificate of Occupancy is issued.

NOTE: All compliance documents for a project must be registered, as appropriate, once a HERS provider data registry is approved for the 2016 Energy Standards.

## Master Plan Permit Applications

When builders submit permit applications to an enforcement agency for new residential subdivisions, they often have multiple model homes or “master plan” designs to which all homes in the project will be built. CF1Rs are submitted with the permit application to demonstrate compliance with the Energy Standards.

When registered CF1Rs for new residential subdivisions are submitted to and approved by the enforcement agency, builders can continue to pull permits for all the homes in the subdivision under the approved “master plan” design using the approved CF1Rs, provided the approved “master plan” designs have not been changed.

If one or more of the “master plan” designs have changed, the affected homes will require new CF1Rs with the new permit application. CF1Rs must be generated using a version of the computer compliance software approved for the new permit application date. New CF1Rs are only required for plans that are changed.

## Online Resource Center

The new **Online Resource Center (ORC)** is a central location for Energy Standards educational materials. The ORC offers quick access to:

- » 2016, 2013, and archived Energy Standards home pages
- » A list of topic specific Energy Standards materials
- » Acceptance Test Technician Certification Provider (ATTCP) and HERS resources
- » Approved compliance software resources
- » Blueprint newsletters
- » California climate zone information
- » Energy Code Ace and other external education providers
- » Training and event schedules

The ORC also organizes the following resources by topic:

- » Checklists
- » Fact Sheets
- » Guides
- » Presentations
- » Trigger Sheets

The layout of the new ORC is shown in Figure 1.

## Lighting ATTCP Training Approved for 2016

On September 14, 2016, the Energy Commission approved the National Lighting Contractors Association of America's (NLCAA) nonresidential lighting controls ATTCP application updates for the 2016 Energy Standards. NLCAA can now train, certify, and recertify lighting acceptance test technicians (ATTs) and their employers under the 2016 Energy Standards.

For more information, please visit:

<http://energy.ca.gov/title24/attcp/>.

## Online Resource Center

The Online Resource Center is provided to assist the building community and enforcement agencies with Building Energy Efficiency Standards (Energy Standards) compliance. Energy Standards apply to newly constructed buildings, as well as additions and alterations for existing buildings. Presently, the Energy Standards are updated every three years.

To assist in the compliance process, we provide compliance documents and free Public Domain Compliance Software programs for commercial and residential buildings. Training and links to the Energy Standards and compliance software are available on the Energy Commission website and at utility training centers throughout the state. To help direct you to an appropriate resource, Energy Commission and external resource information are provided on this page.

### Building Energy Efficiency Standards



2016  
Energy Standards



2013  
Energy Standards



Past  
Energy Standards

### Energy Standards Information and Training Materials



Overview



Commissioning



Covered Processes



Envelope



Electrical Power  
Distribution



HVAC



Lighting



Solar Ready



Water Heating

Figure 1 - Layout of the New Online Resource Center

# 2016 High Efficacy Requirements for Ceiling Recessed and Enclosed Luminaires

The 2016 Energy Standards require that all lighting in residential buildings, high-rise residential dwelling units, and hotel and motel guest rooms be high efficacy. This is a significant change from the 2013 Energy Standards which allows low efficacy light sources in some instances, provided additional controls are installed.

## Classification of High Efficacy Light Sources

Under the 2016 Energy Standards, residential lighting can be classified as high efficacy through two methods which are presented in Table 1 below. Light sources listed in the left-hand column of Table 1 are automatically classified as high efficacy and may be installed without meeting any additional requirements. Light sources shown in the right-hand column of Table 1 must be certified as meeting the performance requirements in **Reference Joint Appendix JA8** before they can be installed.

## Ceiling Recessed Downlights and Enclosed Luminaires

The 2016 Energy Standards also introduced new requirements for recessed downlight luminaires in ceilings and enclosed luminaires. All light sources installed in ceiling recessed downlight luminaires and **enclosed luminaires** must be JA8 certified. Additionally, light sources installed in ceiling recessed downlights and enclosed luminaires must pass the elevated temperature test to ensure that they work properly in these types of luminaires. This means that light sources that are automatically classified as high efficacy (left-hand column of Table 1), for instance pin-based CFLs, must be JA8 certified to be installed in ceiling recessed downlights and enclosed luminaires.

## Controls for Luminaires with JA8 Certified Light Sources

**Section 150.0(k)2K** requires that all luminaires with JA8 certified light sources must be controlled by a dimmer or vacancy sensor. Because recessed downlight luminaires and enclosed luminaires are required to have JA8 certified light sources installed, they must also be controlled by a dimmer or vacancy sensor.

In summary, the 2016 Energy Standards require ALL light sources installed in residential buildings, high-rise residential dwelling units, and hotel and motel guest rooms to be high efficacy. Per Table 1, certain light sources are automatically classified as high efficacy, while others must be JA8 certified to be classified as high efficacy. All light sources, including light sources which are automatically classified as high efficacy, installed in ceiling recessed downlight luminaires and enclosed luminaires must be JA8 certified and pass the elevated temperature test. Additionally, all ceiling recessed downlights and enclosed luminaires must be controlled by a dimmer or vacancy sensor.

**Table 1 - High Efficacy Light Sources**

High Efficacy Light Sources	
No JA8 Certification Required	JA8 Certification Required
<ul style="list-style-type: none"> <li>» Pin-based linear or compact fluorescent light sources using electronic ballasts</li> <li>» Pulse-start metal halide</li> <li>» High pressure sodium</li> <li>» GU-24 sockets containing light sources other than LEDs<sup>a,b</sup></li> <li>» Luminaires with hardwired high frequency generator and induction lamp</li> <li>» Inseparable SSL luminaires that are installed outdoors</li> <li>» Inseparable SSL luminaires containing colored light sources that are installed to provide decorative lighting</li> </ul>	<ul style="list-style-type: none"> <li>» All light sources in ceiling recessed downlight<sup>c</sup></li> <li>» All light sources in enclosed luminaires</li> <li>» GU-24 sockets containing LED light sources</li> <li>» Any light source not listed in this table</li> </ul>

a. GU-24 sockets containing light sources such as compact fluorescent lamps and induction lamps.

b. California Title 20 **Section 1605.3(k)4** does not allow incandescent sources to have a GU-24 base.

c. Ceiling recessed downlight luminaires must not have screw base sockets regardless of the lamp type as described in **Section 150.0(k)1C**.

## Deep-Dimming Fluorescent Lamp Ballast Efficiency Standards

The 2013 and 2016 Energy Standards require multi-level lighting controls for non-residential lighting systems. Fluorescent lighting systems can meet the multi-level lighting control requirements of **Section 130.1** by using deep-dimming fluorescent lamp ballasts. These ballasts allow lamps to be dimmed to or below 50 percent of full light output. Dimming ballasts can reduce energy consumption significantly by providing the ability to control the amount of light in the space based on occupant needs.

Deep-dimming fluorescent lamp ballasts manufactured on or after July 1, 2016, are regulated by the Appliance Efficiency Regulations (Title 20). These **new regulations** require deep-dimming fluorescent lamp ballasts to meet certain efficiency requirements and to be listed in the **Appliance Efficiency Database**. These regulations apply only to fluorescent lamp ballasts designed to operate the following fluorescent lamps:

- » One to four T5 four-foot linear
- » One to four T8 four-foot linear
- » U-shape

Questions regarding the new efficiency requirements may be directed to the **Title 20 Call Center**.

## Overlapping Requirements for Residential Hot Water Pipe Insulation

The 2016 Energy Standards and California Plumbing Code both have requirements for insulating residential domestic hot water pipes. These requirements differ slightly.

**Section 1.1.7.3** of the California Building Code states,

*“When the requirements of this code conflict with the requirements of any other part of the California Building Standards Code, Title 24, the most restrictive requirements shall prevail.”*

**Section 150.0(j)2A** of the Energy Standards requires all hot water system piping, which meet the conditions below, to be insulated according to **TABLE 120.3-A**:

- i. The first 5 feet (1.5 meters) of hot and cold water pipes from the storage tank
- ii. All hot water piping with a nominal diameter of 3/4 inch (19 millimeter) or larger
- iii. All piping associated with a domestic hot water recirculation system regardless of the pipe diameter
- iv. Piping from the heating source to storage tank or between tanks
- v. Piping buried below grade
- vi. All hot water pipes from the heating source to the kitchen fixtures

**Section 609.11** of the 2016 Plumbing Code states,

*“Insulation of domestic hot water piping shall be in accordance with Section 609.11.1 and Section 609.11.2.*

*“609.11.1 Insulation Requirements. Domestic hot water piping shall be insulated.*

*“609.11.2 Pipe Insulation Wall Thickness. Hot water pipe insulation shall have a minimum wall thickness of not less than the diameter of the pipe for a pipe up to 2 inches (50mm) in diameter. Insulation wall thickness shall be not less than 2 inches (51 mm) for a pipe of 2 inches (50 mm) or more in diameter.”*

## TITLE 20 CALL CENTER

Monday through Friday  
HOURS 8:30 a.m. to 4:30 p.m.



Available to answer Title 20  
technical, regulatory, and  
compliance related questions.

888-838-1467 916-651-7100  
Toll free in CA Outside CA

appliances@energy.ca.gov  
www.energy.ca.gov/appliances

## New Mechanical ATTCP

On September 14, 2016, the Energy Commission approved the California State Pipe Trades Council (CSPTC) as a mechanical ATTCP.

This gives CSPTC the authority to train, certify, and oversee mechanical ATTs and their employers. CSPTC will train and certify ATTs to perform all 17 mechanical acceptance tests required in the 2013 Energy Standards.

For more information, please visit:  
<http://energy.ca.gov/title24/attcp/>.

## ATTCP and HERS Reference Cards Now Available

The Energy Commission has just released **ATTCP** and **HERS** reference cards. These cards are designed to quickly identify when acceptance testing or HERS verification is required and how to find approved providers. A preview of the ATTCP and HERS cards are provided below in Figures 2 and 3, respectively.

## Q&A

### 2016 Nonresidential Lighting Alterations

I have two rooms, each with 15 altered luminaires. The luminaires in each room will have new separate controls (e.g. occupancy sensor). Exception 4 to Section 141.0(b)2I states,

**“Acceptance testing requirements of Section 130.4 are not required for alterations where lighting controls are added to control 20 or fewer luminaires.”**

**Since the controls will each be controlling 15 luminaires, is this project exempt from the acceptance testing requirements?**

No. The 20 controlled-luminaire threshold is specific to the project. Since the controls are installed to control more than 20 luminaires for the project, the acceptance testing requirements are applicable.

**When is acceptance testing required?**

- Acceptance testing is mandatory for certain nonresidential lighting, mechanical, fenestration, covered processes, and controls.
- Acceptance testing applies when regulated systems or controls are installed in newly constructed buildings, additions, and alterations.
- Any acceptance testing that is required will be specified on the NRCC(s).

**Who can conduct acceptance testing?**

- Only a lighting Acceptance Test Technician (ATT) certified by an ATT Certification Provider (ATTCP) may perform testing for indoor and outdoor lighting systems and controls.
- The builder, contractor, engineer, or commissioning agent may perform testing for HVAC, fenestration, covered processes, and controls.
- A mechanical ATT certified by an ATTCP will be required to perform testing for HVAC systems and controls when the industry thresholds in § 10-103.2 are met.

**How do I find an ATT?**

- ATTCPs approved by the Energy Commission maintain a directory of certified ATTs on their respective websites (provided on back of this card).
- Search filters, like name and county, are available to make finding an ATT in your area easier.

Figure 2 - ATTCP Reference Card Preview

**When is HERS testing/verification required?**

- Home Energy Rating System (HERS) testing is mandatory for all newly constructed buildings and is prescriptively required for most HVAC alterations.
- Some mechanical, envelope, and water heating systems require HERS testing when modeled for compliance credit under the performance approach.
- Any HERS testing that is required for a project will be specified on the CF1R.

**Who can conduct HERS testing?**

- Only a HERS Rater who is certified by a HERS Provider may perform HERS testing required under the Energy Standards.
- A HERS Rater can be certified to complete HERS testing for new construction (including additions) and/or alteration projects.

**How do I find a HERS Rater?**

- HERS Providers approved by the Energy Commission maintain a directory of certified HERS Raters on their respective websites (provided on the back of this card).
- Search filters, like project type and county, are available to make finding a HERS rater in your area easier.

NOTE: Duct leakage testing by a HERS Rater is prescriptively required for smaller nonresidential HVAC systems (see § 140.4 (f)).

Figure 3 - HERS Reference Card Preview

# 2016 Residential Water Heating Options

It takes a long time for hot water to reach my master bathroom. To reduce the wait time for hot water, can I prescriptively install a second water heater closer to my master bathroom?

Yes. Per **Section 150.2(b)1Giid**, the Energy Commission used the performance compliance approach and determined that an additional natural gas or propane instantaneous water heater uses no more energy than the standard design system, and can be installed prescriptively. If an additional storage or electric instantaneous water heater is added, the performance compliance approach must be used. The information in the “Residential Water Heating Options” article in **Blueprint Issue 113** is still applicable to the 2016 Energy Standards.

## For More Information

### Home Energy Rating System:

<http://www.energy.ca.gov/HERS/>

### Acceptance Test Technician

### Certification Provider Program:

<http://www.energy.ca.gov/title24/attcp/>

### Approved Computer Compliance

### Programs:

[http://www.energy.ca.gov/title24/2013standards/2013\\_computer\\_prog\\_list.html](http://www.energy.ca.gov/title24/2013standards/2013_computer_prog_list.html)

**The California Energy Commission welcomes your feedback on Blueprint.**

**Please contact Andrea Bailey at:**

[Title24@energy.ca.gov](mailto:Title24@energy.ca.gov)

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