

BLUEPRINT

California Energy Commission
Efficiency Division

In This Issue

- » Decertification of Energy Analysis and Comfort Solutions
- » New Computer Compliance Program Available
- » Filter Grille Area Requirements
- » Clarification of Letter to Building Industry
- » Updated 2013 Compliance Manuals Now Available
- » 2016 Nonresidential Lighting Alteration Provisions Adopted
- » Tools for the 2016 Energy Standards Now Available
- » Funding for Workforce Training
- » Q&A
 - Radiant Barriers
 - Marking of Controlled Receptacles
 - Below Grade Hot Water Pipe Insulation
 - Air Conditioning System Changeouts

Decertification of Energy Analysis and Comfort Solutions

At the December 9, 2015, Business Meeting, the California Energy Commission (Energy Commission) approved the request of **Energy Analysis and Comfort Solutions, Inc.**

(EACS) to be decertified as a Home Energy Rating System (HERS) Provider. With this approval, EACS is no longer a HERS Provider under the 2013 Building Energy Efficiency Standards (Energy Standards).

For a current list of approved HERS Providers, please visit: <http://www.energy.ca.gov/HERS/providers.html>.

New Computer Compliance Program Available

Simergy, offered by Digital Alchemy, Inc., was approved by the Energy Commission as a nonresidential computer compliance program for the 2013 Energy Standards. Simergy Version 2.0, which uses the detailed geometry three dimensional (3D) option of the CBECC-COM application program interface (API), is now available for use.

With this approval, there are now four software programs available to demonstrate performance compliance with the nonresidential requirements of the 2013 Energy Standards.

Technical support resources, expiration dates, and links to download all of the software programs approved for the 2013 Energy Standards are located at:

http://www.energy.ca.gov/title24/2013standards/2013_computer_prog_list.html.

Filter Grille Area Requirements

When complying with the Alternative to **Section 150.0(m)13B**, the nominal size of the air filter media should be used to calculate the minimum total return filter grille gross area. If the air filter is not located at the filter grille, use the nominal size of the filter grille to determine the area. The calculated area must be equal to or greater than the values in **TABLES 150.0-C or D**.

Additionally, **TABLES 150.0-C and D** also require that:

1. Each return duct must be no longer than 30 feet.
2. Each return duct must not have more than 180 degrees of total bend.
3. If the total bending of a return duct is more than 90 degrees, one bend must be a metal elbow.
4. Return grille devices, which include the air filter and return grille locations, must be labeled in accordance with the requirements of **Section 150.0(m)12A**.
5. The label must state the grille's design airflow rate and a maximum allowable clean-filter pressure drop of 12.5 Pa (0.05 inches water) for the air filter, as rated in accordance with AHRI Standard 680 for the design airflow rate for the return grille.

Please note that additional air filtration requirements of **Section 150.0(m)12** may apply.

Clarification of Letter to Building Industry

Procedure for Verifying Outside-Airflow Measurement When Using an Exhaust Fan with an Inlet Device

The following information provides guidance for taking outside airflow measurements when a ventilation system consists of only an exhaust fan and an inlet device. This information applies to the 2013 Energy Standards for nonresidential, high-rise residential, and hotel/motel buildings.

Per **Section 120.1**, outside air ventilation is required for spaces normally used for human occupancy. **Section 120.5(a)1** requires these systems to be tested in accordance with **NA7.5.1** of the Reference Nonresidential Appendices. Specific details for constant volume system outdoor air acceptance testing are provided in **NA7.5.1.2**.

Acceptance tests for outside airflow measurements on this ventilation system should be obtained at the inlet device, where the outside air enters the building space. A measurement at any other location, including the exhaust fan, does not provide accurate outside airflow measurements because infiltration from other areas of the building becomes part of the airflow measurement.

This procedure should be followed by January 1, 2016, for ventilation systems consisting of only an exhaust fan and inlet device. Permit applications submitted before this date may measure airflow at the exhaust fan during acceptance testing.

Updated 2013 Compliance Manuals Now Available

The Energy Commission has updated the 2013 Residential and Nonresidential Compliance Manuals, which provide Energy Standards instructions and reference information. The updates include language clarification, compliance applicability, and reference

tables. Errata summary sheets are provided to identify specific updates by chapter and page.

To review or download the updated Compliance Manuals, please visit:

Residential Compliance Manual

http://www.energy.ca.gov/title24/2013standards/residential_manual.html

Nonresidential Compliance Manual

http://www.energy.ca.gov/title24/2013standards/nonresidential_manual.html

2016 Nonresidential Lighting Alteration Provisions Adopted

The nonresidential lighting alteration provisions of the 2016 Energy Standards were adopted November 12, 2015. These provisions allow for several cost effective approaches to lighting upgrades.

Compared to the 2013 nonresidential lighting alteration provisions, the newly adopted provisions are expected to save an additional 112 gigawatt hours of electricity per year. That is equivalent to the annual electricity use in about 16,000 homes.

To view the 2016 Energy Standards, which are effective January 1, 2017, please visit:

<http://www.energy.ca.gov/2015publications/CEC-400-2015-037/CEC-400-2015-037-CMF.pdf>

Tools for the 2016 Energy Standards Now Available

During the November 12, 2015, Business Meeting, several tools were approved that support the implementation of the 2016 Energy Standards. These tools, which are required by **Public Resources Code**, include: compliance manuals; Alternative Calculation Method (ACM) Reference Manuals; compliance software; and the Data Registry Requirements Manual.

Compliance Manuals

The **Residential** and **Nonresidential** Compliance Manuals are guidance documents designed to assist the building industry and enforcement agencies in complying with the Energy Standards. The manuals include helpful explanations of the regulatory language and provide question and answer scenarios, compliance documents, charts, and tables.

ACM Reference Manuals

The **Residential** and **Nonresidential** ACM Reference Manuals document the modeling methods to be used in the 2016 compliance software.

Compliance Software

The 2016 public domain compliance software, **CBCECC-RES 2016.1.0** and **CBCECC-COM 2016.1.0**, are used to demonstrate performance compliance with the 2016 Energy Standards.

Data Registry Requirements Manual

The **Data Registry Requirements Manual** provides detailed development guidance to data registry providers. Data registries enable users to register standardized compliance documents and data to demonstrate compliance with Title 24, Part 6.

These tools are available on the new 2016 Energy Standards webpage at:

<http://www.energy.ca.gov/title24/2016standards/>

Funding for Workforce Training

The Energy Commission approved grant funding to create a workforce trained in advanced technologies for making new and existing buildings more energy efficient. The California Homebuilding Foundation received nearly \$4.5 million for training on the proper installation of high performance walls and attics in new home construction projects.

This funding will help ensure the workforce is ready for the new high performance attic and wall requirements in the 2016 Energy Standards.

Funding came from the Energy Commission's Electric Program Investment Charge (EPIC) Program, which develops, demonstrates, and brings to market technologies and best practices that support California's energy policy goals.

Q&A

Radiant Barriers

I want to reroof the steep-sloped roof at my house, which is in climate zone 12. However, I do not want to install a cool roof, as described in Section 150.2(b)1Hi. Can I install new solid roof decking, that has a radiant barrier laminated to the underside, over existing spaced (skipped) sheathing to meet Exception "e" to Section 150.2(b)1Hi?

No. A radiant barrier cannot be installed directly over skipped sheathing. The effectiveness of a radiant barrier is reduced when not provided with the minimum amount of air-space specified by the manufacturer.

Below are three acceptable methods to install radiant barriers below the roof deck above the rafters:

1. Install 1-inch thick spacers, vertically, the length of rafters, on top of the skipped sheathing. Then install the new solid roof decking with a laminated radiant barrier (Figure 1). There may be structural issues with the added weight to the roof assembly, so confirm with your enforcement agency prior to using this method.

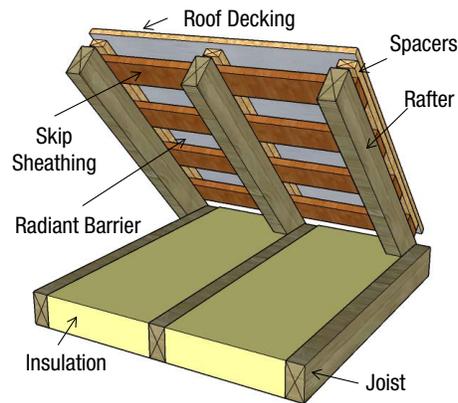


Figure 1 - Solid roof decking with radiant barrier laminated to underside installed over spacers and skipped sheathing.

2. Remove the existing skip sheathing, and install new solid roof decking with a laminated radiant barrier (Figure 2).

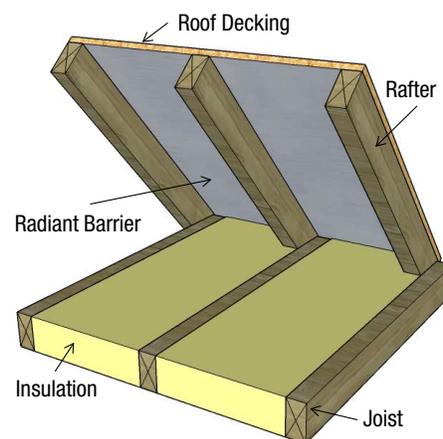


Figure 2 - Skipped sheathing removed, solid roof decking with radiant barrier laminated to the underside installed over rafters.

3. Remove the skipped sheathing, and drape the radiant barrier over the rafters. Then install the roof decking (Figure 3).

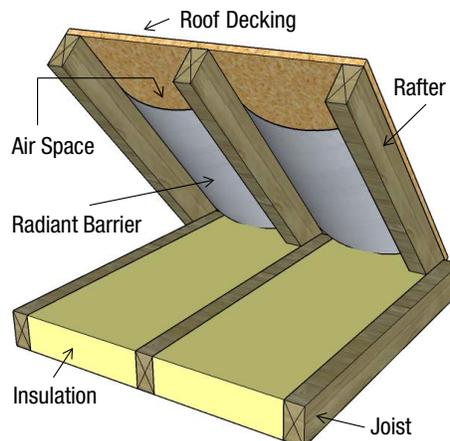


Figure 3 - Skipped sheathing removed, radiant barrier draped over the top of the rafters, solid roof decking installed over the radiant barrier.

I don't want to install a radiant barrier using the previously described methods. Are there other methods that can be used to install a radiant barrier?

Yes. Radiant barriers can also be installed below the roof deck between the rafters, or below the rafters. Below are two additional methods of radiant barrier installation that can be used to meet Exception "e" to Section 150.2(b)1Hi.

1. Span the radiant barrier between the rafters, and secure to each side (Figure 4).

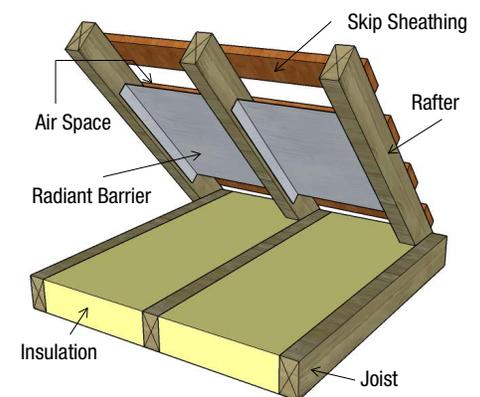


Figure 4 - The radiant barrier spans the rafters, and is attached to each side.

2. Secure the radiant barrier to the bottom surface of the rafter. Maintain a minimum air space of at least 1.5 inches between the top surface of the radiant barrier and the bottom of the roof decking (Figure 5).

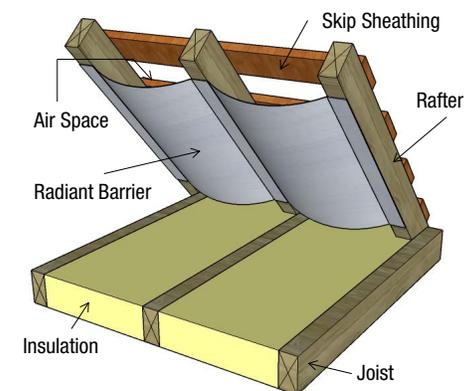


Figure 5 - The radiant barrier is attached to the bottom of the rafters. A minimum of 1.5 inches of airspace is provided.

Are there additional requirements for installing radiant barriers?

Yes. Additional requirements are provided in **Section 110.8(j)** of the Energy Standards, and **RA4.2.1** of the Reference Residential Appendices, which include:

- » The radiant barrier must have an emittance of 0.05 or less.
- » The radiant barrier must be tested in accordance with American Society of Testing and Materials (ASTM) C1371 or ASTM E408.
- » The radiant barrier must be certified to the **Department of Consumer Affairs** as required by Title 24, Part 12, Chapter 12-13, Standards for Insulating Material.
- » The radiant barrier must be installed in a permanent manner (e.g. stapled).
- » The shiny side of the radiant barrier must face down toward the ceiling or attic floor (building interior).
- » The radiant barrier must be installed to cover all gable end walls and other vertical surfaces in the attic.
- » The attic must be ventilated according to **RA4.2.1.1**.

Are there other exceptions, besides installing a radiant barrier, to the cool roof requirements of Section 150.2(b)1Hi?

Yes. There are six additional exceptions to the cool roof requirements of **Section 150.2(b)1Hi** for steep-sloped roofs. These exceptions were reviewed in detail in **Blueprint Issue 107**.

Marking of Controlled Receptacles

Section 130.5(d)3 of the 2013 Energy Standards requires controlled receptacles to be permanently marked to differentiate them from uncontrolled receptacles. What are some acceptable methods of marking controlled receptacles?

Below are examples of acceptable methods of marking controlled receptacles.

2014 NEC Article 406.3 and ANSI/NEMA WD6-2012 Wiring Devices - Dimensional Specifications

Controlled receptacles can be marked as described in 2014 National Electric Code Article 406.3 and ANSI/NEMA WD6-2012 Wiring Devices – Dimensional Specifications.

Field markings

It is not advisable to use ink, applied in the field, as a permanent marking. There is no guarantee that the ink will remain as needed.

Ink can be permanently applied under factory conditions, directly to the face of the receptacle.

Labels

Labels can be used as long as they have high wear tolerance and strong adhesive. It is important for installers to apply labels according to manufacturers' instructions.

Different colored receptacles

There are conventions in some building sectors to use certain colors to designate emergency powered receptacle outlets.

The use of markings described previously could be sufficient to distinguish controlled receptacles from uncontrolled receptacles. The Energy Standards do not require the use of different colors to differentiate controlled receptacles from uncontrolled receptacles.

Below Grade Hot Water Pipe Insulation

All-in-one piping systems include pipes, insulation, and sleeves. These systems are certified by manufacturers for below slab installation, and are not considered removable. Can these all-in-one systems be used for below grade domestic hot water piping to meet the requirements of **Section 150.0(j)2B**?

Yes, as long as the thickness of the insulation meets the requirements of **Section 120.3**, and the casing is water proof and non-crushable.

Section 150.0(j)2B of the 2013 Energy Standards states,

“all domestic hot water pipes that are buried below grade must be installed in a water proof and non-crushable casing or sleeve that allows for installation, removal, and replacement of the enclosed pipe and insulation.”

To add clarity, **Section 150.0(j)2B** of the 2016 Energy Standards was updated to,

“all domestic hot water pipes that are buried below grade must be installed in a water proof and non-crushable casing or sleeve.”

Air Conditioning System Changeouts

I'm changing out the air conditioning unit in my home. What are the minimum efficiency requirements for my replacement unit?

The Department of Energy (DOE) has set regional minimum Seasonal Energy Efficiency Ratio (SEER) and Energy Efficiency Ratio (EER) requirements that are effective based on the date a unit is installed. These requirements are applicable to split system and single package central air conditioners installed in California on or after January 1, 2015. If you are installing one of these types of units on or after this date, it must meet both the minimum SEER and EER requirements in the table below.

Please note that these regional standards apply to any unit manufactured on or after January 1, 2015, as well.

Can I install a heat pump with a SEER rating of 13?

Yes, as long as the heat pump was manufactured before January 1, 2015. It's important to note that the DOE's regional date of installation requirement is only applicable to split system and single package central air conditioners. All other heating, ventilation, and air conditioning (HVAC) minimum efficiency requirements are based only on the date of manufacture, not date of installation.

Split System and Single Package Central Air Conditioners

Product Class	Minimum SEER	Minimum EER
Split System with Cooling Capacity < 45,000 Btu/hour	14	12.2
Split System with Cooling Capacity ≥ 45,000 Btu/Hour	14	11.7
Single Package Systems	14	11.0

For the purposes of this clarification, the term "central air conditioner" means a product, other than a package terminal air conditioner, which:

1. Is powered by single phase electric current;
2. Is air-cooled;
3. Is rated below 65,000 Btu per hour; and
4. Is not contained within the same cabinet as a furnace the rated capacity of which is above 225,000 Btu per hour.

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

The California Energy Commission welcomes your feedback on Blueprint. Please contact Andrea Bailey at:
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