



CERTIFICATE OF INSTALLATION		CF2R-ENV-22-H
Quality Insulation Installation (QII) - Air Infiltration Sealing - Ceiling/Roof Deck		(Page 1 of 2)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City:	Zip Code:

*For typical vented attics where the insulation is at the roof deck ceiling air barrier must be verified after the ceiling drywall is installed and before attic insulation is installed. If SPF will be used in the attic this can be considered the air barrier. Soffit and chases must still be covered and chimneys and flues require metal flashing. Buildings with a Non-vented attic all air sealing requirements appropriate for the roof must be verified.*

<b>A. Ceiling Inspection – Vented Attics</b>	
01	If there is a continuous air barrier at the ceiling level; All opening into walls, drops, chasses, double walls are sealed. Examples are below.
02	Chimney's and Flue's require sheet metal flashing. The flashing shall be sealed to the chimney/flue with fire rated caulk. The flashing shall be sealed to the surrounding framing.
03	All penetration through the top plate of interior and exterior walls are sealed.
04	Electrical boxes, fire alarm boxes, fire sprinklers, cut into ceiling are sealed to the surrounding drywall and all gaps in the box are sealed. If not possible to seal fixture directly a secondary air barrier was created around the fixture.
05	All installed recessed light fixtures that penetrate the ceiling to unconditioned space, or where insulation is present, are rated to be Insulation Contact and Air Tight (IC and AT) which allows direct contact with insulation. Housing is sealed to the drywall.
06	Exhaust fan housing is sealed to surrounding drywall and all holes and seams in the housing sealed.
07	All soffits and chases are covered with a hard cover that is sealed to the framing with caulk or foam.
08	Double walls that open to attic are covered and the cover sealed to the framing.
09	Attic Access forms airtight seal from conditioned space to unconditioned space. Vertical attic access requires mechanical compression using screws, or latches.
10	Knee walls require solid and sealed blocking at the bottom, top left side and right side of the knee wall. When the knee wall is placed on top of a subfloor the open cavity below the subfloor and the ceiling below are sealed.
11	HVAC ducts that travel down a chase the chase are sealed at the ceiling level.
12	HVAC boots that penetrate the ceiling are sealed to the surrounding drywall.
13	All top plates of interior and exterior walls sealed to drywall.
14	Attic access must be surrounded with a dam at least the same depth as the insulation to prevent loss of ceiling insulation.
15	There must be a dam placed at the exterior edge of all kneewalls and all edges of insulation to stop air movement through insulation.
<b>The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.</b>	

<b>B. Roof Inspection – Non vented attics</b>	
01	There is a continuous air barrier at the roof deck and gable ends.
02	Chimney's and Flue's require sheet metal flashing at the roof deck. The flashing is sealed to the chimney/flue with fire rated caulk. The flashing is sealed to the surrounding framing.
03	All penetrations for plumbing, electrical etc in the roof deck and gable ends are sealed.
<b>The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.</b>	

**AIR INFILTRATION SEALING – CEILING/ROOF DECK**

CEC-CF2R-ENV-22-H (Revised 10/15)

CALIFORNIA ENERGY COMMISSION



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<b>DOCUMENTATION AUTHOR'S DECLARATION STATEMENT</b>		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS Certification Identification (if applicable):	
City/State/Zip:	Phone:	
<b>RESPONSIBLE PERSON'S DECLARATION STATEMENT</b>		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> <li>The information provided on this Certificate of Installation is true and correct.</li> <li>I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.</li> <li>The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations, and the installation conforms to the requirements given on the plans and specifications approved by the enforcement agency.</li> <li>I understand that a HERS rater will check the installation to verify compliance, and that if such checking identifies defects; I am required to take corrective action at my expense. I understand that Energy Commission and HERS Provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if those installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at my expense.</li> <li>I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.</li> <li>I will ensure that a registered copy of this Certificate of Installation shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy.</li> </ol>		
Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

**LINE ITEMS ADDRESSED:**

- A 04:** Electrical boxes, fire alarm boxes, and fire sprinklers cut into ceilings are sealed to the surrounding drywall. If it is not possible to seal the fixture directly, a secondary air barrier shall be created around the fixture.
- A 06:** Exhaust fan housing is sealed to the surrounding drywall and all holes and seams in the housing are sealed.
- A 09:** Attic access forms an airtight seal between conditioned space and unconditioned space.
- A 10:** When the knee wall is placed on top of a subfloor the open cavity between the subfloor and the ceiling below is sealed.
- A 13:** All top plates of interior and exterior walls are sealed to drywall.
- A 14:** Attic access must be surrounded with a dam at least the same depth as the insulation to prevent loss of ceiling insulation.

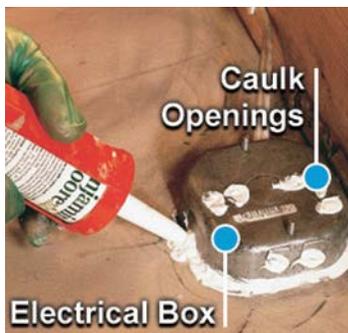
**LINE ITEM CLARIFICATIONS:**

All graphics are from ENERGY STAR® 10-12-14 U.S. Environmental Protection Agency and U.S. Department of Energy and can be found at [www.energystar.gov](http://www.energystar.gov).

**A 04: Electrical boxes, fire alarm boxes, and fire sprinklers cut into ceilings are sealed to the surrounding drywall. If it is not possible to seal the fixture directly, a secondary air barrier shall be created around the fixture.**

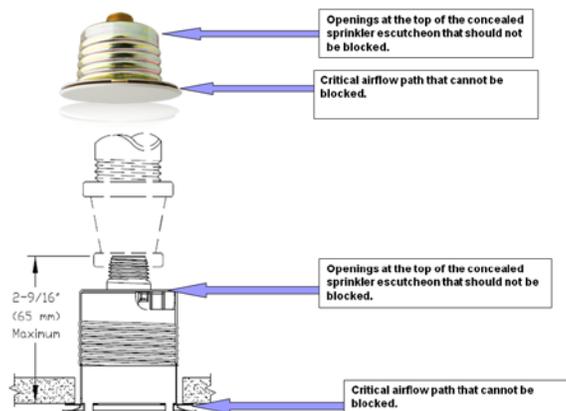
**Sealing of the above items are required only when they penetrate the ceiling to unconditioned space.**

- Seal electrical boxes to the surrounding air barrier.
- Seal openings (knockouts) in the electrical box.
- Use tape, caulk or foam. Ensure sealing products do not enter into the electrical box.

**Fire Sprinklers**

- Concealed fire sprinklers have openings at the top of the sprinkler that shall not be blocked, sealed or have a secondary air barrier.
- When sprinklers are installed in the ceiling air barrier where the back opens into the attic, it is recommended that flush mount or non-vented recessed sprinklers be used. These do not require air flow through the sprinkler to activate and they can be sealed to the ceiling air barrier.
- See California State Fire Marshal Bulletin 13-007 link: [http://osfm.fire.ca.gov/informationbulletin/pdf/2013/IB-13007\\_ResFireSpklsEnergyRegs.pdf](http://osfm.fire.ca.gov/informationbulletin/pdf/2013/IB-13007_ResFireSpklsEnergyRegs.pdf).
- Additional link on proper installation:
- <http://osfm.fire.ca.gov/codedevelopment/pdf/califfiresprinklercoalition/OSFMCEC10142013.zip>.

**Illustration of Critical Airflow Features of a Typical Concealed Fire Sprinkler**



Illustrations of typical sprinkler types that generally do not rely on airflow through the ceiling interface for timely sprinkler operation in the event of a fire.



**A 06: Exhaust fan housing is sealed to the surrounding drywall and all holes and seams in the housing are sealed.**

- Sealing of the exhaust fan only required when they penetrate the ceiling to unconditioned space. Seal all gaps and holes to unconditioned space with caulk, foil backed HVAC duct tape, or foam. Fibrous insulation is not an air barrier and cannot be used for sealing gaps.

**A 09: Attic access forms an airtight seal between conditioned space and unconditioned space.**

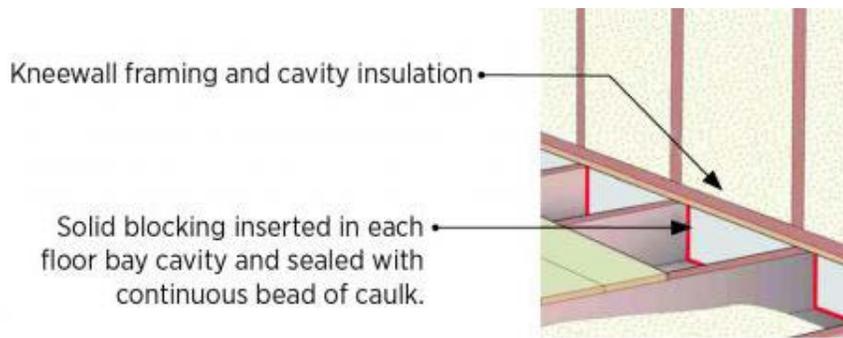
- To air seal the attic access, weather stripping must be added to the frame of the attic access panel. Vertical attic access in a wall requires mechanical compression using screws or latches that will pull the access door tight to the weatherstripping for an airtight seal. A standard door knob, dead-bolt or similar latching mechanism will work to provide mechanical compression for vertical access.



Attic access door has foam or rubber weather stripping.

**A 10: When the knee wall is placed on top of a subfloor the open cavity between the subfloor and the ceiling below is sealed.**

- Air Barrier must be added to the joist cavity below the knee wall and sealed.



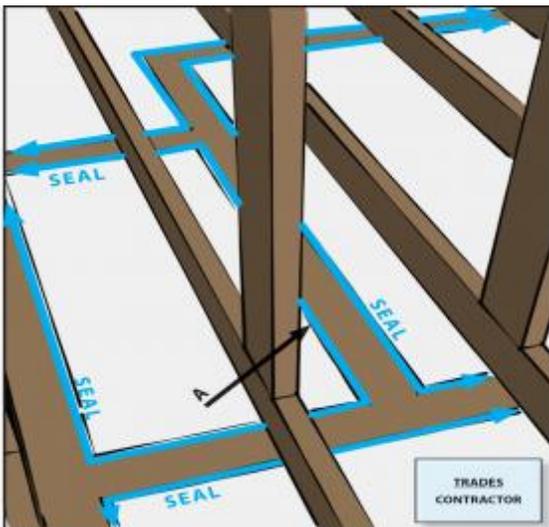
### A 13: All top plates of interior and exterior walls are sealed to drywall.

#### Interior Walls

- Top plates do not need to be sealed unless there is an unconditioned space above.
- Sealing of the top plate can be done from the attic after all the drywall is installed, or from below before drywall is installed.
- If sealing from the attic after drywall is installed, use caulk or foam to seal all top plates to the drywall.
- If sealing from below when the drywall is installed at a later date, a gasket type material must be used. The gasket must be thick enough to fill any irregularities (approximately 1/4 inch thick) between the two surfaces and the gasket must remain flexible so that it can expand/compress and still seal the two materials together when they meet.

#### Exterior Walls

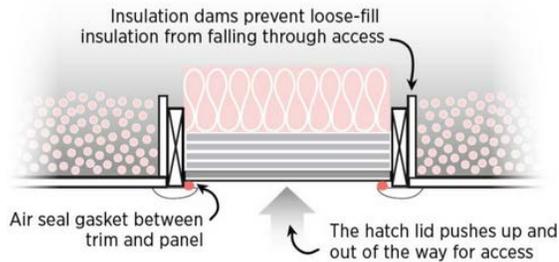
- For multi-story buildings and a continuous air barrier is used (like stucco) only the bottom plate of the first story and the top plate of the top story need to be sealed.
- Use a gasket material that hangs down below the top plate so that it can be verified at a later date; or
- Seal the exterior air barrier to the top plate from the interior so that it can be verified; or
- Rater must watch sealing of the exterior air barrier to the top plate during construction.



Sealing from attic

**A 14: Attic access must be surrounded with a dam at least the same depth as the insulation to prevent loss of ceiling insulation.**

- A dam must be installed around the attic access that is at least the same depth as the required attic insulation to ensure full depth around the attic access.
- Most insulation manufacturer instructions require a rigid dam around the attic access for all types of insulation. Check insulation manufacturer instructions.
- R-38 insulation would require a 13 ¾" to 14 ½" dam. R-48 insulation would require a 17" dam in most situations.
- The depth of the dam would be measured from the ceiling to the top of the dam.



**A 15: There must be a dam placed at the exterior edge of all knee walls and at all edges of insulation to stop air movement through the insulation.**

- The dam must be at least the same depth as the attic insulation to ensure full depth and to stop air migration into the insulation.
- The dam shall be a solid material to keep the insulation in place. Some of the materials that can be used are listed on the CF2R-ENV-21-H.

