

BLUEPRINT

CALIFORNIA ENERGY COMMISSION
EFFICIENCY DIVISION

IN THIS ISSUE

- Nonresidential Mechanical Acceptance Testing
- New 2019 Energy Code Resources Available on the ORC
 - 2019 HERS Reference Card
 - 2019 ATTCP Reference Card
 - 2019 Water Heater Guides
 - 2019 Energy Code Envelope Air Sealing Fact Sheet
 - 2019 Energy Code Presentations
- Energy Code Dynamic Forms Relocated
- Q&A
 - Nonresidential Indoor Lighting
 - Nonresidential Outdoor Lighting Alterations
 - Nonresidential Curtain Walls
 - High-Rise Residential and Low-Rise Residential Kitchen Range Hoods
 - Indoor Air Quality
 - Residential ADUs
 - Residential Single-Width Headers

Nonresidential Mechanical Acceptance Testing

For several codes cycles, the Building Energy Efficiency Standards (Energy Code) have included requirements for acceptance testing of mechanical systems in nonresidential buildings by a certified acceptance test technician (ATT). Until now, the minimum thresholds of 300 certified ATTs and ATT certification training available to all qualified technicians had not been met. These prerequisites for mandating compliance with the mechanical ATT regulations are now fulfilled.

As a result, California Energy Commission (CEC) staff is preparing a recommendation to the CEC to move forward with implementation of the mechanical ATT mandate. The CEC is expected to adopt staff's recommendations at its business meeting in January 2021. After adoption, a phased plan for enforcement will be announced. All technicians performing mechanical acceptance tests on nonresidential building projects must then be

trained and certified by an approved Acceptance Test Technician Certification Provider (ATTCP). The certified ATT's will be held to quality assurance standards, with penalties for nonconformance.

Staff is seeking input from all stakeholders by encouraging participation in the upcoming workshop and public comment period, or by contacting staff directly. For more information on the ATTCP program and to participate in developing the implementation plan, please refer to the **Mechanical Acceptance Test Technician Implementation Proceedings**. Any comments or questions may be submitted to the CEC's docket (**20-ATTCP-01**). Visit the **ATTCP web page** for more information.

New 2019 Energy Code Resources Available on the ORC

The Online Resource Center (ORC) is available virtually during this time of social distancing. The CEC continues to publish new resources on the ORC. These resources are free, available on demand, and ADA compliant.

2019 HERS Reference Card

The 2019 Home Energy Rating System (HERS) Reference Counter Card (Figure 1) is now available on the ORC [HERS web page](#).

2019 ATTCP Reference Card

The 2019 ATTCP Reference Counter Card (Figure 2) is now available on the ORC [ATTCP web page](#).

2019 Water Heater Guides

Two 2019 water heater guides are now available on the ORC [Water Heating web page](#):

- 2019 Water Heater Efficiency Guide
- 2019 Water Heater Alterations Counter Card (Figure 3)

2019 Energy Code Envelope Air Sealing Fact Sheet

The 2019 Envelope Air Sealing fact sheet is available on the ORC [Envelope web page](#). This fact sheet covers both residential and nonresidential envelope air sealing requirements.

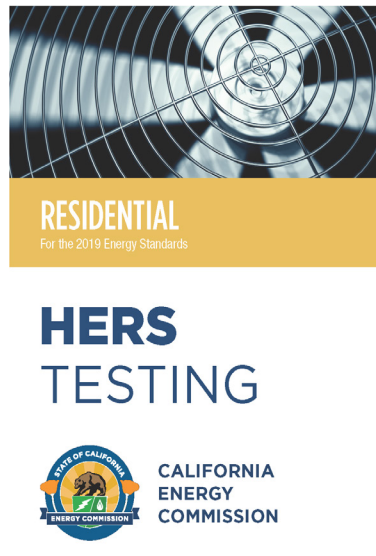


Figure 1: HERS Reference Card

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 non-residential HVAC systems (see § 140.4 (f)).



Figure 2: ATTCP Reference Card

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.

CALIFORNIA ENERGY COMMISSION | EFFICIENCY DIVISION

Water Heater Alterations Individual Dwelling Units

2019 Title 24 Building Energy Efficiency Standards



Is Natural Gas Connected to Existing Water Heater's Location?	What type can I install prescriptively?	What can I install under the performance approach?
YES	Natural gas or propane - tank or tankless (§150.2(b)1Hiii)	Any type that uses no more energy than the standard design (gas or propane tankless ⁴ ; or heat pump ⁵ , if proposed is electric). Must use CEC-approved compliance software (§150.2(b)2B)
	Heat pump - (§150.2(b)1Hiiib; Climate Zones 1-15) ¹	
	Heat pump - NEEA Tier 3 or higher (§150.2(b)1Hiiic; Climate Zones 1-15) ²	
NO	Consumer Electric - tank or tankless (§150.2(b)1Hiiid) ³	

All existing accessible and newly installed piping must be insulated per §150.2(b)1Hi.

Figure 3: Water Heater Alterations Card

2019 Energy Code Presentations

These 2019 Energy Code presentations are available on the ORC:

- [What's New Overview](#)
- [Residential Updates](#)
- [Residential HVAC](#)
- [Nonresidential HVAC](#)
- [Residential Lighting](#)
- [Nonresidential Indoor Lighting](#)
- [Nonresidential Outdoor Lighting](#)
- [Nonresidential Sign Lighting](#)
- [Nonresidential Electrical Power Distribution Systems](#)
- [Insulation and QII Requirements](#)
- [Nonresidential Envelope](#)

For additional 2019 Energy Code training see Energy Code Ace's [online offerings](#) for tools, training, and resources.

Energy Code Dynamic Forms Relocated

The 2016 and 2019 Energy Code **dynamic non-HERS residential** and **dynamic nonresidential** fillable compliance forms have been moved from the CEC's website to the [Energy Code Ace website](#) under the new *Get Forms* tab.

Q&A

Nonresidential Indoor Lighting

Are sidelit daylight zones determined differently for an area adjacent to a window that is recessed in a bay?

No. The sidelit daylight zones will be determined the same way as for a window that is not recessed. The primary sidelit daylight zone extends out one window head height deep into the space, and one half a window head height to each side of the rough opening of the window. The only difference is that the sidelit daylight zone of a recessed window will be reduced by the incursion of the bay and exterior walls into the sidelit daylight zone, as shown in Figure 4.

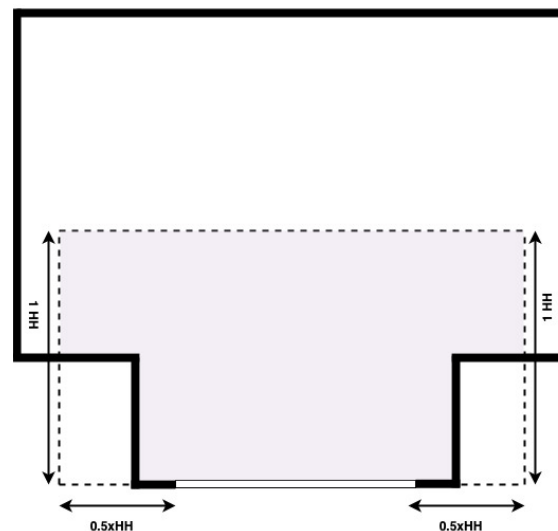


Figure 4: Bay window lighting zones

Do controlled receptacle requirements apply to first-time tenant improvements in a building with multiple tenant shells?

Yes. If the local enforcement agency classifies first-time buildouts (first-generation tenant improvement) as a newly constructed building or space, it must meet all requirements for newly constructed buildings. These requirements include controlled receptacles in [Section 130.5\(d\)](#). Check with the local enforcement agency for its policy on first-generation tenant improvements.

A tenant improvement to an existing space that has been previously developed must meet the alteration requirements for controlled receptacles in [Section 141.0\(b\)2Piv](#). Controlled receptacle requirements will apply only to alterations where there is an entirely new or complete replacement of the electrical power distribution system for the whole building.

Nonresidential Outdoor Lighting Alterations

Can the initial wattage allowance (IWA) be used when calculating the prescriptive lighting power allowance for an outdoor lighting alteration or addition?

Yes. The IWA is a one-time power allowance that can be used for outdoor lighting alterations and additions. IWA use is specific to alterations or additions where the entire site lighting complies with prescriptive outdoor lighting power allowance requirements in Section 140.7. The IWA is a flat power allowance that applies once to each outdoor lighting project per **Section 140.7(d)1C**. The wattage allowed depends on the outdoor lighting zone of the project as listed in **Table 140.7-A** (Figure 5). The Energy Code assumes that the IWA is used for lighting power allowance calculations when the site is initially designed and restricts double counting the IWA. When

TABLE 140.7-A GENERAL HARDSCAPE LIGHTING POWER ALLOWANCE

Type of Power Allowance	Lighting Zone 0 ³	Lighting Zone 1 ³	Lighting Zone 2 ³		Lighting Zone 3 ³		Lighting Zone 4 ³
	Asphalt/Concrete	Asphalt/Concrete	Asphalt	Concrete ²	Asphalt	Concrete ²	Asphalt/Concrete
Area Wattage Allowance (AWA)	No allowance ¹	0.018 W/ft ²	0.023 W/ft ²	0.025 W/ft ²	0.025 W/ft ²	0.03 W/ft ²	0.03 W/ft ²
Linear Wattage Allowance (LWA)		0.15 W/lf	0.17 W/lf	0.4 W/lf	0.25 W/lf	0.4 W/lf	0.35 W/lf
Initial Wattage Allowance (IWA)		180 W	250 W	250 W	350 W	350 W	400 W

¹Continuous lighting is explicitly prohibited in Lighting Zone 0. A single luminaire of 15 Watts or less may be installed at an entrance to a parking area, trail head, fee payment kiosk, outhouse, or toilet facility, as required to provide safe navigation of the site infrastructure. Luminaires installed shall meet the maximum zonal lumen limits as specified in Section 130.2(b).

²Where greater than 50% of the paved surface of a parking lot is finished with concrete. This does not extend beyond the parking lot, and does not include any other General Hardscape areas.

³Narrow band spectrum light sources with a dominant peak wavelength greater than 580 nm – as mandated by local, state, or federal agencies to minimize the impact on local, active professional astronomy or nocturnal habitat of specific local fauna – shall be allowed a 2.0 lighting power allowance multiplier.

Figure 5: Table 140.7-A

altering or adding to an existing outdoor lighting system, the entire site lighting power allowance must be calculated per Section 140.7, including allowances for general hardscape and specific applications. All lighting at the site, including existing, altered, and new luminaires, must comply with the calculated lighting power allowance. This process is similar to lighting power allowance requirements for an entirely new outdoor lighting system. If the entire site lighting power allowance is not considered, the IWA cannot be used.

Example: A portion of an existing illuminated parking lot is being converted into an outdoor dining area with new outdoor dining lighting added.

In this scenario, the IWA can be used if the entire site complies with outdoor lighting power allowance requirements in Section 140.7. The lighting power allowance includes the general hardscape for existing parking lot lighting and specific application for newly added dining area lighting.

The project may also comply if the newly added dining area lighting meets the dining area specific application lighting power allowance, which is listed in **Table 140.7-B**. The existing parking lot lighting is not altered; therefore, general hardscape lighting power allowances would not apply. In this case IWA is not applicable to the project.

ENERGY STANDARDS

HOTLINE

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



EMAIL

title24@energy.ca.gov



CALL

800-772-3300 | 916-654-5106
Toll free in CA | Outside CA

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

Nonresidential Curtain Walls

Do transparent curtain wall sections (Figure 6) need to be modeled separately from opaque curtain wall sections within the same storefront?

Yes. Transparent sections will need to meet the U-factors for curtain wall/storefront fenestration per **Table 140.3-B or C**, and opaque sections will need to meet the U-factors for opaque walls per **Section 120.7(b)6**.

If one or more of the transparent sections is operable, will that also be modeled separately?

Yes. Operable transparent sections will need to meet the U-factor for operable fenestration per **Table 140.3-B or C**.

High-Rise Residential and Low-Rise Residential Kitchen Range Hoods

What is a kitchen range hood?

The Home Ventilating Institute (HVI) definition for a kitchen range hood is:

“A ducted exhauster for use over cooking equipment that captures contaminants by buoyancy and exhausts them. May be a dual-function appliance incorporating microwave and/or clock function. Includes non-powered kitchen range hoods. Ductless range hoods are excluded.”

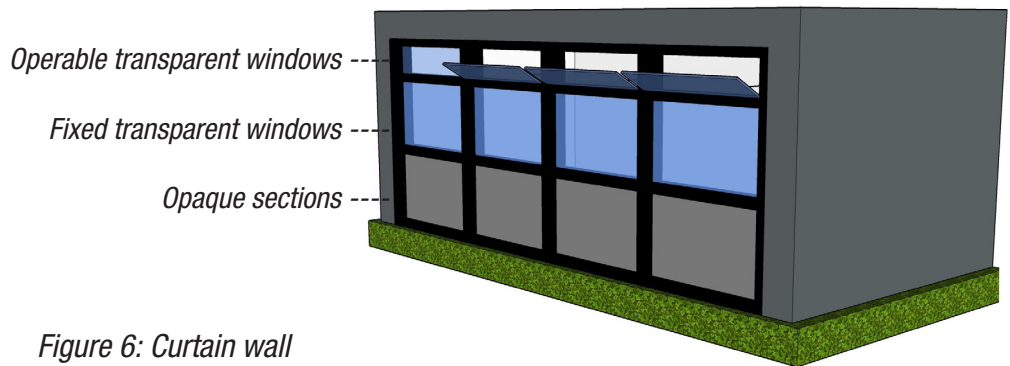


Figure 6: Curtain wall

Is a kitchen range hood required to be installed for compliance with the Energy Code Sections 120.1(b)2 and 150.0(o), and local exhaust requirements of ASHRAE 62.2 Section 5?

No. A kitchen range hood is not required to be installed to meet the Energy Code and ASHRAE local exhaust requirements. However, if a range hood is not used to meet the local exhaust requirements, another system must be installed in the kitchen to meet the local exhaust requirements of ASHRAE 62.2 Section 5.

If a range hood is used to meet local kitchen exhaust requirements, what are the mandatory requirements for the range hood airflow and sound level?

When a range hood is used to meet the local kitchen exhaust requirements, it must exhaust a minimum of 100 cubic feet per minute (cfm) to the outdoors and have a sound rating of no more than 3 sones. If the minimum airflow setting for the range hood is 400 cfm or greater, there is no sound requirement.

What are the mandatory airflow and sound level requirements for systems installed to meet local kitchen exhaust requirements that do not use a vented range hood?

For enclosed kitchens, if an exhaust system other than a range hood is installed for local kitchen exhaust compliance, the system must exhaust a minimum of 300 cfm or provide five air changes per hour (ACH) to the outdoors and have a sound rating of no more than 3 sones. If the minimum airflow setting for the exhaust system is greater than 400 cfm, there is no sound requirement. ASHRAE Standard 62.2-2016 defines an enclosed kitchen as a kitchen whose permanent openings to interior adjacent spaces do not exceed a total of 60 square feet.

For non-enclosed kitchens, if an exhaust system other than a range hood is installed for kitchen exhaust compliance, the system must exhaust a minimum of 300 cfm. There is no air change option for non-enclosed kitchens. There is a maximum sound rating for these exhaust systems

of 3 sones, unless the minimum airflow setting for the exhaust system is greater than 400 cfm.

Does a recirculating range hood with no exhaust to the outdoors meet the mandatory requirements?

No. When a recirculating range hood without outdoor exhaust is installed, another system must also be installed that exhausts to the outdoors and meets the local kitchen exhaust flow rate and sound requirements in ASHRAE 62.2.

Is HERS verification required for kitchen range hoods installed to meet local kitchen exhaust requirements?

Yes. A HERS Rater must verify the installed range hood flow rate, sound rating, and certification.

Verification is performed by reviewing the listed flow rate and sound rating in either the HVI database or the Association of Home Appliance Manufacturers (AHAM) database. If the range hood is not listed in one of these databases, it cannot be used to meet local kitchen exhaust requirements.

Is HERS verification required for a kitchen range hood that is installed but not used to meet local exhaust requirements?

No. Installed kitchen range hoods that are not used to meet local kitchen exhaust requirements, such as a recirculating range hood, do not require HERS verification. However, another system must be installed to meet the local kitchen exhaust requirements.

Is HERS verification required for local kitchen exhaust systems other than kitchen range hoods installed to meet kitchen exhaust requirements?

No. HERS verification is required only for kitchen range hoods installed to meet local kitchen exhaust requirements.

Do kitchen range hood and local exhaust requirements apply to additions and alterations?

Yes. In addition to new construction, these requirements also apply to additions and alterations that include new or replacement kitchen range hoods ducted to the outside. Systems that previously met indoor air quality requirements must continue to meet indoor air quality requirements after the additions or alterations are completed.

What forms are used by the installer, acceptance test technician, and HERS Rater to document kitchen range hood compliance?

For high-rise residential buildings:

- The installer reports the installed equipment on the NRCI-MCH-01-E form
- The installer or acceptance test technician reports on the NRCA-MCH-20-H form
- The HERS Rater reports on the NRCV-MCH-32-H form

For low-rise residential buildings:

- The installer reports on the CF2R-MCH-32-H form
- The HERS Rater reports on the CF3R-MCH-32-H form

For more information on local kitchen exhaust and other residential indoor air quality requirements and applicable exceptions, please see Energy Code **Sections 120.1(b)** and **150.0(o)**, **Section 4.6** of the 2019 Residential Compliance Manual, **Section 4.3** of the Nonresidential Compliance Manual, and ASHRAE Standard 62.2-2016.

Indoor Air Quality

Can a 2-inch (or deeper) filter be installed into a grille or rack designed for a 1-inch filter in order to comply with Sections 120.1(b)1Bia, 120.1(c)1Ci, and 150.0(m)12Bia?

No. To comply with the indoor air quality requirements of the Energy Code, a filter with a thickness greater than one inch cannot be installed in a filter grille or rack that is designed for a filter with a thickness of one inch or less. The installed filter cannot be thicker than the filter grill or the designed filter thickness of the rack.

Residential ADUs

When converting an existing garage into an ADU in a high-rise residential building, do the high-rise residential Energy Code requirements apply to the ADU?

Yes. The building occupancy type determines the compliance approach. If there are four or more habitable stories in the building, the ADU must comply with high-rise residential Energy Code requirements.

Residential Single-Width Headers

Does a single-width header require insulation when modeled in a project without quality insulation installation (QII)?

No. The standard design includes QII with insulated single-width headers and continuous exterior rigid insulation. When using the performance approach, QII can be traded for other building energy efficiencies to meet compliance. There are exceptions for multifamily new construction in climate zone 7, and additions under 700 square feet, where QII is not part of the standard design.

FOR MORE INFORMATION

Online Resource Center (ORC):
www.energy.ca.gov/orc

Home Energy Rating System (HERS):
www.energy.ca.gov/HERS

Acceptance Test Technician Certification Provider Program (ATTCP): www.energy.ca.gov/ATTCP

2019 Approved Compliance Software:
<https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency-2>

EDITOR

Amie Brousseau

SPECIAL THANKS

Christine Collopy	Dee Anne Ross
Todd Ferris	Michael J. Sokol
Joe Loyer	Peter Strait
Kelly Morairty	Lorraine White
Chris Olvera	Allen Wong
Javier Perez	Daniel Wong
Jose Perez	

Building Standards Office

1516 9th St, MS 37
Sacramento, CA
95814
(916) 654-4147

Gavin Newsom Governor
David Hochschild Chair
Janea A. Scott, J.D. Vice Chair
Karen Douglas, J.D. Commissioner
J. Andrew McAllister, Ph.D. Commissioner
Patricia Monahan Commissioner
Drew Bohan Executive Director



CALIFORNIA ENERGY COMMISSION

CEC-400-2020-012

