Efficiency Standards Office

Blueprint

Spring 1997, No. 58

California Energy Commission

NOTE: Because of production problems that delayed the release of the Fall issue of ***Blueprint*** , there is no Winter issue.

RESIDENTIAL STANDARDS

Questions and Answers

Q ***I've seen products that permanently convert a medium-base down-light socket to a fluorescent fixture. Can these be used to meet the lighting requirements for bathrooms and kitchens?***

Yes, but the conversion must be permanent; i.e., the fixture cannot be changed back to accept medium base incandescent bulbs without destroying the socket. There are products that screw into a medium base product which cannot be removed, thus leaving a different socket which accepts only fluorescent bulbs. Since the bulb can be replaced with a fluorescent bulb only, the fixture effectively does not contain a medium base incandescent lamp socket. These **permanent** products will provide a new alternative for builders to consider for meeting the high efficacy requirements of the standards (*Energy Efficiency Standards*, Section 150(k)). Caution: Using these devices can change the dimensions of the fixture and lamp,creating an awkward fit and look (i.e., the lamp may extend outward from the fixture).

Q ***What are the duct insulation requirements for residential mechanical systems?***

Section 150(m) of the *Energy Efficiency Standards* requires the greater of R-4.2 or the level required by *Uniform Mechanical Code* (UMC) Section 604. UMC Section 604 requires R-6.3 duct insulation in two cases:

1. When cooling system ducts are installed on the roof or exterior of the building.

2. When heating system ducts are installed on the roof (exterior) of the building in an area with greater than 8,000 heating degree days.

For more details on UMC requirements, see Blueprint No. 56 (page 6).

NOTE: These insulation levels are the mandatory *minimum* levels. If compliance calculations show a higher R-value is being used for credit, the higher value is required.

Q ***What are the requirements for sealing ducts in residential mechanical systems?***

Section 150(m) of the *Energy Efficiency Standards* refers to Sections 601 and 603 of the *Uniform Mechanical Code* (UMC) for minimum requirements for installing and

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sealing ducts. Section 601.5 requires "joints of duct systems to be made substantially airtight by means of tapes, mastics, gasketing or other means." This section specifically addresses installation requirements for residential round ducts, residential rectangular ducts, rectangular ducts, oval ducts,and listed ducts. Section 603 addresses installation of metal ducts, factory-made air ducts, protection, and support.

Q ***When modeling an existing residence using the default assumptions from Table 7-2 of the Residential Manual, is the water heater modeled with or without an R-12 blanket?***

The existing water heating system is assumed to meet the current water heating budget. Regardless of the actual conditions, it is modeled with an R-12 insulation blanket and a 0.53 energy factor. It is not necessary to install the R-12 blanket on an existing uninsulated water heater.

Q ***I know that R-4 pipe insulation is mandatory for a recirculating water heating system (on the entire length of recirculating pipe), but is it true that if there is also a demand control system you can get credit for the R-4 pipe insulation? If so, why?***

Yes, this is true. A demand pumping system activates the recirculating pump only when the occupant indicates a need for hot water. Since hot water will not be continuously recirculating through the pipes, the R-4 is not a mandatory requirement and is eligible for pipe insulation credit. A recirculating system with a demand pump and pipe insulation is the only type of system that is eligible for two credits—one for the demand control and one for the pipe insulation.

Q ***What are the installation requirements for a demand control on a recirculating water heating system?***

The plans must include a wiring/circuit diagram, and a manufacturer and model number for the pump and control device. One of two types of control devices can be used. One type of control device must shut the pump off when it senses that the pipe is full of hot water; the other type must limit pump run time to two minutes or less. If the pump is activated by contact switches located inside the home, there must be at least one switch at each floor level, and one of the switches must be located at the kitchen sink. If the pump is controlled by a hot water flow sensing device, that device must be installed at the water heater. (*Residential Manual*, page 6-38.)

Q ***When insulating pipes for a recirculating water heating system, I insulate the entire length of hot water pipes, but do I need to insulate runouts?***

No. Since the water in runouts does not recirculate, they do not need to be insulated.

Q ***If pipes in a home are less than 3/4-inch in diameter, is it acceptable to take credit for pipe insulation? What if the main pipes are less than 3/4-inch, can they still take the credit?***

The credit is only allowed for pipes that are 3/4-inch and larger. At a minimum, the entire hot water main must be 3/4-inch or larger and insulated to R-4 to receive the credit. Runouts may be less than 3/4-inch and uninsulated. (*Residential Manual*, page 6-36.)

NONRESIDENTIAL STANDARDS

Questions and Answers

Q ***As a lighting designer, I would like to be able to prepare compliance documentation without having to coordinate with the envelope and/or mechanical designers. Is it acceptable for me, for example, to use the tailored method while the envelope designer uses computer compliance? Is there any time when we must coordinate?***

Unless there are trade-offs between building features, they do not need to be modeled together. Therefore, the only time you must

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Questions and Answers (continued)

coordinate is if there will be trade-offs between various building components.

If the envelope designer uses computer compliance, s/he will indicate in the scope of compliance that lighting is not included. The PERF-1 (Certificate of Compliance for the performance approach) will indicate that lighting compliance is not in the scope of the submittal for the envelope compliance. This provides the plan checker with verification that features of a building that are not part of the compliance documentation are automatically set to "default" values by the certified program.

As an example, in a building with *all features permitted at the same time*, the envelope could comply with prescriptive requirements, the mechanical could comply with the performance approach to avoid the economizer requirements, and the lighting could comply using any approach including computer compliance. (All the possible variations are explained on pages 6-4 through 6-7 of the *Nonresidential Manual*.)

Q ***I'd like to use the Complete Building Lighting approach for a building with several different occupancies, none of which is dominant. Since this lighting approach requires that I select only one occupancy type, how do I determine the primary occupancy (as directed in Blueprint No. 48)?***

The complete building method is intended for, and the lighting allotments are based on, a single building type with a lighting plan for the entire building permitted at one time. With multiple occupancies, you have one of four prescriptive choices:

(1) Choose the building type that makes up 75 percent or more of the entire building from the Complete Building Method

(2) Choose "All Others" (0.8 Watts/ft^2) from the Complete Building Method

(3) Use the Area Category Method, or

(4) Use the Tailored Lighting Method.

Q ***Are there any tables I can use to obtain information for T-8 lamps and electronic ballasts?***

The Addendum to the Nonresidential Manual has an extensive list of products in Appendix B, including electronic, magnetic and magnetic energy efficient ballasts. If you haven't received your copy, contact the Energy Standards Hotline (*see back page*).

CORRECTION

Q ***In reading the summary of the 1995 changes to the standards in Blueprint No. 52, the way the 1,000 square foot documentation exemption is stated seems incorrect. Which is correct, the Blueprint or the Standards?***

The Standards are correct (Blueprint No. 52 is incorrect). The Standards exemption from documentation may be granted by the building department if there is no more than 1,000 ft^2 of "conditioned" area in the entire building (which includes conditioned and unconditioned spaces) and an occupant load of 49 persons or less. This means the exemption can be allowed for a small office in an unconditioned warehouse (a statement of compliance, signed by the person with project responsibility, is still required). However, if there is a small tenant space in a building with other conditioned spaces, and the combined total of conditioned spaces is more than 1,000 ft^2, the exemption cannot be granted by the building department.

DID YOU KNOW . . . ?

. . . The CALBO Training Institute (CTI) will present the Certified Energy Plans Examiner (CEPE) residential exam in May and the nonresidential exam in June. For more information, contact CTI at (916) 456-3824.

. . . PERFORM 95, the Commission's nonresidential public domain computer program for compliance with the 1995 *Energy Efficiency Standards* is available. It can be purchased for $250.00 from the Publications Office.

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Did You Know...? (continued)

Technical support for this program is available only from Gabel Dodd/Energy Soft. Contact them at (415) 833-5900.

. . . When a design, material or device cannot be adequately modeled using a public domain computer program, the standards contain a provision for "exceptional methods." The process for getting approval of an exceptional method is contained in the Administrative Regulations (Title 24, Part 1) of the *Energy Efficiency Standards*, Section 10-109. Subsection (e) requires that the Energy Commission publish a list of public domain computer programs, alternative calculation methods (including exceptional methods) and alternative component packages approved during the past year.

In 1996, the Commission approved the following exceptional methods and computer programs:

- Gas Heat Pump exceptional method
- PERFORM 95, nonresidential public domain computer program
- CALRES2 version 1.31a (bug fix)
- COMPLY 24 version 5

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