NONRESIDENTIAL BUILDINGS BUILT ON SPEC AND THE ENERGY CODE

Q:

A nonresidential building is built without tenants to occupy it. The builder installs an HVAC system but does not run it while the building is vacant. The builder does not install insulation at the time of construction, preferring to wait until tenants move in. Should the inspector write this up as non-complying with the energy efficiency code?

A:

Not necessarily. The energy efficiency code allows for speculation ("spec") buildings that are not occupied upon completion of the shell. However, not complying with the code at the time of initial construction carries consequences.

Below is code interpretation language from the *Nonresidential Manual*. Buildings can comply on a component-by-component basis with mandatory and prescriptive measures (for example, if just the envelope and HVAC are completed at first, they must comply with mandatory and prescriptive measures; lighting and water heating can wait but will also have to comply with mandatory and prescriptive requirements). In this case, THE DEVELOPER OR BUILDER LOSES THE ABILITY TO USE THE PERFORMANCE APPROACH FOR OVERALL BUILDING COMPLIANCE.

Some building departments ask the builder to sign an affidavit at the time of the initial building permit for the shell, acknowledging the potential difficulties of future envelope or lighting compliance. It is potentially a lot more work for building departments to track, and it is not recommended, but it IS allowed under the code.

From the *Nonresidential Manual* (from the Energy Commission website http://www.energy.ca.gov/title24/nonresidential_manual/index.html)

Section 2.2.2F. New Buildings

Speculative Buildings – Unknown Occupancy

Speculative buildings are often built for which the ultimate occupancy is determined at the time of leasing and not during construction of the building shell. The structure, for example, could eventually be used as an office, a warehouse, a restaurant, or retail space. Because the *Standards* treat these occupancies in a similar fashion, the fact that the ultimate occupancy is unknown is not a significant problem. The major items affected by the ultimate occupancy have to do with lighting and ventilation requirements.

The major problem that can occur with this type of building comes when the owner elects to declare it as an unconditioned building and defer *Standards* compliance until such time as a tenant installs mechanical space conditioning equipment. Refer to Section 2.2.2B (included below) for a complete discussion of this.

Speculative Buildings – Known Occupancy

Speculative buildings of known occupancy are commonly built by developers. For example, if a strip shopping center or an office building were built on speculation, the owner would usually know the ultimate occupancy of the space but might not know the actual tenants. For this type of building, the owner could take responsibility for any or all of the major components by simply building and showing energy compliance for the envelope, and leaving the lighting and HVAC improvements to the tenants (or the project could include the other systems as well).

Because compliance may be demonstrated for each component separately, the owner can simply demonstrate that the systems being built meet the *Standards*. The remaining construction and *Standards* compliance work can be dealt with as each tenant obtains building permits for work in their individual spaces (see Section 2.2.2C [below]).

Often, the developer will seek to minimize first cost by delaying compliance and construction of as much of the project as possible. While this can be done under the *Standards,* there are two disadvantages:

1. If all *Standards* compliance is deferred by declaring the building to be unconditioned, the owner needs to understand the potential problems that could arise later when the building is conditioned. Refer to the discussion in Section 2.2.2B [below].

2. If only the envelope or lighting systems are shown to comply, the owner loses the opportunity to apply the performance approach to the entire building and so to make trade-offs between systems to optimize the cost-effectiveness of the design.

2.2.2B. Newly Conditioned Space

While unconditioned buildings do not have to comply with the *Standards,* it is not simple to change an unconditioned building to a conditioned building.

When previously unconditioned space becomes conditioned, the space is then considered an "addition" and all the building's components must then comply as if it were a new building (see Section 2.2.2E and *Standards* §149(a).) If conditioning an existing building results in a space that is semi-conditioned [defined below], the *Standards* do not apply.

This situation has potentially significant construction and cost implications. For example, if an unconditioned warehouse is upgraded with a heating system thus becoming conditioned space, the building envelope must comply with the current envelope requirements and the lighting system must be brought into conformance with the current lighting requirements, including mandatory wiring and switching. If the envelope has large windows, it is conceivable that some would have to be eliminated or replaced with more efficient windows. If the lighting system is inefficient, fixtures might have to be removed and new, more efficient fixtures installed.

This requirement can cause difficulty when an owner of a building seeks exemption from complying with the *Standards* by erecting a shell with no plans to condition it. For example, the owner of an office building obtains a permit for the structure and envelope, but wishes to leave the space conditioning and lighting improvements to the tenants. If that owner claims unconditioned status for that building, the owner does not have to demonstrate compliance with the envelope requirements of the *Standards.* As soon as the tenant applies for a permit to install

the HVAC equipment, however, the envelope and any existing lighting in the shell must then be brought into full compliance. (This is the only circumstance when systems, other than those subject to the current permit application, fall under the *Standards.*) If the building was initially designed in a way that makes this envelope compliance difficult, the building envelope may require expensive alterations to bring it into compliance. A similar situation could occur with the lighting system if it is installed in the "unconditioned" building.

Many building departments require the owner to sign an affidavit at the time of the initial building permit for the shell, acknowledging the potential difficulties of future envelope or lighting compliance. For a discussion of the compliance procedures associated with this practice, refer to Sections 3.3, 4.3 and 5.3.

To minimize *Standards* compliance difficulties, the recommended practice is to demonstrate energy compliance at the time the envelope is built, and to demonstrate compliance for the lighting systems even when lighting systems are installed in unconditioned spaces.

Section 2.2.2C. New Construction in Existing Buildings

Alterations, tenant improvements, and repairs are new construction in an existing building. For example, the base building has been constructed, but the individual tenant spaces have not been completed. Tenant improvements can include work on the envelope, the mechanical or the lighting systems. Whatever the case, the system or systems being installed are considered to be new construction, and must comply with some or all of the current *Standards*, depending on the extent of the changes (see following sections).

The only circumstance when systems other than those subject to the current permit application come under scrutiny is when the tenant improvement results in the conditioning of previously unconditioned space. Refer to the previous Section 2.2.2 for a complete discussion of this situation.

SEMI-CONDITIONED SPACE
is an enclosed nonresidential space that is provided with wood heating, cooling by direct or indirect evaporation of water, mechanical heating that has a capacity of 10 Btu/(hr ft²) or less, mechanical cooling that has a capacity of 5 Btu/(hr ft²) or less, or is maintained for a process environment.

as set forth in the definition of DIRECTLY CONDITIONED SPACE.

FYI - Not mentioned in the manual, but in reality (and not in all cases), the last T.I. to go in may get HVAC shortchanged especially if the T.I.'s location is in the South-West where heat gain can be greater; not enough HVAC may have been allocated for the space. Since type of occupancy is unknown, it is difficult to predict the appropriate HVAC size without oversizing. Of course this is applicable only to unknown occupancy, and if known then HVAC can be better proportioned out....