

What is the Performance Method Trying to Do?

NCSEA's Position on Some Confusing Code Provisions

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As states adopt the 2015 *International Existing Building Code* (IEBC), more engineers are learning the differences between two of its compliance methods – the Prescriptive method and the Work Area method. (See “What Happened to Chapter 34?” in the June 2016 issue of STRUCTURE.)

But there is a third set of code provisions for existing buildings. The Performance method is less commonly used, but it's available both as Chapter 14 of the IEBC and as Section 3412 of the 2012 *International Building Code* (IBC).

The Existing Buildings Subcommittee of NCSEA's Code Advisory Committee has done a lot to improve the IEBC since 2006, but it has mostly stayed away from the Performance method, which appears to have limited application to structural issues. Some code officials and engineers, however, have a completely different interpretation of how the Performance method should be applied, and the differences have important implications for engineers, their clients and their communities.

Which projects are exempt?

Two provisions from the 2015 IEBC Performance method are most likely to affect structural work. First, Section 1401.2:

1401.2 Applicability. Structures existing prior to [DATE TO BE INSERTED BY THE JURISDICTION. Note: it is recommended that this date coincide with the effective date of building codes within the jurisdiction.], in which there is work involving additions, alterations or changes of occupancy shall be made to conform to the requirements of this chapter or the provisions of Chapters 5 through 13. The provisions of Sections 1401.2.1 through 1401.2.5 shall apply to existing occupancies that will continue to be, or are proposed to be, in Groups A, B, E, F, I-2, M, R and S. These provisions shall not apply to buildings with occupancies in Group H or I-1, I-3 or I-4.

The first sentence says the Performance method, (or, optionally, the Work Area method in Chapters 5 through 13) applies to buildings older than a date to be provided, raising some questions:

- What about newer buildings? Are addition, alteration, and change of occupancy projects in newer buildings completely exempt from any regulation? Or does this mean that a newer building must comply with the Prescriptive method in Chapter 4 instead?
- For a project in a newer building, does the second sentence still apply? The only reasonable answer (discussed below) is yes, but that is not how the provision reads.
- Does the last sentence mean those H and I occupancies are exempt from the limits imposed by 1401.2.1 through 1401.2.5? That would seem backward for such sensitive uses as high-hazard facilities, jails, and daycare centers. Or does it mean those occupancies need more restrictive regulations not specified?
- What about repairs? Chapter 14 mentions repairs in several places, but not here. So in newer buildings, are repairs subject to the Performance method while additions and major alterations are exempt?

Does a 70-year old structure need to be checked?

In terms of code clarity, Chapter 14 is not exactly off to a good start. The big question in 1401.2, however, is about that DATE TO BE INSERTED. The note recommending “the effective date of building codes within the jurisdiction” is printed with the text of the code.

What date does that mean? Does it mean the date on which the current code edition replaced the previous edition, a date that shifts every time a state or city adopts a new set of I-codes? Or does it mean the date when the jurisdiction started enforcing its first building codes, which for many east coast cities was before 1900?

Consider that latter interpretation. Say a city started enforcing building codes in 1947. Then any addition or alteration project in a building up to 70 years old would be exempt from regulation. It seems nonsensical. This interpretation is supported by the ICC's commentary, but that commentary

has scarcely changed since it was written for the 1993 BOCA code. That doesn't make it wrong, but it does mean that neither the provision nor the commentary has been updated for a quarter century, even while codes for existing buildings have otherwise evolved dramatically.

NCSEA's Existing Buildings Subcommittee interprets the “cutoff date” provision the first way, expecting states and cities to insert a recent date within the last three, maybe six years. The idea is that the Performance method is an option for buildings that are essentially new. If the building is more than a few years old, one may either show that it is still just as good as a recent building (as discussed below) or use either of the IEBC's other two methods.

This interpretation makes sense when you consider what the Performance method appears to be about. Chapter 14 has one page of generic requirements followed by ten pages of detailed rules, tables, and equations all about fire safety and egress. Clearly, this method is meant to provide an alternative way to assess room layouts and corridors that do not quite match what the IBC requires for new buildings. That is a valuable tool, as long as the structure and other systems are unaffected. But if a project affects the structure, as most additions and many alterations do, how can the code exempt the whole project from review just because of the age of the building?

One way around this is to assume that the second sentence of 1401.2 applies even to newer buildings that the first sentence appears to exempt. Of course, that is not what the code (or the 1993 commentary) says. Plus, the hypothetical 70-year old building would still be exempt from fire, maintenance, flood, and structural provisions in 1401.3 and 1401.4. Is that the intent?

So there are two, maybe three, different interpretations. How are actual cities and states setting their cutoff dates? The Subcommittee canvassed jurisdictions across the country and found some interesting answers.

A number of jurisdictions insert an early date. For example:

- St. Louis: December 19, 1951
- Michigan: November 6, 1974

- Denver: The date it adopted the 1976 Denver Building Code
- Ohio: July 1, 1979
- Portsmouth, New Hampshire: September 14, 2003

Others share the Subcommittee's understanding that the cutoff date is meant to be recent. California no longer allows the Performance method, but when it did, the 2013 state code set January 1, 2014, as the cutoff. Oregon sets it at July 1, 2014. The cities of Seattle and Dallas and the states of Florida and Virginia delete the entire "existing prior to" phrase, effectively making today the cutoff and removing any date-based exemption.

Interestingly, many jurisdictions – including Rhode Island, Pennsylvania, Utah, Montana, North Carolina, South Carolina, and Washington state – fail to insert any date, either because they are reserving judgment or because they did not realize the blank needed to be filled. When we spoke to a member of Utah's building commission, he read the ICC note and assumed it meant 2016.

In any case, implementation of the Performance method is inconsistent from state to state, and sometimes even within a state.

Should a deficient structure be upgraded?

The other critical provision involves structural checks for any building that is not exempt by age:

1401.4.1 Structural analysis. The owner shall have a structural analysis of the existing building made to determine adequacy of structural systems for the proposed alteration, addition or change of occupancy. The analysis shall demonstrate that the building with the work completed is capable of resisting the loads specified in Chapter 16 of the *International Building Code*.

The first sentence is about the proposed project itself, and it is sensible. The second sentence is about the building as a whole – or at least it seems to be, and that is how the Subcommittee understands it. The *building*, not just the parts affected by the proposed project, must satisfy requirements for new construction. That is a high bar, but it makes sense together with our understanding of the cutoff date.

An effective code sets the same standards for all buildings in similar situations. If the Performance method is to be effective, then any building subject to Chapter 14 should be as good (or should be made as good) as any building automatically exempted due to age. So if the cutoff date in 1401.2 is recent, then

the requirement to satisfy IBC Chapter 16 is appropriate. Taken together, the two provisions effectively say that if the building is recent, or if you can show by analysis that it's as good as a recent building, then the building is eligible for the Performance method, and you may use the rest of the chapter to check the fire safety and egress. If your building has an obsolete structural system, however, you must use one of the IEBC's other methods, which account more completely for structural issues.

This interpretation is consistent with similar eligibility rules in Section 1401.3.2: Any building using the Performance method must comply with, or must be upgraded to comply with, the current *International Fire Code and International Property Maintenance Code*.

But some read 1401.4.1 differently. They say the first sentence sets the required scope: Check the effects of the proposed project, and ignore the rest of the structure. The second sentence then merely gives the criteria and loads for this limited structural review. Again, that is not what the plain language of the code says, but maybe this interpretation is correct.

Maybe it is the intent of the Performance method never to trigger an upgrade of a deficient structure, no matter how extensive the addition, alteration, or repair. Of course, if this is the intent, it is contradicted by Section 1401.3.3, which uses typical IEBC language to trigger flood upgrades based on the cost of the proposed work. It would also deviate from the IEBC's other two methods, allowing permit applicants to "game the code," or take advantage of an unclear or inconsistent provision to avoid certain requirements.

The NCSEA Existing Buildings Subcommittee Position

Vagueness, illogic, incompleteness, and inconsistency in the text of Chapter 14 thus give rise to two opposite interpretations of when and how the Performance method should be applied:

- Read one way, projects in buildings 30, 50, or even 100 years old are exempt from a thorough structural review, and perhaps from any regulation at all. Older buildings subject to review are still never required to be structurally upgraded, no matter how extensive the project.
- As NCSEA's Existing Buildings Subcommittee reads it, the Performance method is for checking fire safety and egress in otherwise reliable, typically recent, buildings. Structures of obsolete design may use the Performance method if they can

show equivalence to newer buildings or if they are structurally upgraded.

It is only because of confidence in this second interpretation that the Subcommittee has left Chapter 14 alone over the last several code cycles. As we work to refine the Prescriptive and Work Area methods, having a more conservative third option has not been a concern. If the Subcommittee's interpretation has been wrong, however, then it will have more work to do.

The NCSEA Existing Buildings Subcommittee's position regarding the IEBC's different methods is 1) that the structural provisions should not differ to the degree that the differences encourage gaming, and 2) that it is not only reasonable but advisable for extensive projects to trigger structural upgrades. These positions have informed the Subcommittee's work on the Prescriptive and Work Area methods, whose structural provisions and upgrade triggers will be practically identical with the 2018 edition. The Subcommittee sees no reason why the Performance method should be so different. The Subcommittee will rely on these positions, and revisit them as needed, when developing proposals for the next cycle and working with jurisdictions adopting the 2015 code.

What should engineers do?

Until the Performance method can be clarified in the next code cycle, the NCSEA Existing Buildings Subcommittee's recommendation is to:

- Know your local code. If the jurisdictions you work in allow the Performance method, know what cutoff dates they have selected and how they interpret the two key sections discussed above.
- Advise and educate your staff, your code official colleagues, and your clients about the options presented by the IEBC, and how some of them might lead to unexpected results depending on how they are interpreted.
- Send comments and questions to your SEA delegates to NCSEA's Existing Buildings Subcommittee, or to the author of this article. ■



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