

Formulating technical standards of buildings

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1. Foreword

At the Building Department, we develop the drafts of technical standards¹⁾ based on the Building Standard Law and conduct relevant investigation/research activities. As recent examples, we have implemented development of a series of standards to prevent falling of ceilings, which have been enforced since last April, as well as new fire prevention standards for 3-story wooden schools to be enforced in June. And we have been conducting necessary investigation/research work for technical standards regarding measures against long-period earthquakes. For making building standards²⁾ to meet society's needs, its contents must be technically valid, fit relevant regulatory systems, be operated appropriately and be applied to buildings without difficulty. I would like to introduce various issues we take into consideration when developing drafts of building standards and conducting other activities, interjecting my own personal views as well. I would be happy if this proves useful in helping you understand our activities.

2. The building confirmation system and building standards

One of the typical procedures that ensure conformity of buildings with the standards under the Building Standard Law is by receiving an application from the building owner to conduct a "building confirmation" or examination of the construction plan to ensure conformity to the standards prior to the construction start. Unlike "permits," which are similar administrative procedures, confirmation is a judgment where there is no room for discretion by the interpreter. Furthermore, standards are required to be established in "definite/unambiguous" terms so that the result of the judgment is the same regardless of the interpreter.

Judgments are easy if the building standards are so-called "prescriptive codes," or, in other words, written by dimensions, shapes, materials allowed to be used, and so on. Actual standards, however, include provisions whose conformity must be judged based on experiments and calculations, and qualitative expressions. As a rule, standards must be established in a manner that the building officials/private

inspectors³⁾ can understand and make the proper judgment in their confirmation.

In recent revisions of building standards, from the perspective of ensuring proper operations, there has been a shift to use more prescriptive expressions, as well as a shift of active adoptions of entrusted provisions from cabinet ordinances to the Minister's notices (in order to introduce more detailed standards). Especially, with provisions requiring technical judgments by calculations and qualitative expressions, NILIM has also been involved in preparing technical guidelines to prevent uneven interpretations.

As a result of pushing forward such shift of the way of expressing building standards to more prescriptive and detailed ones, there may be a concern that the range of technical choices may become limited. In this regard, performance-based coding has been promoted to rid or reduce this side effect (see "4").

3. Conditions for revising building standards

The Building Standard Law, with regards to the property rights of buildings which should be guaranteed based on the constitution, enforces the minimum requirements in the interest of public welfare, as Article 1 (Purpose) declares the "minimum standards" must be established.

For example, if buildings are damaged in a major earthquake, the need to review the building standard is taken into consideration to prevent its recurrence. While it is effective to increase the safety level of buildings by revising standards and implementing new and more stringent regulations, there is also a need to ensure that the contents of these tighter standards are suitable "minimum standards" and that they are not overly excessive. In this regard, "existing nonconforming buildings" present a particular problem.

While buildings should always meet building standards upon its completion and after its usage has begun, "existing buildings (or buildings under construction)", however, are exempt from this obligation when such standards are being introduced or revised after their completion. Such "exceptional" buildings which do not meet the latest standards are called "existing nonconforming buildings". Yet, when extension work or large-scale repairs are conducted on

them, their "exception" to the rule is annulled. As a result, owners of buildings who carry out such repairs may face a heavy burden⁴⁾ for extra works necessary to make their buildings satisfy all the standards. Therefore, when contemplating reviewing or tightening building standards, it is essential to make the decision after analyzing both the necessity and the impact of them.

Among the examples I mentioned earlier, the standard to prevent falling of ceilings is a "tightening regulation" that gives rise to a number of "existing nonconforming buildings." In this case, the target was limited to suspended ceilings above a certain scale, height and weight. And easier-to-apply standards for existing buildings were issued to lighten the burden of the owners.

4. The "performance-based coding" of building standards

"Performance-based coding" of building standards was adopted in the revision of the Building Standard Law enforced in 2000. This coding is a conversion of the expression of technical standards from the "prescriptive provisions" to the "performance requirements." By this system, if a building possesses a required function, the building has then various merits like the freedom of selecting various design methods and materials and new technologies. On the other hand, since it is difficult to judge the direct compatibility of demanded performance, "verification methods (calculation and test methods)" of the performance and the "deemed-to-satisfy provisions (example of solutions)" were also prescribed. Also, by introducing a separate system called the Minister's approval that judges innovative methods and materials, the two purposes mentioned in "2": "ensuring the freedom of design" and "preventing uneven interpretation" can be realized at the same time.

"Performance-based coding" has been adopted in many countries worldwide, and several countries have switched their entire regulations to the performance coding system. But, in Japan, we introduced as many performance-based requirements as possible in our standards. Regarding fire safety regulations, which had been conventional prescribed regulations, the "fire resistance verification method" and the "evacuation safety verification method" have been adopted, although the prescriptive type provisions still remain in some areas.

5. Conclusion

In the latest revision of the Building Standard Law (to be enforced in June 2015), by introducing a new Minister's Approval Scheme (Article 38)⁵⁾, alternative methods can be substituted for all provisions including prescriptive fire safety requirements. But to change the

whole standards structure into performance-based one still remains a goal to be reached. In order to attain this, as well as other targets to meet society's needs, we continue our activities to better building standards. In this regard, we would like to ask for your ongoing opinions and support.

(Reference)

1. "Technical standards" don't mean such standards as ISO or JIS standards but "technical documents" issued under the Building Standard Law or other similar systems as regulations or requirements to be applied to buildings, etc.
2. Regarding standards based on the Building Standard Law, there are "building regulations" for safety and other requirements applied to individual buildings and also "group regulations" for securing areal environments. Here, I would like to talk about the former (called "building standards").
3. Regarding a certain part of the structural calculation standards, it is also required to get additional checks made by structural calculation reviewers.
4. Due to the enactment of the "Law Concerning Promotion of Anti-seismal System Improvement of Buildings" after the Great Hanshin Earthquake and several revisions to the Building Standard Law, the application of new standards to existing buildings have become more relaxed with regards to the seismic strengthening and small-scale extensions of buildings.
5. Abolished once in the 2000 revision and will be revived again.