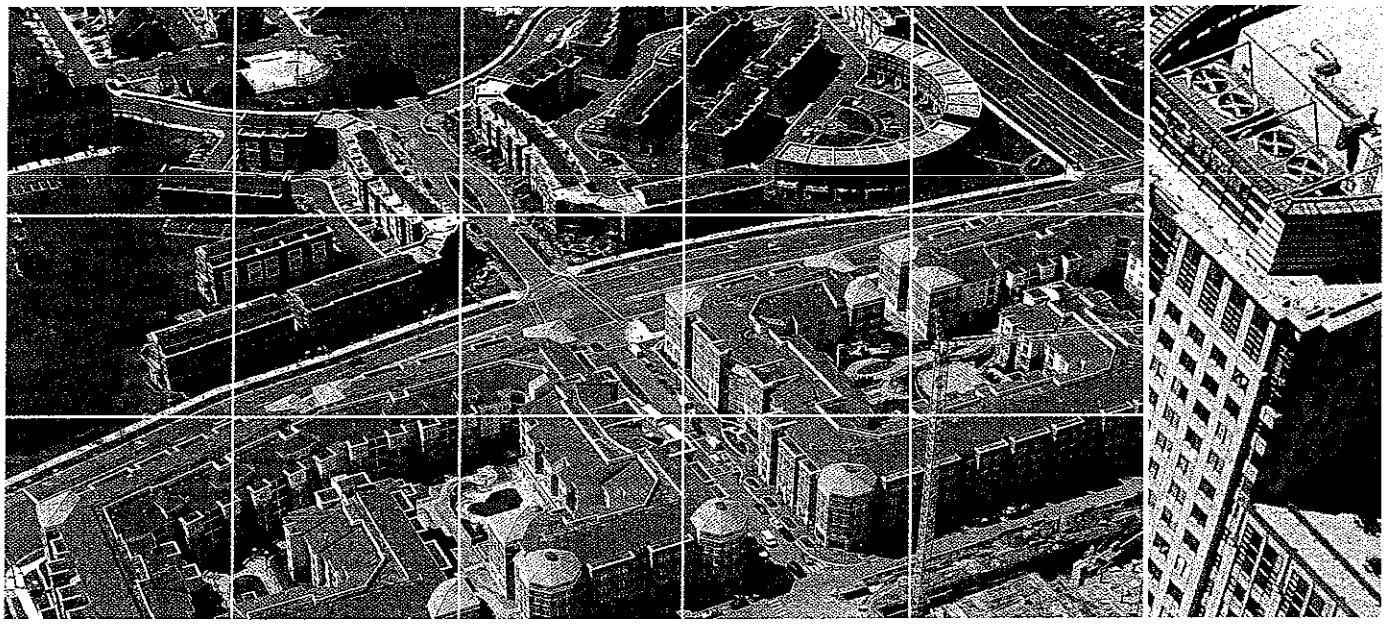

# PEDESTAL BUILDING DESIGN
## UNDER 2003 IBC SECTION 508.2

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The purpose of this article is to provide guidance to design professionals attempting to meet the unique requirements of Section 508.2 of the 2003 *International Building Code* (IBC), which is commonly referred to as the "Pedestal Building Design Concept." This concept entails two separate buildings, built one upon the other, designed in compliance within the specific parameters of Section 508.2. One building no more than one story above grade of Type IA construction type serves as the "pedestal" for another building or buildings which are then built on top of it. The pedestal building must be separated from the buildings above by a 3-hour fire-resistance-rated horizontal barrier.

### History

Requirements for the design of pedestal buildings have been provided by the model codes since the 1967 edition of the *Uniform Building Code* (UBC). The requirements were modified in the early 1990s to permit A, B and M uses both above and below the 3-hour horizontal fire separation. The relevant code change proposals were submitted by the City of Seattle, Washington, with the following justification:

> *Section 702 mixed occupancy/mixed construction buildings have become a frequently constructed building type in urban areas. They provide a cost-effective means of providing housing in areas of high land costs. Many cities are trying to promote mixed-use neighborhoods where street floors of buildings contain shops, and apartments are located on upper floors. The* Uniform Building Code *discourages this type of development. The proposal would allow the Section 702 type of building to have offices and retail shops in the Type I portion of the building if it is fully sprinklered. Fully sprinklered offices and retail shops have an excellent safety record. The proposal would provide a cost-effective way of allowing housing to be provided in commercial areas without jeopardizing the safety of the residents.*

### Application

In the drafting of the 2000 IBC, the pedestal construction requirements from the UBC were placed in Section 508.2. Under IBC Section 508.2, multistory buildings can be placed above a one-story, above-grade pedestal building. The simplest example is that of a residential building placed above an enclosed garage, but other specified combinations of building uses are also allowed.

It is common practice to take full advantage of Type V construction for the multistory buildings above the pedestal building. Provided that the pedestal building is no more than one story in height above grade and of Type IA construction, IBC

Section 508.2 provides a variety of options and conditions. In fact, special provisions of Section 508.2 provide alternatives not found in the general provisions for building heights and areas as regulated under Chapter 5.

### Advantages

The advantages of pedestal design under the IBC include the following.

- The one-story, above-grade pedestal building, being of Type IA construction, is permitted to be of unlimited area and have more than one basement.
- Buildings constructed above the pedestal building are permitted to be of any construction type and size permitted by the allowable area calculations in Chapter 5.
- The pedestal building and the buildings above it are considered to be separate and distinct when determining type of construction, allowable area limitations, number of stories allowed and continuity of fire walls.
- The continuation of any firewall from the buildings above through the pedestal building is not required because the 3-hour fire-resistance-rated horizontal assembly between the buildings acts as the equivalent to an "offset" firewall.

### Limitations

In addition to the basic requirement that the pedestal building be of Type IA construction and separated from the buildings above by a horizontal ceiling/floor/roof assembly having a minimum 3-hour fire resistance rating, the following limitations also apply.

- Per Section 508.2, Item 4, Exceptions, the use of the pedestal building is restricted to any combination of the following:
  - S-2 enclosed parking garage;
  - multiple Group A uses limited to those having assembly rooms with occupant loads of less than 300 each;
  - Group B uses;
  - Group M uses; and
  - entry lobbies, mechanical rooms, storage areas and similar uses incidental to the operation of the building
- Per Section 508.2, Item 3, the use of the buildings above the pedestal building is restricted to any combination of the following:
  - Group R uses,
  - multiple Group A uses limited to those having assembly rooms with occupant loads of less than 300 each,
  - Group B uses and
  - Group M uses.
- Per Section 508.2, Item 2, shaft enclosures (i.e., stairway, ramp, escalator, mechanical, electrical) penetrating through the 3-hour fire-resistance-rated horizontal floor/ceiling assembly are required to be 2-hour fire resistance rated with the appropriate opening protectives.
- Alternatively, per the Exception to Section 508.2, Item 2, if the floor opening connects three stories or fewer, the enclosure can be 1-hour fire-resistance-rated within the building above the pedestal building. However, if that shaft communicates within the pedestal building below, that portion of the shaft below the 3-hour fire-resistance-rated horizontal assembly must be 3-hour fire-resistance-rated with the appropriate opening protectives.
- When applying Section 508.2, Item 4, only the pedestal building is required to be sprinklered by way of Section 903.2.9 when it is an enclosed parking garage, or by way of Section 508.2, Item 4, Exception 2, when it contains A, B or M uses. It should be noted that if a building above the pedestal building is required to be sprinklered based on the sprinkler threshold requirements of Section 903 or the height/area increase thresholds of Chapter 5, then it must comply with the applicable requirements of NFPA 13, *Installation of Sprinkler Systems*, or, if applicable, NFPA 13R, *Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height*.
- Per Section 508.2, Item 5, the height of the buildings above the pedestal building cannot exceed the height limits set forth in Table 503 for the type of construction selected. It is important to mention that the height of the building above the pedestal building is measured from the grade plane of the pedestal building.

## Unique Provisions and Commentary

Several unique provisions of IBC Section 508.2 contain alternatives to the basic principle set forth in Section 705.5 that a fire wall is strictly a wall without horizontal offsets (note that Section 705.6, Exception 5, specifically correlates this issue with Section 508.2). Others address alternatives or exceptions to the general provisions for determining allowable building heights and areas as regulated by Chapter 5. These unique provisions should be viewed as specific in nature and, based upon Section 102.1, take precedence over any general provisions that may apply.

Section 508.2.1 regulates the type of construction of the pedestal building and mandates the use of a 3-hour fire-resistance-rated horizontal assembly as an alternative to the traditional fire wall. Section 508.2.2 provides the methods for

protection of vertical openings through the 3-hour fire-resistance-rated horizontal assembly. It requires, as a general rule, 2-hour fire-resistance-rated shaft enclosures. However, the Exception to Section 508.2.2 allows 1-hour fire-resistance-rated enclosure walls above the horizontal assembly if the building above is not required to be of Type I construction and the enclosure connects fewer than four stories.

Section 508.2.3 allows the occupancies/uses of the stories above the pedestal building to be Group A (limited to those having assembly rooms with occupant loads of less than 300), Group B, Group M or Group R. Note that the requirement dealing with Group A having an assembly room with an occupant load of less than 300 would permit multiple individual assembly rooms, each room having up to 300 persons, based upon the legacy classification for assembly uses (1990 UBC Group A, Division 3 Occupancy).

Section 508.2.4 confirms that a building of Type IA construction located below the 3-hour fire-resistance-rated horizontal assembly is to be considered distinct from the buildings above, which may therefore be classified separately for type of construction and occupancy classification. Although this section generally limits the use of the pedestal building to the parking and storage of private motor vehicles, two exceptions allow other occupancies. Exception 1 allows rooms and uses that are incidental to the operation of the building to be located below the 3-hour fire-resistance-rated horizontal assembly. Exception 2 allows the occupancy of offices (B uses), retail occupancies (M uses), and multiple small assembly spaces (A uses), each having an occupancy load of less than 300. In any case, sprinkler protection is required throughout the pedestal building.

It appears that the IBC Drafting Committee made an unintentional error in transcribing the pedestal height requirements from the legacy code to IBC Section 508.2, Item 5. The UBC indicates that "The maximum building height in feet shall not exceed the limits set forth [ ... ] for the least type of construction involved," whereas the IBC draft reads: "The maximum building height in feet shall not exceed the limits set forth [ ... ] for the least *restrictive* type of construction involved" (emphasis added).

The Ad Hoc Task Group presumably intended to clarify the original intent of the UBC to limit the maximum building height to the "lowest" type of construction involved (combustible construction), but the addition of the word "restrictive" changed the meaning of this section to permit the maximum height to be governed by the pedestal building's Type 1A construction. If read literally, with Type 1A being the "least restrictive type of construction," the maximum height is unlimited. This certainly was not the intent of the legacy code or the IBC Drafting Committee.

If designed to the original intent of this section, the construction of basements and the first story above grade will conform to the code requirements for a Type IA building and therefore correspond to what is commonly termed a pedestal building. Under the basic requirements of IBC Chapter 5, the story above grade of a pedestal building is included in the total number of stories above grade permitted for a building. The statement within Section 508.2 that the pedestal building "shall be considered as a separate and distinct building for the purpose of determining [ ... ] limitation of number of stories" allows the first story above grade of a pedestal building to be disregarded when determining the number of stories permitted by Table 503. However, it is important to understand that Section 508.2, Item 5, requires that the total overall height of both buildings above grade do not exceed the height limits set forth in Chapter 5 and Table 503 for the "least," as opposed to "least restrictive," type of construction. The approval of Code Change Proposal G129 by the ICC membership during the 2004/2005 Final Action Hearings will clarify this issue in the 2006 edition of the code by stating that the height of "the building having the smaller allowable height" is to be used and that the measurement is made from the grade plane.

In practical application, the number of stories permitted for buildings above a pedestal building is not diminished by having to include the pedestal building story below the horizontal assembly. Buildings above a pedestal building are typically Type V construction, and determining the number of allowable stories without having to include the pedestal building's above grade story presents a significant design advantage. ◆

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