



Code Connection

Enclosure Classifications for Wind

by WTCA Staff

Are you familiar with the three enclosure classifications used to evaluate wind on a structure?

To evaluate a building for the effects of wind on the structure from the inside, one of three enclosure classifications must be assigned to the structure: open, partially enclosed or enclosed. The classifications are common between the International Building Code (IBC)/International Residential Code (IRC) 2000, 2003 and ASCE 7-98/02 and are defined as follows:

- **OPEN** is typically assigned to structures when all walls subject to positive wind pressure are determined to be 80 percent open.
- **PARTIALLY ENCLOSED** is typically assigned to structures where any wall meets both of the following conditions:
 - The total area of openings in a wall exceeds the sum of the areas of openings in the balance of the building envelope (walls and roof) by more than ten percent.
 - The total area of openings in a wall exceeds four square feet or one percent of the area of the wall whichever is smaller, and the percentage of openings in the balance of the building envelope does not exceed 20 percent.
- **ENCLOSED** is assigned to any building that does not meet one of the two other definitions.

Take a few minutes to apply the above definitions to the following structures:

DESCRIPTION	OPEN	PARTIALLY ENCLOSED	ENCLOSED
Park shelter or carport - open four sides, posts with no walls			
Plane hanger - open 90 percent of one side, closed on three sides			
Typical one- or two-family dwelling			
Typical building with recessed entryway			
Typical building with porch open on two sides			
Typical building with porch open on three sides			
Typical building with attached carport (carport open on three sides)			
Typical building with two sections joined by a covered walkway with no walls			

The answers may vary based upon the specifics of the math, interpretations by code jurisdictions and/or upon engineering judgment. And, although the enclosure designation is typically applied to the entire structure, there may be times when it is more appropriate to assign different designations to portions of a structure. Thus, more than one answer may apply.

- A typical structure that is fully open on four sides, like a park shelter or carport, is pretty easy. They generally receive an open classification, since they are typically supported by posts. To qualify for the “open” designation, all walls of the

at a glance

- ❑ The three enclosure classifications are: open, partially enclosed and enclosed.
- ❑ These classifications are common between the IBC and IRC 2000/2003 and ASCE 7-98/02.

building must qualify as open.

- A structure that is mostly open on one side would typically be considered partially enclosed, since it does not meet the open criteria on three sides. The evaluation of the one side 90 percent open will typically result in meeting the partially enclosed criteria when that wall is evaluated. In the case of the partially enclosed designation, if any wall meets the requirement, then the entire structure qualifies as partially enclosed.
- Typical one- and two-family dwellings are generally enclosed, since the windows and doors do not qualify as openings or require windborne debris-resistant coverings as specified by local codes.
- A building with a recessed entry but otherwise having typical windows and doors causes some confusion. The recessed entry should not impact the enclosure classification. The exposed area over the recessed entry is typically evaluated using overhang pressures. Only if specifically required by local code jurisdiction or engineering judgment should the recessed entry area be evaluated separately using partially enclosed wind pressure parameters.
- A building with an open-sided porch or canopy presents the same consideration. If one follows the enclosure definitions exactly, this is no different than the previous item and the exposed porch area would be considered using overhang pressures. Only if specifically required by local code

jurisdiction or engineering judgment should the porch area be evaluated separately using partially enclosed wind pressure parameters.

- When an otherwise typical building has an attached carport or canopy that is open on three sides, a decision has to be made (by someone other than the truss designer) as to what designation applies. In many cases it makes sense to evaluate the one building as if it were two separate structures: the carport or canopy as open and the building per its appropriate designation.
- The case of a covered walkway is another situation where the building designer should determine the enclosure classification and whether the building should be viewed as three separate structures and each section evaluated individually.
- Engineering judgment is required for all but the most basic structure types.

More detail on the equations for the enclosure designations are included in ASCE 7, Chapter 6 and IBC Section 1609. The IRC assumes building design using the enclosed designation and specifies in Chapter 3 that if a building requires design as partially enclosed, that design is required per the IBC. **SBC**

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