2. Provide an integrated system of ties among the principal elements of the structural system. These ties may be designed specifically as components of secondary load-carrying systems, which often must sustain very large deformations during catastrophic events.
3. Returns on Walls. Returns on interior and exterior walls make them more stable.
4. Changing Directions of Span of Floor Slab. Where a one-way floor slab is reinforced to span, with a low safety factor, in its secondary direction if a load-bearing wall is removed, the collapse of the slab will be prevented and the debris loading of other parts of the structure will be minimized. Often, shrinkage and temperature steel will be enough to enable the slab to span in a new direction.
5. Load-Bearing Interior Partitions. The interior walls must be capable of carrying enough load to achieve the change of span direction in the floor slabs.
6. Catenary Action of Floor Slab. Where the slab cannot change span direction, the span will increase if an intermediate supporting wall is removed. In this case, if there is enough reinforcement throughout the slab and enough continuity and restraint, the slab may be capable of carrying the loads by catenary action, though very large deflections will result.
7. Beam Action of Walls. Walls may be assumed to be capable of spanning an opening if sufficient tying steel at the top and bottom of the walls allows them to act as the web of a beam with the slabs above and below acting as flanges (Schultz et al. 1977).
8. Redundant Structural Systems. Provide a secondary load path (e.g., an upper-level truss or transfer girder system that allows the lower floors of a multistory building to hang from the upper floors in an emergency) that allows framing to survive removal of key support elements.
9. Ductile Detailing. Avoid low-ductility detailing in elements that might be subject to dynamic loads or very large distortions during localized failures (e.g., consider the implications of shear failures in beams or supported slabs under the influence of building weights falling from above).
10. Provide additional reinforcement to resist blast and load reversal when blast loads are considered in design (ASCE Petrochemical Energy Committee 1977).
11. Consider the use of compartmentalized construction in combination with special moment resisting frames (as defined in FEMA 1997) in the design of new buildings when considering blast protection.

Although not directly adding structural integrity for the prevention of progressive collapse, the use of special, nonfrangible glass for fenestration can greatly reduce risk to occupants during exterior blasts (ASCE Petrochemical Energy Committee 1977). To the extent that nonfrangible glass isolates a building's interior from blast shock waves, it can also reduce damage to interior framing elements (e.g., supported floor slabs could be made to be less likely to fail due to uplift forces) for exterior blasts.

C1.5 CLASSIFICATION OF BUILDINGS AND OTHER STRUCTURES

C1.5.1 Risk Categorization

In this (2010) edition of the Standard a new Table 1.5-2 has been added that consolidates the various importance factors specified for the several type of loads throughout the Standard in one location. This change was made to facilitate the process of finding values of these factors. Simultaneously with this addition, the importance factors for wind loads have been deleted as changes to the new wind hazard maps adopted by the standard incorporate consideration of less probable design winds for structures assigned to higher risk categories, negating the need for separate importance factors. Further commentary on this issue may be found in the commentary to Chapter 26.

The risk categories in Table 1.5-1 are used to relate the criteria for maximum environmental loads or distortions specified in this standard to the consequence of the loads being exceeded for the structure and its occupants. For many years, this Standard used the term Occupancy Category, as have the building codes. However, the term "occupancy" as used by the building codes relates primarily to issues associated with fire and life safety protection, as opposed to the risks associated with structural failure. The term "Risk Category" was adopted in place of the older Occupancy Category in the 2010 edition of the Standard to distinguish between these two considerations. The risk category numbering is unchanged from that in the previous editions of the standard (ASCE 7-98, -02, and -05), but the criteria for selecting a category have been generalized with regard to structure and occupancy descriptions. The reason for this generalization is that the acceptable risk for a building or structure is an issue of public policy, rather than purely a