



Section III: Building Your Shelter

Your builder/contractor can use the design drawings in this booklet to build a shelter for any of the wind zones shown on the map in Figure I.2. The design drawings provided include the details for building five types of shelters: concrete, concrete masonry, wood-frame, lean-to, and in-ground. Each of these alternatives is expected to perform equally well in resisting material fatigue and connection failures caused by extreme winds.

The materials and connections were chosen for their “ultimate strength,” which means that the materials are expected to resist the loads imposed on them until they or the connections between them fail. The forces of extreme winds may cause cracks or other signs of stress in the materials or connections, and they may cause materials or connections to yield. However, the intent of the designs is not to produce a shelter that will always remain completely undamaged, but rather a shelter that will enable its occupants to survive an extreme windstorm with little or no injury. The shelter itself may need to be extensively repaired or completely replaced after an extreme wind event.

The shelter size and materials specified in the drawings are based on principles and practices used by structural engineering professionals and the results of extensive testing for effects of missile impact. Before increasing the shelter size or using material types, sizes, or spacings other than those specified in the drawings, review the changes with a licensed professional structural engineer.

The information in this section includes the following:

- design drawings and details for shelters in basements, above the ground, and in the ground
- designs for both slab-on-grade and crawlspace foundations
- general design notes and fastener and hardware schedules
- materials lists with quantities and specifications

The Wind Engineering Research Center at Texas Tech University has been involved in shelter design for many years. If you or your builder/contractor have questions about the design drawings in this booklet, call the Wind Engineering Research Center at (888) 946-3287, ext. 336 for technical guidance.



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* IG = In-Ground, B = Basement, AG = Aboveground

How To Use the Drawings

- Drawings shall not be scaled to determine dimensions.
- If there is a conflict between a dimension shown on the drawings and a scaled dimension, the dimension shown on the drawing shall govern.
- If there is a conflict between the drawings and local codes, the local codes shall govern.
- If there is a conflict among the general notes, specifications, and plans, the order of precedence is notes, then specifications, then plans.