

Chapter 1

Application and Administration

101 General

101.1 Purpose. The purpose of this standard is to establish minimum requirements to safeguard the public health, safety, and general welfare relative to the design, construction, and installation of storm shelters constructed for protection from high winds associated with tornadoes and hurricanes. This standard is intended for adoption by government agencies and organizations for use in conjunction with model codes to achieve uniformity in the technical design and construction of storm shelters.

101.2 Scope. This standard applies to design, construction, installation, and inspection of storm shelters constructed as separate detached buildings or constructed as safe rooms within buildings for the purpose of providing safe refuge from storms that produce high winds, such as tornadoes and hurricanes. Shelters designed and constructed to this standard shall be designated to be hurricane shelters, tornado shelters, or combined hurricane and tornado shelters.

101.3 Requirements not included. Where requirements are not provided by this standard, the applicable provisions of the construction codes adopted by the authority having jurisdiction shall apply to the storm shelter.

101.4 Special Needs. Provisions that are necessary for persons with special needs, including any special electrical or mechanical equipment, sanitary facilities, or other special features are outside the scope of this standard.

101.4 Referenced standards. The specific year date and editions of the standards referenced by this standard are listed in Chapter 9.

102 Compliance Alternatives

102.1 Compliance alternatives. Nothing in this standard is intended to prevent the use of designs, technologies, or products as alternatives to any prescriptions in this standard, provided equivalence is demonstrated and approved by the authority having jurisdiction.

103 Conventions

103.1 Dimensions. All dimensions that are not stated as “maximum” or “minimum” are absolute. All dimensions are subject to conventional industry tolerances unless otherwise noted.

104 Occupancy

104.1 Rooms or spaces within other uses. Where storm shelters are designated areas occupied for other purposes, the requirements of the applicable construction codes for the normal occupancy of the building shall apply unless otherwise stated in this standard.

104.2 Dedicated facilities. Where a facility is designed to be occupied solely as a storm shelter, the designated occupancy shall be A-3 as defined by the International Building Code for purposes of determination of applicable requirements that are not included in this standard.

104.3 Combination Storm Shelters. Where the purpose of a storm shelter is to provide protection from both tornadoes and hurricanes, the storm shelter shall be designed and constructed using the most restrictive requirements for each hazard applied to the entire storm shelter.

105

Applicable Building Code

105.1 Applicable code. Where construction of a storm shelter is to take place where no applicable construction codes are adopted, the provisions of the International Code Council *International Building Code* shall apply.

106

Inspections and Structural Observations

106.1 General. Construction of storm shelters and installation of all equipment shall be subject to inspections in accordance with the applicable building code.

106.2 Special Inspections. Special inspections shall be provided for construction and installation of materials as required by the applicable building code, and Section 106.3 of this standard.

106.2.1 Inspection of fabricators. Where fabrication of structural load-bearing and debris impact resistant components and assemblies is being performed on the premises of a fabricators shop, special inspection of the fabricator shall be provided.

Exception: Prefabricated or panelized storm shelter components which have been inspected and labeled by an approved agency meeting the requirements of the applicable building code.

106.3 Special cases. Special inspections shall be provided for proposed work that is unusual in nature, such as:

1. Construction materials and systems that are alternatives to traditional materials and systems prescribed by the applicable code.
2. Unusual design applications.
3. Materials and systems that are required to be installed in accordance with additional manufacturer's instructions that detail requirements not contained in the applicable code, in standards referenced herein, or in this standard.

106.4 Structural Observations. During construction of community shelters, the building owner shall employ a registered design professional to conduct visual observations of the construction of the structural system for general conformance to the approved construction documents at significant construction stages and at completion of the construction of the structural system. Structural observation shall not obviate the need for other inspections or testing required by this standard or the applicable building code.

Deficiencies shall be reported in writing to the owner and to the authority having jurisdiction. At the conclusion of the work, the registered design professional who made the structural observations shall submit to the authority having jurisdiction a written statement that the site visits have been made and identify any reported deficiencies which, to the best of the structural observer's knowledge, have not been resolved.

107

Construction Documents

107.1 General. Where required by the authority having jurisdiction, construction documents shall be prepared. Such documents shall contain information as required by the applicable building code and this Section.

107.2 Information required. The following information applicable to construction and operation of the storm shelter shall be supplied on the construction documents,

107.2.1 Design Information. For the areas of a building designed for occupancy as a storm shelter, the following information shall be provided within the construction documents:

1. A statement that the wind design conforms to the provisions of the ICC/NSSA Standard for the Design and Construction of Storm Shelters, with the edition year specified.
2. The shelter design wind speed, mph.
3. The importance factor, I.
4. The wind exposure category (indicate all if more than one is used.)
5. The internal pressure coefficient, GCpi

6. The topographic factor K_{zt}
7. A statement that the shelter has/has not been constructed within an area susceptible to flooding in accordance with Chapter 4 of this standard.
8. The Design Flood Elevation and Base Flood Elevation for the site (if applicable)
9. Documentation showing that components of the shelter envelope will meet the pressure and missile impact test requirements identified in Chapters 3 and 8 of this standard.
10. A floor plan drawing or image indicating location of the storm shelter on a site or within a building or facility; including drawing or image indicating the entire facility.
11. The occupant load of the storm shelter.
12. The usable storm shelter floor area.

107.2.2 Enclosure. When a storm shelter is to be constructed as a portion of a host building, the walls and floors enclosing the shelter shall be clearly indicated on the drawings.

107.2.3 Signage. The type and location of signs required by this standard shall be indicated on the floor plans.

107.2.4 Inspections. Where any special details are utilized in the design of the structure, or where any special investigations are required that are additional to those required by the applicable building code, the construction documents shall contain a schedule of the inspections required and the criteria for the special installation.

107.2.5 Special details. The construction documents shall provide any special manufacturer's details or installation instructions for systems or equipment designed for the storm shelter.

107.2.6 Special instructions. The construction documents shall contain details of special instructions required for the specified functional operation of the storm shelter, such as:

1. Type and location of equipment and amenities required within the shelter, including water supply, sanitary facilities, fire extinguishers, batteries, flashlights, special emergency lighting equipment, or any other equipment required to be installed in the shelter.
2. Specifications for any alarm system to be installed.
3. Instructions for the installation or deployment of any special protection equipment, such as shutters, screens, special latching of doors or windows, any equipment or switching for mechanical, electrical and plumbing equipment.

107.3 Quality Assurance Plan. The construction documents for community shelters shall contain a quality assurance plan in accordance with Sections 107.3.1 through 107.3.3.

107.3.1 Detailed requirements. A quality assurance plan shall be provided for the following:

1. Roof cladding and roof framing connections.
2. Wall connections to roof and floor diaphragms and framing.
3. Roof and floor diaphragm systems, including connectors, drag struts and boundary elements.
4. Vertical main wind force resisting systems, including braced frames, moment frames, and shear walls.
5. Main wind force resisting system connections to the foundation.
6. Fabrication and installation of components and assemblies of the shelter envelope required to meet missile impact test requirements of Chapter 3.
7. Requirements for cladding and soffit connections.

107.3.2 Quality assurance plan preparation. The design of each main wind force resisting system and each wind-resisting component shall include a quality assurance plan prepared by a registered design professional.

The quality assurance plan shall identify the following:

1. The main wind force resisting systems and wind-resisting components.
2. The special inspections and testing to be required in accordance with Section 106.2.
3. The type and frequency of testing required.
4. The type and frequency of special inspections required.

5. The structural observations to be performed in accordance with Section 106.4
6. The required distribution, type, and frequency of reports of test, inspections, and structural observations.

107.3.3 Contractor responsibility. Each contractor responsible for the construction of a main wind force resisting system or any component listed in the quality assurance plan shall submit a written statement of responsibility to the authority having jurisdiction, the responsible design professional, and owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain:

1. Acknowledgement of awareness of the special requirements contained in the quality assurance plan.
2. Acknowledgement that control will be exercised to obtain conformance with the construction documents.
3. Procedures for exercising control within the contractor's organization, the method and frequency of reporting and the distribution of reports.
4. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.

108

Design Information Signage

108.1 Design Information. All shelters shall be labeled on or within the shelter with the name of the producer of the shelter and for the storm type and wind speed. The label shall remain legible and visible.