

ICC 500-2020

ICC/NSSA Standard for the Design and Construction of Storm Shelters

American National Standard



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American National Standard

International Code Council
500 New Jersey Avenue, NW, 6th Floor
Washington, D.C. 20001

Approved November 2, 2020

American National Standards Institute
1899 L Street, NW, 11th Floor
Washington, D.C. 20036



ICC/NSSA Standard for the Design and Construction of Storm Shelters—2020
(ICC 500—2020)

First Printing: December 2020

ISBN: 978-1-952468-93-3

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ICC/NSSA

Standard for the Design and Construction of Storm Shelters

FOREWORD

[The information contained in this foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to this standard.]

Introduction

In May of 2002 the International Code Council (ICC) and the National Storm Shelter Association (NSSA) initiated a joint project to write a standard for the design and construction of storm shelters. A standard development committee was created, and the first meeting of that committee was in May of 2003. The scope of the standard is to provide minimum design and construction requirements for storm shelters that provide a safe refuge from storms that produce high winds, hurricanes and tornadoes. Hurricanes and tornadoes generate high winds that produce wind pressures on buildings and structures and that create flying debris at levels and intensities that are higher than those for which most commercial building and residences are designed. The magnitude of the wind speeds associated with these storms are such that building occupants and residents are required to evacuate the area or seek protection in a shelter designed for resistance to extraordinary loads and flying debris. This standard provides design requirements for the main wind-resisting structural system and components and cladding of these shelters, and provides basic occupant life safety and health requirements for these shelters, including means of egress, lighting, sanitation, ventilation, fire safety and minimum required floor space for occupants.

Development

This is the third edition of the International Code Council (ICC) and National Storm Shelter Association's (NSSA) *Standard for the Design and Construction of Storm Shelters*. This standard was developed by the ICC/NSSA Consensus Committee on Storm Shelters (IS-STM) that operates under ANSI Approved ICC Consensus Procedures for the Development of ICC Standards. The consensus process of ICC for promulgating standards is accredited by ANSI. The Storm Shelter Committee is a balanced committee formed and operated in accordance with ICC rules and procedures.

The meetings of the ICC/NSSA IS-STM Consensus Committee were open to the public and interested individuals and organizations from across the country participated. The technical content of currently published documents on storm shelters, including documents of the National Storm Shelter Association, the Federal Emergency Management Agency (FEMA), the Red Cross, and the State of Florida, was reviewed and considered by the committee. The information from these documents helped form a basis for the regulations installed in this standard. The exact provisions adopted by the committee were determined based upon the scope and intent of this standard. The requirements of ICC/NSSA 500 are based on the intent to establish provisions consistent with the scope of the ICC family of codes and standards that are written to adequately protect public health, safety and welfare; provisions that do not necessarily increase construction costs; provisions that do not restrict the use of new materials, products or methods of construction; and provisions that do not give preferential treatment to particular types or classes of materials, products or methods of construction.

Adoption

ICC/NSSA 500 *Standard for the Design and Construction of Storm Shelters* is available for adoption and use by any jurisdiction. Its use within a governmental jurisdiction is intended to be accomplished through adoption by reference in accordance with proceedings establishing the jurisdiction's laws. At the time of adoption, jurisdictions should insert the appropriate information in provisions requiring specific local information, such as the name of the jurisdiction.

Interpretations

Requests for Interpretations on the provisions of ICC 500—2020 should be addressed to: ICC, Central Regional Office, 4051 Flossmoor Road, Country Club Hills, IL 60478.

Maintenance – Submittal of Proposals

All ICC standards are periodically updated as required by ANSI. Proposals for revising this edition are welcome. Please visit the ICC website at www.iccsafe.org for the official “Call for Proposals” announcement. A proposal form and instructions can also be downloaded from www.iccsafe.org.

This standard is maintained under a continuous maintenance schedule to consider recommended changes to any part of it by the action of the consensus body. The Code Council accepts public comments and proposals for this standard on a continual basis and during regular calls for comment. Comments and proposals submitted on ICC Public Comment and Proposal Forms may be submitted to the committee secretariat at kpaarlberg@iccsafe.org.

ICC, its members and those participating in the development of ICC 500—2020 do not accept any liability resulting from compliance or noncompliance with the provisions of ICC 500—2020. ICC does not have the power or authority to police or enforce compliance with the contents of this standard. Only the governmental body that enacts this standard into law has such authority.

International Code Council/National Storm Shelter Association Consensus Committee on Storm Shelters (IS-STM)

Consensus Committee SCOPE: The ICC/NSSA Consensus Committee on Storm Shelters (IS-STM) shall have primary responsibility for minimum requirements to safeguard the public health, safety and general welfare through design, construction and installation requirements for storm shelters.

This standard was processed and approved for submittal to ANSI by the ICC/NSSA Consensus Committee on Storm Shelters (IS-STM). Committee approval of the standard does not necessarily imply that all committee members voted for its approval.

Representatives on the Consensus Committee are classified in one of three voting interest categories. The committee has been formed in order to achieve consensus as required by ANSI Essential Requirements. At the time it approved this standard, the IS-STM Consensus Committee consisted of the following members:

General Interest (G) - User Interest (U) - Producer Interest (P)

Mr. Brian Bishop, CBO (G), City of Des Moines, IA

Mr. Gary J. Ehrlich, P.E. (P), National Association of Home Builders, Washington, DC

Mr. John T. Hutton, P.E., S.E. (U), NCSEA Code Advisory Committee, Atlanta, GA

Mr. Danny John Kilcollins (G), Florida Division of Emergency Management, Tallahassee, FL

Mr. Scott Lambaise, CBO (G), MA Building Code Officials and Inspectors, Duxbury, MA

Dr. Marc L. Levitan (U), National Institute of Standards and Technology, Gaithersburg, MD

Mr. Andie Lorenz, CBO (G), Adams County, Ouello, WA

Ms. Bonnie Manly, P.E. (P) American Iron and Steel Institute, Norfolk, MA

Mr. Kurt A. Roeper (P), ASSA APLC / Americas Door Security Solutions, New Haven, CT

Ms. Pataya Scott (G), FEMA, Washington, DC

Mr. Corey Schultz (U), Schultz Squared Architects, LLC, Wichita, KS

Mr. Steve Szoke, P.E. (U) American Concrete Institute, Antioch, IL

Mr. Paul Taft (G), Town of North Salem, NY

Mr. E. Scott Tezak, P.E. (U), Atkins, Boston, MA

Dr. Borjen Tsch, P.E. (P), APA-The Engineered Wood Association, Tacoma, WA

Committee Secretariat **Kimberly Paarlberg, RA**, Senior Staff Architect, Codes and Standards, International Code Council, Country Club Hills, IL

Voting Membership in Each Category

Category	Number
General (G)	5
User (U)	6
Producer (P)	4
TOTAL	15

Interest Categories

General Interest: Individuals assigned to the General Interest category are those who represent the interests of an entity, including an association of such entities, representing the general public or entities that promulgate or enforce the provisions within the committee scope. These entities include consumers and government regulatory agencies.

User Interest: Individuals assigned to the User Interest category are those who represent the interests of an entity, including an association of such entities, which is subject to the provisions or voluntarily utilizes provisions within the committee scope. These entities include academia, applied research laboratory, building owner, design professional, government nonregulatory agency, insurance company, private inspection agency and product certification/evaluation agency.

Producer Interest: Individuals assigned to the Producer Interest category are those who represent the interests of an entity, including an association of such entities, which produces, installs or maintains a product, assembly or system subject to the provisions within the committee scope. These entities include builder, contractor, distributor, labor manufacturer, material association, standards promulgator, testing laboratory and utility.

NOTE — Multiple Interests: Individuals representing entities in more than one of the above interest categories, one of which is a Producer Interest, are assigned to the Producer Interest. Individuals representing entities in the General Interest and User Interest categories are assigned to the User Interest.

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TABLE OF CONTENTS

CHAPTER 1 APPLICATION AND ADMINISTRATION	1	402 Flood Criteria	27
Section		403 Maximum Travel Distance for Tornado Shelters	28
101 General	1	CHAPTER 5 OCCUPANT DENSITY, ACCESS, ACCESSIBILITY, EGRESS AND SIGNAGE	29
102 Compliance Alternatives	1	Section	
103 Conventions	1	501 General	29
104 Construction and Occupancy	1	502 Occupant Density in Community Storm Shelters	29
105 Applicable Code	1	503 Occupant Density in Residential Storm Shelters	29
106 Submittal Documents	1	504 Access and Egress in Community Shelters	30
107 Quality Assurance Plan	3	505 Access and Egress in Residential Storm Shelters	30
108 Owner's Responsibility	3	506 Vertical Access and Egress	31
109 Peer Review	4	507 Watchdog	32
110 Special Inspections	4	508 Signage	32
111 Structural Observations	4	CHAPTER 6 FIRE SAFETY	33
112 Listing and Labeling	5	Section	
113 Evaluation, Maintenance and Repairs	5	601 General	33
CHAPTER 2 DEFINITIONS	7	602 Fire Protection Systems	33
Section		603 Fire-Resistant-Rated Construction	33
201 General	7	604 Fire Extinguishers	33
202 Definitions	7	CHAPTER 7 STORM SHELTER ESSENTIAL FEATURES AND ACCESSORIES	35
203 Symbols and Nomenclature	9	Section	
CHAPTER 3 STRUCTURAL DESIGN AND TESTING CRITERIA	11	701 General	35
Section		702 Tornado Shelters	35
301 General	11	703 Hurricane Shelters	36
302 Load Combinations	11	CHAPTER 8 TEST METHODS FOR IMPACT AND PRESSURE TESTING	39
303 Loads	11	Section	
304 Wind Loads	12	801 General	39
305 Debris Hazard	12	802 Test Specimens	39
306 Storm Shelter Envelope Component Design and Testing	14	803 Impact Testing	39
307 Connection of Storm Shelters to Foundations or Slabs	15		
CHAPTER 4 SITING	27		
Section			
401 General	27		

TABLE OF CONTENTS

804 Static and Cyclic Pressure Testing. 48
805 Static and Cyclic Pressure Testing Procedures . . . 48

CHAPTER 9 REFERENCED STANDARDS. 49

**APPENDIX A STORM SHELTER PREPAREDNESS
AND EMERGENCY OPERATIONS
PLAN (SSPEOP) 53**

Section

A101 General. 53
A102 Definitions 53
A103 SSPEOP Requirements 53
A104 SSPEOP Basic Information Requirements 53
A105 SSPEOP Preparedness Requirements 54
A106 SSEOP Emergency Operational
Procedures Requirements 56

CHAPTER 1

APPLICATION AND ADMINISTRATION

SECTION 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 tornadoes, hurricanes and other severe windstorms. This standard is intended for adoption by government agencies and organizations for use in conjunction with *applicable codes* to achieve uniformity in the technical design and construction of *storm shelters*.

101.2 Scope. This standard applies to the design, construction, installation and inspection of *storm shelters* constructed for the purpose of providing protection from tornadoes, hurricanes and other severe windstorms. *Storm shelters* shall be constructed as either separate detached buildings or rooms or spaces within new or existing buildings. Design of facilities for use as emergency shelters after the storm is outside the scope of this standard.

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

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

SECTION 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*.

SECTION 103 CONVENTIONS

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

103.2 Figures. Unless specifically stated, figures included herein are provided for informational purposes only and are not considered part of the standard.

SECTION 104 CONSTRUCTION AND OCCUPANCY

104.1 Storm shelters within host buildings. Where a designated *storm shelter* is constructed as a room or space within a *host building* that will normally be occupied for other pur-

poses, the requirements of the *applicable code* for the occupancy of the building, or the individual rooms or spaces thereof, shall apply unless otherwise required by ICC 500.

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

Exceptions:

1. Where the facility has a *design occupant capacity* of less than 50 persons the designated occupancy shall be in accordance with Section 303 of the *International Building Code*.
2. Where the facility is a *residential storm shelter*, the designated occupancy shall be the Group R occupancy served as defined by the *International Building Code* or the facility shall comply with the *International Residential Code*[®], as applicable

104.3 Design and construction. *Storm shelters* designed and constructed to this standard shall be designated as *hurricane shelters*, *tornado shelters* or combined *hurricane and tornado shelters*.

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

104.3.2 Storm shelters on islands in the Western North Pacific Ocean and South Pacific Ocean and in Alaska. *Storm shelters* located in Guam, the Northern Mariana Islands, American Samoa and Alaska shall be designed and constructed using the requirements for *hurricane shelters*.

SECTION 105 APPLICABLE CODE

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

SECTION 106 SUBMITTAL DOCUMENTS

106.1 General. Submittal documents consisting of construction documents and other documentation shall be prepared and submitted to the *authority having jurisdiction* with each permit application. Such documents shall contain information as required by the *applicable code* and this standard. *Storm shelter* construction documents, including the design infor-