



ICC 500/NSSA Standard for the Design and Construction of Storm Shelters and FEMA P-361 Safe Rooms for Tornadoes and Hurricanes

Description of ICC 500 / FEMA P-361 Shelters

Tornados are one of the most severe forces in Mother Nature’s arsenal. On average, the United States experiences 1,200 tornadoes a year many times resulting in devastating loss of life and catastrophic damage. In 2009, the International Code Council (ICC) in conjunction with the National Storm Shelter Association (NSSA) developed and released a standard known as ICC 500 which codified the design, installation, construction and inspection of storm shelters. These shelters could provide protection to communities and schools in the event of a tornado strike. ICC 500 could then be adopted by government agencies and organizations to offer technical design and guidance when building storm shelters. In addition, The Federal Emergency Management Agency (FEMA) created a more stringent guideline for the construction of safe rooms. These safe rooms would have to meet the standard ICC 500 code and then go further to provide near absolute protection in the event of a tornado or hurricane.

Though these shelters provide a safe haven during emergencies, they lack sufficient daylight for everyday use. Solatube International has recognized this and has undergone rigorous testing in order to meet the requirements of ICC 500 storm shelters and FEMA P361 safe rooms. We want to be able to maintain a safe environment and still meet the everyday needs of a desirable building.

What Testing was Conducted

Solatube® International conducted physical testing of its SolaMaster® Series 750 DS-O product at the Intertek test facility in Lake Forest, California. The product was subjected to a Large Missile impact test utilizing a 15 lb. (6803 g), 13 ft. (4 m) 2x4 with a velocity of 98 fps. (30 mps). After successful completion of the impact test, the product was subjected to Air Pressure Cycling (3500 cycles) to simulate positive and negative wind force effects during a tornado. Testing results met the requirements for the following tests:

Testing was Conducted in Accordance with FEMA P-361, ICC 500, ASTM E1886 / E1996, and ASTM E330		
Standard	Test Name	Results
ASTM E330	Structural Wind Load Testing	Pass
ASTM E1886 / E1996	Large Missile Impact With Thermal Insulation Panel	Pass
ASTM E1886 / E1996	Large Missile Impact Without Thermal Insulation Panel	Pass
ASTM E1886 / E1996	Air Pressure Cycling – Positive and Negative Pressure	Pass
	Design Pressure	±12940 Pa (±270 psf)
	Uniform Load Structural Test Pressure	±15560 Pa (±325 psf)

Unique Product Configurations

In order to meet the rigorous requirements for ICC 500 and FEMA p 361 testing, a 750 DS-O with a 750 DS-O Polycarbonate Inner-Dome, Curb Cap, Curb Cap Insulation, a Polycarbonate Prismatic Diffuser and a Suspension Wire Kit were utilized for testing. Please see our updated Product Cut Sheets for specific indicators that will show what products must be used to meet ICC 500 and FEMA P 361 requirements.

Approved Accessories for use with FEMA Applications

(B)	Security Bar	(TIP)	Thermal Insulation Panel
(SK)	Security Kit	(D1)	0-10V Daylight Dimmer
(PBC)	Dome Edge Protection Band Curb Cap	(D)	Daylight Dimmer
(CI)	Curb Insulator		

Note that no other accessories have been approved for use with this product.

What Does All of This Mean?

Having product that meets ICC 500/FEMA P 361 requirements allows the Solatube SolaMaster® Series 750 DS-O product to be easily specified into ICC 500/FEMA P 361 storm shelters and safe rooms.

It is important to note that FEMA does not provide certification or product approvals for “FEMA Approved” or “FEMA Certified” products. Documentation of successful testing to appropriate test standards showing compliance with ICC 500/FEMA P 361 criteria can be provided to the authority having jurisdiction over an ICC 500/FEMA P 361 project.

Solatube International’s is committed to providing products that have been tested to the highest standards to provide confidence in the performance of our products.

We at Solatube International are very proud to have achieved this high mark of acceptance and are pleased to offer our customers the highest quality products available in the marketplace.

The products listed in this document have been independently tested and have shown to meet the defined standards and requirements for FEMA P 361, Design and Construction Guidance for Community Safe Rooms, and ICC 500, Standard for the Design and Construction of Storm Shelters. This document applies to the tested product mentioned above only. This document does not constitute certification or approval from the Federal Emergency Management Agency, FEMA or ICC. It is provided as a self-declaration of successful test completion of appropriate standards and requirements listed above.

Please contact your Solatube International representative for further details or with any questions.