



National Wind Institute
Debris Impact Facility- Texas Tech University
P.O. Box 43155
Lubbock, Texas 79409-1023

Report No. _20130726A
Specimen No. _2_
Test Date: _July 26, 2013_

1.0 MANUFACTURER'S IDENTIFICATION

- 1.1 NAME OF APPLICANT:** **Staying Home Corporation**
P.O. Box 37
Harrisonville, MO 64701
- 1.2 CONTACT PERSON:** **Troy Bowers or Mike Vogt**
- 1.3 TEST LAB CERTIFICATION:** Federal Emergency Management Agency (FEMA) and the ICC-500 Shelter Standard; ISO 17025 certified tests available.

2.0 TEST UNIT IDENTIFICATION

- 2.0 PRODUCT TYPE:** **Series 1 - FEMA 320/ICC-500 Above Ground Stationary Shelter**
Series 2 - Fema361/ICC-500 Steel Plate
- 2.1 MODEL NUMBER:** N/A
- 2.2 CONFIGURATION:** See Article 3.0 Test Unit Description
- 2.3 SAMPLE SIZE:** See Article 3.0 Test Unit Description
- 2.4 DOOR ASSEMBLY:** See Article 3.0 Test Unit Description,
see installation photos, pages 5-21.
- 2.5 DRAWINGS:** See Appendix B Drawings

3.0 TEST UNIT DESCRIPTION

- 3.0 TEST FRAME UNIT CONSTRUCTION:** N/A
- 3.1 ASSEMBLY CONSTRUCTION:**

3.1.1 **Series 1-** FEMA 320/ICC-500 Above Ground Stationary Shelter See Appendix B Drawings.

Series 2- FEMA 361/ICC-500 Steel Plate. 3/16-in. ballistic steel plate 30-in. x 30-in. See Appendix B Drawings



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4.0 TEST RESULTS

4.1 SCOPE: Conduct impact tests on an above ground steel shelter and steel plate.

4.2 SUMMARY OF RESULTS:

Test Method	Test Conditions	Test Conclusion
<p><u>Impact Test</u> FEMA 320 & ICC-500 – Tornado Protocol 4, See Appendix A</p>	<p><u>Impacts</u> Series 1 FEMA 320 above ground shelter test. Series 2 FEMA 361 ballistic steel plate test.</p> <p>Test projectile 15 lb. wooden 2-in. x 4-in. propelled at 100 mph</p>	<p>Series 1 Above ground shelter passed the required three impacts. Series 2 plate passed the required impacts. See Conclusions Article 5.0</p>

4.3 OUTDOOR WEATHER CONDITIONS:

Temperature	75 degrees
Wind	23 mph
Relative Humidity	71%



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4.4 IMPACTS

Impact Speed 100 mph x 15 lb. wood 2-in. x 4-in.

Impacts Test

Series/Test	Velocity (mph)	Location	Results
1/1	105.7	Upper left lock.	1/32-in. deformation; see photos, pages 22-23.
1/2	102.7	Near center lock.	1/8-in. indentation; see photos, pages 24-25.
1/3	102.5	Near hinge.	1/4-in. indentation; see photos, pages 26-27.
1/4	104.4	Over upper vent.	1/2-in. deformation of vent cover; see photos, pages 28-29.
1/5	105.4	Side center.	5/8-in. indentation; see photos, pages 30-31.
2/1	106.0	Center.	1/4-in. deformation; see photos, pages 32-33.



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5.0 CONCLUSIONS

Within the bounds of reasonable engineering and technical certainty, and subject to change if additional information becomes available, the following is my professional opinion:

An impact test was conducted by WISE on a above ground shelter assembly and a steel plate produced by Staying Home Corporation. The tested products included:

- 1) **Series 1** - FEMA 320/ICC-500, Above Ground Stationary Shelter
- 2) **Series 2** - FEMA 361/ICC-500, Ballistic Steel Plate

These tests were consistent with the guidelines of FEMA 320 (2008) and ICC-500 (2008) Standard for "The Design and Construction of Storm Shelters." The stationary shelter was tested with multiple impacts and three debris impacts on the door, per the Test Protocol 4, Tornado. These impacts relate to a 250 mph ground speed tornado.

The **Series 1** and **Series 2** assemblies are qualified to meet both the FEMA 320/361 and the ICC-500 standards of impacts for storm shelters and shelter components.

The manufacturer is advised to install warning signs inside the shelter that warns the occupants to not come in contact with the surfaces of the shelter and to wear hearing protection during a storm event. Any alterations made to the shelter design or construction must be approved or retested by WISE at Texas Tech University.

All testing was in strict accordance to FEMA 320 (2008), and ICC-500 (2008).

Engineer of Record
Larry J. Tanner, P.E.