

**SBCCI PUBLIC SAFETY TESTING AND EVALUATION SERVICES INC.**

**900 Montclair Road, Suite A  
Birmingham, Alabama 35213-1206**

**The Committee on Evaluation in review of the data submitted finds that, in their opinion, the product, material, system or method of construction specifically identified in this report conforms with or is a suitable alternate to that specified in the Standard Codes, SUBJECT TO THE LIMITATIONS IN THIS REPORT.**

The Committee on Evaluation has reviewed the data submitted for compliance with the *Standard Building Code*® and the CABO One and Two Family Dwelling Code and submits to the Building Official or other authority having jurisdiction the following report. The Committee on Evaluation, SBCCI PST & ESI and its staff are not responsible for any errors or omissions to any documents, calculations, drawings, specifications, tests or summaries prepared and submitted by the design professional or preparer of record that are listed in the Substantiating Data Section of this report. Portions of this report were previously included in SBCCI Evaluation Reports #8632, #8778, #87202, and #9226. Copyrighted © 1994 SBCCI PST & ESI

REPORT NO.: 9459

EXPIRES: See current SBCCI PST & ESI EVALUATION REPORT LISTING

CATEGORY: FACTORY BUILT HOUSES

SUBMITTED BY:

HEARTHSTONE INC.  
1630 EAST HWY 25-70  
DANDRIDGE, TENNESSEE 37725

**I. PRODUCT TRADE NAME**

Hearthstone Log Homes

**II. PERFORMANCE OF PRODUCT FOR WHICH EVALUATION IS REQUESTED**

1. Structural (including seismic)
2. Thermal

**III. USES**

Hearthstone Log Homes are used as detached one and two story single family residences, Group R3 Occupancy of unprotected Type VI construction.

**IV. DESCRIPTION**

**A. General**

Hearthstone Log Homes are assembled at the job site using specially prepared logs in combination with conventional lumber. All beams, girders, rafters, ridge, blocking, and support posts are rustic select or premium eastern white pine or premium western hemlock timber. The logs are debarked, square cut into a 6 x 12 inch (152.4 mm x 304.8 mm) and marked in accordance with the grading rules of Timber Products Inspection, Inc. All timbers are hand hewn. A dovetail notch system is used to join the logs with a spline system creating a cavity for wiring, insulation, and easy repair. To protect against air infiltration, the dovetail corners and hardboard spline system are constructed using Kwikstick InSeal sealant. For protection, Hearthstone, Inc., recommends that the logs be coated with a quality wood preservative and the hardboard spline system be covered with either perma-chink or textured paint. The dovetail corners, rafters, floor beams, girders, and wall logs are pre-drilled for structural spikes or alignment rods. (See Figure No. 1.)

**B. Building Design and Planning**

Hearthstone Log Homes are designed with one or two floors in widths as allowed by Hearthstone Structural Design Standards, sealed by Hans C. Ottem, Registered Architect and Steven Winter Registered Architect. Four foot gable dormers shall be spaced no closer than 12 feet (3.6 m) on center with the rafters supporting the dormers designed to support the additional dead and live loads of the dormers, exclusive of adjacent roof loads. Shed dormers are permissible in lengths as required; however, shed dormers which exceed 9 feet (2.7 m) in length shall have a column supported ridge beam (see "Collar Beams" in Hearthstone Design Standards). Collar beams (TIE) shall be maximum of 8 feet (2.4 m) on center as set forth in Hearthstone's Design Standards. Ridge beams are a minimum of 4 inches (101.6 mm) thick with ridge supports at spans not exceeding 22 feet (6.6 m).

Maximum length of continuous walls shall not exceed 80 feet (24 m) with shear walls, jamba, or vertical wall stiffeners located at

not more than 33 feet 3 inches (9.98 m) on centers. Maximum wall height is 7 logs above finished floor. Wall logs are 6 x 12 logs with 2-3/4" W x 6" L x 4" H (69.9 mm x 152.4 mm x 101.6 mm) hemlock load bearing blocks located at maximum centers of 7 feet (2.1 m) and at both sides of all openings.

The foundation design and first floor construction are conventional construction and shall be designed for a shear load of 225 pounds per linear foot (3282.75 N/m) x length of wall (not to exceed 40 feet [12 m]). Floor and roof decking shall be 2 x 6 tongue and groove. On roof rafter spacing of 72 inches (1828.8 mm) where design live load in 30 psf (1440 Pa) a 3 x 6 roof decking shall be used.

The foundation design, first floor conventional wood frame and floor design, roof covering, plumbing, mechanical (heating, air conditioning and ducts), light and ventilation, insulation, emergency egress, stairs, handrails, smoke detectors, and electrical are not part of the Hearthstone Log Homes materials package and are therefore not part of this report.

### C. Design Loads

Dead Loads:	Actual material weight
Live Loads:	Roof = 30 psf (1440 Pa) Floor = 40 psf (1920 Pa) Sleeping areas = 30 psf (1440 Pa)
Snow Load	Maximum Ground Snow Load = 40 psf (1920 Pa)
Wind Loads	Maximum Wind Speed = 110 mph (176 km/hr)
Earthquake Load:	Peak $A_e \leq 0.30$

Load Combinations:	Dead + Roof Load (or Snow) Dead + Wind Dead + Wind + 1/2 Snow Dead + 1/2 Wind + Snow (1.1 + 0.5 $A_e$ )Dead + (0.7)Snow <sup>1</sup> + Seismic (0.9 - 0.5 $A_e$ )Dead + Seismic (0.9 - 0.5 $A_e$ )Dead + (2R/5)Seismic <sup>2,4</sup> (1.1 + 0.5 $A_e$ )Dead + (0.7)Snow <sup>1</sup> ± (2R/5)Seismic <sup>3,4</sup>
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$A_e$  = The seismic coefficient representing effective peak velocity related acceleration under Section 1206.1.5.

R = The response modification factor of the seismic-resisting system from Table 1206.3.3.

### NOTES:

- The load factor may be reduced to zero, where the ground snow load is less than 30 psf (1440 Pa). The load factor may be reduced to 0.2, where the ground snow load is equal to or greater than 30 psf (1440 Pa) when approved by the Building Official.
- Applies to building structural systems which have unreinforced masonry, horizontal prestressed members assigned to Seismic Performance Category D or E (See 1206.3.6.4), or building structural systems with low ductility.
- 2R/5 shall be greater than or equal to 1.0.

### D. Quality Control

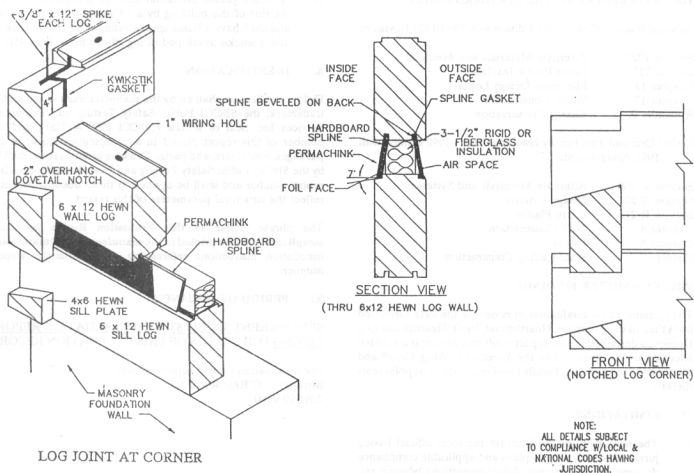
All of the hand hewn timber logs used as beams, girders, rafters, ridge, blocking and support posts are graded and marked by Hearthstone, Inc. in accordance with rules established by and under the supervision of Timber Products Inspection, Inc.

### V. INSTALLATION

The manufacturer's published construction manual, engineering drawings, specifications, and typical detail drawings shall be strictly adhered to and a copy of these instructions shall be available at all times on the job site during construction. On-site construction is subject to local inspection.

The manufacturer's thermal transmittance calculations for the envelope and charts with window/door limitations and requirements shall be used for the specific location's heating degree days in which the home is erected. The calculations and charts are based on ASHRAE Standards 90A and 90B.

FIGURE NO. 1



NOTE: STANDARD ALL MODELS.

NOTE:  
ALL DETAILS SUBJECT  
TO COMPLIANCE W/LOCAL &  
NATIONAL CODES HAVING  
JURISDICTION.

## VI. SUBSTANTIATING DATA

1. Manufacturer's Descriptive Literature, and Construction and Maintenance Manual ©1988, Revised 1991, Hearthstone, Inc.
2. Structural Calculations for the "Greenbriar", prepared by the Design Group Architects, dated September 1985, sealed by Hans C. Ottem, Registered Architect.
3. Engineering Drawings on the "Greenbriar" by Hearthstone Builders, Inc., signed and sealed by Steven Winter, Licensed Architect, December 28, 1993.
4. Structural Design Standards, Spline Details, and Engineering Standards by Hearthstone Builders, Inc., 2/27/92, signed and sealed by Steven Winter, Licensed Architect.
5. Minimum "U" Values of Envelope Components Table, prepared by The Design Group Architects, dated October 25, 1985, sealed by Hans C. Ottem, Registered Architect.
6. Sample Engineering Calculations, Thermal Envelope for the "Greenbriar", prepared by the Design Group Architects, dated September 30, 1985, signed by Hans C. Ottem, Registered Architect. Thermal Envelope Summary prepared by Hans C. Ottem, Architect, dated February 21, 1986, signed and sealed by Hans C. Ottem, Registered Architect.
7. Quality Control Manual, Log Home Grading Rules, prepared by Timber Products Inspection, Inc., dated

- November 1987, signed by Mark S. Hope, P.E. Letter verifying QC Manual in accordance with 1991 NDS, January 26, 1994, signed by Mark S. Hope, P.E.
8. Wind Load Calculations prepared by V. J. Gerley & Associates, dated April 1987, sealed by Victor J. Gerley, P.E.
9. Revised Roof Rafter and Floor Beam Load Span Tables In Accordance with the 1991 National Design Specification, Pages 1 thru 68, prepared Steven Winter Associates, Inc., dated December 19, 1993, signed and sealed by Steven Winter, Licensed Architect, December 19, 1993.
10. Engineering Calculations For Snow, Post Jack, Handrail, Guardrail, and Load Combinations, prepared by Mohammed R. Hariri, P.E., signed and sealed by Steven Winter, Licensed Architect, January 31, 1992.
11. Seismic Analysis and Design Under the 1993 Revisions to the 1991 *Standard Building Code*, prepared by Steven Winter Associates, Inc., dated December 1, 1993, signed and sealed by Steven Winter, Registered Architect.
12. Detailed engineering calculations for Revised Load Tables under the 1991 NDS, connection calculations and 6x6 rustic hewn post under the 1991 NDS, prepared by Mohammed R. Hariri, P.E., signed and sealed by Steven Winter, Licensed Architect, March 18, 1994.

## VII. REFERENCES TO THE STANDARD CODES

*Standard Building Code* - 1991 Edition with 1992/1993 Revisions

Section 102.7	Alternate Materials and Methods
Section 717	Foam Plastic Insulation
Chapter 12	Minimum Design Loads
Chapter 17	Wood Construction
Appendix E	Energy Conservation

## CABO One and Two Family Dwelling Code - 1992 Edition with 1993 Amendments

Section R-108	Alternate Materials and Systems
Section R-201	Design Criteria
Section R-216	Foam Plastic
Chapter 4	Wall Construction
Chapter 6	Floors
Chapter 7	Roof-Ceiling Construction

## VIII. COMMITTEE FINDINGS

The Committee on Evaluation in review of the data submitted finds that, in their opinion, Hearthstone, Inc.'s Hearthstone Log Homes as described in this report conforms with or is a suitable alternate to that specified in the *Standard Building Code*® and the CABO One and Two Family Dwelling Code or Supplements thereto.

## IX. LIMITATIONS

1. The manufacturer shall furnish the local official having jurisdiction with a set of plans and applicable compliance documentation for required state inspections, labeling, etc.
2. All logs shall be graded according to ASTM D 3957 (Standard Methods for Establishing Stress Grades for Structural Members Used in Log Buildings) by an approved log grader with the Log Home Council's certification.
3. The logs shall not contain excessive checks, splits, etc.
4. All applications for a building permit for Hearthstone, Inc., shall be accompanied by a copy of this report, structural calculations, plans, construction guidelines, detail drawings and specifications. The remaining portions of the building not covered in this report shall be designed and detailed for submittal to the local Building Official for approval.
5. Hearthstone Log Homes shall not be erected where wind speeds exceed 110 mph (176 km/hr) or where design loads exceed those shown in Section IV, unless structural calculations signed and sealed by a registered professional engineer are submitted, to the local Building Official, which document the higher loads.
6. Foundation plans shall be submitted for approval to the local Building Official. Foundation requirements are not covered by this report.
7. Thermal efficiency calculations shall be submitted for approval to the local official having jurisdiction.
8. No Hearthstone Log Home shall be constructed where the interior finish requirements for flame spread and smoke development are Class A or B.
9. All lumber which is less than 8 inches (203.2 mm) above grade, shall be of approved natural decay resistance wood or pressure treated wood.

10. All foam plastic insulation shall be separated from the interior of the building by a 15 minute thermal barrier and shall have a flame spread rating of not more than 75 and a smoke developed rating of not more than 450.

## X. IDENTIFICATION

Field identification shall be by the manufacturer's name and/or trademark, the SBCCI Public Safety Testing and Evaluation Services Inc. Seal or initials (SBCCI PST & ESI), and the number of this report placed in a conspicuous place on the packages, containers, and parts. Drawing identification shall be by the SBCCI Public Safety Testing and Evaluation Services Inc. report number and shall be applied to those documents which reflect the structural parameters of this report.

The phrase "Refer to this Evaluation Report for Code compliance" shall be printed in the manufacturer's literature and installation instructions referencing this Evaluation Report number.

## XI. PERIOD OF ISSUANCE

SEE CURRENT SBCCI PST & ESI EVALUATION REPORT LISTING FOR STATUS OF THIS EVALUATION REPORT.

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