DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT Housing—Federal Housing Commissioner	STRUCTURAL ENGINEERING BULLETIN NO. 1071 Rev. 3 (Supersedes issue dated November 1, 1993)
TO: DIRECTOR, HOUSING DIVISION DIRECTOR, MULTIFAMILY DIVISION DIRECTOR, SINGLE FAMILY DIVISION	ISSUE DATE: February 10, 1998
	REVIEW DATE: February 10, 2001

SUBJECT:	1. Item Description	Field Constructed Precut Log Housing System
	2. Name and address of Manufacturer	Real Log Homes P.O. Box 202 Hartland, VT 05048

This Structural Engineering Bulletin (SEB) should be filed with other SEBs and related Bulletins on materials or products as required by prescribed procedures.

The technical description, requirements and limitations expressed herein do not constitute an endorsement or approval by the Department of Housing and Urban Development (HUD) of the subject matter, and any statement or representation, however made, indicating approval or endorsement by HUD is unauthorized and false, and will be considered a violation of the United States Criminal Code, 18 U.S.C. 709.

NOTICE: THIS BULLETIN APPLIES TO DWELLING UNITS BUILT UNDER HUD HOUSING PROGRAMS. NON-HUD INSURED UNITS MAY OR MAY NOT BE IN CONFORMITY WITH THE REQUIREMENTS OF THE HUD MINIMUM PROPERTY STANDARDS.

Any reproduction of this Bulletin must be in its entirety and any use of all or any part of this Bulletin in sales promotion or advertising is prohibited.

1. General:

This Bulletin sets forth specific requirements under the Technical Suitability of Products Program for determining the eligibility of housing to be constructed under HUD mortgage insurance, or other HUD housing programs.

2. Scope:

This Bulletin applies only to the structural features of this method of construction. Final determination of eligibility is made by the appropriate HUD Field Office. Other factors considered by the Field Office will be valuation, location, architectural planning and appeal, mechanical equipment, thermal characteristics, and market acceptance. Consideration is also necessary to determine whether a specific property will qualify under the specific HUD program, when constructed according to the method outlined in this Bulletin, and where the structure is to be located.

In geographical areas subject to hurricanes, earthquakes, or other severe conditions affecting dwelling structures, the HUD Field Office shall require additional safeguards in proposed design, when necessary.

3. Minimum Property Standards (MPS):

Compliance with HUD MPS will be determined by the HUD Field Office on the same basis as submissions involving conventional construction, except for the special features described in this Bulletin.

4. Inspection:

Field compliance inspections covering conventional items of construction, and any special features covered in this Bulletin shall be made in accordance with prescribed procedures.

The appropriate HUD Field Office shall furnish a copy of a HUD field inspection report to Headquarters, Manufactured Housing and Standards Division, Office of Consumer and Regulatory Affairs, when there is:

a. Evidence of noncompliance with any portion of the system of construction described in this Bulletin.

b. Faulty shop fabrication, including significant surface defects.

c. Damage to shop fabricated items or materials due to improper transportation, storage, handling, or assembly.

d. Unsatisfactory field workmanship or performance of the product or system.

e. Any significant degradation or deterioration of the product or evidence of lack of durability or performance.

Periodic plant inspections will be made by HUD Field Office personnel in accordance with prescribed procedures. Factory inspection reports shall be submitted to HUD Headquarters, upon request.

5. Certification:

The manufacturer named in this Bulletin shall furnish the builder with written certification stating that the product has been manufactured in compliance with the HUD Minimum Property Standards (MPS), except as modified by this Bulletin. The builder shall endorse the certification with a statement that the product has been erected in compliance with HUD MPS except as modified by this Bulletin, and that the manufacturer's certification does not relieve the builder, in any way, of responsibility under the terms of the Builder's Warranty required by the National Housing Act, or under any provisions applicable to any other housing program. This certification shall be furnished to the HUD Field Office, upon completion of the property.

OUTLINE DESCRIPTION, CATEGORY II CONSTRUCTION

GENERAL:

Field constructed dwellings using shop-milled interlocking log wall building system and conventional construction features are furnished in this method of construction. Log walls may be used as interior or exterior loadbearing or non-loadbearing walls. Floor and roof framing members may be log floor joists and girders, log roof rafters or conventional wood construction.

This Bulletin is based on a structural review of the log building system as provided by Real Log Homes, including the shop fabricated components and installation requirements of this company. Foundation design and nonstructural items (such as architectural, plumbing, heating and electrical features) are not covered by this Bulletin.

All materials and methods of installation shall be in accordance with HUD Minimum Property Standards, Use of Materials Bulletins (UM), and Materials Releases (MR), except as may be specifically noted herein.

SPECIFICATIONS:

Form HUD-92005, "Description of Materials" specifying only the structurally related items (Nos. 1 to 12, 14, 26 and 27), as submitted for review for determination of technical suitability, describes the materials that shall be used in construction of housing units under this system of construction. Form HUD-92005, furnished with each application for use under HUD housing programs, shall include as a minimum the same structural materials.

DESIGN LOADS:

The method described in this Bulletin is based on maximum design loads of 50 psf for snow, Seismic Zone 4, and a Basic Wind Speed of 80 mph and Exposure C (American Society of Civil Engineers Standard 7-88). Structural calculations shall be submitted to the local HUD Field Office if housing units are to be located in geographical areas where these conditions are exceeded.

Framing of Loadbearing Walls: Wood-to-wood connections shall be provided between bearing walls and roof/ceiling or floor construction. Floor covering, including carpeting and vinyl tile, shall not be continued under loadbearing walls.

Roof Construction: Trussed rafters, if used, shall be designed and constructed in accordance with ANSI/TPI 1-1995 Standard (American National Standards Institute and Truss Plate Institute), "National Design Standard for Metal Plate Connected Wood Truss Construction."

DRAWINGS:

The following drawings Real Log Homes shall be considered an integral part of this Bulletin:

Drawing No.	Date	Description
	Shire Model No. 153	
1 of 5	4/18/86	Elevations
2 of 5	4/17/86	Elevations
3 of 5	4/18/86	Floor Plans
4 of 5	4/17/87	Found/Framing Plans
5 of 5	4/17/87	Ceiling Joist/Rafter Plans
	Shire Typical (old) Details	
1 of 36	5/2/81	Wall Logs
2 of 36	11/16/81	Window Foam Details
4 of 36	10/28/81	Found/First Floor Framing Details
5 of 36	8/17/81 Rev.	Framing Connections
6 of 36	9/12/81 Rev.	Framing Connections
11 of 36	5/18/81 Rev.	Setting Allowance
20 or 36	8/31/81 Rev.	Gusset Bracing
26 of 36	8/17/81 Rev.	Roller & Ridge Beam
28 of 36	11/12/81	Gambrel Roof Details
32 of 36	10/10/81 Rev.	Dormer A-Frame
33 of 36	11/23/81	Gambrel Dormer Details
36 of 36	4/11/81	Typical Details

Plymouth A Model No. 140

1 of 9	3/5/87	Elevations
2 of 9	1/6/86	Elevations
3 of 9	3/5/87	First Floor Plan
4 of 9	1/6/87	Second Floor Plan
5 of 9	3/5/87	Foundation Plan
6 of 9	3/5/87	First Floor Framing Plan
7 of 9	3/5/87	Girder & Joist Plan
8 of 9	3/5/87	Lower Rafter Plan
9 of 9	3/5/87	Upper Rafter Plan

The Builder shall submit construction drawings to the local HUD Office with each application under HUD housing programs, which shall include the same or similar structural features as shown on the drawings listed above. Copies of these listed drawings shall also be furnished to the local HUD Office by the Builder upon request. Drawings submitted to the local HUD Office shall bear the seal and the signature of a registered architect or a professional engineer.

LOG GRADING AND GRADING RULES:

Logs used as wall elements, truss elements, and beams are graded as "Wall-Logs" or "Sawn Round Timber Beams", in accordance with ASTM D 3957-90, "Standard Methods for Establishing Stress Grades for Structural Members Used in Log Buildings." Certification that logs are graded in accordance with ASTM Specification D 3957-90 must be provided. Grading rules defining wall-log profile, limiting characteristics and allowable stresses are required, with data justifying those stresses.

All logs shall be identified by the grademark and/or Certificate of Inspection of a recognized grading association or of an independent lumber-grading inspection agency authorized to grade the species. Dimension lumber is graded and marked in accordance with PS 20-94 American Softwood Lumber Standard.

LOG GRADES:

Specific structural conditions (open span logs) - Beam (Select) Grade
Headers and openings (open span logs) ---------- Header (No. 1) Grade
Loadbearing and exterior wall logs ---------- Wall (No. 2) Grade
Non-loadbearing interior wall logs ---------- Utility (No. 3) Grade

SPECIAL CONSTRUCTION FEATURES:

Wall-Logs General: Species shall be the following: Eastern White Pine, Southern Yellow Pine, Lodgepole Pine, Ponderosa Pine, Idaho White Pine, White Fir, Douglas Fir, Western Red Cedar, Atlantic White Cedar, Incense Cedar or Redwood.

Logs are planed to a depth of 6 1/16" (top flat surface to bottom surface) with a 3/4" top tongue and 7/8" bottom groove. Logs are stacked and spiked together in accordance with the reference drawings.

Shrinkage Allowance: Design shall account for total shrinkage and differential shrinkage of log walls. The amount and nature of shrinkage varies depending on log profile, species, moisture content and other factors. Shrinkage allowance is to be provided at windows, doors, interior walls and other areas that may be adversely affected. Submittals for a specific project shall include proper shrinkage allowance details.

Preservation: Exterior wall logs shall be pressure treated using chromated copper arsenate (CCA) or any other method using approved preservative to resist insects and decay. Exterior wall logs shall be protected against moisture using an approved water-repellent preservative. All joints, saw cuts, deep checks and major surface cracks shall be sealed with caulk or other material against moisture intrusion. Areas which can collect moisture, such as lapped corners, shall be caulked against moisture intrusion or have adequate ventilation to remove any trapped moisture. The method of treatment shall be submitted to the local HUD Field Office for review and acceptance.

MANUFACTURING PLANTS:

Housing units covered under this Bulletin will be produced in the following plants:

Southwest Manufacturing, Inc.
P.O. Box 989
Highway 71, South
Mena, AR 71953

Vermont Log Buildings, Inc.
P.O. Box 202
Depot Road
Hartland, VT 05048

Northwest Manufacturing, Inc.
P.O. Box 8509
Futurity Drive
Missoula, MT 59807

The Little Rock, Helena, and Burlington HUD Offices will inspect the above plants in accordance with prescribed procedures.

QUALITY CONTROL:

The HUD Field Office in whose jurisdiction the manufacturing plant is located shall review and approve plant fabrication procedures and quality control program, to ensure compliance with approved plans and specifications. The quality control program

includes field erection with crews either employed, trained, or supervised by the manufacturer or its representative. For purposes of this paragraph, such training shall consist of, but not be limited to, an obligation on the part of the manufacturer or its representative to supply construction drawings with all appropriate, referenced details, a written and illustrated guide to recommend construction techniques and a minimum of four hours of on-site technical assistance. All drawings and recommended procedures supplied will, with regard to floor and roof systems, be in compliance with specification and HUD Minimum Property Standards and will, in conjunction with the minimum of four hours of on-site technical assistance, illustrate and explain the connection of conventional materials to log components. The manufacturer or its representative shall certify that the above minimum obligations have been met.

The manufacturer or its representative shall certify and approve the:

1. Proper erection of log walls and components;

2. Other structural components in floor and roof systems for compliance with specifications and HUD Minimum Property Standards; and

3. Connection of conventional building materials to log components.

RECORD OF PROPERTIES:

The manufacturer shall provide a list of the first ten properties in which the component or system described in this Bulletin is used. The list shall include the complete address or description of location, and approximate date of installation or erection. Failure of the manufacturer to provide HUD with the above information may result in cancellation of this Bulletin.

NOTICE OF CHANGES:

The manufacturer shall inform HUD in advance of changes in production facilities, transportation, field erection procedures, design, or materials used in this product. Further, HUD must be informed of any revision to corporate structure, change of address or change in name or affiliation of the prime manufacturer. Failure of the manufacturer to notify HUD of any of the above changes may result in cancellation of this Bulletin.