DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT Housing - Federal Housing Commissioner	STRUCTURAL ENGINEERING BULLETIN NO. 1072 Rev. 5 (Supersedes issue dated September 11, 2002)
TO: DIRECTORS, SINGLE FAMILY HOCs DIRECTORS, MULTIFAMILY HUBs	ISSUE DATE June 12, 2007
	REVIEW DATE June 12, 2010

SUBJECT:	1. Item Description	THERMASTRUCTURE®/WALLFRAME™ BUILDING SYSTEMS Steel Channel, Foam Core, Wall and Roof Panels
	2. Name and address of Manufacturer	THERMASTEEL Corporation 609 West Rock Road Radford, VA 24141

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 CONFORMINTY 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.

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 designs, 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, FHA Standards, Office of Manufactured Housing Programs, when there is:

a. Evidence of noncompliance with portions 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 or State Agency personnel in accordance with their 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 a 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 the 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:

Shop fabricated foam core with steel channel, load bearing wall and roof panels for one- and two-story dwellings are furnished in this method of construction.

Panels are transported to the building site where they are assembled with conventional construction, and may include various types of interior and exterior finish materials. All materials and methods of installation shall be in accordance with HUD Minimum Property Standards (MPS), Use of Materials Bulletin (UM), and Materials Releases (MR), except as may be specifically noted herein. Plumbing, heating and electrical systems are field installed.

This Bulletin is based on a structural review of RADVA Corporation's THERMASTRUCTURE® One-Story Three Bedroom with/Loft Model and Two-Story "Family Housing Construction", but may be considered applicable to all structurally similar units of this company. Foundation design and nonstructural items (such as architectural, plumbing, heating and electrical features) are not covered by this Bulletin.

SPECIFICATIONS:

Form HUD-92005, "Description of Materials" specifying only the structurally related items (Nos. 1 to 12, 14, 26 and 27), as originally submitted for technical suitability determination, 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.

DRAWINGS:

The following drawings by RADVA for the one story with loft model and drawings by Ed. Zublin A.G. for the two-story family housing construction shall be considered an integral part of this Bulletin:

Drawing No.	Date	Description

One-Story 3 BR w/Loft Model (RADVA Dwgs)

A-1	12/12/83	Floor Plan
A-2	12/12/83	Elevations
A-3	12/12/83	Sections, Details
A-4	12/12/83	Wall and Roof Panels Elevations and Schedules
A-5	04/18/88	Panel Details

Two-Story Family Housing Construction (Zublin Dwgs)

A-2	09/08/87 Rev.	Floor Plans 3BR JNCO
A-6	09/08/87 Rev.	Elevations 3BR JNCO
A-10	09/10/87 Rev.	Sections
A-17	09/08/87 Rev.	Typ. Party Wall Sections
A-18	09/08/87 Rev.	Typ. Wall Roof Sections
A-23	09/10/87 Rev.	General Details
S-2	09/08/87 Rev.	Framing Plans, Structural Details
S-6	09/08/87 Rev.	Ext. Wall Panels, Wall Bracing
S-7	09/07/87 Rev.	Wall Panel Types
S-8	09/08/87 Rev.	Structural Details

The Builder shall submit construction drawings to the HUD Homeownership Center 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 HUD Homeownership Center by the Builder upon request.

SPECIAL CONSTRUCTION FEATURES:

Wall and Roof Panels: Panels consist of a polystyrene foam (1.0 pcf density for 5½" panels, 1.5 pcf for 3½" panels) with embedded vertical steel channels on the interior and exterior faces of the core, combined in a low pressure molding process into a load bearing panel. Horizontal steel shiplap strips on both sides, at the top and bottom of the panels are shop fastened onto the vertical channels. Sizes and details of the roof, standard wall panels, corner, door and window panels, headers, and interior partition panels are as shown on the reference drawings.

Steel strips shall be 24 ga., 37,000 psi minimum yield, Grade 37 in accordance with ASTM A 653-98. Protective coating shall be G-90 (galvanized) conforming to ASTM A 924-96. The steel strips are formed into channels or angles and are embedded or fastened to the panel during the manufacturing process. Sizes and locations of channels are shown on reference drawings. Horizontal strips may be added for securing accessories, fixture, etc.

The expanded polystyrene foam core is ARCO Polymers, Inc., M-77 or equal.

Wall panels are connected in the field by fastening together overlapping steel strips with No. 8 x 5/8" self-tapping metal screws @ 12" o.c. The panels are connected to a 2 x 4 wood sill plate and cap plates with 18 gage galvanized steel plates located at each vertical steel channel on each side of the panel.

Roof panels are connected to support beams by 6" galvanized steel spikes or screws, and galvanized clip angles. Spikes or screws go through the plywood roof sheathing and the metal channels of the roof panel, or the plywood sheathing is attached separately to the channels with screws.

DESIGN AND CONSTRUCTION REQUIREMENTS:

Design Loads: The construction for the One-Story 3BR, w/Loft Model described in this Bulletin is based on ASCE 7-88 maximum design loads of: 30 psf for snow, SeismicZone II and a Basic Wind Speed of 80 mph and Exposure C. The following allowable superimposed Load Table shall be used as a basis for structural designs submitted to the local HUD Office for the Two-Story Family Housing Construction and for housing units located in geographical areas where the above design loads are exceeded. Allowable loads include a safety factor of 2.5, except deflection loads are the lesser of the applied load at the allowable deflection or the maximum load divided by the 2.5 safety factor.

Allowable Superimposed Load Table

Roof Panels* :

Uniform Load	Span	Deflection / Span Ration (Short-term load test)
3 ½ " Roof Panels w/ [@ 16"o.c.:		
95 psf**	4'	L / 360**
95 psf**	4'	L / 240**
3 ½ " Roof Panels w/ [@ 24"o.c.:		
63 psf**	4'	L / 360
71 psf**	4'	L / 240**
5 ½ " Roof Panels w/ [@ 16"o.c.:		
53 psf**	6'	L / 360
63 psf**	6'	L / 240**
5 ½ " Roof Panels w/ [@ 24"o.c.:		
55 psf**	6'	L / 360**
55 psf**	6'	L / 240**

*Panels are 4' wide x 8' long for 4' spans, and 12' long for 6' spans (see wall panel table for L/240 at 8' span).

**Limited by failure load divided by 2.5 safety factor.

WALL PANELS* :

Panels*	Vert. Comp. Uniform (Axial) Load (plf)	Horiz. (Lateral) Uniform Load (psf) L/240	Racking Shear Load (plf)			Mid-Point Concent. Load (lbs)
				Deflection		
			**Max.	1/8"	L/480 (0.02")	
3 ½" w/ [@ 16" o.c	1,300 plf	27.9 psf	354	162	216	2,646 lbs.
3 ½" w/ [@ 24" o.c	1,033 plf	20.5 psf	248	107	144	2,646 lbs.
5 ½" w/ [@ 16" o.c	.,868 plf	42.3 psf	311		201	2,646 lbs.
5 ½" w/ [@ 24" o.c	.,067 plf	21.8 psf	243	63	100	2,942 lbs.
3 ½" Window, w/[Wood Surround	1,130 plf					2,667 lbs.
3 ½" Window, w/[Surround	800 plf					
3 ½" Door	.,130 plf					1,866 lbs.
3 ½" Corner	.,300 plf		320			5,200 lbs.
10 1/4" Party Wall	3,567 plf	44.3 psf	403	312	403**	6,400 lbs.

*Panels are 4' wide x 8' high. For other sizes refer to manufacturer's test data or compute by engineering formulas.

**Limited by failure load divided by 2.5 safety factor.

FIRE PROTECTION:

The polystyrene foam core shall have a flame spread rating of not more than 75, and a smoke development rating of not more than 450 when tested in accordance with ASTM E-84. All interior surfaces are covered with ½" thick gypsum wallboard or equivalent material with a 15 minute finish (fire) rating.

NOTE: Caution shall be exercised in the use of foam plastics. If foam plastics are allowed to remain exposed or unprotected, they may, under some circumstances produce rapid flame spread, quick flashover, intense heat, dense smoke, toxic and flammable gases and may present a serious fire hazard. The manufacturer of the foam plastic or the Society of the Plastic Industry, Inc., shall be consulted for instructions to minimize the risk in the use of these products in manufacture and in construction.

Roof Construction: Trussed rafters 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."

MANUFACTURING PLANT:

Structural components covered under this Bulletin will be produced in the following plant:

THERMASTEEL Corporation
609 West Rock Road
Radford, VA 24141
(540) 633-5000

The Richmond HUD Office or HUD designated representative will inspect this plant in accordance with prescribed procedures.

QUALITY CONTROL:

The appropriate HUD Field Office or the State Agency (in Category III states) 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 shall include field erection or supervision by THERMASTEEL Corporation.

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 of materials used in this product. Further, the manufacturer must inform HUD 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.

EVALUATION:

This SEB shall be valid for a period of three years from the date of initial issuance or most recent renewal or revision, whichever is later. The holder of this SEB shall apply for a renewal or revision 90 days prior to the Review Date printed on this SEB. Submittals for renewal or revision shall be sent to:

U. S. Department of Housing and Urban Development
FHA Standards, Office of Manufactured Housing Program
451 7th Street, SW, Room 9168
Washington, DC 20410-8000

Appropriate User Fee shall be sent to:

U.S. Department of Housing and Urban Development
Miscellaneous Income – Technical Suitability of Products Fees
Bank of America
P. O. Box 198762
Atlanta, GA 30384-8762

The holder of this SEB may apply for revision at any time prior to the Review Date. Minor revisions may be in the form of a supplement.

If the Department determines that a proposed renewal or supplement constitutes a revision, the appropriate User Fee for a revision will need to be submitted in accordance with Code of Federal Regulations 24 CFR 200.934, "User Fee System for the Technical Suitability of Products Program", and current User Fee Schedule.

CANCELLATION:

Failure to apply for a renewal or revision shall constitute a basis for cancellation of the SEB. HUD will notify the manufacturer that the SEB may be canceled when:

conditions under which the document was issued have changed so as to affect production of, or to compromise the integrity of the accepted material, product, or system,

2. the manufacturer has changed its organizational form without notifying HUD, or

3. the manufacturer has not complied with responsibilities it assumed as a condition of HUD's acceptance.

However, before cancellation, HUD will give the manufacturer a written notice of the specific reasons for cancellation, and the opportunity to present views on why the SEB should not be canceled. No refund of fees will be made on a canceled document.

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This Structural Engineering Bulletin is issued solely for the captioned firm, and is not transferable to any person or successor entity.

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