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| <p style="text-align: center;">DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT Housing—Federal Housing Commissioner</p> <p>TO: DIRECTOR, HOUSING DIVISION DIRECTOR, MULTIFAMILY DIVISION DIRECTOR, SINGLE FAMILY DIVISION</p> | <p>STRUCTURAL ENGINEERING BULLETIN NO. 1125</p> |
| | <p>ISSUE DATE: July 7, 1997</p> |
| | <p>REVIEW DATE: July 7, 2000</p> |
| <p>SUBJECT: 1. Item Description Shop Fabricated Foam Core Sandwich Panels</p> <p>2. Name and address of Manufacturer Enercon Products Company P.O. Box 625 6850 McNutt Road Santa Teresa, NM 88008</p> | |

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 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, Manufactured Housing and Standards Division, Office of Consumer and Regulatory Affairs, 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 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:

Shop fabricated foam core sandwich roof, exterior wall, and floor panels for one story dwellings are furnished in this method of construction. Panels consist of oriented strand board (OSB) skins and polystyrene foam cores. Panels are transported to the building site where they are connected together.

Conventional construction 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, Use of Materials Bulletin (UM), and Materials Releases (MR), except as may be specifically noted herein. Plumbing, heating and electrical systems are shop installed and field connected.

This Bulletin is based on a structural review of Enercon Products Company, Model 1200 option "A". 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 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.

DRAWINGS:

The following drawings by Enercon Products Company shall be considered an integral part of this Bulletin:

| <u>Drawing No.</u> | <u>Date</u> | <u>Description</u> |
|--------------------|-------------|--|
| Sheet 1 of 2 | 6/18/96 | Floor Plan and Elevations |
| Sheet 2 of 2 | 6/18/96 | Foundation Plan, Roofing Plan and Details |

The Builder shall submit construction drawings to the HUD Field Office with each application under HUD housing programs, which shall include the same or similar structural features shown on the drawings listed above. A professional engineer, licensed in the appropriate State, shall prepare plans and construction details for specific projects and geographical conditions. Copies of the listed drawings shall also be furnished to the HUD Field Office by the Builder, upon request.

SPECIAL CONSTRUCTION FEATURES:

General: The Enercon foam core sandwich building panels are maximum 16 feet (4.8m) long and 4 feet (1.2m) wide. The core thicknesses of the EPS is 3 5/8, 5 5/8, 7 5/8, 9 5/8 and 11 3/8 inches. The panels can be used individually or may be connected to form larger sections and assemblies. The facing thickness of the oriented strand board (OSB) panel is 7/16" or 3/4".

Facings, Foam Core and Adhesive: Panels consist of two layers of OSB facings. OSB facing must bear the stamp meeting the requirements of Performance Standard, PS 2 with Exposure 1.

The expanded polystyrene (EPS) core material has a density of 1.0 pcf, Type I, flame modified polystyrene insulation board in accordance with ASTM C 578-95. Skin shall be bonded to the foam core with King Adhesives Corporation water paste duct liner adhesive. Product #11-279.

Field Assembly: Wall panels for one-story dwellings and one-story dwellings with loft, roof panels spanning up to 8', and the Enercon foam panels are connected to each other at the panel edges by using thermal break wood splines. The splines are mechanically fastened using 8d box nails or 1 1/2" staples or 1 1/2" screws at 8 - 12" o.c. The top and bottom plates of the panel are dimension lumber sized to match the core thickness and are installed using adhesive, and 8d box nails at 6 - 12" o.c. or 1/2" anchor bolts at 48" o.c. on concrete slab or approved equal. An EPS latex caulk is applied along the base plate prior to the panel placement.

Openings: Openings for doors or windows shall be a minimum of 6" from edge of the panel. If doors or windows exceed 36" width, conventional frame 2x header shall be provided.

DESIGN AND CONSTRUCTION REQUIREMENTS:

Design Loads (Allowable Superimposed Loads): Each structure built using Enercon panels shall be certified by a registered architect or engineer.

Enercon Panels
3 5/8 to 11 3/8 inch EPS Cores
7/16 or 3/4 inch OSB Facings
8 feet Height

Transverse Load
30 psf (1440 Pa)

Combined Axial and Transverse Load
Axial 1000 lb. per 4 foot wall section (4500 N/1.2m)
Transverse 30 psf (1440 Pa)

Racking Load
229 plf (3.34 kN/m)

Compressive Load
3333 plf (226 kN/m)

Notes:

1. The allowable loads are the result of failure loads divided by a factor of safety of three.
2. Panels are framed with 2 x 's at 4' - 0" o.c. and single 2 x 's at the panel edges as end blocking.

Enercon Panels
5 5/8 inch EPS cores
3/4 inch OSB top facing
7/16 inch OSB bottom facing
Span less than 8 feet

Uniform Floor Live Load
40 psf (1920 Pa)

Note: Design is in accordance with Engineered Wood Association (American Plywood Association) sandwich panel analysis.

Fire Protection and Interior Finish: 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 ceilings and wall surfaces are covered with 1/2" thick gypsum wallboard or equivalent material with a 15-minute finish (fire) rating.

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 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:

Shop fabricated foam core sandwich roof, wall and floor panels covered under this Bulletin will be produced in the following plant:

Enercon Products Company
6850 McNutt Road
La Union, NM 88021
(505) 589-9873

The New Mexico State HUD Office will inspect the above plant 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, and shall report to HUD Headquarters in accordance with outstanding instructions. The quality control program shall include field erection and supervision by Enercon Products Company.

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 HUD Headquarters. Appropriate User Fee shall be sent to:

U.S. Department of Housing and Urban Development
Technical Suitability of Products Fees
P.O. Box 954199
St. Louis, MO 63195-4199

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:

1. 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.

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