

*Description of*

**ENDURA<sup>TM</sup>**

*Insulation*

**SouthWest Management**

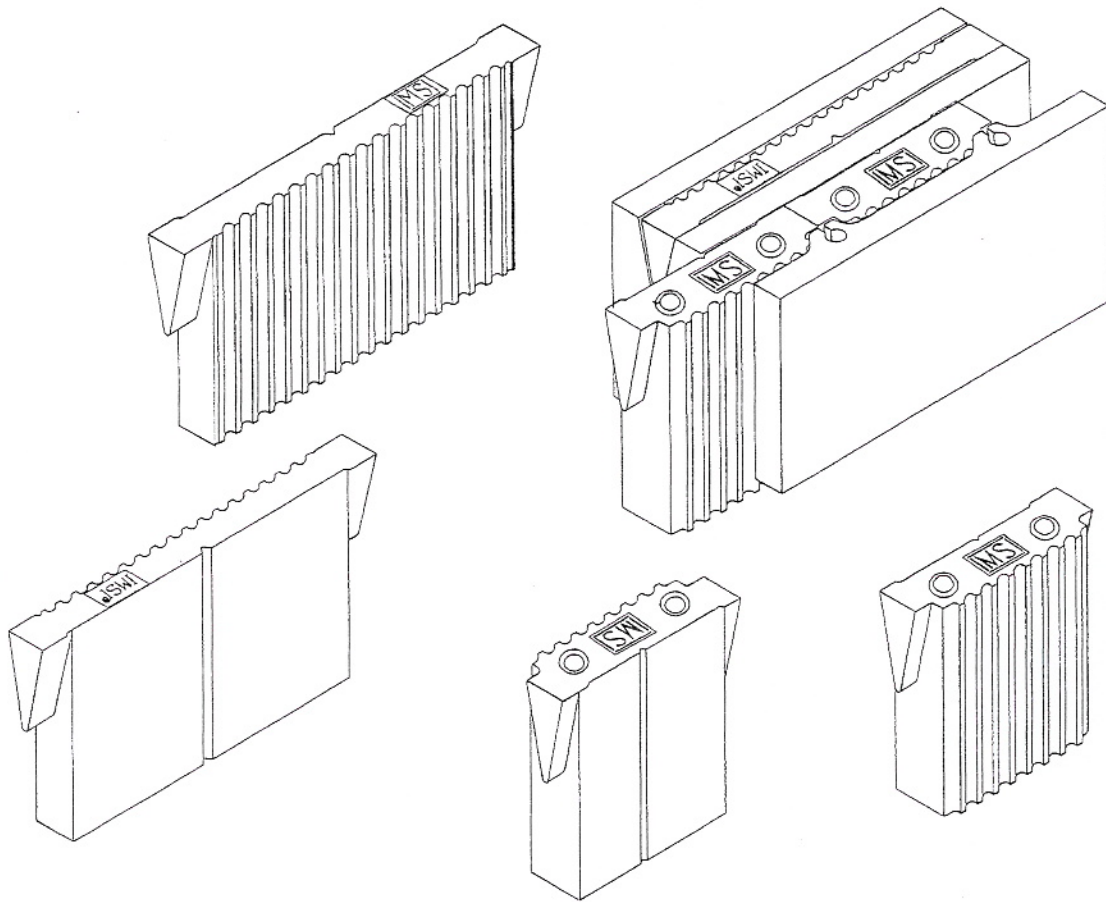
532 East 800 North

Orem, UT 84097

(801) 724-9870 Fax: (801) 802-8788



## The Insulation



There are two insulation insert sizes, long and short. One long insert fits in each long outer cell. Two short inserts fit in the inner cells, one centered in the block while the other interlocks into the next block in line. Short inserts are left out where cells are used for reinforcing rebar and grout. The inserts are installed by workers on the job-site as the walls are erected.

Where no reinforcing cells occur, the 8" CMU uses one long insert and two short inserts while the 12" CMU uses one long insert and four short inserts.

The inserts are molded with a score line ("V") down the middle of the flat side where they may be broken to fit half cores in the end block and beside window and door openings.



# Council of American Building Officials

BUILDING OFFICIALS AND CODE  
ADMINISTRATORS INTERNATIONAL, INC.

SECRETARIAT  
INTERNATIONAL CONFERENCE  
OF BUILDING OFFICIALS

SOUTHERN BUILDING CODE  
CONGRESS INTERNATIONAL, INC.

4051 West Flossmoor Road  
Country Club Hills, Illinois 60478

5360 South Workman Mill Road  
Whittier, California 90601

900 Montclair Road  
Birmingham, Alabama 35213

Report No. **NER-238**

Reissued February 1, 1992

THIS REPORT IS SUBJECT TO  
RE-EXAMINATION IN TWO YEARS

## NATIONAL EVALUATION REPORT

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### EXPANDED POLYSTYRENE THERMAL INSULATION SCOTT TYPE EPS M500, EPS M550 AND M590

SCOTT POLYMERS, INC.  
3607 NORTH SYLVANIA  
FORT WORTH, TEXAS 76111

I. **SUBJECT:** Expanded Polystyrene Thermal Insulation Scott Type EPS M500, EPS M550 and M590.

II. **PROPERTY FOR WHICH EVALUATION IS SOUGHT:** Surface burning characteristics.

III. **DESCRIPTION:** Expanded polystyrene nonstructural thermal-insulation boards are manufactured from expandable polystyrene beads designated as Scott Types EPS MA-500, MB-500, MC-500, EPS MA-550, MB-550, MC-550 or MA-590, MB-590, MC-590. The second letter of the designation is used to identify the size of the bead, and the number identifies the bead by its molecular weight.

Products are produced by introducing steam into a heating chamber containing the unexpanded beads. This process expands the beads, which are then molded into insulation products.

When manufactured to the densities and thicknesses shown in Table No. I, the manufactured boards yield the following flame-spread and smoke-developed ratings when tested in accordance with ASTM E 84.

TABLE NO. I

DENSITY (pcf)	THICKNESS (Inches)	FLAME SPREAD	SMOKE DEVELOPED
1	6 max.	5	85-130
1-2	6 max.	5	85-160

IV. **INSTALLATION:** Installation of insulation boards shall conform with a current evaluation report on foam plastic insulation board or shall be approved by the building official in accordance with the appropriate model code.

V. **IDENTIFICATION:** Each polystyrene bead container shall bear the manufacturer's name, address, bead identification, the name Underwriters Laboratories Inc. and NER-238.

VI. **EVIDENCE SUBMITTED:** 1. Follow-up service procedure and results of ASTM E 84 Flame-Spread and Smoke-Developed tests, contained in Underwriters Laboratories File No. R10302, dated July 19, 1989 and revised February 14, 1990.

2. Results of tests performed on manufactured insulation boards according to ASTM E 84 contained in Underwriters Laboratories File No. R10302, test reports, Project No. 89NK5411, dated September 29, 1989.

3. Letter from Underwriters Laboratories, dated July 15, 1991.

VII. **CONDITIONS OF USE:** The National Evaluation Service Committee finds that expandable polystyrene beads described in this report comply with or are an acceptable alternative to that specified in the 1990 BOCA National Building Code with the 1992 Accumulative Supplement, the 1991 Standard Building Code, and the 1991 Uniform Building Code, subject to the following condition:

Individual products manufactured from polystyrene beads described in this report, are not part of this report and are subject to additional evaluation. Also, evaluation of manufacturers who use Scott EPS Beads is beyond the scope of this report.

*This report is limited to the specific product and data and test reports submitted by the applicant in its application requesting this report. No independent tests were performed by the National Evaluation Service Committee, and the committee specifically does not make any warranty, either expressed or implied, as to any finding or other matter in this report or as to any product covered by this report. This disclaimer includes, but is not limited to, merchantability. This report is also subject to the limitation listed herein.*

# Underwriters Laboratories, Inc.®

## Mark for IMSI® Insulation

BRYX  
Foamed Plastic

March 30, 1994

INSULATED MASONRY SYSTEMS INC , SCOTTSDALE R14894 (N)  
AZ 85251

Foamed plastic in the form of shape molded parts.

Flame Spread 5#  
Smoke Developed 85-130#  
+Installed in a thickness or stored in an effective thickness, as indicated, for a density of 1.0 lb/cu ft.  
#Flame spread and smoke developed, recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 80 and smoke developed classification of 500 to over 500.

SUITE 1 7234 E SHOEMAN LN

LOOK FOR CLASSIFICATION MARKING ON PRODUCT

Replaces R14894 dated February 18, 1993.

835706001

Underwriters Laboratories Inc.®

A11/0229134

168



*Drawings of*

**ENDURA™**

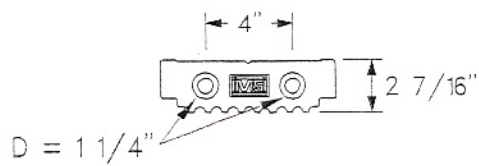
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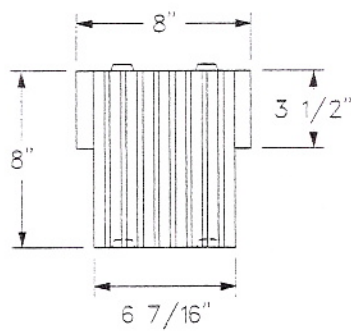
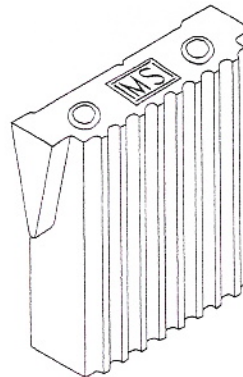


**ENDURA<sup>TM</sup>**

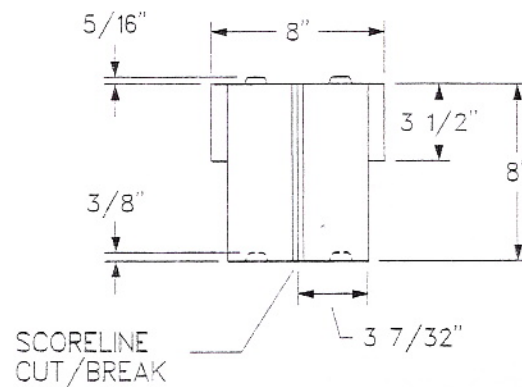
## SHORT INSULATION INSERT



TOP VIEW



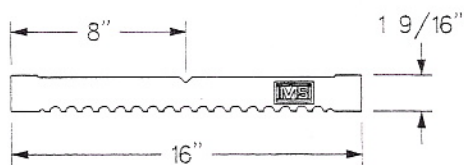
FRONT VIEW



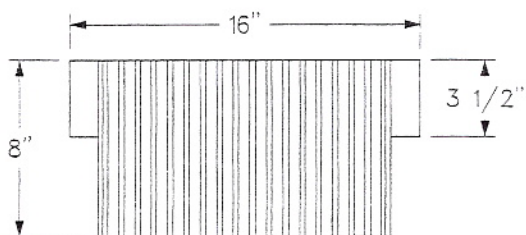
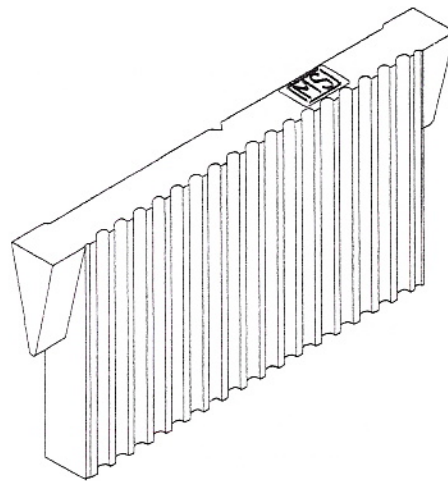
REAR VIEW

**ENDURA<sup>TM</sup>**

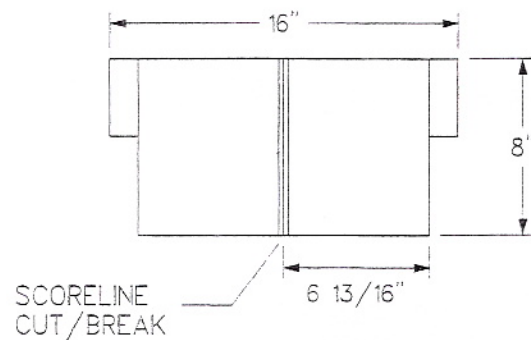
## LONG INSULATION INSERT



TOP VIEW



FRONT VIEW



REAR VIEW



*Description of*

**ENDURA<sup>TM</sup>**

*Structure Coat  
and  
Surface Bonding Cement*

**SouthWest Management**

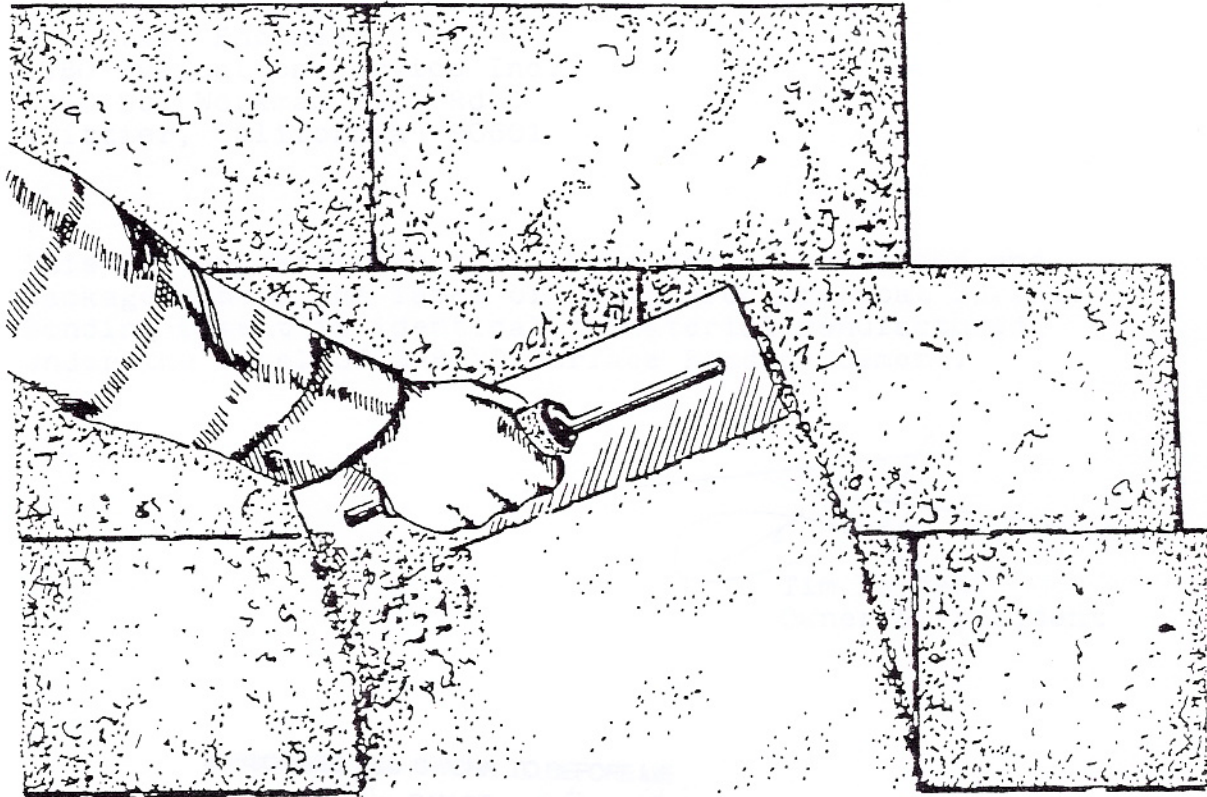
532 East 800 North

Orem, UT 84097

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## Structure/Coat® Surface Bonding Cement



Structure/Coat® Surface Bonding Cement is a mixture of Portland Cement, fine silica sand, chopped fiber glass fibers, chemical plasticizers and anhydrators. Structure/Coat® comes in 50# bags and needs only the addition of approximately 1½ gallons of water per bag to make stucco-like mix for trowel application.

Structure/Coat® is applied at a minimum thickness of 1/8" to **both**

**sides** of the wall. Different surface finishes such as skip-trowel exterior or smooth troweled interior may be achieved by skilled field craftsmen. No additional furring or other material need be applied to either side of the wall. Once Structure/Coat® is troweled to the desired surface appearance the wall is finished and may be left in its natural white or grey or may be painted.





## EVALUATION REPORT

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Report No. 3044

April, 1994

Filing Category: EXTERIOR COATINGS (060)

### Q-BOND

TIM LAYDEN  
POST OFFICE BOX 1481  
BROOMFIELD, COLORADO 80038

#### I. Subject: Q-Bond.

**II. Description:** A. **General:** Q-Bond consists of a proportional mixture of portland cement, hydrated lime, fiberglass reinforcing strands, fine sand, calcium stearate and water. The mixture is troweled onto both faces of hollow concrete block masonry in lieu of mortaring of head and bed joints. The Type "E" fiberglass strands have a length of approximately  $\frac{1}{2}$  inch and treated to resist the alkaline cement matrix. The minimum ultimate compressive strength at 28 days, when 2-inch cubes are tested, is 3,900 pounds per square inch. The ratio of water to the sacked dry mix material shall not exceed 0.25 by weight. Mineral oxides may be added to the mix to provide various colors as desired. No other materials are to be added to the mix in the field except water. The material is troweled to a minimum thickness of  $\frac{1}{8}$  inch on both faces of prestacked, running bond pattern, hollow unit masonry. The finished surface may be textured, starting with a smooth troweled surface, provided the minimum thickness is maintained and the prepared mix is unaltered. The material is considered weather resistive under Section 1708 of the code.

The walls are limited to supporting no more than a roof, with a maximum unsupported wall height of 8 feet. Where gable roof construction occurs, the wall may extend above 8 feet, provided it is laterally stayed at the top and at maximum 8-foot intervals.

**B. Design:** 1. **Unreinforced Hollow Unit Masonry:** Walls with a running bond pattern may be designed as unreinforced masonry based on Section 2408 of the code, provided the wall height does not exceed the limitations set forth above. The allowable working stresses on the net cross-sectional area of 6-, 8-, or 12-inch-thick walls are as set forth in Table No. 1.

Bolt values in Tables Nos. 24-O-1, 24-D-2 and 24-M of the code for grouted masonry are not applicable unless the entire embedded portion of the bolt is set in grout.

2. **Reinforced Hollow Concrete Masonry:** The design of walls laid in running bond shall be based solely on the net section of grout in cells with a minimum  $f'_c$  of 2,000 pounds per square inch at 28 days. Design procedures may be based on working stress design of reinforced concrete. When higher values of  $f'_c$  are used, special inspection in accordance with Section 306 of the code is required. Grouting shall comply with Section 2404 (f). Coarse grout is required and shall comply with Section 2403 (d).

Higher strengths may be necessary depending on the  $f'_c$  used in design. Reinforced hollow unit masonry construction shall have horizontal and vertical wall reinforcing as required in Chapter 24 of the code. The vertical wall reinforcing is to have continuity with the footing wall or slab by dowels or other acceptable measures. Additional design criteria are as follows:

(a) For unsupported height considerations, the  $h/t$  factor may be based on the nominal thickness of the block walls, providing wall heights do not exceed those set forth above.

(b) The design procedure shall be based on the working stress design formulae included in Table No. 11 with the "d" dimension being the distance from the centroid of the reinforcing to the edge of the grouted cell in the direction of bending. The "b" dimension shall be the width of the grouted cell measured perpendicular to the direction of movement.

(c) Horizontal beams or lintels shall be precast concrete, mortared and grouted reinforced masonry or structural steel.

(d) No more than one vertical reinforcing bar with necessary splicing is permitted in a grouted cell unless the clearances and spacing comply with Sections 2404(e), 2407 (f), and 2409 (e) 1 and 2 of the code.

(e) Bearing areas for beams lintels or other concentrated loads shall be confined to the reinforced, grouted cells alone.

(f) Bolt values in the code for grouted masonry are not applicable to this type of construction, unless the entire embedded portion of the bolt is set in grout.

**C. Installation:** The hollow concrete masonry units shall comply with U.B.C. Standard No. 24-4 for Type N masonry. The first course of block is leveled and aligned in a full bed of Type S mortar on a concrete foundation; and all first course cells filled with grout complying with the code. As an alternate, the first course may be set in a bed of the surface coating material and grouted with the same material. See footnotes for Table No. 1 for allowable racking shear loads based on construction of the first block course. Subsequent block courses may be laid in a running bond pattern without mortar. Stack bond is permitted when the concrete masonry units are mechanically interlocked and horizontal steel is provided as required in Chapter 24. Corrugated metal or plastic shims are used to align individual block as necessary to keep the wall plumb. Head joints are butted as closely as possible. Window and door openings are formed by conventional construction procedures, including temporary shoring for lintel sections. All vertical wall reinforcement shall have continuity into the foundations by dowels or other approved methods.

The walls are braced laterally as necessary to maintain proper alignment and left until the surface coating is applied and cured. The material is mixed in strict compliance with the manufacturer's instructions to a trowelable mixture. If the mix becomes too stiff and difficult to apply, it may be retempered once within 60 minutes after the initial mixing.

The wall surfaces are thoroughly misted prior to applying the surfacing material to a uniform minimum thickness of  $\frac{1}{8}$  inch, with stopping points prearranged to avoid cold or lap joints in the center of a wall, unless specially designed. Cold joints may occur at wall corners, wall intersections, pilasters, or at special control joints. Designs shall not consider continuity across control joints or around corners. Each panel between control joints shall be considered isolated for design purposes. Special vertical control joints completely separating long walls may be spaced to reduce cracking due to expansion or contraction, provided differential movements normal

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to the wall surface are properly accounted for. Horizontal cold joints are not permitted except at midheight of a solidly grouted block course.

Concrete slabs or beams and/or steel beam ends may be embedded in walls, provided that portion of the wall is laid up with conventional mortar construction and fully grouted. This construction shall extend from at least 4 inches above the beam or slab to at least 4 inches below the beam or slab to develop continuity for the coating material. Bond beams may be incorporated in this area to act as the chords of diaphragms when required.

The coating is to be misted once with water within 24 hours after application and more often during windy or dry weather. The surface coating shall not be applied when the temperature exceeds 110°F. or falls below 40°F. and shall be protected with a moisture-proof cover if rain, snow or sleet is expected within 8 hours after application. Tops of all walls are to be protected from moisture intrusion during the curing period. The surface coating shall be carried down the exterior face of walls to provide weatherproof continuity with the footing or slab.

**D. Fire Resistance:** When 8- or 12-inch-thick lightweight three-cell hollow unit concrete block walls are laid in running bond with Q-Bond applied to both faces as described in this report, a two-hour load-bearing fire-resistant rating is permitted. The block must have a minimum equivalent thickness of 4.4 inches and be made of expanded shale.

**E. Identification:** The material is packed in 50-pound bags which indicate the manufacturer's name, net weight, product name, mixing and application instructions.

III. **Evidence Submitted:** Descriptive data and results of structural and fire tests.

### Findings

IV. **Findings:** That Q-Bond described in this report complies with the 1991 *Uniform Building Code*<sup>TM</sup>, subject to the following conditions:

1. Construction and design are in accordance with Chapter 24 of the code except as noted in this report.
2. Coarse grout as specified in Section 2403 (d) of the code is used for reinforced hollow unit masonry construction.
3. Fully reinforced construction is required in Seismic Zones Nos. 2, 3 and 4.
4. The material is assigned a two-hour fire-resistive classification when constructed in accordance with this report.
5. The walls are limited to supporting no more than a roof, with a maximum wall height of 8 feet. Where gable roof construction occurs, the wall may extend above 8 feet, provided it is laterally stayed at the top and at maximum 8-foot intervals.
6. The concrete masonry units must comply with U.B.C. Standard No. 24-4 for Type N masonry

1993 Accumulative Supplement to the U.B.C.: This report is unaffected by the supplement.

This report is subject to re-examination in two years.

TABLE NO. 1  
UNREINFORCED MASONRY

TYPE OF STRESS <sup>1</sup>		WITHOUT SPECIAL INSPECTION	WITH SPECIAL INSPECTION (Section 306)
Compression		75 psi	150 psi
Flexural tension	Vertical span	7 psi	14 psi
	Horizontal span	12 psi	24 psi
	Shear	7 psi	14 psi
Modulus of elasticity <sup>2</sup>		430,000 psi	860,000 psi
Racking shear for first course set in mortar and solidly grouted <sup>1</sup>		450 plf	900 plf
Racking shear for first course set in mortar but ungrouted <sup>1</sup>	6-inch wall	215 plf	430 plf
	8-inch wall	240 plf	480 plf
	12-inch wall	325 plf	650 plf

<sup>1</sup>Values are for walls without openings having a height-width ratio not exceeding one. Uplift forces are to be resisted by positive means such as embedded reinforcement. No increase in values for duration of load is permitted.

<sup>2</sup>Where determinations involve rigidity considerations in combination with other materials or where deflections are involved, the modulus of elasticity under "With Special Inspection" shall be used.

<sup>3</sup>The stresses are based on Type N masonry units complying with U.B.C. Standard No. 24-4 and having the following minimum properties.

NOMINAL WALL THICKNESS (Inches)	MINIMUM FACE SHELL THICKNESS (Inches)	MODIFIED DESIGN SECTION MODULES (Inches Cubed)	MODIFIED DESIGN NET AREA (Inches Squared)
6	1	52.8	27
8	1 1/4	90	33
12	1 1/2	174	39

NOTE: The section modulus and net area are based on two minimum-thickness face shells 12 inches long, plus an allowance for surface coating. No increase in properties is permitted for thicker face shells.



TABLE NO. II  
DESIGN STRESSES FOR GROUTED CELLS

DESCRIPTION	SYMBOL	FOR ANY STRENGTH OF $f'_c$ <sup>4</sup>
Modulus of elasticity ratio:	$n$	$\frac{29,000,000}{w^{1.5} 33 \sqrt{f'_c}}$
Flexure: $f_c$ Extreme fiber stress in compression	$f_c$	$0.45 f'_c$
Shear: $v$ (as a measure of diagonal tension at a distance "d" from the face of the support)	$v$	$1.1 \sqrt{f'_c}$
Shear in walls resisting other than seismic forces: <sup>1</sup> (Shear carried by grouted vertical cells)	$v_c$	$1.1 \sqrt{f'_c}$
Bearing: $f_c$ On full area On one third area or less <sup>2</sup> (Grouted cells only)	$f_c$	$0.25 f'_c$ $0.375 f'_c$
Shear in walls resisting seismic forces in buildings <sup>3</sup> Shear carried by grouted vertical cells only	$v_c$	$.45 \sqrt{f'_c}$

<sup>1</sup>The stresses indicated may be increased one third when caused by wind forces.

<sup>2</sup>This increase is permitted only when the least distance between the edges of the loaded and unloaded areas is a minimum of one fourth of the parallel side dimension of the loaded area. The allowable bearing stress on a reasonably concentric area greater than one third but less than the full area shall be interpolated between the values given.

<sup>3</sup>The stresses indicated may be increased one third when caused by seismic forces.

<sup>4</sup> $f'_c$  in excess of 2000 psi requires special inspection.



# Field Application