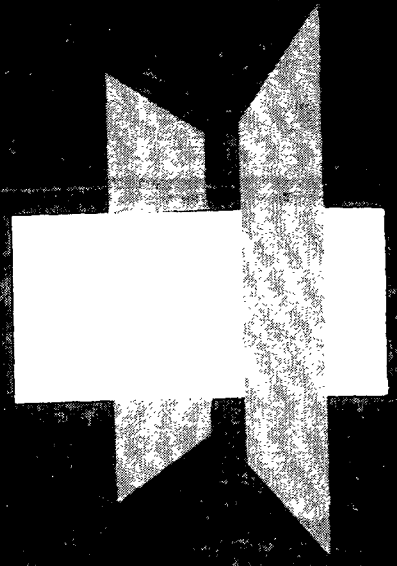
BESTWALL
GYPSUM PRODUCTS MANUAL



WALLBOARD
BOOK 2

GP GEORGIA-PACIFIC / BESTWALL GYPSUM DIVISION

PLAINTIFF'S EXHIBIT
GP-652

SGP 0028055

BESTWALL

GYPSUM PRODUCTS MANUAL

WALLBOARD

BOOK 2

SGP 0028056

GEORGIA-PACIFIC CORPORATION

BESTWALL GYPSUM DIVISION

1965 EDITION GYPSUM WALLBOARD PRODUCTS MANUAL

BOOK #1

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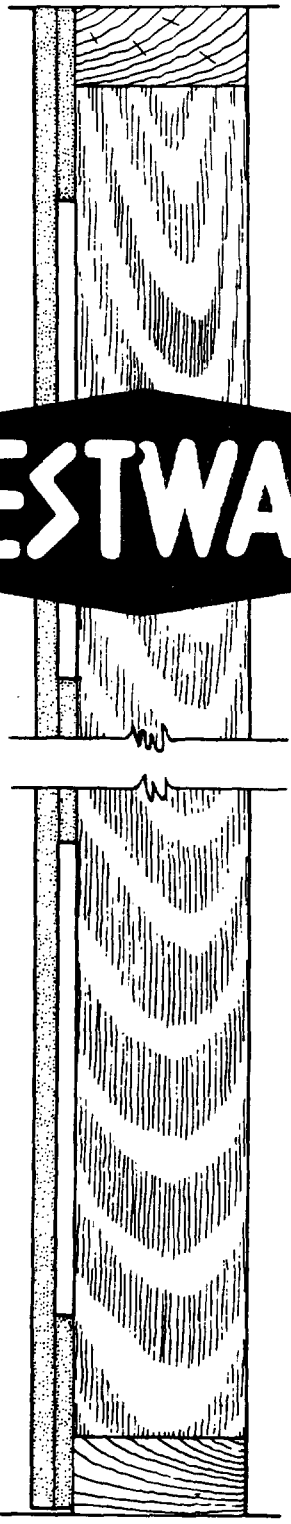
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BESTWALL SYSTEMS ENGINEERING

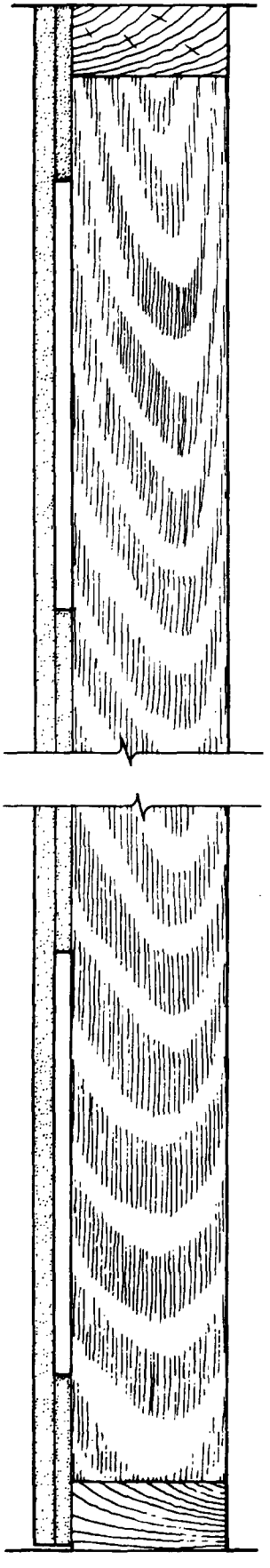
HUMMER SYSTEMS

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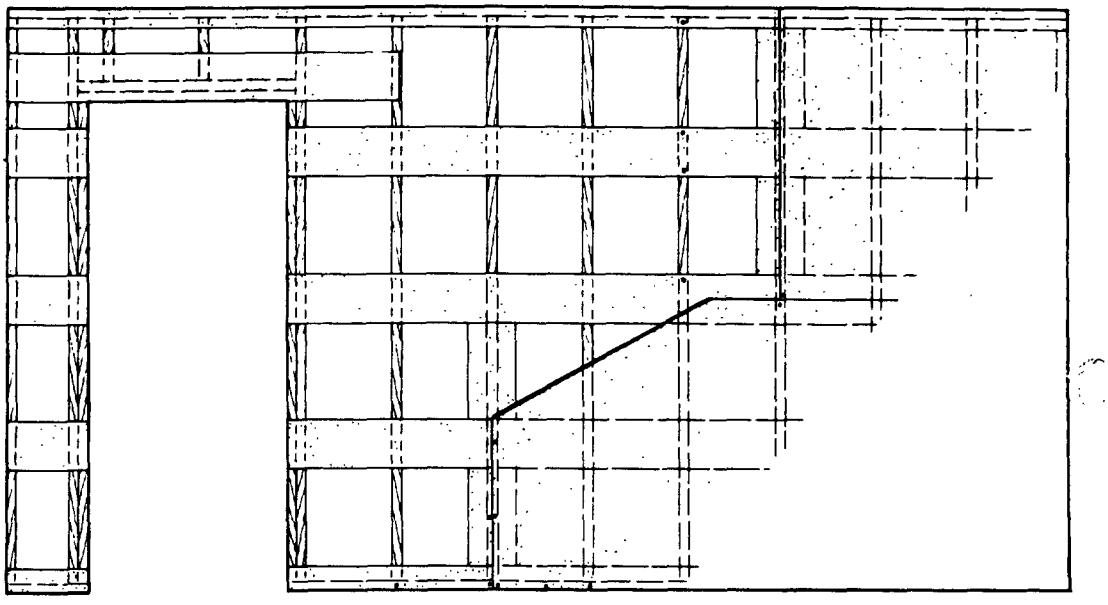
STRIP LAMINATION

This original strip laminated method of applying Bestwall Gypsum Wallboard provides nearly all the advantages of two-ply lamination at lower cost. Full size sheets of Bestwall Gypsum Wallboard are applied to the framing of walls and ceilings over strips of gypsum wallboard. The System is recommended for commercial and residential work in new construction or remodeling — wherever strong, durable walls and ceilings are desired.

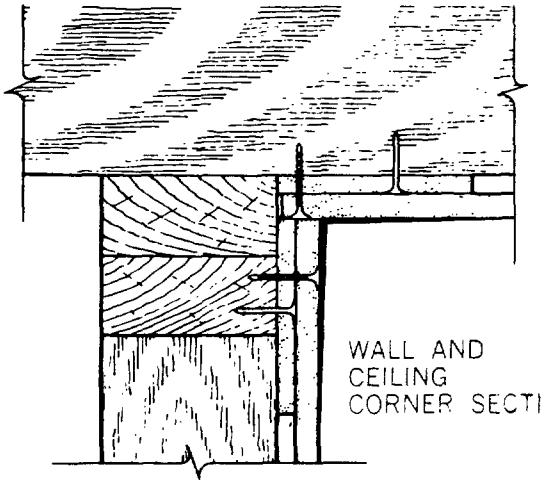
- SOUND TRANSMISSION—34 db.
- STRENGTH—Strip lamination at joining of boards and in center greatly strengthens construction.
- LAMINATED CONSTRUCTION—Smooth surfaces—monolithic finish.



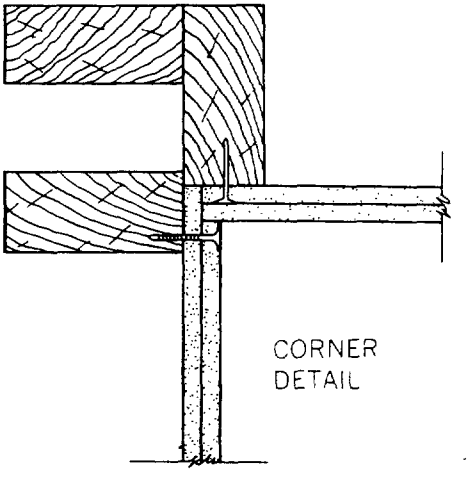
WALL SECTION



WALL ELEVATION SCALE 3/8" = 1'0"



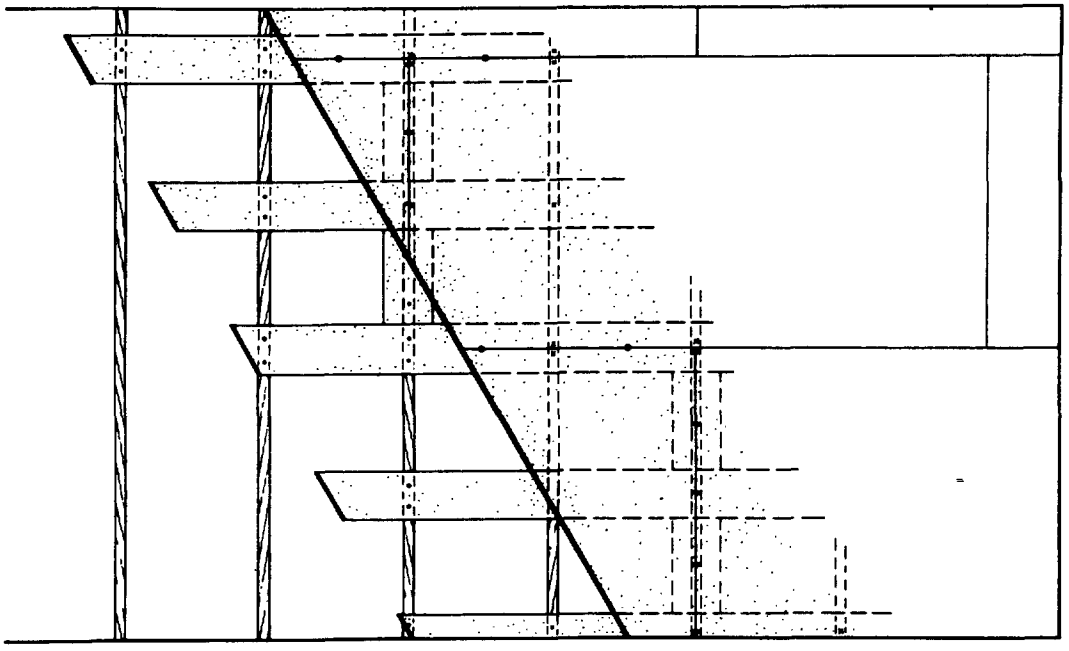
WALL AND CEILING CORNER SECTION



CORNER DETAIL

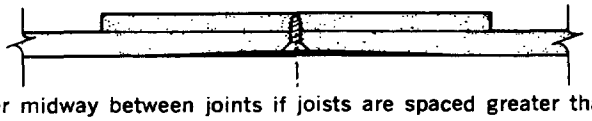
SCALE 3" = 1'0"

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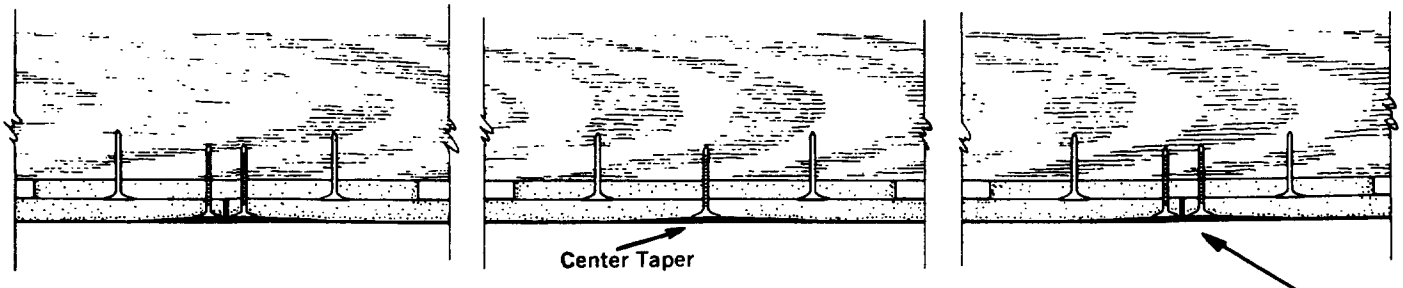


STRIP LAMINATED CEILING—Joist spacing 24" o.c.

NOTE: Screws may be eliminated if joist spacing is 16" o.c.



Center taper midway between joints if joists are spaced greater than 16" o.c.



CEILING CROSS SECTION PARALLEL TO JOISTS

SCALE 3" = 1'0"

BESTWALL HUMMER SYSTEMS

STRIP LAMINATION

FEATURES:

1. Sound Transmission Loss: . 34 Decibels (Tested before 1957).
2. Strength: . . . . . Strip lamination at joint of boards and in center greatly strengthens application.
3. Laminated Construction: . . Smooth monolithic walls created by unitized lamination of multi-plies of Gypsum Wallboard.

SPECIFICATIONS:

All gypsum wallboard and joint system materials used, including laminating compound, shall be manufactured by the Bestwall Gypsum Company and shall be installed by a Bestwall Hummer licensed contractor in a first-class workmanship manner.

FIRST (or back) LAYER (apply to ceilings first and then to sidewalls).

Backer Board: Use $\frac{3}{8}$" thick, 8" wide strips at right angles to the framing. 4" wide strips may be used at floor line and ceiling angles. 8" wide board strips should be spaced 24" o.c.

Nailing: Use $1\frac{1}{4}$"Drywall nails (or 1" long, flat head divergent point staples). Over metal framing use annular ring nail, serrated staple or Bestwall Drywall screws. Use two fasteners, each 1" from edge, in every nailer, back of strip. Nail heads (or staples) should be driven flush with the surface of the board.

DO NOT DIMPLE BOARD.

SECOND (or face) LAYER (apply to ceilings first and then to sidewalls).

Face Board: Use $\frac{1}{2}$" thick, 4' wide, 8' to 16' long, tapered edge Gypsum Wallboard (use wallboard with center taper on ceilings), applied at right angles to the framing. Make joints in face board centered over the 8" board strips.

Laminating Compound: See Bestwall Product Sheet BW-52355 Apply laminating compound to back of board in strips with serrated spreader or on strips on ceilings and walls with a machine glue spreader.

Face Nailing: Use $1\frac{5}{8}$" long, Drywall nail. Over metal framing use Bestwall Drywall screw. Do not dimple board for fasteners that are under tape or trim.

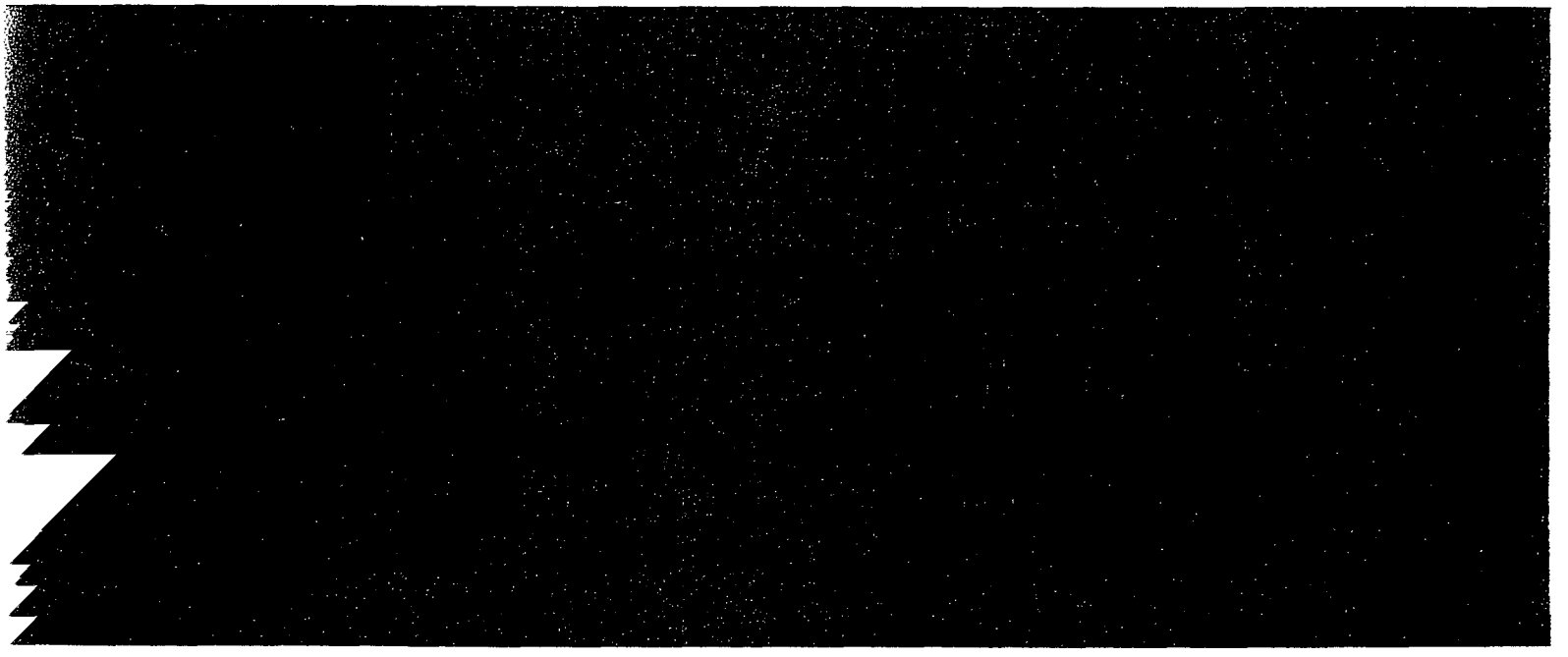
Ceilings: Nail in edges and center taper at every nailing member.

Sidewalls: Nail in edges only at every stud.

Additional Fasteners: Use Bestwall flat head screws in joints midway between joists or studs, if spaced more than 16" o.c. (as 24" o.c.).

Note: For sidewalls only use a double-headed nail in the center of the sheet at every other stud to hold face board tight to back strips until glue hardens.

Joint Treatment and Decoration: See Bestwall Product Sheet BW-52360.

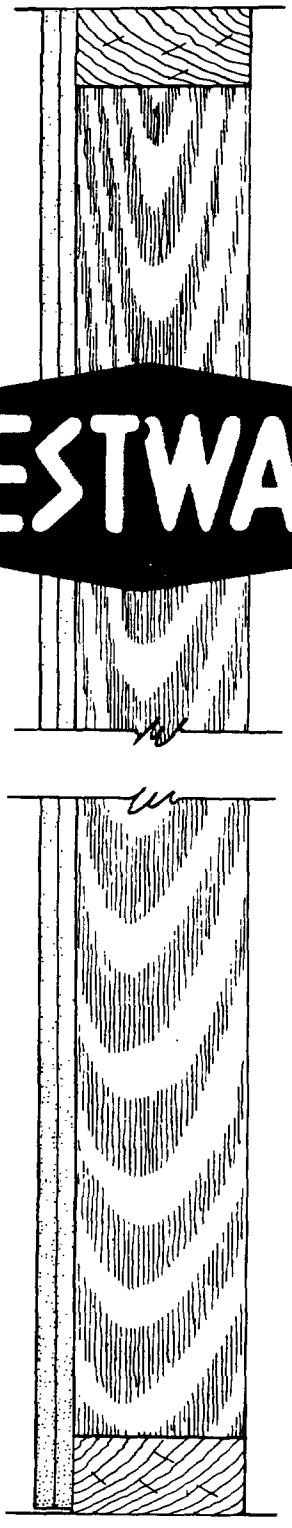


FIREPROOF GYPSUM BESTWALL BUILDING PRODUCTS

BESTWALL GYPSUM COMPANY

PAOLI, PENNSYLVANIA

SGP 0028062



BESTWALL

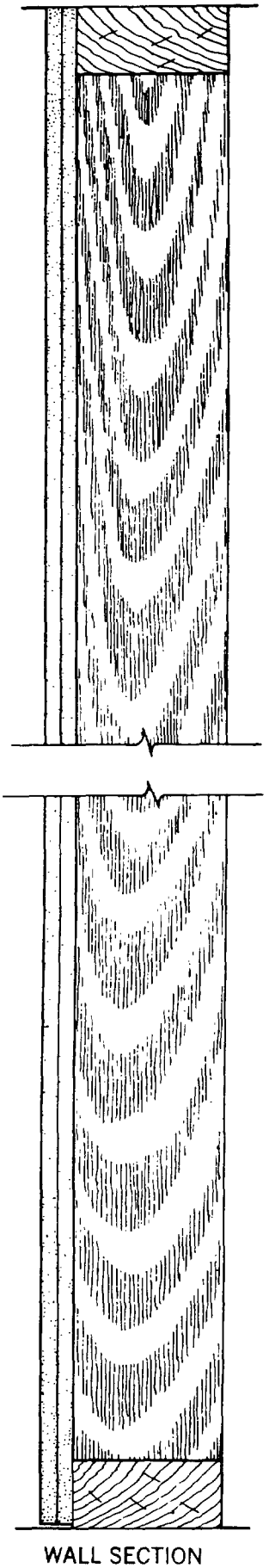
HUMMER SYSTEMS

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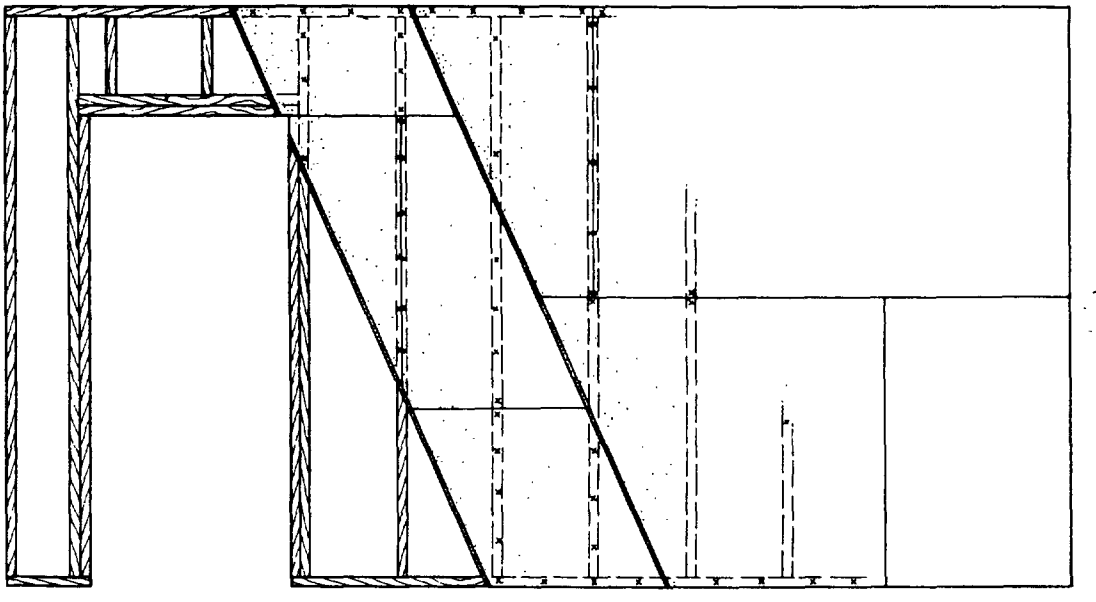
TWO-PLY GYPSUM LAMINATION

Two-Ply Lamination is an advanced system of wall and ceiling construction erected by laminating two plies of ⅜" Bestwall Glass Fiber Reinforced Gypsum Wallboard to conventional framing. The first ply is nailed. The second is applied with adhesive and nails. It is the basic system for fire rated, durable walls and ceilings for residential and commercial work in new construction or remodeling.

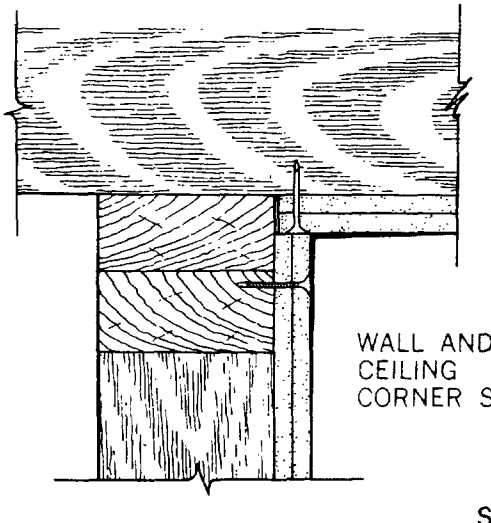
- FIRE RESISTANCE—One-Hour
- SOUND TRANSMISSION—38-43 db.
- STRENGTH—Two-ply lamination offers twice the strength of one-ply application.
- LAMINATED CONSTRUCTION—Smooth surfaces—monolithic finish.



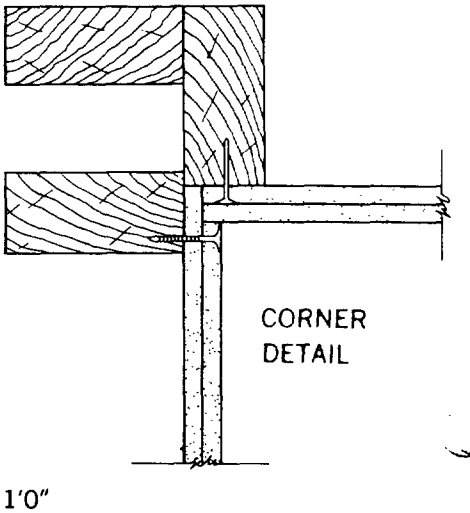
WALL SECTION



WALL ELEVATION SCALE ⅜" = 1'0"



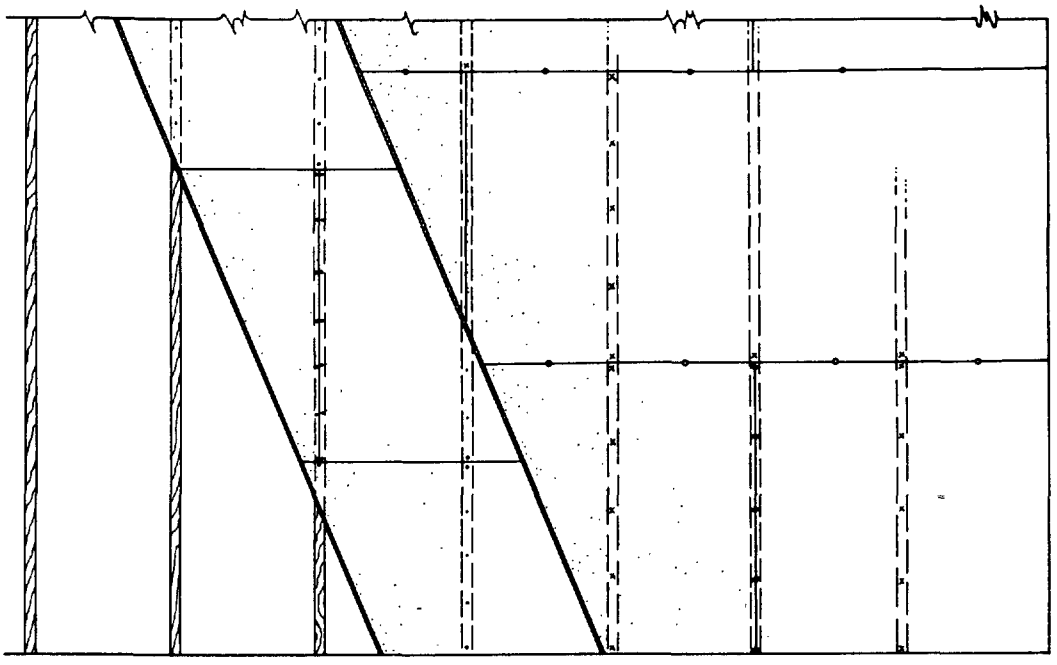
WALL AND CEILING CORNER SECTION



CORNER DETAIL

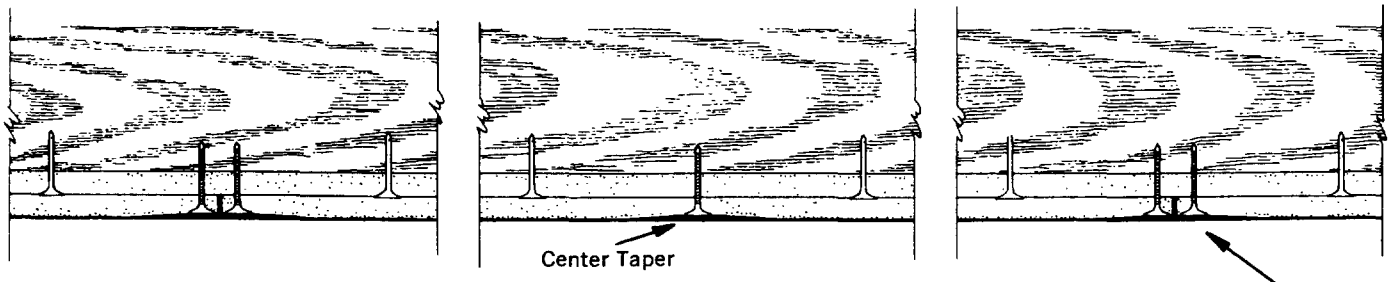
SCALE 3" = 1'0"

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TWO-PLY CEILING—Joist spacing 24" o.c.

NOTE: Screws may be eliminated if joist spacing is 16" o.c.



CEILING CROSS SECTION PARALLEL TO JOISTS

SCALE 3"=1'0"

BESTWALL HUMMER SYSTEMS

TWO-LAYER LAMINATION

FEATURES:

1. Fire Resistance: . . . . . One hour.

2. Sound Transmission Loss: .43 Decibels (Tested before 1957).
   38 Decibels (Tested 1958).

3. Strength: . . . . . Two-layer lamination has twice the strength of a single layer application.

4. Laminated Construction: . . Smooth monolithic walls created by unitized lamination of multi-plies of Gypsum Wallboard.

SPECIFICATIONS:

All gypsum wallboard and joint system materials used, including laminating compound, shall be manufactured by the Bestwall Gypsum Company and shall be installed by a Bestwall Hummer licensed contractor in a first-class workmanship manner.

FIRST (or back) LAYER (apply to ceiling first and then to sidewalls).

Backer Board: Use 3/8" thick, 4' or 2' wide, square edge gypsum backer, applied at right angles to the framing.

Nailing: Use 1¼" Drywall nails (or 1" long, divergent point staples). Ceiling spacing 5" to 7" o.c. Walls 6" to 8" o.c. Over metal framing use Bestwall Drywall screws or attachments recommended by metal framing manufacturing specifications.

DO NOT DIMPLE BOARD.

SECOND (or face) LAYER (apply to ceilings first and then to sidewalls).

Face Board: Use 3/8" thick, 4' wide, 8' to 16' long, tapered edge Gypsum Wallboard (use wallboard with center taper on ceilings) applied at right angles to the framing. Joints in face board must not occur over joints in the first layer board (spaced 12" min.). Do not dimple board for nails or screws that are under tape or trim.

Laminating Compound: See Bestwall Product Sheet BW-62355. Apply glue to back of face layer with serrated metal blade or to face of back layer with machine glue spreader.

Note: For applying face layer which has a vapor barrier predecorated finish, use a "contact type" adhesive.

Face Nailing: Use 1⅝" long Drywall nails.

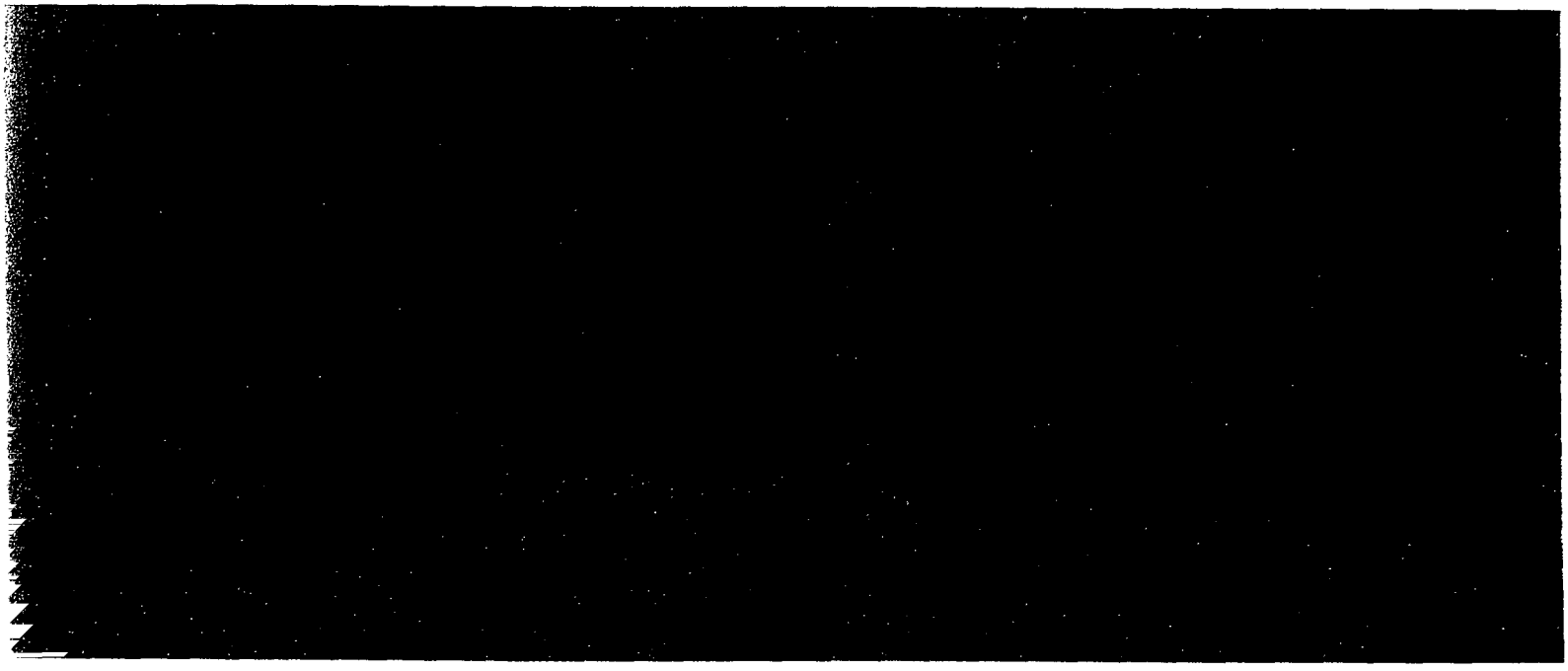
Ceilings: Nail in edges and center taper at every nailing member.

Sidewalls: Nail in edges only at every stud.

Additional Fasteners: Use Bestwall Drywall screws in joints midway between joists or studs, if spaced more than 16" o.c. (as 24" o.c.).

For sidewalls only, use a double-headed nail in the center of the sheet at every other stud to hold face board tight to back layer until glue hardens.

Joint Treatment and Decorating: See Bestwall Product Sheet BW-6236C.

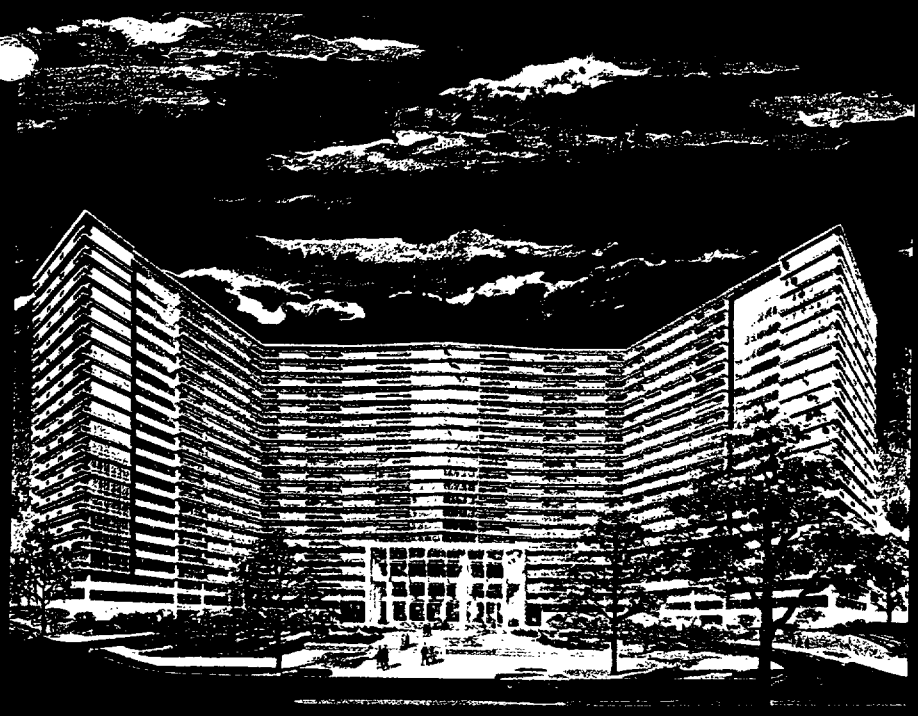


FIREPROOF GYPSUM BESTWALL BUILDING PRODUCTS

BESTWALL GYPSUM COMPANY
PAOLI, PENNSYLVANIA

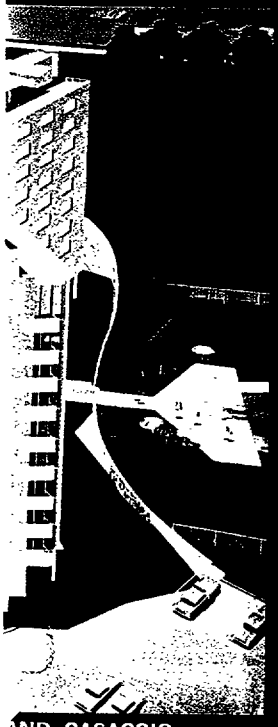
SGP 0028066

Partitions



THE PHILADELPHIAN—ARCHITECT, SAMUEL I. OSHIVEP AND ASSOCIATES

BESTWALL GYPSUM COMPANY PRESENTS



AND CASACCIO



SGP 0028068

WHY DRYWALL SYSTEMS:

1. Dry Construction
   - **A.** Fast installation
   - **B.** Minimum clean up
   - **C.** Work progress in any weather
2. Exacting fire rating
3. Exacting sound rating
4. Price competitive with other wall systems

BACKGROUND:

Laminated Gypsum Wallboard Systems are not new. The first patents were issued in 1938 to Mr. E. B. Hummer, Bestwall Gypsum Company's Research and Development Director for Drywall Systems. The development by Bestwall of a **one-hour** fire resistive assembly utilizing a 5/8" thick patented gypsum core (Firestop), coupled with the "know how" of laminating multi-plies of Gypsum Wallboard together, made possible the creation of systems which could develop fire resistive qualities and sound attenuation acceptable in multi-story residential buildings. All of these systems have been accepted by F.H.A., lending institutions, and approved under local building codes.

EXPANSION:

In 1962 Bestwall Gypsum Company completed an expansion program that increased production capacities by 90 per cent. This program was designed to accommodate the added uses of Gypsum Wallboard created by the acceptance of commercial application of these systems. Adequate manufacturing facilities are now maintained to service projects regardless of schedule or scope.

THE CREATION OF SYSTEMS ENGINEERING:

Systems Engineers, specialists in application of commercial Drywall Systems, have been thoroughly trained to recommend the proper combination of systems that meet the specifications of the most discriminating architects. They can assist with architectural detailing, lending institution presentations, quantity surveys and actual on-the-job application. Bestwall Systems Engineers are available through all local Bestwall Certain-teed Sales Corporation District Sales Offices. There are twenty-four located in strategic cities across the nation.

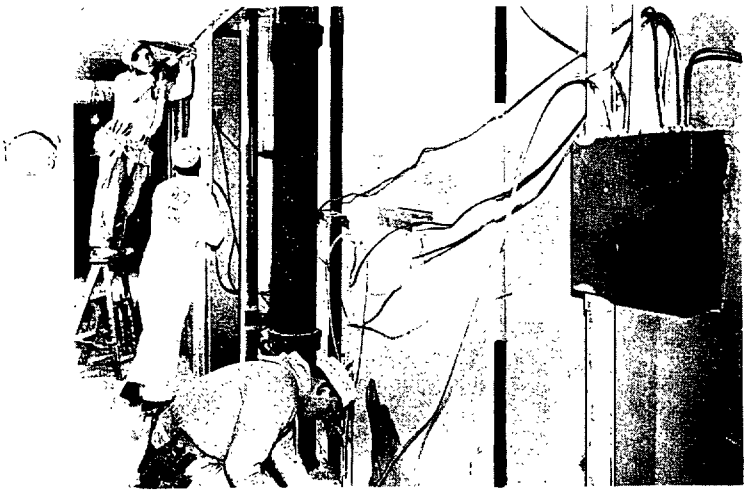
CONCLUSION:

For the **architect** who desires walls that produce a quiet, safe building, the Bestwall Systems Engineer will recommend the proper Bestwall System. The **owner** will appreciate the low insurance rates and the smooth, maintenance-free walls that can receive any type of finish. The **tenant** will renew leases in a comfortable, quiet residence. Consideration and planning **now** will assure a profitable investment.

DOUBLE SOLID PARTITION SYSTEM

SEMI-SOLID PARTITION SYSTEM

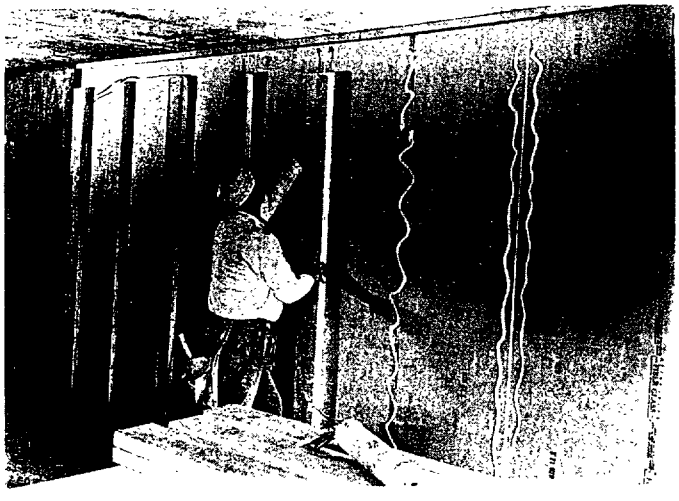
METAL STUD PARTITION SYSTEM



Electrical work roughed in, ready for 1" coreboard



Laminating finished layer to 1" coreboard

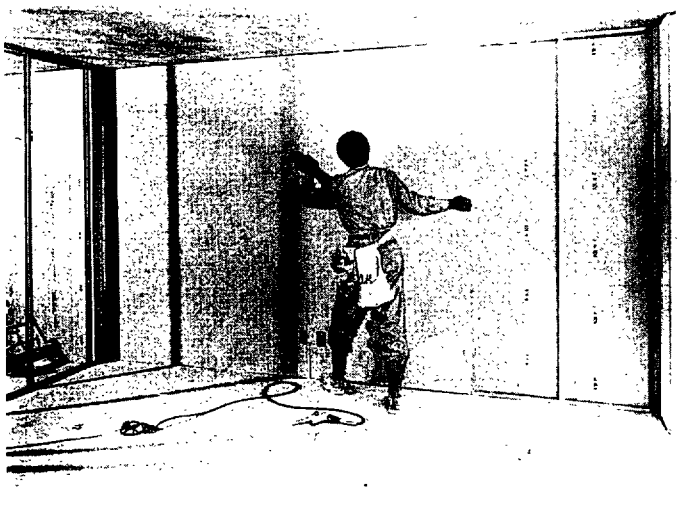


Stud lamination to first side

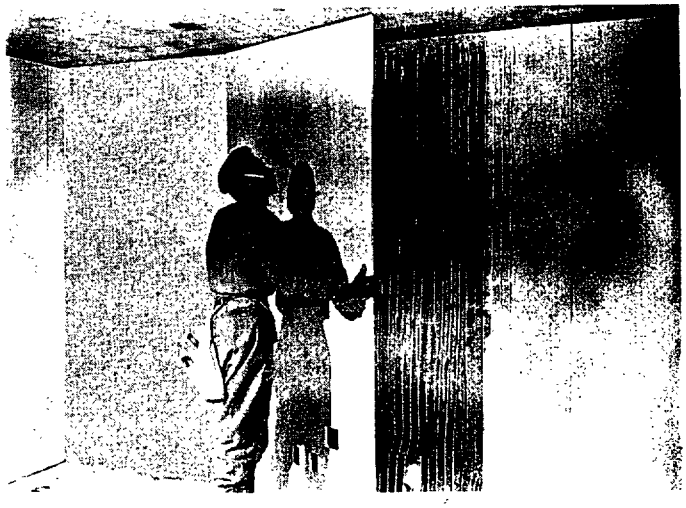


Completion of partition

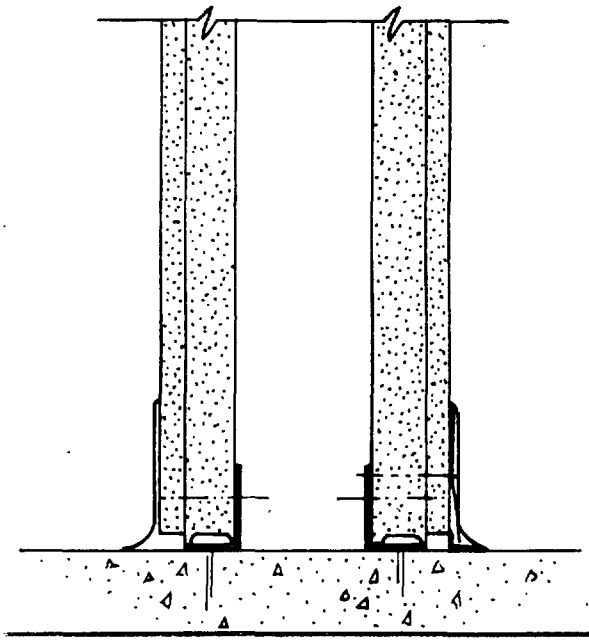
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Applying first layer to metal studs



Face layer being laminated

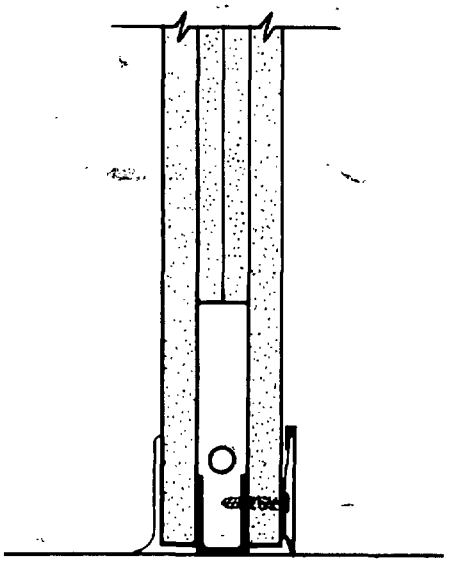


DESCRIPTION

This non-load bearing gypsum partition is recommended for high-rise apartment houses, commercial installations and institutional buildings, wherever party walls with particularly good sound resistance and fire protection are desired. It is erected by laminating ½" ply to 1" homogeneous board on each side of an air space. This center air cavity allows space for concealed wiring, electrical boxes, hose boxes, piping, and other rough work. It also provides greater resistance to sound transmission. For specifications see Bestwall Systems Engineering Folder BW-62400.

FEATURES

- Fire Resistant: The Double Solid Partition System (6" thick-basic) provides 2-hour fire protection.
- Sound Transmission Loss: 47.2 db. (6" thick-basic).
- Strength: Proven in ASTM "Bump" tests and performance to have greater resistance to deflection and cracking than a standard frame or thin solid wall.
- Laminated Construction: Smooth monolithic walls created by unitized lamination of multi-plies of Gypsum Wallboard.
- Center Air Space: (1" to 6" as required) space for piping—conduit—fixture framing—additional resistance to sound transmission.

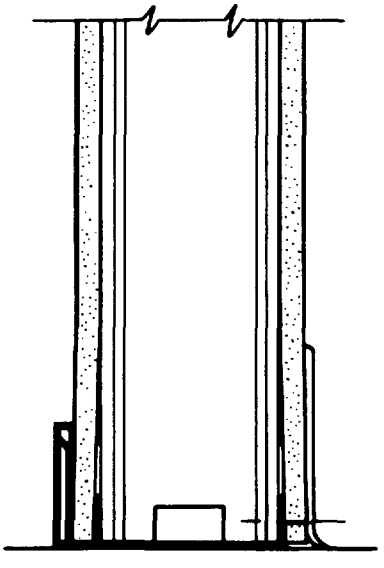


DESCRIPTION

This basic system is the original method for erecting non-load bearing corridor and party walls. It is erected by laminating ⅝" Bestwall Firestop Gypsum Wallboard to gypsum ribs with metal or wood floor and ceiling runners. It provides thin, yet strong, lightweight, highly fire resistive partitions. A Bestwall Systems Engineer can modify this, and all other Bestwall Partition Systems, to meet your specific job requirements of sound and fire resistant characteristics and also electrical and telephone conduits, mechanical and air equipment, etc. For specifications see Bestwall Systems Engineering Folder BW-62390.

FEATURES

- Fire Resistant: Semi-Solid Laminated Gypsum Partitions (2¼" thick-basic) provide 1-hour fire protection. With modifications 1½, 2, and 3-hour fire resistance can be obtained.
- Sound Transmission Loss: 2¼" partitions—35 db., 2¾" partitions—37.5 db., 4" partitions—37 db., 5" partitions—40 db.
- Strength: At least 10 per cent less deflection under standard ASTM "Bump" test than walls within 2" x 4" studs 16" o.c. faced with ½" Gypsum Wallboard.
- Laminated Construction: Smooth monolithic walls created by unitized lamination of multi-plies of Gypsum Wallboard.



DESCRIPTION

This is a complete non-load bearing system that integrates Bestwall, the original glass fibered gypsum wallboard, with lightweight steel framing. It is designed and engineered to create an economical partition that may be fire rated. It offers accurate and speedy installation with savings in material and labor. In addition, this system provides a varied range of functional and decorative space design for new and remodeling work in commercial, industrial, institutional and residential buildings. For specifications consult Bestwall's Metal Stud Partition Folder BW-62120.

FEATURES

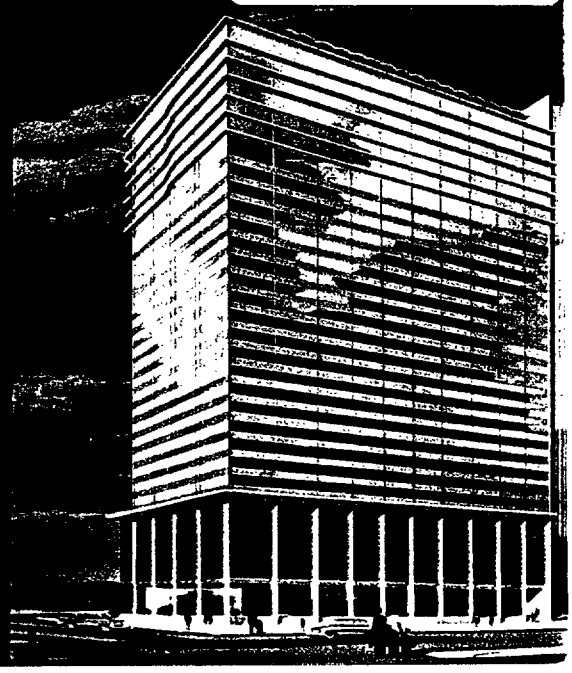
- Versatility: System components may be combined with a variety of board thicknesses to meet individual requirements.
- Light Weight: This is a factor which can result in savings in structural design requirements.
- Workability: Simplicity of design assures minimum on-site construction delays.
- Fire Resistant: 1-hour fire rating is achieved with a single layer of ⅝" Bestwall Gypsum Wallboard on both faces. A 2-hour fire rating is achieved with a double layer of ⅝" Bestwall Firestop on both faces.



PARK CITY WEST—ARCHITECT, SAMUEL I. OSHIVER AND ASSOCIATES

"GYPSUM WALLBOARD IN HIGH-RISE BUILDINGS"

SGP 0028072



BW-63215 5/63



PENN CENTER INN—ARCHITECT, CHARLES LUCKMAN ASSOCIATES





EVERGREEN TOWERS—ARCHITECT, ANDE

SGP 0028073

SEMI-SOLID PARTITION

Correct Erection Method

The semi-solid partition which involves a layer of wallboard on each side of gypsum ribs is the present name for the original Bestwall Hummer System "B". Much of the Company literature has shown the manufacture of a panel and the erection of this panel in a wall. In some instances, this involved a two faced panel and in other instances, it was one face with ribs. This prefabrication was done in a warehouse or on the job by the drywall applicator's men.

Current literature no longer shows 3-1/2" and 6-1/4" ribs nor 12" ribs. A standard 6" wide rib is used in the semi-solid partition. A full scale fire test with 5/8" Firestop and 1" thick ribs made of this assembly has proven that the fire resistance is applicable with 6" wide ribs at the joint between the face boards and in the center, that is, 2' on center. Furthermore, the test was made without joint treatment but with mechanical fasteners, as shown in the details.

The Bestwall Laboratory has experimented with and shown that it is practical to erect a semi-solid partition in place without any prefabrication. The new sound slide film showing "Gypsum Wallboard in High Rise Buildings", shows this method.

Install the floor runners, plumb up and install the ceiling runners. Then start at the exterior wall columns, etc., and set the wallboard vertically on one side, fastening it with 1" long Bestwall Drywall Screws (nails may be used in wood runners) to the ceiling and floor runner. Next to the backside of this first layer, apply Bestwall Laminating Compound with a glue spreader 3" on each of the joints between sheets and in a 6" width down the center of the board.

A 6" gypsum rib (1" thick, or as specified) should then be held in place against the back of the board over the glue by a workman with one centered over the joint and the other rib at the center of the sheet. A second workman on the face side of an initial layer should attach a 1-1/2" long Bestwall Drywall screw (designed for this use and shown in the Price Schedule) with an electric power screw driver, approximately 2' on center, with 4 screws to an 8' high partition to hold the rib tight in the board. A screw should be used on the edge of each board into the rib and in the center of the sheet.

After the ribs are all in place and the various electrical wiring, piping, and other rough in work completed, the applicator should run Bestwall laminating compound with a mechanical glue spreader down the ribs and then install the other face side of the semi-solid partition, using Bestwall Drywall Screws (1" long) at the top and bottom runners, and (1-1/2" long) in the face board into the ribs in the same manner as on the first side.

The next day when the glue has set, the partition will show remarkable rigidity and strength. This semi-solid partition with 5/8" Firestop and 1" ribs is one

hour fire resistant.

Advantages

1. The screw attachment is no more costly than the screw attachment of gypsum board to metal studs. Actually, this construction method is similar to the installation followed by many applicators for 8' to 9' high partitions of single layer Gypsum Board over metal studs.

2. Stronger by test than conventional 5" partition, stud and 1/2" gypsum wallboard.

3. Saved - 20 square feet more usuable floor area than 2" x 4" wood stud wall construction for every 100 lineal feet of partition.

LAMINATED GYPSUM WALLBOARD SYSTEMS

Bowing Board

For years E. B. Hummer has advocated bowing the face board in all laminated gypsum wallboard work. After the base layer is in place, the face layer to be laminated if it is bowed so that the outer or exposed face is concave and the backside is convex, the board will hug the wall in application and reduce to eliminate the necessity for fasteners within the field of the board. This bowing should very generally be across the long dimension of the board, that is the long dimension should be bent in the curve.

Where the face board is erected vertically it is obvious that by doing this the board can be nailed at the top plate, pressed down and nailed at the bottom plate, hugging the wall all the way down and eliminating the need of the nailing through the face of the board in the field. This is particularly helpful when applying predecorated board as Woodgrain board, Eternawall, or the Decorator line. This is equally applicable to the application of the board to wood framing and those framing numbers are in the same plane or where the board is being applied to an existing surface. When the face board is applied horizontally, bow the board across the short direction of the board, that is make the 4' width curved, and again applying the board with the top edge in place first and pull the bottom edge in, nailing along the tapered edge.

Bestwall literature many years ago had detailed drawings showing the method of piling board to develop this curvature. While competition minimized the idea at that time, you will see USG, National and other manufacturers showing details on bowing gypsum wallboard in some of their current literature.

Do not place a support in the middle of a sheet of board and let the ends hang down to accomplish this curvature. This will result in very badly misshaped and warped board which will defeat the purpose of curving the board. Have the board flat on the floor with the surface that is to be concave up and then lay supports under the edges of the board to raise the edge up and allow the weight of the board to accomplish the curvature. This should be no more than 1" in 4' or 2" in 8'. Generally, allowing the board to set in this position over night will accomplish the desired curvature on the face board. Allowing the board to remain too long in this position will again defeat the purpose and result in some badly warped board.

With care E. B. Hummer's idea as advocated by Bestwall for many years and now by other gypsum manufacturers can assist the contractor in getting good laminated installations and eliminate the need of fasteners in the field thereby reducing the cost of the installation.

CONSULT YOUR **BESTWALL®** SYSTEMS ENGINEER

BESTWALL FIRESTOP GYPSUM WALLBOARD

ONE HOUR NON-LOAD-BEARING STUDLESS WALL

REPRODUCTION FROM UNDERWRITERS' LABORATORIES, INC. GUIDE NO. 40 U18.23.

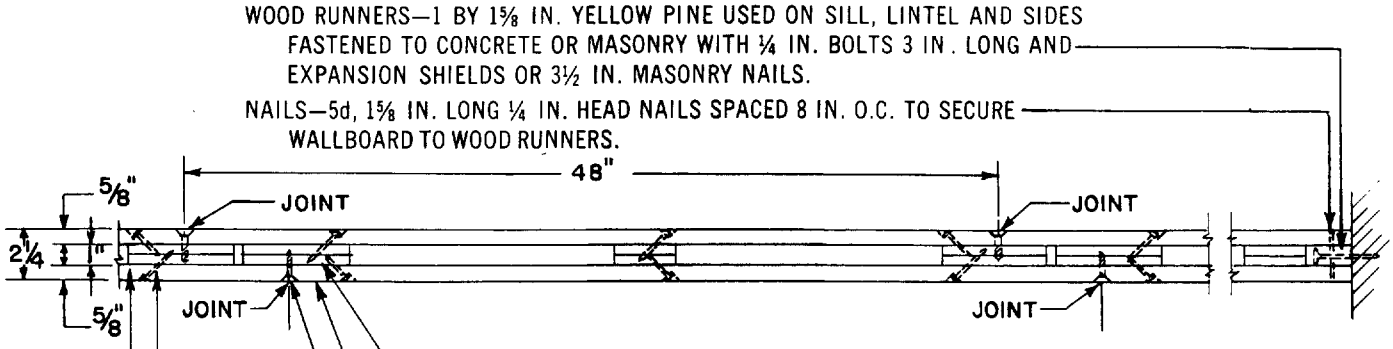
Guide No. 40 U18.23. June 3, 1957 File R2717
Wallboard.

Bestwall Gypsum Co., Ardmore, Pa.

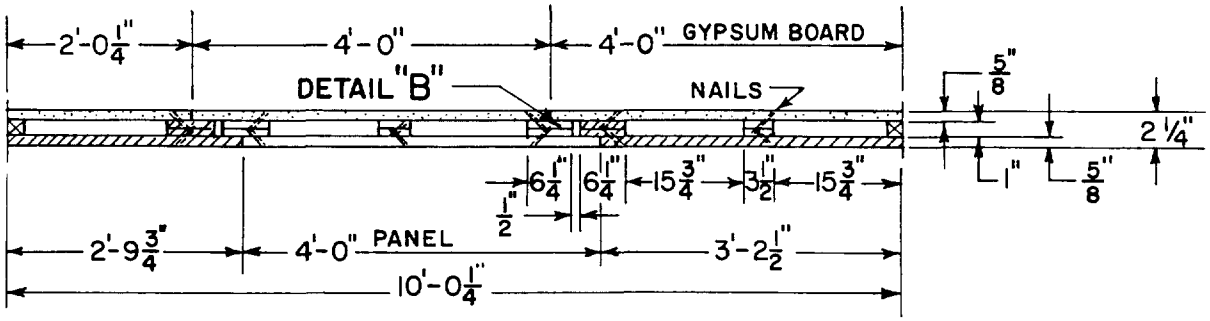
For Wall and Partition Design No. 10-1 Hr.

GUIDE NO. 40 U18
GENERAL INFORMATION (CONT'D)
WALLS AND PARTITIONS

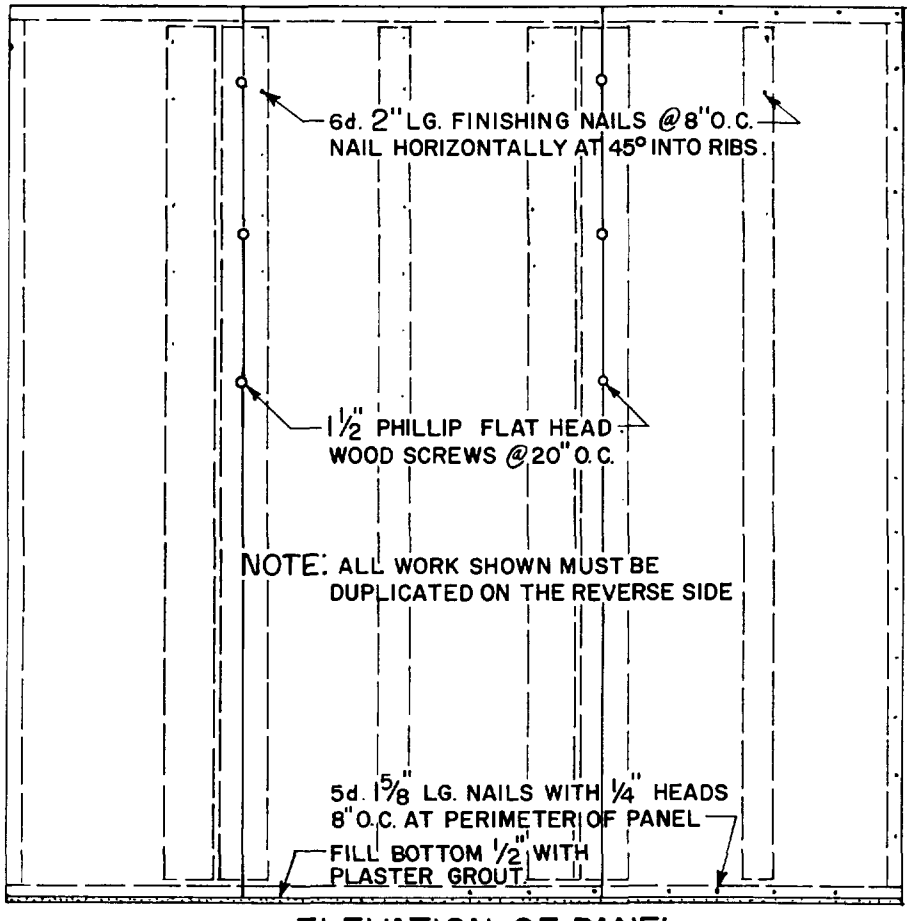
CLASS E-1 DESIGNS
DESIGN NO. 10-1 HR.—(NON-BEARING PARTITION)



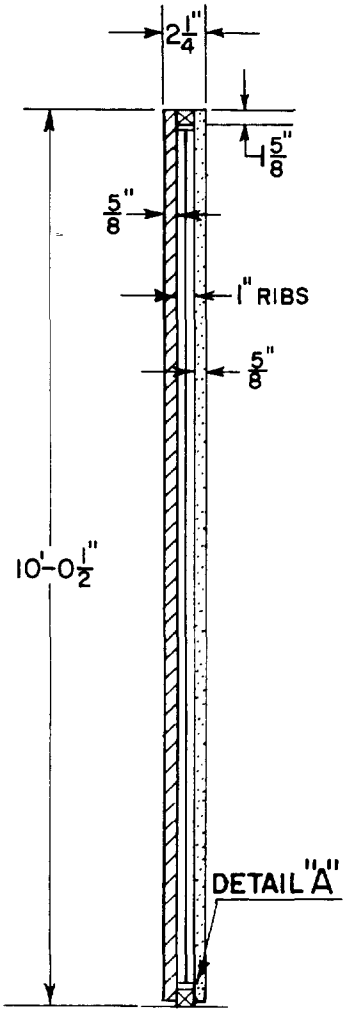
SGP 0028077



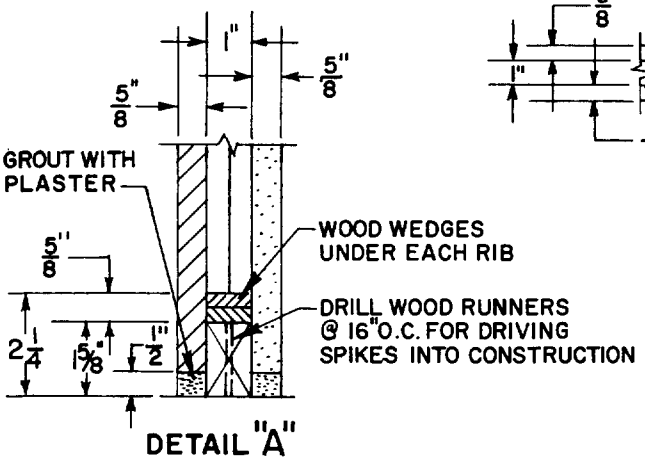
PLAN VIEW
SCALE 1/2" = 1'-0"



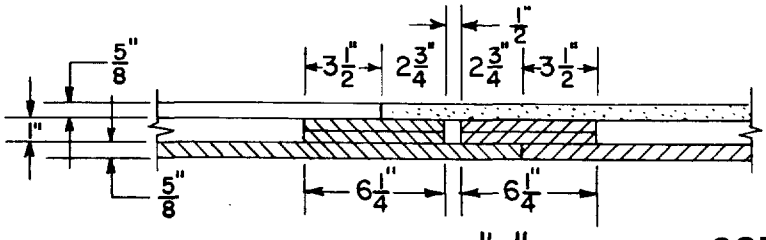
ELEVATION OF PANEL
SCALE 1/2" = 1'-0"



SECTION



DETAIL "A"



DETAIL "B"
SCALE 1 1/2" = 1'-0"

SGP 0028078

BESTWALL GYPSUM CO. SYSTEMS ENGINEERING, ARDMORE, PA.	
BESTWALL HUMMER SYSTEM "B" (MODIFIED) NON LOAD BEARING PARTITION	4-8-57 2-21-57

FIG. 1
R 2717-19-21

CONSULT YOUR **BESTWALL®** SYSTEMS ENGINEER

BESTWALL FIRESTOP GYPSUM WALLBOARD

TWO HOUR NON-LOAD BEARING STUDLESS WALL

REPRODUCTION FROM UNDERWRITERS' LABORATORIES, INC. GUIDE NO. 40 U18.23.

Guide No. 40 U18.23 August 26, 1957 File R2717
Wallboard.

Bestwall Gypsum Co., Ardmore, Pa.

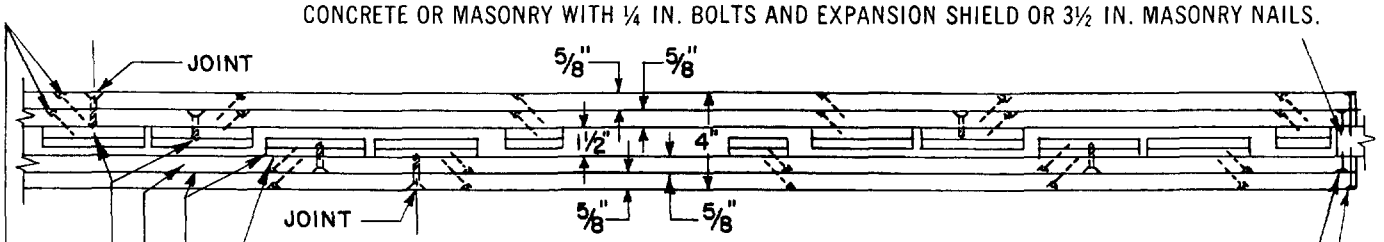
For Wall and Partition Design No. 7-2 hr and 5-3 hr

GUIDE NO. 40 U18
GENERAL INFORMATION (CONT'D)
WALLS AND PARTITIONS

SGP 0028079

CLASS D-2 DESIGN
DESIGN NO. 7—2HR (NON-BEARING PARTITION)

WOOD RUNNER—1½ X 1⅝ IN. YELLOW PINE, USED ON SILL, LINTEL AND SIDES, FASTENED TO CONCRETE OR MASONRY WITH ¼ IN. BOLTS AND EXPANSION SHIELD OR 3½ IN. MASONRY NAILS.



NAILS—5d, 1⅝ IN. LONG, ¼ IN. HEADS SPACED 8 IN. O.C. TO SECURE INNER LAYER WALLBOARD WITH RIBS ATTACHED TO WOOD RUNNERS.
8d, 2½ IN. LONG, ¼ IN. HEAD NAILS SPACED 8 IN. O.C. TO SECURE OUTER LAYER OF WALLBOARD TO WOOD RUNNERS.

WALLBOARD RIBS—2 LAYERS OF ½ IN. THICK WALLBOARD GLUED TOGETHER WITH A CASEIN TYPE GLUE TO FORM EITHER 6¼ IN. OR 3¼ IN. WIDE RIBS 4 IN. LESS IN LENGTH THAN PARTITION HEIGHT. THE 6¼ IN. RIBS (2) FORM THE JOINT BEARING AREA AND THE 3¼ IN. RIB IS USED IN THE CENTER OF EACH WALLBOARD SHEET.

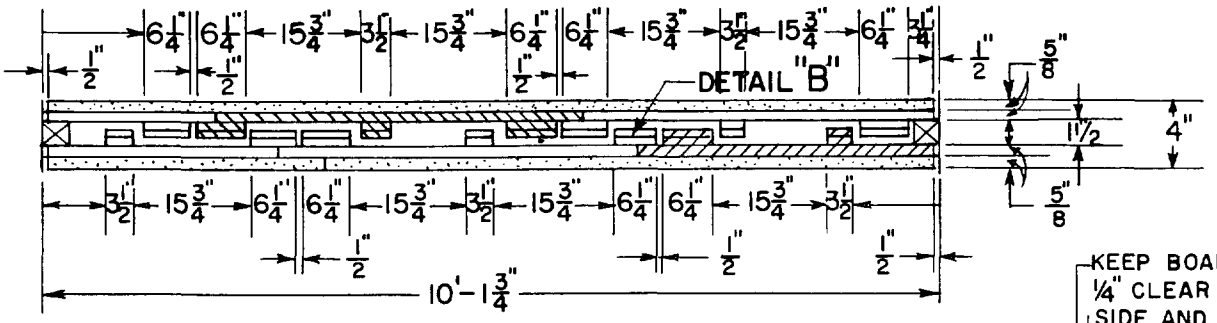
ADHESIVE—CASEIN TYPE, MIX 4 LB. OF DRY POWDER TO 1.4 GAL. OF WATER.

WALLBOARD—⅝ IN. THICK LISTED BY U.L. INC. GUIDE NO. 40 U18.23 ATTACHED TO RIBS WITH GLUE, NAILS AND SCREWS, AND TO WOOD RUNNERS WITH NAILS.
THE OUTER LAYER ATTACHED TO INNER LAYER WITH GLUE, NAILS AND SCREWS.

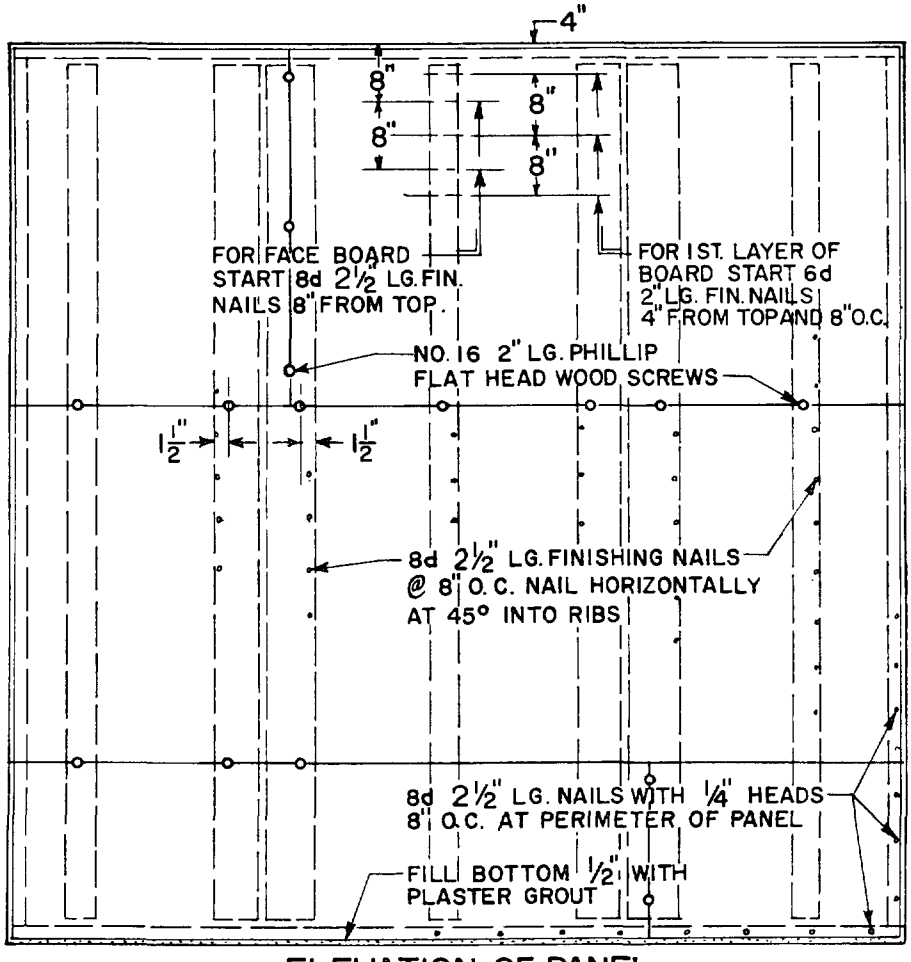
SCREWS—NO. 16 PHILIPS HEAD WOOD SCREWS 1½ IN. LONG SPACED 20 IN. O.C. AT EACH JOINT OF INNER BOARD. NO. 16 PHILIPS HEAD WOOD SCREWS 2 IN. LONG SPACED 20 IN. O.C. AT EACH JOINT OF OUTER BOARD. JOINTS COVERED WITH TAPE AND JOINT CEMENT.

NAILS—6d, 2 IN. LONG FINISHING NAILS SPACED 8 IN. O.C. AND AT 45 DEG. ANGLE ATTACHING INNER LAYER TO RIBS. 8d, 2½ IN. LONG FINISHING NAILS SPACED 8 IN. O.C. AND AT 45 DEG. ANGLE ATTACHING OUTER LAYER THROUGH INNER LAYER TO RIBS. NAIL HEADS COVERED WITH JOINT CEMENT.

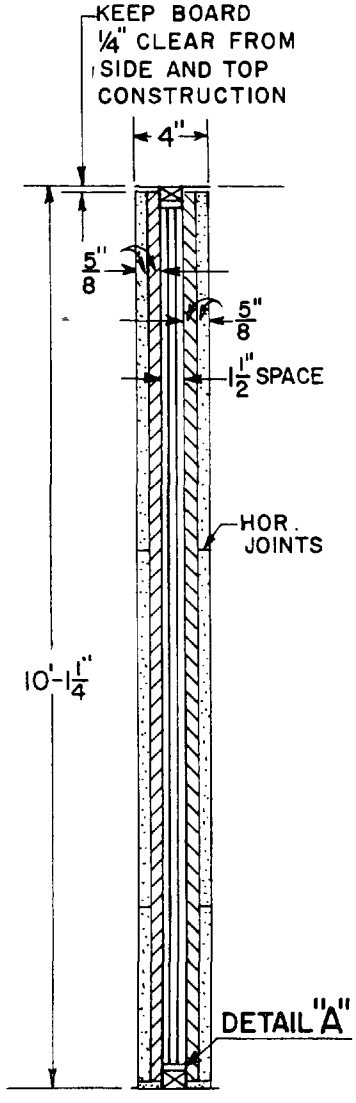
R 2717



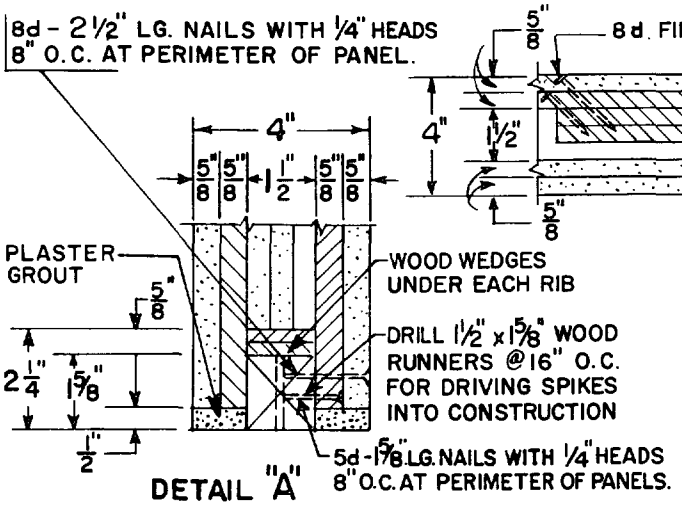
PLAN VIEW
SCALE ½" = 1'-0"



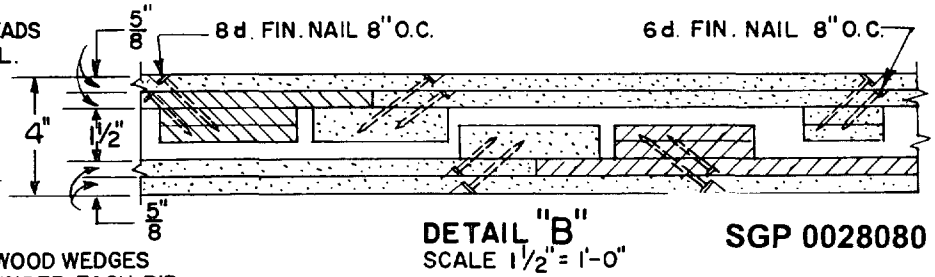
ELEVATION OF PANEL
SCALE ½" = 1'-0"



SECTION



DETAIL "A"



DETAIL "B"
SCALE 1½" = 1'-0"

SGP 0028080

BESTWALL GYPSUM CO. SYSTEMS ENGINEERING, ARDMORE, PA.	
BESTWALL HUMMER SYSTEM "B" MODIFIED WITH TWO LAYER APPLICATION ON EACH SIDE NON LOAD BEARING PARTITION	2-21-57

FIG. 2
R 2717-20

CONSULT YOUR **BESTWALL** SYSTEMS ENGINEER

BESTWALL FIRESTOP GYPSUM WALLBOARD

THREE HOUR NON-LOAD BEARING STUDLESS WALL

REPRODUCTION FROM UNDERWRITERS' LABORATORIES, INC. GUIDE NO. 40 U18.23.

Guide No. 40 U18.23 August 26, 1957 File R2717
Wallboard.

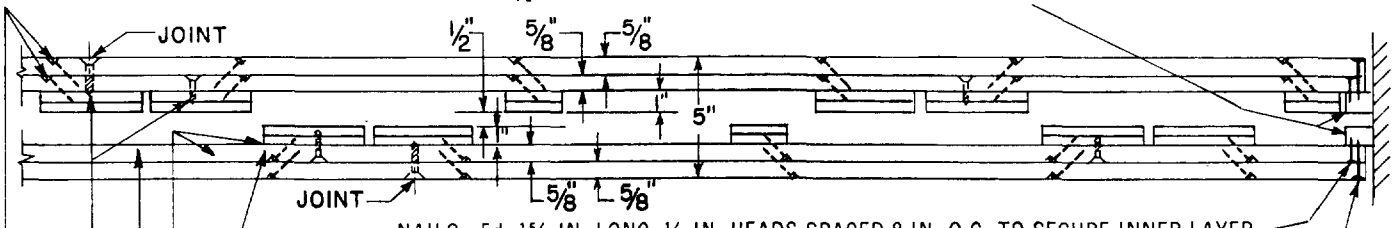
Bestwall Gypsum Co., Ardmore, Pa.

For Wall and Partition Design No. 7-2 hr and 5-3 hr

GUIDE NO. 40 U18
GENERAL INFORMATION (CONT'D)
WALLS AND PARTITIONS

CLASS C-3 DESIGNS
DESIGN NO. 5—3 HR (NON-BEARING WALL)

TWO WOOD RUNNERS*—1 X 1⅝ IN. YELLOW PINE, SPACED ½ IN. APART USED ON SILL LINTEL AND SIDES, FASTENED TO CONCRETE OR MASONRY WITH ¼ IN. BOLTS 3 IN. LONG AND EXPANSION SHIELDS OR 3½ IN. MASONRY NAILS SPACED 16 TO 20 IN. O.C.



NAILS—5d, 1⅝ IN. LONG, ¼ IN. HEADS SPACED 8 IN. O.C. TO SECURE INNER LAYER WALLBOARD WITH RIBS ATTACHED TO WOOD RUNNERS.
8d, 2½ IN. LONG, ¼ IN. HEAD NAILS SPACED 8 IN. O.C. TO SECURE OUTER LAYER OF WALLBOARD TO WOOD RUNNERS.

WALLBOARD RIBS—2 LAYERS OF ½ IN. THICK WALLBOARD GLUED TOGETHER WITH A CASEIN TYPE GLUE TO FORM EITHER 6¼ IN. OR 3¼ IN. WIDE RIBS 4 IN. LESS IN LENGTH THAN PARTITION HEIGHT. THE 6¼ IN. RIBS (2) FORM THE JOINT BEARING AREA AND THE 3¼ IN. RIB IS USED IN THE CENTER OF EACH WALLBOARD SHEET.

ADHESIVE—CASEIN TYPE, MIX 4 LB. OF DRY POWDER TO 1.4 GAL. OF WATER.

WALLBOARD—⅝ IN. THICK LISTED BY U.L. INC. GUIDE NO. 40 U18.23 ATTACHED TO RIBS WITH GLUE, NAILS AND SCREWS, AND TO WOOD RUNNERS WITH NAILS. THE OUTER LAYER ATTACHED TO INNER LAYER WITH GLUE, NAILS AND SCREWS.

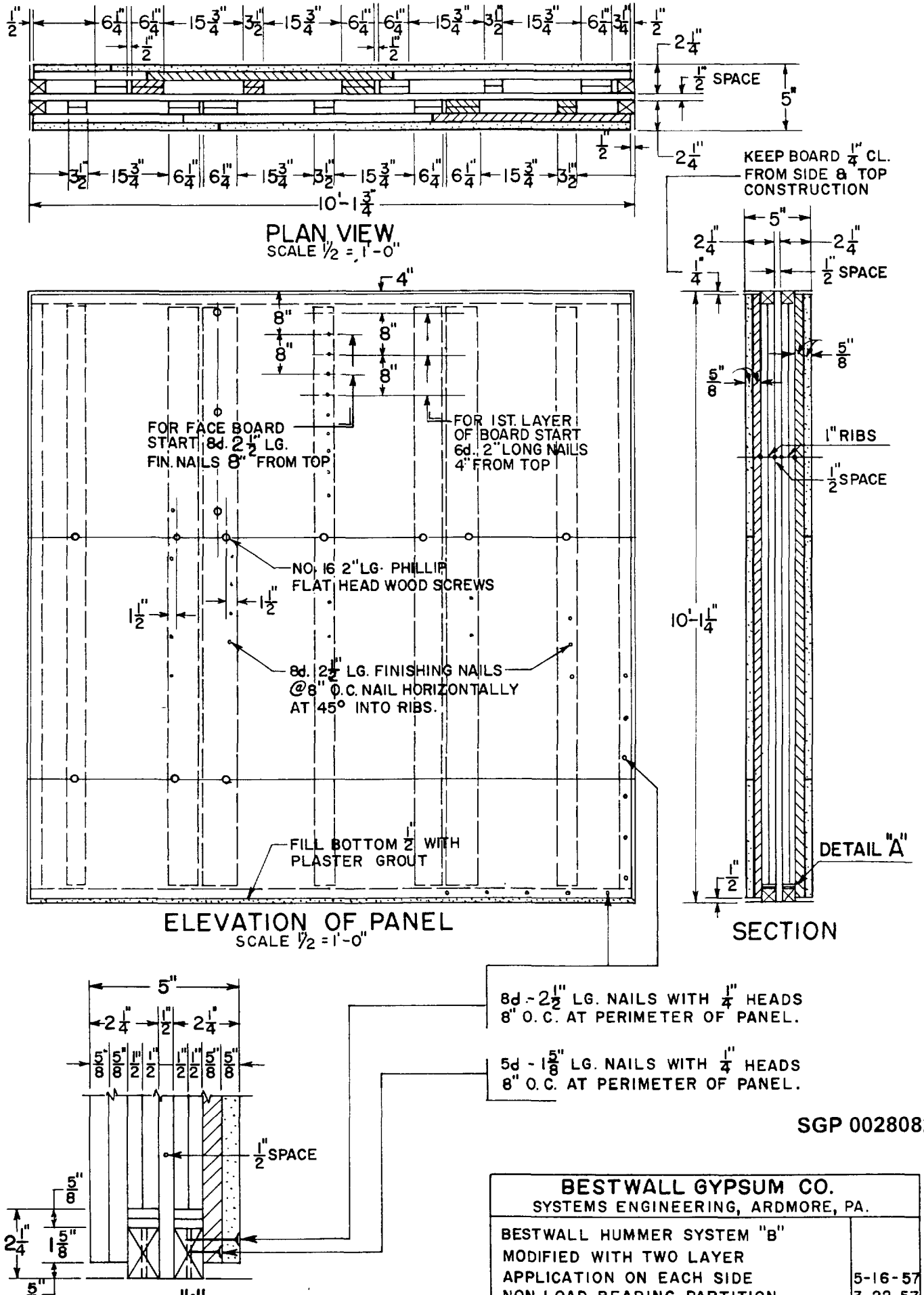
SCREWS—NO. 16 PHILIPS HEAD WOOD SCREWS 1½ IN. LONG SPACED 20 IN. ON CENTERS AT EACH JOINT OF INNER BOARD. NO. 16 PHILIPS HEAD WOOD SCREWS 2 IN. LONG SPACED 20 IN. ON CENTERS AT EACH JOINT OF OUTER BOARD. JOINTS COVERED WITH TAPE AND JOINT CEMENT.

NAILS—6d, 2 IN. LONG FINISHING NAILS SPACED 8 IN. ON CENTERS AND AT 45 DEG. ANGLE ATTACHING INNER LAYER TO RIBS. 8d, 2½ IN. LONG FINISHING NAILS SPACED 8 IN. ON CENTERS AND AT 45 DEG. ANGLE ATTACHING OUTER LAYER THROUGH INNER LAYER TO RIBS. NAIL HEADS COVERED WITH JOINT CEMENT.

R 2717

SGP 0028081

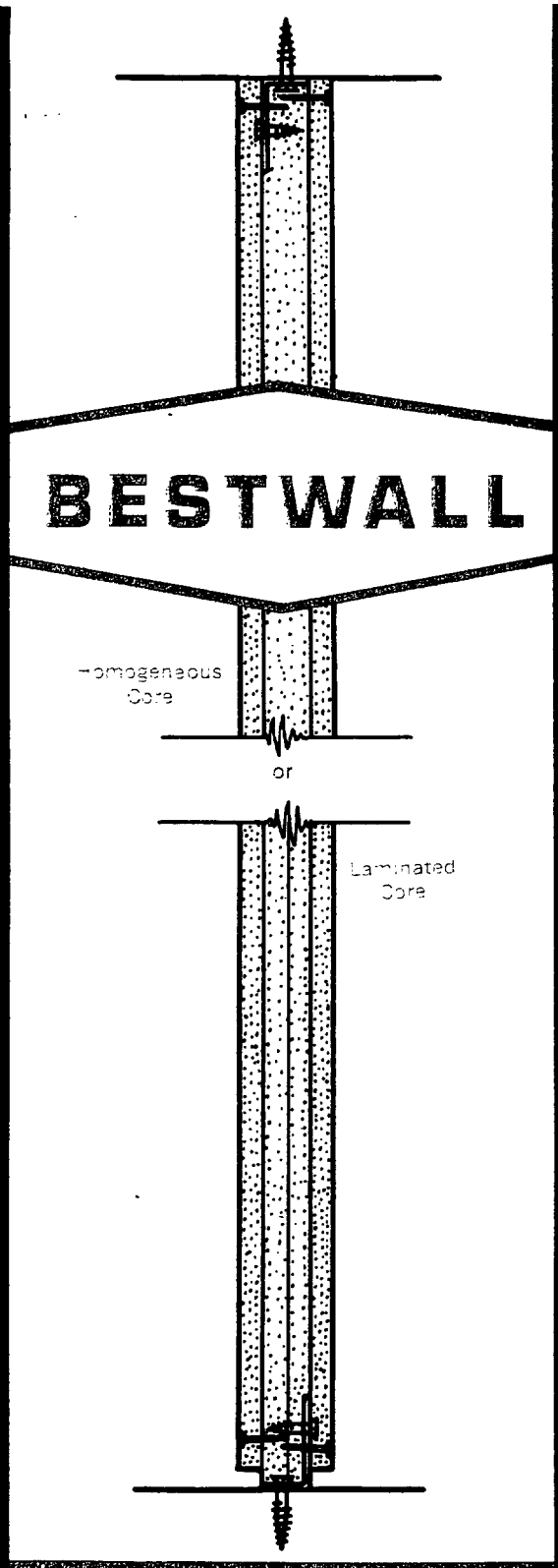
*NOTE: For incombustible construction and rating use 24 gauge sheet metal hat section



SGP 0028082

BESTWALL GYPSUM CO. SYSTEMS ENGINEERING, ARDMORE, PA.	
BESTWALL HUMMER SYSTEM "B" MODIFIED WITH TWO LAYER APPLICATION ON EACH SIDE NON LOAD BEARING PARTITION	5-16-57 3-22-57

FIG. 3



HUMMER SYSTEMS

7/8" SOUND CONTROL GYPSUM PARTITION

Non-load bearing wood stud partition

Rated 37 decibels sound transmission loss

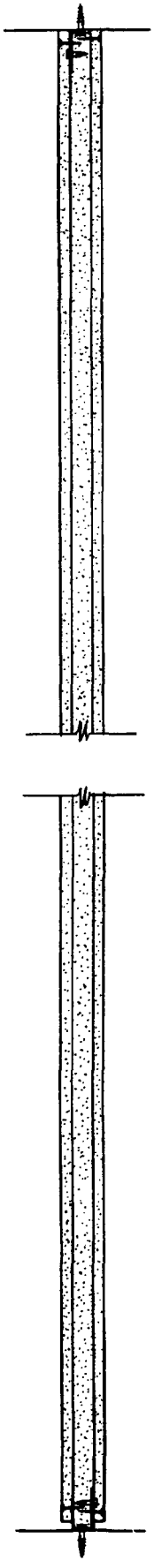
GP

SGP 0028083

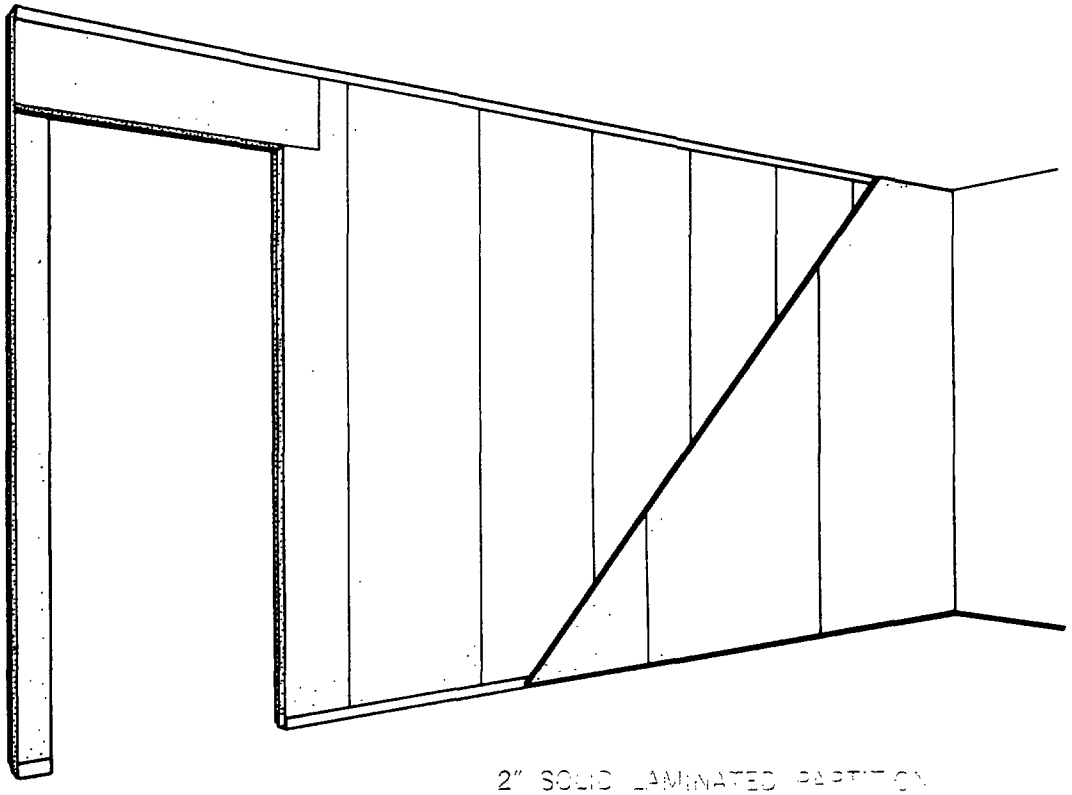
2" SOLID

This laminated non-load bearing Gypsum partition system consists of 1" homogeneous core board with face plies of ½" Bestwall Gypsum Wallboard.

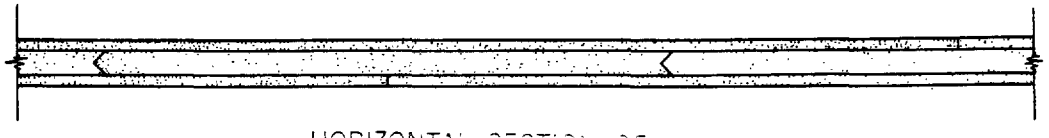
- FIRE RESISTANCE—Two hours with Bestwall Gypsum Wallboard.
- SOUND TRANSMISSION CLASS—36 db (Tested 1958).
- STRENGTH—Standard "Bump" tests show partition equal to ½" gypsum board over 2" x 4" wood studs 16" o.c.
- LAMINATED CONSTRUCTION — Smooth monolithic walls created by unitized lamination of multi-plies of Gypsum Wallboard.
- EXTRA USABLE FLOOR SPACE—26 sq. ft. more than 2" x 4" stud wall construction for every 100 lin. ft. of partition.



WALL SECTION



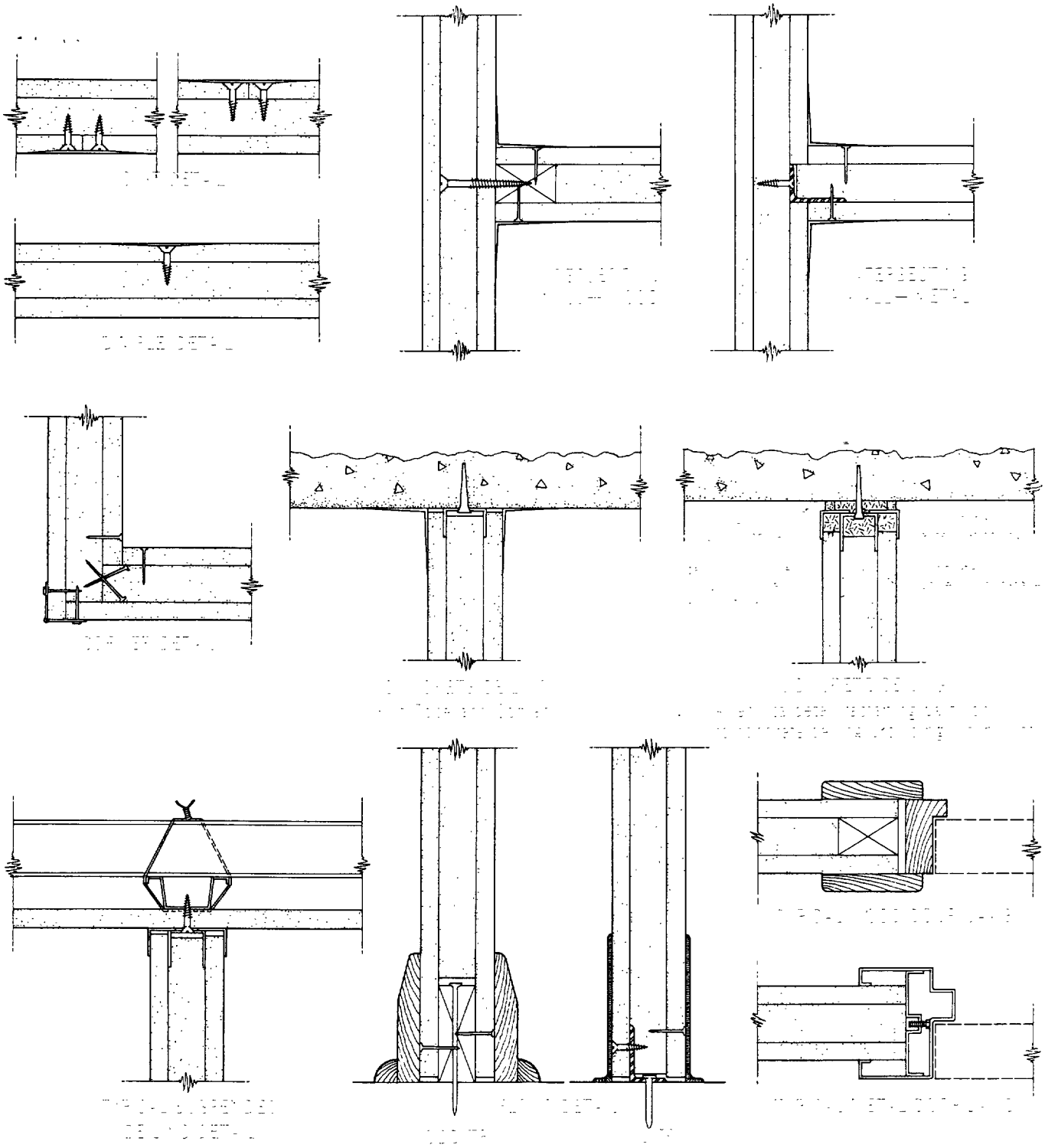
2" SOLID LAMINATED PARTITION



HORIZONTAL SECTION OF WALL

SCALE: 1½" = 1'0

SGP 0028084



SYSTEMS ENGINEERING

Bestwall research and engineering combine Bestwall Glass Fiber Reinforced Gypsum Wallboard with the most comprehensive and advanced techniques in gypsum drywall construction. These include single ply, laminated plies, metal studs, screw application and movable partitions with and without metal framing. Each system tailors space to your requirements with substantial savings on material and labor.

A staff of Bestwall Systems Engineers is available from coast-to-coast to assist you in quantity survey; detailing and installation of drywall systems to help you meet your requirements.

For detailed data, check your Sweet's File or write directly to Georgia-Pacific Corporation, Bestwall Gypsum Division.

SGP 0028085

BESTWALL HUMMER SYSTEMS

2" SOLID LAMINATED GYPSUM WALLBOARD PARTITIONS

FEATURES:

1. Fire Resistance	Two hours with Bestwall Gypsum Wallboard.
2. Sound Transmission Loss	36 Decibels (Tested 1958)
3. Strength	Will withstand abuse as determined by ASTM E-72-55 Impact.
4. Laminated Construction	Smooth monolithic walls created by unitized lamination of multi-plies of Gypsum Wallboard.
5. Extra Usable Floor Space	20 sq. ft. more floor space compared with 2" x 4" stud wall construction for every 100 lin. feet of partition.

SPECIFICATIONS:

All gypsum wallboard and joint system materials used, including laminating compound, shall be manufactured by Georgia-Pacific Corporation, Bestwall Gypsum Division and shall be installed by a Bestwall Hummer licensed contractor in a first class workmanlike manner.

Metal Angles: Minimum 1½" by 1½" by 20 gauge.

Bestwall Gypsum Laminated Backer Board (Coreboard): 1" thick, 24" wide, with ship lapped edges. Board should be laminated at least 24 hours before using. Factory laminated or homogeneous coreboard may be used. Board should be cut accurately to fit in floor and ceiling runners (metal angles) and installed vertically. Where partitions intersect, backer board panels shall be nailed together with heavy nails 2' on centers.

Bestwall Taper Edge Gypsum Wallboard (Face Board): Use ½" thick, 4' wide board, floor to ceiling length (12' max.).

Bestwall Laminating Compound: Use either a comb type spreader, a mechanical tool designed for applying laminating compound, or equivalent. The comb type spreader should have triangular notches 7/16" wide by 7/16" deep, spaced ¾" on centers. Other spreaders should have the same size and pattern of ridges as the comb type spreader.

Nails: 1½" long finishing nails.

Screws: No 6, 1¼" and 1¾" long, Bestwall Phillips head drywall screws.

Openings: Door and borrowed light openings shall be left accurately located in coreboard and face board for two (or three) part frames to be set in after completion of wall. Single piece door frames shall be accurately set (by others) before coreboard, which must then be started from frame.

Joint Treatment and Decorating: See Bestwall Product Sheet BW-62360.

APPLICATION DETAILS:

1. Secure metal angles to floor and ceiling with appropriate fasteners spaced 2' on centers.
2. Fasten 1" Bestwall Coreboard to metal angles with 1¼", No. 6, Bestwall Phillips head drywall screws.
3. Laminate face layers with Bestwall Laminating Compound to 1" Bestwall Coreboard and fasten with 1¾", No. 6, Bestwall Phillips head drywall screws, spaced 12" on center. Joints should be staggered and fall a minimum of 6" off those in coreboard.
4. Where necessary to hold face layer tight to coreboard while adhesive sets, or for other reasons, drive 1½" finishing nails down at a 45° angle through face layers into 1" Bestwall Coreboard at vertical joints and center of board at quarter points.

The wallboard system covered in this Georgia-Pacific/ Bestwall Gypsum Division folder has been developed with due regard to practical construction methods. However, since the Bestwall Gypsum Division does not have any prior knowledge of a specific building design and construction, or methods of application and use of their products, no warranty of performance is made. All of the test results shown have been obtained under laboratory testing conditions where controlled environment reduces variables to a minimum. In the field, such laboratory conditions are not always met, since many other variables are introduced. Laboratory results will generally exceed results of field tests, but the tests under controlled conditions are the only logical way to compare the performance of different assemblies. The Bestwall Gypsum Division of the Georgia-Pacific Corporation makes no warranty as to the performance of assemblies in the field having a performance equal to or better than that developed in the test.

SALES OFFICES

ATLANTA
801 Peachtree 25th Building
1720 Peachtree, N.W.
Atlanta, Georgia 30309

BRUNSWICK
Foot of Union Street
Brunswick, Georgia 31521

CHICAGO
5544 W. St. Charles Road
Berkeley, Illinois 60162

CLEVELAND
3530 Warrensville Center Road
Shaker Heights
Cleveland, Ohio 44122

DALLAS
600 Exchange Bank Building
Dallas, Texas 75235

DETROIT
Suite 227, Officenter Building
Detroit, Michigan 48235

HOUSTON
Bayou Building
3322 Richmond Avenue
Houston, Texas 77019

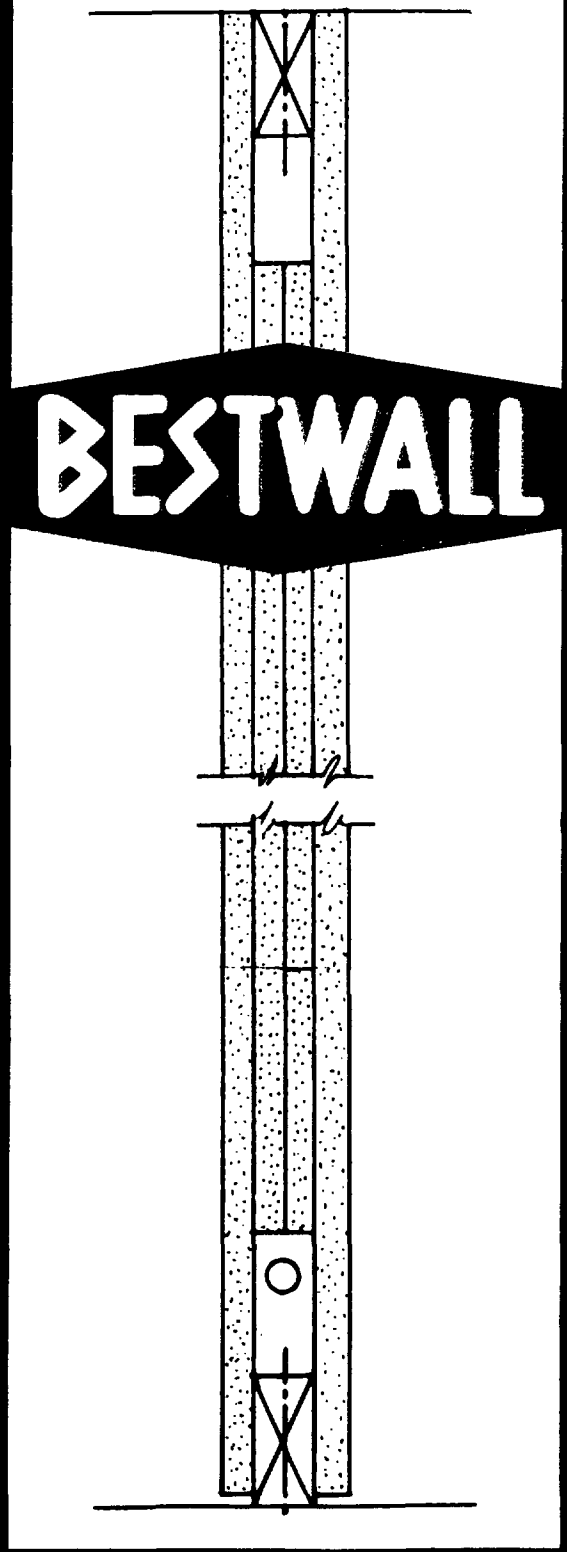
KANSAS CITY
4233 Blue Ridge Boulevard
Kansas City, Missouri 64133

NEW ORLEANS
7800 Alamonaster Drive
New Orleans, Louisiana 70126

SAN FRANCISCO
301 El Cerito Plaza
El Cerito, California 94532

WESTERN
Room 404, Tribune Building
143 S. Main Street
Salt Lake City, Utah 84101

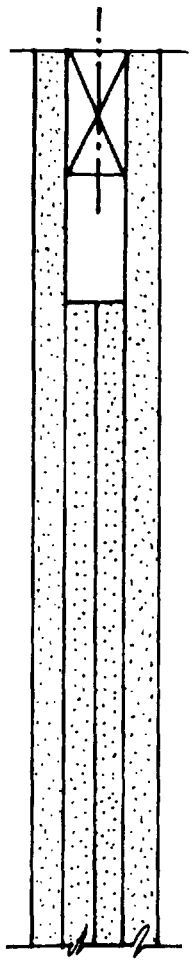
WILMINGTON
Wilmington Marine Terminal
Wilmington, Delaware 19899



BESTWALL

HUMMER SYSTEMS

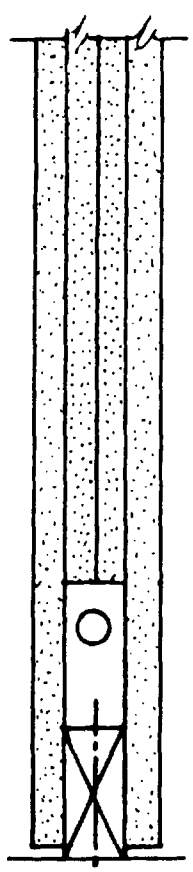
SGP 0028087

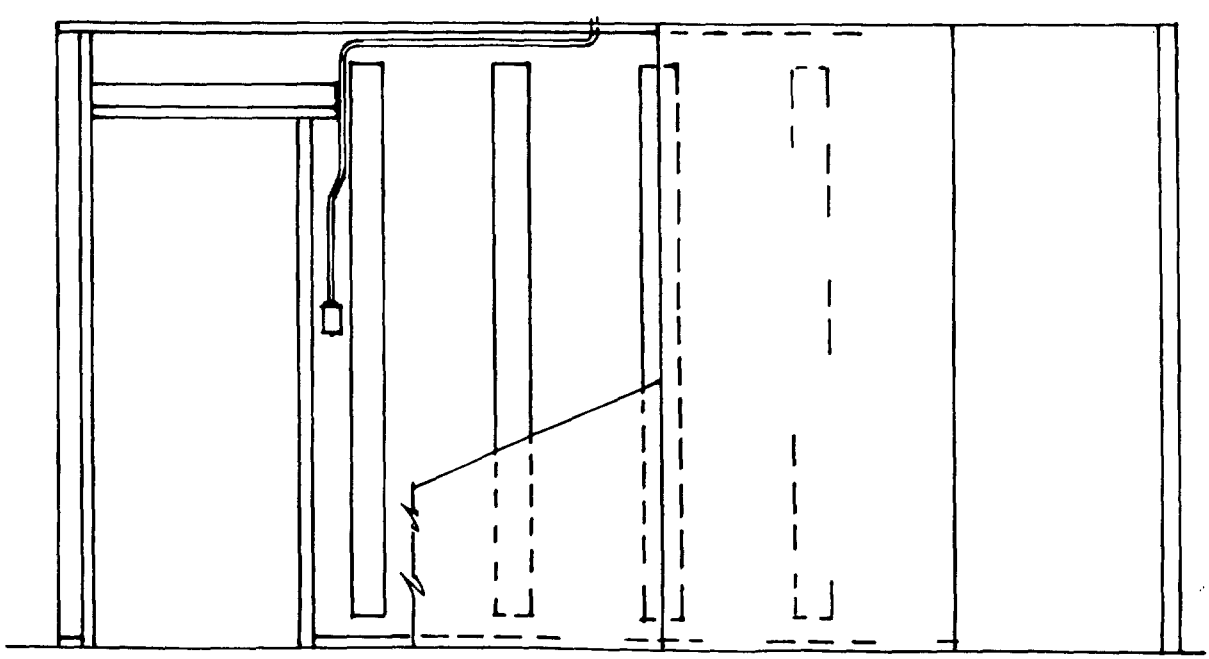


SEMI-SOLID LAMINATED GYPSUM PARTITIONS

The Semi-Solid Gypsum Partition System is a non-load bearing construction erected by laminated 5/8" Bestwall Firestop Gypsum Wallboard to gypsum ribs inserted in metal or wood floor and ceiling runners. It is recommended for commercial and residential work in both new construction and remodeling—wherever fire-rated, non-load bearing partitions are required.

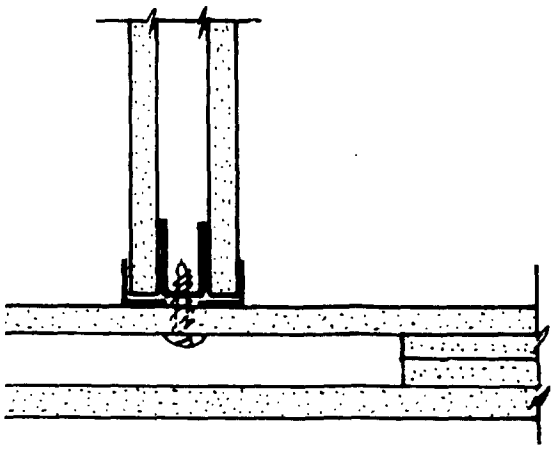
- FIRE RESISTIVE—One-hour.
- SOUND TRANSMISSION—35 db.
- STRENGTH — More rugged, less joint breakage, no nail pops.
- LAMINATED CONSTRUCTION— Smooth surfaces—monolithic finish.

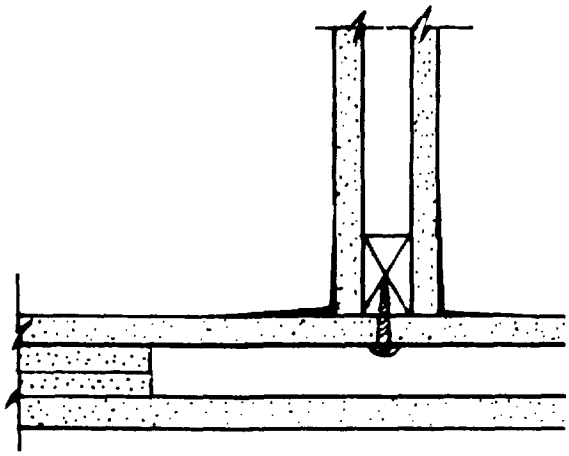


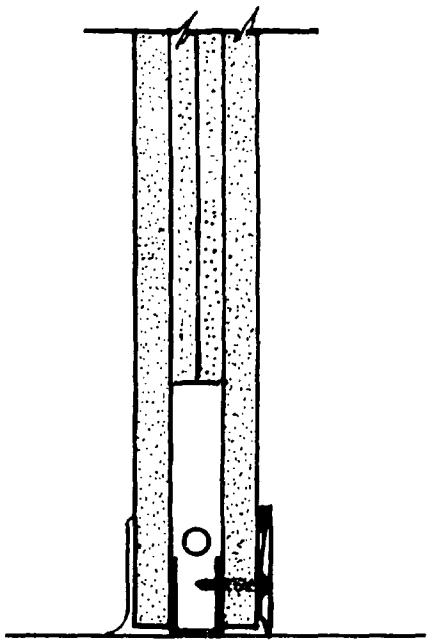


WALL ELEVATION SCALE 3/8" = 1'0"

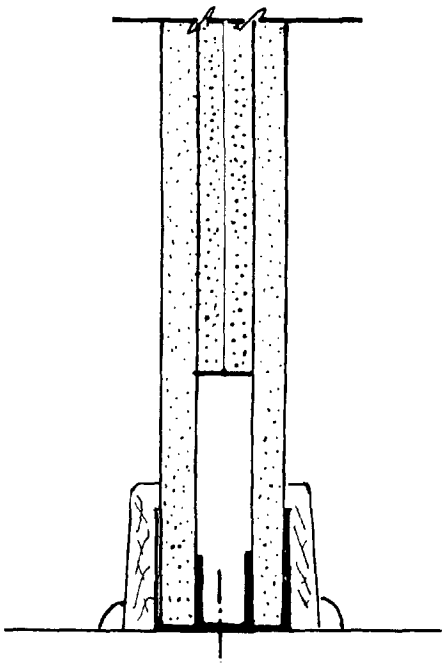
SGP 0028088







TYPICAL METAL RUNNER WITH
VINYL OR METAL BASE



TYPICAL METAL RUNNER WITH
WOOD BASE

SCALE 3" = 1'0"

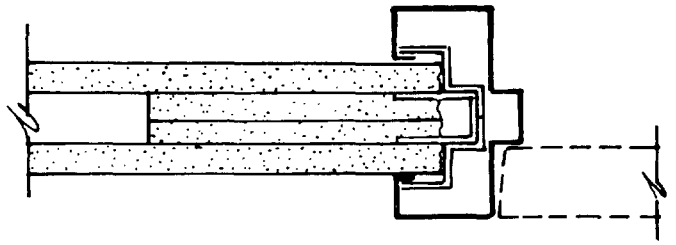
SGP 0028089

SYSTEMS ENGINEERING

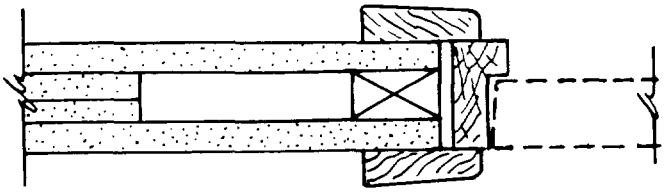
Bestwall research and engineering combine Bestwall Glass Fiber Reinforced Gypsum Wallboard with the most comprehensive and advanced techniques in gypsum drywall construction. These include single ply, laminated plies, metal studs, screw application and movable partitions with and without metal framing. Each system tailors space to your requirements with substantial savings on material and labor.

A staff of Bestwall Systems Engineers is available from coast-to-coast to assist you in quantity [illegible] detailing and installation of drywall systems to help you meet your requirements.

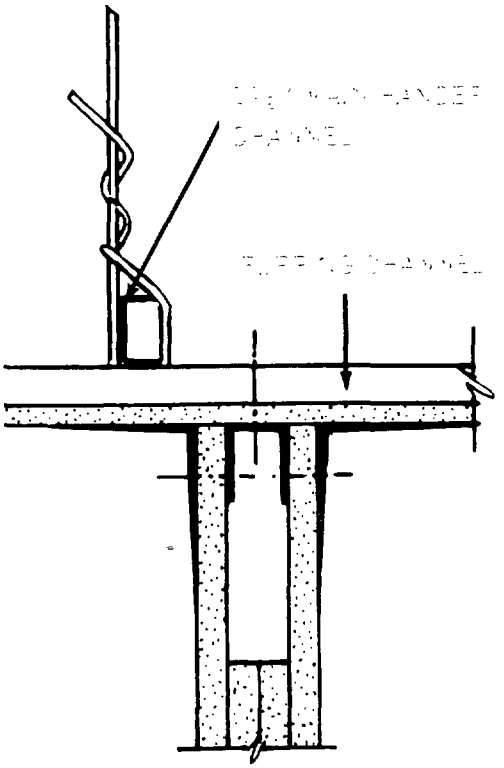
For detailed data, check your Sweet's File or write directly to the Bestwall Gypsum Company.



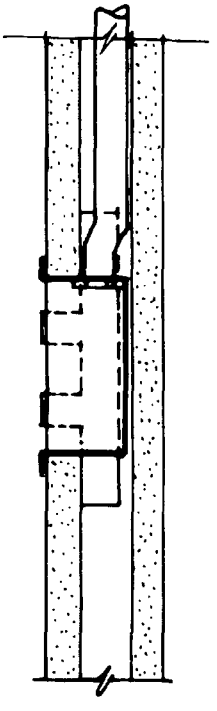
TYPICAL METAL DOOR

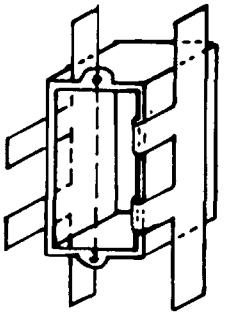


TYPICAL WOOD DOOR

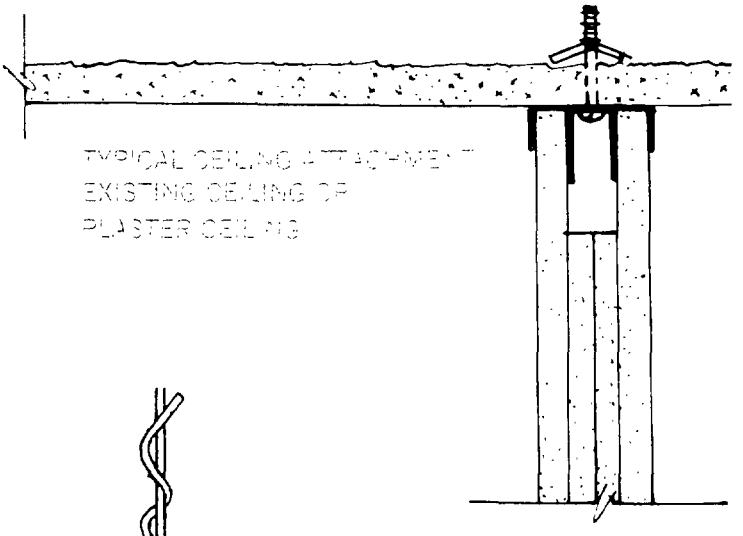


TYPICAL CEILING ATTACHMENT
SUSPENDED GRID SYSTEM

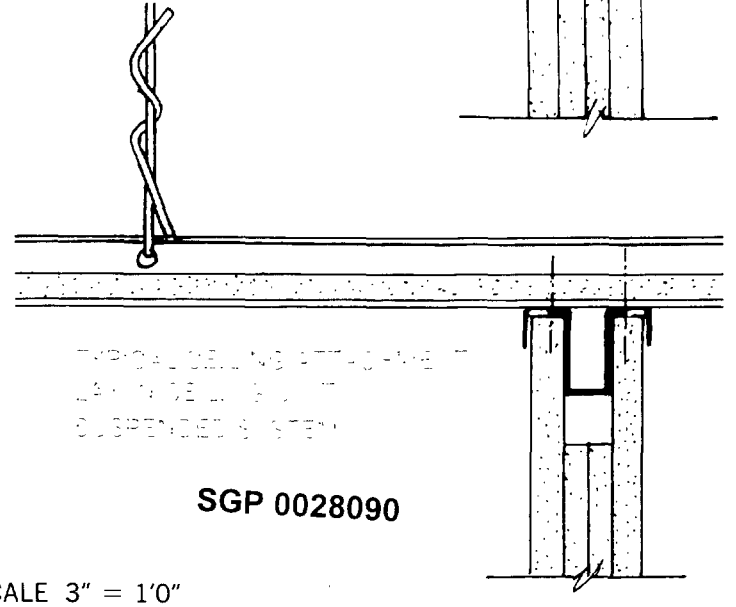




ELECTRIC BOX
MOUNTING DETAIL



TYPICAL CEILING ATTACHMENT
EXISTING CEILING OR
PLASTER CEILING



SGP 0028090

SCALE 3" = 1'0"

2¼" SEMI-SOLID GYPSUM WALLBOARD NON-LOAD BEARING PARTITION

FEATURES:

1. Fire Resistance: . . . . . One hour with Bestwall Firestop.
2. Sound Transmission Loss: . 35 Decibels (Tested before 1957).
   30 Decibels (Tested 1958).
3. Strength: . . . . . More rugged, under standard "Bump" test than wall with 2" x 4" studs, 16" o.c., faced with ½" gypsum wallboard.
4. Laminated Construction: . . Smooth monolithic walls created by unitized lamination of multi-plies of Gypsum Wallboard.
5. Extra Usable Floor Space: . . 20 sq. ft. more than 2" x 4" stud wall construction for every 100 lin. ft. of wall.

SPECIFICATIONS:

All gypsum wallboard and joint system material used, including laminating compound, shall be manufactured by the Bestwall Gypsum Company and shall be installed by a Bestwall Hummer licensed contractor in a first-class workmanship manner.

Floor and Ceiling Runners: Use 1" x 1⅝" wood or metal hat section runners. #105 Metal Casings for ⅝" board may be used at ceiling line in lieu of wood or metal runners.

Laminated Ribs:

Construction: Made by laminating 2—½" gypsum strips 6" wide.

Spacing: One rib centered over joint between first layer boards. Another centered between joints.

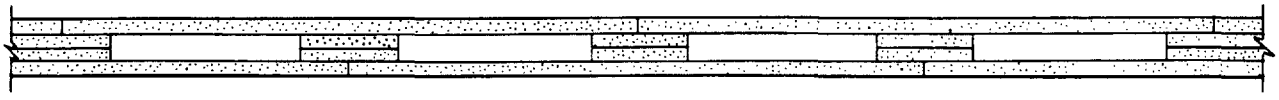
Face Board: Use ⅝" Bestwall Firestop, 4' wide, floor to ceiling height (12' max.), tapered edge, applied vertically with joints on center of rib.

Laminating Compound:

Apply glue to back of face layer with serrated knife in strips or to rib on wall with a mechanical glue spreader.

Face Nailing: Use 1⅝" long, Drywall nails at ceiling and floor line, space 5" o.c. If board is set on floor, space 8" o.c. Use 1½" long, Bestwall Drywall screws in joints spaced max. 24" o.c. as shown. Do not dimple board for fasteners that are under tape or trim.

Joint Treatment and Decoration:



ONE-HOUR FIRE RESISTANCE

4" SEMI-SOLID GYPSUM WALLBOARD NON-LOAD BEARING PARTITION

FEATURES:

1. Fire Resistance: . . . . . Two-hours with ⅝" Bestwall Firestop.
2. Sound Transmission Loss: 42 Decibels (Tested before 1957).
   37 Decibels (Tested 1958).
3. Strength: . . . . . At least 10% less deflection under standard ASTM "Bump" test than walls with 2" x 4" studs 16" o.c. faced with ½" Gypsum Wallboard.
4. Laminated Construction: . . Smooth monolithic walls created by unitized lamination of multi-plies of Gypsum Wallboard.

SPECIFICATIONS:

All gypsum wallboard and joint system materials used, including laminating compound, shall be manufactured by the Bestwall Gypsum Company and shall be installed by a Bestwall Hummer licensed contractor in a first-class workmanship manner.

Floor and Ceiling Runners: Use 1½" x 1⅝" wood runner or metal hat section with ½" thick 2" wide gypsum board strip applied to metal runner.

Laminated Ribs:

Construction: Made by laminating 2—½" gypsum strips 6" wide.

Spacing: One rib centered over joint between first layer boards. Another centered between joints.

First Layer Board: Use ⅝" Bestwall Firestop, 4' wide, floor and ceiling height (12' max.). Apply vertically with joints centered over rib.

Nailing: Use 1⅝" long, Drywall nail at ceiling and floor lines spaced 8" o.c. or Bestwall Drywall screws with metal floor and ceiling runners.

Face Layer Board: Use ⅝" Bestwall Firestop, 4' wide, floor to ceiling height (12' max.) tapered edge, applied vertically with joints off those in first layer.

Laminating Compound:

Apply glue to back of face layer with serrated knife in strips or to ribs on wall with a mechanical glue spreader.

Face Board Nailing: Use 2½" nail at ceiling and floor, 8" o.c. or Drywall screws with metal runners.

Screws: Use 2" long Bestwall Drywall screws at edges of first layer and face boards, 24" o.c.

Joint Treatment and Decorating:



TWO-HOUR FIRE RESISTANCE

BESTWALL HUMMER SYSTEMS

5" SEMI-SOLID GYPSUM WALLBOARD NON-LOAD BEARING PARTITION

FEATURES:

1. Fire Resistance: .....Three-hours with Bestwall Firestop.
2. Sound Transmission Loss: 47 Decibels (Tested before 1957).
   40 Decibels (Tested 1958).
3. Strength: .....At least 10% less deflection under standard ASTM "Bump" tests than walls with 2" x 4" studs, 16" o.c., faced with ½" Gypsum Wallboard.
4. Laminated Construction: ..Smooth monolithic walls created by unitized lamination of multi-plies of Gypsum Wallboard.

SPECIFICATIONS:

All gypsum wallboard and joint system materials used, including laminating compound, shall be manufactured by the Bestwall Gypsum Company and shall be installed by a Bestwall Hummer licensed contractor in a first-class workmanship manner.

Floor and Ceiling Runners: Use metal hat sections or 1" x 1⅝" wood runners spaced ½" apart.

Laminated Ribs:

Construction: Made by laminating 2—½" gypsum strips 6" wide.

Spacing: One rib centered over joint between first layer boards. Another centered between joints.

First Layer Board: Use ⅝" Bestwall Firestop, 4' wide, floor and ceiling height (12' max.). Apply vertically with joints centered over rib.

Nailing: Use 1⅝" long, Drywall nail at ceiling and floor lines spaced 8" o.c. or Bestwall Drywall screws with metal floor and ceiling runners.

Face Layer Board: Use ⅝" Bestwall Firestop, 4' wide, floor to ceiling height (12' max.) tapered edge, applied vertically with joints off those in first layer.

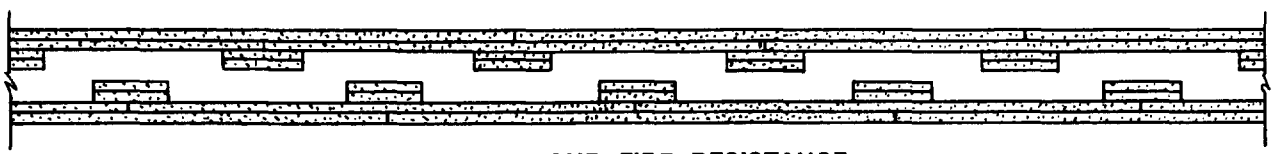
Laminating Compound: See Bestwall Product Sheet B-82355 Apply glue to back of face layer with serrated knife in strips or to ribs on wall with a mechanical glue spreader.

Face Board Nailing: Use 2½" nail at ceiling and floor, 8" o.c. or Drywall screws with metal runners.

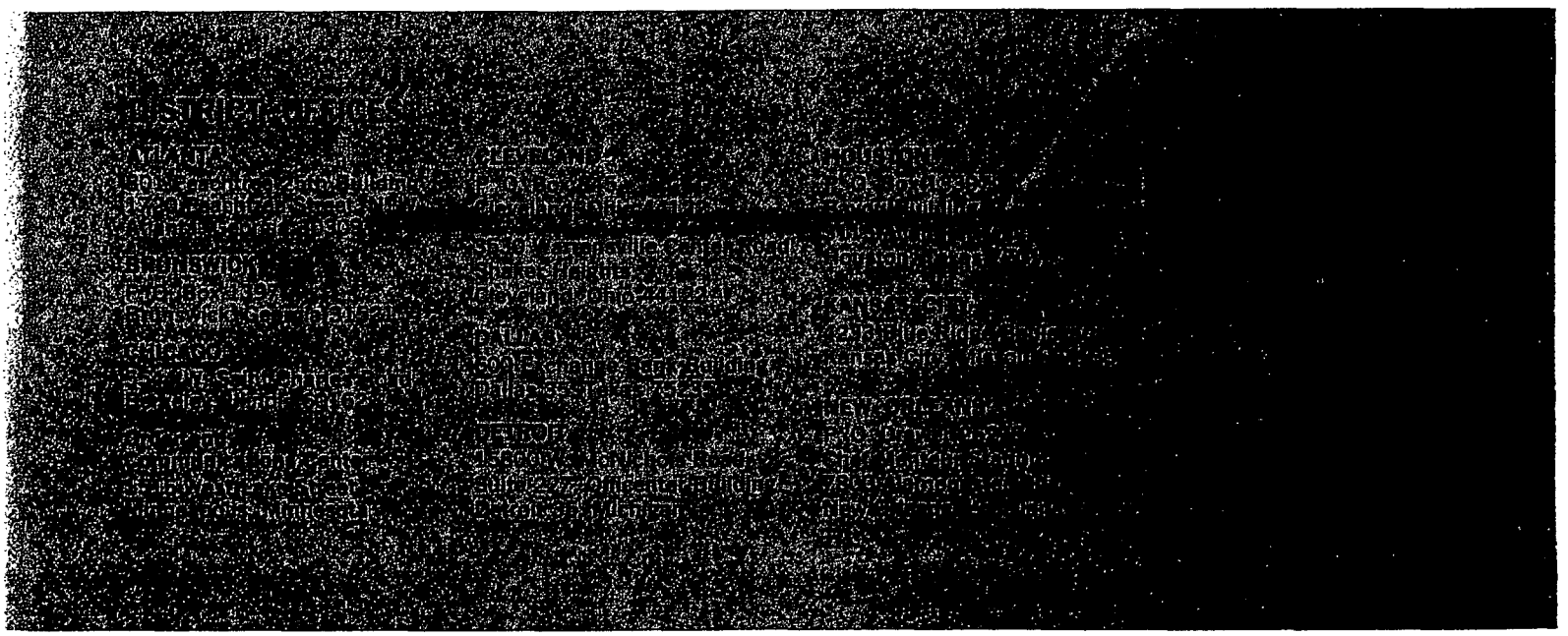
Screws: Use 2" long Bestwall Drywall screws at edges of first layer and face boards, 24" o.c.

Joint Treatment and Decorating: See Bestwall Product Sheet B-82360

Note: For best value in reducing sound transmission a ½" rigid glass fiber low density material should be inserted in center space between two sides of wall.



THREE-HOUR FIRE RESISTANCE

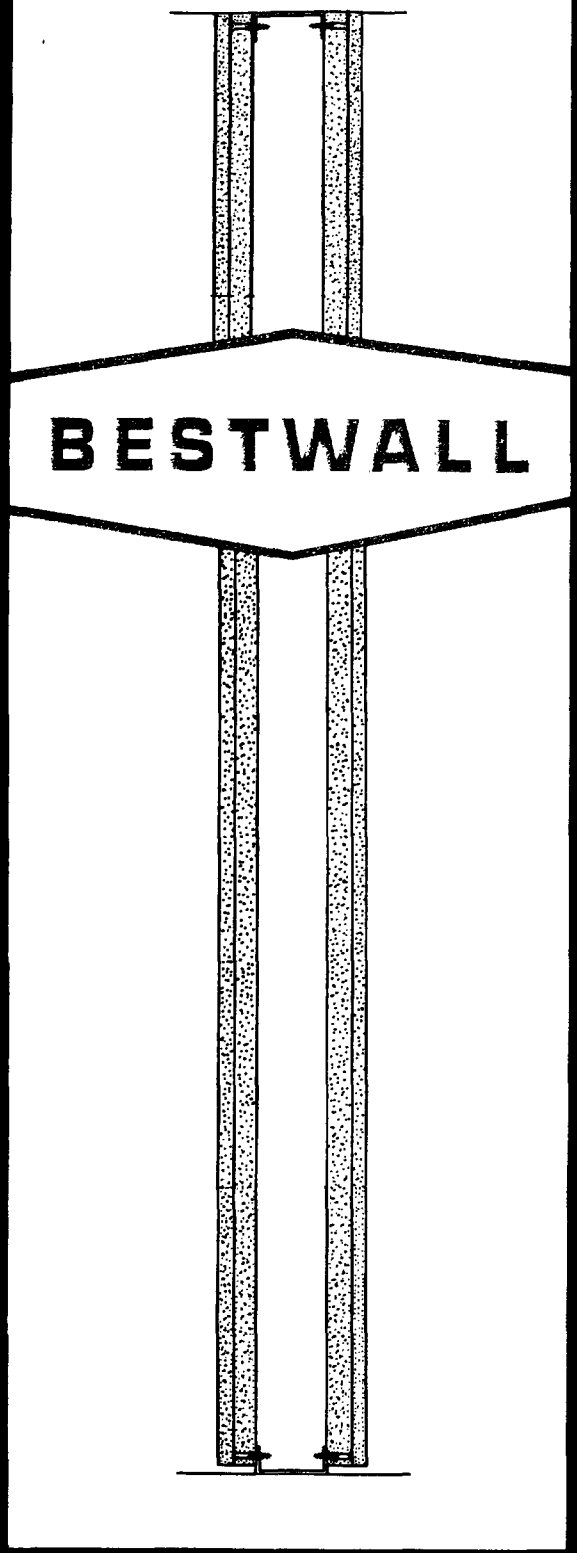


FIREPROOF GYPSUM BESTWALL BUILDING PRODUCTS

BESTWALL GYPSUM COMPANY
PAOLI, PENNSYLVANIA

SGP 0028092

B. Double-Solid Partitions



BESTWALL

HUMMER SYSTEMS

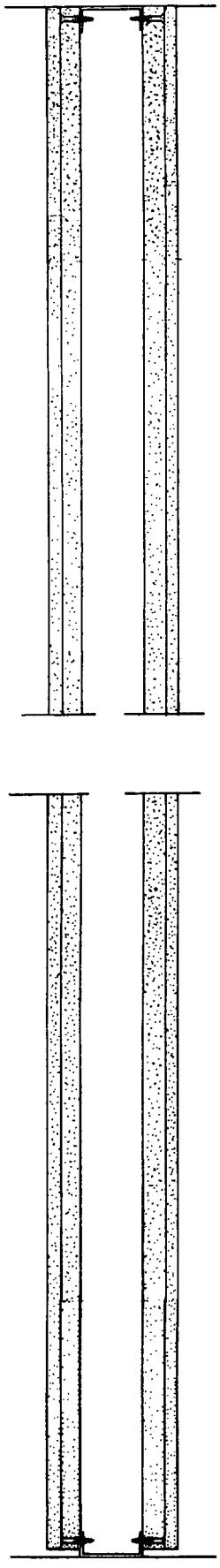
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SGP 0028094

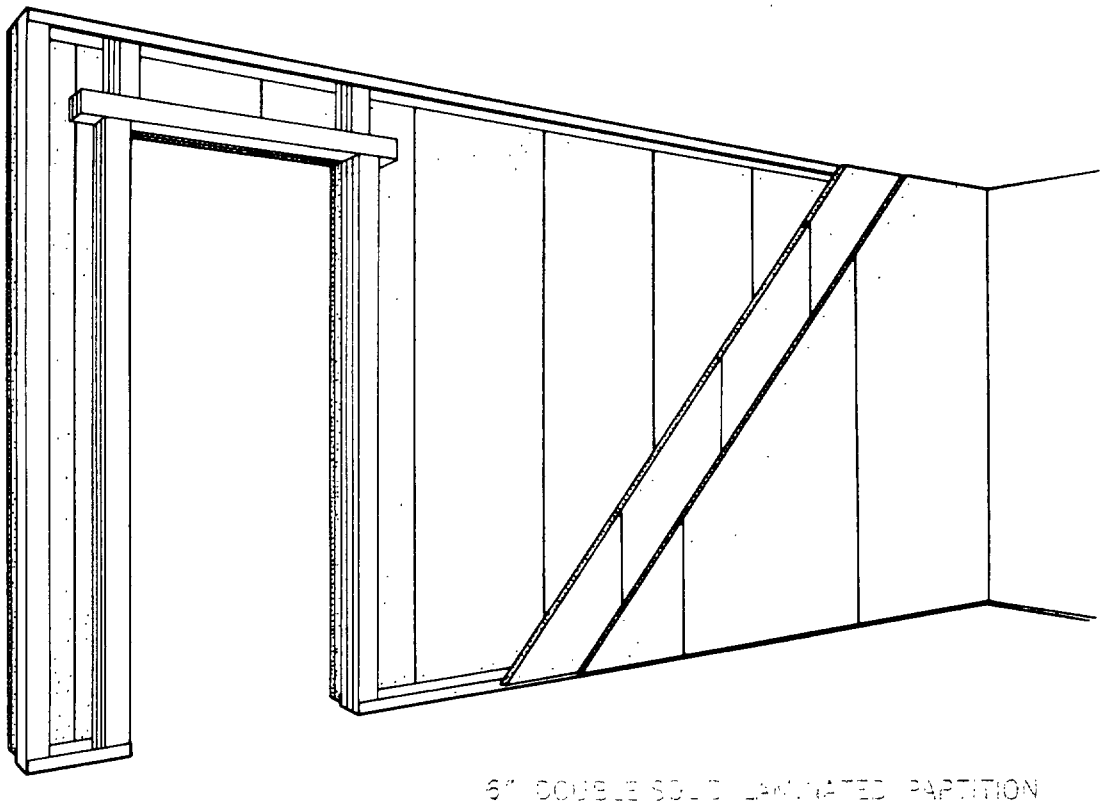
6" DOUBLE SOLID

This non-load bearing Gypsum partition system is erected by laminating ½" ply to 1" homogeneous board each side of a 3" void. It is recommended for party walls in high rise, residential construction.

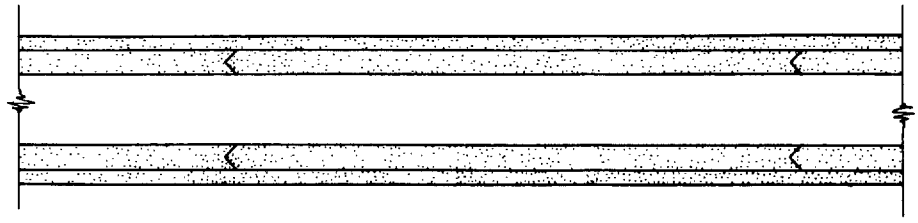
- FIRE RESISTANCE—Two hours.
- SOUND TRANSMISSION CLASS—47 db (Tested 1964).
- STRENGTH—Proven in ASTM "Bump" tests and performance to have greater resistance to deflection and cracking than a standard frame or thin solid wall.
- LAMINATED CONSTRUCTION — Smooth monolithic walls created by unitized lamination of multi-plies of Gypsum Wallboard.
- CENTER AIR SPACE—3" space for piping—conduit —fixture framing—for additional sound transmission loss.



WALL SECTION

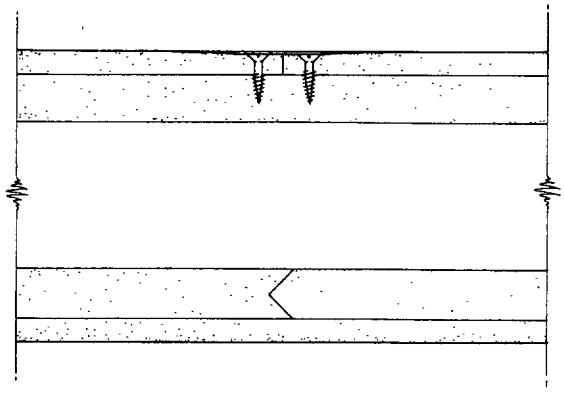


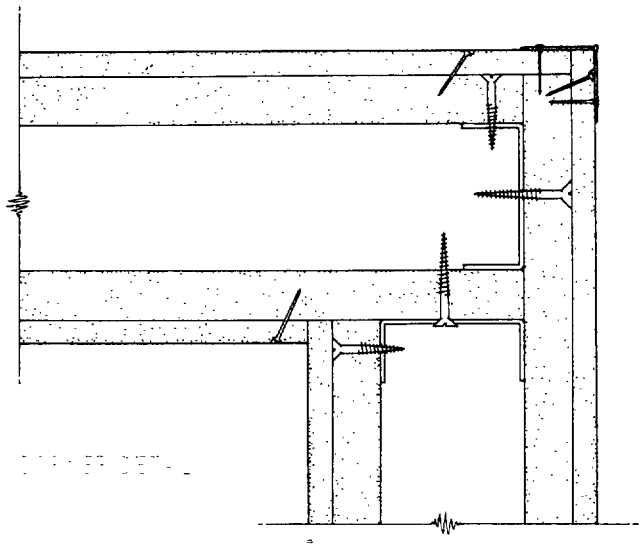
6" DOUBLE SOLID LAMINATED PARTITION

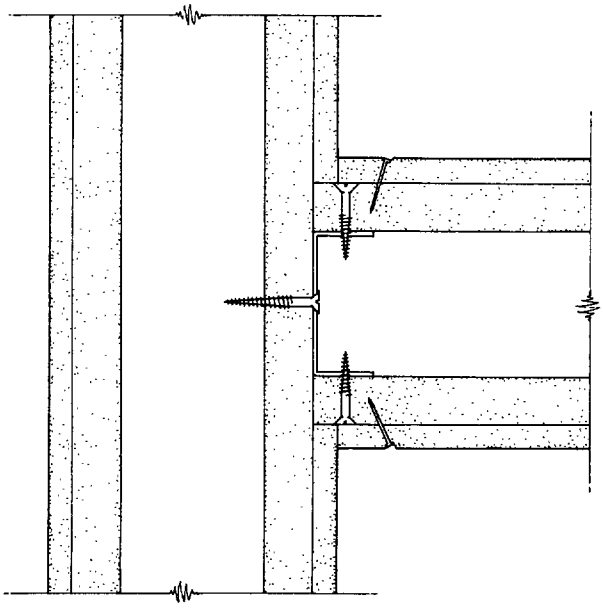


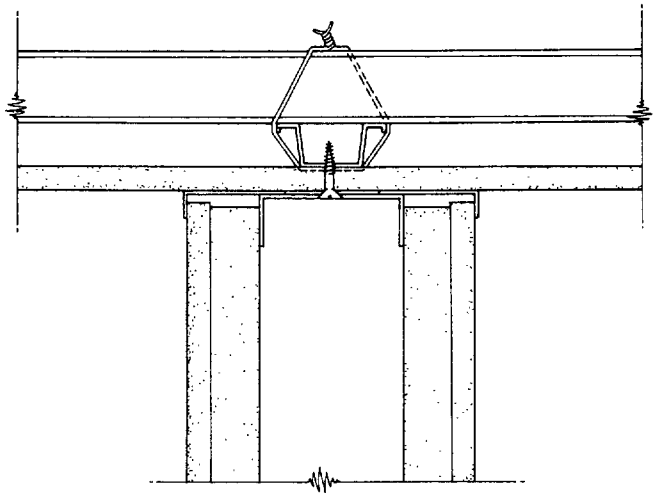
HORIZONTAL SECTION OF WALL
SCALE: 1½" = 1'0"

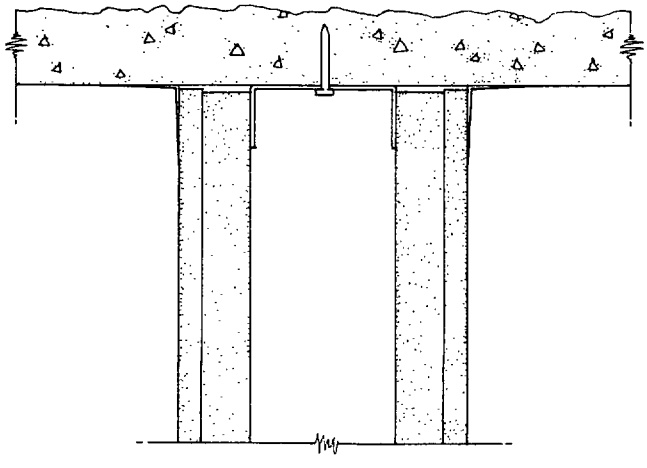
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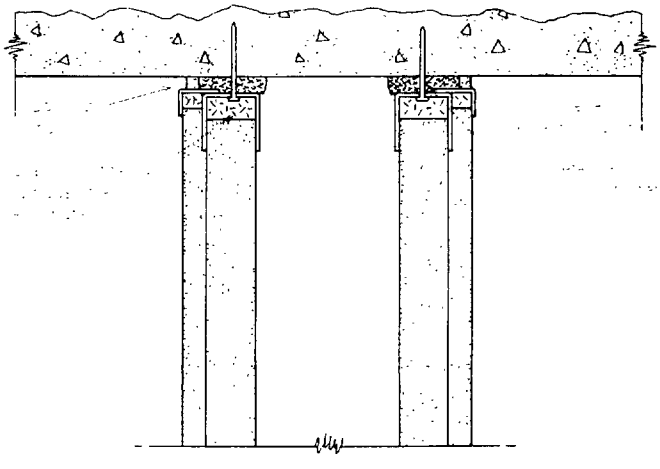


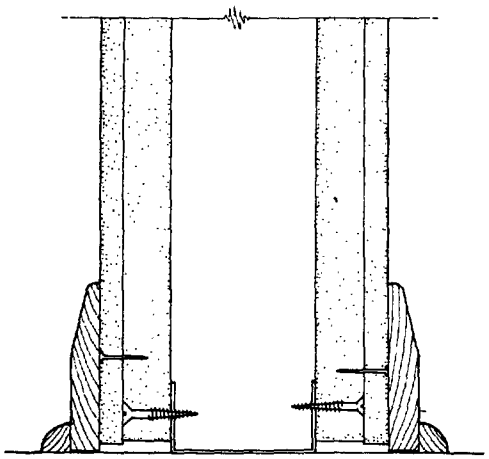




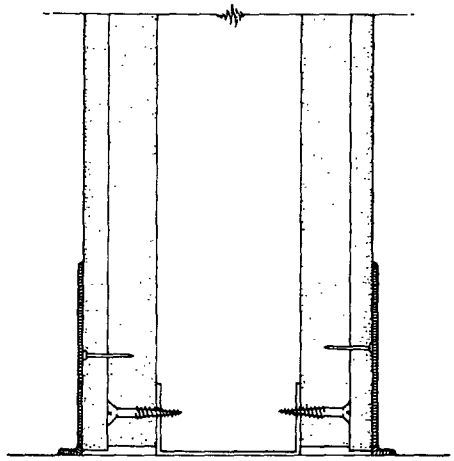




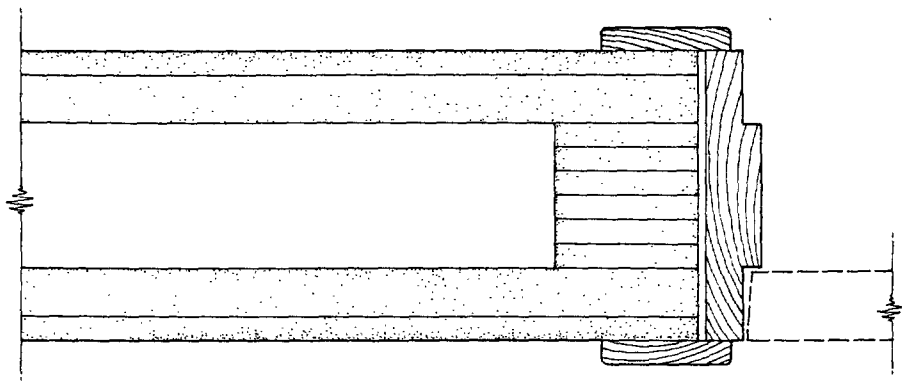




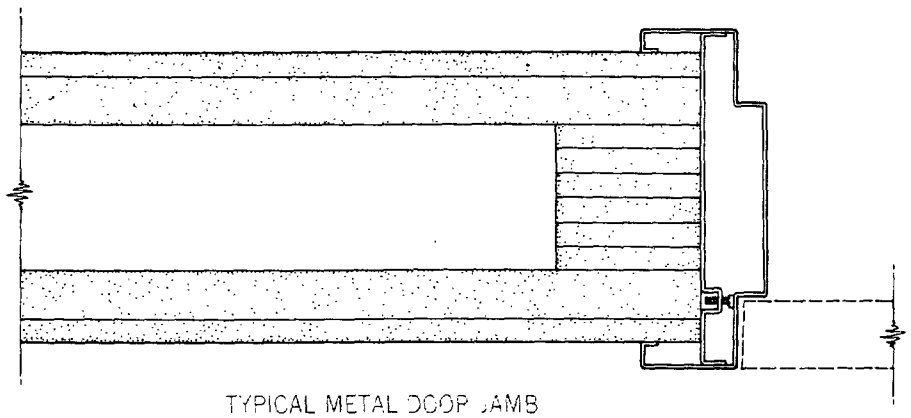
FLOOR DETAIL — WOOD TRIM



FLOOR DETAIL — VINYL TRIM



TYPICAL WOOD DOOR JAMB



TYPICAL METAL DOOR JAMB

SGP 0028097

SYSTEMS ENGINEERING

Bestwall research and engineering combine Bestwall Glass Fiber Reinforced Gypsum Wallboard with the most comprehensive and advanced techniques in gypsum drywall construction. These include single ply, laminated plies, metal studs, screw application and movable partitions with and without metal framing. Each system tailors space to your requirements with substantial savings on material and labor.

A staff of Bestwall Systems Engineers is available from coast-to-coast to assist you in quantity survey, detailing and installation of drywall systems to help you meet your requirements.

For detailed data, check your Sweet's File or write directly to Georgia-Pacific Corporation, Bestwall Gypsum Division.

BESTWALL HUMMER SYSTEMS

6" DOUBLE SOLID LAMINATED GYPSUM WALLBOARD PARTITIONS

FEATURES:

1. Fire Resistance: . . . . . Two hours with Bestwall Gypsum Wallboard.
2. Sound Transmission Class: . . . . . 47 db (Tested 1964).
3. Strength: . . . . . Proven in ASTM E-72-55 Impact Test to have greater resistance to abuse than a standard frame or thin solid wall.
4. Laminated Construction: . . . . . Smooth monolithic walls created by unitized lamination of multi-plies of gypsum wallboard.
5. Center Air Space: . . . . 3" space for piping, conduit, fixture framing, additional sound transmission loss.

SPECIFICATIONS:

All gypsum wallboard and joint system materials used, including laminating compound, shall be manufactured by Georgia-Pacific Corporation Bestwall Gypsum Division and shall be installed by a Bestwall Hummer licensed contractor in a first class manner.

Floor and Ceiling Runners: 1⅝" x 3' wood runners or special shaped metal runners.

Bestwall Gypsum Coreboard (may be Tongue & Groove Coreboard or lamination of two ½" boards with ship lapped edges): 1" thick, 24" wide. Laminated boards should set at least 24 hours before using.

Bestwall Taper Edge Gypsum Wallboard (Face Board): ½" thick, 4' wide, floor to ceiling length (12' max.).

Bestwall Laminating Compound: Use either a comb type spreader, a mechanical tool designed for applying laminating compound, or equivalent. The comb type spreader should have triangular notches 3/16" wide by 3/16" deep, spaced ¾" on centers. Other spreaders should have the same size and pattern of ridges as the comb type spreader.

Nails: 8d box nails and 8d finishing nails.

Screws: 1⅜" — 2¼" long, Bestwall Drywall Screws.

Openings: Door and borrowed light openings shall be left accurately located in coreboard and face board for two (or three) part frames to be set. Single piece door frames shall be accurately set (by others) before coreboard, which must then be started from door frame.

Joint Treatment and Decorating: See Bestwall Product Sheet BW-6510.

APPLICATION DETAILS

1. Secure floor and ceiling runners in place with appropriate fasteners spaced a maximum of 2' on centers.
2. Attach coreboard to floor and ceiling runners with nails or screws 8" o.c. (Do not dimple).
3. Apply Bestwall Laminating Compound to the coreboard or to the back of the faceboard with a mechanical or comb type spreader.
4. Apply face layer of ½" Bestwall Gypsum Wallboard vertically to each side of the partition. Joints should be staggered and fall a minimum of 6" off those in coreboard.

Note: In buildings where movement may occur of sufficient magnitude to load the partitions, a relief joint should be provided at the ceiling line, and also where the partitions are erected between building columns at the intersection with the columns. An illustration would be the upper floors of concrete flat slab constructions.

The wallboard system covered in this Georgia-Pacific/Bestwall Gypsum Division folder has been developed with due regard to practical construction methods. However, since the Bestwall Gypsum Division does not have any prior knowledge of building design and construction on a specific job, or methods of application and use of their products, no warranty of performance is made. All of the test results shown have been obtained under laboratory testing conditions where controlled environment reduces variables to a minimum. In the field, such laboratory conditions are not always met, since many other variables are introduced. Laboratory results will generally exceed results of field tests, but the tests under controlled conditions are the only logical way to compare the performance of different assemblies. The Bestwall Gypsum Division of the Georgia-Pacific Corporation makes no warranty as to the performance of assemblies in the field having a performance equal to or better than that developed in the test.

SALES OFFICES

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1720 Peachtree N.W.
Atlanta, Georgia 30309

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Brunswick, Georgia 31521

CHICAGO
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Skokie, Illinois 60077

CLEVELAND
3630 Warrensville Center Road
Shaker Heights
Cleveland, Ohio 44120

DALLAS
6900 Fairmont Park Building
Dallas, Texas 75235

DETROIT
Suite 227, 10 Mile/Greenfield Building
Detroit, Michigan 48235

HOUSTON
Bayou Building
3822 Richmond Avenue
Houston, Texas 77027

KANSAS CITY
4235 Blue Ridge Boulevard
Kansas City, Missouri 64133

NEW ORLEANS
[redacted]
New Orleans, Louisiana 70130

SAN FRANCISCO
201 El Camino Real
El Centro, California 94025

WESTERN
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[redacted]
Salt Lake City, Utah 84101

WILMINGTON
Wilmington Marine Terminal
Wilmington, Delaware 19899

GEORGIA-PACIFIC BESTWALL GYPSUM DIVISION

[redacted]

SGP 0028099

C. Ceiling Systems

J. C. Clark
Signed

GEORGIA-PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION
January 25, 1967

General Sales Bulletin #11-67

TO: ALL REGIONAL SALES MANAGERS
ALL DISTRICT SALES MANAGERS
ALL SALESMEN

CC: R. I. Fredericks, Paoli
K A. McCaskill, Paoli
M. M. Powers, Paoli

SUBJECT: STEEL BEAM FIREPROOFING WITH GYPSUM WALLBOARD

By: G. C. Moore:jw
GCM

FILE: GYPSUM WALLBOARD PRODUCTS MANUAL - 7C

Attached are two copies of descriptive literature that describes two construction applications for fireproofing steel beams for a 2-Hour fire resistance rating with two layers of Type "X" Gypsum Wallboard.

These construction assemblies were fire tested at the Underwriters' Laboratories for the Gypsum Association. The assemblies are covered under UL Design Nos. 254-2 Hours, and 255-2Hours.

Two methods were employed to frame in the three sides of the steel beams. In UL Design 254, 1" x 2" - 24 gauge L shaped metal runners were applied and in UL Design 255, 1-5/8" x 1" - 25 gauge metal runners were used. Two layers of 5/8" Type "X" Gypsum Wallboard were screw attached to the metal framing and finished in the conventional manner.

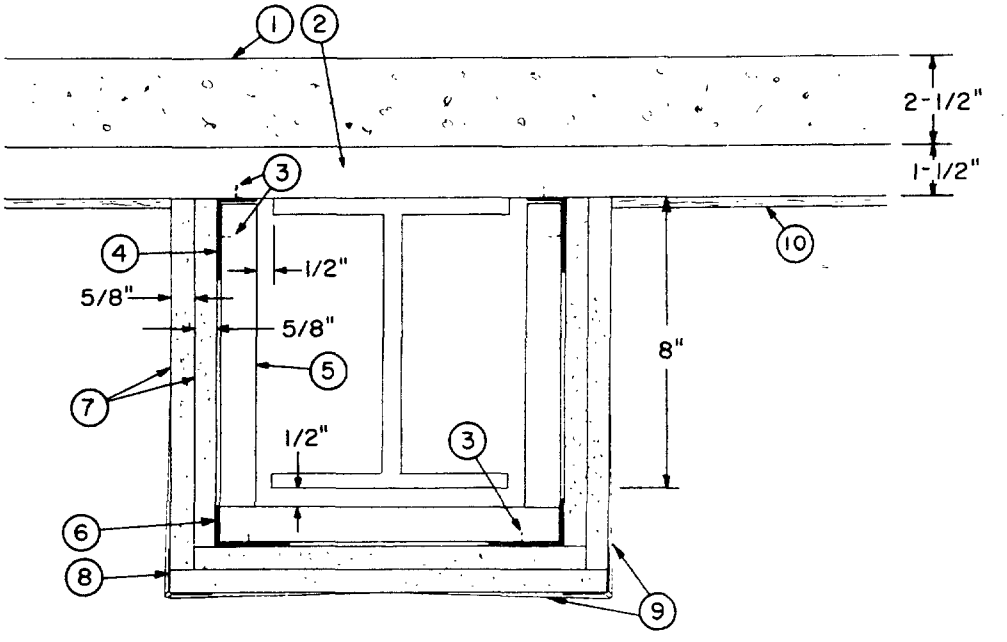
The Gypsum Association will continue to fire test similar assemblies in an effort to get three and four hours fire resistance ratings. Georgia-Pacific/Bestwall's Firestop labels will show the two described design numbers as new tapes are printed

Promote and sell Georgia-Pacific/Bestwall Gypsum products with the new methods of fire resistant applications

ATT(2)

Class D-2 Designs

Design No. 254 — 2 Hr. (Beam Only)† F



September 14, 1966

Part 2 - Description of Numbered Items

Class D-2 Designs

Design No. 254 - 2 Hr. (Beam only)†

† - When used with floor and ceiling similar to that shown having at least a 2-hr classification.

1. Sand-Gravel Concrete.

2. Fluted Steel Floor Units - Welded to beam.

3. Drill Screw - No. 8-18 by 1/2-in. long Phillips pan-head drill screws, self-drilling and tapping, made of case-hardened steel.

4. Runner Angle - No. 24 gauge galvanized steel with 1 and 2-in. legs. Fastened to steel deck 12 in. O.C. with Item 3.

5. Channel Bracket - Fabricated from No. 25 gauge galvanized steel, 1-11/16 in. deep with 1-in. legs and spaced 24 in. O.C. Fastened to the runner angles with Item 3.

6. Corner Angle - Same material as Item 4, fastened to channel brackets with Item 3.

7. Wallboard - 5/8 in. thick, listed by Und. Lab., Inc. (Building Materials List, Guide No. 40 U18.23). First layer fastened with 1-1/4-in. long, 0.150-in. diameter screws spaced 16 in. O.C. Second layer attached with 1-3/4-in. long, 0.150-in. diameter screws spaced 8 in. O.C. Screws are self-drilling and self-tapping Phillips head made of case-hardened steel.

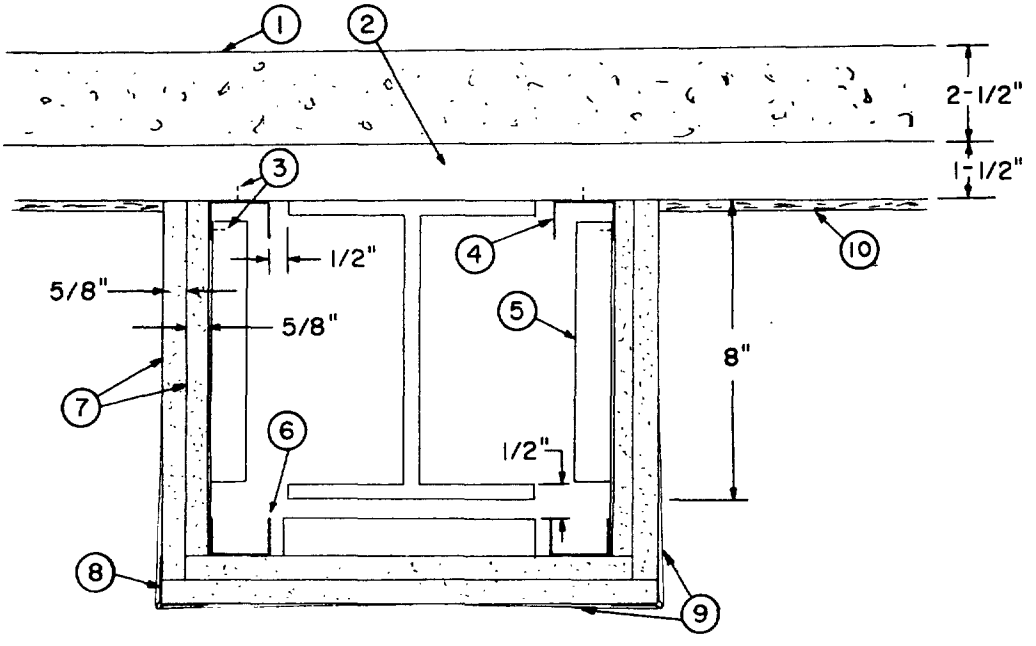
8. Corner Bead - Fabricated from No. 20 gauge galvanized steel to form an angle with 1-1/4-in. legs. Legs perforated with 1/4-in. diameter holes approx 1 in. O.C. Attached to wallboard with special crimping tool approx. 6 in. O.C. As an alternate, the bead may be nailed to the wallboard.

9. Joint Compound - 1/32 in. thick on bottom and sides of wallboard from corner beads and feathered out. Paper tape imbedded in joint compound over joints with edges of compound feathered out.

10. Protective Material.

Floor or Roof and Ceiling Construction and Beam Protection **Part I - See Part 2 for Description of Numbered Items**

Class D-2 Designs
Design No. 255—2 Hr. (Beam Only)† F



September 14, 1966

Part 2 - *Description of Numbered Items*

Class D-2 Designs

Design No. 255 - 2 Hr. (Beam only)†

† - When used with floor and ceiling similar to that shown having at least a 2-hr classification.

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2. Fluted Steel Floor Units - Welded to beam.

3. Drill Screw - No. 8-18 by 1/2-in. long Phillips pan-head drill screws, self-drilling and tapping, made of case-hardened steel.

4. Runner Channel - Fabricated from No. 25 gauge galvanized steel, 1-11/16 in. deep with 1-in. legs. Fastened to steel deck with Item 3, 12 in. O.C.

5. Channel Bracket - Same material as Item 4 and fastened to runner channels with Item 3. Brackets spaced 24 in. O.C.

6. Corner Channel - Same material as Item 4. Placed in cutouts of channel brackets without attachment.

7. Wallboard - 5/8 in. thick, listed by Und. Lab., Inc. (Building Materials List, Guide No. 40 U18.23). First layer fastened with 1-1/4-in. long, 0.150-in. diameter screws and spaced 16 in. O.C. Second layer attached with 1-3/4-in. long, 0.150-in. diameter screws spaced 8 in. O.C. Screws are self-drilling and self-tapping Phillips head made of case-hardened steel.

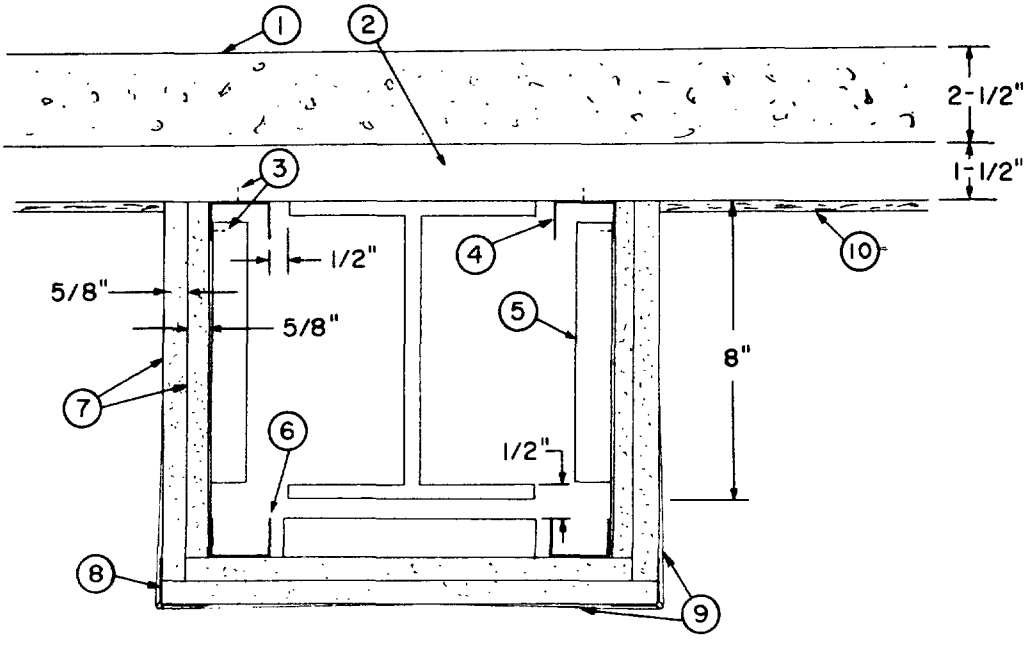
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9. Joint Compound - 1/32 in. thick on bottom and sides of wallboard from corner beads and feathered out. Paper tape imbedded in joint compound over joints with edges of compound feathered out.

10. Protective Material.

Class D-2 Designs
Design No 255—2 Hr. (Beam Only)†

F



September 14, 1966

Part 2 - Description of Numbered Items

Class D-2 Designs

Design No. 255 - 2 Hr. (Beam only)†

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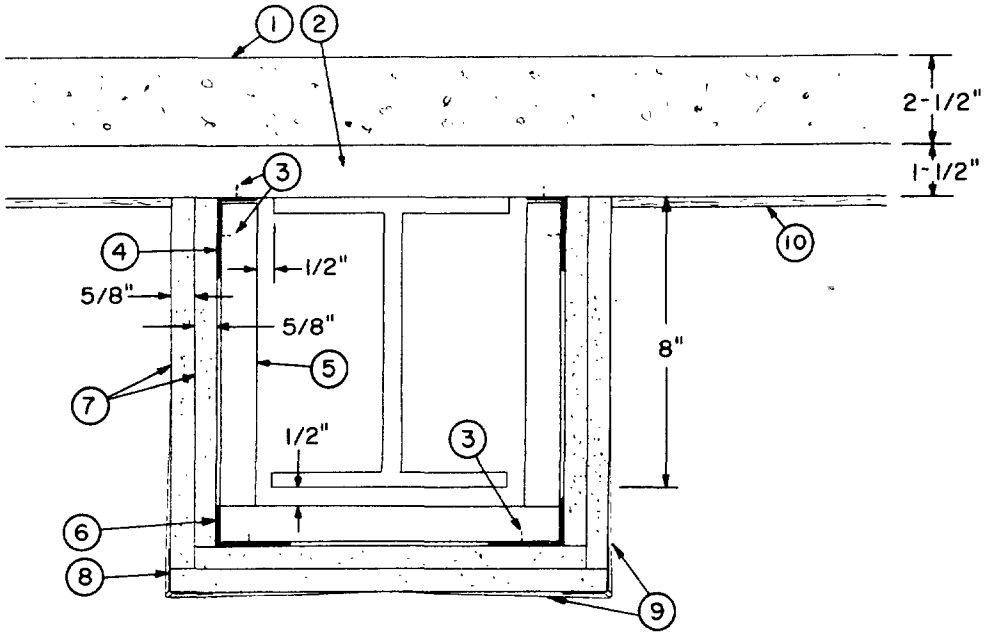
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8. Corner Bead - Fabricated from No. 20 gauge galvanized steel to form an angle with 1-1/4-in. legs. Legs perforated with 1/4-in. diameter holes approx 1 in. O.C. Attached to wallboard with special crimping tool approx. 6 in. O.C. As an alternate, the bead may be nailed to the wallboard.

9. Joint Compound - 1/32 in. thick on bottom and sides of wallboard from corner beads and feathered out. Paper tape imbedded in joint compound over joints with edges of compound feathered out.

10. Protective Material.

Class D-2 Designs
Design No. 254—2 Hr. (Beam Only)† F



September 14, 1966

Part 2 - Description of Numbered Items

Class D-2 Designs

Design No. 254 - 2 Hr. (Beam only)†

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10. Protective Material.

Sigurd Plant
E. M. Bigay

PAOLI, PENNSYLVANIA

21 September 1965

To: All Regional Sales Managers
All Area Sales Managers
All Salesmen
Distribution Division

Cc: Mr. R.I. Fredericks Paoli
Mr. K.A. McCaskill Paoli

General Sales Bulletin #87-65

Subject: AMERICAN PLYWOOD INSTITUTE

Re: Combustible Floor & Ceiling Assemblies-Plywood Subfloors

By: G.C. Moore /ghp

File - Wallboard Gypsum
Product Manual #2 - Section 7-C

The American Plywood Institute have conducted fire tests at the Underwriters' Laboratories on combustible (floor and ceiling) construction assemblies using various thicknesses of plywood in lieu of using the conventional 1" x 4" or 1" x 6" sub-flooring which is presently used over wood joists for sub-flooring.

Underwriters' have approved the use of 5/8" plywood (underlayment grade T8.6) over building paper over 1/2" structural interior plywood (with exterior glue, grade - CD).

This type construction applies to floor and ceiling assemblies with a 45 minute and 1 hour fire rating (not over 1 hour).

The Underwriters' Laboratories are presently changing their literature and when reprinted, UL literature will show this alternate method of construction under the already approved design numbers using plywood for underlayment in 45 minute and 1 hour floor and ceiling construction assemblies.

This alternate method will allow contractors to use plywood in lieu of the conventional wood flooring over wood joists in combustible ceiling assemblies.

Please note and file - Bestwall 1966 Sweet's will show this approval.

SGP 0028106

SEP 25 1965



The Lowest Cost 2-Hour Fire Resistive Floor And Ceiling In Single Layer Application

Now from the Bestwall Gypsum Company and available only through the Bestwall Certain-teed Sales Corporation comes New Improved Bestwall Firestop. What's new about it? Plenty! There's substantially greater glass fiber reinforcement . . . more than ever before. This means increased fire ratings providing increased protection . . . possibly reduced fire insurance premiums . . . additional strength minimizing breakage in handling and installation . . . better nailing qualities . . . all available to the customer at no increase in price.

The Original ⅝" fire rated gypsum wallboard (Type "X") had a one-hour fire resistance in single layer application over wood or steel framing in walls and ceilings. Now through greater glass fiber reinforcement, its fire resistance has been increased to permit two hours when used in a single layer application in incombustible floor and ceiling assemblies.

In an Official Fire Test at Underwriters' Laboratories a single layer of ⅝" thick New Improved Bestwall Firestop was used as the ceiling beneath a concrete floor on steel bar joists (see reverse side for details) with sheet metal furring channels 24" on center, **NOT** 12", and drywall screws 12" on center, **NOT** 8".

The result: The lowest cost two-hour fire resistive incombustible floor and ceiling assembly available today! This construction with New Improved Bestwall Firestop passed the hose stream and double overloading tests, as well as the fire resistance test, which actually ran two hours and twenty minutes, with **no joint finishing treatment.**

All Bestwall Firestop, including the ⅝" and ½" thicknesses and Firestop Backer, is being manufactured with this improved glass fiber reinforcement . . . all *Bestwall Firestop users will benefit from this improvement* at no increase in price. Improved Bestwall Firestop is available only from the Bestwall Certain-teed Sales Corporation.

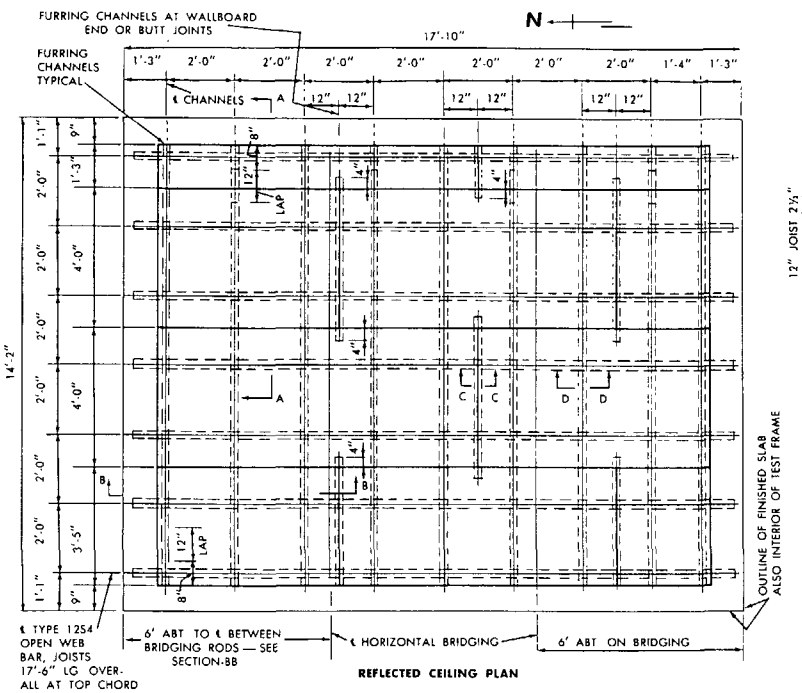
For additional information, including news about future tests to be conducted on New Improved Bestwall Firestop, contact the nearest sales office, located in principal cities throughout the United States. A staff of Bestwall Systems Engineers is available from coast-to-coast to assist in quantity survey, detailing and installation of Firestop floor, ceiling and wall systems.

BW-63130 3/63

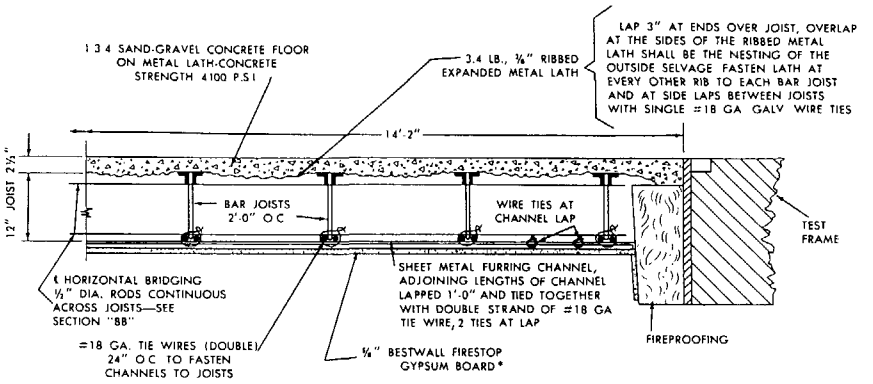
SGP 0028107

FIREPROOF BESTWALL GYPSUM BUILDING PRODUCTS

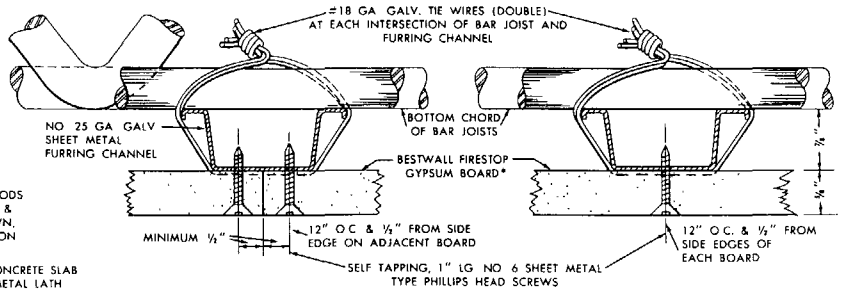
BESTWALL GYPSUM COMPANY
ARDMORE, PENNSYLVANIA
Plants and Offices throughout the United States



REFLECTED CEILING PLAN

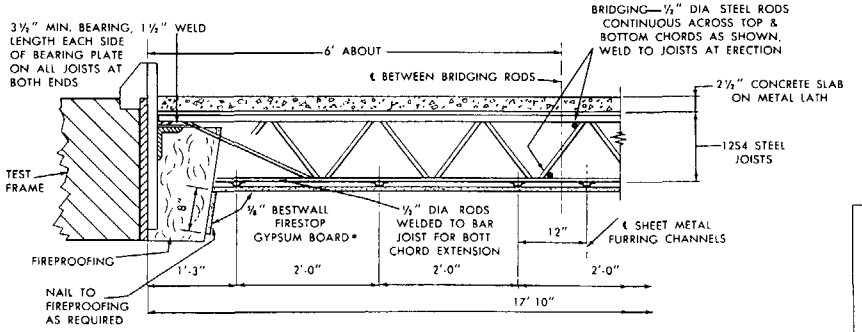


CROSS SECTION THRU STRUCTURE AT—"AA"



SECTION-CC AT BUTT JOINT

SECTION-DD BOARD CONTINUOUS OVER CHANNEL



SECTION-BB

*LISTED BY UNDERWRITERS' LABORATORIES, INC.
FIRE RESISTANCE CLASSIFICATION
FLOOR OR ROOF AND CEILING CONSTRUCTION
CLASS D-2
DESIGN #69 — 2 HOURS

BESTWALL GYPSUM COMPANY
ENGINEERING DEPT

CONCRETE SLAB ON STEEL BAR JOISTS WITH BESTWALL FIRESTOP CEILING

DATE 12-20-62		SCALE NONE APPLICABLE	
DRN BY J R M	CH K'D BY	DWG NO T-106	SHEET NO 1 OF 1

SGP 0028108

NO. 2467

OCTOBER 15, 1964

COMMONWEALTH OF PENNSYLVANIA

CERTIFICATE OF APPROVAL

THIS IS TO CERTIFY THAT

The Industrial Board of the Pennsylvania Department of Labor and Industry has examined and approved

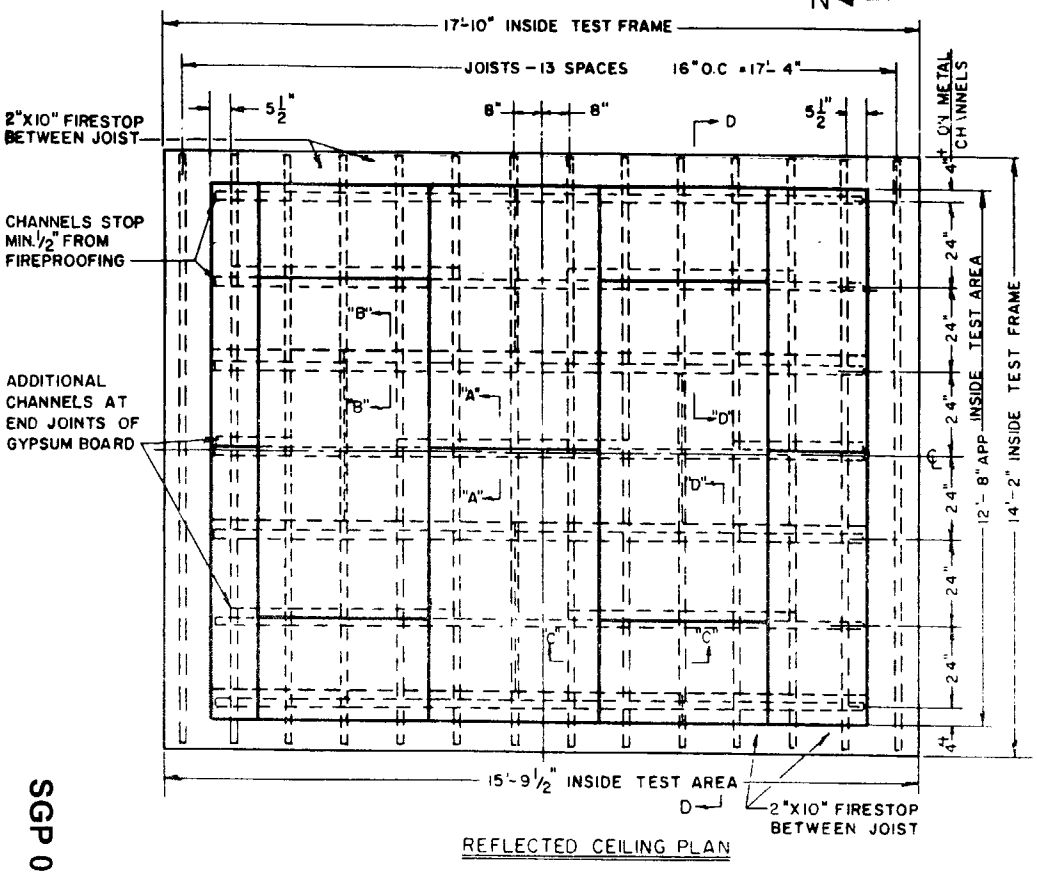
The "FLOOR AND CEILING DESIGN" WITH A 2 HR. FIRE RESISTIVE RATING. THE ASSEMBLY WILL CONSIST OF CEILING AND FLOOR CONSTRUCTION ON WOOD JOISTS WITH TWO LAYERS OF 5/8" BESTWALL FIRE STOP WITH RESILIENT CHANNEL.

of the BESTWALL GYPSUM COMPANY

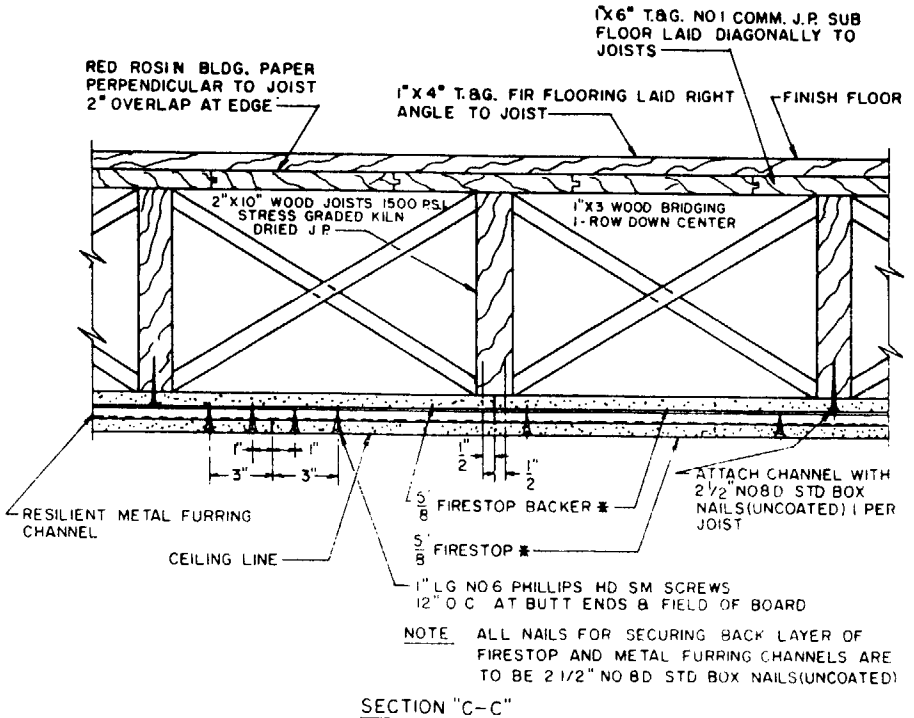
PAOLI, PENNSYLVANIA

R. PAUL LESSY *Secretary*

SGP 0028109

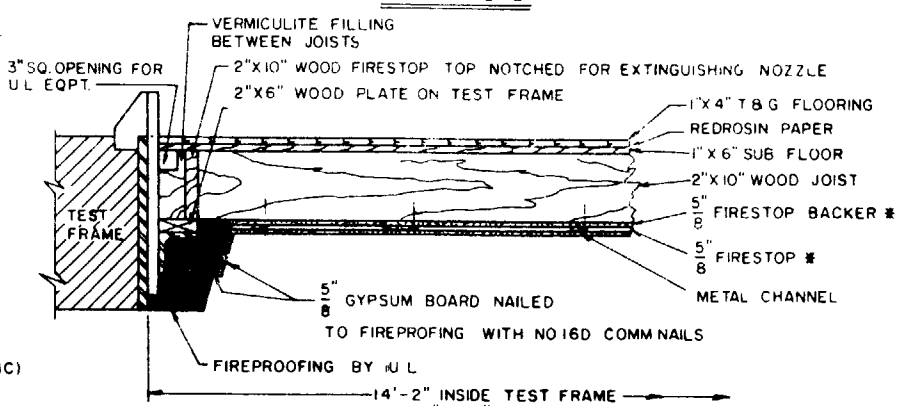


REFLECTED CEILING PLAN

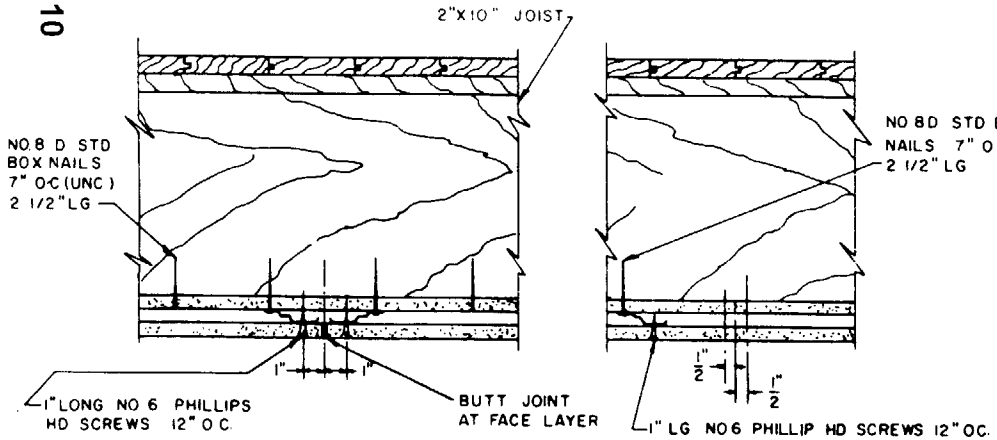


NOTE ALL NAILS FOR SECURING BACK LAYER OF FIRESTOP AND METAL FURRING CHANNELS ARE TO BE 2 1/2" NO 8D STD BOX NAILS (UNCOATED)

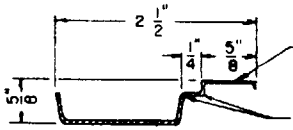
SECTION "C-C"



SECTION "D-D"



SECTION "A-A" SECTION "B-B"



CROSS SECTION - METAL CHANNEL

LISTED BY U L INC *
DESIGN NO. 217 - 2 HRS.

BESTWALL GYPSUM CO.
PAOLI PA

CEILING & FLOOR CONSTRUCTION ON JOIST TWO LAYER 5/8" BESTWALL FIRESTOP WITH RESILIENT CHANNEL

R 2717 64 K 2179

DATE	8-17-64	SCALE ——
DRN	CKD	DWG NO T-122

SGP 0028110

NO. 2467

OCTOBER 15, 1964

COMMONWEALTH OF PENNSYLVANIA

CERTIFICATE OF APPROVAL

THIS IS TO CERTIFY THAT

The Industrial Board of the Pennsylvania Department of Labor and Industry has examined and approved

The "FLOOR AND CEILING DESIGN" WITH A 2 HR. FIRE RESISTIVE RATING. THE ASSEMBLY WILL CONSIST OF CEILING AND FLOOR CONSTRUCTION ON WOOD JOISTS WITH TWO LAYERS OF 5/8" BESTWALL FIRE STOP WITH RESILIENT CHANNEL.

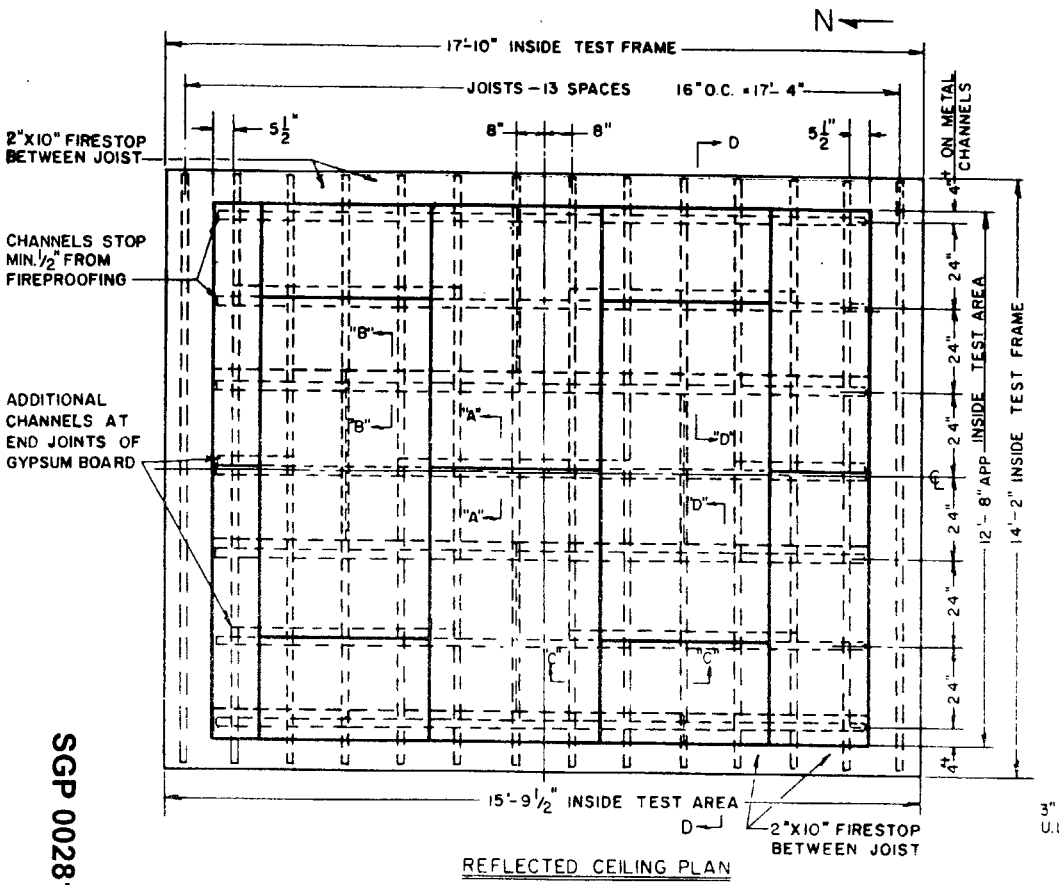
of the BESTWALL GYPSUM COMPANY

PAOLI, PENNSYLVANIA

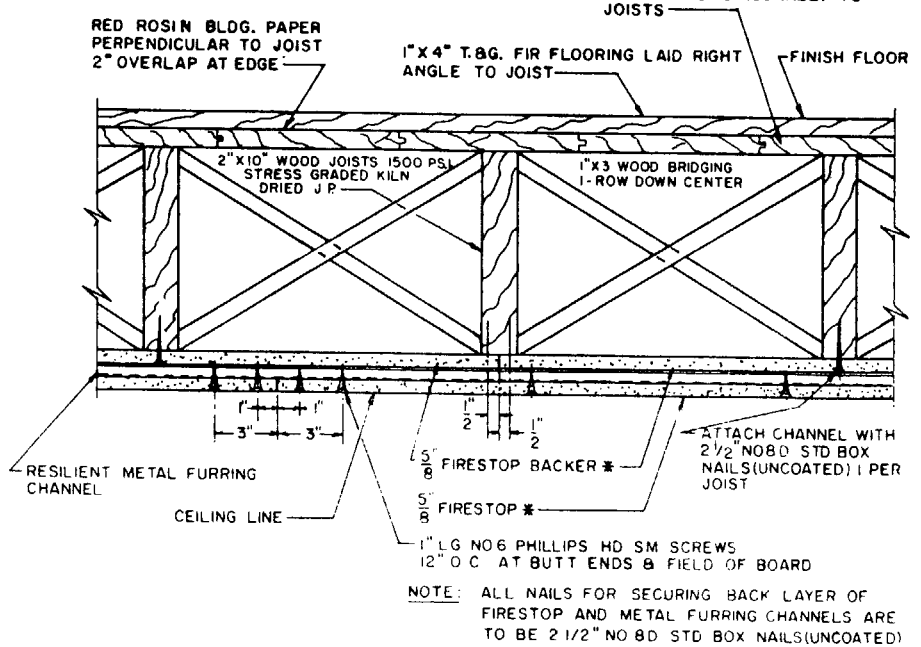
Secretary

R. PAUL LESSY

SGP 0028111

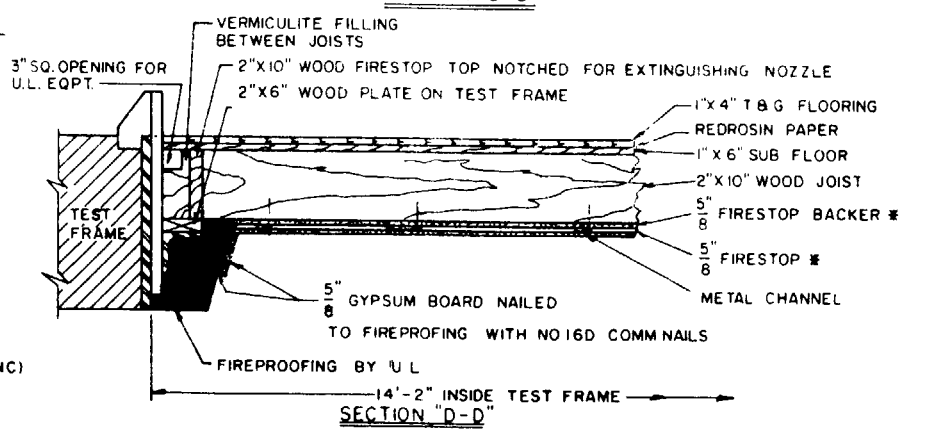


REFLECTED CEILING PLAN

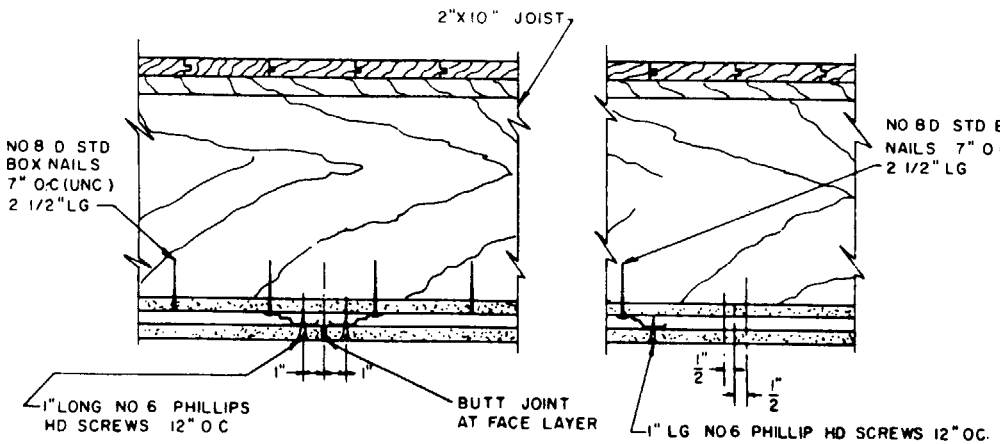


NOTE: ALL NAILS FOR SECURING BACK LAYER OF FIRESTOP AND METAL FURRING CHANNELS ARE TO BE 2 1/2" NO 8D STD BOX NAILS (UNCOATED)

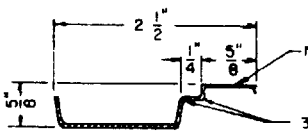
SECTION "C-C"



SECTION "D-D"



SECTION "A-A" SECTION "B-B"



CROSS SECTION - METAL CHANNEL

LISTED BY U L INC *
DESIGN NO 217 - 2 HRS

BESTWALL GYPSUM CO
PAOLI PA

CEILING & FLOOR CONSTRUCTION ON JOIST. TWO LAYER 5/8" BESTWALL FIRESTOP WITH RESILIENT CHANNEL

R 2717 64 K 2179

DATE	8-17-64	SCALE ——
DRN	CKD	DWG NO T-122

SGP 0028112

D. Steel Column Fireproofing

STEEL COLUMN FIREPROOFING

The system for applying 5/8" Bestwall Firestop around a steel column will be listed by Underwriters' Laboratories under "Column Protection".

Designs

1 - (1-Hour) not tested - estimated - 1 layer 5/8" Firestop

2 - (2-Hour) U. L. Tested Design No. 8 - 2 layers 5/8" Firestop

3 - (3-Hour) U. L. Tested Design No. 18 - 3 layers 5/8" Firestop

4 - (4-Hour) Not tested - Estimated - 4 layers 5/8" Firestop

Application

1 - One layer or the base layer is screwed to two 1-5/8" x 1-3/8" metal screw stud. 1" lg #6 drywall screw 24" O. C.

2 - First or base layer may be completed on the floor. Stood up.

3 - Opposite sides are then screwed to the 1-5/8" x 1-3/8" metal screw stud. 1" lg #6 Drywall Screws, 24" O.C.

4 - 2nd, 3rd or 4th layers of 5/8" Firestop are screwed to the metal studs with the various length drywall screws.

5 - Corner bead is nailed to the four outside corners only. 6d nails - 12" o.c.

Advantages

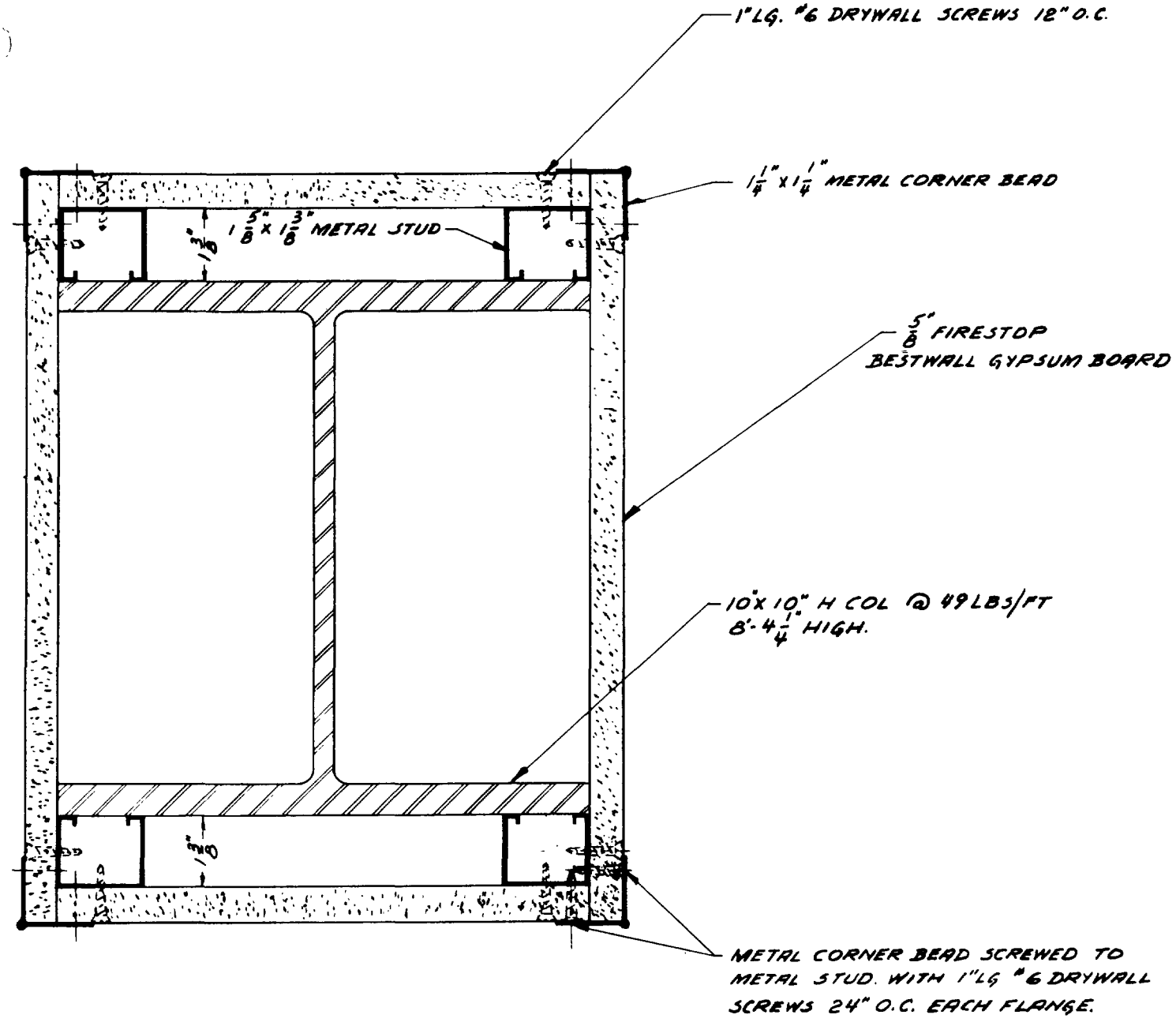
1 - Simplicity of erection

2 - The sides are independent of the column and might be held out further if necessary so that piping may be placed in the web sections or on the face of the column.

3 - No wire ties.

4 - Corner beads on the outside corners only.

5 - Less screws on single or first layer of gypsum wallboard (24" O.C.)



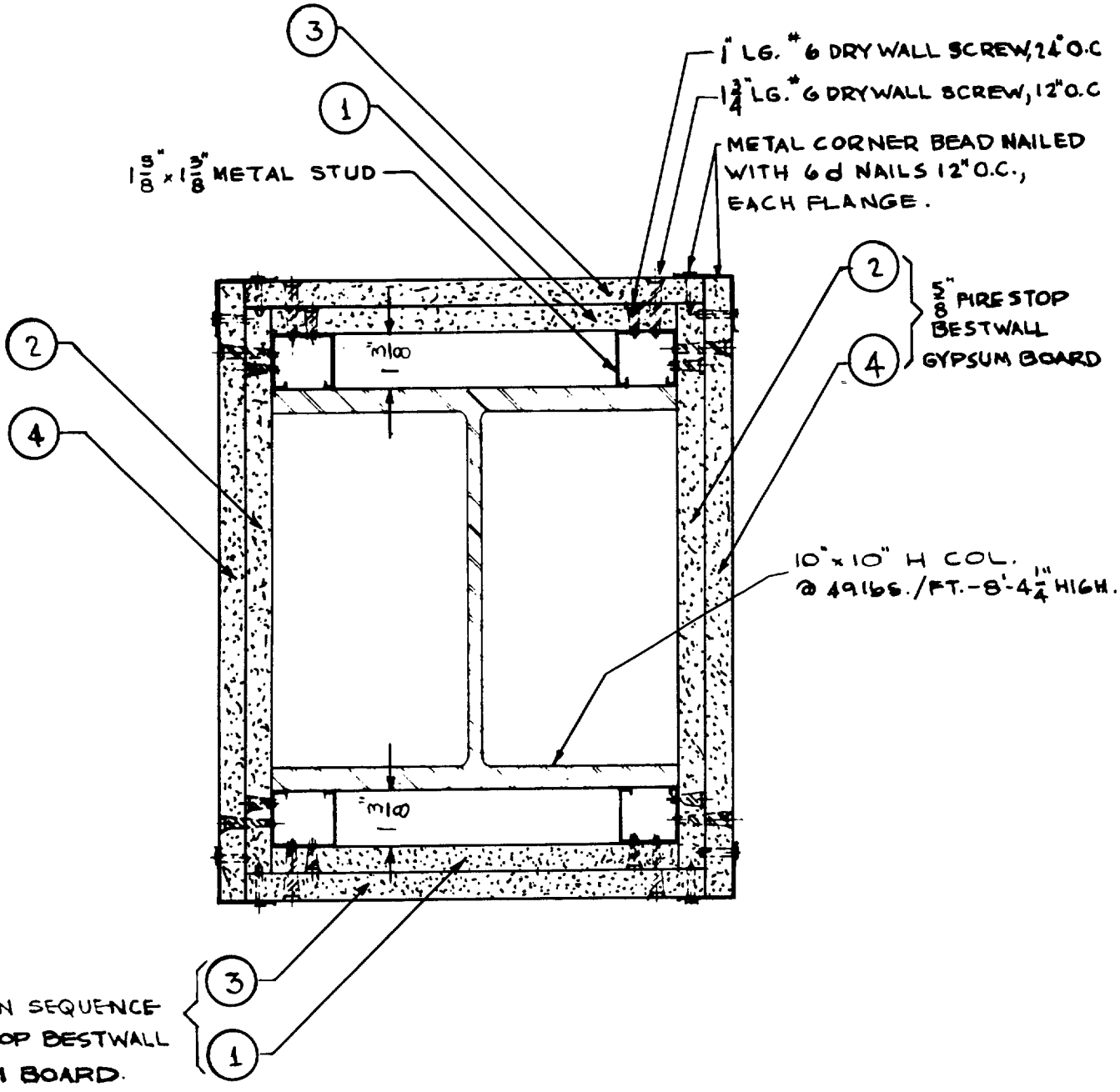
ESTIMATED - 1HR.

SECTION THRU FIREPROOFING & COLUMN

BESTWALL GYPSUM COMPANY PAOLI PA.			
5/8" FIRESTOP BESTWALL GYPSUM BOARD. SINGLE LAYER FIREPROOFING ENCASEMENT ON STEEL COLUMN			
DATE: 4-17-64	SCALE: 6"=12"		
DRN. BY T.P	CH'KD BY	DWG NO. T-120	SHEET NO 1 OF 1

SGP 0028115

BW-6415-1 HR



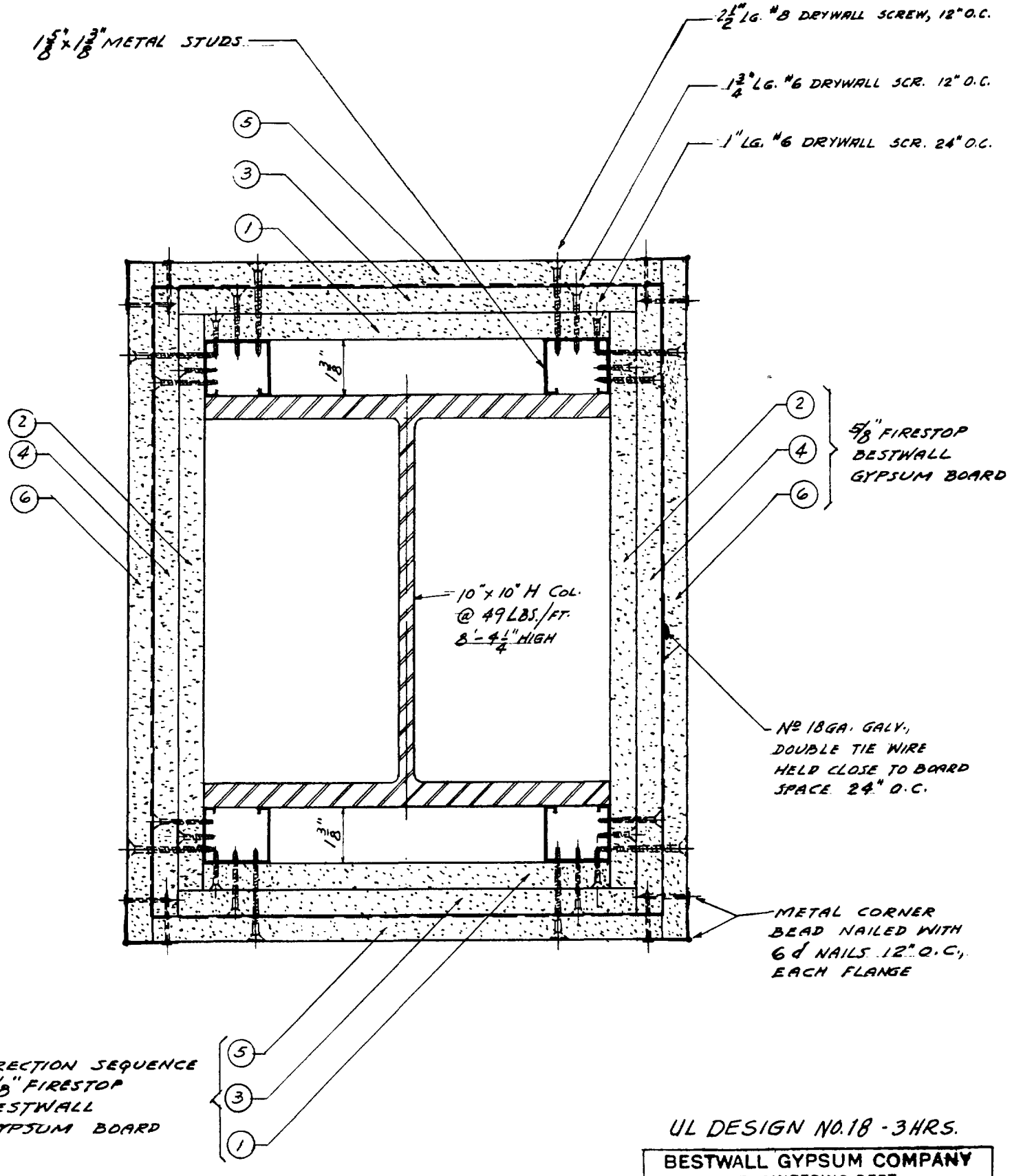
UL DESIGN NO. 8 - 2 HRS.

SECTION THRU FIREPROOFING & COL.

SCALE 3" = 12"

BESTWALL GYPSUM COMPANY PAOLI PA.			
⅝" FIRESTOP BESTWALL GYPSUM BOARD FIREPROOFING ENCASEMENT ON STEEL COLUMN			
DATE: 2-3-64		SCALE: AS NOTED	
DRN. BY H.H.K.	CH'K'D BY	DWG. NO. T-118	SHEET NO 1 OF 1

SGP 0028116



UL DESIGN NO. 18 - 3 HRS.

BESTWALL GYPSUM COMPANY
ENGINEERING DEPT.

5/8" FIRESTOP BESTWALL GYPSUM BOARD FIREPROOFING ENCASEMENT ON STEEL COLUMN

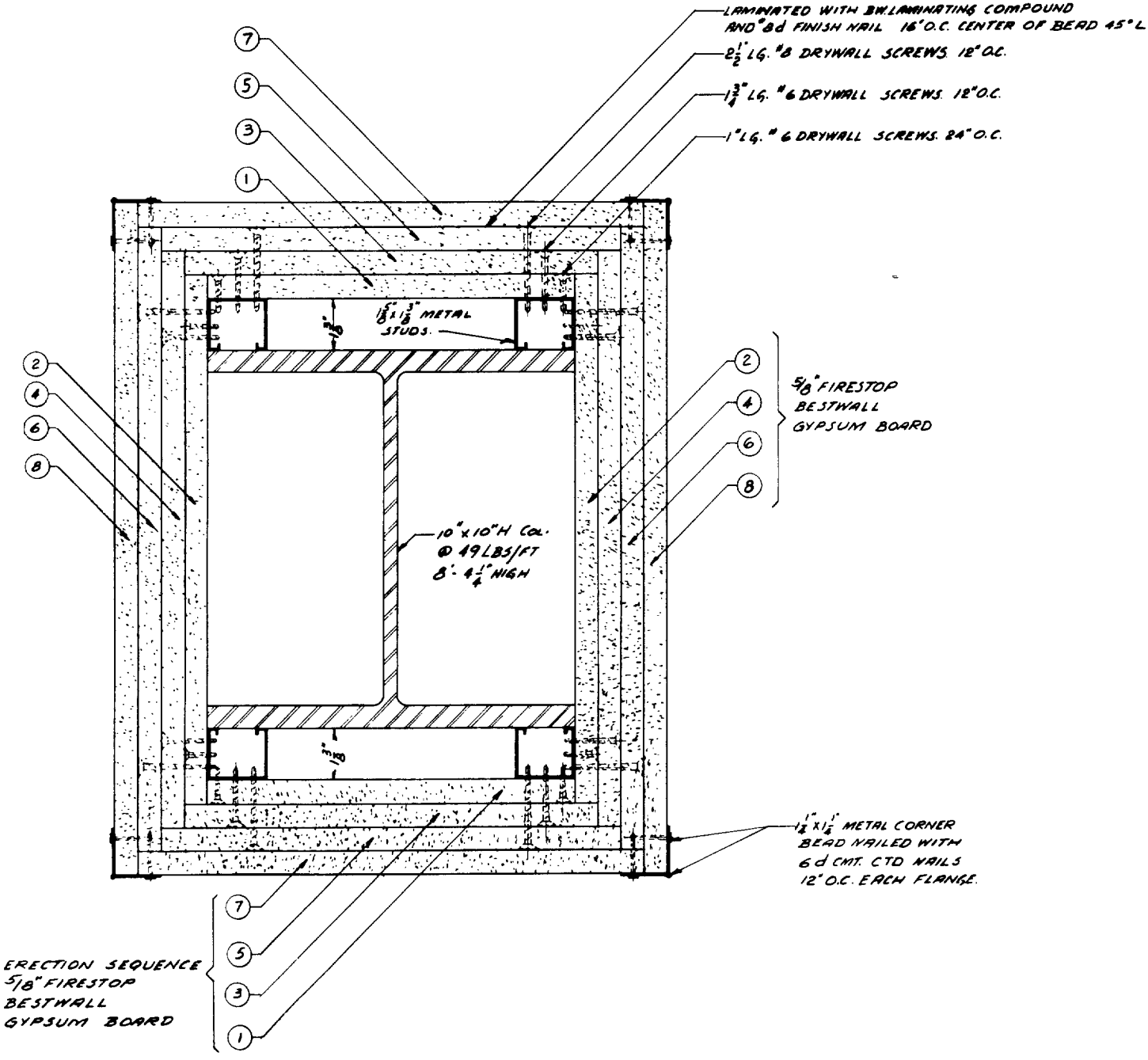
DATE: 11-5-63	SCALE 6" = 1'-0"		
DRN. BY J.R.M.	CH'K'D. BY	DWG. No. T-114	SHEET Nº 1 of 1

SECTION THRU FIREPROOFING & COLUMN

SCALE: 6" = 1'-0"

BW - 6415 - 3 HR

SGP 0028117



ESTIMATED - 4 HRS.

SECTION THRU FIREPROOFING & COLUMN

SGP 0028118

BESTWALL GYPSUM COMPANY PAOLI PA.			
⅝" FIRESTOP BESTWALL GYPSUM BOARD. FIREPROOFING ENCASEMENT ON STEEL COLUMN			
DATE: 4-16-64		SCALE: 6"=12"	
DRN. BY T.P	CH'KD BY	DWG NO. T-119	SHEET NO 1 OF 1

E Metal and Accessories

2-14-66

E. C. Cook
Sigurd

PAOLI, PENNSYLVANIA
February 9, 1966

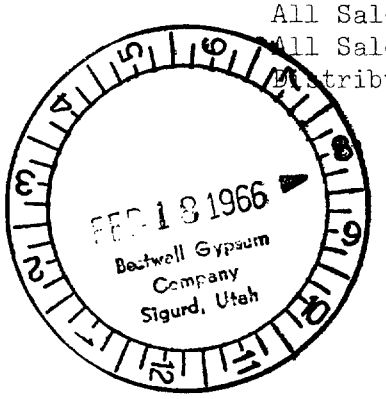
TO: All Regional Managers
All Salesmanagers
All Salesmen
Distribution Division Sales Personnel

General Sales Bulletin #12-66

Subject: ETERNAWALL-DECORATOR LIN

Re: MATCHING MOLDINGS
3/8" - 1/2" - 5/8"

By: G. C. Moore - jw
GCM



BW - Gypsum Manual #2-Section 7-E
FILE: GP - Gypsum Manual- Section 2-A

This is a repeat of information originally sent to the Bestwall sales force in General Sales Bulletin #45-62. Those who still refer to General Sales Bulletin #45-62 should destroy it and use this new bulletin for correct current information.

Matching Moldings (four aluminum shapes) prefinished with Eternawall or the Decorator Line Eternawall Vinyl to be used as a trim for finishing joints and angles with the application of Bestwall Eternawall Gypsum Wallboard is available directly from the manufacturer.

Your customers' orders for matching molding shapes should be sent direct to The Keller Products, Inc., 41 Union Street, Manchester, New Hampshire - Telephone 603-627-7887. Keller Products manufacture, stock and ship on order and invoice direct to the buyer (dealer or contractor) four predecorated sections. These matching moldings are designated as:

OC - Outside Corner	EC - End Cap
IC - Inside Corner	H - Divider

The attached sheet shows the four sections and indicates their use. Keller stocks a limited quantity of each of the four shapes in each of the six Eternawall colors for 1/2" Eternawall Gypsum Wallboard.

MATCHING MOLDINGS - 3/8" or 1/2"

Orders for large quantities of 3/8" or 1/2" thick matching moldings for Eternawall or Decorator Line requires a minimum of fifteen (15) days on Keller's part or receipt by them after receiving a firm order.

Note: On orders for special colors and/or large quantities, Keller Products will confirm pricing and shipping dates.

Continued on Page 2....

MATCHING MOLDINGS - 5/8"

Orders to Keller for 5/8" thick matching moldings (Eternawall or Decorator Line) require a minimum of thirty (30) days on receipt by them of firm order.

GYPSUM PLANTS - 1/2" THICK MATCHING MOLDINGS

The Bestwall Gypsum Plants stock limited quantities of Matching Moldings for three shapes only: OC - IC - EC - for 1/2" Eternawall.

NOTE: a. Refer to price schedule for delivered prices of 1/2" Matching Moldings

b. Refer to price schedule for delivered prices of matching colored nails.

PRICES - MATCHING MOLDINGS
From
KELLER PRODUCTS, INC., MANCHESTER, NEW HAMPSHIRE

All prices are F.O.B. Manchester, New Hampshire

	3/8" Per Ft.		1/2" Per Ft.		5/8" Per Ft.	
	Dealer	Contractor	Dealer	Contractor	Dealer	Contractor
OC	.29	.34	.32	.37	.34	.39
IC-EC-H	.28	.33	.30	.35	.33	.38

Package - Twenty (20) pieces - Plastic Covered - In Tube

Minimum Order - The minimum order for any one shape, size and color is twenty (20) pieces or 160'. Keller Products have indicated that on the first order to a contractor they will mix items within one tube, but would require a minimum of twenty (20) pieces in the mixed order.

Samples - Samples of four (4) short sections are available through the Advertising Department with use of Order for Sample Forms. Samples are stocked at Fort Dodge Gypsum Plant.

Please be sure you follow the price differential indicated in the higher price to the contractor. The lower price is only for those dealer accounts who will stock the material for re-sale. It is our understanding this pricing is competitive to that available through other gypsum manufacturers for a comparable section and that insofar as this type of molding is concerned, there is no competition price-wise such as exists with drywall corners.

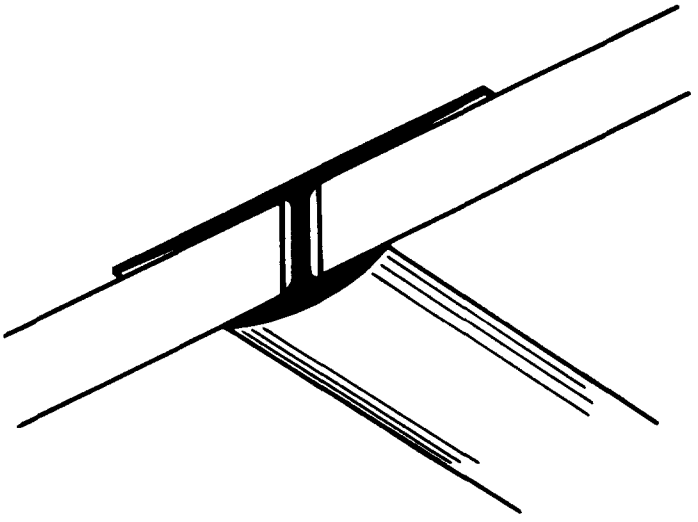
Continued on Page 3....

Remember that since Keller will be billing the dealers and contractors direct they will need some credit reference, particularly on large orders. Where Bestwall credit has already been established, Bestwall may be a reference.

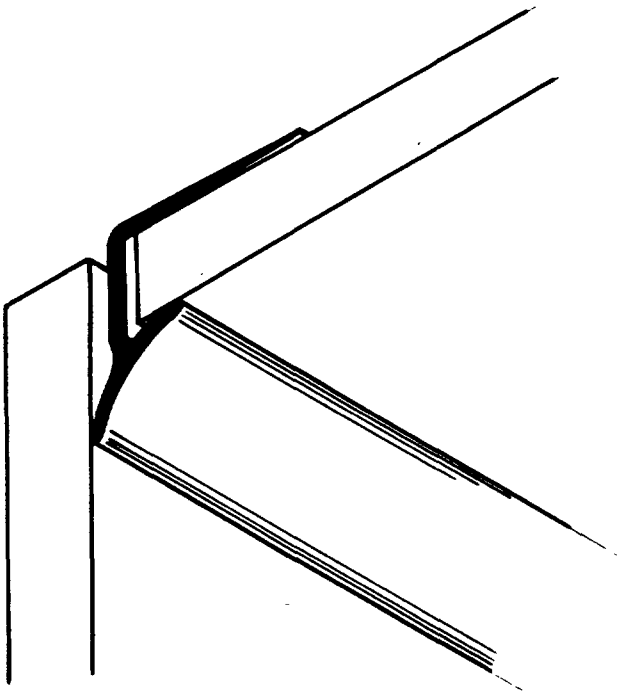
These prices, based on information furnished by Keller Products, Inc. are subject to change by them.

Insofar as other lengths or thicknesses, special colors, plain aluminum finish, or other special conditions, Keller's position would be to analyze each inquiry. Where the order exceeds 500 lineal feet on one specific item, they would consider making it and quote price and delivery.

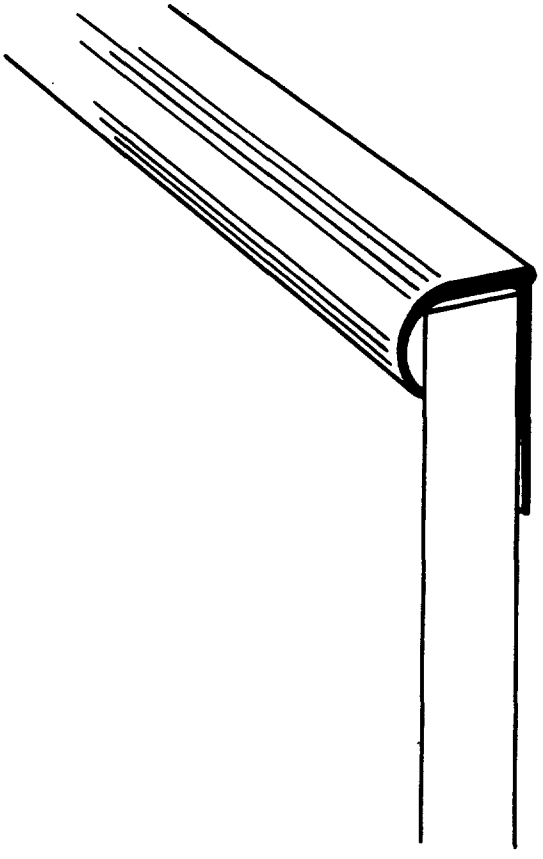
DIVIDER



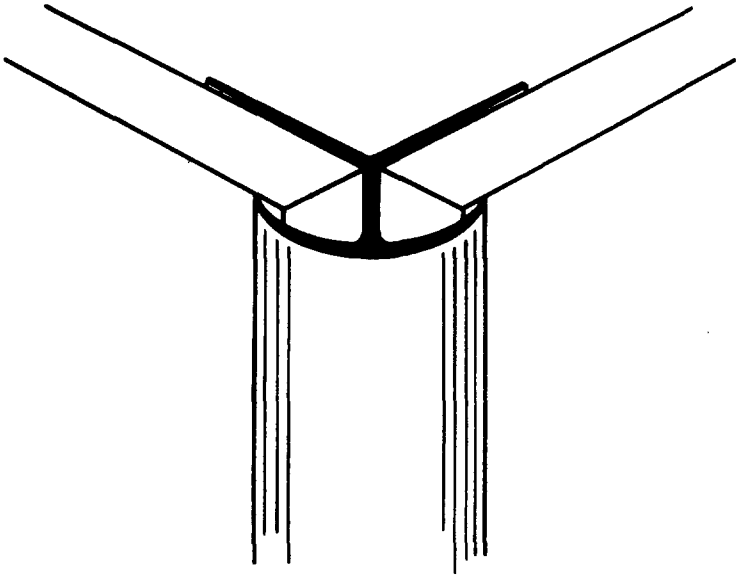
INSIDE CORNER



END CAP



OUTSIDE CORNER



SGP 0028123

SIGURD HANT
E.C COOK

PAOLI, PENNSYLVANIA

28 September 1965

To: All Regional Sales Managers
All Area Sales Managers
All Salesmen
All Distribution Divisions

Cc: Mr. R.I. Fredericks Paoli
Mr. K.A. McCaskill Paoli

General Sales Bulletin #90-65

Subject: METAL STUDS

Re: Surface Protection

By: C.E. Abbey /ghp

File in Gypsum Wallboard Manual #2
Section 7E

A technical point relative to the studs has developed which requires some explanation. Terms such as "electrogalvanized", "hot dip galvanized", and "bonderized" are used. "Hot dip galvanizing" is just what it says, the strip metal passes through hot liquid zinc to receive a protective coating on both sides against rusting. "Electrogalvanizing" means the sheet of steel has passed through a chemical solution containing zinc and the protective coating is developed on both sides by electrolytic action. Hot dip galvanizing puts a thicker application of zinc coating on the sheet than does electrogalvanizing. However, it is more extensive and requires longer processing and as a result, most fabricators of sheet steel use the electrogalvanizing process since in a majority of uses, it gives sufficient protection from rusting. The standard ASTM test to determine the extent of the protective coating is a so-called "salt-spray" cycling test in which the item is subject to a standard salt solution spray for a specific period of time and allow to dry and the process repeated and notes made as to when rust first appears. Hot dip galvanized sheets will perform better than electrogalvanized sheets in such a test.

Bear in mind however, this processing is done when the sheet is still at least 24" wide and frequently as wide as 48". Major producers of studs buy the full width sheet in large rolls, slit it into strips, and then roll the narrow strip making the shape desired, punching and crimping it through a continuous process. Thus both the hot dip galvanized and the electrogalvanized shapes have edges exposed and where there are cutouts in the items, these also expose the original raw steel sheet and rusting begins at such points.

The National Gypsum Company is using hot dip galvanized sheet for their studs and currently are widely promoting this feature. All the suppliers considered by Bestwall use electrogalvanized material and Bestwall cannot get hot dip galvanized material, except at a greater cost to Bestwall and with a long delay on the part of Bestwall's supplier in getting the sheet from the mill. Extra protection from rusting is mainly a problem in some Gulf Coast areas, but it will be up to the Bestwall salesmen to sell against this feature in any event.

SGP 0028124

(continued on page 2)

OCT 2 1965

Neither of these sheets hot dip galvanized or electrogalvanized have a good surface for painting. When the metal used is to be painted, galvanized sheets as well as ungalvanized are chemically treated to "prime" the surface. This is referred to as "bonderizing". Generally, metal studs, tracks, furring sections are not bonderized but many of metal corner and casings are "bonderized". Be sure to read Bestwall's literature and Price Schedules which generally reflect the thickness of the metal, type protection, and finish, of the product available. Reputable companies in giving the gauge of the metal, refer to the thickness of the metal without any surface treatment. Actually the thickness of the galvanized protective coating is less than 0.001" and results in less than 0.002" added thickness of the sheet.

Several suppliers of electrogalvanized studs and track are experimenting with bonderizing and painting to be competitive with hot dip material in resistance to the salt spray test. Hot dip galvanized sheets are considerably more expensive than bonderized sheets and less available.

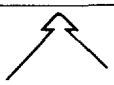
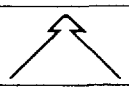
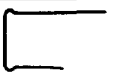
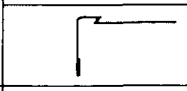
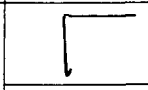
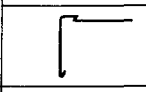
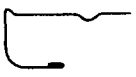
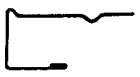
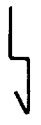
In selling against the hot dip galvanized stud, bear in mind that millions of feet of electrogalvanized studs and track have been sold and used satisfactorily. It is only where there is extreme water or moisture to contend with that the hot dip galvanized section would be justified or needed. The automobile industry because of many considerations, has moved to electrogalvanized sheets for auto bodies and where needed, give additional protection by painting.

A separate Bulletin for the Western Sales region only will be sent out shortly on metal studs from a West Coast supplier.

CONSULT YOUR **BESTWALL** SYSTEMS ENGINEER

PACKAGING INFORMATION

BESTWALL METAL CORNERS AND METAL CASINGS

BESTWALL NUMBER	EASTERN SUPPLIER'S NUMBER	PRODUCT DESCRIPTION	SECTION	APPROX. WEIGHT #/M FT.	GROUNDS OR FLANGE WIDTH	STANDARD LENGTHS	QUANTITY PER CRATE*
100	220	metal corner (A)		95#	Standard 15/16" x 15/16"	8'-0"	63 pcs.—504 ft.
100-S	240			100#	1" x 1"	8'-0"	25 pcs.—200 ft.
DL-100	220	metal corner		120#	1 1/4" x 1"	8'-0"	63 pcs.—504 ft.
DL-100-S	240				1 1/8" x 1 1/8"	8'-0"	25 pcs.—200 ft.
DLL-100	220	metal corner		130#	1 1/4" x 1 1/4"	8'-0"	63 pcs.—504 ft.
DLL-100-S	240						25 pcs.—200 ft.
DC-120	230	thin plaster metal corner		145#	1 1/4" x 1 1/4"	8'-0"	63 pcs.—504 ft.
101	108	channel edge metal casing		105#	3/8" - 1/2" - 5/8"	7'-0" 8'-0" 10'-0"	86 pcs.—602 ft. 75 pcs.—600 ft. 60 pcs.—600 ft.
102	106	angle edge metal casing		100#	3/8" - 1/2" - 5/8"	7'-0" 8'-0" 10'-0"	86 pcs.—602 ft. 75 pcs.—600 ft. 60 pcs.—600 ft.
102-S	133			120#			
DC-130	233	thin plaster casing		120# 140#	3/8" - 1/2" - 5/8"	7'-0" 10'-0"	86 pcs.—602 ft. 60 pcs.—600 ft.
103	107	recessed edge metal casing		105#	3/8" - 1/2" - 5/8" (adjustable)	7'-0" 8'-0" 10'-0"	86 pcs.—602 ft. 75 pcs.—600 ft. 60 pcs.—600 ft.
103-S	134			115#			
104	101	round nose metal casing		170#	3/8" - 1/2" - 5/8"	7'-0" 8'-0" 10'-0"	86 pcs.—602 ft. 75 pcs.—600 ft. 60 pcs.—600 ft.
105	102	square nose metal casing		170#	3/8" - 1/2" - 5/8"	7'-0" 8'-0" 10'-0"	86 pcs.—602 ft. 75 pcs.—600 ft. 60 pcs.—600 ft.
				230#	3/4"		
WATER STOP	103	sheet metal section		200#	1/2" - 5/8" - 3/4"	5'-0" 5'-6"	20 pcs.—100 ft. 20 pcs.—110 ft.
WATER STOP	103	zinc section		190#	1/2" - 5/8" - 3/4"		

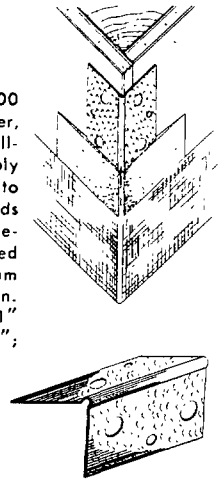
All casing items made of Hot Galvanized .018" steel, except 104, 105 and 105-S which are .020" steel and Water Stop Sections available in .018" galvanized or .022" zinc.

D-100, DL-100, DLL-100 available as electrogalvanized .0157" steel. On special orders to meet Government specifications .0172" steel available.

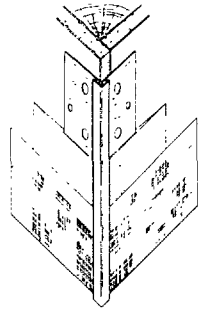
*Some items available in tubes with smaller quantity. Consult price list.

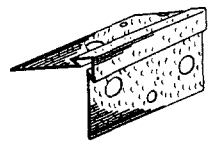
SGP 0028126

100, DL-100 and DLL-100 METAL CORNER — Stronger, more accurate external wallboard corners. Easy to apply by nailing through board to stud. Provides proper grounds and precise screed for cement application. Knurled and perforated for maximum cement and paint adhesion. Regular 100 has 1" x 1" flanges; DL-100, 1¼" x 1"; DLL-100, 1¼" x 1¼".

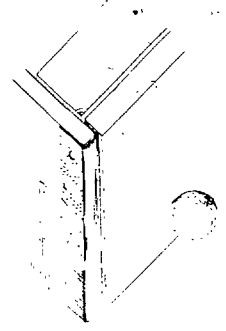


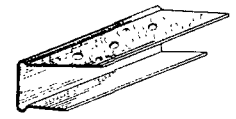
100-S, DL-100-S and DLL-100-S — Similar to No. 100, DL-100 and DLL-100 except for square corner, as illustrated.



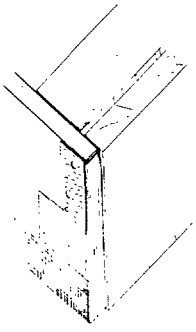


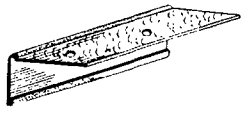
101 CHANNEL EDGE METAL CASING — Slips readily over edge of wallboard at door or window opening to give functional square trim. Nails are driven through knurled flange and wallboard into jamb or header. Beaded nose affords accurate screed for proper thickness of cement and adds strength without taping. No mitering is required.



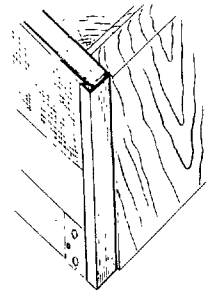


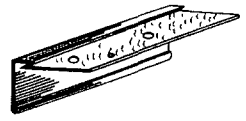
102 ANGLE EDGE METAL CASING — Similar to 101, except it eliminates the back flange. This means that the wallboard may be completely nailed in all areas — even around door and window openings — before angle edge trim is applied. This permits independent trimming savings in time and money.



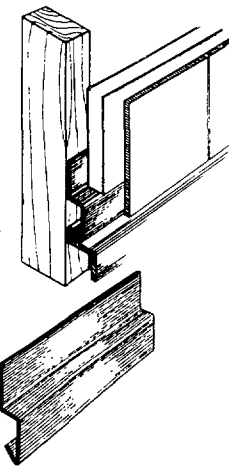


102-S METAL CASING — Similar to No. 102 except for square edge as illustrated.

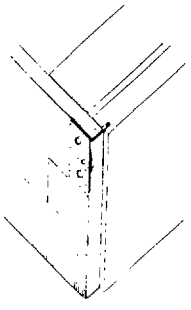


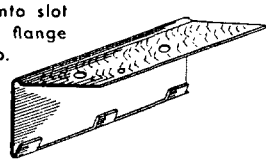


WATER STOP—Raises gypsum wall board one full inch above tub rim. Pure zinc or hot dipped galvanized steel available.

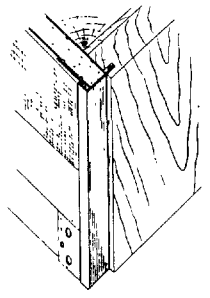


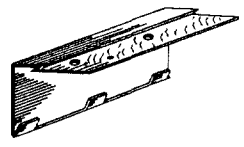
103 RECESSED EDGE METAL CASING—A further refinement of 101. Jambs and headers for all door and window openings are slotted ⅜" deep, back approximately 3/16" to ⅜" from face. Wallboard is completely erected, leaving slot exposed beyond wallboard edge. Recessed edge trim is then installed by inserting angle hemmed leg into slot and nailing through flange and board into jamb.



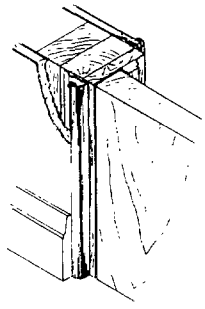


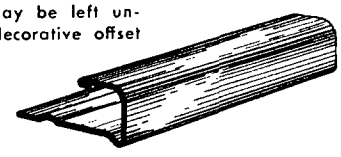
103-S METAL CASING — Similar to No. 103 except for square edge as illustrated.



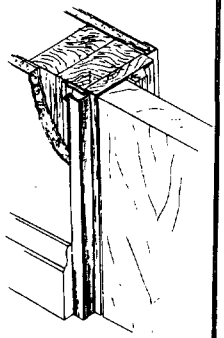


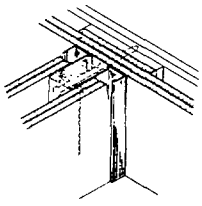
104 ROUND-NOSE METAL CASING — Extra rigid traditional type casing for wallboard construction with streamlined quarter round returns. May either be nailed in place first — and board inserted into nose as shown — or slid over wallboard edge at openings, nailed right through board and flange into door buck. Hemmed edge may be left untreated as decorative offset trim.

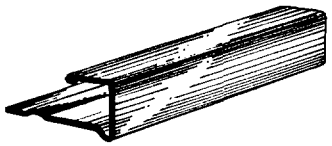




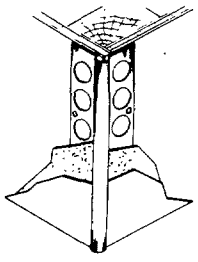
105 SQUARE-NOSE METAL CASING — Same as 104 except for square nose as illustrated. Special use of section to close edges of Bestwall Hummer "C" panels at ceiling and wall intersections, as illustrated.

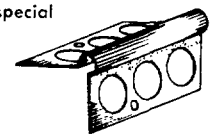




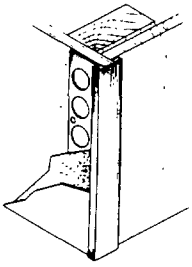


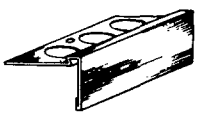
DC-120 METAL CORNER — Designed especially for the rapidly growing thin wall plastering systems. Now available with a special combination of large holes plus surface roughening. Provides a ground size of 3-32" to 1-8". Designed for one or two coat thin plaster applications. Requires very little follow-up work. Produced from hot dipped galvanized steel in standard and special lengths.





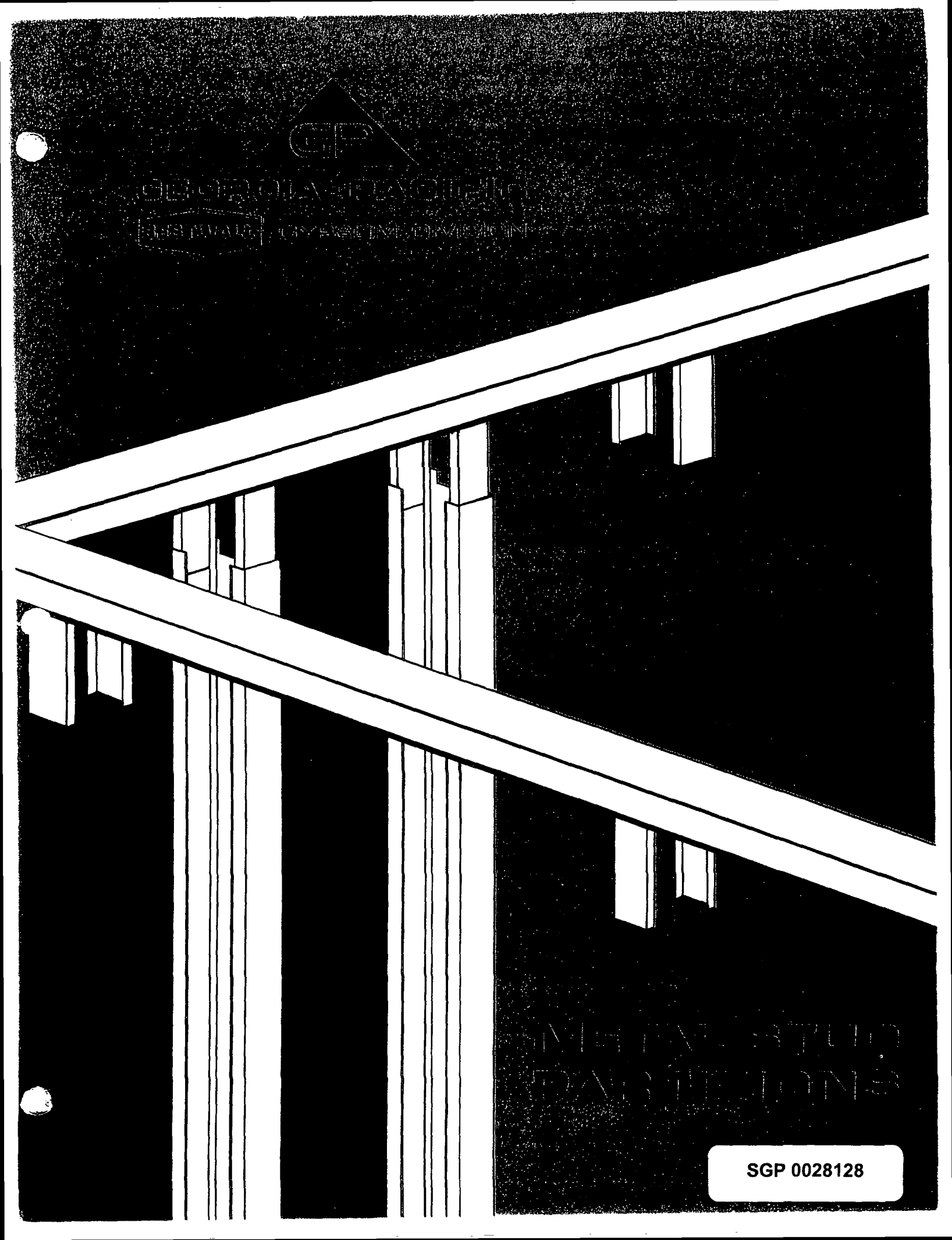
DC-130 THIN WALL CASING —Similar to DC-120 except for square edge as illustrated. Designed for one or two coat thin plaster applications.



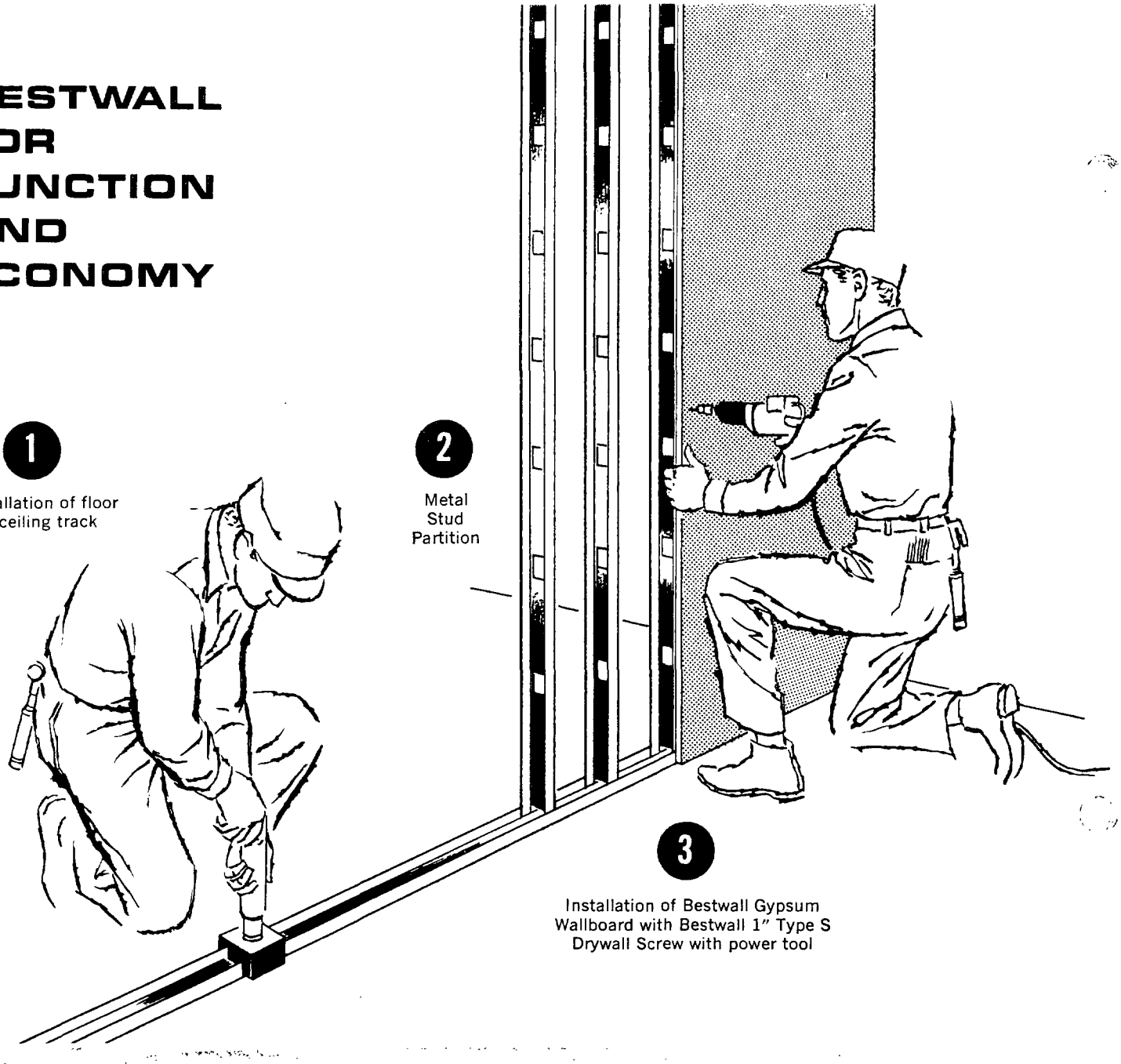


SGP 0028127

GP-6605-E


GP
GEORGIA-PACIFIC
GYPSUM
METAL STUD
PARTITIONS
SGP 0028128

BESTWALL FOR FUNCTION AND ECONOMY



1 Installation of floor and ceiling track

2 Metal Stud Partition

3 Installation of Bestwall Gypsum Wallboard with Bestwall 1" Type S Drywall Screw with power tool

BESTWALL GYPSUM WALLBOARD

The availability of various Bestwall gypsum boards used in any number of combinations makes Bestwall Partitions ideal for dividing space beautifully.

Bestwall Eternawall, for example, offers a textured vinyl surface in Woodmere Walnut and Five decorator colors:

Seafoam Blue ■ Snowdrift White ■ Spring Green ■ Shadow Gray and Sand.

SGP 0028129

BESTWALL METAL STUD AND GYPSUM PARTITIONS

GENERAL DESCRIPTION — A complete system that integrates lightweight Bestwall framing with Bestwall *original* glass fibered gypsum wallboard. It is designed and engineered for the most economical, non-load bearing fire-rated partitions adaptable to all construction. This coordination of materials offers accurate and speedy installation with savings in material and labor. It provides a varied range of functional and decorative space design for new and remodeling work in commercial, industrial, institutional and residential buildings.

FINISHES — Bestwall Regular Gypsum Wallboard forms a smooth, durable base for any decorative scheme. It can be painted or papered. Bestwall predecorated panels are ready for immediate use when installed, serving to create harmonious interiors or special "accent" walls.

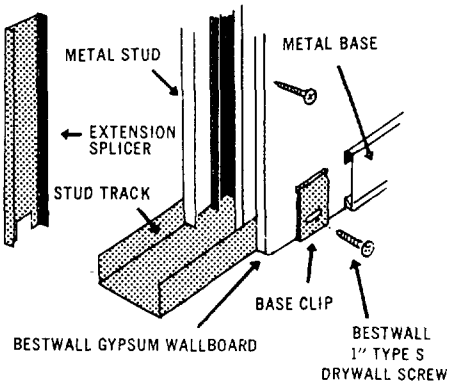
VERSATILITY — System components may be combined with a variety of board thicknesses for individual requirements. The System can be easily taken down to accommodate remodeling.

LIGHT WEIGHT — Light weight can result in savings in structural design requirements. A Bestwall partition, erected with 3⅝" studs, with a single layer of ⅝" wallboard and screws applied to each side, weighs approximately 7.2 lbs. per sq. ft.

WORKABILITY — Design simplicity assures minimum on-site construction delays. Steel studs are tailored for all size requirements. Glass fibered Bestwall Wallboard can be easily scored and snapped.

FIRE RESISTANCE — Entirely composed of incombustible framing members and panels, the Bestwall System, as a combined assembly, is capable of one- and-two-hour fire ratings. This depends on the screw spacing described in the specifications and joint treatment and the thicknesses of wallboard used. A ½" thick Bestwall Regular Gypsum Wallboard provides 40 minutes fire rating in single application, and a single layer of ⅝" Bestwall Gypsum Wallboard on both faces gives a one-hour fire rating. Two-hour fire rating is achieved with a double layer of ⅝" Bestwall Firestop on both faces with the base layer being screw attached and face layer laminated. ⅝" Bestwall Firestop meets building code acceptance in all the constructions listed in the table on Page 6.

SYSTEMS ENGINEERING — A staff of Bestwall Systems Engineers is available from coast to coast for on-the-job consultation, advice and installation details. These specialists can help you create functional space design to meet your requirements and to realize all the benefits and economies inherent in these Systems.



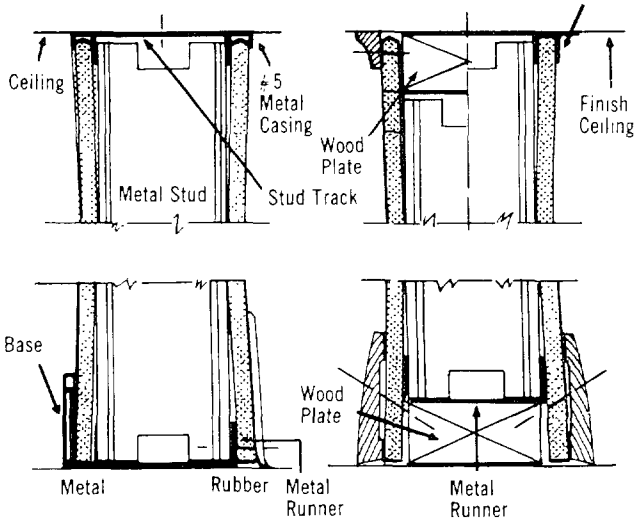
BESTWALL GYPSUM WALLBOARD consists of a *glass fiber reinforced* core of incombustible gypsum rock enclosed between two layers of tough paper. Gypsum won't burn or transfer heat in excess of 212° until all its water of crystallization has been driven off in the form of steam. The durable cream face paper is folded around the long edges to reinforce and protect the core. The ends are square cut and smooth finished. A strong gray paper is on the back side.

FIRESTOP — Bestwall Firestop, recommended where extra fire resistance is required, is the *original* drywall material providing up to one-hour fire resistant load bearing walls and ceilings with one layer application over both combustible and incombustible framing. It was also first to provide two-hour fire resistant load bearing walls in two layer application and a two-hour floor-ceiling assembly in single layer application. This extra fire protection is the result of incombustible glass fibers and unexpanded vermiculite added to the gypsum core — an exclusive Bestwall manufacturing process.

GLASS FIBER REINFORCEMENT — Literally miles of glass fiber filaments of uniform strength and length are dispersed in the core of Bestwall Gypsum Wallboard for greater resilience, strength and handling ease. Bestwall resists flexural stresses. It will not crack or sag when applied in the specified manner.

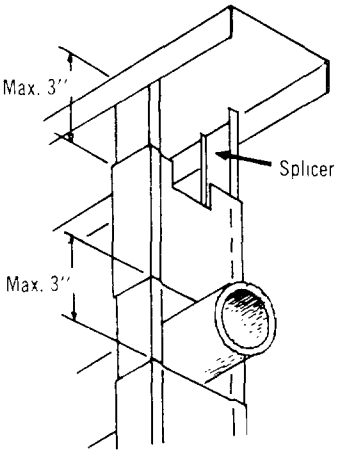
GEORGIA-PACIFIC / BESTWALL GYPSUM DIVISION

CEILING ATTACHMENTS

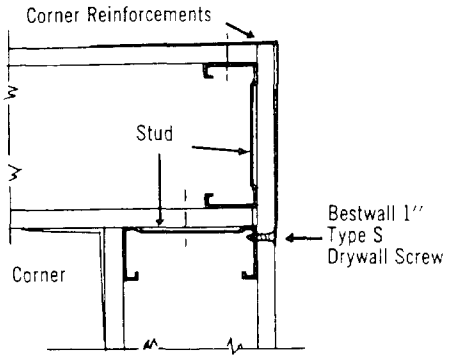


FLOOR ATTACHMENTS

STUD EXTENSION AND SPLICER

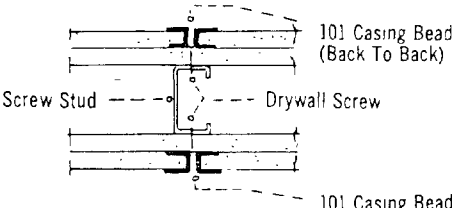


TYPICAL WALL PLAN SECTIONS



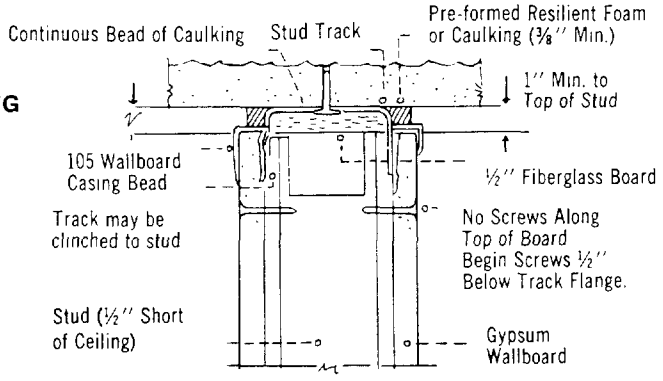
ALTERNATE SECTION AA

Finish with Tape and Cement onto Board

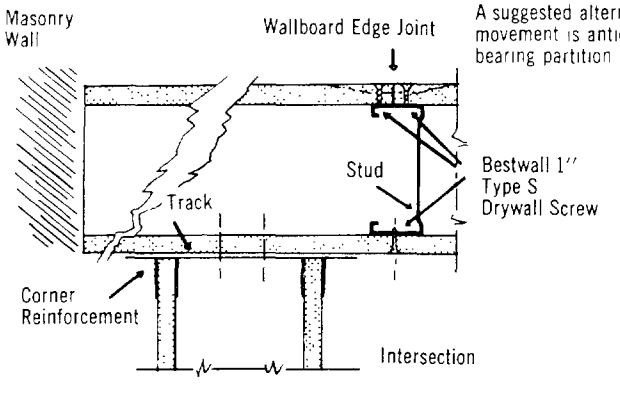


A suggested relief joint for long runs of partitions to be provided at 40 ft. max. centers

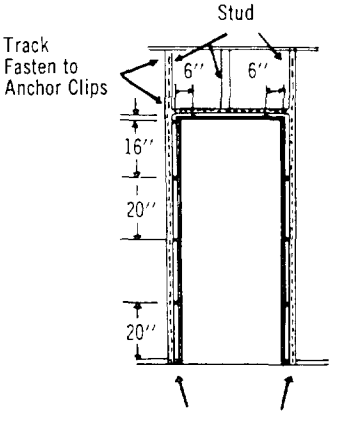
SECTION AT CEILING



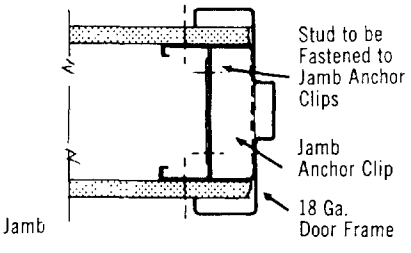
TYPICAL WALL PLAN SECTIONS



A suggested alternate detail to be used where building movement is anticipated to the extent that the non-load bearing partition will be loaded and relief is needed.

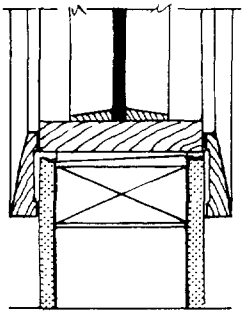


ELEVATION

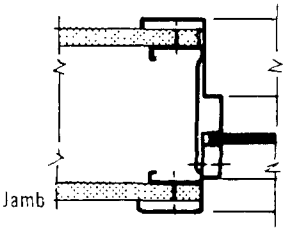


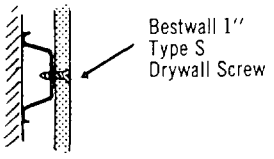
DOOR DETAILS

WOOD BORROW LIGHT

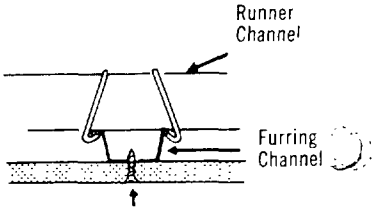


METAL BORROW LIGHT





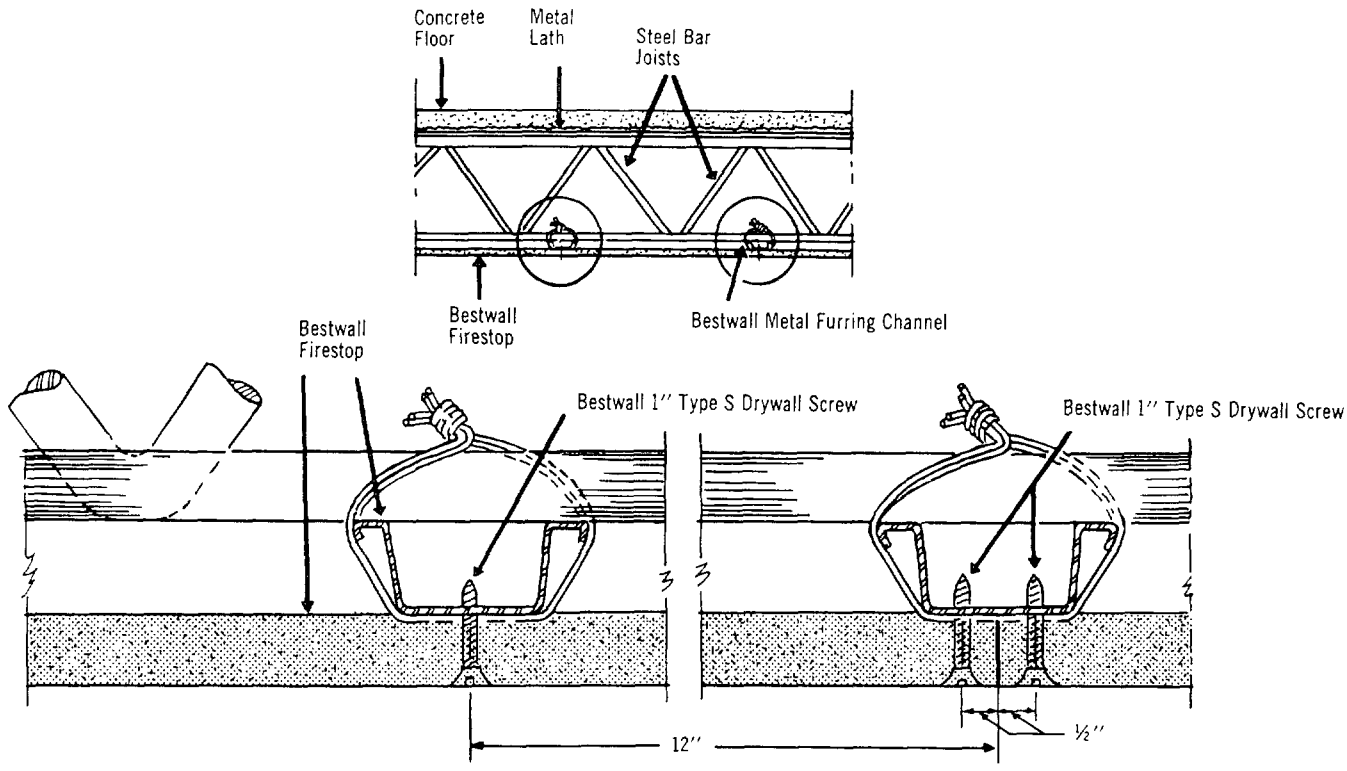
WALL FURRING DETAIL



CEILING FURRING DETAIL

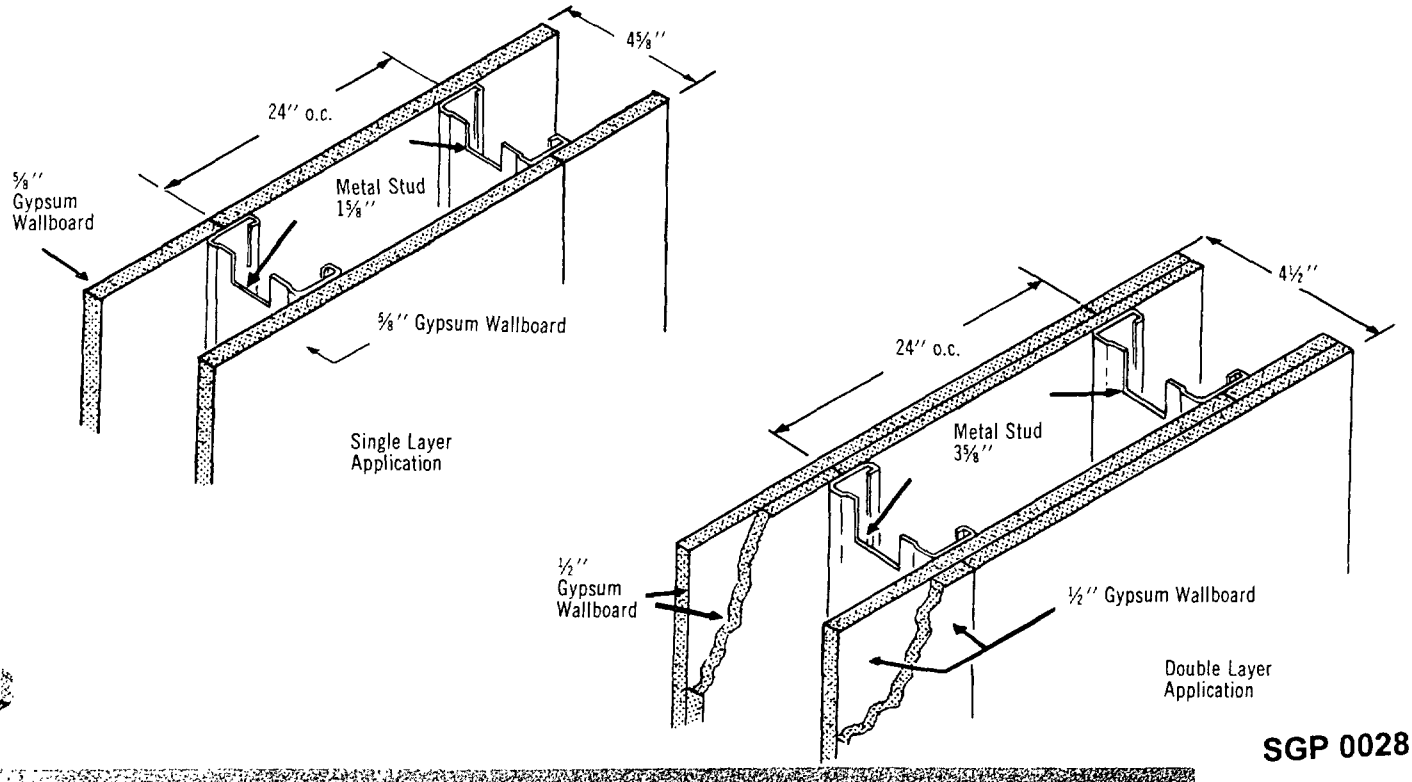
SGP 0028131

CEILING AND FLOOR CONSTRUCTION



Furring Channels are 24" o.c. everywhere except adjacent to the end joint as shown.

METAL STUD PARTITIONS



SGP 0028132

TECHNICAL DATA

Application	Gypsum Wallboard	Frame Spacing	Fire Rating*	Test Reference	Weight Per Sq. Ft.
PARTITIONS Both Sides same application	½" REGULAR BESTWALL	24" o.c.	40 min.	Est.	4.0
	½" BESTWALL FIRESTOP-1 Layer	24" o.c.	1 hour	Est.	4.0
	½" BESTWALL FIRESTOP-2 Layers	24" o.c.	2 hours	T-3218	8.1
	⅝" BESTWALL FIRESTOP-1 Layer	24" o.c.	1 hour	T-2316	5.2
	⅝" BESTWALL FIRESTOP-2 Layers	24" o.c.	2 hours	T-2557	10.4
CEILINGS 2" Concrete Floor on Metal Lath over Steel Bar Joists	⅝" BESTWALL FIRESTOP OR ⅝" BESTWALL FIRESTOP BACKER BOARD	16" o.c.	1 hour	U.L. #2	34.2
	⅝" BESTWALL FIRESTOP	24" o.c.	1 hour	U.L. #19	32
	½" BESTWALL FIRESTOP	24" o.c.	1½ hours	U.L. #17	33.9
	⅝" BESTWALL FIRESTOP	24" o.c.	1½ hours	U.L. #13	34.1
	½" BESTWALL FIRESTOP (2½" Concrete Floor)	24" o.c.	2 hours	U.L. #237	38.5
	⅝" BESTWALL FIRESTOP (2½" Concrete Floor)	24" o.c.	2 hours	U.L. #69	39.5
STEEL COLUMN Fire Proofing	½" REGULAR BESTWALL-2 Layers		1 hour	G.A.	
	½" REGULAR BESTWALL-3 Layers		1½ hours	G.A.	
	⅝" BESTWALL FIRESTOP-1 Layer		1 hour	Est.	
	⅝" BESTWALL FIRESTOP-2 Layers		2 hours	U.L. #8	
	⅝" BESTWALL FIRESTOP-3 Layers		3 hours	U.L. #18	
	⅝" BESTWALL FIRESTOP-4 Layers		4 hours	Est.	

*All ratings are incombustible with Bestwall Gypsum Wallboard or Bestwall Firestop over metal studs.

NOTE: For additional fire resistive ratings and sound transmission characteristics, see latest Bestwall Sweet's catalog.

Above tabulations have some interpellative results based on tests by Underwriters' Laboratories, National Bureau of Standards and/or Ohio State University sponsored by Georgia-Pacific, Bestwall Gypsum Division, Gypsum Association and/or others. Fire rating, weight and sound characteristics are based on combination of details covered in official publications of U.L., N.B. of S., Ohio State University and/or the Bestwall Gypsum Division. Details of construction, transmission ratings and flexural strength sent on request.

The wallboard systems covered above have been developed with due regard to practical construction methods. However, since the Bestwall Gypsum Division does not have any prior knowledge of a specific building design and construction or methods of application and use of their products, no warranty of performance is made. All of the test results have been obtained under laboratory testing conditions where controlled environment reduces variables to a minimum. In the field, such conditions are not always met, since many other variables are introduced. Laboratory results will generally exceed results of field tests, but the tests under controlled conditions are the only logical way to compare the performance of different assemblies. The Bestwall Gypsum Division of the Georgia-Pacific Corporation makes no warranty as to the performance of assemblies in the field having a performance equal to or better than that developed in the test.

LABEL SERVICE SYMBOL FOR ⅝" BESTWALL FIRESTOP

FIRE HAZARD CLASSIFICATION

Flame Spread	10-15
Fuel Contributed	5-15
Smoke Developed	0.45



FIRE RESISTANCE CLASSIFICATION

Floor and Ceiling	Column Protection	Walls and Partitions
Design No. 69 — 2 hr	Design No 18 — 3 hr.	Design No. 5 — 3 hr.
Design No. 217 — 2 hr.	Design No 8 — 2 hr.	Design No. 7 — 2 hr.
Design No. 13 — 1½ hr.		Design No 5 — 1 hr.
Design No. 2 — 1 hr.		Design No. 10 — 1 hr.
Design No. 1 — 1 hr.		

LABEL SERVICE SYMBOL FOR ⅝" BESTWALL FIRESTOP — The Label Service symbol of Underwriters' Laboratories, Inc., which appears on the twin mounting tape binding each bundle of two pieces, is the method provided by Underwriters' Laboratories, Inc., to identify gypsum wallboard which has been produced under the Label Service. And especially important to architects and building inspectors, the front of each sheet is marked with "⅝" Bestwall Firestop Type X" so that it's easy to identify when in place.

BESTWALL METAL STUD SELECTION

STUD SIZE NOMINAL DIMENSION	MAXIMUM HEIGHT SPAN
1⅝"	9' — 0
2½"	12' — 0
3"	14' — 0
3⅜"	15' — 0
3⅝"	16' — 0

BOARD SIZE vs MEMBER SPACING

Board Size	Member Spacing
½"	24" c. to c.
⅝"	24" c. to c.

SGP 0028133

SPECIFICATIONS

BESTWALL ENGINEERED SYSTEMS

MATERIALS

Gypsum Wallboard—All Gypsum Wallboard and joint system materials used, including laminating compound, shall be as manufactured by the Bestwall Gypsum Division, Georgia-Pacific Corporation.

Metal Studs—All metal studs, tracks, furring and other metal accessories used shall be as manufactured for the Bestwall Gypsum Division.

Studs—1⅝"; 2½"; 3"; 3⅜"; 3⅝". Studs shall be roll formed channels of 25 gauge (0.22") galvanized (electro or hot dipped) sheet steel with conduit or electrical wiring holes and notches provided at each end.

Metal Floor and Ceiling Track—1⅝"; 2½"; 3"; 3⅜"; 3⅝". The track shall be roll formed channel of 25 gauge (0.22") galvanized (electro or hot dipped) sheet steel with width dimensions suitable to corresponding size of Steel Stud.

Extension Splicer—Snap-in splicers shall be formed of 25 gauge (0.22") galvanized (electro or hot dipped) sheet steel used in compensating for floor to ceiling variations up to 3" and/or splicing the stud around horizontal obstructions.

Metal Screw Fasteners—Bestwall 1" Type S Drywall, self-drilling, sheet-metal type screw for use with a power-driven tool.

Base Clip—Base clip shall be of 16 gauge galvanized (electro or hot dipped) sheet steel which is screwed to the floor track.

Snap-On Metal Base—Snap-on metal base shall be of 20 gauge paint-lock galvanized (electro or hot dipped) sheet steel that provides for an attractive, functional base trim. A vinyl base may be used as an option.

Furring Member—25 gauge (0.22") galvanized (electro or hot dipped) sheet steel; ⅞" depth.

Furring Member Clip—11 gauge hot-dipped galvanized wire.

STUD SYSTEM

Materials: Bestwall Gypsum Wallboard; Studs; Metal Floor and Ceiling Track; Extension Splicer; Metal Screw Fastener; Base Clip; Snap-On Metal Base.

INSTALLATION

Ceiling and floor track shall be aligned and anchored securely with suitable fasteners at a maximum of 24" o.c.

Steel Studs shall be positioned vertically in ceiling and floor tracks spaced not over 24" o.c. Screws shall be installed at all intersections of stud and track. All studs located adjacent to window and door frames, partition intersections and corners shall be screwed through the stud and track flanges. Studs shall be installed not over 2" from abutting partitions, partition corners and all door frames. Studs shall be anchored by bolt or screw attachment to jamb and head anchor clips of door or borrow light frames. A stud of required length shall be positioned at vertical joints over door headers.

Use Extension Splicers where required.

Screws shall be power-driven and seated with screw heads being slightly below surface of Bestwall Gypsum Wallboard. Screws shall not be closer than ⅜" from all ends and edges.

Base clips shall be screwed to floor track after installation of Bestwall Gypsum Wallboard at a maximum of 24" o.c. and at start and termination of base runs. Use Snap-On Metal Base and Clips. Vinyl base may be used as an option.

CEILING SYSTEM

Materials: Extension Splicer; Metal Screw Fastener; Furring Member; Furring Member Clip.

INSTALLATION

Hangers shall be anchored securely to structural frame. Spacing of hangers should not exceed 4' on 1½" furring channels. The spacing of 1½" channels to be determined by the furring member selected.

Furring members shall be attached at right angles and securely fastened at no greater distance than 24" c. to c.

End joints of Bestwall Gypsum Wallboard shall be centered and staggered over furring member and board shall be applied with long dimension at right angles to furring members.

Power-driven screw shall be spaced at a maximum of 8" o.c. around the perimeter of each sheet and 12" o.c. in the field of the board. Screws shall not be located closer than ⅜" from ends of edges of board.

FURRING SYSTEM

Materials: Bestwall Gypsum Wallboard; Metal Floor and Ceiling Track; Metal Screw Fastener; Base Clip; Snap-On Metal Base; Furring Member.

Furring members may be anchored vertically or horizontally to concrete or masonry surfaces. Fastened at a maximum of 24" o.c., staggered through alternate flanges, Bestwall Gypsum Wallboard shall be applied vertically or horizontally to furring member. All ends shall be staggered and shall abut over furring members. Power-driven screws shall be spaced 12" o.c. along furring member and no closer than ⅜" from ends of board.

JOINT SYSTEM PRODUCTS

Bestwall Joint System Products are designed to conceal joints and screw heads. All have easy working characteristics and very low shrinkage.

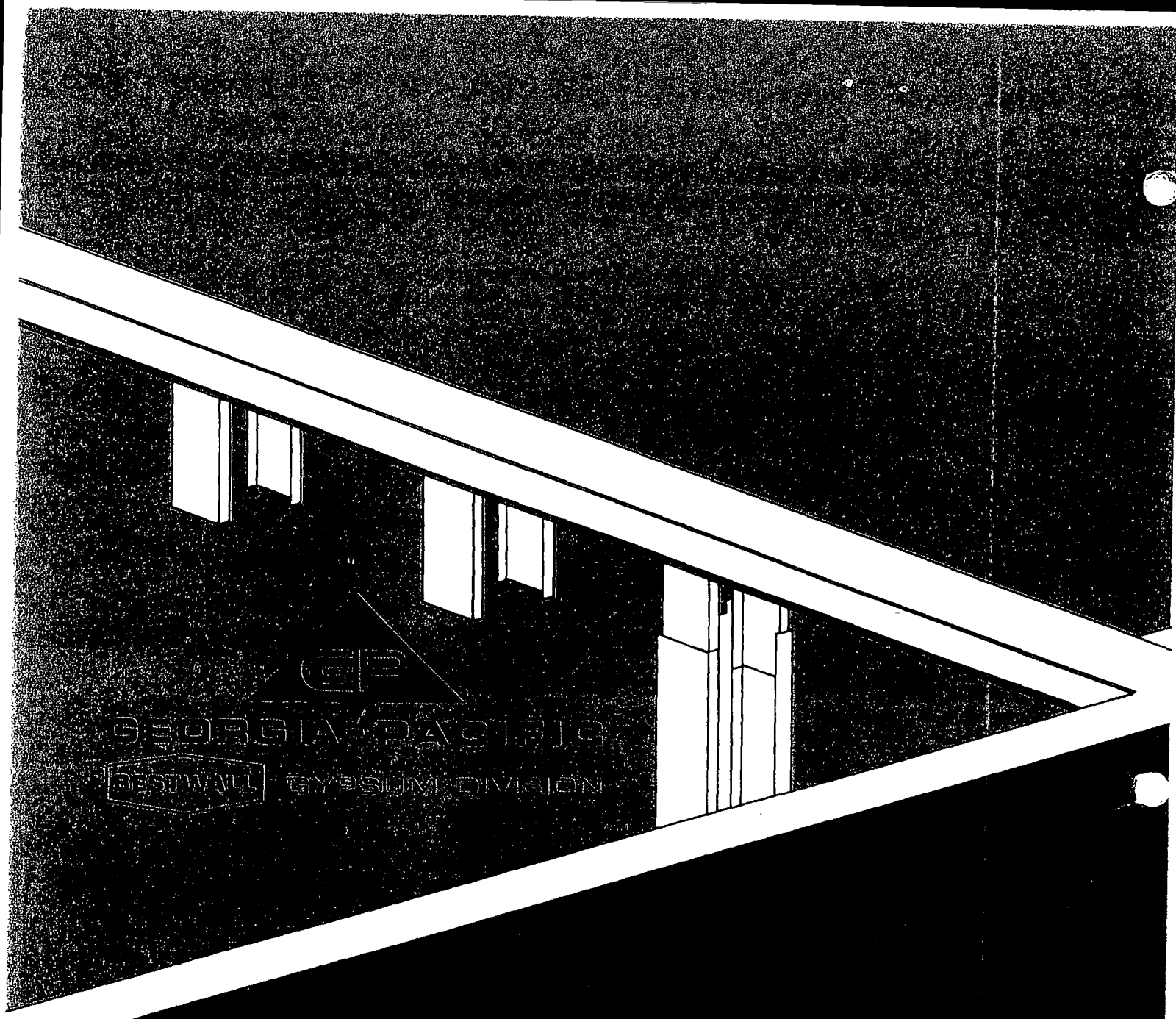
MATERIALS:

1. **One—Material Treatment — Bestwall Wallboard Joint Compound, Bestwall Triple Duty Joint Compound or Bestwall Ready Mix Joint Compound. All are used for bedding and spotting screw heads.**
2. **Two—Material Treatment—Bestwall Bedding Compound or Bestwall 1-Day Wallboard Joint Compound and Bestwall Topping Compound. Specially designed for large projects.**
3. **Bestwall Metal Corners and Metal Casings—A Bestwall Metal Corner shall be used at all outside corners. For uncased door and window openings and at intersections of wall and ceilings, Bestwall Metal Casings may be used.**

FOR LAMINATING LAYERS

Laminating Compound: Bestwall Laminating Compound is a casein base dry powder product requiring addition of water only. Add 25 lbs. of Laminating Compound to 9¼ gal. of water (2¾ lbs. per one gal.). Consistency of the mixed material should be such that when spread over gypsum board with a 12" serrated sheet metal blade having notches 3/16" wide, 3/16" high, ½" o.c., it will not self-level. Ribbons of glue may be applied with serrated knife or mechanical glue spreader. Coverage is approximately 16 lbs. per one thousand sq. ft.

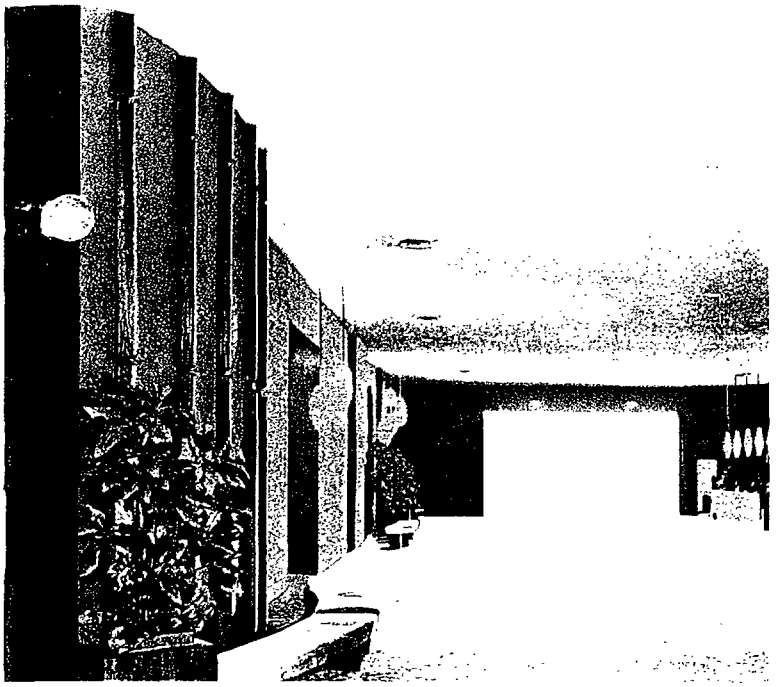
Note: When laminating predecorated gypsum wallboard, which forms a vapor barrier, to backer board, one of the following adhesives may be used as per manufacturer's direction: General Adhesives & Chemical Co., Nashville, Tenn.; Acorn Adhesives Co., Inc., Los Angeles, Calif.; Borden Chemical Co., No. ELP-75-74; Armstrong Cork Co., Industrial Adhesive No. 10073; Permalistic Products Inc., Detroit, Mich.



SGP 0028135

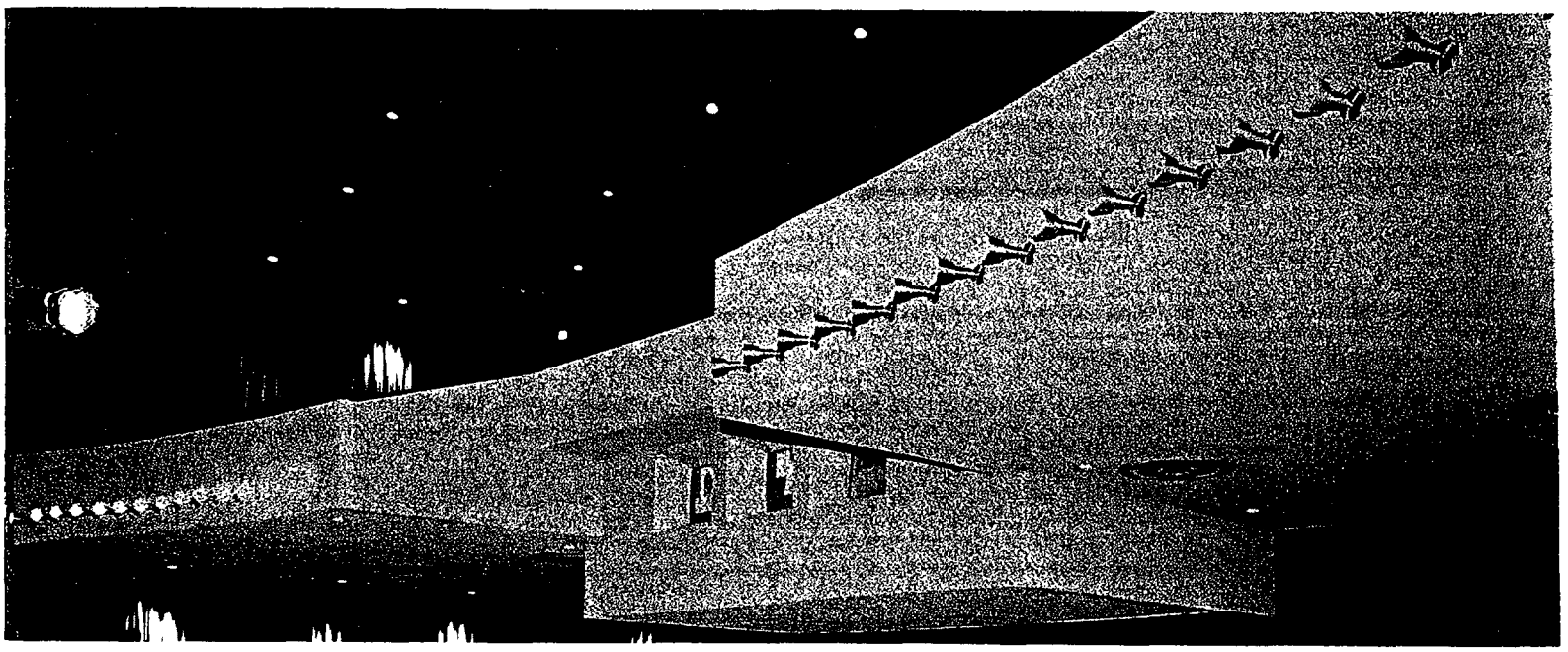
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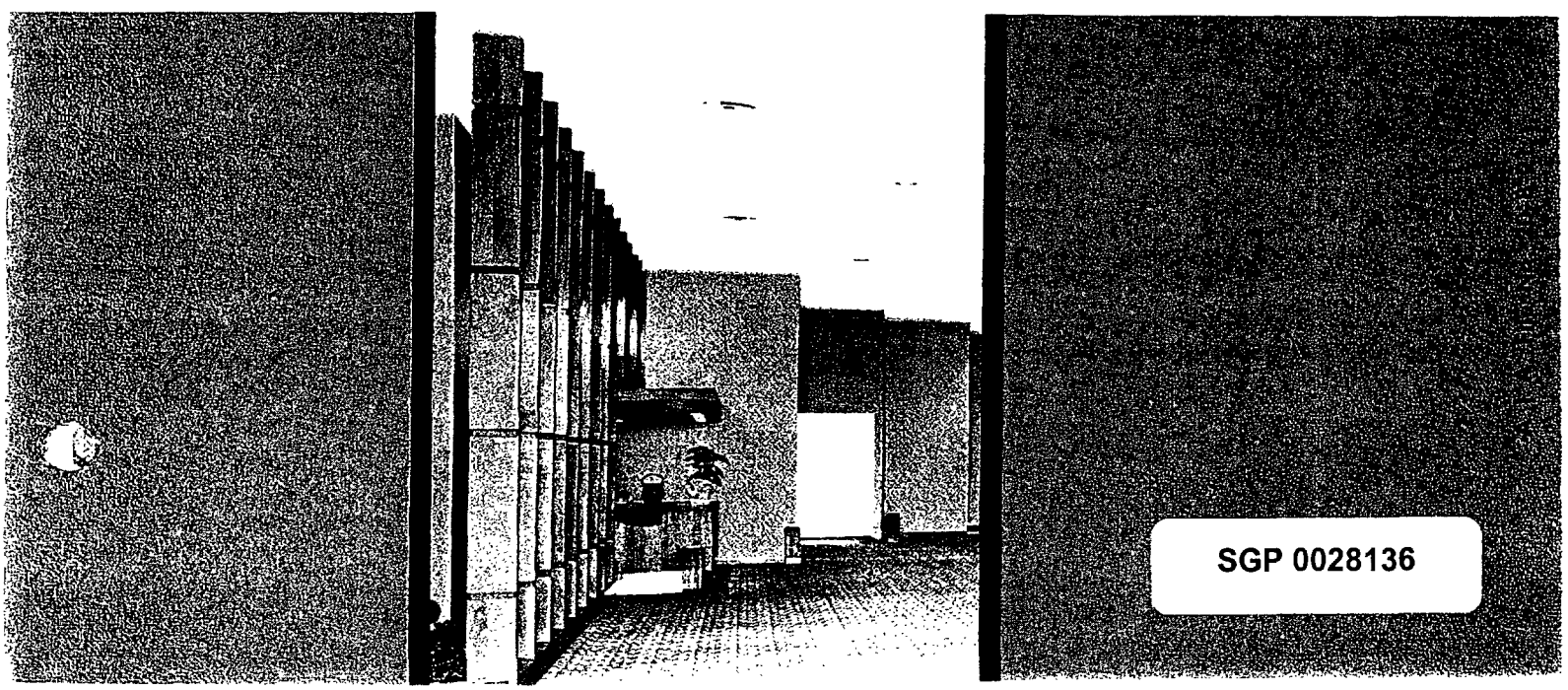
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DONN

DRYWALL PARTITION *Systems*





SGP 0028136

GRENADIER

D-G Series



The DONN® GRENADIER STEEL STUD DRYWALL PARTITION SYSTEM is a most unique concept for constructing lightweight non-load-bearing gypsum wallboard partitions. The steel stud has integral positive locking tabs on one face into which the wallboard is secured without the requirement for other fasteners and on the opposite face a flat surface to receive power-driven screws. This design feature eliminates 75% of the screws yet assures a more rigid wall than conventional screw stud systems. This system makes it practical to erect one complete side of a partition without any fasteners whatever. The wallboard automatically modulates the stud at 2'-0" on centers thus eliminating time consuming layout. Holes are punched the entire length of the stud at 18" on centers to allow for ease of installing horizontal utilities.

SOUND TRANSMISSION LOSS TESTS

	Construction	Nine Freq. Av'g.	Sound Trans. Class	Inter-ference Speech Zone
TL 63-219	DG-404 Studs 24" o.c., ½" gypsum wallboard each side.	37	38	43
DG 110.1	DG-585 Studs @ 24" o.c., ⅝" gypsum wallboard, each side.	39	43	47
DG 110.2	Same as above with ½" fiberglass applied one side, DG-8 Resilient Channel horizontal, 24" o.c., ⅝" gypsum wallboard over DG-8.	46	45	55
64-1	DG-585 Studs @ 24" o.c., ⅝" gypsum wallboard, each side.	39	39	44
64-2	Same as above with ½", ½ lb. density fiberglass stapled to face, one side, DG-8 Resilient Channel horizontal, 24" o.c., ⅝" gypsum wallboard over DG-8.	46	49	54
64-3	Same as above with ⅝" gypsum wallboard laminated to non-resilient side.	48	53	55
64-6	DG-585 studs @ 24" o.c., two layers ⅝" gypsum wallboard each side.	41	43	46

Specifications

MATERIALS

Studs: DG-264 (1⅝" x ½"); DG-265 (1⅝" x ⅝"); DG-404 (2½" x ½"); DG-405 (2½" x ⅝"); DG-484 (3" x ½"); DG-485 (3" x ⅝"); DG-584 (3⅝" x ½"); DG-585 (3⅝" x ⅝"); DG-644 (4" x ½"); DG-645 (4" x ⅝"). The studs are roll-formed channels of 25 gauge steel tabbed to receive ½" or ⅝" tapered gypsum wallboard as indicated above. Conduit or electrical wiring holes are provided on 18" centers.

Metal Floor and Ceiling Track: DS-260 (1-⅝"); DS-400 (2½"); DS-480 (3"); DS-580 (3⅝"); DS-640 (4"). The tracks are roll-formed channels of 25 gauge steel in width dimensions suitable to corresponding sizes of D-G studs.

Metal Screw Fasteners: W-616 Flange-head, Phillips, self-drilling, sheet-metal-type screw for use with a power-driven tool.

Ceiling Trim: Various methods of treating the juncture of walls to ceilings are available as illustrated.

Snap-On Metal Base: DW-408 (2½"); DW-648 (4"). Formed of 20 gauge steel providing for an attractive, functional base trim.

INSTALLATION

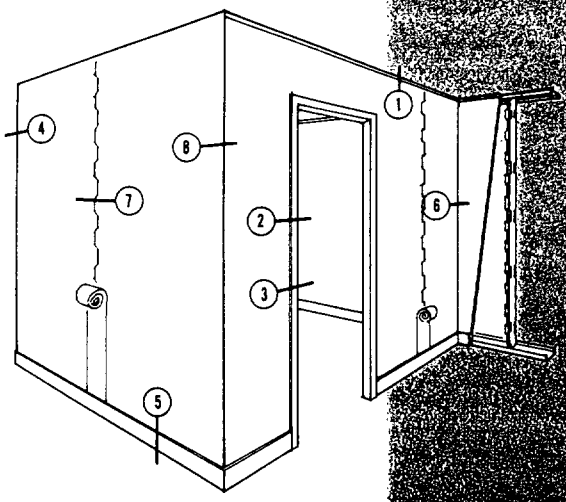
Ceiling and floor track shall be aligned and anchored securely with suitable fasteners at a maximum of 24" on centers. A 2'-0" starter board shall be fastened to a vertical track at the start of each individual run. The stud is positioned and then a 4'-0" board inserted on the opposite side or on the same side depending on whether it is desired to install one side only or both sides simultaneously.

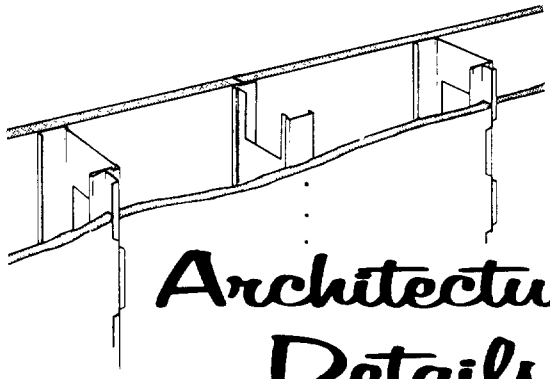
Self-tapping, self-drilling screws shall be power driven at 18" on centers into the flat side of the stud, slightly below the surface of the wallboard, also into the floor and ceiling tracks in the centers of the wallboards. Screw heads and face joints to receive joint treatment.

Corner and door frame openings shall be constructed as per manufacturer's recommendations. (See details.)

Base clips shall be screwed to floor track at a maximum of 24" on centers and at the start and termination of base runs. Use Snap-On Metal Base with base clips or omit clips and use set-on type base.

See: D-G Furring System—Page 10.

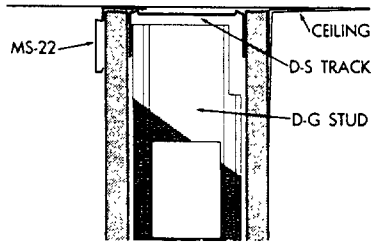




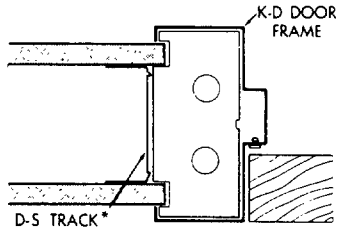
Architectural Details

SCALE 3" = 1'0"

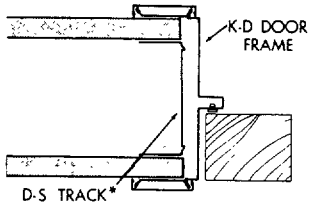
Frequency —cps.	125	175	250	350	500	700	1000	1400	2000	2800	4000
TL 63-219	25	26	34	36	40	42	46	47	46	36	41
DG 110.1	21	24	34	36	44	50	54	53	42	40	44
DG-110.2	23	28	44	48	54	58	59	56	52	51	52
64-1	25	28	34	38	42	46	50	49	39	38	45
64-2	29	31	40	47	52	56	57	59	52	49	55
64-3	33	36	44	48	52	56	58	59	55	51	57
64-6	25	31	37	42	47	49	48	43	42	47	52



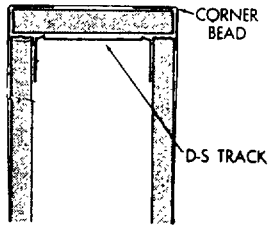
CEILING (1)



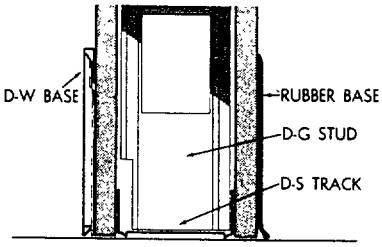
DOOR JAMB (2)



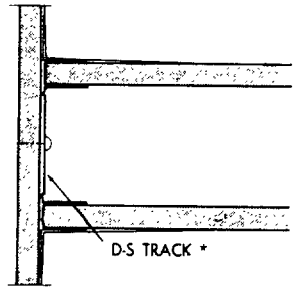
DOOR JAMB (3)



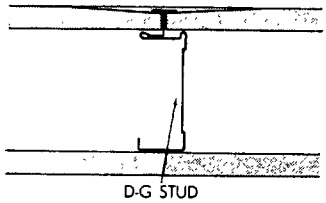
TERMINATION (4)



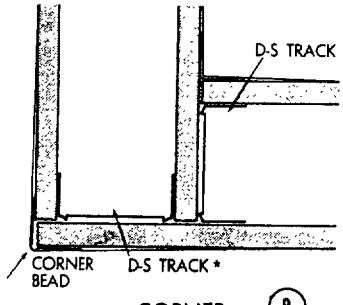
BASE (5)



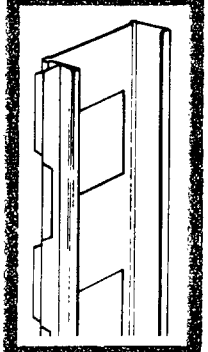
INTERSECTION (6)



VERTICAL STUD (7)



CORNER (8)



FIRE TESTS

Construction — DG-110.1 — DG-585 Studs @ 24" o.c., 5/8" gypsum wallboard, each side.

Type of Test — Fire Endurance and Fire and Hose Stream.

Rating—1 hour, 1 minute.

STUD SELECTION

Stud Size Nominal Dimension		Maximum Height Span
DG-264	1⅝"	9'-0"
DG-404	2½"	12'-0"
DG-484	3"	14'-0"
DG-584	3⅝"	16'-0"
DG-644	4"	18'-0"

*NOTE: D-W Stud may be substituted for D-S Track.

WARRIOR

D-W Series



The DONN® WARRIOR STEEL STUD PARTITION SYSTEM is a non-load bearing partition system that consists of light weight steel channel studs set into metal floor and ceiling tracks and faced on both sides wih gypsum wallboard. A unique power-driven, self-tapping, self-drilling screw with radius-contoured head is used to apply the wallboard to the system. The gypsum wallboard may be applied either horizontally or vertically—in single or double layers—depending on the requirements of fire and sound for the particular partition.

Two outstanding features of the stud are the stud extension splicer and the holes punched 6" on centers through the entire length of the stud. The extension splicer compensates for floor to ceiling variations up to 3" and also can be used to splice the stud to accommodate large horizontal utility lines. The punched holes line exactly from stud to stud and permit horizontal utilities to be installed with ease, an important time saving factor. These holes are dimensioned to receive either ¾" or 1½" channels which are positively locked in place to stiffen the system should unusual conditions require this application.

SOUND TRANSMISSION LOSS TESTS

CONSTRUCTION	Nine Freq. Av'g.	Sound Trans. Class	Speech Interference Zone
OR 63-1—DW-40 Studs 24" o.c., ⅝" gypsum wallboard both sides	36	39	43
OR 63-10—DW-58 Studs 24" o.c., ⅝" gypsum wallboard both sides. DG-8 attached horizontally, 24" o.c., over ½# fiberglass, ⅝" gypsum wallboard to DG-8.	45	46	53
OR 63-11—DW-58 Studs 24" o.c., ⅝" gypsum wallboard both sides	38	42	45
OR 64-24—DW-58 Studs 24" o.c., ⅝" Fi-Rok® gypsum wallboard one side; ½" sound deadening board DG-8 horizontal 24" o.c., ⅝" Fi-Rok® gypsum wallboard applied to DG-8 other side	43	45	53
OR 64-25—DW-58 Studs 24" o.c., ⅝" Fi-Rok® gypsum wallboard one side. ⅝" Fi-Rok® gypsum wallboard laminated to ½" sound deadening board other side	42	44	50
OR 64-26—DW-58 Studs 24" o.c., ½" sound deadening board, ⅝" Fi-Rok® gypsum wallboard laminated over, both sides	47	49	56
OR 64-28—DW-40 Studs 24" o.c., ½" gypsum wallboard both sides.	34	36	43
OR 64-29—DW-58 Studs 24" o.c., ½" gypsum wallboard both sides, ½# fiberglass, DG-8 horizontal 24" o.c., ½" gypsum wallboard over DG-8	43	40	54
OR-64-33—DW-58 Studs 24" o.c., ½" sound deadening board, DG-8 resilient channel horizontal 24" o.c., ⅝" Firestop® gypsum wallboard over one side. Two layers, ⅝" Firestop® gypsum wallboard, other side.	49	48	57
OR-64-34—DW-58, 24" o.c., ½" sound deadening board, ⅝" Firestop® gypsum wallboard over, one side. Double layer ⅝" Firestop® gypsum wallboard, other side.	46	48	53
TL 62-72—DW-26 Studs 24" o.c., ⅝" gypsum wallboard each side.	36	35	39
TL 62-18—DW-48 Studs 24" o.c., ½" gypsum wallboard each side.	38	42	46
TL 61-208—DW-58 Studs 16" o.c., ⅝" gypsum wallboard each side.	42	44	46
TL-62-19—DW-58 Studs 16" o.c., ⅝" gypsum wallboard one side, double layer ⅝" gypsum wallboard other side.	42	45	45
TL 61-237—DW-58 Studs 16" o.c., double layer ⅝" gypsum wallboard, both sides.	43	40	45

Specifications

MATERIALS

Studs: DW-26 (1⅝"); DW-28 (1¾"); DW-40 (2½"); DW-48 (3"); DW-54 (3⅜"); DW-58 (3⅝"); DW-64 (4"). The studs are roll-formed channels of 25 gauge steel. Conduit or electrical wiring holes are provided 6" on centers.

Metal Floor and Ceiling Track: DS-260 (1⅝"); DS-280 (1¾"); DS-400 (2½"); DS-480 (3"); DS-540 (3⅜"); DS-580 (3⅝"); DS-640 (4"). The tracks are roll-formed channels of 25 gauge steel with width dimensions suitable to corresponding sizes of D-W studs.

Extension Splicer: W-1 Snap-In splicers are of 25 gauge steel, used in compensating for floor to ceiling variations.

Metal Screw Fasteners: W-616 Flange-head, Phillips, self-drilling, sheet-metal-type screw for use with a power-driven tool.

Base Clip: W-2 (2½") and W-4 (4") Base Clips of 16 gauge steel which are screwed to the floor track.

Snap-On Metal Base: DW-408 (2½") or DW-648 (4") Snap-On Metal Bases are of 20 gauge steel.

INSTALLATION

Ceiling and floor track shall be aligned and anchored securely with suitable fasteners at a maximum of 24" on centers.

Studs shall be positioned vertically into ceiling and floor tracks spaced not over 16" or 24" on centers depending upon the thickness of gypsum wallboard used. Screws shall be spaced 12" on centers in the field and 8" on centers, staggered, at vertical joints of board, ⅜" from all ends and edges. Screw heads and face joints to receive joint treatment.

Use Extension Splicers where required.

Base Clips shall be screwed to floor track at a maximum of 24" on centers and at start and termination of base runs.

Use Snap-On Metal Base or set-on type (omitting base clips).

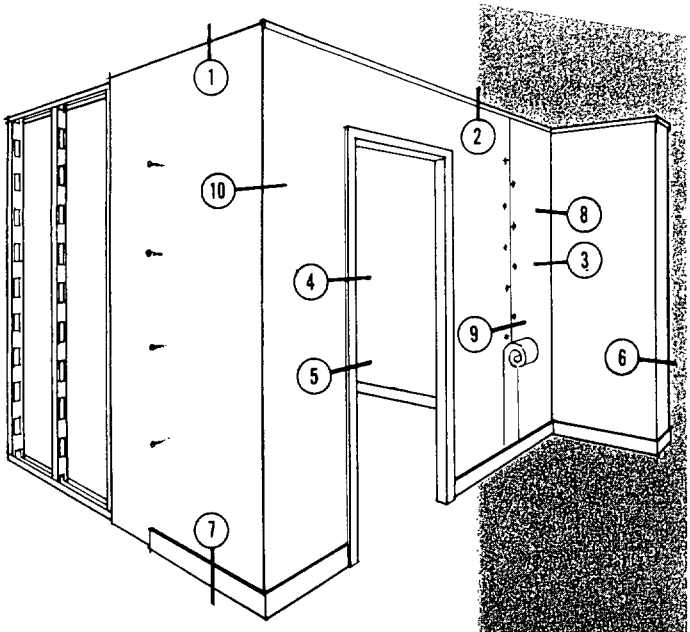
Single unit responsibility is assured by utilizing gypsum wallboard as manufactured by Bestwall Gypsum Company and The Celotex Corporation. Single unit responsibility with various other wallboard manufacturers available on request.

FIREPROOF GYPSUM BESTWALL BUILDING PRODUCTS

CELO-ROK GYPSUM PRODUCTS

See: D-W Furring System—Page 11.

SGP 0028139



Architectural Details

SCALE 3" = 1'0"

Frequency— cps.	125	175	250	350	500	700	1000	1400	2000	2800	4000
OR 63-1	24	22.5	28	33.5	40	44	49	48.5	40	39	45
OR 63-10	23.5	29.5	37	45	49.5	53	57	59.5	52	49	57
OR 63-11	20.5	26	31	37	41.5	46	50	50.5	42	40	48
OR 64-24	25	26.5	34	40.5	47	52.5	57	58	52	49.5	56
OR 64-25	24	26	34	40.5	47	50.2	55	54.5	48	47	53
OR 64-26	28	32	39	46	52	56.5	57	59.5	55	55	59
OR 64-28	17	19	27	30.5	37	42	47	50	48	36	37
OR 64-29	21	21	33	38	47	54	57	59	59	49	51
OR 64-33	25	35	44	52	54	57.5	59	59	56	55	58
OR 64-34	25	33	41	47	52	54	56	55	50	51	55
TL 62-72	25	29	35	35	40	41	44	43	33	36	44
TL 62-18	26	27	33	37	40	44	47	48	50	42	40
TL 61-208	32	32	38	40	43	44	49	51	46	45	51
TL 62-19	34	35	39	41	43	45	45	45	46	46	53
TL 61-237	32	34	41	42	44	46	40	45	45	50	59

Fi-Rok®: registered trademark of The Celotex Corp.

Firestop®: registered trademark of Bestwall Gypsum Co.

FIRE TESTS

CONSTRUCTION: T-2316—DW-26 Studs set into DS-260 Track @ 24" o.c., ⅝" Firestop® gypsum wallboard each side.

TYPE OF TEST: Fire Endurance and Fire and Hose Stream.

RATING: 1 hr., 5 min.

CONSTRUCTION: T-2016—DW-58 Studs set into DS-580 Track @ 24" o.c., ⅝" Firestop® gypsum wallboard each side.

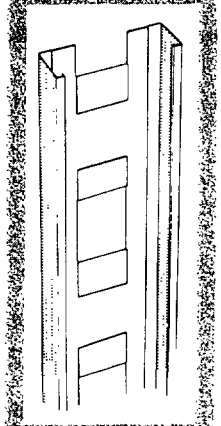
TYPE OF TEST: Fire Endurance and Fire and Hose Stream.

RATING: 1 hr., 8 min.

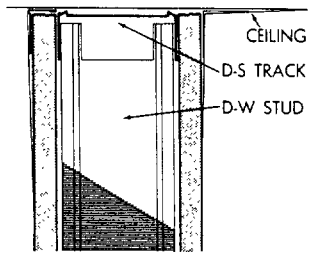
STUD SELECTION

Stud Size Nominal Dimension		Maximum Height Span
DW-26	1⅝"	9'-0"
DW-28	1¾"	9'-0"
DW-40	2½"	12'-0"
DW-48	3"	14'-0"
DW-54	3⅜"	15'-0"
DW-58	3⅝"	16'-0"
DW-64	4"	18'-0"

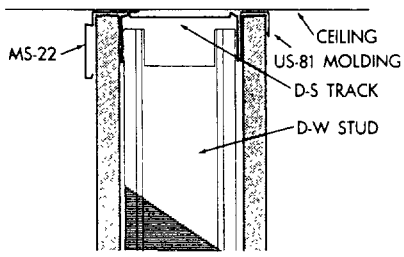
BOARD SIZE	MEMBER SPACING
⅜"	16" c. to c.
½"	24" c. to c.
⅝"	24" c. to c.



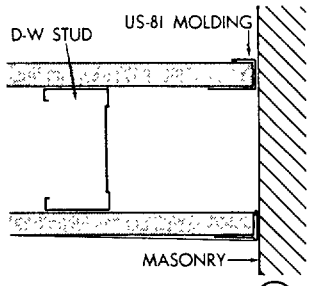
SGP 0028140



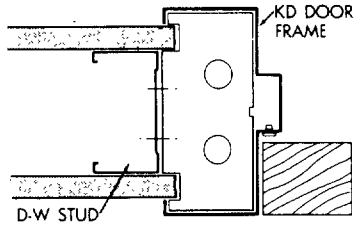
CEILING (1)



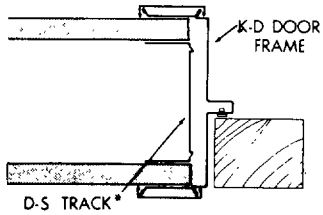
CEILING (2)



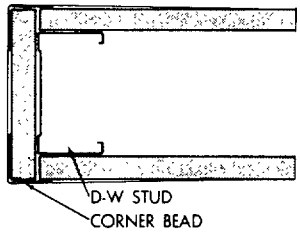
INTERSECTION (3)



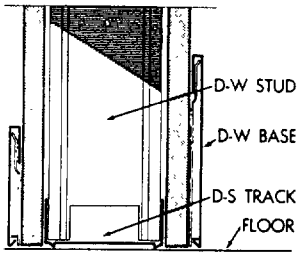
DOOR JAMB (4)



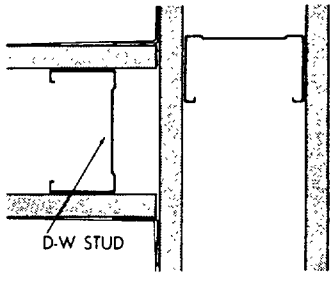
DOOR JAMB (5)



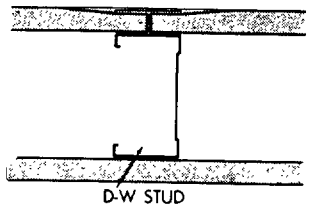
TERMINATION (6)



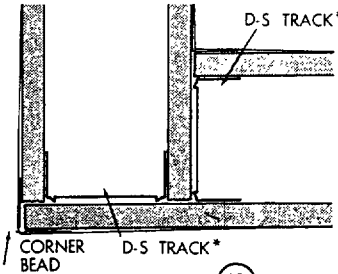
BASE (7)



INTERSECTION (8)



VERTICAL STUD (9)

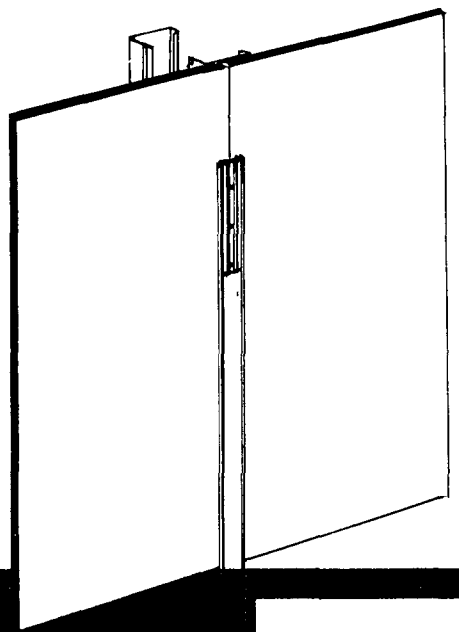


CORNER (10)

*NOTE: D-W Stud

MODU MAKER
DEMOUNTABLE PARTITION

A-W Series



THE DONN® MODU MAKER SYSTEM is a completely new and versatile method of applying gypsum wallboard to a Warrior stud system. The components are used where inexpensive movable floor to ceiling partitions are required. All the steel and aluminum components are virtually 100% demountable and reusable. The aluminum batten strips of this attractive system can be either on a two or four foot module. To enhance the decor of the wall the vinyl insert for the batten is available in five decorator colors which match or compliment a variety of vinyl covered gypsum panels. The system consists entirely of incombustible materials. When increased fire resistance is desired, a 5/8" rated gypsum panel is screw attached to the framing members at 12" on centers in the field and 8" on centers, staggered, at the joints, and the wider batten strip applied to conceal these screws. (This type of application on Warrior studs has been assigned a one-hour fire rating.) The battens, ceiling trim, base and corners, are all satin finished anodized aluminum.

SOUND TRANSMISSION LOSS TESTS

	CONSTRUCTION	Nine Freq. Av'g.	Sound Trans. Loss	Speech Interference Zone
OR 64-65	DW-40 Studs, 24" o.c., 1/2" vinyl covered gypsum wallboard, both sides, AW-14 aluminum batten 24" o.c., with vinyl inserted.	33	35	41
OR 64-67	Same as above with 1 1/2" fiberglass insulation inserted into cavity.	38	40	47
OR 64-68	DW-40 Studs, 24" o.c., 5/8" vinyl covered gypsum wallboard, both sides, AW-14 aluminum batten, 24" o.c., with vinyl insert.	33	37	39

Specifications

SGP 0028141

MATERIALS

Studs: (Same as Warrior System)
Metal Floor and Ceiling Track: (Same as Warrior System)
Metal Screw Fasteners: W-620 (1 1/4") Flange-head, Phillips, self-drilling, sheet-metal-type screw for use with a power-driven tool.
Aluminum Batten: AW-14 (3/4"); AW-16 (1").
Vinyl Insert: AW-15 (3/4"); AW-17 (1"). Colors shall be: Ebony, Hawaiian Tan, Autumn Brown, Spring Green or Alaskan Gray.
Aluminum Ceiling Molding: AW-8 (1/2" panels); AW-10 (5/8" panels).
Aluminum Base: AW-40 (2 1/2"); AW-64 (4").
Aluminum Corner: "F" type molding, AF-8 (1/2" panels); AF-10 (5/8" panels).
Base Clips: W-2 (2 1/2"); W-4 (4").
All aluminum components are extruded of 6063T-5 aluminum, satin finish, etched and anodized.

INSTALLATION

Ceiling track, floor track and studs shall be installed in the same manner as the Warrior system. Aluminum Ceiling Trim shall be slid on the panel and this assembly positioned so the ceiling trim is trapped between the panel and ceiling track.

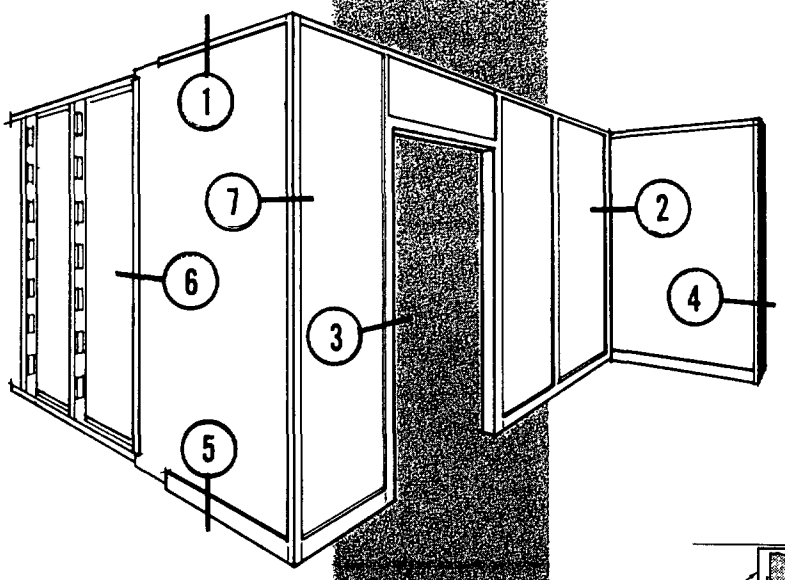
Tack panels to metal studs set 24" on centers.

Apply base clips at 24" on centers maximum. Attach aluminum base.

Apply batten with screws at 12" on centers using power tool to tap through batten and also the steel stud. Insert vinyl cover.

Corner and door frame openings shall be constructed as per manufacturer's recommendations. (See details).

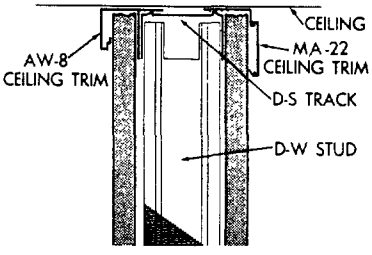
When aluminum battens are to be spaced 48" on centers a drywall adhesive recommended by the manufacturer shall be applied on alternate studs.



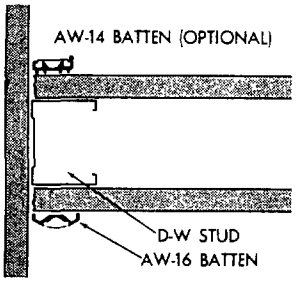
MODU-MAKER

Architectural Details

SCALE 3" = 1'0"



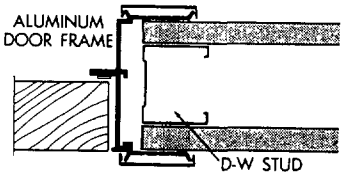
CEILING (1)



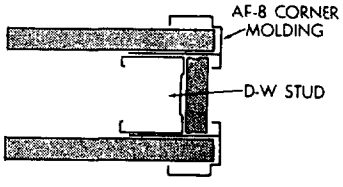
INTERSECTION (2)

Frequency cps	125	175	250	350	500	700	1000	1400	2000	2800	4000
OR 64-65	14	19	23	30	33	39	45	45	45	40	42
OR 64-67	19	24	30	38	42	47	48	49	47	46	45
OR 64-68	19	22	27	31	36	40	41	37	37	40	45

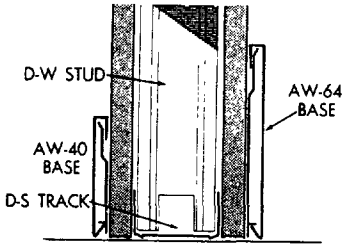
Eternawall®: registered trademark of Bestwall Gypsum Co.



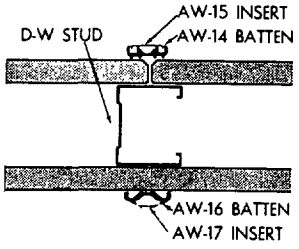
DOOR JAMB OR BORROW LITE (3)



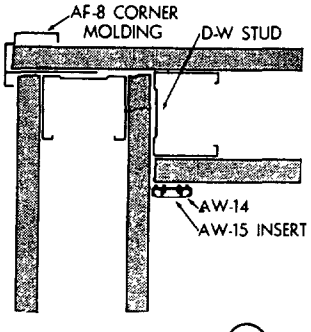
TERMINATION (4)



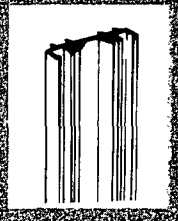
FLOOR (5)

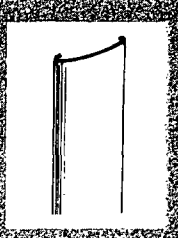


VERT. STUD (6)



CORNER (7)





FIRE TESTS

Construction—DW-40 Studs, 24" o.c., 5/8" type "X" Eternawall® vinyl covered gypsum wallboard, attached vertically; AW-14 and AW-16 aluminum battens 24" o.c. with AW-15 and AW-17 inserts. AW-40 base applied with H-2 clips 24" o.c., MA-22 ceiling trim locked to ceiling track each side.

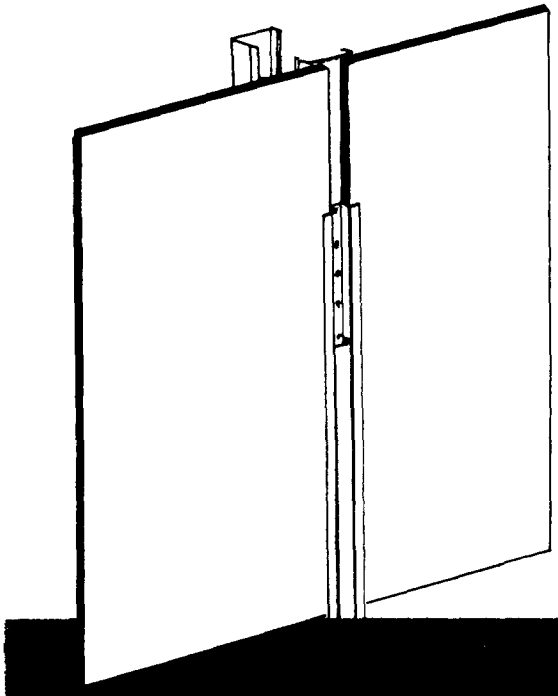
Type of Test—Fire Endurance and Fire and Hose Stream.

Rating—1 hour, 13 minutes.

SGP 0028142

SPACELINE
DEMOUNTABLE PARTITION

S-W Series



The DONN® SPACELINE SYSTEM is an entirely new concept for low cost demountable partition systems. The hat-shaped steel batten strips and steel inserts can be placed on a two or four foot module employing the various Warrior framing systems to hold the gypsum wallboard in place. This system eliminates joint or screwhead treatment with conventional joint compounds and thus is a time saver when erecting and a money saver where movability is a factor. When plain gypsum wallboard is used the entire wall surface can be painted after complete erection. Aluminum or steel base and ceiling trim items are available to enhance the system. All components of the system are made of non-combustible materials.

Specifications

MATERIALS

Studs: (Same as Warrior System)

Metal Floor and Ceiling Track: (Same as Warrior System)

Metal Screw Fasteners: W-616 (1") Flange-head, Phillips, self-drilling, sheet-metal-type screw for use with a power-driven tool.

Steel Batten: SW-8; is a roll-formed section of 25 gauge steel with holes punched 1" on centers to accommodate fasteners. Fasteners are to be placed 12" on centers.

Steel Insert: SW-9; is a roll-formed section of 25 gauge steel and positively locks into the batten to conceal the screws.

Ceiling Molding: Steel or aluminum.

Base: Steel or aluminum.

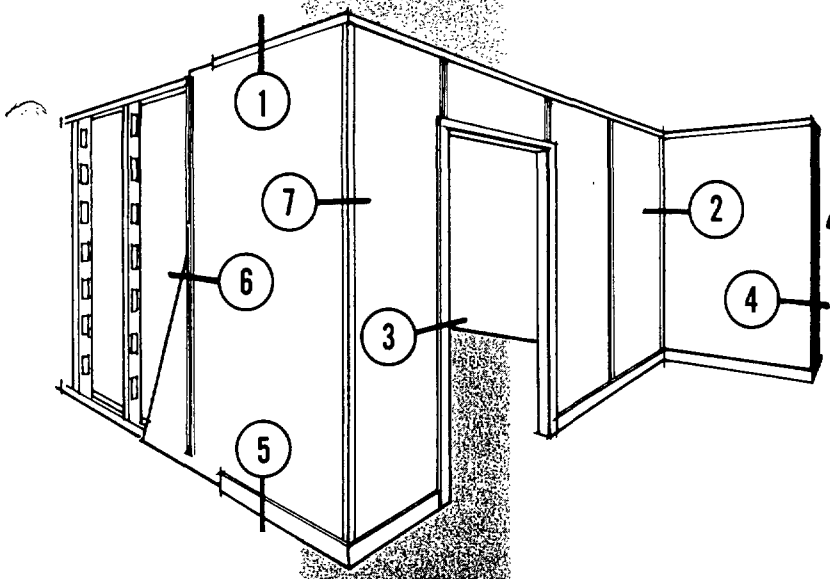
INSTALLATION

Ceiling track, floor track and studs shall be installed in the same manner as the Warrior System.

Apply batten with fasteners 12" on centers using power tool to screw through steel stud.

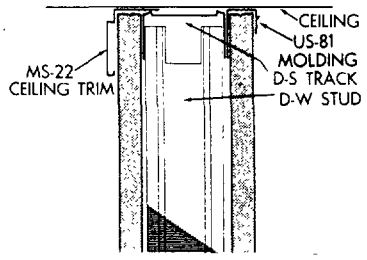
The battens can be spaced 24" on centers. When the battens are to be spaced 48" on centers a drywall adhesive recommended by the manufacturer shall be applied to alternate studs.

Corner and door frame openings shall be constructed as per manufacturer's recommendations. (See details).

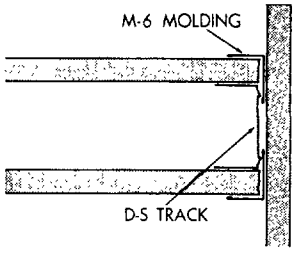


Architectural Details

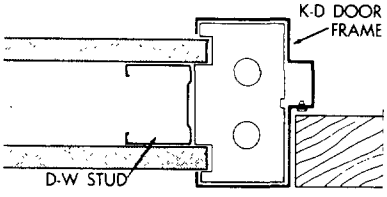
SCALE 3" = 1'0"



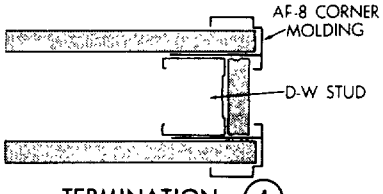
CEILING (1)



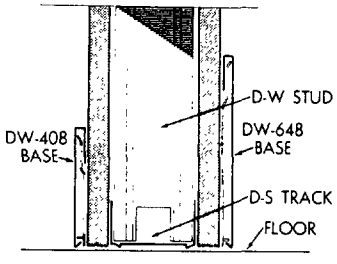
INTERSECTION (2)



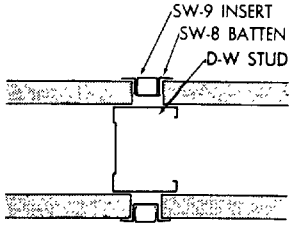
DOOR JAMBS (3)



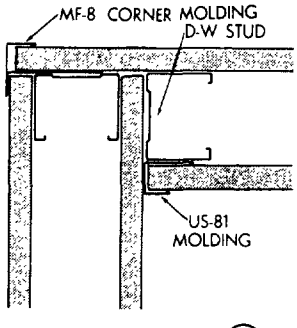
TERMINATION (4)



BASE (5)



VERTICAL STUD (6)



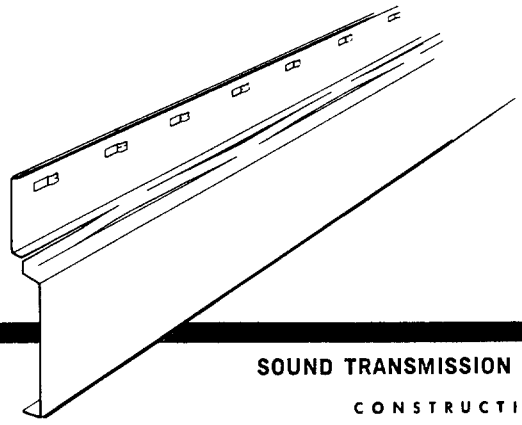
CORNER (7)

SGP 0028144

RESILIENT FURRING

D-G Series

WOOD STUDS • METAL STUDS



The DONN® GRENADIER RESILIENT FURRING SYSTEM is designed for resilient application of gypsum wallboard to wood, steel framing of partitions or existing construction and ceilings, to acquire above average sound transmission loss. The steel channel is a 25 gauge roll-formed shape and is applied at right angles to framing members and fastened with

SOUND TRANSMISSION LOSS TESTS

CONSTRUCTION	Nine Freq. Av'g.	Sound Trans. Class	Speech Interference Zone
OR 64-41 1½" wallboard gypsum core; ½# density fiberglass, DG-8 resilient channel 24" o.c., horilzontal, ⅝" gypsum wallboard over.	41	42	48
OR 64-43 1½" gypsum wallboard core; ½# density fiberglass, DG-8 horizontal, 24" o.c., ⅝" gypsum, over, one side. ½# density fiberglass, DG-8 horizontal, 24" o.c., double layer ⅝" gypsum wallboard over, other side. (Listed below is sound test data as applied to wood framing studs, 2" x 4" wood studs 16" o.c. faced as indicated.)	49	47	57
OR 64-8 ⅝" gypsum wallboard, each side.	32	34	38
OR 64-20 ½" Firestop® gypsum wallboard one side; DG-8 direct to studs, one side @ 24" o.c., horizontally with ½" Firestop® gypsum wallboard over, other side.	37	39	47
OR 64-7 Same as above with ⅝" gypsum wallboard.	40	43	46
OR 64-16 Same as above with 1½" fiberglass economy blanket on resilient side.	48	50	53
OR 64-21 Two layers ½" Firestop® gypsum wallboard one side; DG-8 @ 24" o.c. horizontally with ½" Firestop® gypsum wallboard over, other side.	43	46	51
OR 64-15 Two layers ⅝" gypsum wallboard one side; DG-8 @ 24" o.c. horizontally, with ⅝" gypsum wallboard over, other side.	45	48	51
OR 64-9 ⅝" gypsum wallboard both sides; ½", ½# fiberglass over one face, DG-8, 24" o.c., horizontal, with ⅜" gypsum wallboard over.	41	39	51

Firestop®: registered trademark of Bestwall Gypsum Co.

Architectural

FIRE TESTS

Construction—Floor-ceiling assembly using 2 x 10 wood joists 16" o.c., 1 x 6 T & G subfloor, building paper, 1 x 4 T & G finish floor; DG-8 channel 24" o.c., ½" Firestop® gypsum wallboard attached 12" o.c. with 1" screws.

Rating—1 hour—U.L. Design No. 33-1.

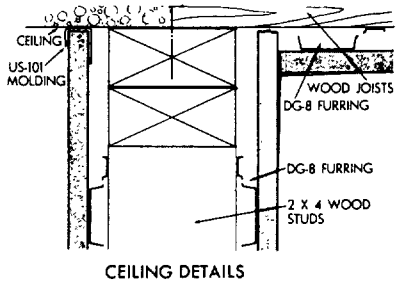
MATERIAL

Resilient Channel: DG-8 Resilient Channels roll-formed of 25 gauge steel with holes 1" on centers to accommodate fasteners.

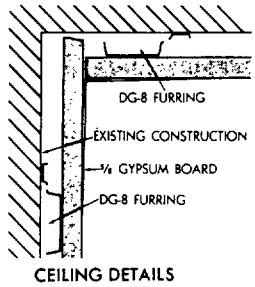
INSTALLATION

Partitions: Attach DG-8 Resilient Channels horizontally to partition studs, 24" on centers. Use W-620 (1 ¼") drywall screws or 5d common nails through prepunched holes in channel flange. Channels shall be located 6" below ceiling and 24" above floor. A 3" wide strip of gypsum is fastened to the studs along the floor.

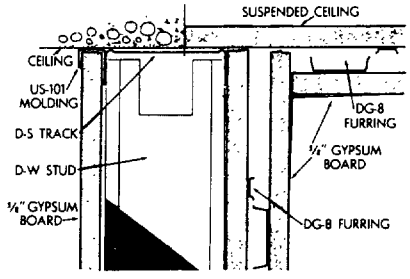
Ceilings: Attach DG-8 Resilient Channels at right angles to ceiling joists with suitable fasteners 24" on centers. Extend channels to partition top plates. If channels run parallel to partitions, locate channels at least 1" from partitions.



CEILING DETAILS



CEILING DETAILS



CEILING DETAILS

SGP 0028145

FURRING

D-G & D-W Series

DONN® GRENADIER AND WARRIOR FURRING SYSTEMS.
Description: A variety of components can be used for either ceiling or wall furring. The limiting factors for ceiling furring are individual spanning characteristics; the chart below lists these. The same components are employed as wall furring members, however, economy and ease of installation are prime considerations in the selection of the proper shape.

CEILING FURRING SELECTION

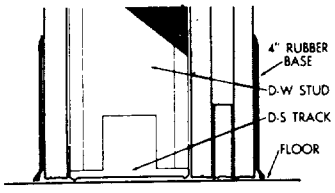
TYPE CEILING MEMBER NOMINAL SIZE		FURR. CHNL. c. to c.	HANGERS c. to c.
DG-10	5/8"	4'-0"	4'-0"
DW-14	7/8"	4'-0"	4'-0"
DW-26	1 5/8"	5'-0"	4'-0"
DW-28	1 3/4"	5'-0"	4'-0"
DW-40	2 1/2"	6'-0"	4'-0"
DW-48	3"	7'-0"	4'-0"
DW-54	3 3/8"	7'-0"	4'-0"
DW-58	3 5/8"	8'-0"	4'-0"
DW-64	4"	8'-0"	4'-0"

- **EXISTING CONSTRUCTION**

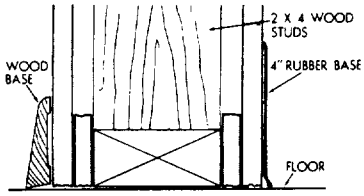
screws or nails. The gypsum wallboard is fastened to the channel with power-driven drywall screws. The panel may be applied either horizontally or vertically with respect to the channels, in single or double layers. The outstanding feature of this member is its resilience even when attached to solid existing walls where better sound attenuation is required.

Freq. cps	125	175	250	350	500	700	1000	1400	2000	2800	4000
OR 64-41	23	24	34	42	48	48	48	48	47	49	54
OR 64-43	26	30	46	53	57	58	58	57	57	55	59
OR 64-8	22	16	29	31	33	38	41	41.5	36	36.5	45
OR 64-20	21.5	21.5	27	36.5	39	46	49	53	52	43	42
OR 64-7	29.5	28	33	41	45	48.5	52	52.5	44	41	51
OR 64-16	33.5	35	43	50.5	51	54	55	55	54	47.5	53
OR 64-21	29.5	28	35	42	45	51	53	56.5	54	46	49
OR 64-15	32.5	32	38	44.5	49	52.5	55	56.5	49	45	54
OR 64-9	18.5	22	34	41.5		46	53	57	56.5	48	54

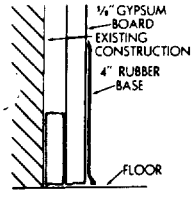
Details



BASE DETAIL

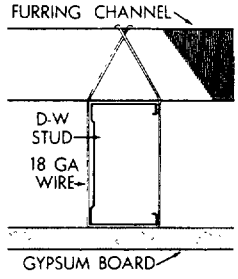


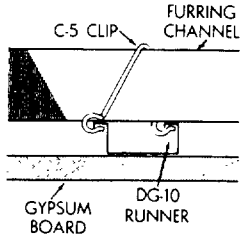
BASE DETAIL

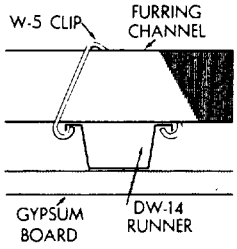


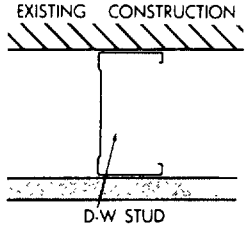
BASE DETAIL

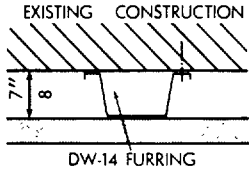
Architectural Details

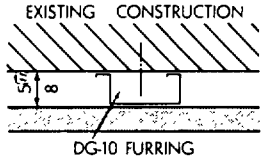










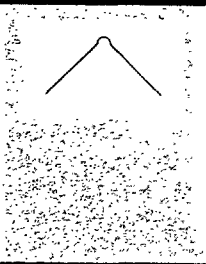


SGP 0028146

DRYWALL

DONN

CORNER EDGE BEADS



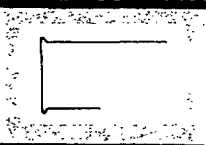
The most economical answer for stronger, more accurate external wallboard corners. Simply applied by nailing through board into stud. Provides proper ground and precise screed for cement application. Knurled and perforated for maximum cement and paint adhesion. Formed from electro-galvanized steel to protect the weakest spot in wallboard construction.

D-1000 has 1" x 1" flanges
DL-1000 has 1" x 1¼" flanges
DLS-1000 has 1⅛" x 1⅛" flanges
DLL-1000 has 1¼" x 1¼" flanges

- All Corner Edge Beads available in 8'-0", 9'-0" and 10'-0" lengths.

The wide range of flange widths provides a selection from the lowest cost to the easiest nailing dependent on individual requirements for protection from knocks, bumps and abuse.

CHANNEL EDGE CASING



Slips readily over edge of wallboard at door or window opening to form functional square trim. Nailed through knurled and perforated flange and through wallboard into header or jamb. Beaded nose provides accurate screed for proper thickness of cement and gives strength where most needed without taping. Fast because no mitering is required.

D-1001 is fabricated for ⅜", ½", ⅝" or ¾" wallboard and in 7'-0", 7'-3" and 10'-0" lengths.

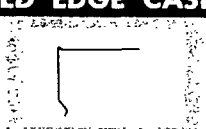
ANGLE EDGE CASING



Similar to Channel Edge Casing but simplified by eliminating the back flange. This allows the wallboard to be completely nailed in all areas—even around door and window openings—before Angle Edge Casing is applied. This permits completely independent trimming crews if desired.

D-1002 is fabricated for ½" or ⅝" wallboard and in 7'-0", 7'-3" and 10'-0" lengths.

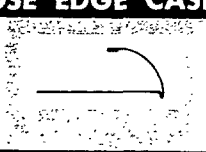
RECESSED EDGE CASING



This represents a further refinement on Angle Edge Casing. To use this trim, jambs and headers for all door and window openings are slotted ½" deep, back approximately 3/16" to ⅜" from face of jambs and headers. Wallboard is completely erected, leaving slot exposed beyond wallboard edge. Recessed Edge Casing is then installed by inserting offset leg into slot and nailing through other flange and through wallboard into jamb or header. This application assures a clean juncture plus true alignment of casing and framing without time-consuming precision fitting.

DS-1003 is fabricated in one single dimension which accommodates ⅜", ½" or ⅝" wallboard, thereby reducing inventories to a minimum and is available in 7'-0", 7'-3" and 10'-0" lengths.

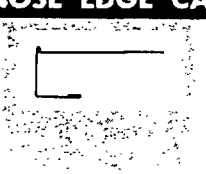
BULLNOSE EDGE CASING



Provides extra rigid, traditional type casing for wallboard construction with streamlined quarter round returns. May either be nailed in place first—and board inserted into nose—or slid over wallboard edge at openings, nailing right through board and flange into jambs or headers. Hemmed edge may be left untreated as decorative offset trim.

D-1004 is fabricated for ⅜" or ½" wallboard and in 7'-0", 8'-0" and 10'-0" lengths.

SQUARENOSE EDGE CASING



Sturdy, conventional type square nose casing which is more rugged than others for maximum protection. Nail casing around wall openings so that wallboard may be readily slipped into nose of casing. Alternate method is to cut back wallboard slightly from opening, slip casing over edge, then nail both to jambs or headers. If desired, surface may be brought flush to trim thickness by feathering back onto wallboard surface with cement.

D-1005 is fabricated for ⅜", ½", ⅝" or ¾" wallboard and in 7'-0", 8'-0" and 10'-0" lengths.

DONN
PRODUCTS, INC.
700 BASSETT ROAD • WESTLAKE, OHIO 44091
Telephone: (216) 871-1000

SGP 0028147

Printed in U S A

Sigurd Plant
T.W. Richards

Paoli, Pennsylvania

February 9, 1965

To: All Regional Sales Managers
All Area Sales Managers
All Salesmen

General Sales Bulletin #10-65

Subject: STEELCRAFT DRYWALL FRAMES

Re: Frames Recommended for Bestwall Gypsum Systems

Cc: Mr. R.I. Fredericks Paoli
Mr. K.A. McCaskill Paoli

By: G.C. Moore /ghp

FILE - Wallboard Manual
Section 7 Sub-section E

Forwarded herewith for your information is one copy of literature developed by the Steelcraft Manufacturing Company on their Steel Frames recommended for Bestwall Gypsum Systems (Form #BW-101).

This literature is sent to give you a more complete understanding of door frames and installation details.

The frames detailed in this literature are made of 16 or 18 gauge, cold rolled, prime quality steel (DW-16 and DW-18 for 1-3/8" or 1-3/4" doors).

Construction and Installation Details you will note:

1 - These door frames are three (3) piece construction

2 - The header or head piece has a snap-lock corner - both corners

3 - The frame is secured to the base runner (wood or metal) by the #14 gauge tabs on the base anchor (2 sides)

4 - The frame is pinched fast to the partition sandwich by the adjustable jamb anchor - adjusting screw - 3 screws on each jamb.

TYPICAL INSTALLATIONS FOR BESTWALL PARTITION SYSTEMS

The nine (9) steel frames can be shown:

SGP 0028148

1 -	Jamb Depth	3" - 2"	Solid Partition
2 -	" "	3 1/4"	Semi-solid Partition
3 -	" "	3-5/8"	Semi-solid Partition
4 -	" "	4 1/4"	M. Stud - 1/2" BWG both sides
5 -	" "	5"	M. Stud - 2 layers 5/8" BWG both sides
6 -	" "	5 1/4"	M Stud - 5/8" BWG both sides
7 -	" "	6"	M Stud - 2 layers 5/8" BWG both sides
8 -	" "	7"	Double Solid Partition
9 -	" "	7-1/8"	Double Solid Partition

Previous reference to Steelcraft Door Frames General Sales Bulletin #48-64, 6/4/64.

INFORMATION DATA SHEET

FRAMES RECOMMENDED FOR BESTWALL GYPSUM SYSTEMS

BW-101

STEELCRAFT

Drywall Frames

To be installed into a rough opening after all basic wall construction is completed.

DW-16 & DW-18
For 1 3/8" or 1 3/4" Doors

SPECIFICATIONS

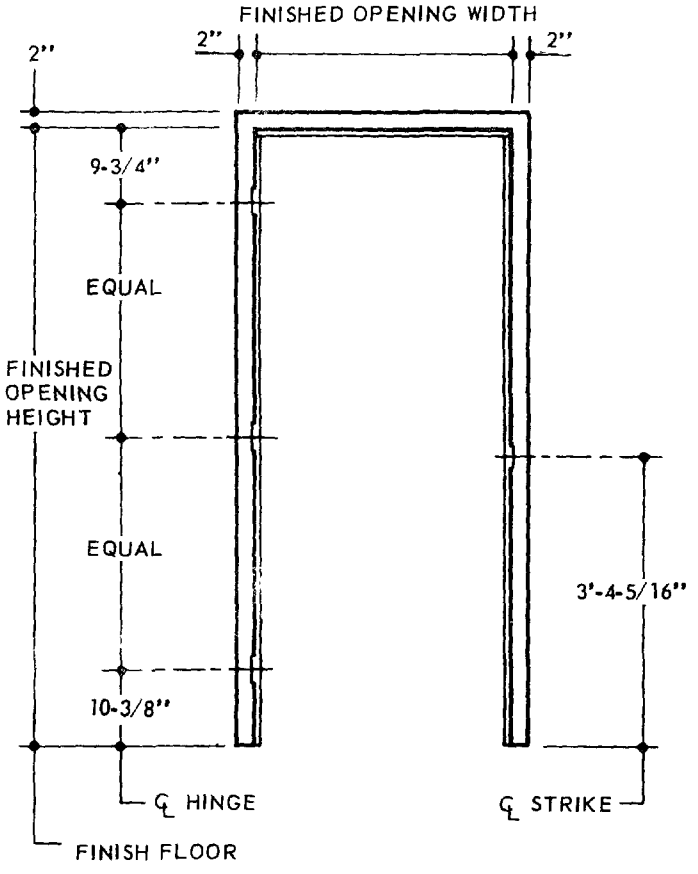
1. Frames shall be made of 16 or 18 gage cold rolled prime quality steel.
2. Frames shall be knock down. Mitered corners shall be reinforced with "Snap-Lock"* corner clips to allow easy interlocking of jamb to head.
3. Each jamb shall have an adjustable jamb anchor* located 6" from top of frames.
4. Each jamb shall have a welded-in base anchor attaching plate, which will allow easy installation of loose base anchors in the field.
5. All frames shall be furnished with three rubber bumpers in each jamb and two rubber bumpers in each double door head installed
6. All frames shall be bonderized and receive one coat of baked-on prime paint.
7. Standard: All frames shall be mortised and reinforced for hinges, strikes, and all surface applied hardware as required. at the factory.

ALTERNATE: All frames shall be mortised and reinforced for strike, surface hardware, and furnished with weld-on hinges.

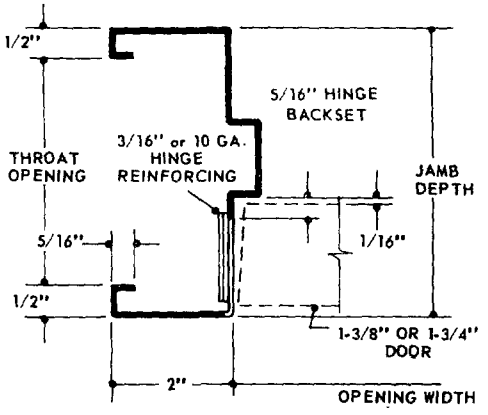
* PAT. PENDING

SGP 0028149

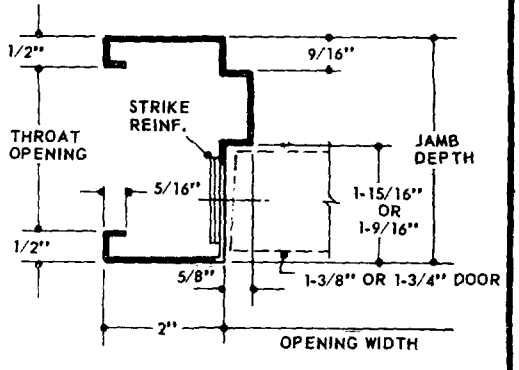
DRYWALL-FRAME ELEVATIONS AND SECTIONS
18 Ga. Frames For 1⅜" Doors; 16 Ga. For 1⅜" & 1¾" Doors



ELEVATION



DOUBLE RABBET SECTION AT HINGE THRU FRAME FOR WALLS 3-1/2" THICK AND OVER



SINGLE RABBET SECTION AT STRIKE THRU FRAME FOR WALLS 2-7/8" THICK AND UNDER

NOTE:
Rough opening dimensions are determined as follows:

Width of drywall opening may be a minimum of 1" and a maximum of 2" wider than finished frame opening width.

Height of drywall openings may be a minimum of 1/2" and a maximum of 1-1/2" higher than finished frame opening height.

SIZES				
FINISHED OPENING HEIGHT	FINISHED OPENING WIDTH		FRAME DIMENSIONS	
	SINGLE	DOUBLE	JAMB DEPTH	THROAT OPENING
			SINGLE RABBET	
	2'-0"	4'-0"	**3"	2"
	2'-4"	4'-8"	*3-1/4"	2-1/4"
6'-8"	2'-6"	5'-0"	*3-5/8"	2-5/8"
7'-0"	2'-8"	5'-8"	DOUBLE RABBET	
7'-2"	3'-0"	6'-0"	*4-1/2"	3-1/2"
8'-0"	3'-4"	6'-8"	5-1/4"	4-1/4"
	3'-6"	7'-0"	5"	4"
	3'-8"	7'-4"	*6"	5"
	4'-0"	8'-0"	7"	6"
			*7-1/8"	6-1/8"

*Standard Steelcraft Jamb Depths.
**Available for 1-3/8" doors only.

SGP 0028150

GENERAL NOTES

Hardware Preparation – Frames for 1-3/8" Doors

Hinges – 1 pair of 3-1/2" x 3-1/2" standard weight template or non-template hinges for 6'8" height. 1-1/2 pair of 3-1/2" x 3-1/2" standard weight template or non-template hinges for 7'0" or 7'2" height.

Strike – Cylindrical Preparation ASA-115-3.

Hardware Preparation – Frames for 1-3/4" Doors

Hinges – 1-1/2 pair of 4-1/2" x 4-1/2" standard weight template hinges for 6'8", 7'0" and 7'2" height. 2 pair of 4-1/2" x 4-1/2" standard weight, template hinges for 8'0" height.

Strike – Universal Preparation ASA-115.1–2 (Standard) or Cylindrical Preparation ASA-115-3.

ANCHORS

Jamb Anchors

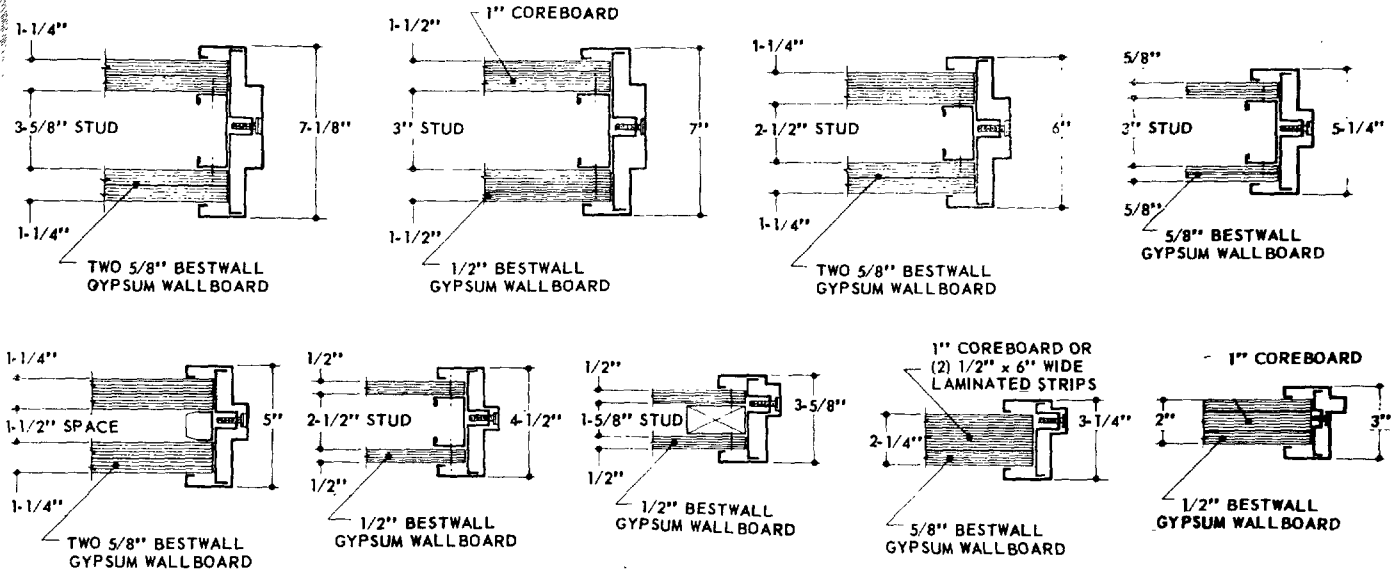
An adjustable anchor is attached to each jamb located 6" from the top of the frame.

BASE ANCHORS

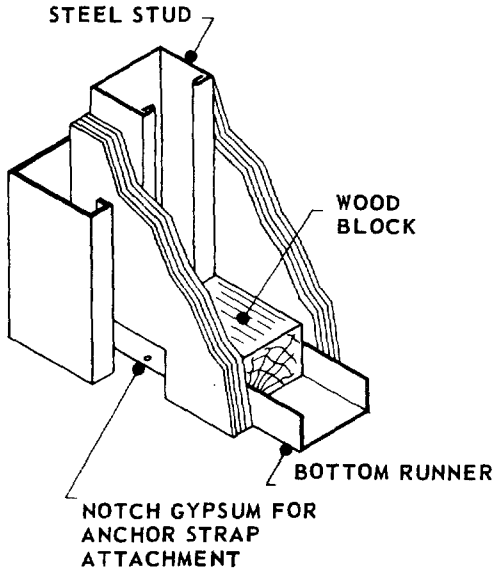
Loose Anchors

Loose base anchors are furnished with each frame. Gypsum board must be notched to allow base anchor to be fastened directly to the steel or wood studs.

TYPICAL INSTALLATIONS FOR BESTWALL PARTITION SYSTEMS

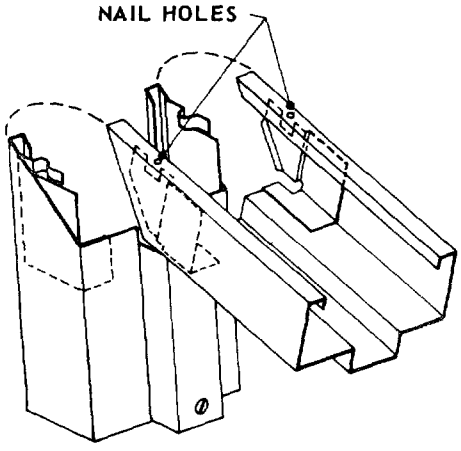


CONSTRUCTION AND INSTALLATION DETAILS



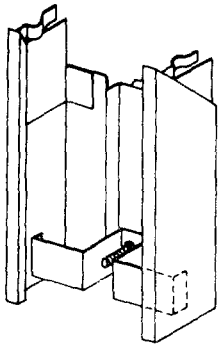
GENERAL NOTES:

1. The rough opening should be finished as square as possible.
2. It is recommended that a small wood block be installed at the bottom corner of each opening. See Ill. at left. This will give necessary reinforcement required for solid anchoring of the frame at the floor line.
3. If the frame must be removed from the wall, insert two 10d nails into the nail holes on both side of the head. Press down on the nails to disengage the snap-lock corner.
4. For installation instructions, see reverse side of this sheet.

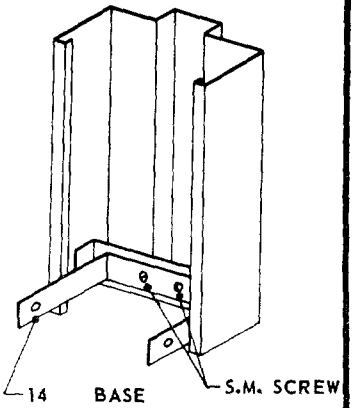


SNAP-LOCK CORNER*

SGP 0028151



ADJUSTABLE* JAMB ANCHOR



*PAT. PENDING

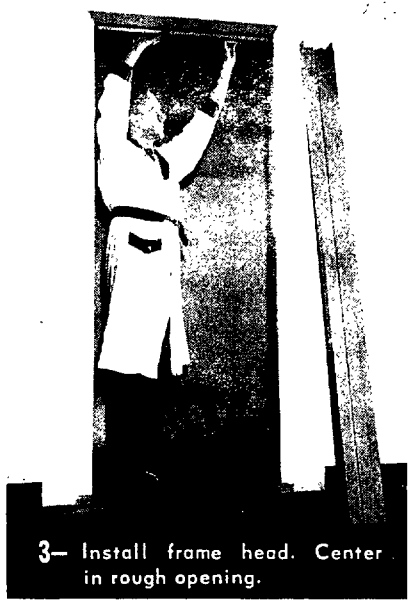
STEPS IN THE INSTALLATION OF THE STEELCRAFT DOOR FRAME FOR DRYWALL PARTITIONS



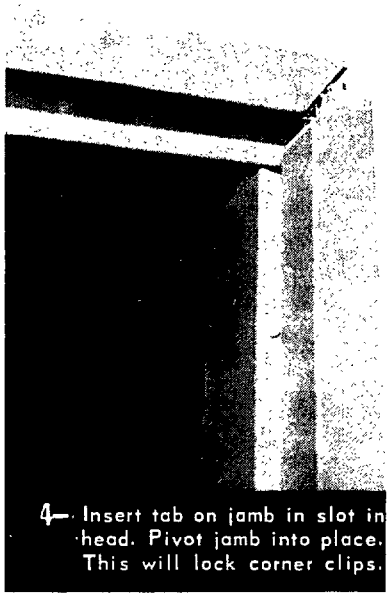
1— Attach base anchor to strap at base of jamb.



2— Notch drywall at base for attachment of base anchor.



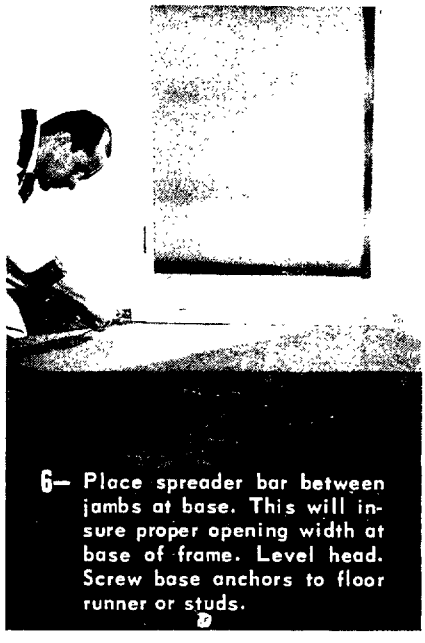
3— Install frame head. Center in rough opening.



4— Insert tab on jamb in slot in head. Pivot jamb into place. This will lock corner clips.



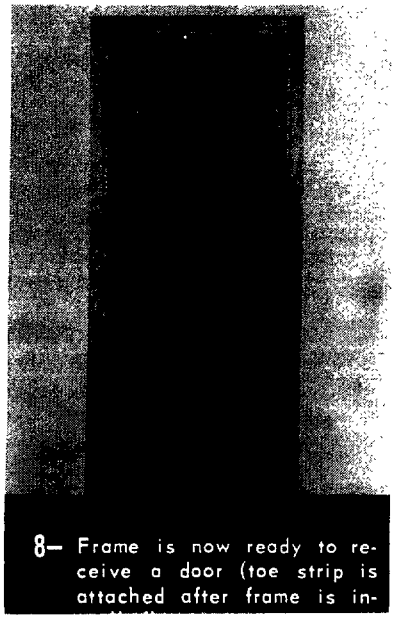
5— Repeat step No. 4 with other jamb.



6— Place spreader bar between jambs at base. This will insure proper opening width at base of frame. Level head. Screw base anchors to floor runner or studs.



7— Plumb frame by adjusting anchors at top of jambs. Make certain anchors are pressed



8— Frame is now ready to receive a door (toe strip is attached after frame is in-

SGP 0028152

B E S T W A L L G Y P S U M C O M P A N Y

GYPSUM WALLBOARD MANUAL

1965 EDITION

Section 7
Sub-Section E

LIST OF MANUFACTURERS OF METAL COMPONENTS FOR PERMANENT AND MOVABLE PARTITIONS

1. Curtis Partition Corp., 722 Liberty Ave., North Bergen, N. J.
2. Donn Products, 700 Bassett Road, Westlake, Ohio
3. Henges Company, 2814 Locust Street, St. Louis 3, Mo.
4. National Rolling Mills, P. O. Box 205, Malvern, Penna.
5. Neslo Partitions, P. O. Box 427, Doylestown, Penna.
6. Penn Metal Co., P. O. Box 1468, Parkersburg, W. Va.
7. White Partitions Co. 56 Glenwood Ave., Boston 36, Mass.

SGP 0028153

MOVABLE PARTITION TAX CREDIT

The new 7% investment tax credit on investments in business equipment and other depreciable personal property is an important sales aid for movable partitions.

Permanent interior walls are considered structural components and therefore do not qualify for the 7% tax credit. Movable partitions are considered depreciable business property and will quality for the credit. This pertains to partitions used in office buildings or any type of business structure.

Assuming that the cost of movable partitions for a typical office building is $50,000 and that their useful life is 10 years (that is, it is expected that they will be used for 10 years), the amount of $3,500 (7% x $50,000) can be deducted from the 1964 tax bill, regardless of when during the year of 1964 the purchase is made.

In addition to the 7% tax credit, you are also entitled to depreciate the movable partitions at 20% of their cost for the first year of their purchase, no matter when during the year the purchase is made. Thus, for the movable partitions costing $50,000, depreciation in the amount of $10,000, for the year of purchase, can be deducted.

Further, if it is expected that the partitions will be used for 10 years, they can be depreciated at 10% for the year of purchase and thereafter until the cost, less salvage value, is recovered. In figuring the 10% depreciation, however, the amount allowed is prorated according to the month of the year in which the purchase is made.

The tax credit and depreciation picture for the first year, with respect to the movable partitions, would look something like this:

Movable Partitions, purchased 1/1/64		$50,000.00
Tax Credit @ 7%	$ 3,500.00	
First Year Depreciation @ 20%	10,000.00	13,500.00
Basis for Yearly Depreciation		$36,500.00
Regular Depreciation @ 10%		$ 3,650.00

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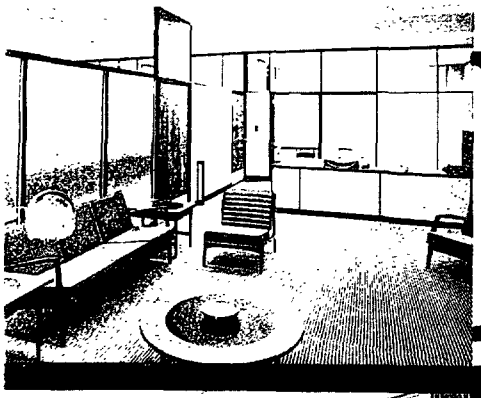
Thus: First, the taxable income is reduced by $13,650 (depreciation of $10,000 and $3,650.00). Second, the tax itself is reduced by $3,500.00 (7% tax credit).

Obviously, the purchase of movable partitions involves very substantial tax savings. This is particularly important in the case of speculative building. (Some legal opinion even indicates that this can be applied to apartment buildings as well as commercial structures. This would have to be verified on a local basis for each particular instance.)

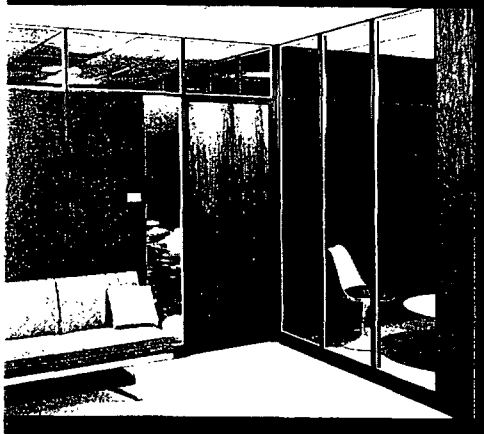
The principal argument for the use of permanent wall construction is the lower initial cost. It is now apparent that any additional cost for movable partitions over fixed walls might well be offset by the tax advantages.

It is important to remember that, in order to receive proper tax credit, the movable partitions must be billed separately to the owner. If the price is buried in the general contract, it may be difficult to prove the cost.

(NOTE: Please verify this tax information with your local tax consultant)



HIGHLANDER



MOVABLE



PARTITION



SYSTEM



DONN
PRODUCTS, INC.
700 Bassett Road • Westlake, Ohio 44091
Area Code 216 Phone: 871-1000

SGP 0028155

HIGHLANDER

AIA FILE NO. 35-H-6



DONN HIGHLANDER

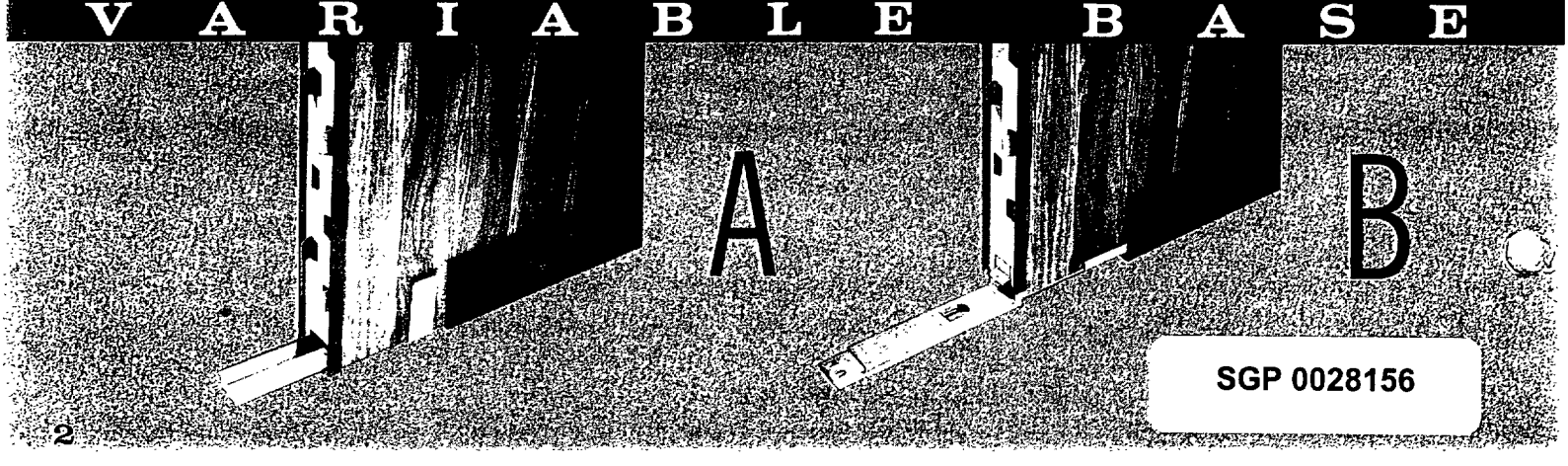
Series of

Movable Partition Systems

Floor to Ceiling – Cornice High – Rail High – Full or Half Glazed – Infinite Variables



VARIABLE BASE



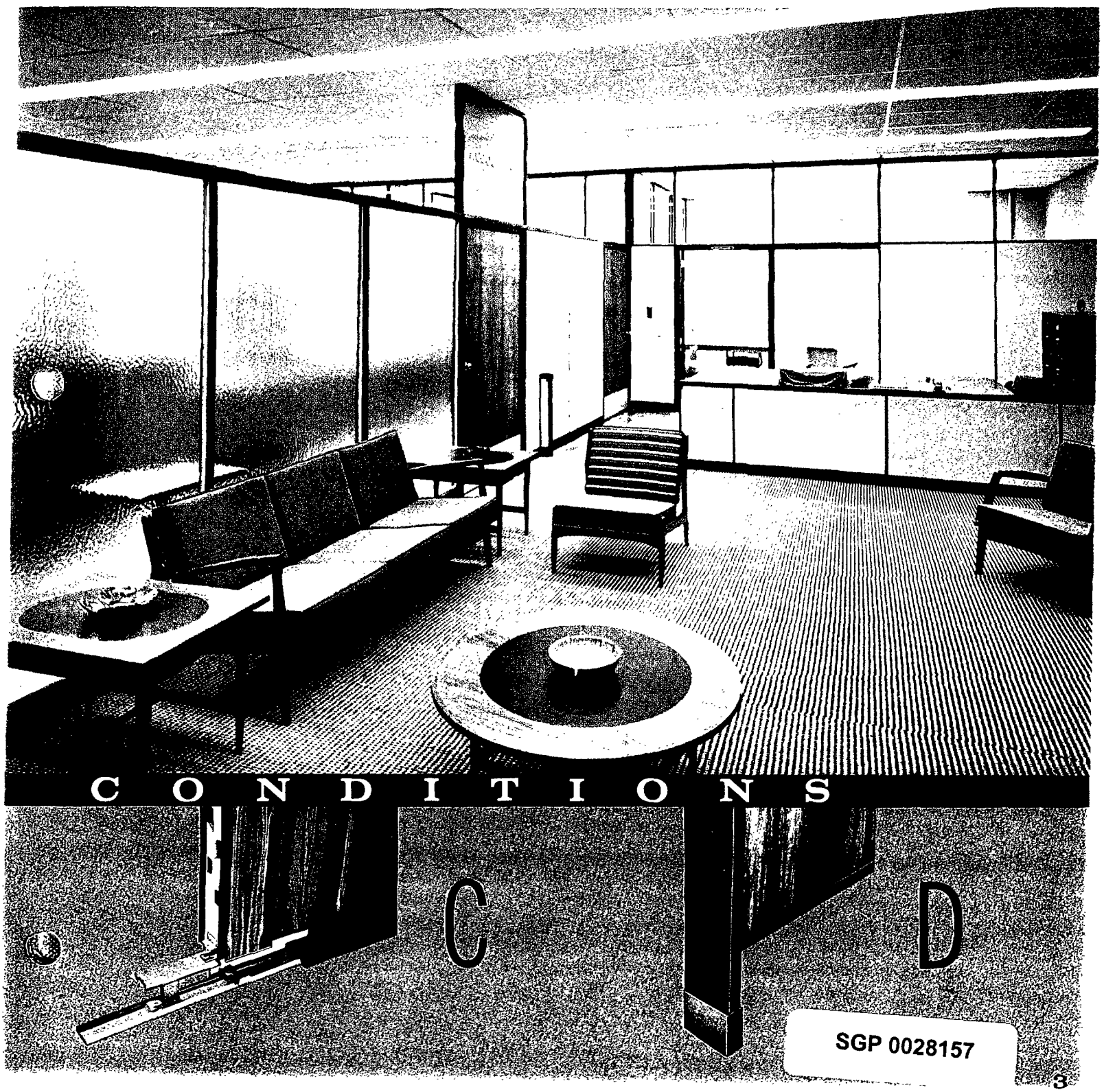
SGP 0028156

The Highlander Movable Partition is a new concept of simplicity and economy, designed and engineered for those concerned with both function and beauty for interior space.

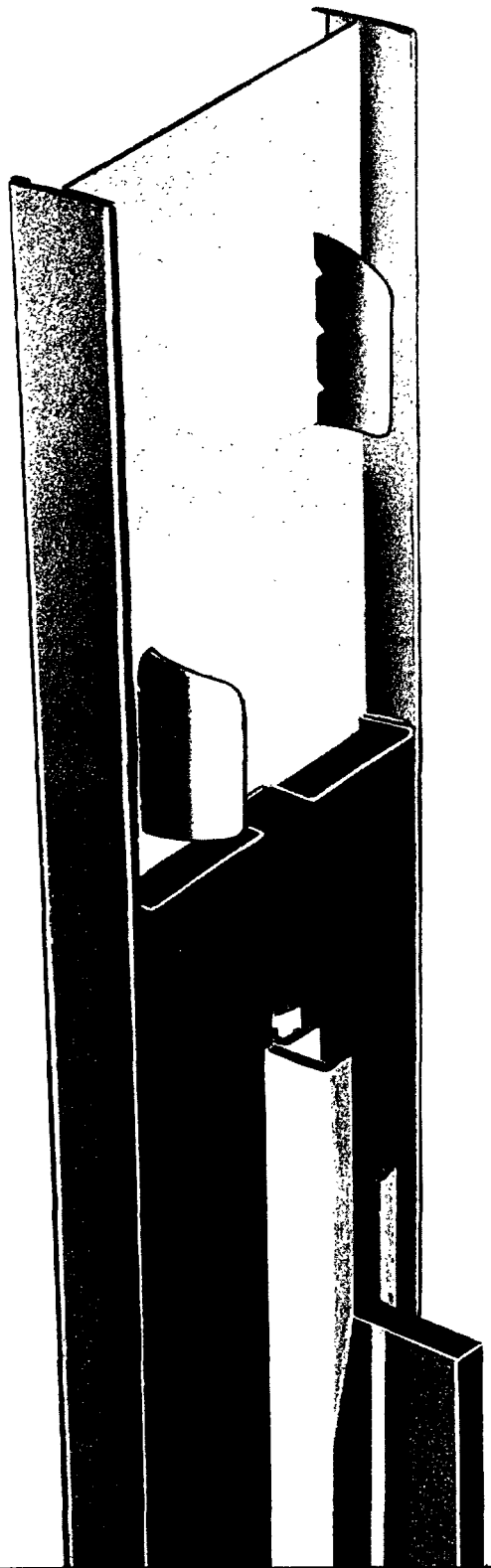
Created to allow limitless selection of module, panel size or thickness, color or texture yet allowing complete electrical accessibility through hollow construction and varied base designs.

Radically few parts function uniquely to form the structural framework and permit disassembly, relocation, interchangeability or accessibility of individual sections or panels with ease and efficiency.

The Highlander Steel Stud, the basis of the system, gives more strength at lower cost, due to its shape, than any other building material. It is a new tool for freedom of expression, long term economy, fast erection time and lifelong beauty.



SGP 0028157



DESIGN DATA

When stud tracks are positioned any modular panel sections can be individually slid into place. These panels can be removed and replaced in minutes without distorting adjacent framework and assembled parts.

In contrast to ordinary sandwich panel-type partitions, the Highlander System is of hollow construction allowing ease of accessibility to mechanical and electrical devices which run free vertically between panels or horizontally in the base.

There is no one size or one type of panel that is required in the system. Panel selection in colors and textures of materials such as gypsum board or plywood in a variety of patterns and colors of the following thicknesses can be used: ¼", ⅜", ½", or ⅝". Sections can be glazed with glass from ⅛" to ¼" thickness. Panels can be varied in height and length with a maximum height of 16' and a maximum width of 4'; width restrictions depend upon panel material selected. With the 4' module an intermediate concealed structural stud is employed.

SOUND ATTENUATION

Employing a ⅝" thick gypsum board panel on a 24" module.

System "A" sound transmission class 36
System "B" sound transmission class 33
System "C" sound transmission class 28

In accordance with ASTM E90-61T and ASA designation: Z 24.19-1957. By a nationally recognized testing facility. Copies of tests available.

(The addition of a fiberglas sound blanket increases the average sound transmission loss by an average of 5 to 6 DB.)

HIGHLANDER SYSTEMS

A System "A" is both assembled and disassembled in progressive sequence. This progressive installation has proven to be the most economical manner of erection. Anchoring of the floor and ceiling tracks completely secures the partition. No separate fastening is required for panels and studs since all components interlock automatically in the system. A 2½" or 4" snap-on metal base or if desired rubber base may be used.

B System "B" is also assembled in economical progressive sequence and has the additional feature of complete accessibility and reinstallation of any two adjoining panels without disturbing adjacent panels. This is accomplished without damage to any components. A 2½" or 4" snap-on metal base or if desired rubber base may be used.

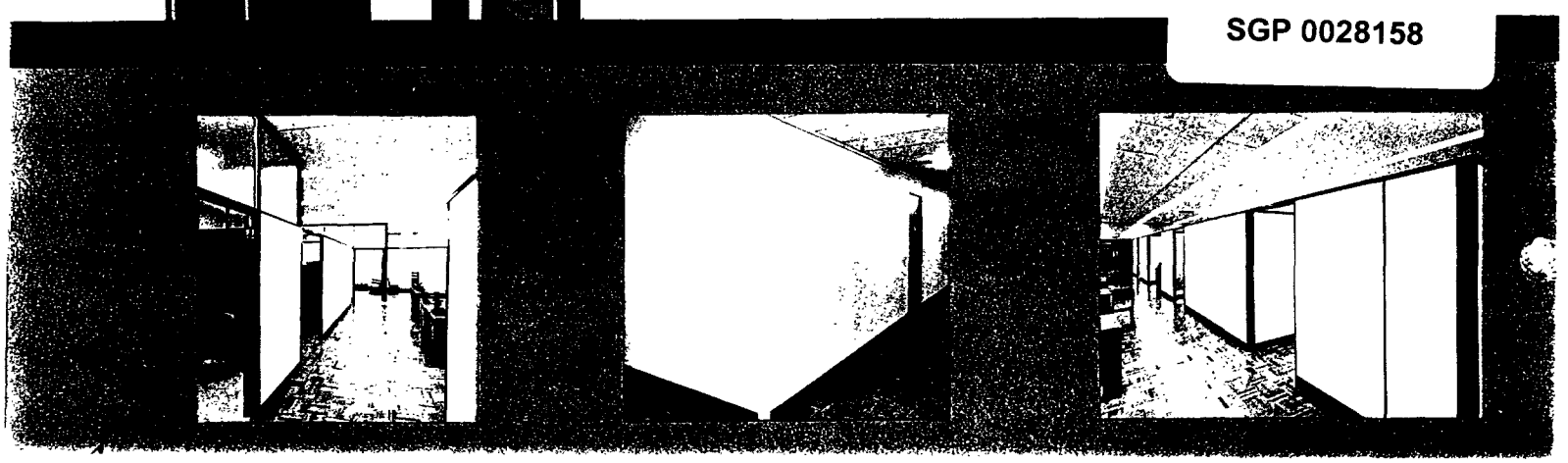
C System "C" provides the same complete accessibility as System "B". However, the entire system is raised three inches to provide an integrated and unrestricted electrical raceway in the base. The raceway is accessible through a 4" snap-on metal base which is easily removed.

D System "D" is rail high or rail high glazed. Available with open or closed base. The components are similar to System "A".

Floor anchors are adjustable to one inch for leveling.

This system is aesthetically harmonious and completely compatible in appearance with the other systems.

SGP 0028158



SPECIFICATIONS

Scope of Work: Furnish and install Donn Highlander series of partitions as manufactured by Donn Products, Inc., as indicated on plans and/or elevations as follows:

Shop Drawings: Submit in triplicate drawings showing the complete floor plan with typical details, elevations, special conditions, glass type, panel materials, and color of finish. Shop drawings shall be approved by architects before proceeding with the work.

General: Partitions shall be skeletal-type roll formed steel structural frame with inserted panels or glass. Net thickness shall be 2 ¾" with hollow core.

Module: The partition module is a function of the spanning characteristics of the panel material selected. Longer modules shall be achieved with interior concealed studs. The maximum module recommended is 48 ⅛", with a standard 48" panel.

STEEL SYSTEM

Studs: The exposed steel stud shall be a minimum metal thickness of .030". The exposed flange shall be ¾" wide. The stud shall be provided with tabs punched from the web at a distance from the flange of (¼", ⅜", ½" or ⅝" depending on the panel thickness). Tab support behind the panel shall be 8" on center.

Stud Track System "A": Shall be minimum steel thickness of .021". Provide suitable anchorage at a minimum of 2' on center.

Stud Track System "B" and "C": Shall be minimum steel thickness of .059". The track shall be punched with a depressed tongue shape to allow for anchorage to floor and ceiling, insuring the installation of anchors below the surface of the track and providing a smooth surface for the movement of the panel.

Corner Posts all systems: Shall be formed from .030" steel and shall be flanked on each side by a stud secured by bending the stud tabs.

Snap-In Glazing Mold all systems: Shall have a minimum thickness of .021" steel. The molding shall be installed flush with the flange edge of the stud into which it snaps. The molding shall surround all four sides of the opening to be glazed.

Glazing: Standard glazing mold shall be gray rigid vinyl to accommodate ⅛" to ¼" glass or panel material. Molding shall fit in the recess provided by the glazing mold herein before specified.

Electrical Raceway System "C" only: Shall be formed by two parallel tracks held apart by spacers. This raceway shall form an accessible raceway for wiring.

Door Frames: 16 or 18 gauge cold rolled steel flush design 2 ¾" width, available in all sizes. Specify hinge and strike preparation requirements.

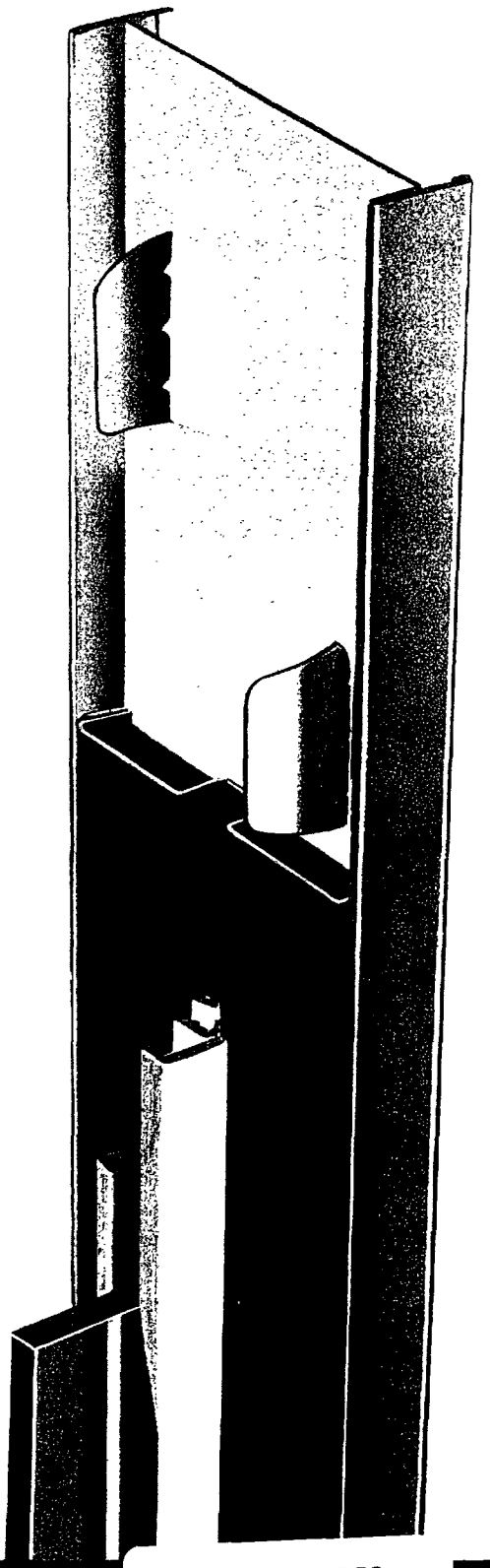
Paint Finish: *All exposed surfaces shall be primed and finished with a hard oven* baked synthetic enamel of manufacturer's standard color. (See color chart)

ALUMINUM SYSTEM

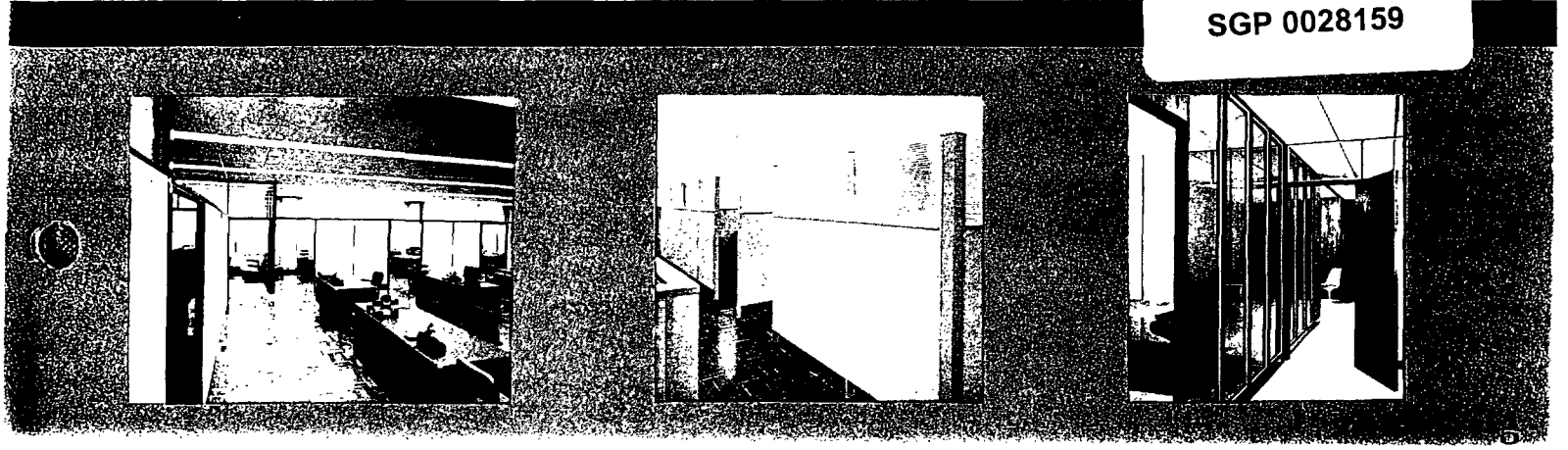
The following components are available to provide a complete "A" type system in Aluminum. These components are 6063-T5 aluminum etched and anodized.

- Snap on trim for steel studs
- Ceiling trim for full height partitions
- Cornice cap for cornice high partitions
- Base available in 2 ½" or 4" height
- "F" corner molding

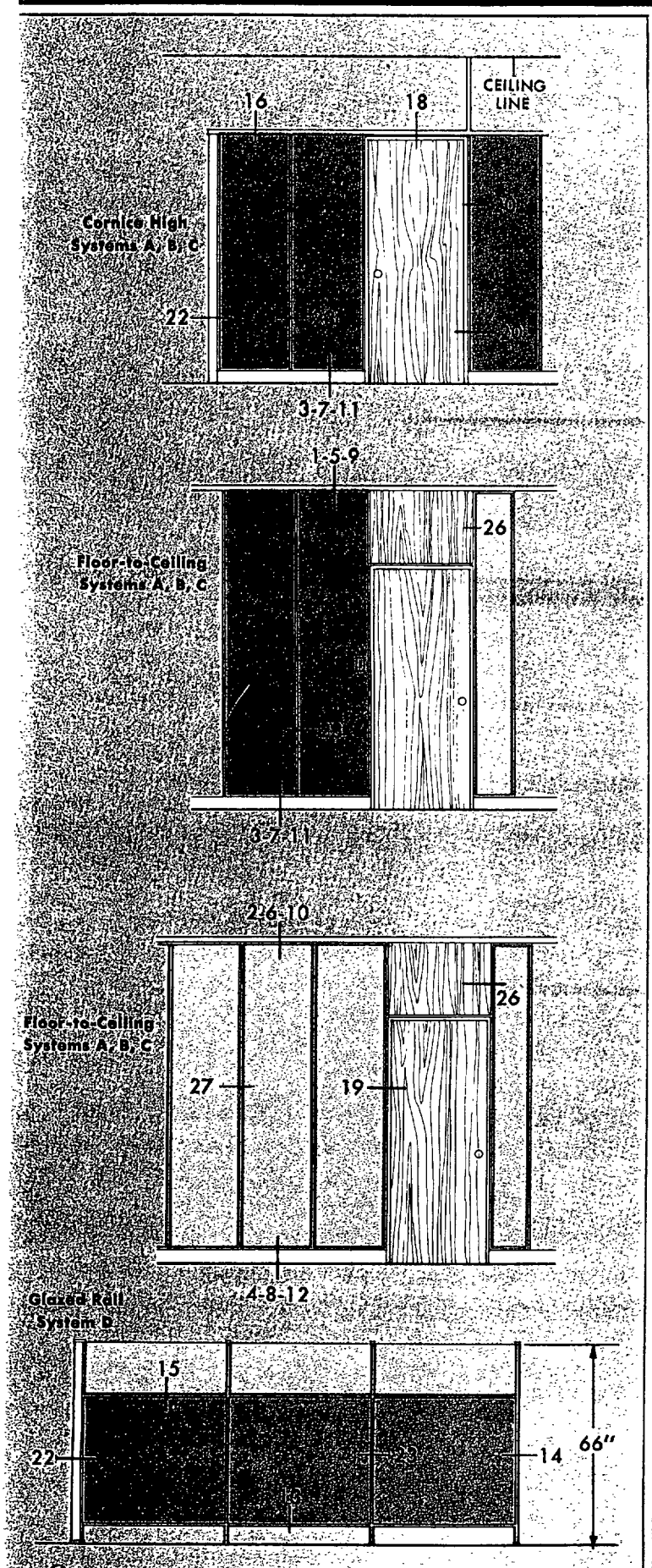
Erection: Partitions shall be installed in a workmanlike manner. Joints between joining members or adjoining members shall be perfectly aligned and close fitting with all vertical members. All work shall be guaranteed for a period of one year against defective materials and workmanship.

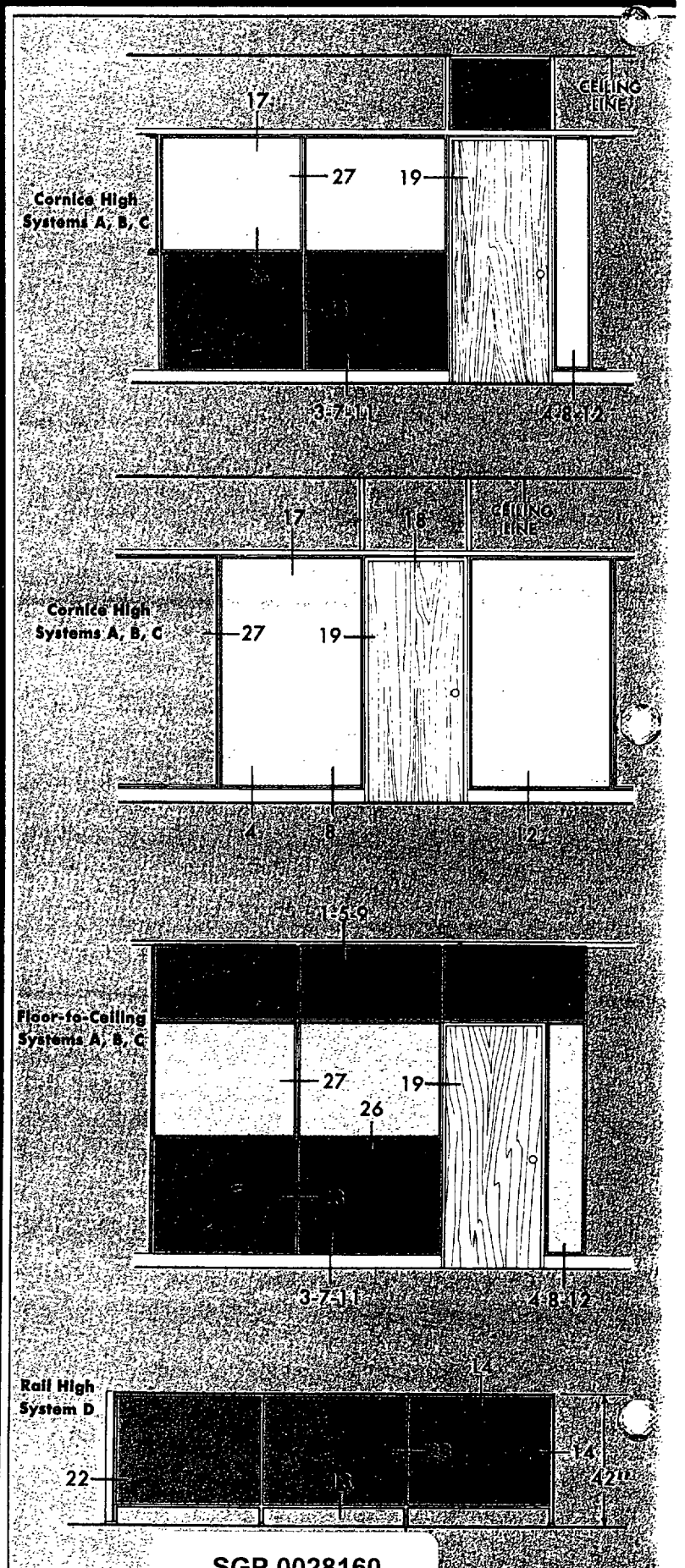


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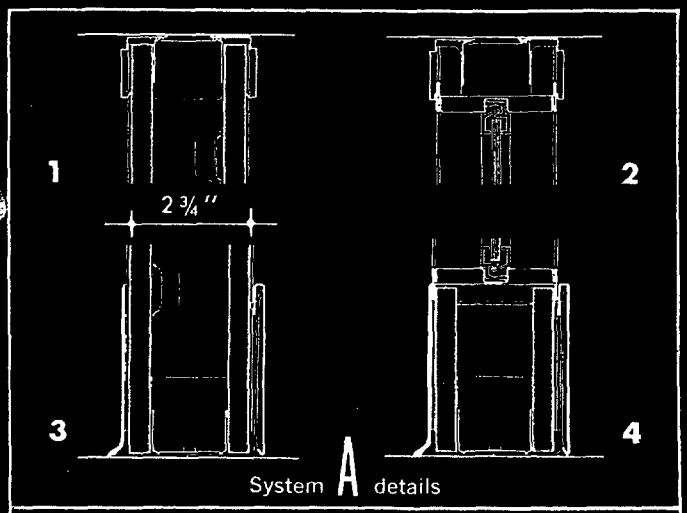


INFINITE VARIABLES

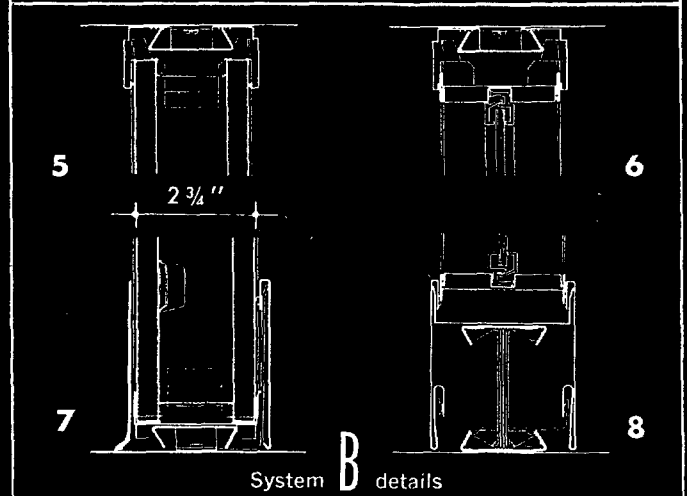




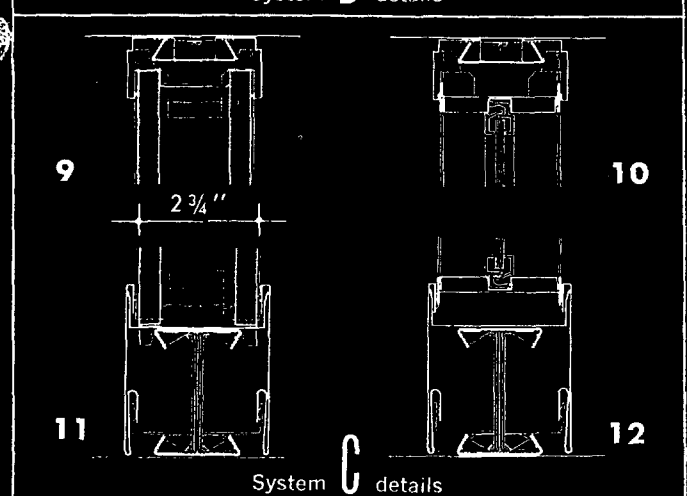
SGP 0028160



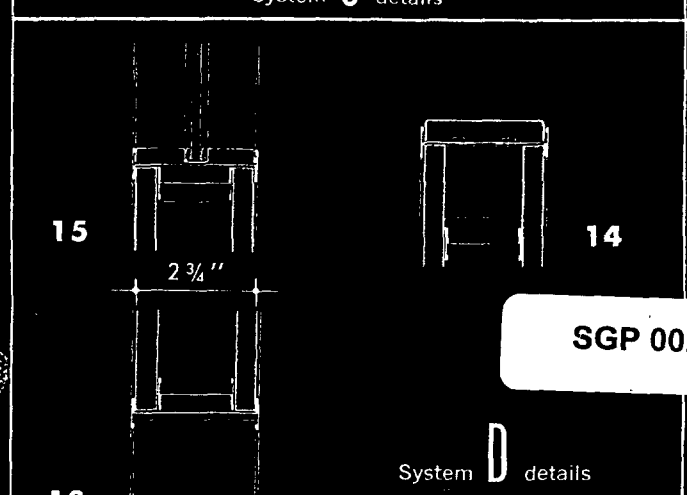
System A details



System B details

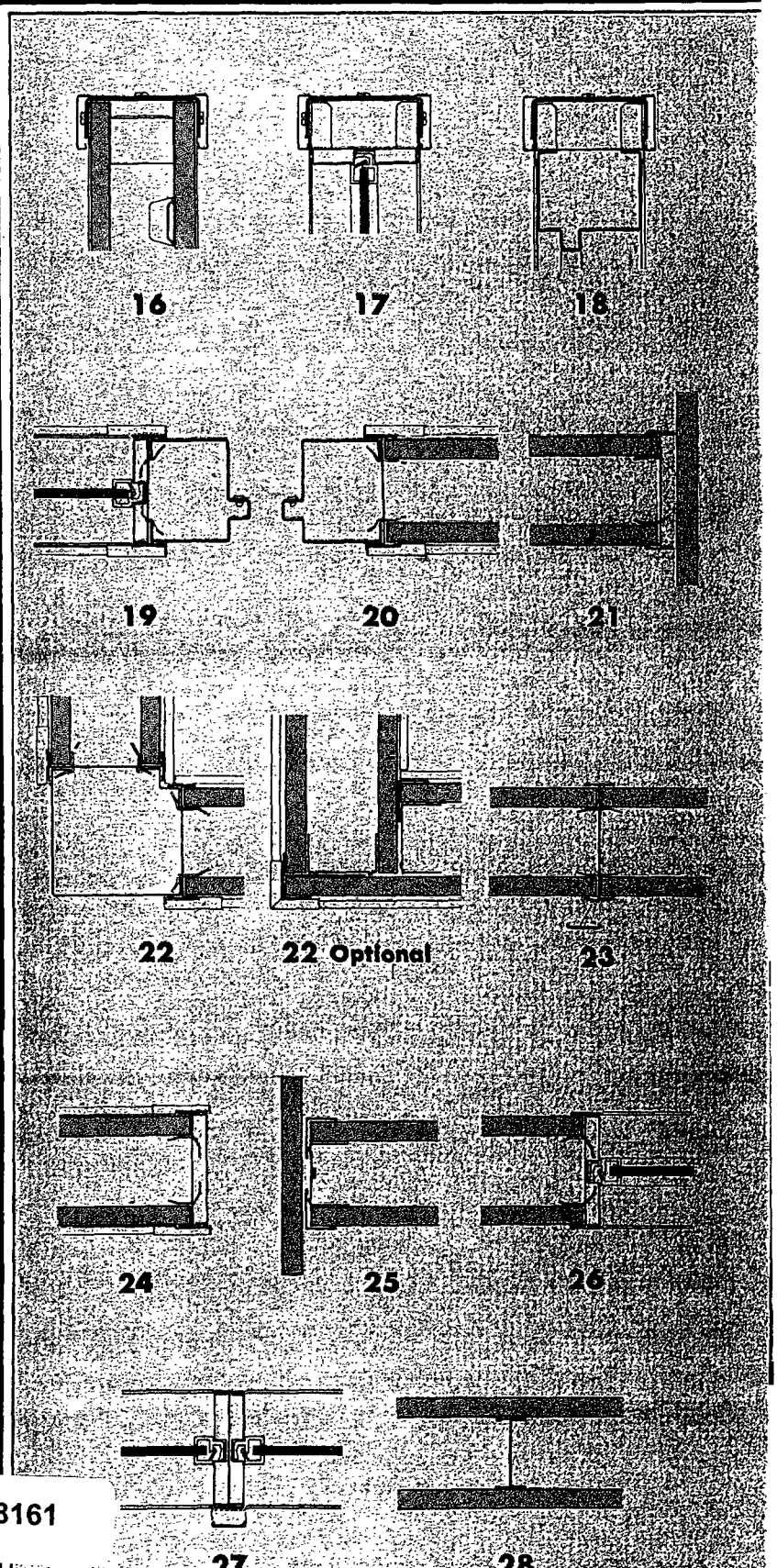


System C details



System D details

SGP 0028161



Single unit responsibility is assured by utilizing gypsum wallboard as manufactured by Bestwall Gypsum Company.

BESTWALL

SUSPENSION SYSTEMS

SCREW-TYPE STEEL STUDS

NAILABLE STEEL STUDS

CEILINGS AND WALLS

DONN®

PRODUCTS, INC.

700 Bassett Road • Westlake, Ohio 44091

Area Code 216 Phone: 871-1000

SGP 0028162

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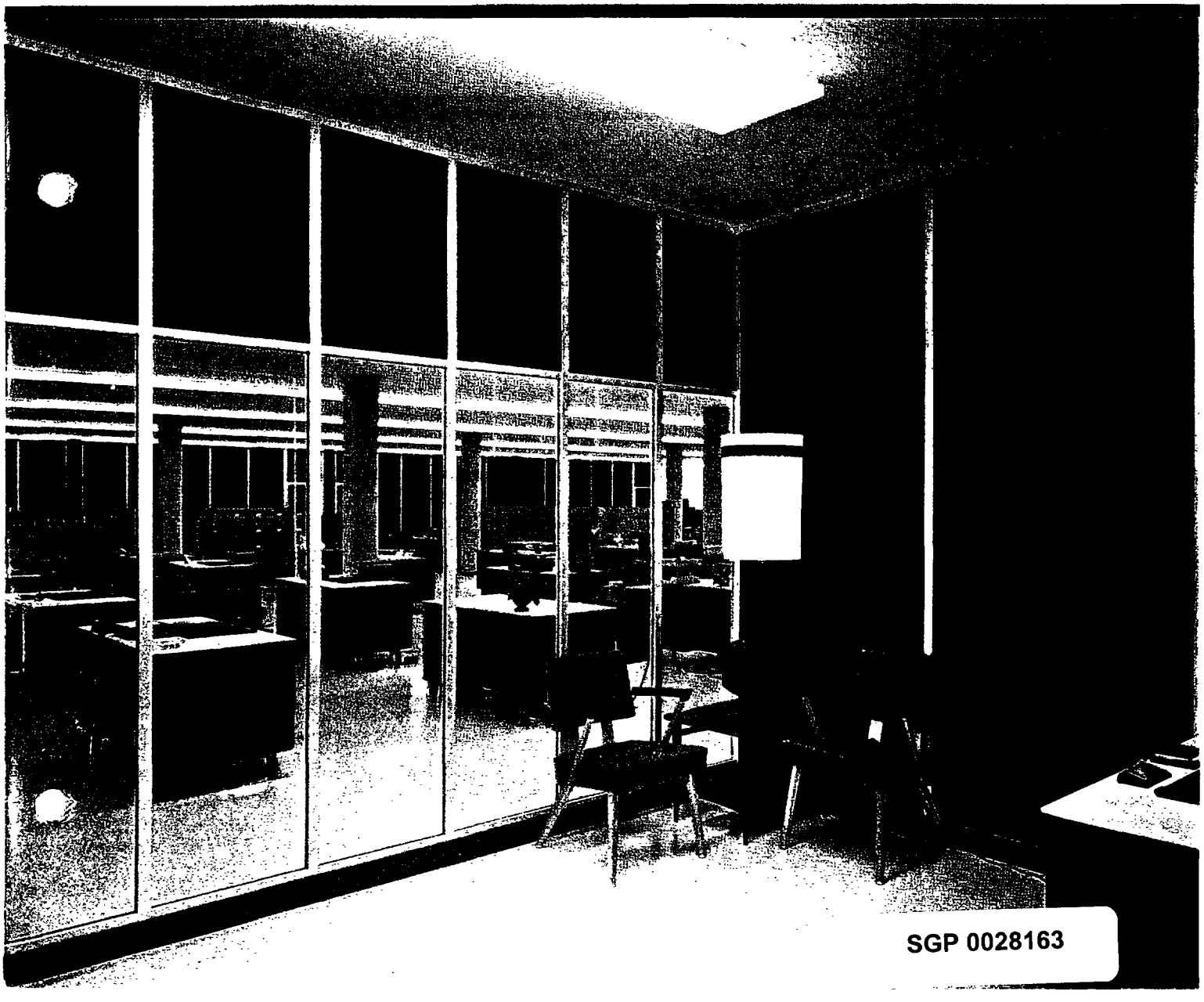
16a
He

VERSATILE

Henges movable partitions
ALUMINUM

PARTITION WALLS

MANUFACTURED BY HENGES COMPANY, INC., ST. LOUIS, MISSOURI 63103



SGP 0028163

ADVANTAGES

ATTRACTIVE—Styled to fit any decor. Blend or contrast by selecting from the widest range of colors, textures and materials.

LOW COST—Unique construction makes this completely movable and reusable partition the most economical wall available.

MOVABLE—Easily moved and reused. Henges Movable Partitions can be relocated quickly and often with few or no additional parts.

FUNCTIONAL—Improves office efficiency and morale by creating private and semi-private work areas. Organizes floor space for maximum effectiveness.

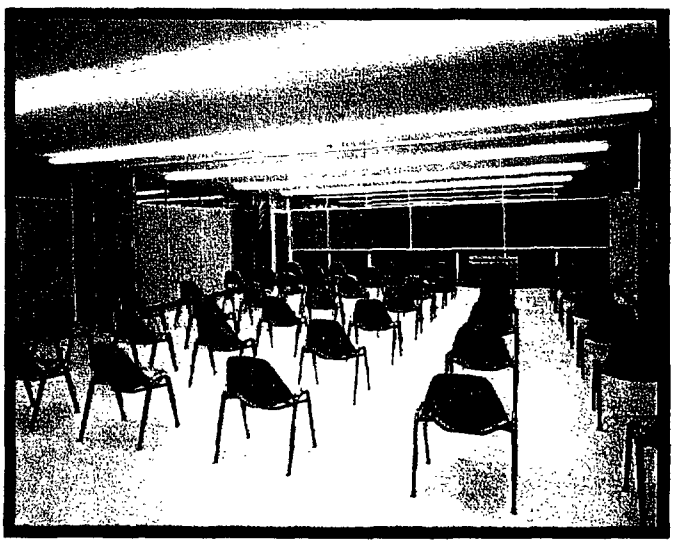
VERSATILE—Unlimited choice. Modules, colors, materials, glazing and heights can all be selected with complete freedom of design.

EASE OF INSTALLATION—The usual clutter and disturbance is eliminated, providing earlier occupancy. In existing buildings, installations are often made during normal office hours without upsetting routine.

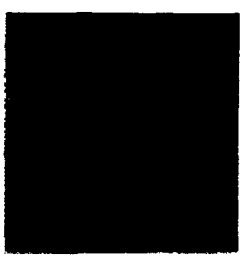
IMMEDIATE DELIVERY—Generally the only partition stocked by local distributors and available for prompt installation. Local warehousing is supported by a large factory inventory.

LOCAL SALES & SERVICE—There are more than 90 distributors who sell and install these versatile partitions. These responsible, well known local companies are factory trained. Write for the name of the Representative in your area.

EXPERIENCE—Since 1932, the Henges Company has served the building industry and maintained a reputation of quality and integrity.

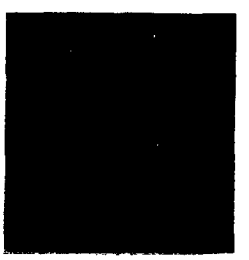


STEEL



Steel partition members are manufactured of high strength electrolytic zinc coated steel by the latest precision roll forming processes.

ALUMINUM



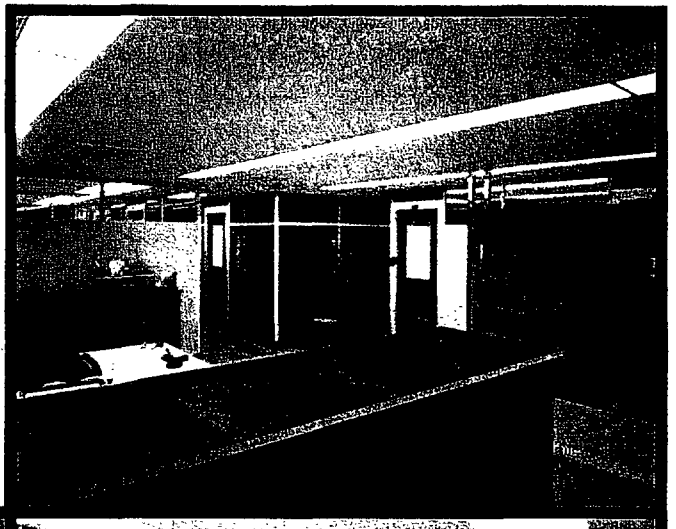
Functional design—accurate fabrication—satin anodizing . . . All are part of the natural beauty and workability of this new system utilizing architectural grade 6063-T5 aluminum alloy.

SGP 0028164

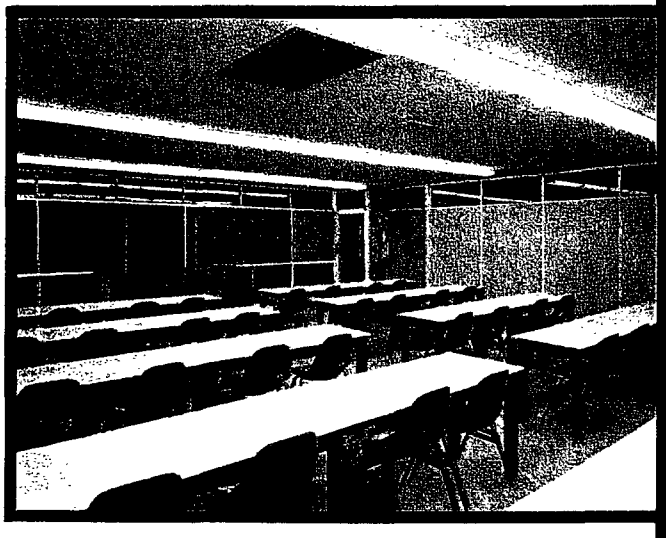
VERSATILE

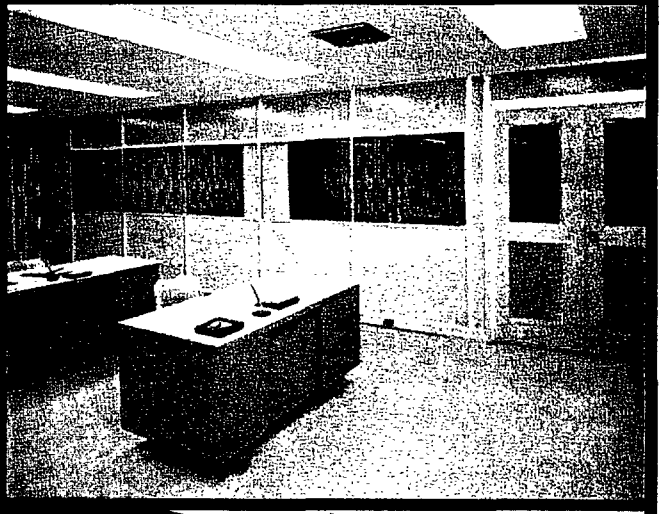
Henges movable partitions
ALUMINUM

PARTITION WALLS

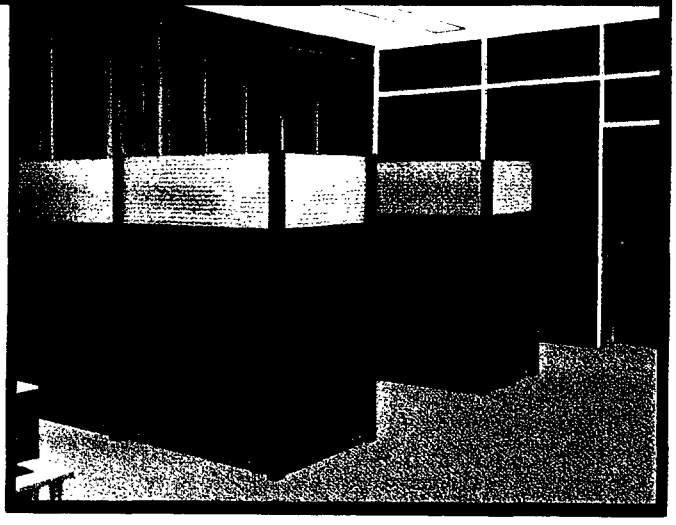


Versatility . . . the key word in Henges Movable Partitions. Changeable, movable walls with an unlimited choice of materials, finishes and dimensions.

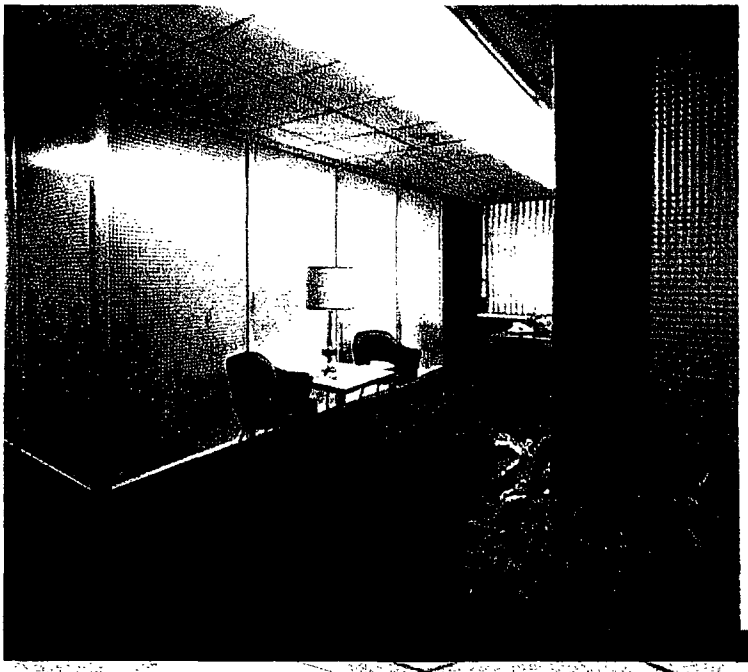




Known for years by the trade mark, Mova-Wall, Henges Movable Partitions are now more versatile than ever. The same fine quality and engineering found in our traditional steel system is also available in our aluminum system.



SGP 0028165

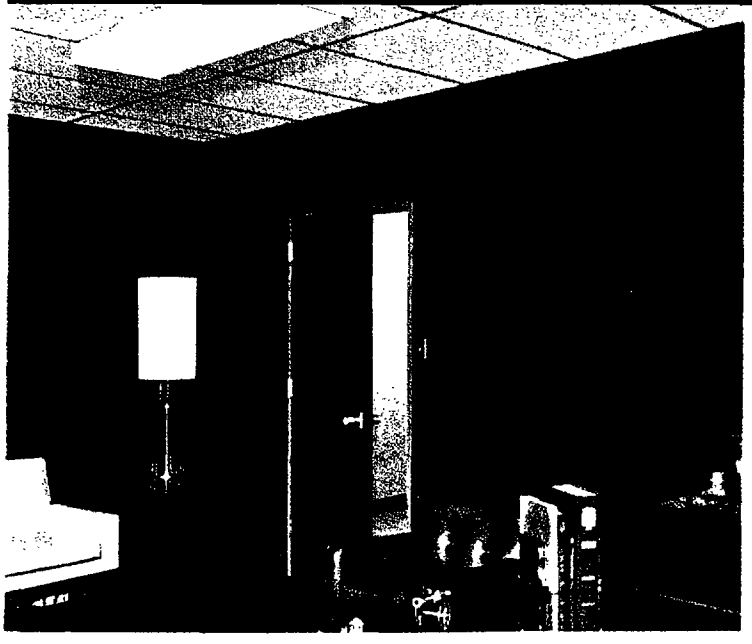


PANEL MATERIALS

Almost any material can be selected as a panel skin. Included are wood veneers, steel, gypsum board, cement asbestos, high-pressure laminates, hardboard, aluminum, plywood and fiberglass. A wide choice of panel cores is also available with honeycomb and gypsum board being used most often.

FINISHES

Pre-finished materials, such as vinyl covered gypsum board, melamine faced hardboard and plastic finished cement asbestos board, are recommended. In addition, trim and panels can be furnished in any color factory applied baked enamel. Partition trim, as well as panels, are available in five different wood grains of cherry, oak, walnut, and maple. Partitions can also be supplied ready for field painting on the job.



PANEL CONSTRUCTION

A. A specially designed perforated pattern (3/32" holes on 1/4" staggered centers) is used on one or both sides. Glass fibre blanket absorbs sound and when perforated on both sides, a gypsum board baffle is used to stop transmission.

B. 20 *ga. stretcher leveled steel, with welded* perimeter channels and honeycomb core, makes exceptionally strong, light weight panels.

C. Melamine faced hardboard is laminated to honeycomb core for low cost, light weight panels, ideal for most wall conditions.

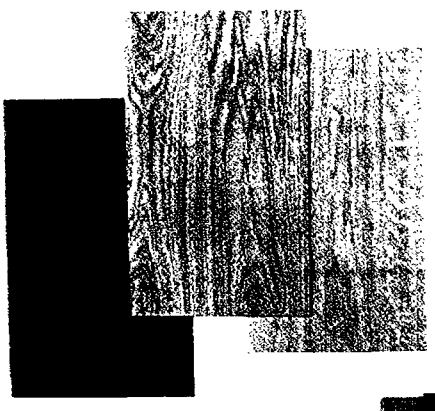
D. Extremely economical and incombustible, 1/2" thick gypsum board (plain or vinyl covered) is bonded to a center core of gypsum strips. Sound attenuation is 41 db. in speech privacy range.

E. Custom panels, such as cork board, chalk board or peg board, are often made up for special use in schools, offices and government installations.

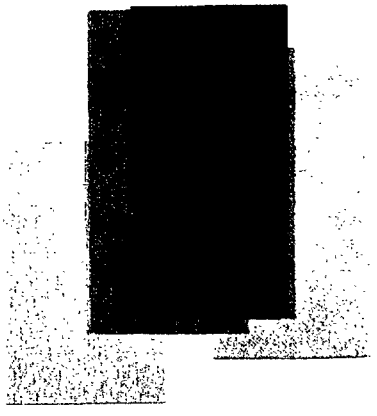
SGP 0028166

Henges movable partitions
ALUMINUM

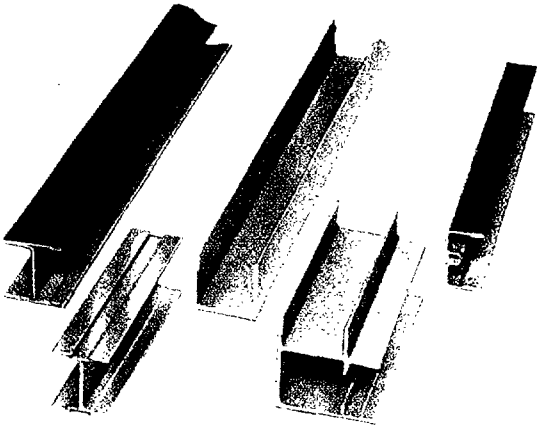
PARTITION WALLS



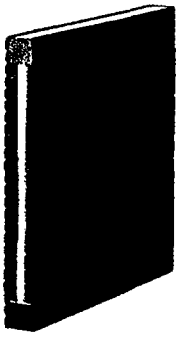


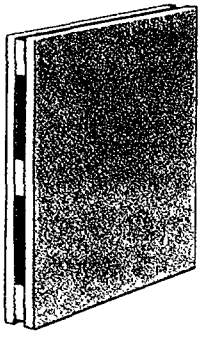


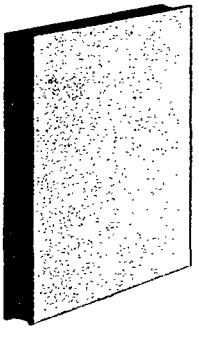


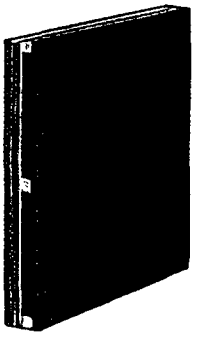






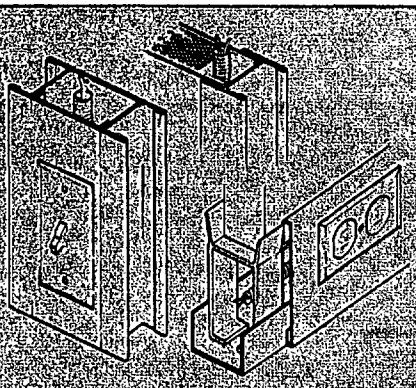






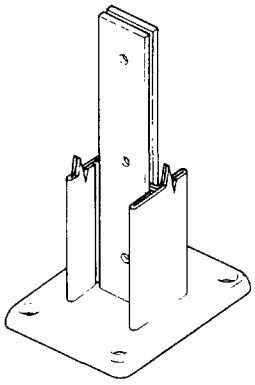
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SPECIFIC DETAILS



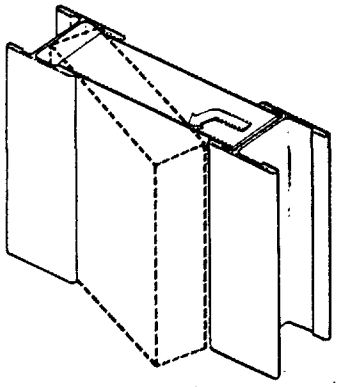
WIRING

Outlets easily installed in base. Vertical wiring installed in panels, or in "wiring stud."



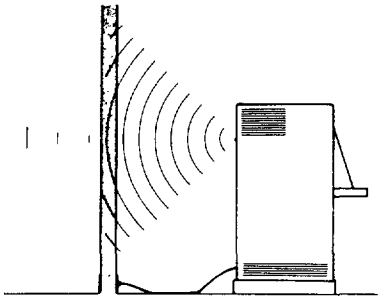
RAILING ANCHOR PLATE

Heavy duty, unobtrusive; Permits unlimited runs of otherwise unbraced railing.



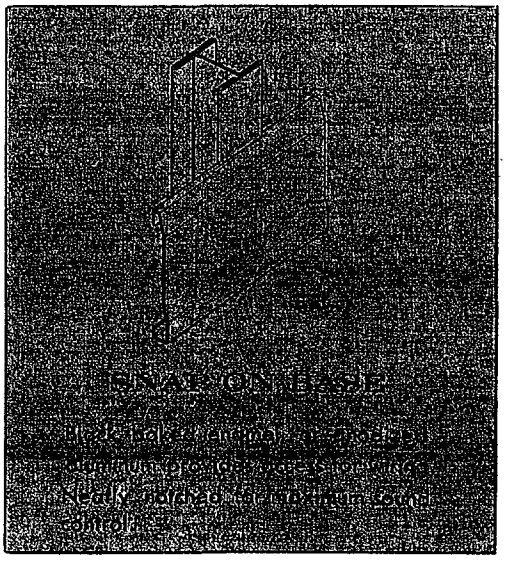
OFFSET STUD

Allows removal of individual panel, without moving adjacent panels.



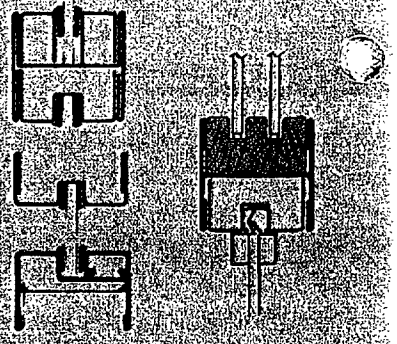
SOUND

Designed and engineered for best possible acoustical benefit. Independent laboratory tests furnished.



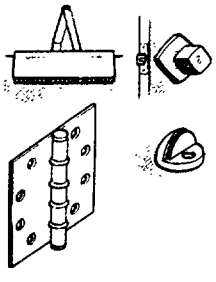
FINISH ON BASE

Black, dark bronze, light bronze, aluminum, or special colors. Easily refinished in the field with paint.



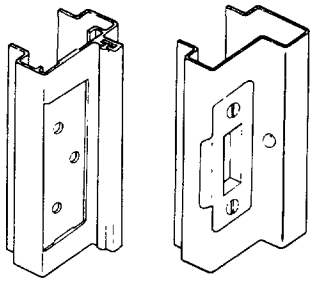
GLAZING

Depends on requirements. Flush, narrow mullions, or snap in type of rigid vinyl or aluminum.



HARDWARE

Most styles and types available in industry standards. "Furnished by others" if desired.



DOORS AND FRAMES

Fully factory mortised frames for wood or hollow metal doors.

SGP 0028168



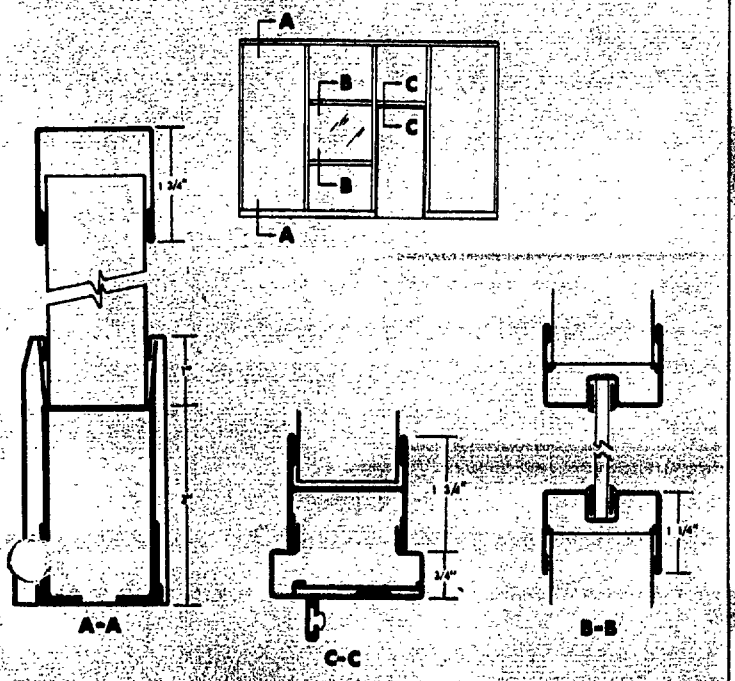
SHADOWLINE STUD

Decorative vinyl insert accentuates color scheme. Any color available.

VERSATILE Henges movable partitions ALUMINUM

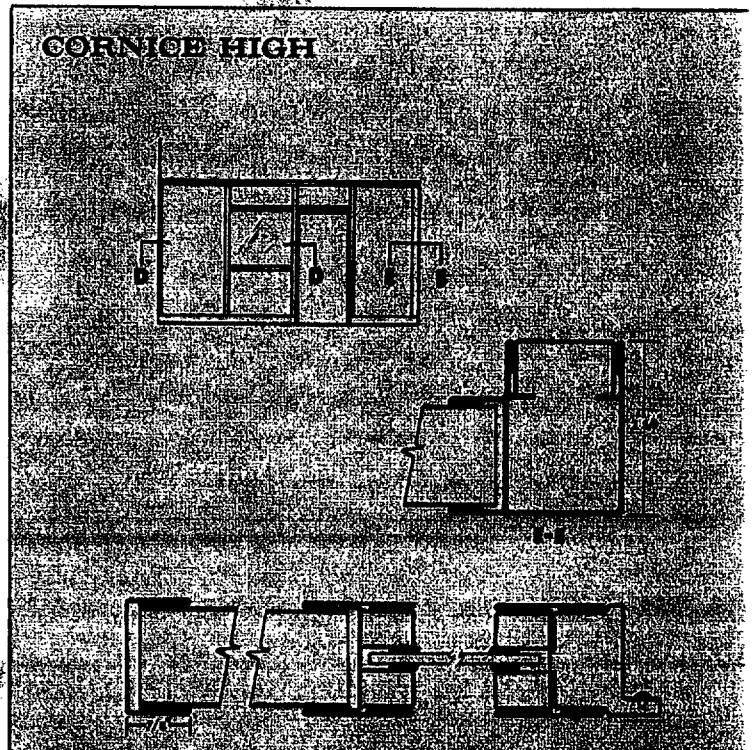
GENERAL DETAILS

CEILING HIGH



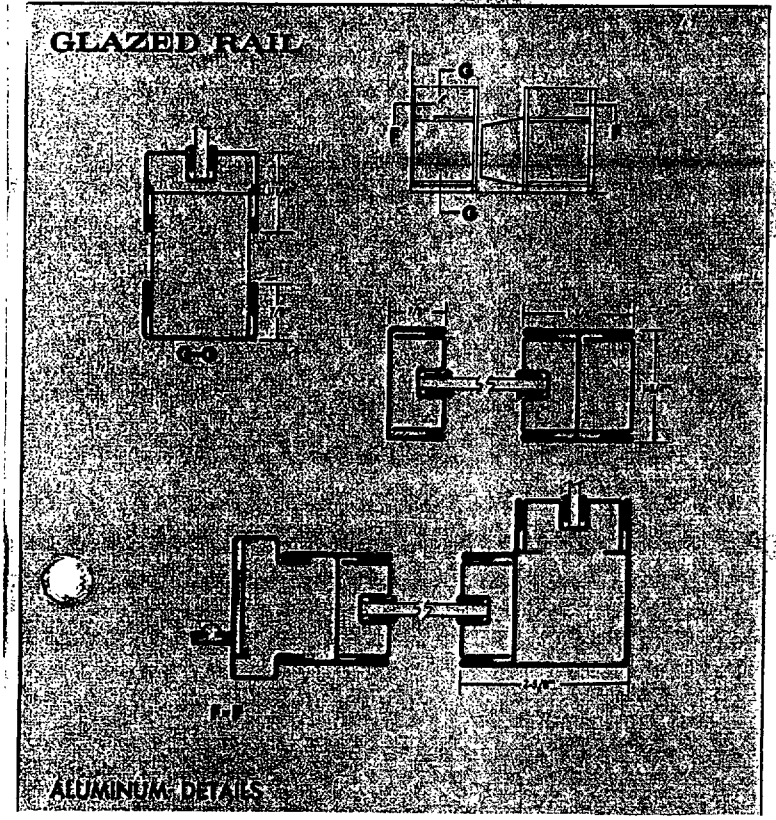
ALUMINUM DETAILS

CORNICE HIGH



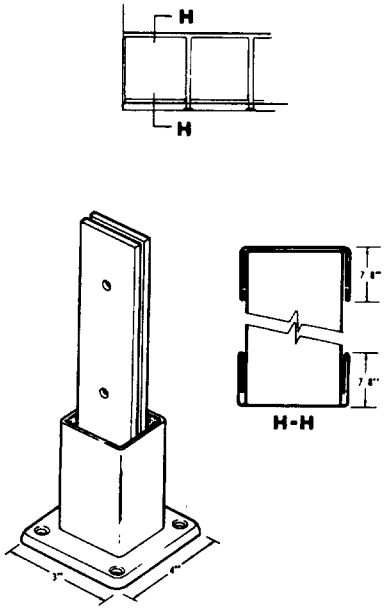
STEEL DETAILS

GLAZED RAIL



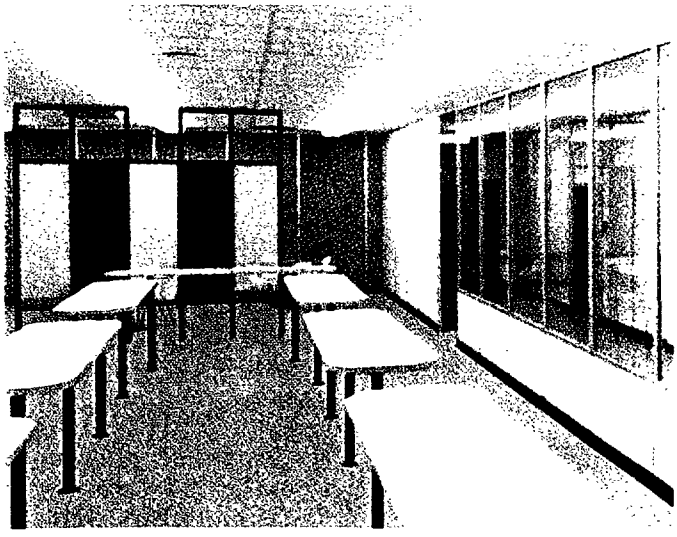
ALUMINUM DETAILS

PLAIN RAIL



STEEL DETAILS

SGP 0028169



RECENT INSTALLATIONS

Veterans Hospitals
Martin Aircraft
General Services Administration
Southwestern Bell Telephone
United States Army
General Dynamics
Delta Air Lines
University of Georgia
Coca-Cola
Sun Oil Company
American Red Cross
Pacific Telephone Co.
American Can Company
Allegheny Ludlum Steel Corp.
General Electric Co.
Colgate-Palmolive Co.
Monsanto Chemical Co.
McDonnell Aircraft Corp.
National Biscuit Company
United States Air Force
International Paper Co.
Olin-Mathieson Chemical Corp.
Eastern Air Lines
Remington Rand, Inc.
Mead Corp.
B & O Railroad
Proctor and Gamble
University of Missouri
Corps of Engineers

DISTRIBUTORS IN PRINCIPAL CITIES

SPECIFICATIONS

ALUMINUM SYSTEM

GENERAL—Furnish and install movable aluminum partitions as manufactured by Henges Company, Inc., St. Louis, Missouri. Partitions shall be of the flush panel type with panels 1 9/16" thick. Trim shall not protrude more than 1/8" from panel.

MATERIALS—Partition trim shall be Type 6063-T5 extruded aluminum. Base shall be flat, snap-on, with no exposed screws, and neatly notched at all posts.

PANELS—Panels shall be 1 9/16" thick and constructed as follows: (select type from page 4). Independent laboratory sound transmission tests shall be furnished.

DOORS & FRAMES—Frames for 1 3/8" doors shall have 1 pair 3 1/2 x 3 1/2 butts. Frames for 1 3/4" doors shall have 1 1/2 pair 4 1/2 x 4 1/2 butts. All butts and hardware to be fully mortised. Doors shall be (wood, hollow steel).

GLASS—Glass shall be (type and thickness) and vinyl gasketed both sides. Stops will have no exposed screws.

FINISHING—Exposed aluminum shall be satin anodized. Panel finish is specified in panels section.

STEEL SYSTEM

GENERAL—Furnish and install movable partitions as manufactured by Henges Company, Inc., St. Louis, Missouri. Partitions shall be of the flush panel type with panels 1 9/16" thick. Trim shall not protrude more than 1/8" from panel surface.

MATERIALS—Partition trim shall be minimum 20 gauge. Structural members, such as stud, corner post, cornice, shall be minimum 18 gauge. All steel parts shall be roll formed of electrolytic zinc coated steel. Base shall be prefinished black baked enamel and neatly notched at all posts.

PANELS—Panels shall be 1 9/16" thick and constructed as follows: (Select type from page 4). Independent laboratory sound transmission test shall be furnished.

DOORS & FRAMES—Frames for 1 3/8" doors shall be flush with other trim, 16 gauge, and have 1 pair 3 1/2 x 3 1/2 butts. Frames for 1 3/4" doors shall have 1 1/2 pair 4 1/2 x 4 1/2 butts. All butts and hardware to be fully mortised. Doors shall be (wood, hollow steel).

GLASS—Glass shall be (type and thickness) and vinyl gasketed both sides. Stops will have no exposed screws.

FINISHING—Partition trim shall be (field painted, baked enameled, wood grained to match panels). Panel finish is specified in panels section.

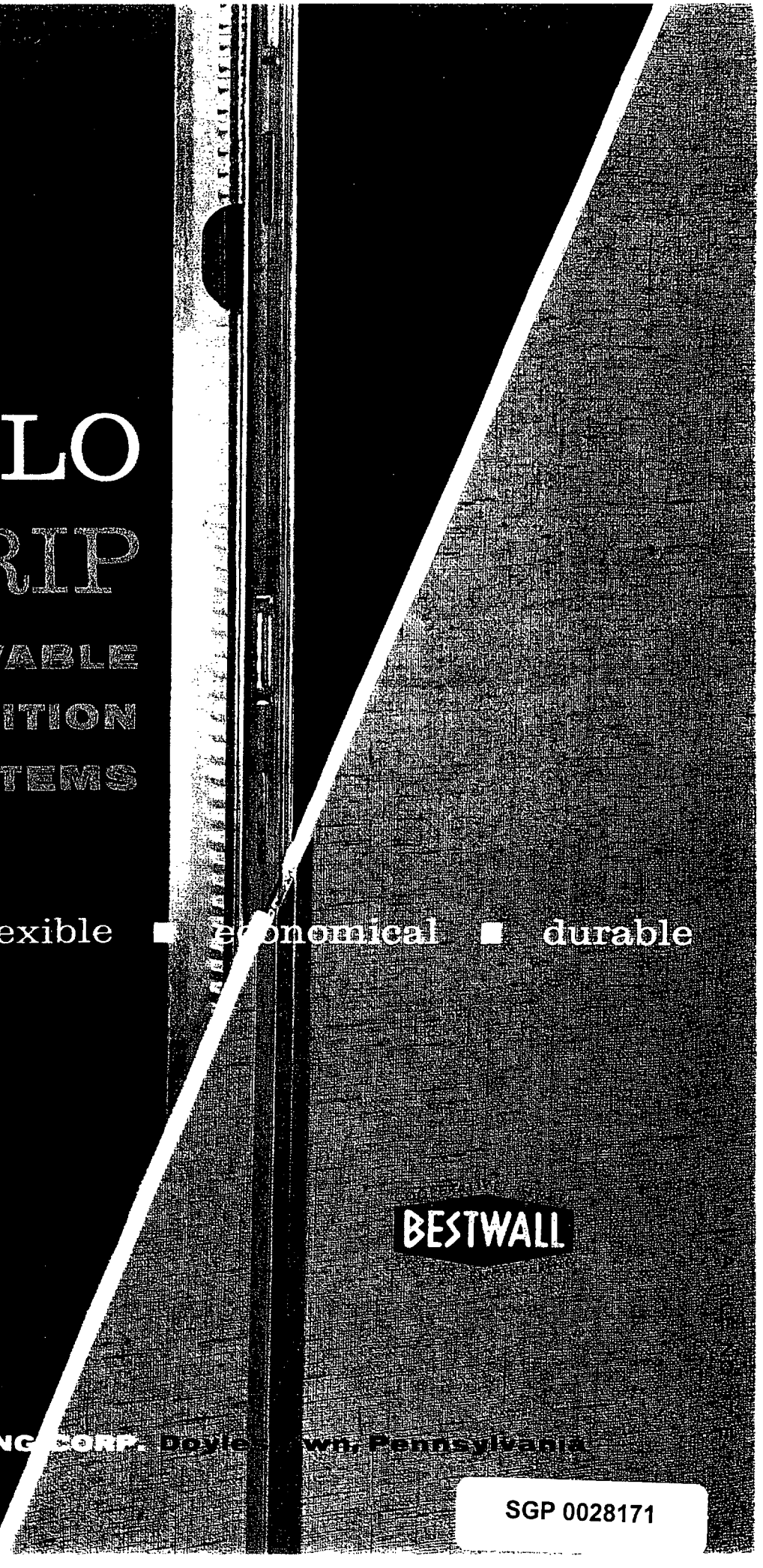
SGP 0028170

A. I. A. FILE NO. -E-1

NESLO CLIP-GRIP

MOVABLE PARTITION SYSTEMS

decorative ■ flexible ■ economical ■ durable



BESTWALL

NESLO MANUFACTURING CORP. Doylestown, Pennsylvania

SGP 0028171

You can space divide economically with

CLIP-GRIP Movable

...the functional approach to partitioning!

THE BEAUTY of prefinished HARDBOARD products, WOOD GRAINED plywoods, prefinished GYPSUM BOARD products are only a few of the many facing materials which combine to afford the functional and aesthetic qualities of the FLUSH and PANEL Movable Systems. You select the materials which best suit your requirements.

NO WAITING for pre-engineered parts or panels. Clip-Grip Partitions are designed to be functional and interchangeable without special tools.

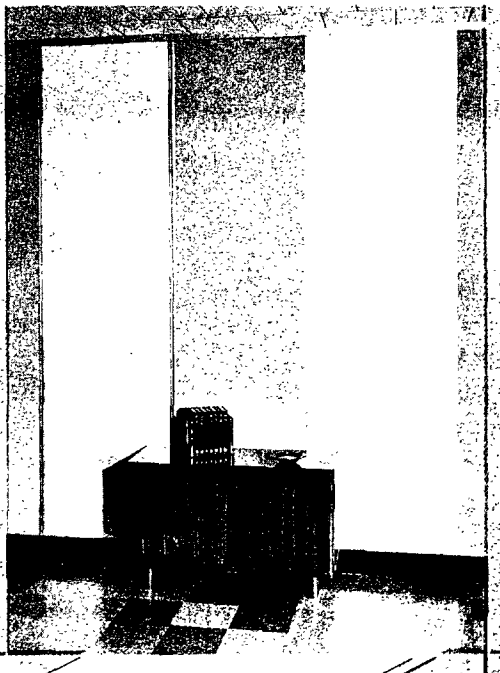
COMPLETE ACCESS to any point within the partition without the necessity of demounting adjoining panels.

flush movable

The slim TIFFANY design of the Flush Movable system permits distinctive partitioning. The combination of satin finished anodized aluminum or prepainted baked enamelled mouldings together with your selected facing materials, combine to establish the great popularity of this system.

ALL FRAMING COMPONENTS ARE INTERCHANGEABLE WITH BOTH THE PANEL AND MONOLITHIC SYSTEMS.

A CLIP-ABLE SYSTEM



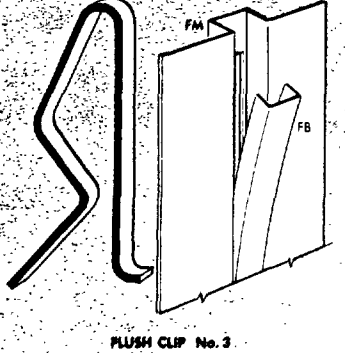
panel movable

A CONTEMPORARY panelled look is the attractive appearance of this completely salvable system. Economy is the result of simple design and a minimum of pa creating ease of construction as well as re-use. Prepainted as well as aluminum mouldings are available for Panel Movable System.

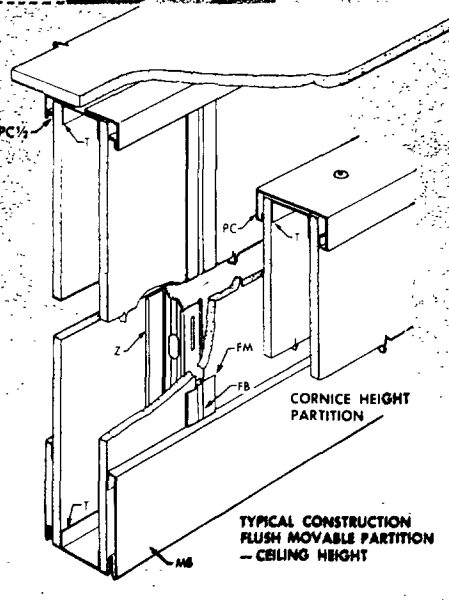
ALL FRAMING COMPONENTS ARE INTERCHANGEABLE WITH BOTH THE FLUSH AND MONOLITHIC SYSTEMS.

A CLIP-ABLE SYSTEM

Tiffany

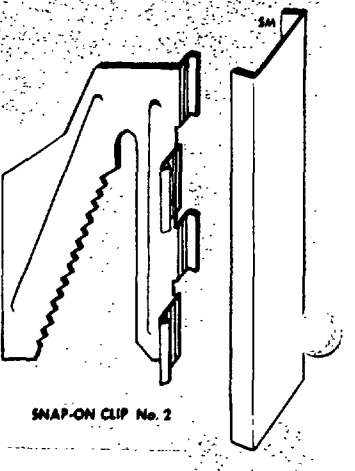


FLUSH CLIP No. 3



TYPICAL CONSTRUCTION FLUSH MOVABLE PARTITION — CEILING HEIGHT

Contemporary



SNAP-ON CLIP No. 2

SGP 0028172

Partitions

- **CLIP-ABLE, SIMPLE AND EFFECTIVE**
- **DESIGNED STRENGTH** (for partitions to 24'-0")
- **REQUIRES NO TOP FILLER CONSTRUCTION**
- **TRULY MOVABLE** (for offices, schools, labs, industrial plants)
- **CAVITY WALL CONSTRUCTION** (to accommodate all services economically)
- **NON-PROGRESSIVE CONSTRUCTION**
- **BEST REDUCTION IN SOUND TRANSMISSION** (45 dbs.)
- **SALVABLE AND RE-USABLE**
- **WALL FURRING SYSTEM** (wall linings to match or contrast partition decor)

NESLO "Q-Z" (Quiet Zone) PARTITION – **THE HIGHEST SOUND TRANSMISSION LOSS** in movable partitioning. Available to you at an extremely low cost. A sound attenuation of 45 dbs. Conclusive test data available. Tests based on a complete 9' x 14' partition, from a recognized Testing Laboratory.

NO WAITING FOR SPECIALISTS. Partition costs for labor and materials are fixed. Take-down and re-erect is accomplished quickly and economically with components designed for inter-changeability.

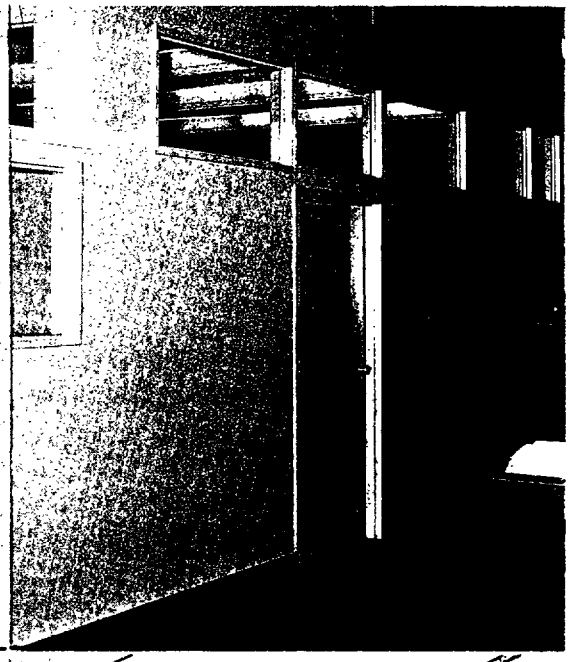


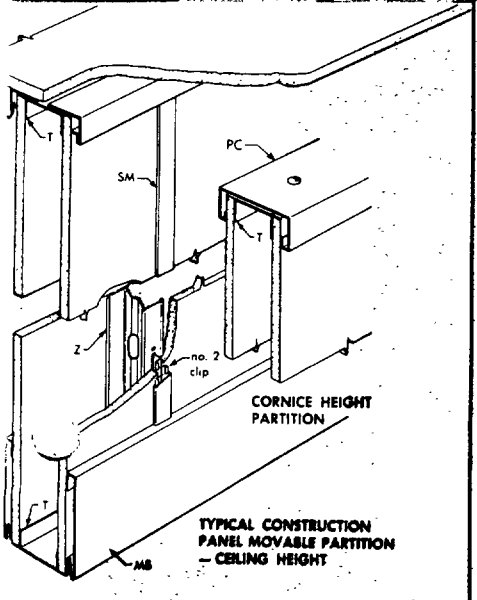
monolithic construction

The finest in drywall construction. Elimination of the ever present problem of nail pops and cracking through the use of finely engineered studs and clips. A truly monolithic surface through positive attachment.

ALL FRAMING COMPONENTS ARE INTERCHANGEABLE WITH BOTH THE FLUSH AND PANEL SYSTEMS.

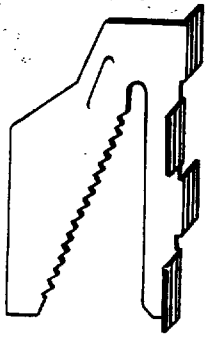
A CLIP-ABLE SYSTEM



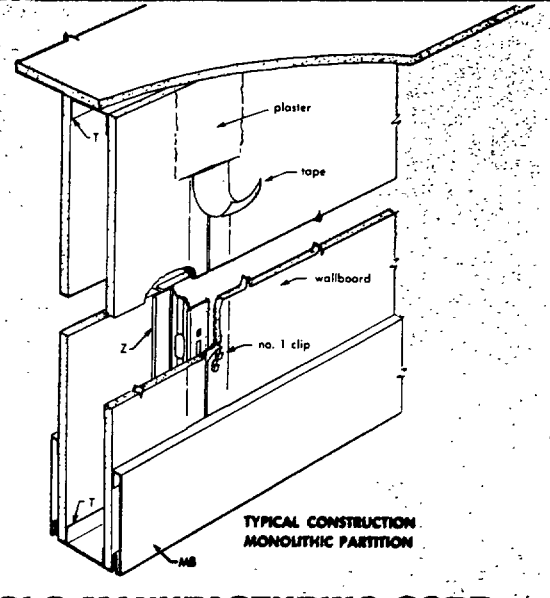


TYPICAL CONSTRUCTION PANEL MOVABLE PARTITION – CEILING HEIGHT

Grecian



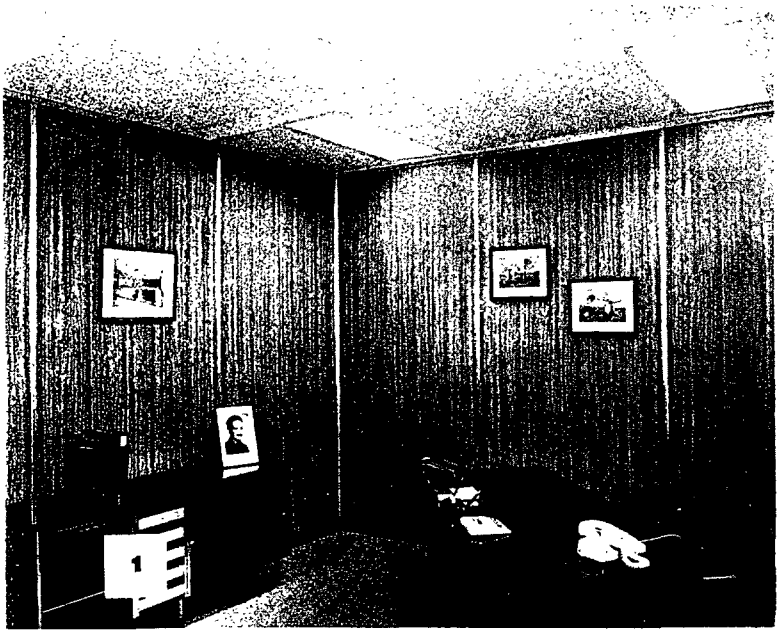
DRYWALL CLIP No. 1

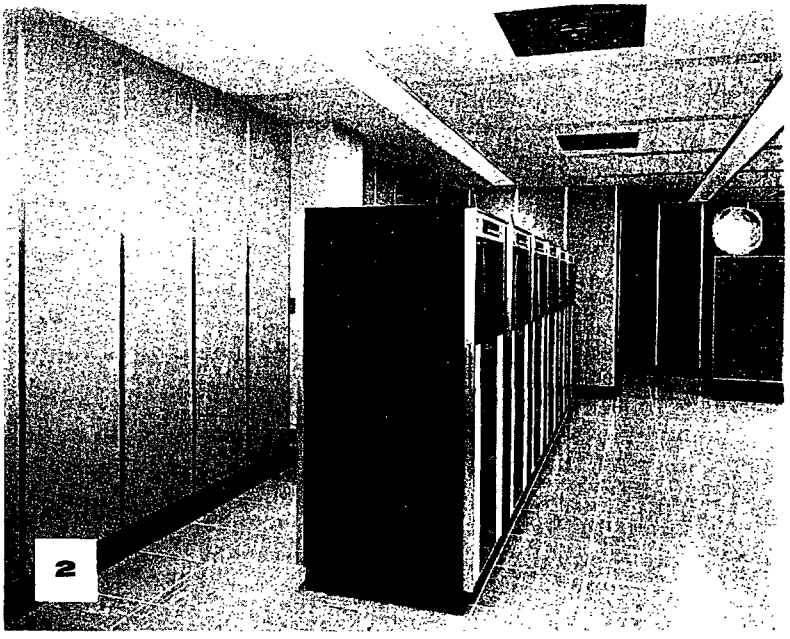


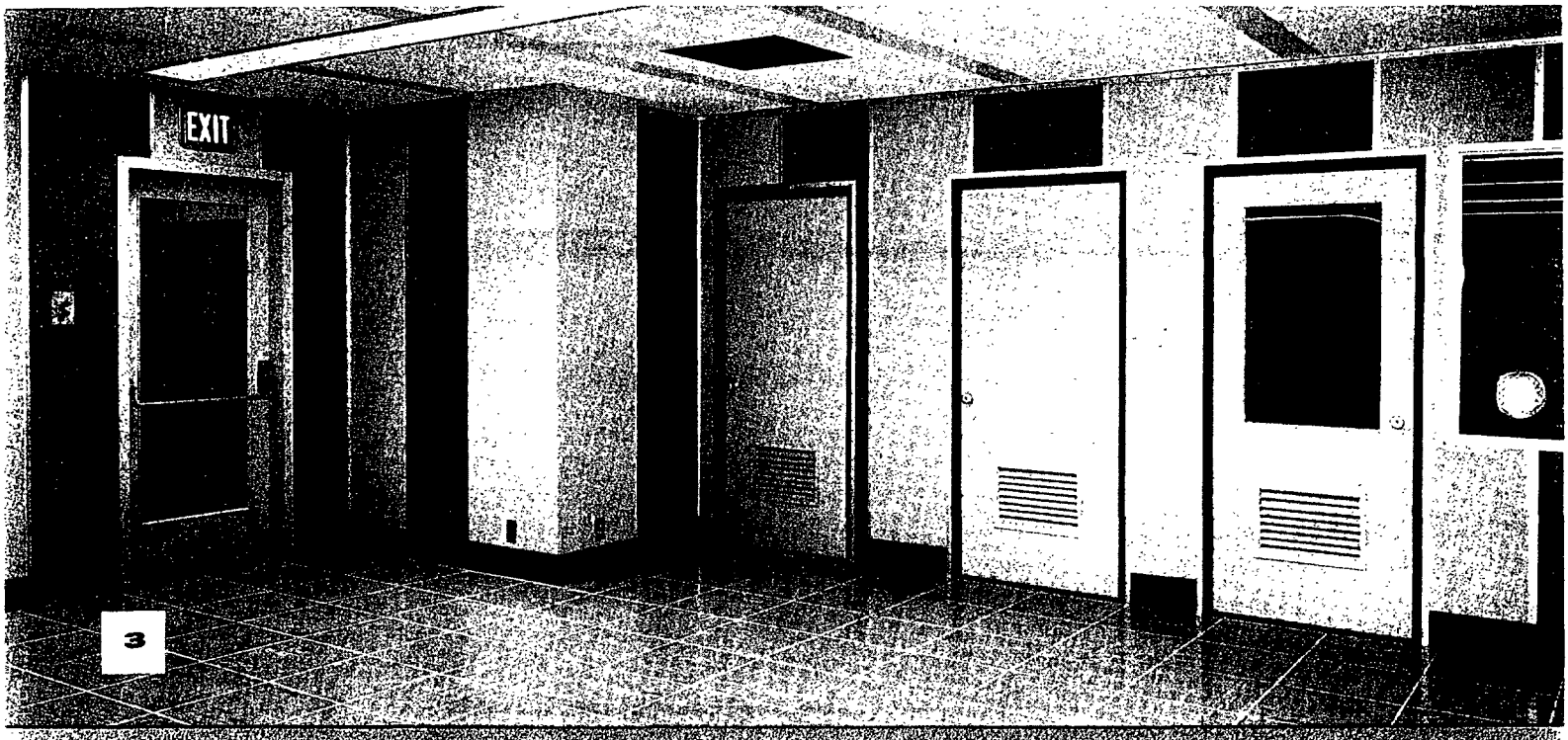
TYPICAL CONSTRUCTION MONOLITHIC PARTITION

SGP 0028173

NESLO MANUFACTURING CORP.







typical installations:

1. Executive Office
2. Computer Lab
3. Lobby

CLIP-GRIP MOVABLE PARTITIONS are engineered to afford complete design freedom for offices, industrial plants, schools, hospitals, banks, motels and hotels.

Also available: Bank Rail, Bank Screen, Wall Furring and ALL Glass Screen

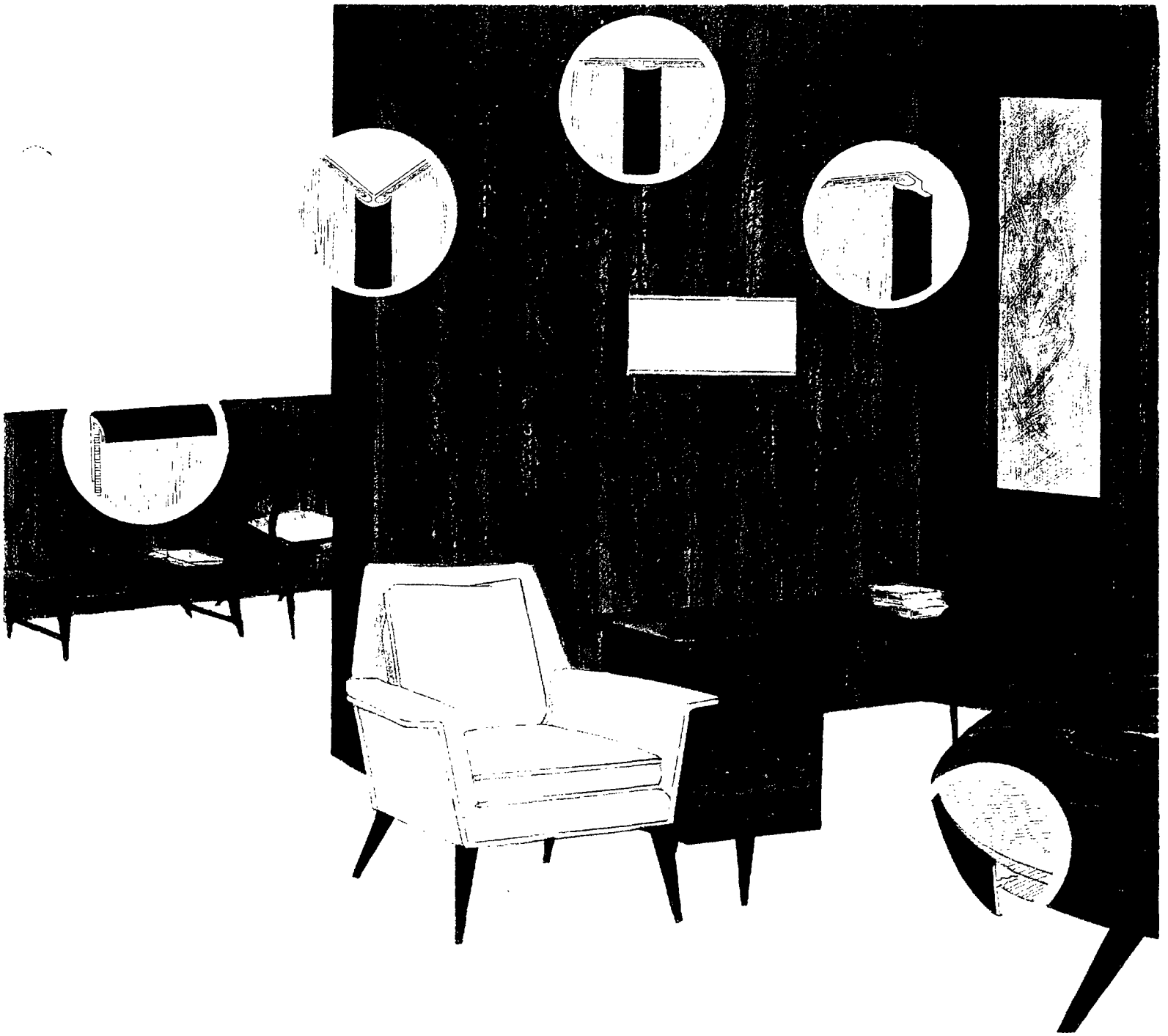
For more information, contact:

SGP 0028174

your local franchised Distributor-Applicator

CG-11/62-10M

Printed in U. S. A.



Keller Products Inc.,
41 Union Street, Manchester, N.H.

KALWOOD MATCHING MOLDINGS

...your insurance of a trouble-free installation

SGP 0028175

KALWOOD MATCHING MOLDINGS THE INSURANCE YOU DON'T NOTICE

PROVIDE PROFESSIONAL FINISH FOR PLASTIC LAMINATE, PLYWOOD, AND VINYL APPLICATIONS

Glance at any job finished with Kalwood Matching Moldings and you *don't* notice the insurance that the conscientious builder has provided for his product. You *don't* notice the insurance of edges held securely in place. You *don't* notice the insurance of joints that virtually eliminate separation or buckling due to temperature and humidity conditions. What you *do* notice is a finish with the beauty of a continuous surface pattern, free of flashy metals or contrasting lines. Kalwood Matching Moldings truly match the pattern and finish (plastic, vinyl or plywood) of all major laminate manufacturers. Precision-engineered of extruded aluminum with durable veneers permanently bonded to exposed surfaces, Kalwood Matching Moldings are available in shapes and sizes for every building need. To insure a complaint-free installation, specify Kalwood Matching Moldings.

beautiful walls...

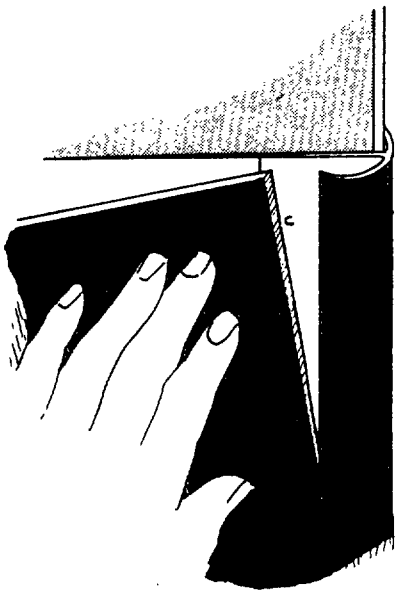
Kalwood Matching Moldings are available in a wide variety of shapes and sizes for all wall applications: outside corners, dividers, inside corners and end caps, in any pattern or color of plastic, wood, or vinyl. Easily installed, panels lie flat whatever the heat or humidity, because panels can contract or expand within the molding.

handsome tables...

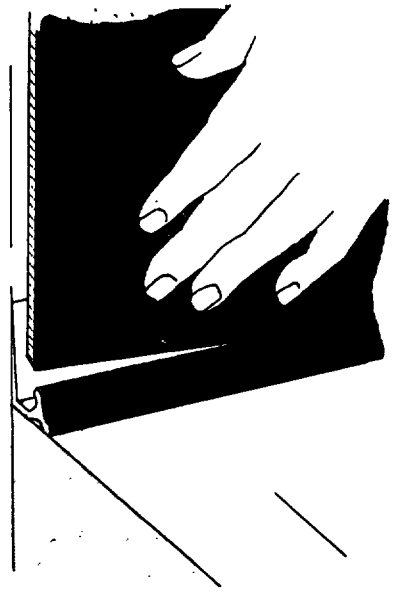
Kalwood T moldings provide a permanent edge for fine tables with a durable finish. These sturdy moldings with no exposed metal surfaces can be installed easily and rapidly, providing edges that match perfectly any material you choose.

custom-finished counters...

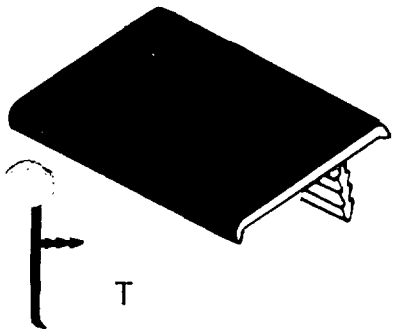
Kalwood inside corners or straight-leg coves provide a perfectly matched contoured back-splash molding for countertop construction. With Kalwood Matching Moldings, kitchen or bathroom counters can be economically and rapidly finished to provide easy cleaning and durability.

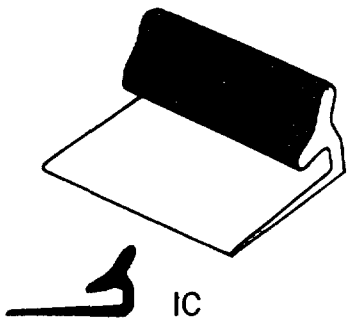


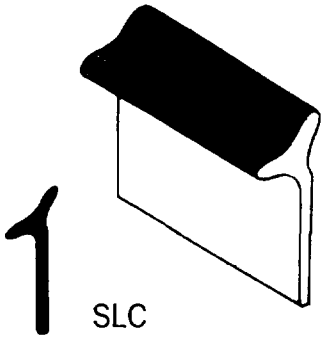


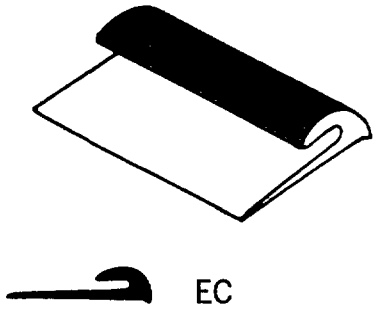


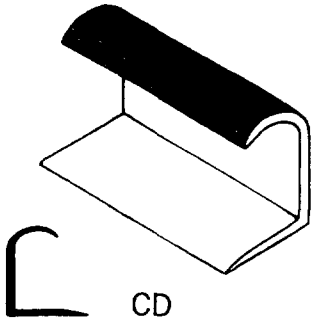
SGP 0028176

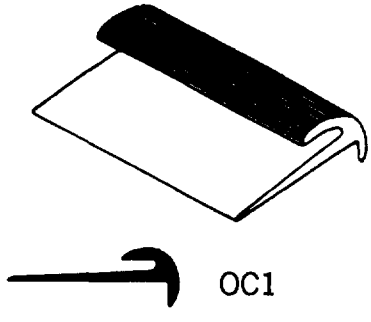

T

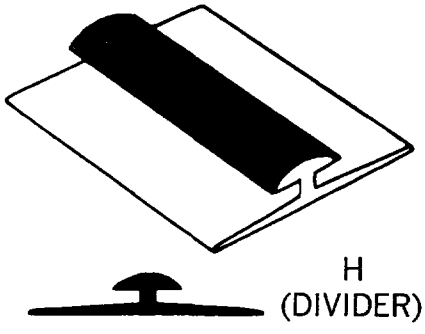

IC

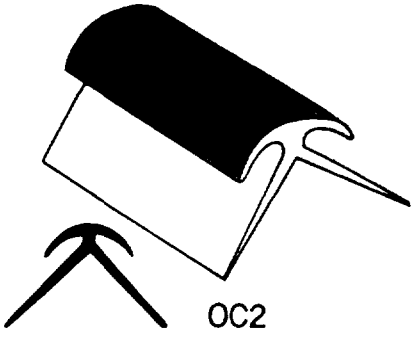

SLC


EC


CD


OC1


H (DIVIDER)


OC2

SGP 0028177

KALWOOD MATCHING MOLDINGS ARE EASY TO INSTALL

Ordinary tools are all that are required to complete your laminate installation with Kalwood Matching Moldings. Moldings can easily be cut to size, and placed into position, following the suggested steps below.

WALLS

Slide panels approximately half way into Kalwood Moldings, allowing room for expansion. Start installing from a corner or door, making certain that starting points are plumb or level. Kalwood Moldings should be nailed every 8 to 12 inches, using a flat head wire nail.

inside corner IC

Slide first panel into place, position molding, and nail. Insert second panel.

divider H (DIVIDER)

Place divider molding on panel before putting into position. After applying panel, nail exposed leg of divider, and then insert adjoining panel.

outside corner OC1 and OC2

Place molding into position. Insert panel and nail exposed leg. Insert adjoining corner panel.

end cap EC

When used for wainscoting, nail molding to plumb line, and insert panel.

FOR COUNTERS AND TABLE TOPS

t molding T

T moldings are available in 3/4", 13/16", 1¼", and 1½", width.

This is a drive-in tee-type molding, which can be bent around a 4" minimum radius when the section of the leg directly behind the bend is cleared out. This will prevent crimping.

straight leg cove SLC

A perfect molding for joining a counter top with a back splash or the wall. It is installed easily by nailing the molding to the back of the counter.

clamp down CD

For non-drip edges, the clamp down molding may be snapped on to the counter edges, and nailed from beneath. For mitered corners, spread the opening to thickness of material being used, and cut to the desired angle in a miter box.

Moldings are available to accommodate materials of the following thicknesses:

1/16"	15/64"	9/16"
1/8"	1/4"*	5/8"
5/32"	3/8"	3/4"
3/16"	7/16"	13/16"
	1/2"	

*1/4" natural wood veneer available in Weldwood® from U. S. Plywood.

KALWOOD MOLDINGS TRULY MATCH THE PATTERN OF VIRTUALLY ALL MANUFACTURERS:

some are listed below

LAMINATE MFGRS.

CONSOWELD
FIBERESIN
FORMICA
LAMIDALL (Woodall Industries)
MELAMITE
MICARTA (Westinghouse)
NATIONAL PLASTIC PROD. CO. INC.
NORPLEX (Northern Plastics)
PANELYTE (St. Regis Paper)
PARKWOOD
PIONITE (Pioneer Plastics)
RAILITE (Reiss)
TEXTOLITE (General Electric)
WILSON ART

DECORATIVE HARDBOARD
ABITIBI · LAMIDALL · MASONITE

PREFINISHED PLYWOOD
U. S. PLYWOOD

VINYL COVERED GYPSUMBOARD

BESTWALL GYPSUM (Eternawall)
KAISER-GYPSUM
NATIONAL GYPSUM (Durasan)
U. S. GYPSUM (Vinyl Covered Sheetrock)

Kalwood Matching Moldings are available through your sheet supplier. If not available in your area, contact Keller Products direct. Kalwood Matching Moldings are available in shapes and sizes for every building need.

HOW TO ORDER

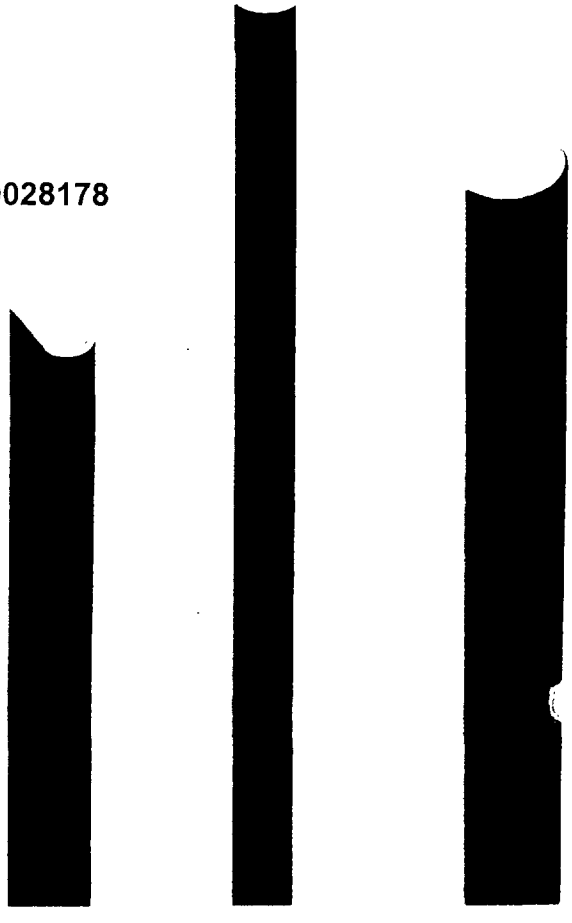
In ordering Kalwood Matching Molding specify:

A) SHAPE IC (inside corner); OC (outside corner) etc.
B) SIZE The opening in the molding to receive the material with which it is being used: 1/16" laminate, 1/4" paneling, 3/8" vinyl gypsum board, etc.
C) PATTERN The manufacturer's pattern number for the material being used: FA 342 Dark Walnut, etc.

HOW TO SPECIFY

"Molding shall be Kalwood Matching Moldings as manufactured by Keller Products, Inc. 41 Union Street, Manchester, N. H."

SGP 0028178



KELLER PRODUCTS

41 Union Street Manchester, New Hampshire
Area Code 603 — 627 - 7887

Kalwood Matching Moldings are another product of one of the world's leading manufacturers of plastic products, laminated sandwich panels, flat and molded plywood.

Printed in U.S.A. 2-63-25

GYPSUM WALLBOARD PARTITIONS

STEEL DOOR FRAMES (FENESTRA)

Mr. Hummer and the Laboratory people at Paoli in the past have worked to develop details of these frames and to include features which Bestwall people thought were desirable for a good three piece metal door frame for use in the various Bestwall drywall partition systems.

There is a folder of details which all Salesmen concerned with knowing the drywall contractor and his problems better, should study carefully. These folders include reference to standard frames from use with a 2-1/4" thick partition up to one, 4-5/8" thick. In addition, their rolling facilities are set up such that they can make the same type door frame for thickness partitions depending, of course, on the quantity involved and a minimum price for the setup.

For further assistance, there is included a copy of personnel of this organization in various parts of the country who may be contacted for further information and availability of these frames. Many are being stocked in warehouses around the country.

This information is to guide you in assisting your Drywall Contractors obtaining such accessories that are needed in erecting gypsum wallboard partitions.
It is not meant to recommend this particular door frame to the exclusion of others which may do a satisfactory job and may be used with Bestwall partitions equally well.

FENESTRA INCORPORATED

Door Products Division
4040 West 20th Street
Erie, Pennsylvania

John McKechnie
Manager of Sales
221 North La Salle
Chicago 1, Illinois

	DISTRICT MANAGERS	Phone
ATLANTA:	Mr. L. N. Markuly 1050 Northside Drive, N.W. Atlanta 18, Georgia	TR 3-1765
CHICAGO:	Mr. W. G. Lettow 221 North La Salle Street Chicago 1, Illinois	782-7960
CLEVELAND:	Mr. N. D. Clifford 4040 West 20th Street Erie, Pennsylvania	TE 8-2001
DETROIT:	Mr. R. I. Hoppe 5900 Caniff Avenue Detroit 12, Michigan	TW 2-6800
PHILADELPHIA:	Mr. J. T. Talman 732 Dale Road Huntingdon Valley, Pennsylvania	TU 6-3687
PHOENIX:	Mr. L. A. Patterson 4747 North 16th, Rm. B 134 P.O. Box 10031 Phoenix 16, Arizona	CR 4-5141
PITTSBURGH:	Mr. V. J. Graziano 201 Chamber of Commerce Building 411 Seventh Avenue Pittsburgh 19, Pennsylvania	CO 1-2695
SOUTHWESTERN:		
LUBBOCK:	Mr. Rayford W. Tanner 2108 Fifty-third Street Lubbock, Texas	Sherwood 4-5762



SGP 0028181

FEN-DRY

The new FEN-DRY Frames fit fast! They go up in minutes . . . *after* the drywall is up. And they are there to stay. The three interlocking members fit fast to the drywall and are anchored right into the wall at the base. Unique lock joints provide superior strength at the corners and guarantee perfect miters. FEN-DRY *is the one frame that makes practical the expanded use of drywall in commercial construction.*

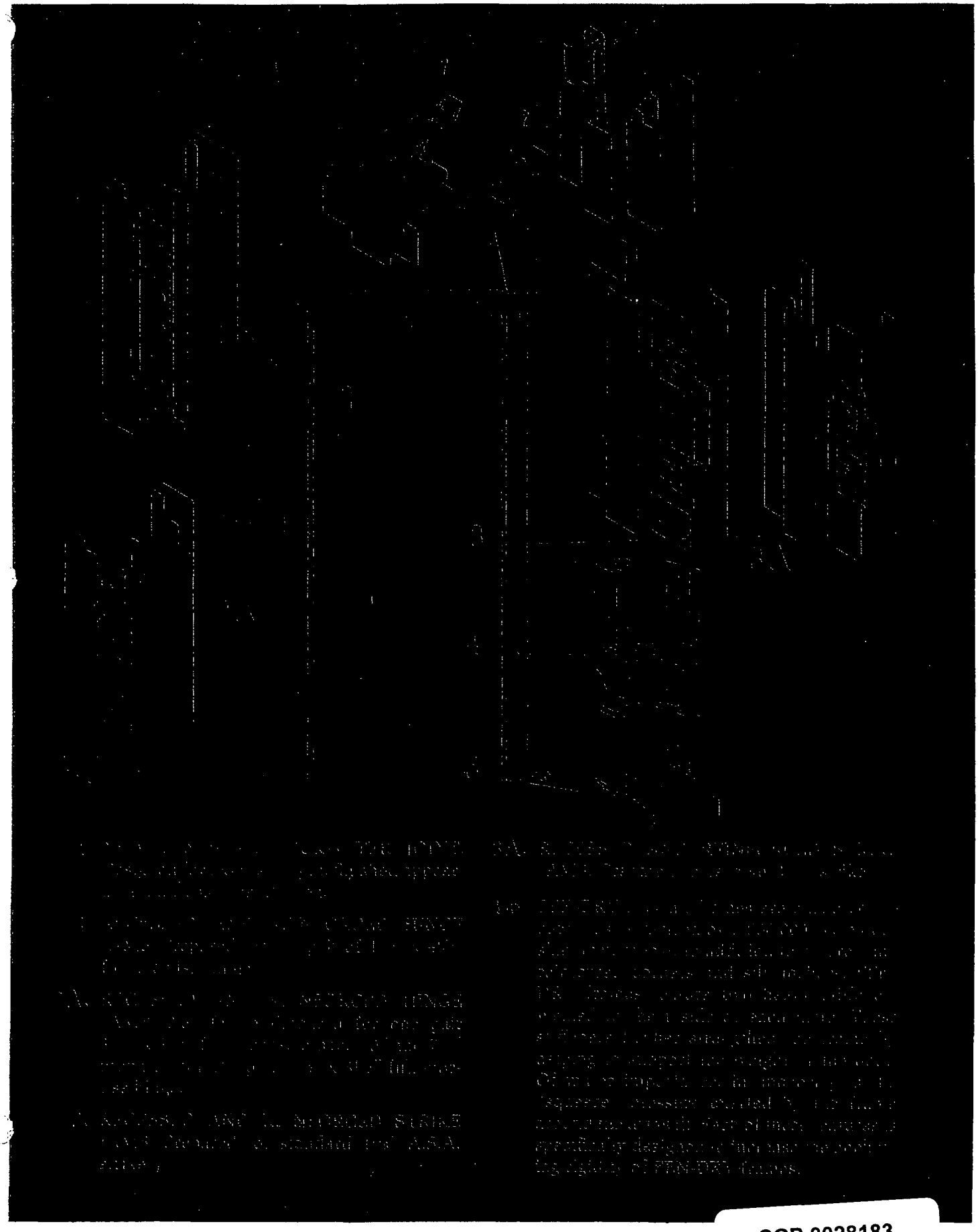
SAVE TIME FEN-DRY frames are installed in minutes . . . *fifteen* minutes on the average! This means that four times as many FEN-DRY frames can be installed in a given time and that labor costs are cut by four! Eliminated is the extra time required in (1) setting to floor slab, (2) attaching frame anchors to studs, notching and fitting gypsum board into and around frame, and (3) shimming and caulking the customary gap between the frame return and the finished surface of the gypsum board.

LOOK BETTER FEN-DRY Frames are made for drywall. They hold tight to the wall, eliminating unsightly gaps. An 89° frame angle and a 1/2 inch double-back bend around the complete frame provide a vice-like gripping area. Their corners are lock-tight miter joints, providing maximum strength and a continuous smooth trim line.

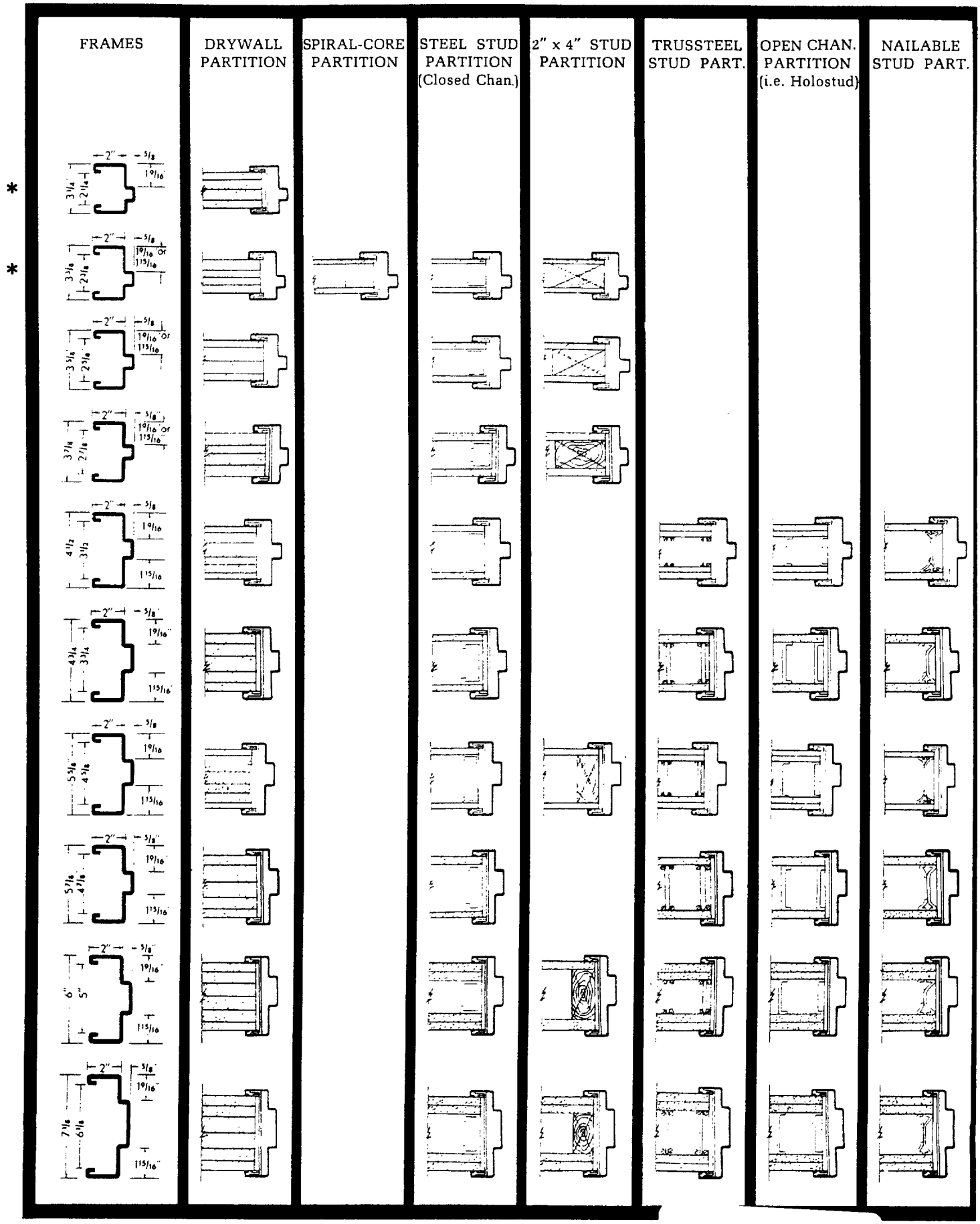
STAY IN PLACE FEN-DRY Frames fit fast and *stay* fast. They are engineered for drywall; even the weight of the door works to advantage—tension and pull function to maintain the frame in perfect locked position. Special welded-in anchors stiffen the frame at the key points and serve as a stop in plumbing the frame. Heavy gauge sill anchors, welded in jambs, lock the frame to the wall at the floor runner. Premortised jambs for template hinges and ASA strike further reflect the quality of the FEN-DRY Frame . . . a frame that has undergone a 500,000 cycle door-slam torture test to prove its positive anchoring.



SGP 0028182

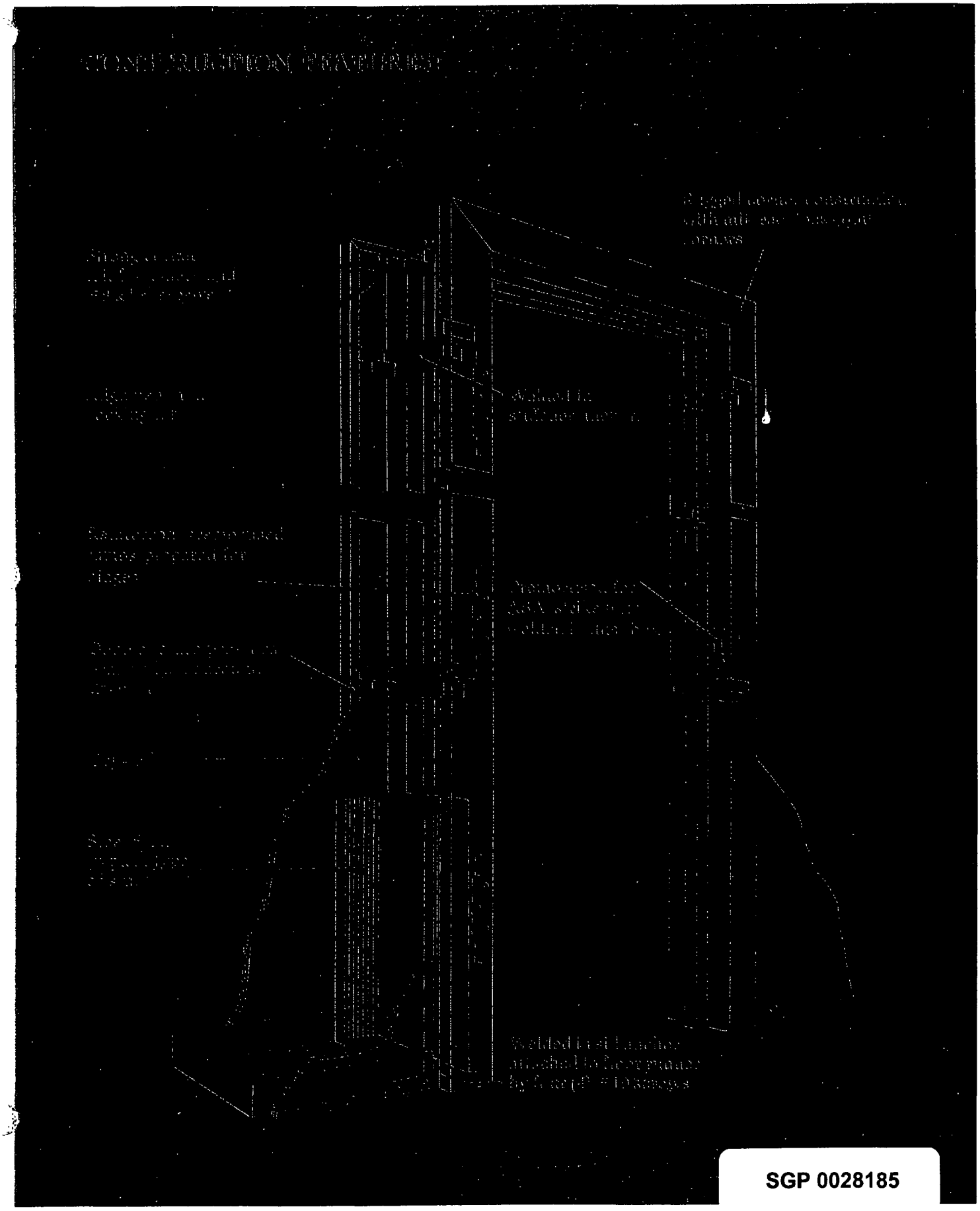


SGP 0028183

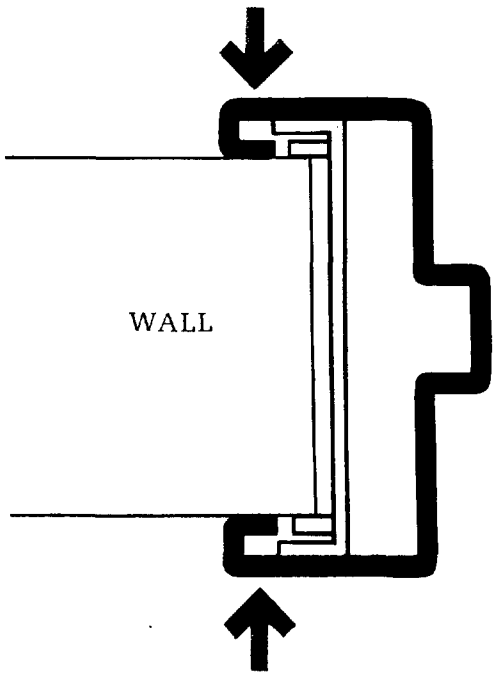


* 1 3/8" Frame shown–1 3/4" Frame is single rabbet
All throat depth available in cased opening.

SGP 0028184



SGP 0028185



FEN-DRY frames are designed to exert a vise-like grip to the wall around the frame. On a typical frame, some 34 feet of 1/2″ bearing surface is squeezed inward against the wall anchoring the frame securely.

DRYWALL FRAME SPECIFICATIONS Frame for all drywall construction shall be of the design and construction as manufactured by Fenestra Incorporated under the trade name of "FEN-DRY."

All standard and cased opening frames shall be of 16 or 18 Ga., with throat dimensions of 2 3/8″, 2 1/4″, 2 5/8″, 2 7/8″, 3 1/2″, 3 3/4″, 4 5/8″, 4 7/8″, 5″ or 6 1/8″.

Frames shall be formed with integral stops and rabbets and shall have a double return on the back bed designed for erection after wall is in place. All frame members shall be formed to grip wall firmly when slipped over wall.

Corners shall be mitered and reinforced and shall form neat, tight joints when assembled. Each corner shall be locked with sheet metal screws on the headbar return to insure positive locking and rigid corners.

Each frame shall be fully mortised and reinforced to receive template hinges and an A.S.A. strike. No welded-on hinges shall be allowed. Strike and hinge reinforcing shall be equipped with dust covers.

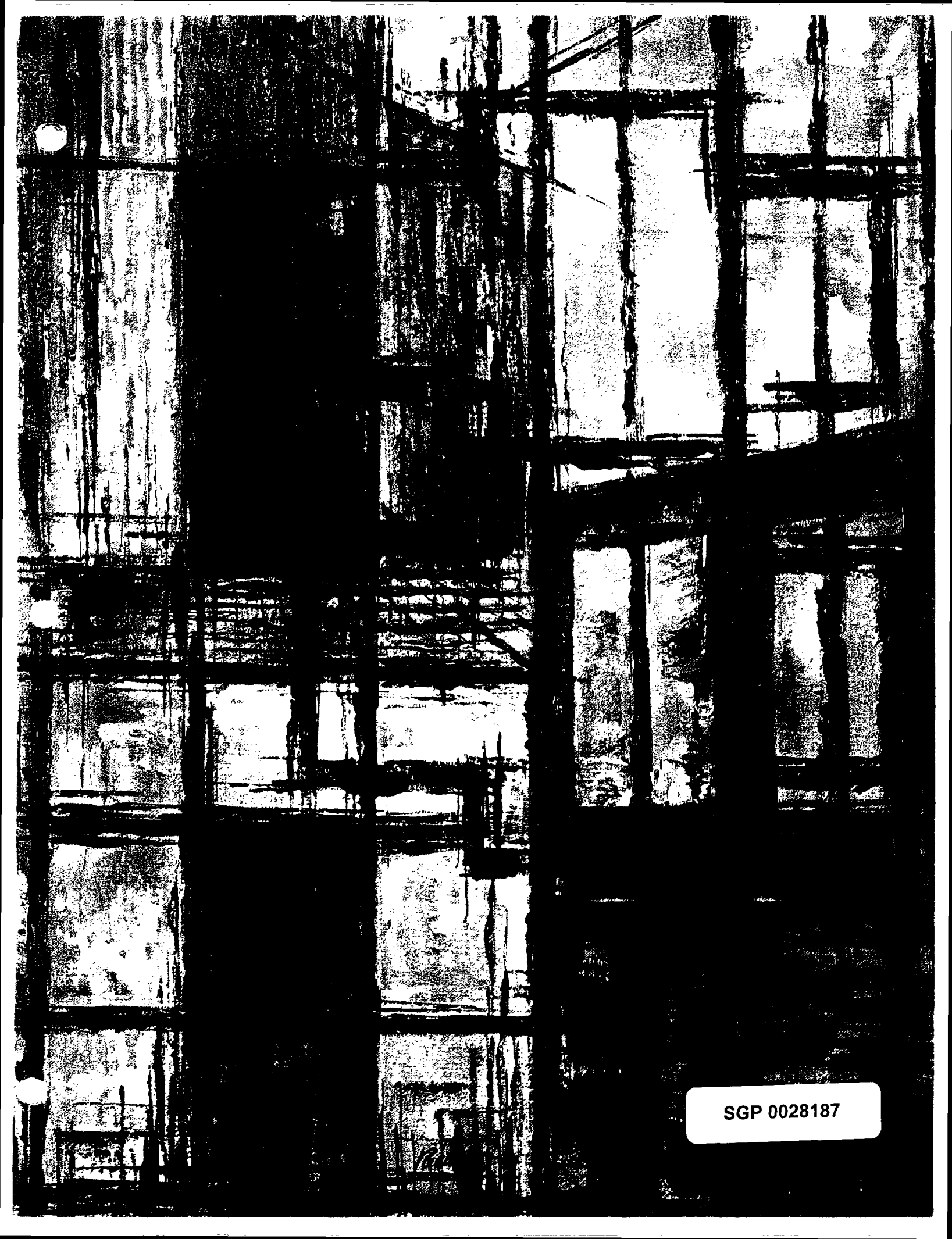
Jambs shall be further strengthened by two heavy gauge stiffeners to provide proper gripping action and bearing surface against the wall.

Each jamb shall be provided with welded-on sill anchors designed to be attached with no notching of wall board.

There shall be no visible fastening devices along the faces or rabbets.

All frames shall be bonderized and receive one coat of baked-on metallic primer.

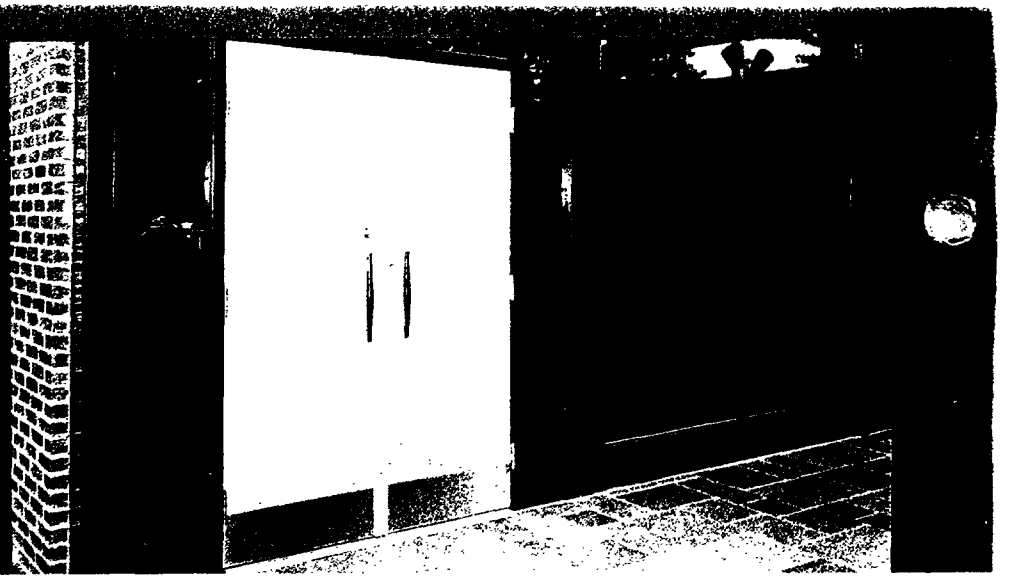
SGP 0028186



SGP 0028187

STEEL Craft®

finest name in metal doors and frames



Steelcraft offers tremendous flexibility and variety in the very finest and most complete line of standard doors and frames available, and they can be prepared for practically every type and function of hardware.

Steelcraft Distributors are thoroughly qualified to give complete technical assistance in preparing and coordinating hardware schedules and approval drawings at the local level for "instant", effective service.

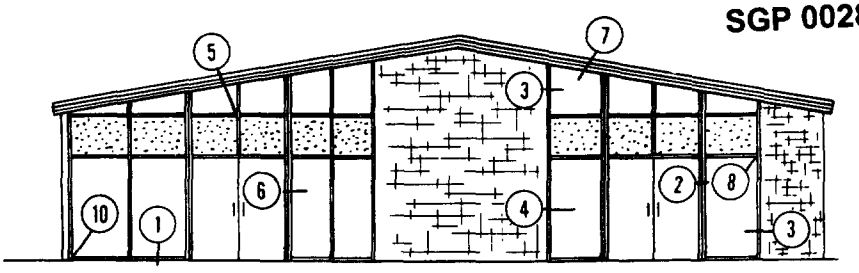
THE STEELCRAFT MANUFACTURING COMPANY

9017 BLUE ASH ROAD, CINCINNATI, OHIO, 45242, U.S.A.

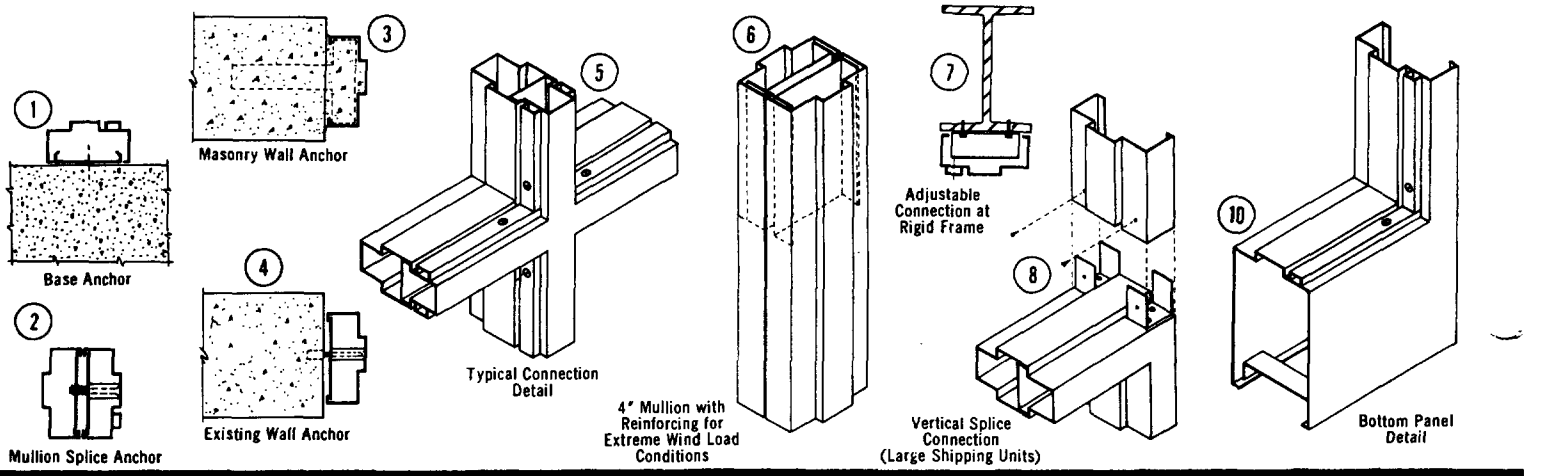


By using stock, regular door frame sections (called sticks), your Steelcraft Distributor can provide any type of frame combination . . . entrance units, transoms, sidelights, partition walls, stair enclosures, end walls. Made-to-order units are fabricated from local inventory of fabricated parts and assembled by factory-trained men.

SGP 0028188



NUMERALS IN THE ABOVE INSTALLATIONS ARE KEYED TO THE DETAILED DRAWINGS BELOW.



● FOR COMPLETE INFORMATION, WRITE FOR TECHNICAL DATA SHEET

TECHNICAL DATA
FULL FLUSH 1¾" DOORS

STEEL Craft

K-18, K-16
(Primed, edge seams exposed)

H-18, H-16
(Primed, no exposed joints)

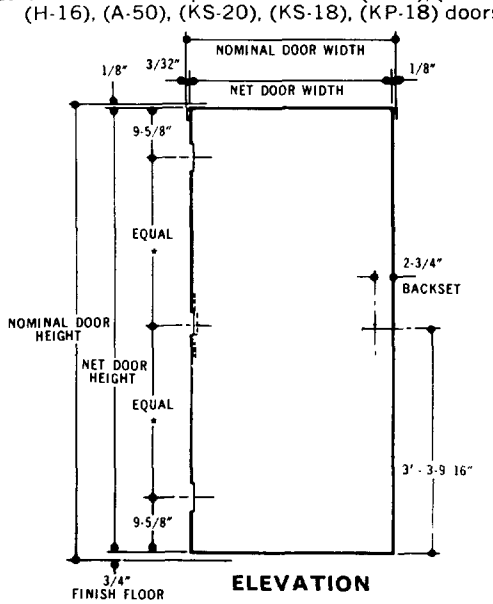
A-50
(Aluminum)

KS-20, KS-18
(Stainless steel)

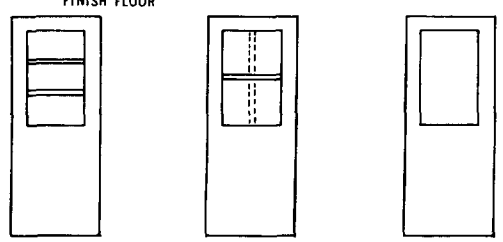
KP-18
(Porcelain enamel)

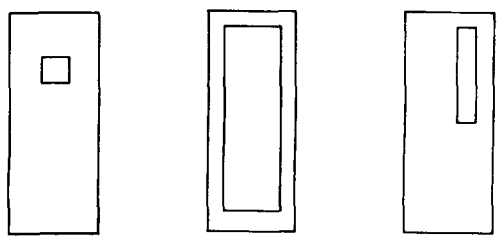
SPECIFICATIONS

1. Doors shall be made of (cold rolled stretcher level steel 18 gage—16 gage) (.050 aluminum #3105 H-25) (stainless steel #304 20 gage—18 gage).
2. Doors shall be full flush of pan type construction.
3. Doors shall be reinforced, stiffened, sound deadened and insulated with Kraft honeycomb core completely filling the inside of the doors and laminated to both inside faces of the panels.
4. Doors shall be mortised and reinforced for hinges and locks. Doors shall be reinforced for closers and other surface-applied hardware when required.
5. All doors shall be bonderized and receive one coat of baked-on prime paint.
6. Doors shall be equal to Steelcraft (K-18), (K-16), (H-18), (H-16), (A-50), (KS-20), (KS-18), (KP-18) doors.

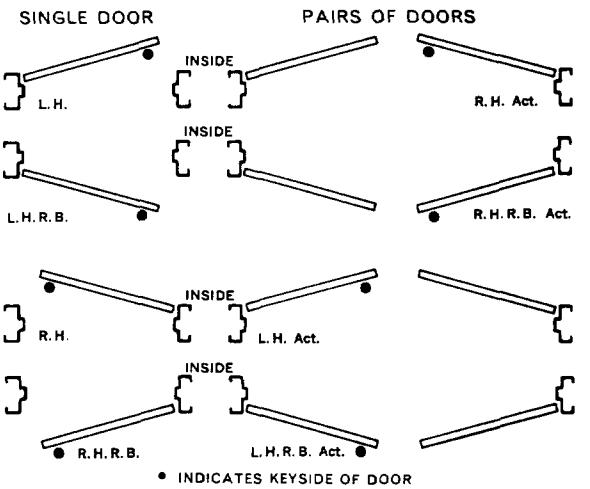


ELEVATION





DOOR HANDING



• INDICATES KEYSIDE OF DOOR

STANDARD DOOR SIZES

Nominal Door Widths		Nominal Door Heights
2'-0"	3'-0"	6'-8"
2'-4"	3'-4"	7'-0"
2'-6"	3'-6"	7'-2"
2'-8"	3'-8"	8'-0"
	4'-0"	

GENERAL NOTES

LOCK PREPARATIONS—Standard Government 161 (ASA 115.2) or Government 86 (ASA 115.1) when ordered. Other lock preparations optional as specified.

HINGE PREPARATION—1½ pair of 4½ x 4½" template hinges for 6'-8", 7'-0", and 7'-2" height. 2 pair of 4½ x 4½" template hinges for 8'-0" heights.

PACKAGING—Each door is individually wrapped in corrugated cardboard with wood stripping on vertical edges of package and banded together with steel straps.

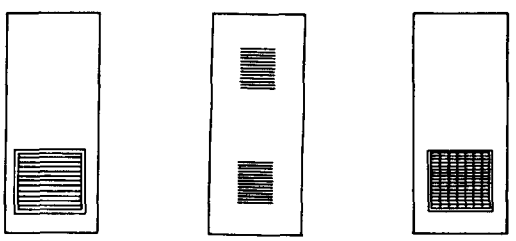
FINISHES

Because of the wide variety of finishes and colors available, these doors are ideally suited to meet every architectural requirement.

ALUMINUM DOORS—Offered in mill finish, prime finish, etched and lacquered finish, painted, anodized.

STAINLESS STEEL—For both interior and exterior use, maximum corrosion resistance, practically maintenance free.

PORCELAIN ENAMEL—Furnished in your choice of lasting fade-proof colors, including 47 widely used PEI colors.



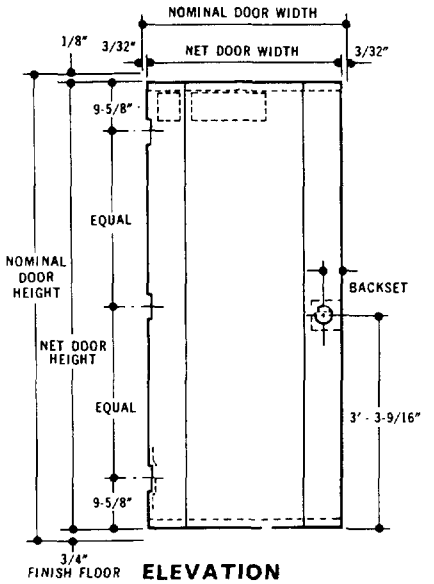
SGP 0028189

• FOR COMPLETE INFORMATION, WRITE FOR TECHNICAL DATA SHEET

STEEL Craft

TECHNICAL DATA

STILE AND PANEL DOORS • STILE AND RAIL DOORS



ELEVATION

Details for Stile and Panel Doors

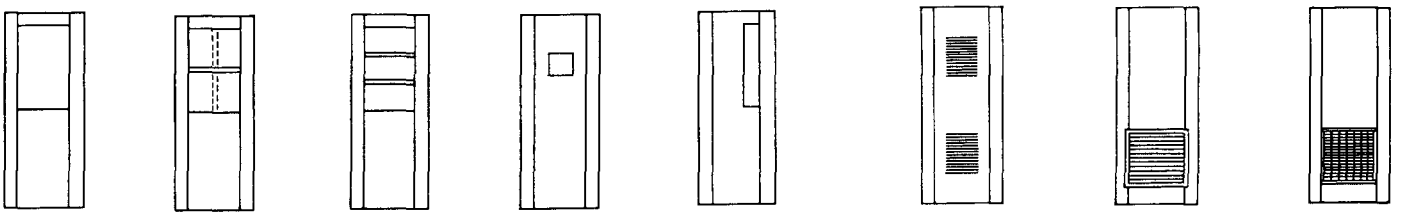
S-20-8
(20 gage steel 1 ¾ " thick)

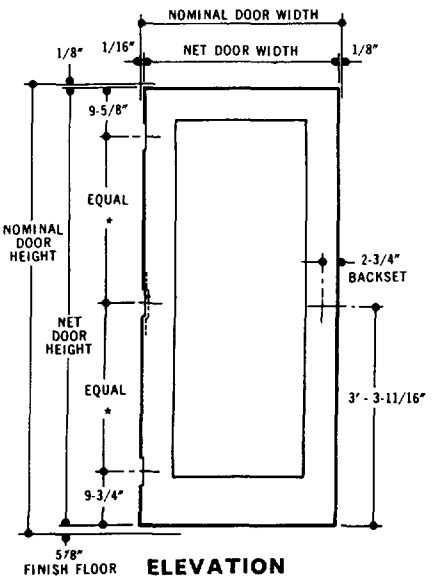
S-20-4
(20 gage steel 1 ¾ " thick)

S-18-4
(18 gage steel 1 ¾ " thick)

SPECIFICATIONS

1. Doors shall be (20 gage), (18 gage) cold rolled prime quality steel.
2. Doors shall be flush, of the three section type construction, consisting of lock and hinge stile and center panel, with tight mechanical interlocking joints. Top and bottom reinforcing channel shall be of 14 gage cold rolled steel spot-welded within the doors.
3. Doors shall be stiffened and sound deadened with Kraft honeycomb laminated to inside of center panels.
4. Doors shall be mortised and reinforced for hinges and locks. Doors shall be reinforced for closers and other surface applied hardware when required.
5. All doors shall be bonderized and receive one coat of baked-on prime paint.
6. Doors shall be equal to Steelcraft (S-20), (S-18) doors.
7. Outswinging exterior doors shall have top cap seal.





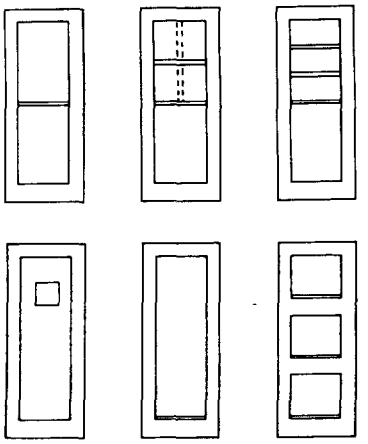
ELEVATION

Details for Stile and Rail Doors

S-16-F
(Flush panel 1 ¾ " thick)

S-16-P
(Recessed panel 1 ¾ " thick)

SGP 0028190



SPECIFICATIONS

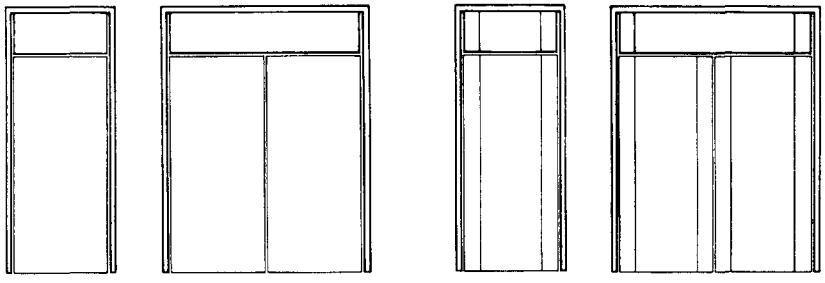
1. Doors shall be of 16 gage cold rolled steel tubular stile and rail construction.
2. Stiles and rails shall be mitered at the corners, reinforced with 16 gage channels, continuously face welded and ground smooth. Doors shall be provided with 1¾" thick panels made of two pieces of 18 gage steel separated, stiffened and sound deadened with Kraft honeycomb laminated within the panels.
3. Doors shall be mortised and reinforced for hinges and lock. Doors shall be reinforced for closers and other surface applied hardware when required.
4. All doors shall be bonderized and receive one coat of baked-on prime paint.
5. Doors shall be equal to Steelcraft (S-16-F), (S-16-P) doors.

TECHNICAL DATA
DOOR ACCESSORIES

STEEL Craft®

TRANSOM PANELS

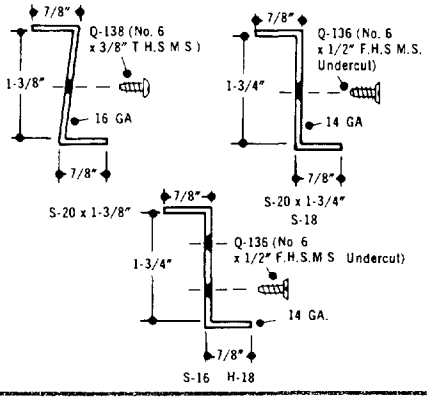
Transom Panels are available for ceiling height frames in any size to allow the use of standard Steelcraft doors. The transom panels match door design in appearance and construction.



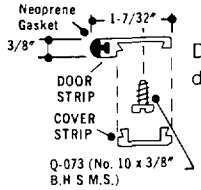
ASTRAGALS

Steelcraft offers two types of astragals . . . split and overlapping. Both types are available in kit form for field installation.

OVERLAPPING ASTRAGALS



SPLIT ASTRAGALS



Design details.

ADJUSTMENT

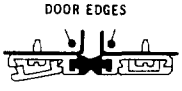
DOOR EDGES



Gaskets should touch when doors are closed. Design allows easy field adjustment.

COVER INSTALLATION

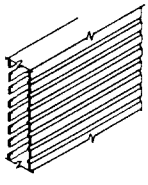
DOOR EDGES



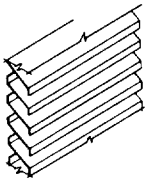
After attaching and adjusting door strips, snap cover strip into place. This design feature provides you with a neat and secure installation.

LOUVERS

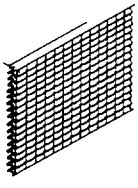
Stamped, fixed, and adjustable slat louvers along with air-conditioning grille are available in kit form or factory installed.



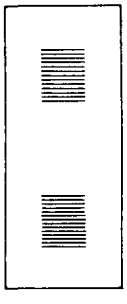
STAMPED LOUVER
Free air 26% of total area.



SLAT LOUVER
Fixed: free air 50% of total area. Adjustable: free air 40% of total area.



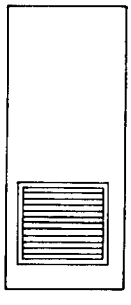
AIR-CONDITIONING GRILLE
Free air 81% of total area.



Top louver when specified.

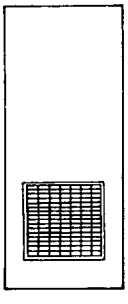
8" L 101
2'-0" only.

12" L 102
2'-4" or over.



Louver opening width is 12 1⁵⁄₁₆" less than door width.

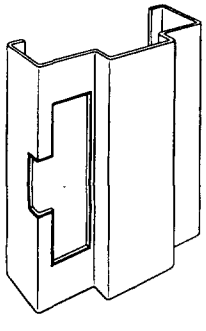
	(Fixed)	(Adj.)
14"	L201	L301
20"	L202	L302
24"	L203	L303



8"	L401
14"	L402
20"	L403
24"	L404

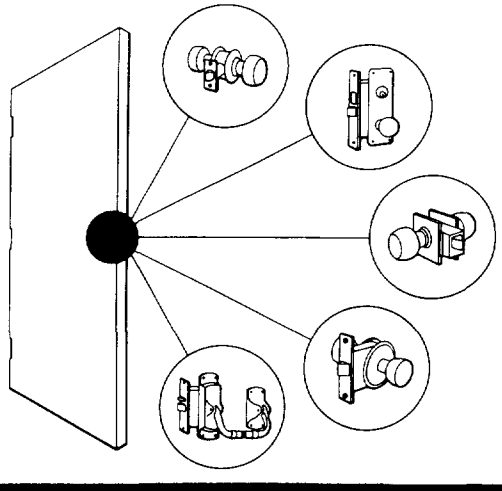
HARDWARE FLEXIBILITY

All Steelcraft doors and frames are reinforced, and prepared for a wide variety of hardware.



A.S.A. STRIKE

The use of the ASA strike will provide complete freedom of hardware since the outside dimensions of the strike are the same regardless of the type of lock



HINGES

In addition to standard hinge preparations, Steelcraft doors and frames can be furnished with many other hinge preparations to meet various job conditions.

- Heavy-weight butt hinges.
- Half mortised hinges.
- Pivots.
- Floor checks.
- Anchor hinges.
- Spring hinges.

SGP 0028191

• FOR COMPLETE INFORMATION, WRITE FOR TECHNICAL DATA SHEET

STEEL Craft

TECHNICAL DATA

UNDERWRITERS' LABEL DOORS AND FRAMES

SPECIFICATIONS

All Steelcraft Fire Doors and Frames shall be manufactured in strict accordance with the specifications and procedures of the Underwriters' Laboratories. (Both U. S. and Canadian Label Service is available.)

LABELED DOORS

Labeled doors are identical in appearance to non-labeled doors. The construction of labeled doors varies from standard door construction to meet Underwriters' requirements. All labeled doors carry labels designating Underwriters' label classification of the door. Gage of door does not determine label classification.

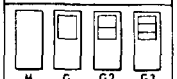
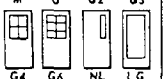
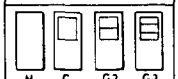
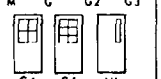
LABELED FRAMES

Labeled frames are identical in appearance to non-labeled frames. Underwriters' requires that labeled frames must have no less than a ⅝" stop and must be provided with welded-on masonry strap anchors.

Underwriters' labeled frames are intended for installation in masonry wall construction to establish an overall wall of fire protection.

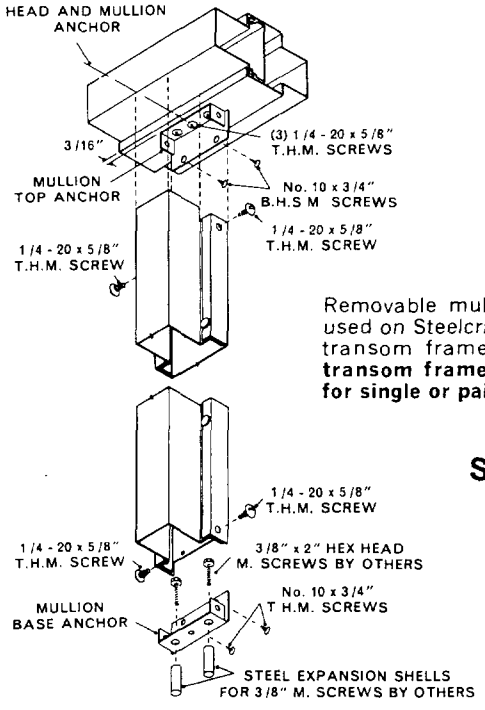
NOTE

The information contained in this sheet is in accordance with Underwriters' Laboratories, Inc. specifications and procedures. It describes those labeled products available from Steelcraft as of August, 1963.

LABEL CLASSIFICATION AND USE IN BUILDINGS	DOOR LINES AVAILABLE	DOOR TYPES AVAILABLE	MAXIMUM SIZES AVAILABLE
A **3 HOUR RATING** Openings in Fire Walls and Division Walls between buildings with a rating of 3 hours.	**FLUSH** H-18 x 1 3/4	 M	H - 18 x 1¾ SINGLE 3670 PAIR 7070
B **1½ HOUR RATING** Openings in Vertical Shafts with a rating of 1½ hours.	**STILE AND PANEL** S-20 x 1 3/8 S-20 x 1 3/4 S-18 x 1 3/4 **FLUSH** H-18 x 1 3/4 **STILE AND RAIL** S-16 x 1 3/4 - Flush S-16 x 1 3/4 - Recessed	 M V  M G G2 G3  G4 G6 NL LG V-Lite Door Available  M  M G G2 G3  G4 G6 NL V-Lite Door Available	S - 20 x 1¾ SINGLE 3072* PAIR – NOT AVAILABLE S - 20 x 1¾ SINGLE 3072* PAIR 6070 S - 18 x 1¾ SINGLE 3072* PAIR 6070 H - 18 x 1¾ SINGLE 3670 PAIR 7070 S - 16 x 1¾ SINGLE 4080 PAIR 8080
C **¾ HOUR RATING** Openings in Corridors and Room Partitions with a rating of 3/4 hour.			
D **1½ HOUR RATING** Openings in Exterior Walls with a rating of 1½ hours.			
E **¾ HOUR RATING** Openings to Exterior Fire Escapes with a rating of 3/4 hour.			

*NOTE: Single S-20 and S-18 are approved thru 7'-2" high only with honeycomb center panel and mineral wool filled stiles. Doors fully insulated with mineral wool are approved thru 7'-0" high single and pair.

DETAIL OF REMOVABLE MULLION

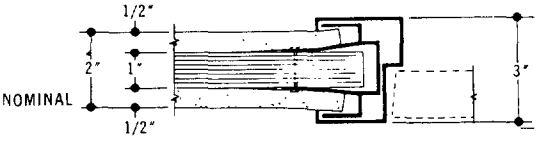


Removable mullion can be used on Steelcraft's labeled transom frames. **Labeled transom frames available for single or pairs of doors.**

SGP 0028192

FRAME FOR LAMINATED WALL

NOTE SPECIAL CONSTRUCTION, UNIQUE WITH STEELCRAFT



Frame available with 1½ hour or "B" label rating and has been accepted for use in 2" walls having a 2 hour rating.

UNDERWRITERS' LABEL FRAMES

CLASSIFICATION OF LABEL FRAMES

Label frames are not classified. One label frame is used for any label classification door.

MINIMUM GAGE REQUIREMENTS

Maximum sizes allowed in 16 Ga-Single 3676, Double 5076 or 6070.
Maximum sizes allowed in 14 Ga-Single 40100, Double 80100.
18 Ga. is not allowed in any label frame.

CONSTRUCTION AVAILABLE

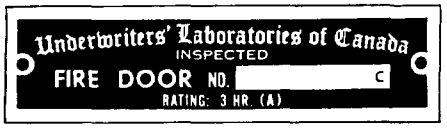
KD (knocked down)
SUA (Set up and arc welded)
SUS (Set up and spot welded)

GENERAL NOTES

Minimum jamb depth .....Frame for 2" wall thickness
Maximum jamb depth.....Unlimited
Minimum stop allowed.....⅝"









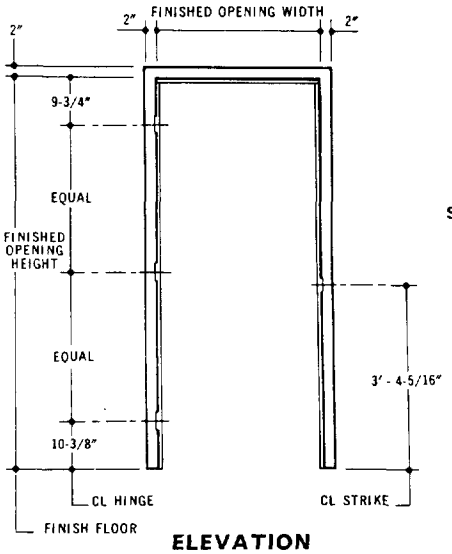
• FOR COMPLETE INFORMATION, WRITE FOR TECHNICAL DATA SHEET

TECHNICAL DATA
DOOR FRAME DETAILS

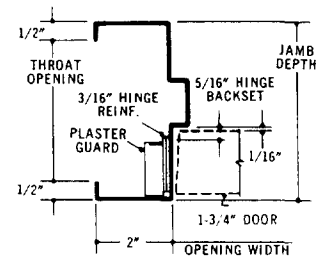
STEEL Craft®

STANDARD SIZES

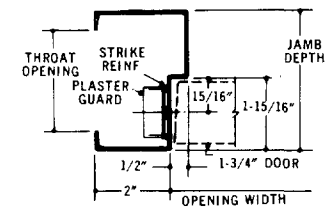
Finished Opening Height	Finished Opening Width		Frame Dimensions	
	Single	Double	Jamb Depth	Throat Opening
	2'-0"	4'-0"		
	2'-4"	4'-8"	3"	2"
6'-8"	2'-6"	5'-0"	3¾"	2¾"
7'-0"	2'-8"	5'-4"	4¾"	3¾"
7'-2"	3'-0"	6'-0"	5¾"	4¾"
	3'-4"	6'-8"	6¾"	5¾"
	3'-8"	7'-4"	8¾"	7¾"
	4'-0"	8'-0"		



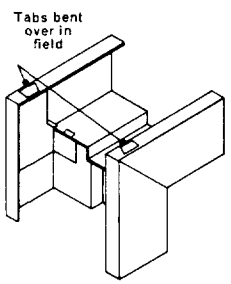
ELEVATION



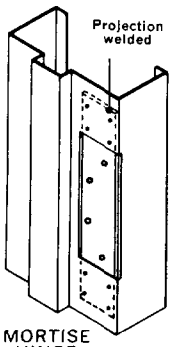
SECTION AT HINGE THROUGH DOUBLE RABBET FRAME



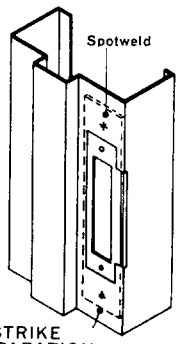
SECTION AT STRIKE THROUGH SINGLE RABBET FRAME
(3" and 3¾" jamb depth only)



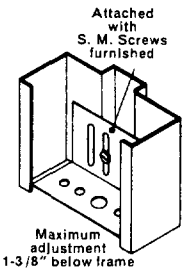
CORNER DETAILS
(KD shown)



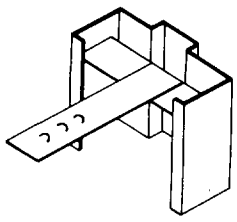
MORTISE HINGE PREPARATION



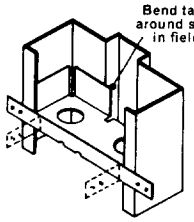
STRIKE PREPARATION



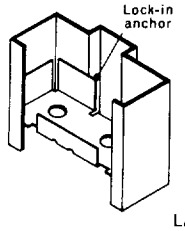
ADJUSTABLE BASE ANCHOR



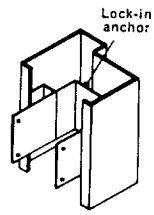
ANCHOR FOR MASONRY WALL



WOOD STUD BASE ANCHOR*



ANCHOR FOR CLOSED STEEL STUD PARTITION*



ANCHOR FOR 2" LAMINATED GYPSUM PARTITION
(3" Frame only FG-18-3)

NOTE: (8) anchors are furnished with this frame. (2) anchors in head (6) anchors in jambs.

* Patented

SPECIFICATIONS

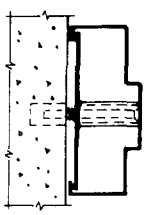
1. Frames shall be made of (18 gage), (16 gage), and (14 gage) cold rolled prime quality steel.
2. Frames shall be knocked down. Mitered corners shall have heavy reinforcements with four integral tabs for secure and easy interlocking of jambs to head at each corner. (Spreader bar available if specified.)

ALTERNATE 2A
Frames shall be set up, arc welded and ground smooth. Set up and arc welded frames shall be furnished with spreader bar attached.

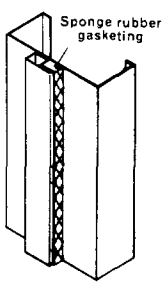
ALTERNATE 2B
Frames shall be set up, spot welded. Set up and spot welded frames shall be furnished with spreader bar attached.

3. Suitable anchors for jambs shall be provided as required by wall construction. Minimum of 6 jamb anchors and 2 base anchors per frame shall be supplied.
4. All frames shall be furnished with two rubber bumpers installed at the factory.
5. Frames shall be mortised and reinforced for strikes and hinges.
6. Strike and hinge reinforcings on frames shall be completely enclosed and protected by a plaster guard welded in place.
7. All frames shall be bonderized and receive one coat of baked-on prime paint.

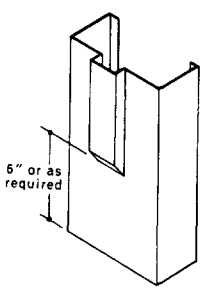
SPECIAL FRAME DETAILS



EXISTING MASONRY
Section through jamb with strap and tube anchor



APPLIED STOP
For use as weatherstrip or for sound deadening purpose



HOSPITAL STOP

SGP 0028193

• FOR COMPLETE INFORMATION, WRITE FOR TECHNICAL DATA SHEET

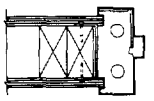
STEEL Craft®

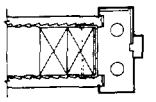
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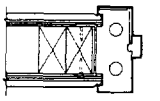
STEELCRAFT FRAMES IN TYPICAL WALL CONDITIONS

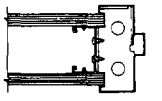
DOUBLE RABBET FRAMES SHOWN

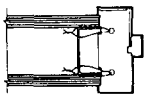
4¾" FRAMES

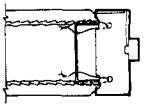

2 x 3 wood stud with ½" drywall

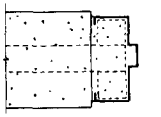

2 x 3 wood stud with ¾" plaster on metal lath

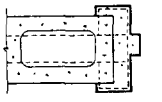

2 x 3 wood stud with ¾" Gypsum and plaster


2½" closed steel stud with ⅝" Gypsum

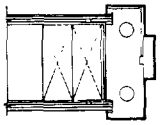

2½" open steel stud with ⅝" Gypsum

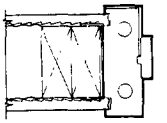

3¼" open steel stud with ¾" plaster on metal lath

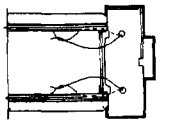

Butted masonry— brick, concrete block, or poured concrete

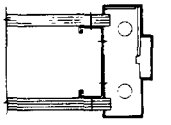

Wrap around masonry 4" block or tile

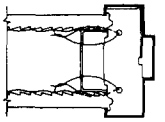
5¾" FRAMES

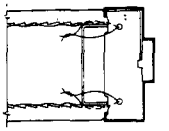

2 x 4 wood stud with ½" drywall

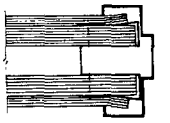

2 x 4 wood stud with ¾" plaster

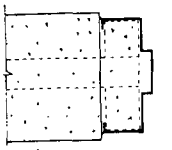

3¼" wire steel stud ⅞" Gypsum and plaster


3⅝" closed steel stud with ½" drywall

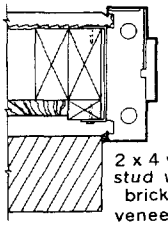

3¼" open steel stud with ¾" plaster

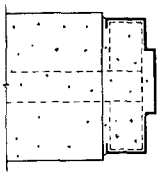

4" open steel stud with ¾" plaster

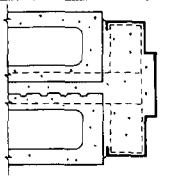

4⅝" laminated wall

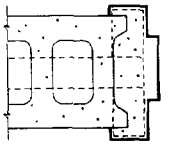

Butted masonry— brick, concrete block, or poured concrete

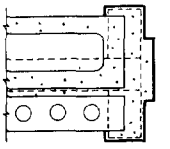
6¾" FRAMES


2 x 4 wood stud with brick veneer

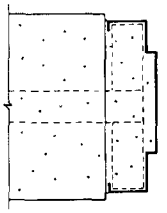

Butted masonry— brick, concrete block, or poured concrete

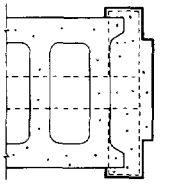

Butted masonry— double 4" block combination

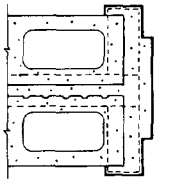

Wrap around masonry— 6" block or tile


Wrap around masonry— block and tile combinations

8¾" FRAMES

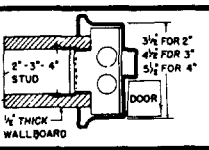

Butted masonry— brick, concrete block, or poured concrete


Wrap around masonry 8" block or tile

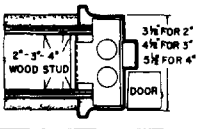

Wrap around masonry block and tile combination or double tile

contour frames

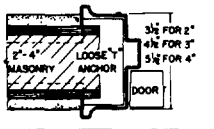
DRY WALL CONSTRUCTION



PLASTER CONSTRUCTION



MASONRY WALL



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STEEL Craft®

finest name in metal doors and frames

SGP 0028194

THE STEELCRAFT MANUFACTURING COMPANY

9017 BLUE ASH ROAD, CINCINNATI, OHIO, 45242, U.S.A.

Telex No.021-298, Phone No. 791-8800

CAT. No. 248

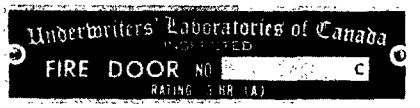
Printed in U.S.A.

TECHNICAL DATA SHEET

No. 107
Revised 11-64

UNDERWRITERS' LABEL DOORS







SPECIFICATIONS

All Underwriters' label doors shall be as manufactured by The Steelcraft Manufacturing Company and in strict accordance with the specifications and procedures of Underwriters' Laboratories.

Labeled doors shall be identical in appearance to non-labeled doors. Construction of labeled doors shall vary from standard door construction to meet Underwriters' requirements. All labeled doors shall have labels attached, designating the Underwriters' Laboratories' label classification of the door.

NOTES

1. All door lines are available in galvanized steel.
2. All labeled doors are reinforced for surface closers.
3. Gage of steel *does not* determine label classification.
4. Both U. S. and Canadian label service is available.

* * * * *

The information contained on this sheet is in accordance with Underwriters Laboratories, Inc. specifications and procedures. It describes those labeled products available from Steelcraft as of November, 1964.

SGP 0028195

STEELCRAFT
THE STEELCRAFT MANUFACTURING COMPANY
In U.S.A. . . Cincinnati, Ohio 45242
In Canada . . Malton (Toronto), Ontario

STEEL Craft *finest name in metal doors and frames*

UNDERWRITERS' LABEL DOORS

STEEL Craft — *finest name in metal doors and frames*

LABEL CLASSIFICATION AND USE IN BUILDINGS	STEELCRAFT DOOR LINES AND MAXIMUM SIZES AVAILABLE	STEELCRAFT TYPES AVAILABLE	MAXIMUM GLASS AREA	HARDWARE REQUIREMENTS — HINGES	HARDWARE REQUIREMENTS — LOCKS OR LATCHES	HARDWARE REQUIREMENTS — FIRE EXIT HARDWARE	HARDWARE REQUIREMENTS — MISCELLANEOUS
A 3 HOUR RATING Openings in Fire Walls and Division Walls between buildings with a rating of 3 hours.	**FLUSH** H-18 1-3/4" Single 4072 Pair 8072 L-20 1-3/8" Single 3472 L-20 1-3/4" Single 3872 NOTE: L-20 Doors available in Pattern Steel EP-1, EP-2.	M	**NO** glass is *permitted.*	**Number of hinges per door height** 2 hinges for doors 5' 0". One additional hinge for each additional 2' 6" of height. **STANDARD PREPARATIONS** 1-3/4" Doors 4-1/2" x .134" thick min. 1-3/8" Doors 3-1/2" x .123" thick min. **OTHER TYPES AVAILABLE** Half Mortise 4" x .130" thick (for 1-3/8" doors only) Heavy Weight 4-1/2" (.180" thick) Single acting spring hinges (for use with standard 3-1/2" or 4-1/2" preparation.) **OTHER REQUIREMENTS** All hinges and machine screws must be made of steel. All hinges must be shipped with doors.	Minimum Latch Bolt Projection 1/2". Except H-18 single doors over 3' 0" x 7' 0" and pairs of doors over 7' 0" x 7' 0" require 5/8" Latch Bolt projection. **PERMITTED** Govt. 86 mortise Govt. 161 cylindrical (1-3/8" & 1-3/4") Govt. 140 integra Mortise panic devices Unit locks (All latch bolts must be shipped from factory) **NOT PERMITTED** Dead locks Rim locks Push and pull plates Rim panic devices	**SUPPLEMENTARY LABEL*** *Supplementary Label signifies that door and hardware combination has been tested for fire and panic. H-18 doors are available in all label classifications with supplementary labels for use with fire exit hardware. **DEVICES APPROVED** **Von Duprin** **Mortise Series NC, 66, 77 & 88** Size ... Single 4072 Pair 7070 **SARGENT** **Mortise 12-9700 and 12-9900 Series** Size ... Single 4072 Pair 7070 **YALE** **Mortise – 30 Line Device** Size ... Single 4072 Doors which bear supplementary labels must have hardware shipped from the factory. This includes hinges and complete panic hardware.	● CLOSERS ● DOOR HOLDERS ● DOORS IN PAIRS **CLOSERS** Surface or *mortise* closers are required for all label doors and frames. If hold open arms are used, they must have fusible links. All closers must be U. L. listed. **DOOR HOLDERS** Door holders with fusible links must be U. L. listed. **DOORS IN PAIRS** Doors in pairs are furnished with over-lapping astragals in accordance with U. L. regulations. Top and bottom bolts are required for all inactive leaves of labeled doors in pairs. Surface bolts must be steel and *attached with steel* screws. Flush bolts may be other than steel as listed by U.L.
B 1½ HOUR RATING Openings in Vertical Shafts with a rating of 1½ hours.	**FLUSH** H-18 1-3/4" Single 4072 Pair 8072 L-20 1-3/8" Single 3472 L-20 1-3/4" Single 3872 Pair 7472	M V NL*	100 square inches per opening. Single Doors – 10 x 10 Standard Pairs of Doors – 7 x 7 Standard (per leaf) Narrow Lite permitted for Flush Doors Size?	**STANDARD PREPARATIONS** 1-3/8" Doors 3-1/2" x .123" thick min. 1-3/4" Doors 4-1/2" x .134" thick min.  **OTHER TYPES AVAILABLE** (For 1-3/4" doors only) ● Extra Heavy Weight (.180" thick) ● Half Mortise Hinges ● 4" x .130" thick (for 1-3/8" doors only)  ● Single acting spring hinges  ● Single acting spring hinges (for use with standard 3-1/2" preparation)	**PERMITTED** Govt. 161 cylindrical (1-3/8" & 1-3/4") Govt. 86 mortise Govt. 140 integra Unit lock Mortise panic devices **NOT PERMITTED** Dead locks Push and pull plates Rim locks		
C ¾ HOUR RATING Openings in Corridors and Room Partitions with a rating of ¾ hour.	**STILE AND PANEL** S-20 1-3/8" Single 3072 S-20 1-3/4" Single 3072 Pair 6072 S-18 1-3/4" Single 3072 Pair 6072	M G G2 G3 G4 G6 NL LG	1296 square inches per lite. Neither dimension may exceed 54".				
D 1½ HOUR RATING Openings in Exterior Walls with a rating of 1½ hours.		M	**NO** glass is permitted.				
E ¾ HOUR RATING Openings to Exterior Fire Escapes with a rating of ¾ hour.	**STILE AND RAIL** S-16 1-3/4" Single 4080 Pair 8080 **FLUSH AND RECESSED PANEL** NOTE: L-20 Doors available in Pattern Steel EP-1, EP-2.	M G G2 G3 G4 G6 NL V-Lite door available	720 square inches per lite. Neither dimension may exceed 54".		**PERMITTED** Govt. 161 cylindrical (1-3/8" & 1-3/4") Govt. 86 mortise Govt. 140 integra Unit lock Rim panic devices Mortise panic devices **NOT PERMITTED** Dead locks Push and pull plates Rim locks		

*Available in H & L series doors only. See note at right.

SGP 0028196

TECHNICAL DATA SHEET

No. 107A
Revised 3-64

UNDERWRITERS' LABEL FRAMES





SPECIFICATIONS

All Underwriters' label frames shall be as manufactured by The Steelcraft Manufacturing Company and in strict accordance with the specifications and procedures of Underwriters' Laboratories.

Labeled frames are similar in appearance to non-labeled frames. All labeled frames shall have no less than $\frac{5}{8}$" stops and shall be provided with welded-on anchors. All labeled frames shall have labels attached indicating conformance to Underwriters' procedures.

NOTES

1. *All frames are available in galvanized steel.*
2. *All frames are reinforced for surface closers.*
3. *Both U.S. and Canadian label service is available.*

* * *

The information contained on this sheet is in accordance with Underwriters' Laboratories, Inc. specifications and procedures. It describes those labeled products available from Steelcraft as of January 1964.

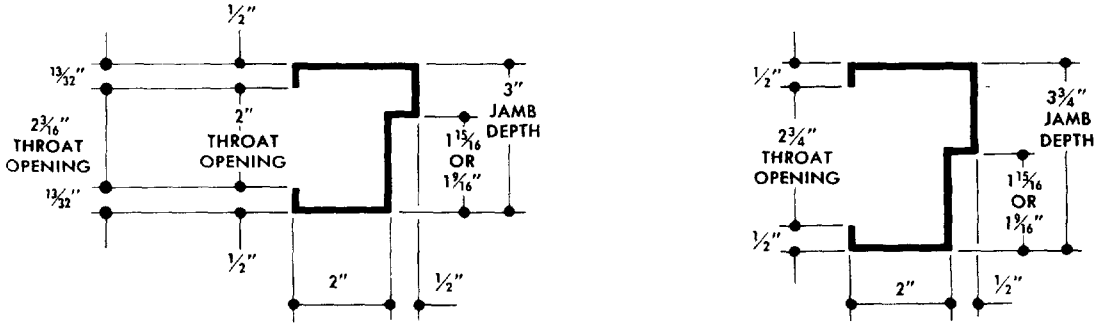
SGP 0028197

STEELCRAFT
THE STEELCRAFT MANUFACTURING COMPANY
Cincinnati, Ohio 45242 U.S.A.
STEEL Craft

PRINTED IN U.S.A.

TECHNICAL DATA SHEET | No. 117

TYPICAL WALL CONDITIONS FOR STEELCRAFT STANDARD 3″ & 3¾″ JAMB DEPTH FLUSH FRAMES



TYPICAL SECTIONS

GENERAL NOTES

3″ and 3¾ Jamb Depth Flush Frames are available for both 1⅜″ and 1¾″ thick doors in a variety of gages and finishes as listed below.

F-18	18 Gage C.R.S., baked on grey prime finish.
F-16	16 Gage C.R.S., baked on grey prime finish.
F-14	14 Gage C.R.S., baked on grey prime finish.
FAL 60	.060 Aluminum, mill finish, anodized,
FP-16	16 Gage Enameling Iron, Porcelain Enamel finish.
FS-16	16 Gage Stainless Steel with No. 4 polish finish.

SGP 0028199

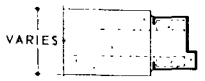
STEELCRAFT
THE STEELCRAFT MANUFACTURING COMPANY
Cincinnati, Ohio 45242 U.S.A

2-64

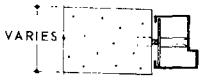
PRINTED IN U.S.A

3" J. D. FRAMES

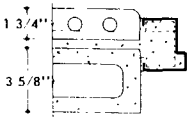
BUTTED MASONRY



POURED CONCRETE BRICK OR TILE

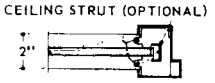


EXISTING WALL

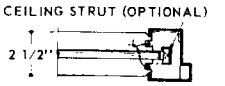


2" CORNER TILE AND 4" BLOCK COMBINATION

PLASTER PARTITION



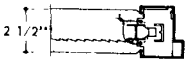
2" SOLID PLASTER WITH 1/2"GYPSUM CORE



2 1/2" SOLID PLASTER WITH 1/2" GYPSUM CORE

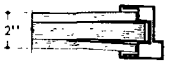


2" SOLID PLASTER ON METAL LATH



2 1/2" SOLID PLASTER ON METAL LATH

LAMINATED WALL

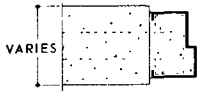


2" LAMINATED PARTITION

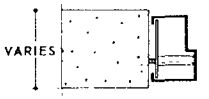
NOTE:
Details shown are those most commonly used, however this frame profile can be used with many other wall conditions.

3-3/4" J.D. FRAMES

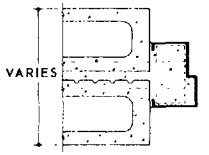
BUTTED MASONRY



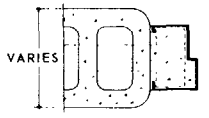
POURED CONCRETE BRICK OR TILE



EXISTING WALL

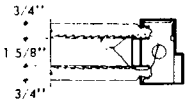


DOUBLE BLOCK AND TILE COMBINATION OR DOUBLE TILE

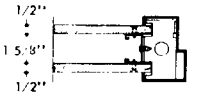


BULLNOSE BLOCK OR TILE

STEEL STUD



1 5/8" OPEN CHANNEL STEEL STUD WITH PLASTER ON METAL LATH



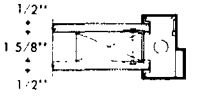
1 5/8" CLOSED CHANNEL STEEL STUD WITH GYPSUM BOARD

GYPSUM TILE

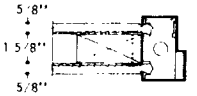


2" PRECAST GYPSUM TILE WITH PLASTER

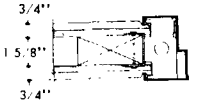
WOOD STUD



2 X 4 WOOD STUD WITH GYPSUM BOARD



2 X 4 WOOD STUD WITH PLASTER ON METAL LATH

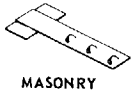


2 X 4 WOOD STUD WITH PLASTER ON ROCKLATH

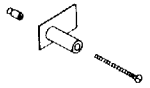
NOTE:
Details shown are those most commonly used, however this frame profile can be used with many other wall conditions.

STANDARD WALL ANCHORS

ANCHORS ARE AVAILABLE FOR COMMONLY USED WALL CONSTRUCTION AND CAN BE USED INTERCHANGEABLE IN STANDARD 3" J.D. FRAMES. SOME OF THE ANCHORS AVAILABLE FROM STOCK ARE SHOWN HERE.



MASONRY TEE ANCHOR
INSTALLED IN JAMBS AS WALL IS BEING CONSTRUCTED



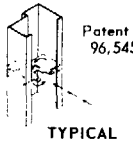
ANCHOR FOR EXISTING MASONRY WALL
FIELD APPLIED FOR USE WITH STANDARD FRAME



ANCHOR FOR PLASTER PARTITION
LOCK-IN TYPE FOR FIELD INSTALLATION



ANCHOR FOR LAMINATED WALL
LOCK-IN TYPE FOR FIELD INSTALLATION



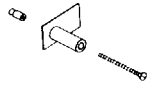
TYPICAL LOCK-IN ANCHOR INSTALLATION

STANDARD WALL ANCHORS

ANCHORS ARE AVAILABLE FOR COMMONLY USED WALL CONSTRUCTION AND CAN BE USED INTERCHANGEABLE IN STANDARD 3 3/4" J.D. FRAMES. SOME OF THE ANCHORS AVAILABLE FROM STOCK ARE SHOWN HERE.



MASONRY TEE ANCHOR
INSTALLED IN JAMBS AS WALL IS BEING CONSTRUCTED



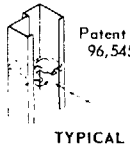
ANCHOR FOR EXISTING MASONRY WALL
FIELD APPLIED FOR USE WITH STANDARD FRAME



ANCHOR FOR OPEN AND CLOSED STEEL STUD
LOCK-IN TYPE FOR FIELD INSTALLATION



ANCHOR NOTCHED FOR CEILING STRUT
LOCK-IN TYPE FOR FIELD INSTALLATION



TYPICAL LOCK-IN ANCHOR INSTALLATION

TYPICAL WALL CONDITIONS FOR 3" & 3¾" JAMB DEPTH FLUSH FRAMES

STEEL Craft

SGP 002820

INFORMATION DATA SHEET

FRAMES RECOMMENDED FOR BESTWALL GYPSUM SYSTEMS

BW-101

STEELCRAFT

Drywall Frames

To be installed into a rough opening after all basic wall construction is completed.

DW-16 & DW-18

For 1 3/8" or 1 3/4" Doors

SPECIFICATIONS

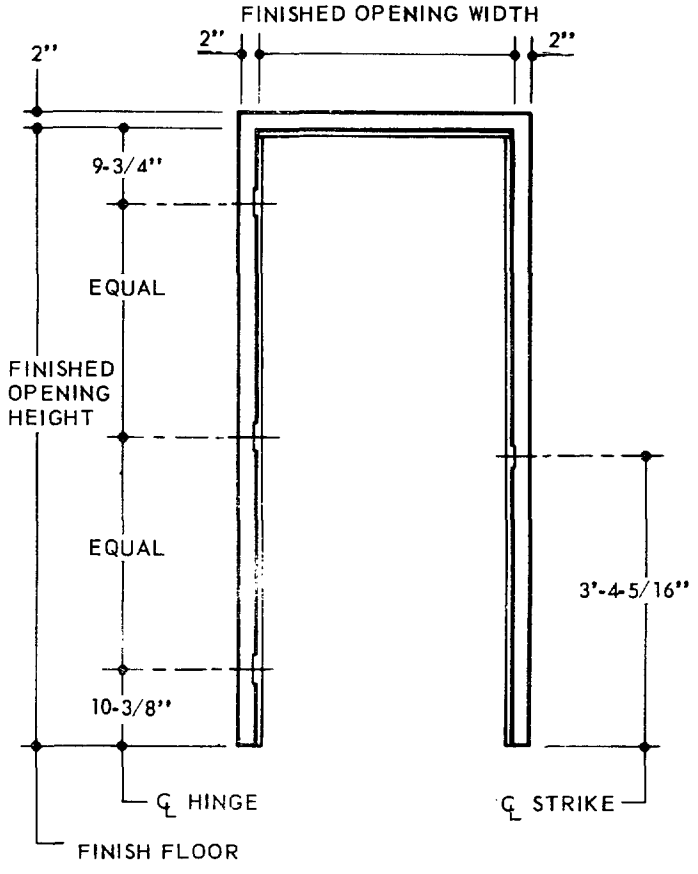
1. Frames shall be made of 16 or 18 gage cold rolled prime quality steel.
2. Frames shall be knock down. Mitered corners shall be reinforced with "Snap-Lock"* corner clips to allow easy interlocking of jamb to head
3. Each jamb shall have an adjustable jamb anchor* located 6" from top of frames.
4. Each jamb shall have a welded-in base anchor attaching plate, which will allow easy installation of loose base anchors in the field.
5. All frames shall be furnished with three rubber bumpers in each jamb and two rubber bumpers in each double door head installed
6. All frames shall be bonderized and receive one coat of baked-on prime paint.
7. Standard: All frames shall be mortised and reinforced for hinges, strikes, and all surface applied hardware as required. at the factory.

ALTERNATE: All frames shall be mortised and reinforced for strike, *surface hardware, and furnished with weld-on hinges.*

* PAT. PENDING

SGP 0028201

DRYWALL-FRAME ELEVATIONS AND SECTIONS
18 Ga. Frames For 1⅜" Doors; 16 Ga. For 1⅜" & 1¾" Doors

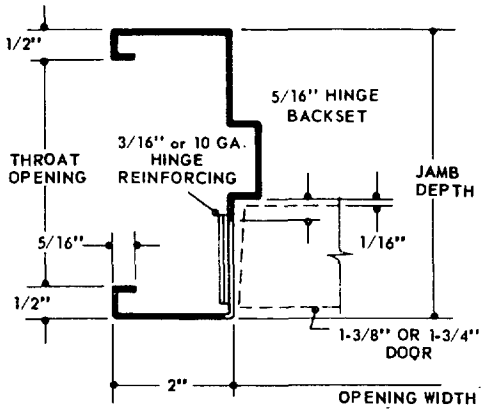


ELEVATION

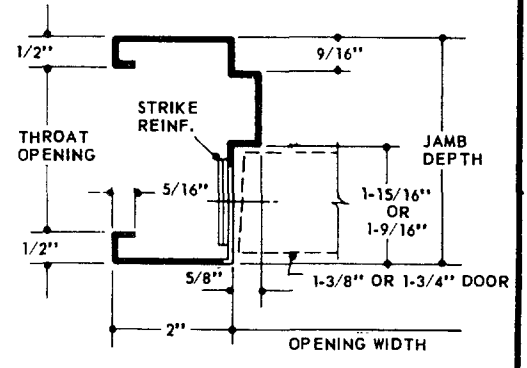
NOTE:
Rough opening dimensions are determined as follows:

Width of drywall opening may be a minimum of 1" and a maximum of 2" wider than finished frame opening width.

Height of drywall openings may be a minimum of 1/2" and a maximum of 1-1/2" higher than finished frame opening height.



DOUBLE RABBET SECTION AT HINGE THRU FRAME FOR WALLS 3-1/2" THICK AND OVER



SINGLE RABBET SECTION AT STRIKE THRU FRAME FOR WALLS 2-7/8" THICK AND UNDER

SGP 0028202

SIZES				
FINISHED OPENING HEIGHT	FINISHED OPENING WIDTH		FRAME DIMENSIONS	
	SINGLE	DOUBLE	JAMB DEPTH	THROAT OPENING
			SINGLE RABBET	
	2'-0"	4'-0"	**3"	2"
	2'-4"	4'-8"	*3-1/4"	2-1/4"
6'-8"	2'-6"	5'-0"	*3-5/8"	2-5/8"
7'-0"	2'-8"	5'-8"	DOUBLE RABBET	
7'-2"	3'-0"	6'-0"	*4-1/2"	3-1/2"
8'-0"	3'-4"	6'-8"	5-1/4"	4-1/4"
	3'-6"	7'-0"	5"	4"
	3'-8"	7'-4"	*6"	5"
	4'-0"	8'-0"	7"	6"
			*7-1/8"	6-1/8"

*Standard Steelcraft Jamb Depths.
**Available for 1-3/8" doors only.

GENERAL NOTES

Hardware Preparation – Frames for 1-3/8" Doors

Hinges – 1 pair of 3-1/2" x 3-1/2" standard weight template or non-template hinges for 6'8" height. 1-1/2 pair of 3-1/2" x 3-1/2" standard weight template or non-template hinges for 7'0" or 7'2" height.

Strike – Cylindrical Preparation ASA-115-3.

Hardware Preparation – Frames for 1-3/4" Doors

Hinges – 1-1/2 pair of 4-1/2" x 4-1/2" standard weight template hinges for 6'8", 7'0" and 7'2" height. 2 pair of 4-1/2" x 4-1/2" standard weight, template hinges for 8'0" height.

Strike – Universal Preparation ASA-115.1–2 (Standard) or Cylindrical Preparation ASA-115-3.

ANCHORS

Jamb Anchors

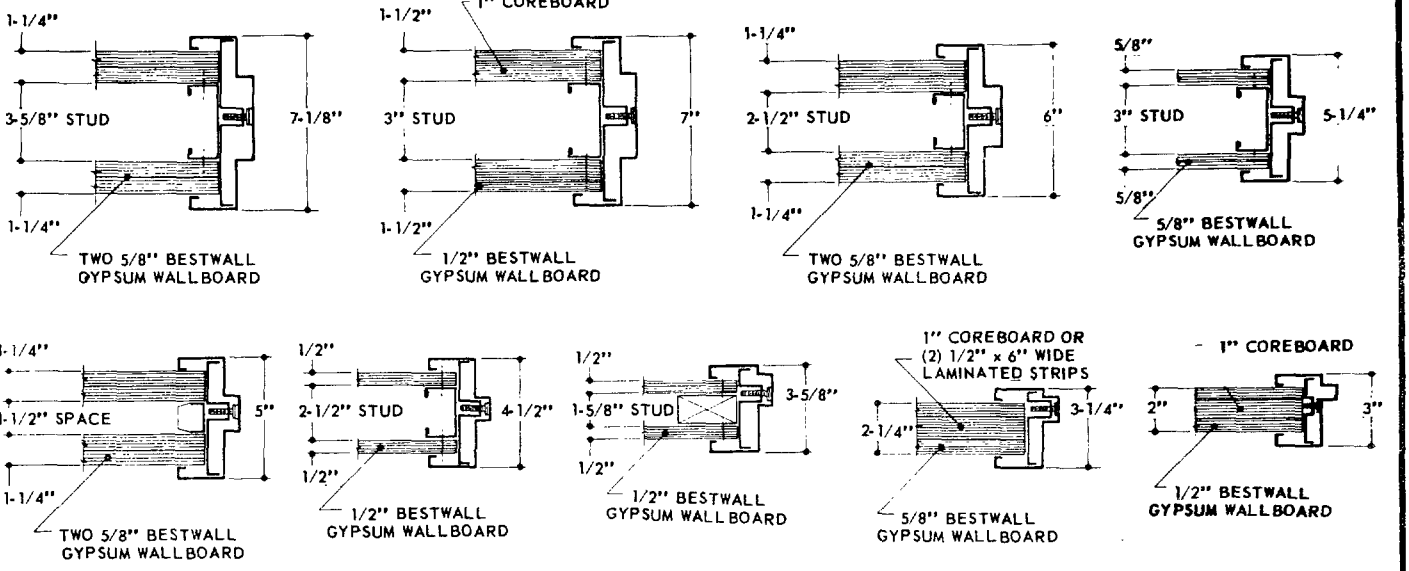
An adjustable anchor is attached to each jamb located 6" from the top of the frame.

BASE ANCHORS

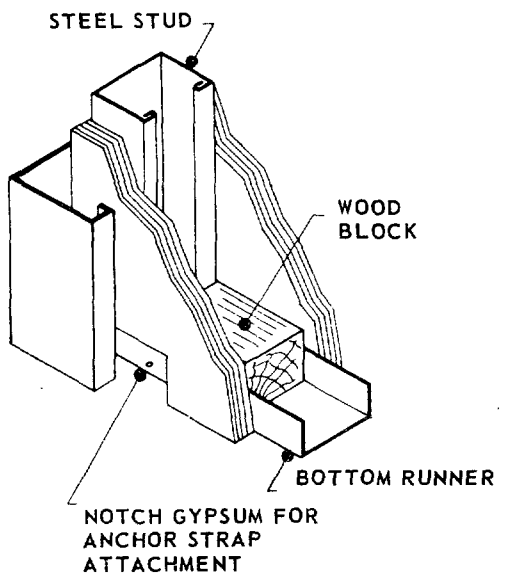
Loose Anchors

Loose base anchors are furnished with each frame. Gypsum board must be notched to allow base anchor to be fastened directly to the steel

TYPICAL INSTALLATIONS FOR BESTWALL PARTITION SYSTEMS

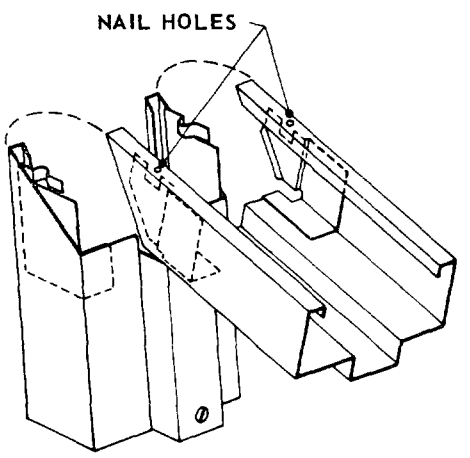


CONSTRUCTION AND INSTALLATION DETAILS



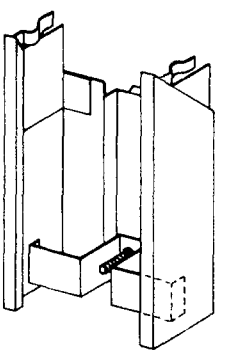
GENERAL NOTES:

1. The rough opening should be finished as square as possible.
2. It is recommended that a small wood block be installed at the bottom corner of each opening. See Ill. at left. This will give necessary reinforcement required for solid anchoring of the frame at the floor line.
3. If the frame must be removed from the wall, insert two 10d nails into the nail holes on both side of the head. Press down on the nails to disengage the snap-lock corner.
4. For installation instructions, see reverse side of this sheet.

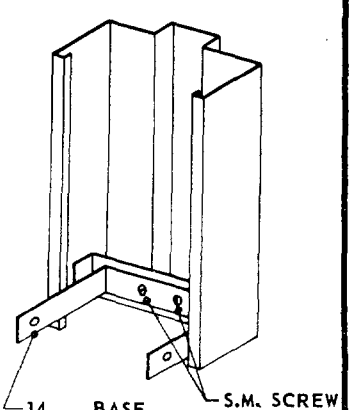


SNAP-LOCK CORNER*

SGP 0028203



ADJUSTABLE* JAMB ANCHOR



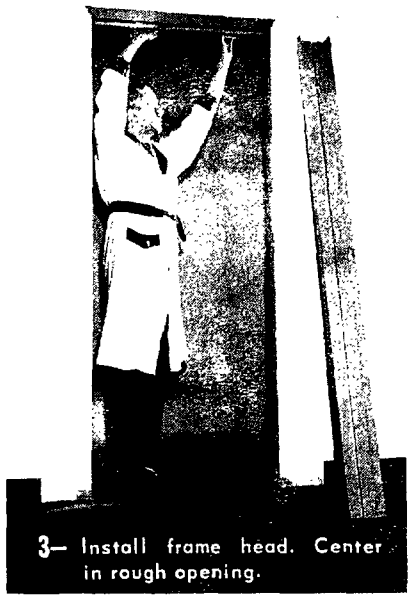
STEPS IN THE INSTALLATION OF THE STEELCRAFT DOOR FRAME FOR DRYWALL PARTITIONS



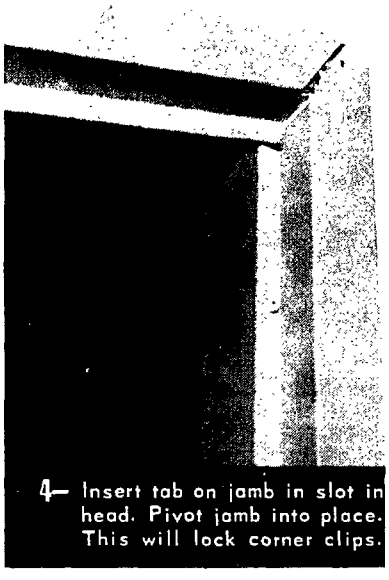
1— Attach base anchor to strap at base of jamb.



2— Notch drywall at base for attachment of base anchor.



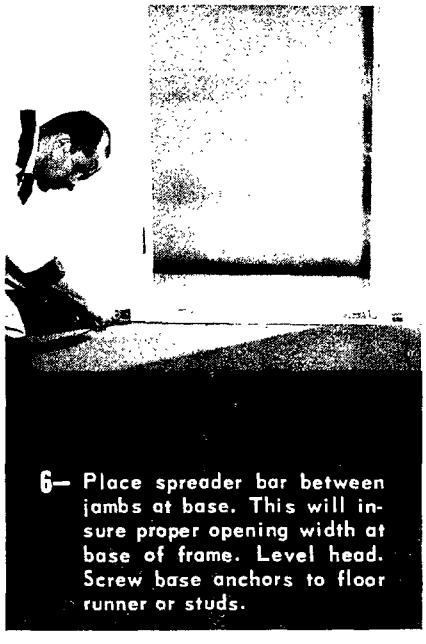
3— Install frame head. Center in rough opening.



4— Insert tab on jamb in slot in head. Pivot jamb into place. This will lock corner clips.



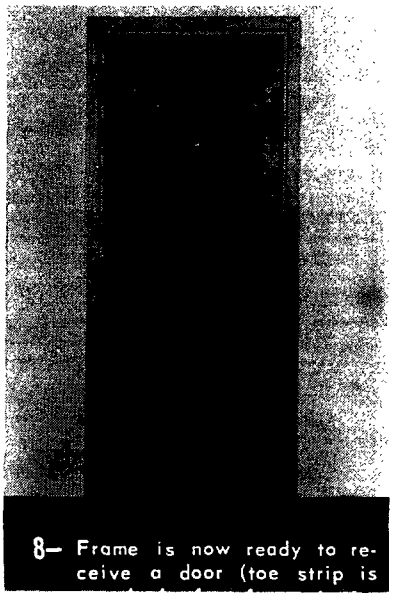
5— Repeat step No. 4 with other jamb.



6— Place spreader bar between jambs at base. This will insure proper opening width at base of frame. Level head. Screw base anchors to floor runner or studs.



7— Plumb frame by adjusting anchors at top of jambs. Make



8— Frame is now ready to receive a door (toe strip is

SGP 0028204

F. Miscellaneous

PAOLI, PENNSYLVANIA

April 15, 1966

TO: All Regional Sales Managers
All Area Sales Managers
All Salesmen
Distribution Division Sales Personnel

CC: Mr. R. I. Fredericks, Paoli
Mr. K. A. McCaskill, Paoli

General Sales Bulletin #28-66

Subject: GYPSUM WALLBOARD

Re: Suggestions for Hoisting Equipment = Special Truck Hoists and Equipment

By: G. C. Moore - jw

FILE: Gypsum Wallboard Product Manual Number 2, Section 7F

A good salesman should be constantly looking for ways and methods to give his customers the kind of service that will assist them to save money. Customers respect (and expect) this kind of service from Sales Representatives.

This new piece of Bestwall literature (GP-6630) covers suggested details for a new concept in hoisting equipment. This type equipment has been used extensively in the Texas market to lift millions of square feet of all types of Bestwall Gypsum Wallboard into twelve-story buildings up to and including a thirty-two story building.

The lift can accommodate 2' or 4' wide gypsum wallboard up to and including 14' lengths with weight loads of 2000 to 5000 pounds.

The complete hoisting assembly as detailed in the new piece of literature includes one lift, one track and three dolly carts. Bestwall does not manufacture or sell this type of equipment. Reference to specific dimensions, gauges of metal and cables and type and thickness of welds have purposely been omitted from the literature. As indicated in the literature, plans for specific equipment should be approved by an engineer in the manufacture of each piece of equipment.

The cost of the lift, track and dolly carts may vary from $70.00 to $100.00 per unit (manufactured and painted).

The gypsum wallboard is delivered in predetermined units to the job site, raised with the lift and placed on a cart set on the track which extends out from the building. The cart has hard rubber wheels, two swiveled, for easy transfer throughout the building. A minimum of three carts is recommended for a smooth distribution operation. A crew of 2 men on the ground to attach the lift under each end of the gypsum wallboard stack, 2 men at the track on the floor being stocked, one operating

Continued on next page...

a walkie-talkie or giving directions to the crane operator and one to position the carts, and two men with each cart for a total of ten, can lift and distribute over 75,000 sq.ft. of gypsum wallboard into a building in three hours.

Additional copies of Bestwall "Hoisting Equipment" suggestions literature (GP-6630) are available through the Advertising Department, Paoli, Pennsylvania.

Also attached is one copy each of literature for other types of hoisting equipment for lifting gypsum wallboard into high rise buildings.

1) Buck Hoist - by Buck Equipment Corporation, 720 Anderson Ferry Road, Cincinnati, Ohio 45238.

2) Champion Jumbo Hoist - by Champion Manufacturing Corporation, 3700 Forest Park Avenue, St. Louis, 8, Missouri.

Copies of literature for various types of special truck beds and special types of hoists that are mounted on the truck of your choice are available for hauling and lifting gypsum wallboard into garden-type apartments are also included.

1) Hiab-Hi-Tilt - by Hiab Hydraulics, Inc., 3410 Lancaster Pike, Wilmington, Delaware 19805.

2) Prentice Model GOBC-SR - by Prentice Hydraulics, Inc., Prentice, Wisconsin.

3) Side-O-Matic Titan Series Hi-Lo - by Side-O-Matic Unloader Corporation, P. O. Box 1561, York, Pennsylvania 17405.

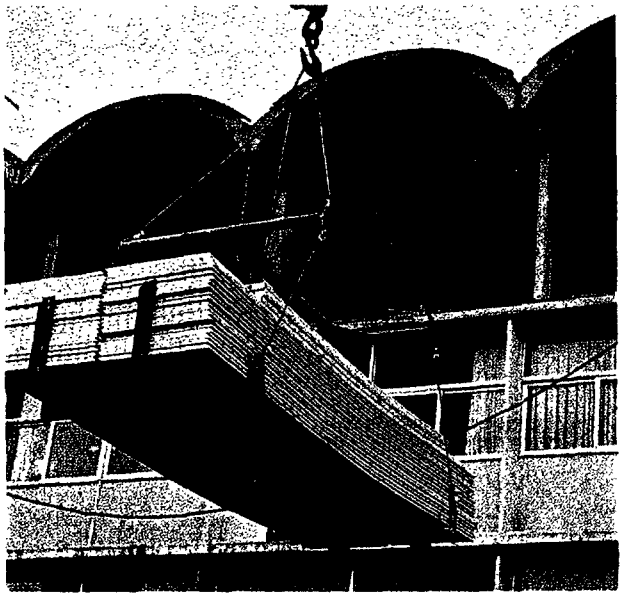
4) Heil Model 6T - by Heil Company, Factories in Milwaukee, Wisconsin; Lancaster, Pennsylvania; Woodbridge, New Jersey; Cleveland, Ohio and Modesto, California.

Note that some of the trucks have out-riggers to stabilize the truck hoist or equipment in operation.

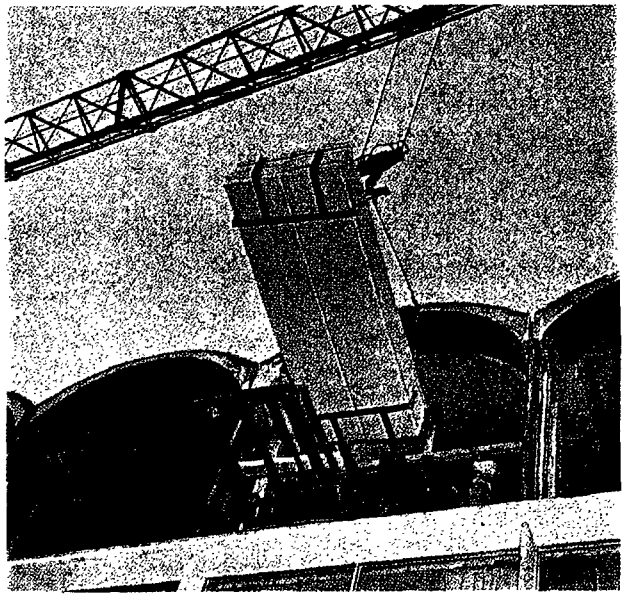
Contact special equipment hoisting manufacturers and special truck manufacturers in your area for additional copies of literature.

Sell more gypsum wallboard through service to your customers!

HOISTING EQUIPMENT
SUGGESTIONS FROM BESTWALL

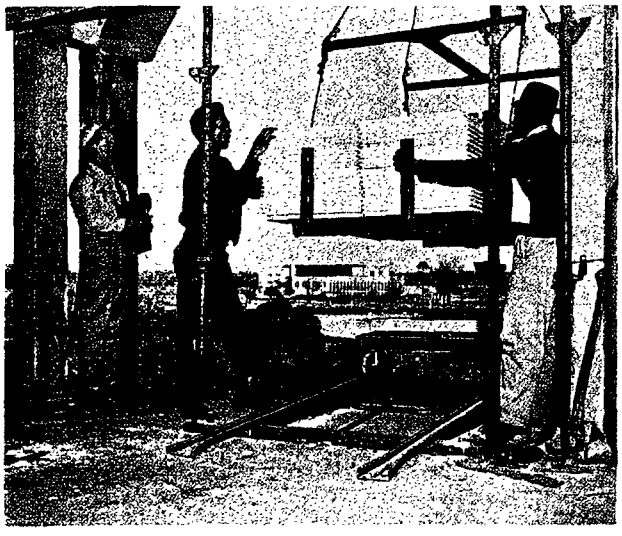


SPEED OF TRANSFER



VERSATILITY (2,000 to 5,000 LB. LOADS)

SIMPLICITY IN DESIGN



ECONOMY IN OPERATION



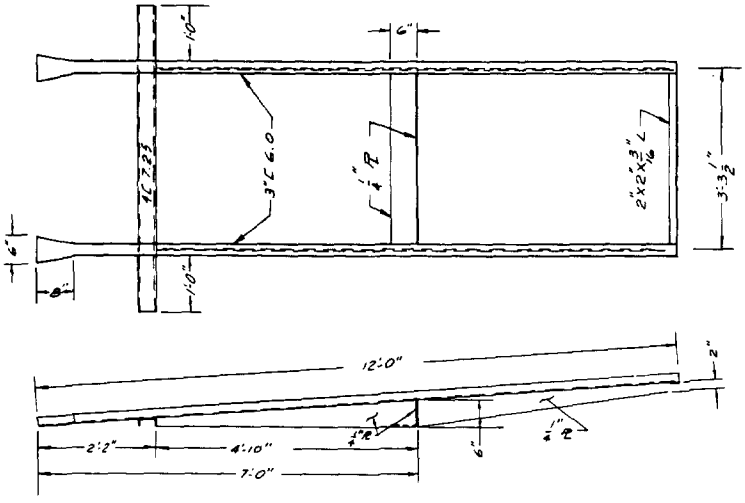
SGP 0028208

Details for a Lift and accessories for hoisting and distributing Gypsum Wallboard, Backer Board, Gypsum Lath or Gypsum Form Board into High Rise Buildings.

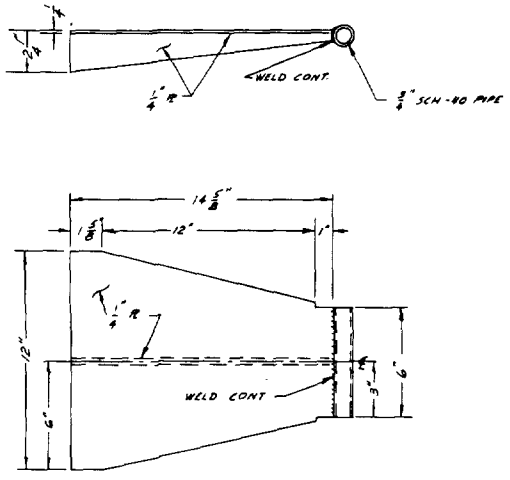
GEORGIA-PACIFIC / BESTWALL GYPSUM DIVISION

Assembly and detail of suggested wallboard handling equipment *(Dolly cart and track)*

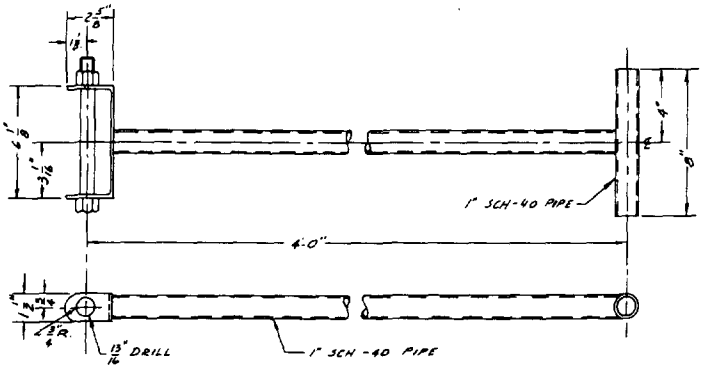
Track



TRACK
SCALE 1" = 1'0"

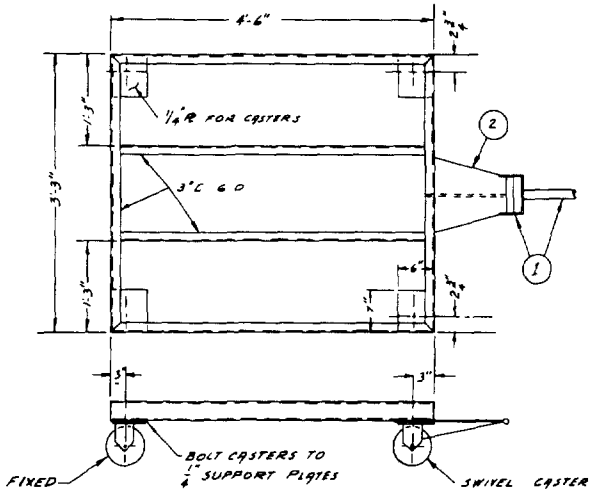


ITEM #1
SCALE 1" = 1'0"



ITEM 2

Dolly Cart

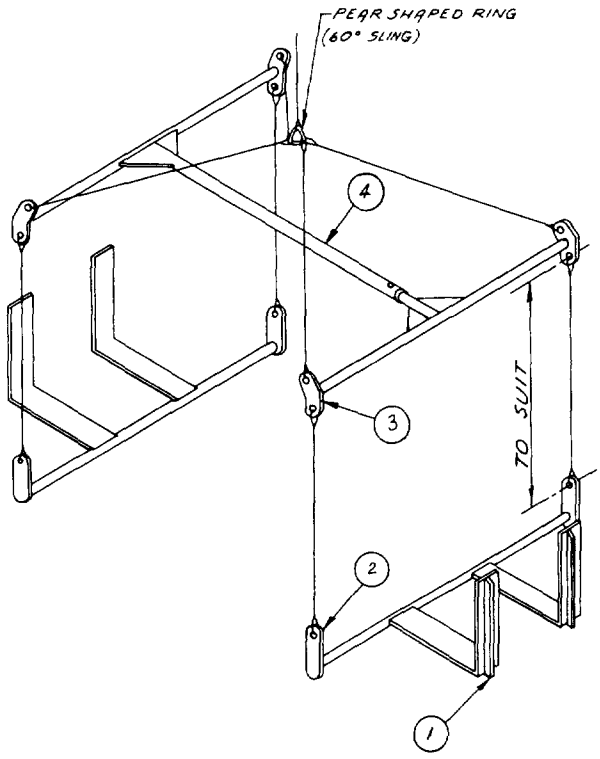


DOLLY CART
SCALE 1" = 1'0"

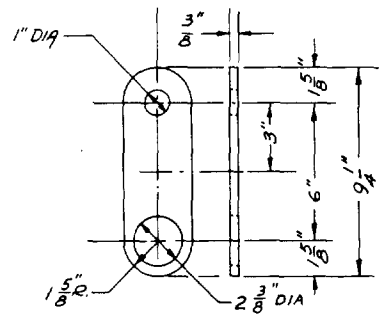
SGP 0028209

As detailed on DWG No. G.S. SK-2-10/6/65—Assembly and Detail of suggested wallboard handling equipment (Dolly Cart and Track)

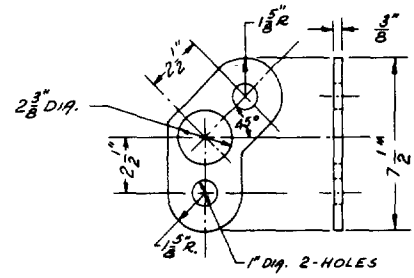
Detail of suggested wallboard "lift" *(Lift)*



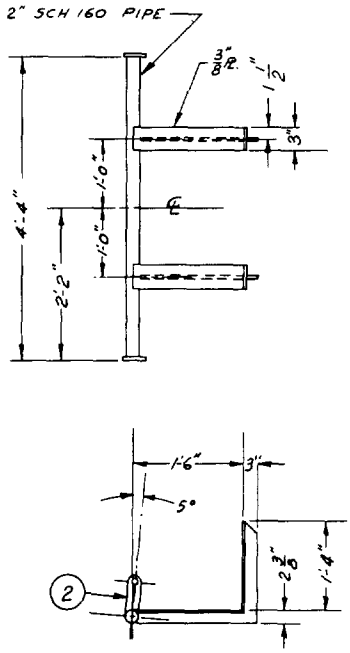
LIFT



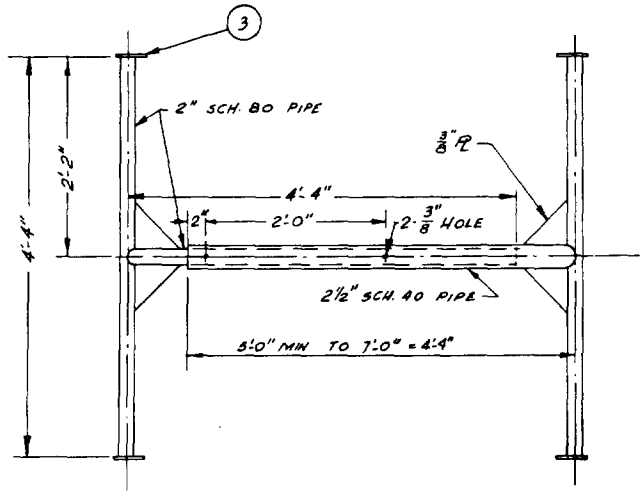
ITEM #2 MAT'L C.R.S.
4 REQ'D



ITEM #2 MAT'L C.R.S. 4 REQ'D
SCALE 3" = 12"



ITEM #1 MAT'L AS NOTED
SCALE 3/4" = 1'0" 2-REQ'D



ITEM #4 1-REQ'D
MAT'L AS NOTED

SGP 0028210

As detailed on DWG No. G.S. SK-1 Detail of Suggested Wallboard "Lift"

DESCRIPTION

The details for the suggested design for a "LIFT" —"DOLLY CART" and "TRACK" has been used in the Texas area by many sub-contractors for lifting gypsum wallboard and distributing gypsum wallboard in high rise buildings.

DRAWINGS

Drawings No. G.S. SK-1 and No. G.S. SK-2 give **suggested details** for your engineers to work out specific details for each and every assembly in all areas for specific design and for your weight load requirements.

The "LIFT" may be used with the various types of **Boom Cranes** and/or the top mounted **Linden Type Crane,** etc.

COMPLETE LIFT AND CART ASSEMBLY

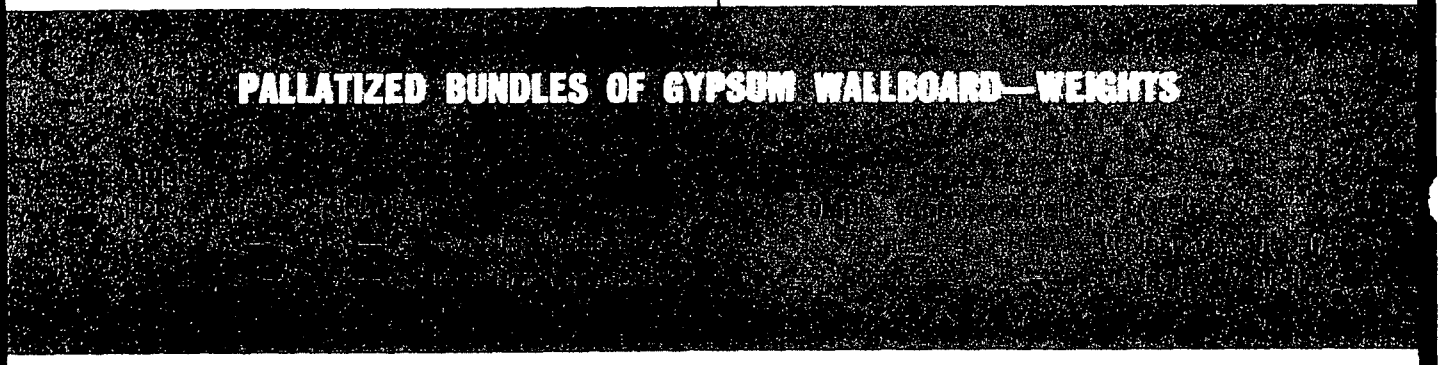
1)—LIFT—(1)
2)—DOLLY CARTS—(3)
3)—TRACK—(1)

Note: The complete assembly is manufactured in some areas, and painted for approximately ($70.00 to $100.00 per unit).

SPEED

Organization in the delivery, lifting and distribution of various lengths of gypsum wallboard in a high rise building is an important factor the sub-contractor must consider when pricing partition assemblies in high rise building. Many sub-contractors have delivered, stocked and distributed over 96,000 sq. ft. of gypsum wallboard throughout a high rise building in less than 6 hours with the described assembly.

Pre-Pallatized bundles of gypsum wallboard of pre-arranged lengths and weights are delivered to a job and lifted and set on the Dolly Carts that have been pre-positioned on the extended track and the Dolly Carts are pulled throughout the building. The wallboard may be hand unloaded or unloaded with various types of small fork lifts (Hydraulic or Electric).



SALES OFFICES

Consult the Bestwall Sales Office for
The Original Glass Fibered Reinforced Gypsum Wallboard.

ATLANTA
125 Otterly Drive, N.E.
Atlanta, Georgia 30324

CHICAGO
5544 W. St. Charles Road
Berkeley, Illinois 60162

CLEVELAND
3530 Warrensville Center Road
Shaker Heights
Cleveland, Ohio 44122

DETROIT
Suite 227, Officenter Building
Detroit, Michigan 48235

KANSAS CITY
4233 Blue Ridge Boulevard
Kansas City, Missouri 64133

NEW ORLEANS
7800 Alamonaster Drive
New Orleans, Louisiana 70126

SAN FRANCISCO
301 El Cerito Plaza
El Cerito, California 94532

SOUTHWEST
600 Exchange Bank Building
Dallas, Texas 75235

WESTERN
Room 404, Tribune Building
143 S. Main Street
Salt Lake City, Utah 84101

WILMINGTON
Wilmington Marine Terminal
Wilmington, Delaware 19899

SGP 0028211

GEORGIA-PACIFIC / BESTWALL GYPSUM DIVISION

2 INDUSTRIAL BOULEVARD • PAOLI, PENNSYLVANIA 19301

GP-6630

HIAB Hi-Tilt

TRADEMARK



Designed expressly for the delivery of dry wall material and similar products, the new HIAB Hi-Tilt gives building material distributors savings in time and dollars impossible only a short time ago.

Hi-Tilt loads or unloads up to 30 pieces of 12-ft. wallboard at a time. It picks up the entire bundle, raises it more than 20 feet in the air, tilts it vertically and places it in upper story openings.

SGP 0028212

One operator, standing on the ground, can unload from either side of the truck.

Extendable hydraulic stabilizers relieve the truck frame of dangerous stresses. And, when in travelling position, the Hi-Tilt nestles snugly over the cab , allowing complete use of the entire truck body for the dry wall or other material.

"The Only Practical Way to Deliver Wallboard"

So said a high official of one of the country's largest gypsum manufacturers after seeing the new HIAB Hi-Tilt in operation. "It makes all other methods seem old fashioned."





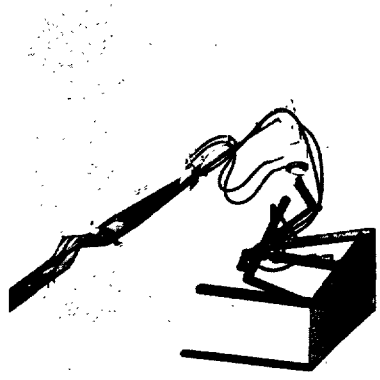
HIAB Engineers designed and developed the Hi-Tilt to do the job safely, efficiently and economically. All the know-how that has made HIAB Speedloaders the most popular hydraulic loading equipment in the world has been incorporated into the new Hi-Tilt. HIAB by-pass valves that prevent overloading, constant flow valves that reduce shock--- these and all the other exclusive HIAB Safeguard Engineering Features-- are found only in the Hi-Tilt.

HIAB Hi-Tilts are made to the most rigid specifications in the industry. They are manufactured to give long years of trouble free service. Ask for a Hi-Tilt demonstration. Check its many features against any other method and you'll know why more than 50,000 customers have made HIAB their choice throughout the world.



SPECIFICATIONS.

Boom Length.....18 ft.
Vertical Reach...21 1/2 ft.
Weight.....2500 lbs.
Stabilizer Span...8 - 12 ft.
Mounting Space.....15 in.
Rotation.....375°



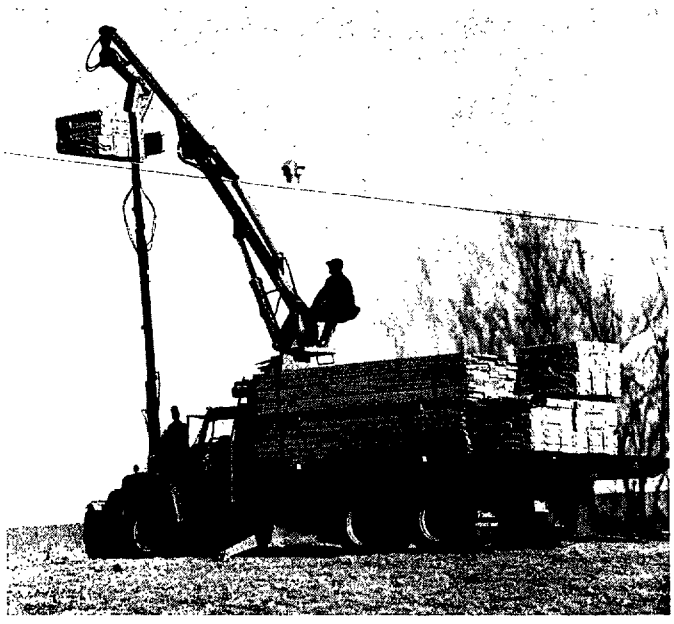
HIAB HYDRAULICS, INC.
(Area Code 302) 994-0997 998-4632
3410 Lancaster Pike, Wilmington, Delaware 19805

SGP 0028213

PRENTICE
Model GOBC-SR
Hydraulic Loader

CUTS THE COST OF HANDLING BUILDING MATERIALS









This PRENTICE Model GOBC-SR Hydraulic Loader with specially designed multi-use fork permits faster, more efficient yard and job-site handling of gypsum wallboard, plywood, lumber, roofing and most palletized materials. Lets your operator cut unloading time by 50%.

Sheet material can be picked up off a truck bed flat – turned on edge, rotated to any position and quickly elevated up to second or third story openings – all in one smooth hydraulically power controlled motion. Saves you time, eliminates labor, prevents costly damage to materials. Mounts behind the cab on any truck, permits full platform usage. Has its own hydraulic stabilizers. Boom rotates 400 degrees – fork rotates 450 degrees – all hydraulically. Handle your mixed loads of "rock", lumber and roofing with one man at any job-site.

Two (2) forged tines, 36" long w/protective tip rollers.

Teflon slide bars.

Adjustable fork spacing, 16" to 60".

Tilt is powered by 4" bore dia. double action cylinder.

Hy-torque orbit motor for full circle rotation of fork.

Hi-strength steel construction.

Self-adjusting automatic brake in knuckle joint to prevent excessive free swing of fork.

52" throat depth.

Manufactured by
PRENTICE HYDRAULICS, INC.
Prentice, Wisconsin

SGP 0028214

Bulletin BH-64111

EXTREMELY VERSATILE UNIT OF RUGGED, EFFICIENT DESIGN . . . *IDEAL FOR AIRPORT OPERATIONS—BUILDING CONTRACTORS—FOR STOCKPILING BY BUILDING MATERIAL SUPPLIERS—ICING RAILROAD CARS—OVERHEAD MAINTENANCE WORK BY MUNICIPALITIES — AND NUMEROUS ADDITIONAL OPERATIONS*

(SINGLE-AXLE APPLICATIONS)*

HEIL

CAPACITY UP TO 6 TONS

MODEL 6T HEILIFT HOIST

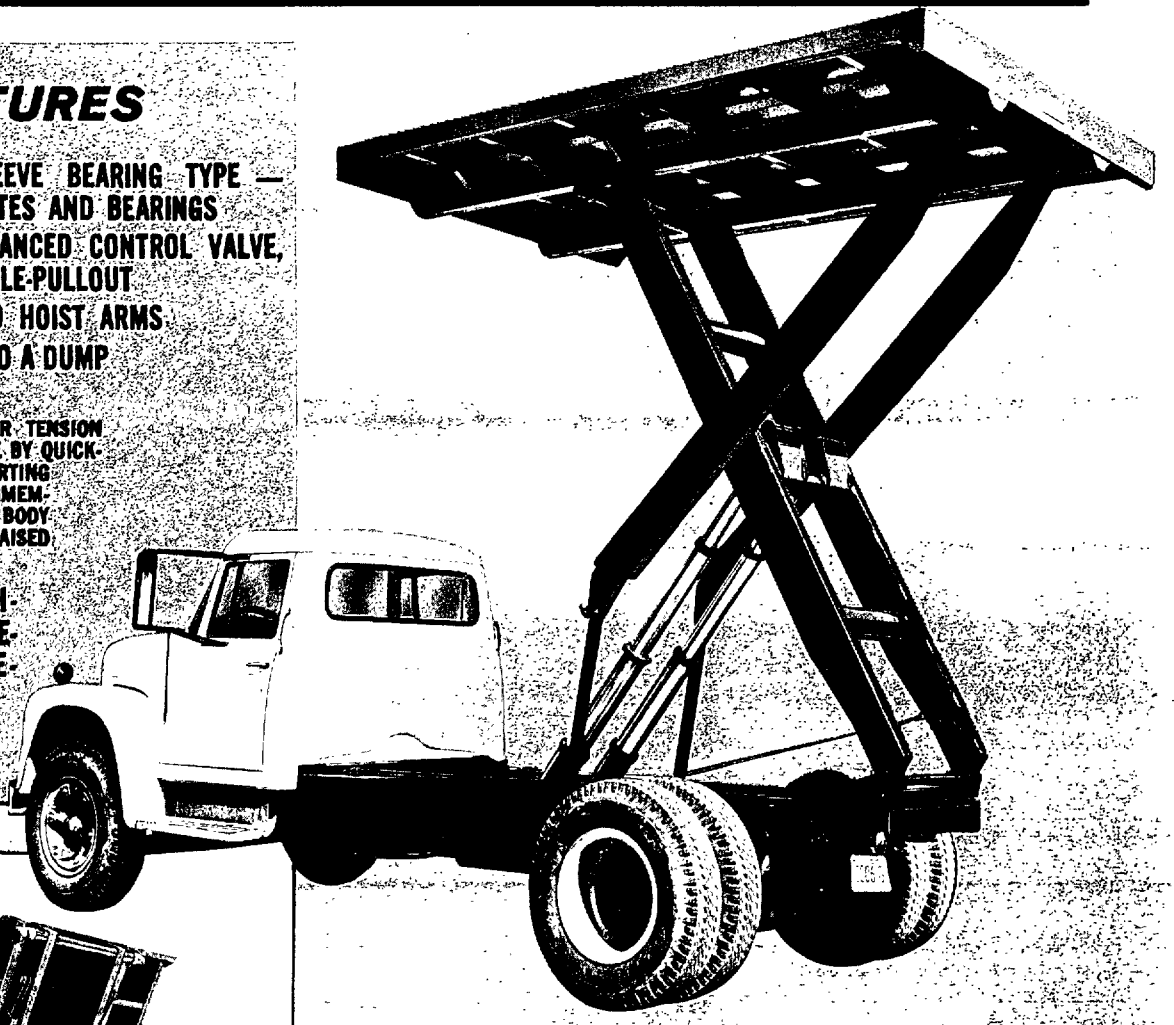
• FOR VERTICAL ELEVATION • FOR HAULING • FOR DUMPING

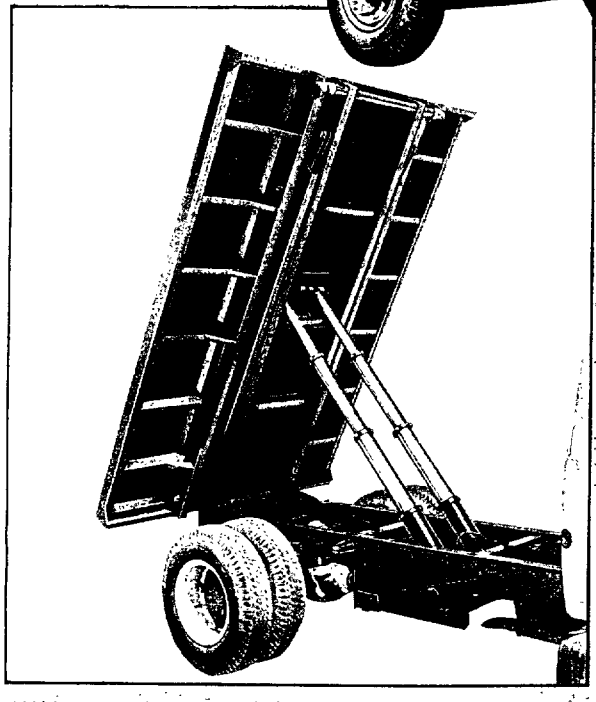
FEATURES

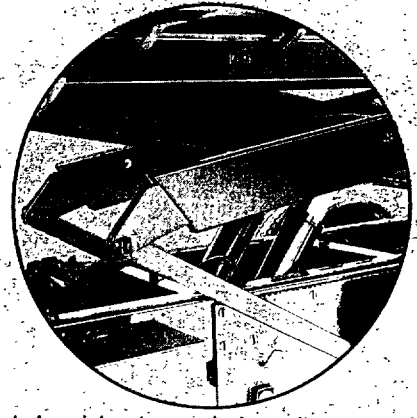
- GEAR PUMP — SLEEVE BEARING TYPE — INTEGRAL WEAR PLATES AND BEARINGS
- HYDRAULICALLY BALANCED CONTROL VALVE, EQUIPPED WITH CABLE-PULLOUT
- HEAVILY REINFORCED HOIST ARMS
- EASILY CONVERTED TO A DUMP UNIT —

  BY REMOVING THE UPPER TENSION LINK PINS, HELD IN PLACE BY QUICK-RELEASE PINS, AND INSERTING THEM IN THE BODY LONGMEMBERS AND ARMS. THE BODY CAN THEN BE QUICKLY RAISED TO A 60° DUMP ANGLE.
- POWERFUL, HIGH-PRESSURE, TWIN-TELESCOPIC HEIL PRECISION-BUILT HOIST

  5" DIAMETER, 3-SLEEVE, 74" STROKE





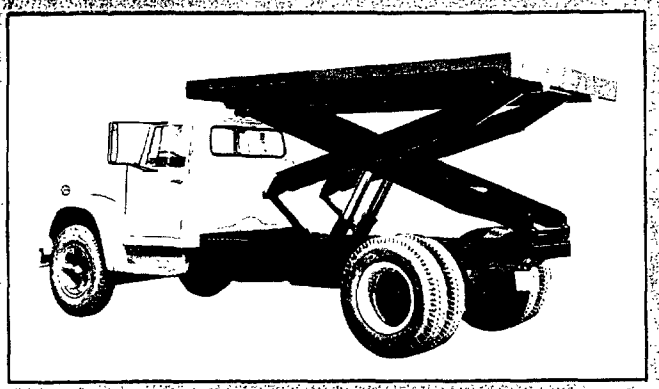


SGP 0028215

Spring loaded, quick release pin is easily removed from upper tension link pin, to adapt unit for dumping.

*NOTE: Proper chassis selection for mounting of Model 6T HEILIFTS is extremely important. Check with The Heil Co. or your local Heil Distributor for G.V.W. spring and frame requirements to suit your particular application.

MODEL 6T HEILIFT

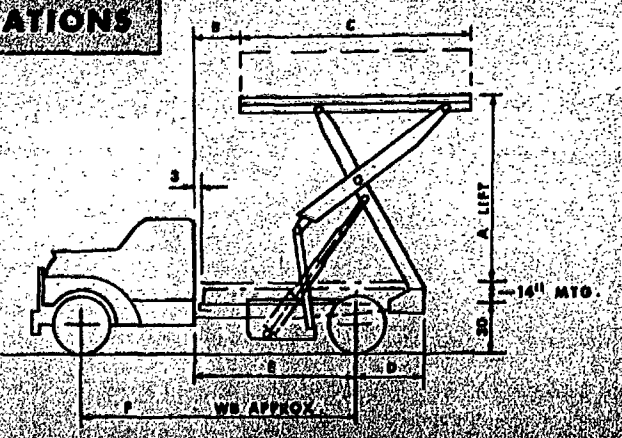


The Model 6T HEILIFT is equally efficient at its fully-raised position as shown above, or at any intermediate position, as shown in the inset. *Check its possibilities for YOUR applications!*

6T HEILIFT SPECIFICATIONS

Net Capacity	12,000 lbs.
Type of Cylinder	Twin Telescopic
Size of Cylinder	5" dia. x 74" stroke
Displacement	1895 cu. in.
Mounting Height	14"
Approximate Weight	*2000 lbs.
Dimension A	118"
Dimension B	19¾"
Body Length C	144" to 168"
Dimension D	38"
Cab to Axle E	102" to 120"
Approximate Wheel Base F	175" to 193"

*Includes Oil



THE HEIL CO.

The company reserves the right under its product improvement policy to change construction or design details and furnish equipment when so altered without references to illustrations or specifications used herein.

SGP 0028216

The World's Most Versatile
Boom Unloader Line . . .

TITAN SERIES HI-LO



Combining the advantages of an open-bed truck, trailer and a continuous swing, elevating boom unloader, completely powered by the truck engine.

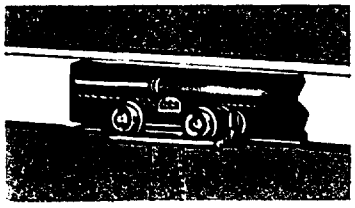
SGP 0028217

SIDE-O-MATIC®

THE ORIGINAL BOOM UNLOADER

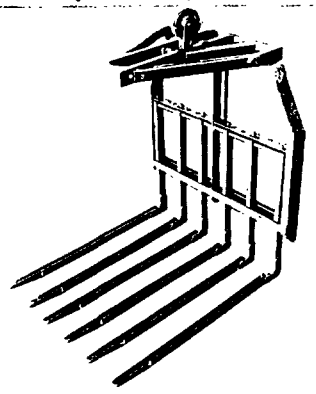
EXCLUSIVE DESIGN FEATURES OF TITAN SERI

1 ROLLER-BEARING BOOM TROLLEY



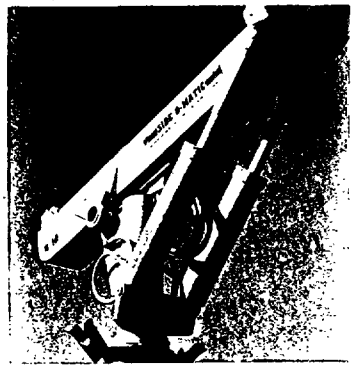
• Powered in both directions hydraulically • Equipped with flow-control valves for speed regulation and safety • Cylinder bottoms at end of travel to eliminate excess strain on trolley cables • Swivel trolley assures longer cable life.

2 SELF-BALANCING FORK (OPTIONAL)



• All-welded, high-strength steel construction • Six tines easily hand adjusted. (Heavy duty two-tine adjustable fork also available.) • Forged Steel tine tips • Improved roller-bearing fork trolley arrangement.

3 TWIN-LIFT CYLINDERS



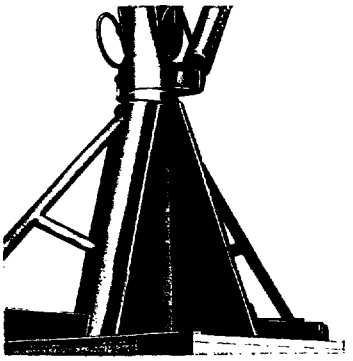
• Engineered to provide maximum lifting power • Assure proper distribution of power to boom.

4 SMOOTH-ACTION HOIST



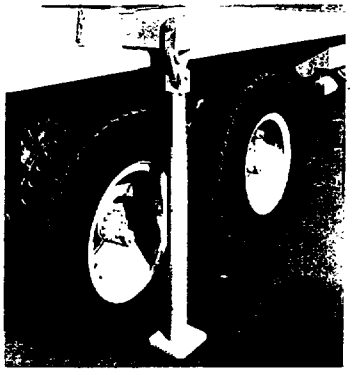
• Hoist is operated by heavy, double-action cylinder • Check valve controls lowering speed • Direct-lift multiple sheave arrangement assures smooth, positive operation.

5 IMPROVED RUGGED PEDESTAL



• Fully enclosed for efficiency, neatness and strength • Single brace permits maximum useable bed space • Pedestal welded to bed at all points for greatest stability.

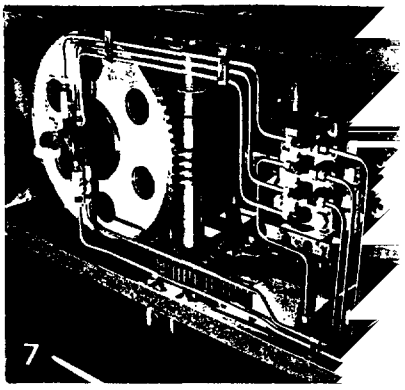
6 SAFETY STABILIZERS (OPTIONAL)

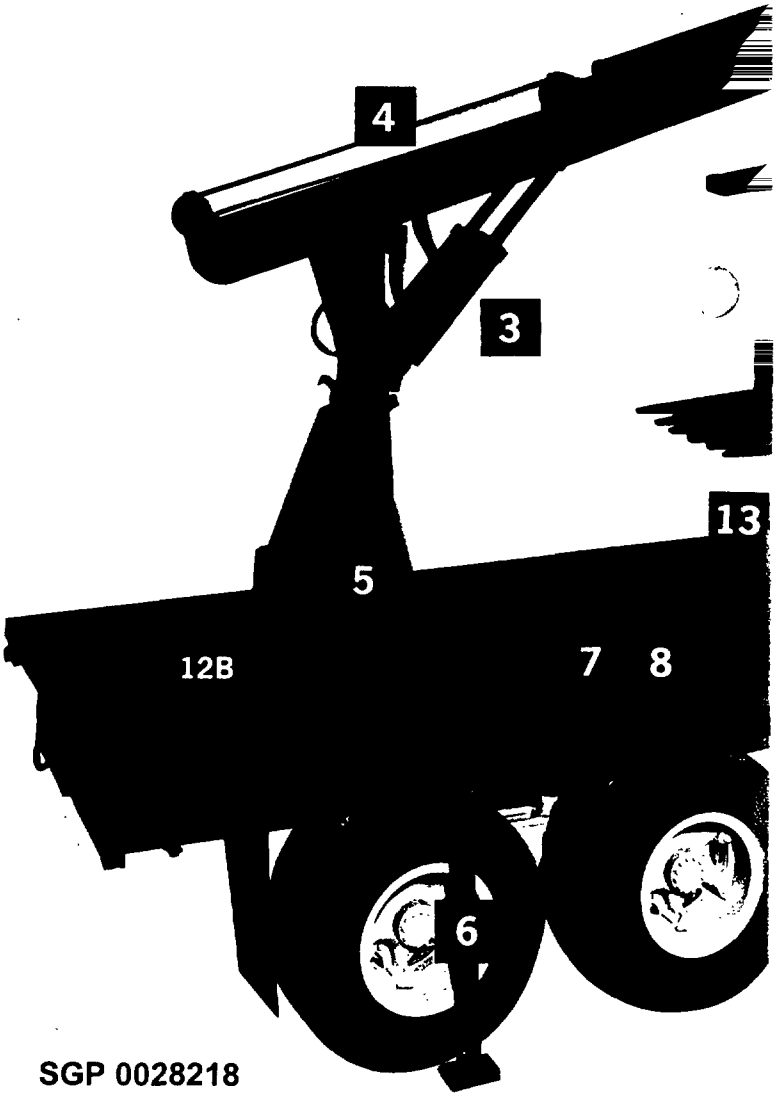


• Prevent injurious bed twist when loading or unloading • All steel, heavily braced • Adjustable to uneven terrain • Easily racked for transit • Hydraulic stabilizers also available.

7 CONTINUOUS TURNING BOOM

• Rotates continuously in either direction • Operated by heavy-duty gear-type oil motor turning steel worm and semi-steel worm gears • Equipped with double-row roller chain and double sprockets with hardened teeth • Self-aligning bearings used on worm shaft and jack shaft • Semi-steel worm wheel has over-size hub for extra load capacity.





SGP 0028218

TITAN SERIES HI-LO UNLOADERS are built in four sizes (see specifications on lengths, boom capacities, heights and depth of lifts, etc.) The complete Side includes the unloader, steel or wood bed, fork, body lights, mud flaps, pump, automatic throttle control. The complete unit is mounted and painted in colors o chassis. Side-O-Matic backs their unloaders with this money-back guarantee—tr loader on your truck for 30 days. If you are not satisfied, your money will be

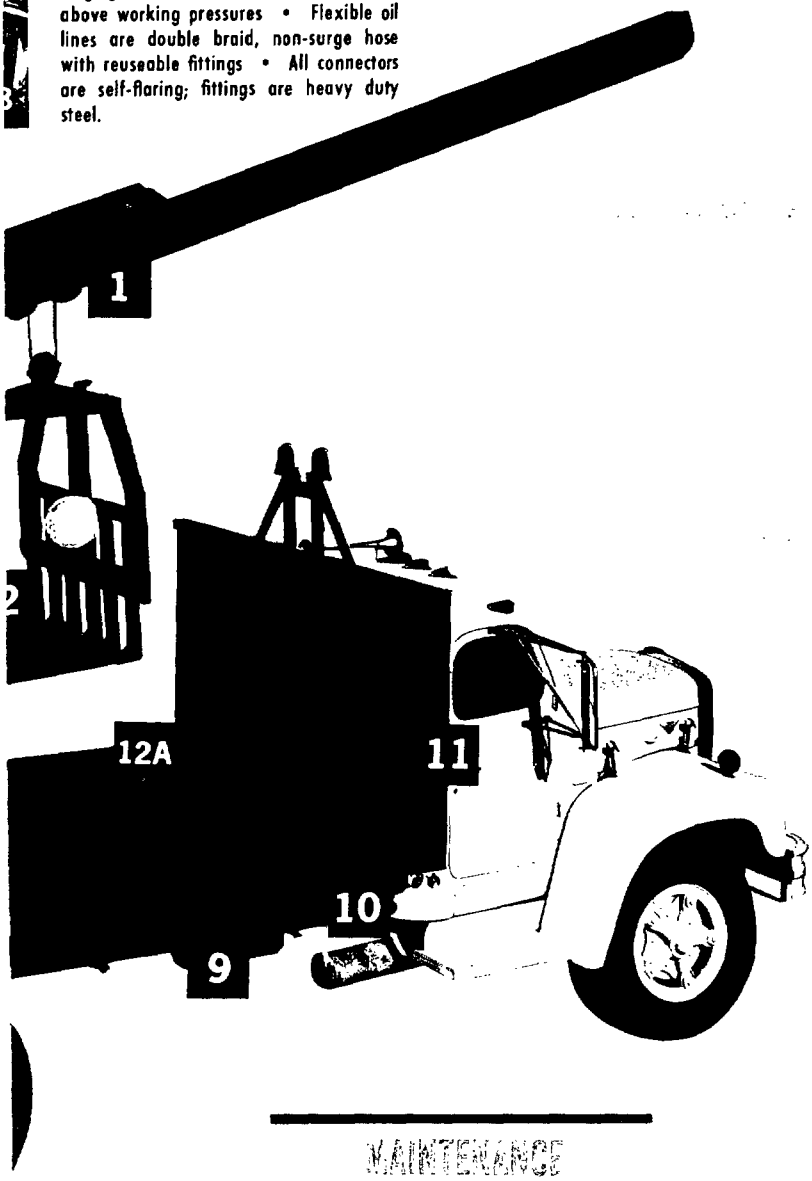
ES HI-LO

SIDE-O-MATIC UNLOADERS

MODELS 40-24, 45-17, 45-21, 60-17

8 NON-SURGE OIL LINES

• Stack type hydraulic control valves, pilot operated, carry oil flow to hoist, trolley, twin boom cylinders and swing motor • All stationary oil lines are J. I. C. Standard Welded Steel hydraulic tubing to eliminate surging and are rated more than 300% above working pressures • Flexible oil lines are double braid, non-surge hose with reuseable fittings • All connectors are self-flaring; fittings are heavy duty steel.

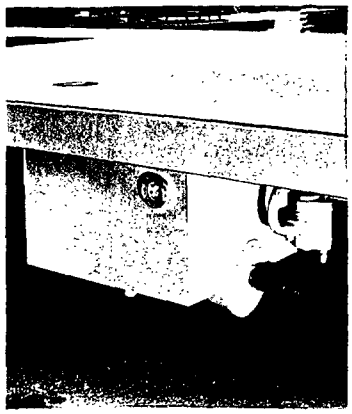


MAINTENANCE

- All moving parts equipped with either ball or roller bearings and Zerk type grease fittings, easily reached for lubrication.
- Swing drive accessable from trap doors in bed.
- SIDE-O-MATIC Service Centers are located throughout the United States, equipped with all tools, spare parts and factory trained personnel, for fast economical service.

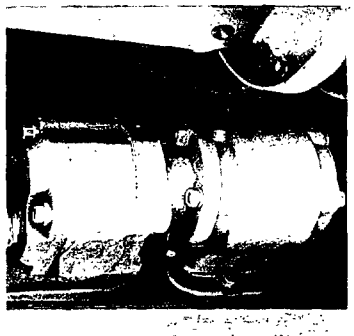
ack page for boom
O-Matic installation
ower take-off, and
your choice on your
a Side-O-Matic Un-
heerfully refunded.

9 TOP-FILLING OIL TANK



• Assures quick, convenient oil replacement • Has built-in reuseable filter and visual oil-level gauge.

10 POWER TAKE-OFF

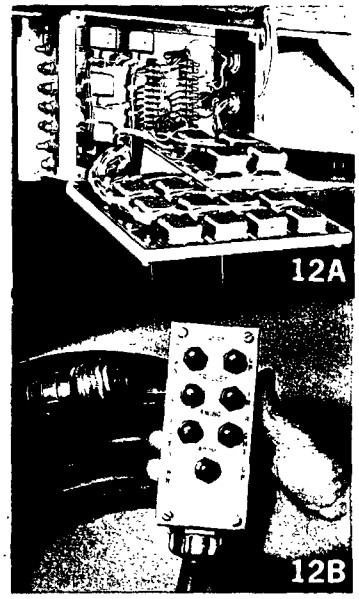


• PTO is mounted on truck transmission which drives heavy-duty gear-type oil pump • Automatic throttle control regulates speed of engine during unloading, permitting engine to idle whenever unloader is not working, but brings it to proper speed whenever unloader is activated • PTO is controlled from inside truck cab.

11 HEAVY-DUTY DASH ASSEMBLY

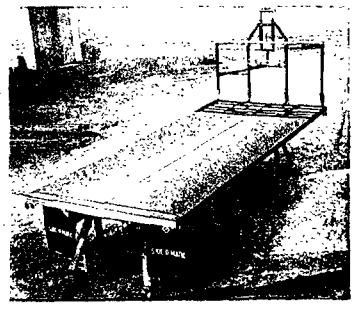
• Fully reinforced for extra strength and long life • Recessed for lift-truck clearance and better rear vision • Improved pin-and-ring fork rack • New steel boom rest for safe road travel.

12 SELECT-O-MATIC CONTROL



• Features two separate control systems • Stationary control (12A), mounted under truck bed, houses relays which operate solenoids and, in turn, actuate oil-flow hydraulic valves • Push-button control (12B), on 25-foot cable enables operator to reach any place fork can reach • Unloader can also be operated from stationary control which also includes emergency button to stop all operations • Operator may control up to three operations at one time with one button.

13 CENTER-PITCHED BED



• Bed has one inch pitch to center to keep loads tight, prevent breakage in transit • Available with steel or wood decking • Heavy-duty, all-steel main frame fully reinforced • Unitized clearance lights, mud flaps, etc.

SGP 0028219

TRUCK AND TRAILER SPECIFICATIONS

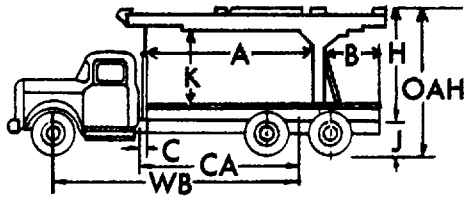
	TRUCK					TRAILER	
Bed Length	13'3"	17'4"	19'3"	21'5"	23'11"	26' to 32'	
Number of Cubes	6	8	8	10	10	12 to 14	
Block Size (Length)	16"	16"	18"	16"	18"	16"	18"
Cube Size (Length & Depth)	48" x 48"	48" x 48"	54" x 48"	48" x 48"	54" x 48"	48" x 48"	54" x 48"
Cab to Axle CA*	120"	135"	150"	150"	165"	—	—
Bed Length-Front of Mast A	101"	150"	168"	150"	168"	150"	168"
Bed Length-Rear of Mast B	48"	48"	54"	97"	109"	152"	170"
Bed Weight (Steel Deck) Lbs.	1580	1980	2160	2390	2630	—	—
Bed Weight (Wood Deck) Lbs.	1200	1550	1700	1900	2120	—	—
Weight of Miscellaneous Tie Downs, Spacers, etc. for Bed Lbs.	200	200	200	200	200	200	200

*Based on truck with conventional cab and Penna. State weight laws. See truck or Side-O-Matic dealer for exact requirements.

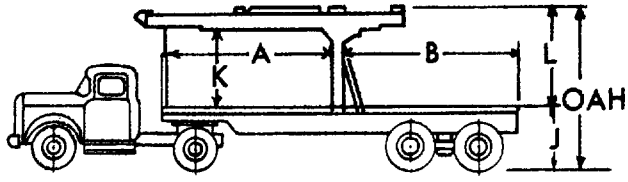
TITAN SERIES HI-LO SPECIFICATIONS

MODEL NUMBER	40-24	45-17	45-21	60-17
*Boom Capacity (Lbs.)	4000	4500	4500	6000
Reach from Center of Mast	24'	17'5"	21'5"	17'5"
Overall Height with Bed (OAH)	H & J	H & J	H & J	H & J
Overall Height for Trailers (OAH)	L & J	L & J	L & J	L & J
Height incl. SOM Bed (H)	100"	100"	100"	101"
Height above Bed (L)	89"	89"	89"	90"
Clearance Height (K)	70"	70"	70"	70"
Elevation of Boom	60°	60°	60°	60°
Depth of excavation fork will reach	16'	15'	16'	15'
Clearance fork to ground (Full Boom UP)	25'	20'	23'	20'
Side-O-Matic Weight (Lbs.) Unit Only	4200	3620	3950	3750
Standard 6-Tine Fork	390	390	390	390
Special 2-Tine Fork	325	325	325	325
Mechanical Stabilizer	460	460	460	460
Hydraulic Stabilizer	500	500	500	500
Hydraulic Oil	170	170	170	170

*Weight of Fork or other Lifting Device must be substracted from this rating to determine maximum payload per lift.



CONVENTIONAL THREE-AXLE CHASSIS



TANDEM AXLE TRAILER

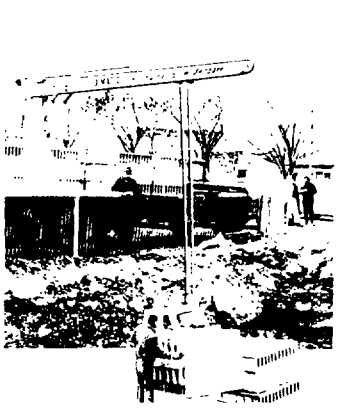
DEALERS THROUGHOUT
UNITED STATES AND CANADA

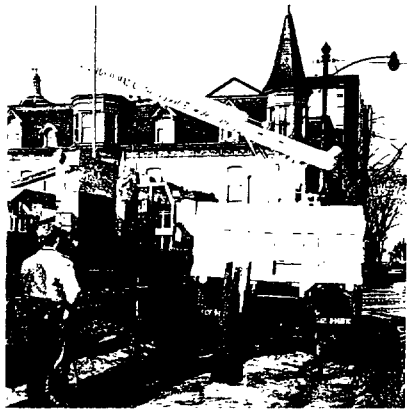
SIDE-O-MATIC®
THE ORIGINAL BOOM UNLOADER

SGP 0028220

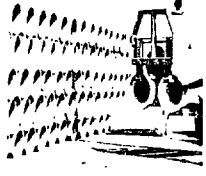
SIDE-O-MATIC UNLOADER CORP.

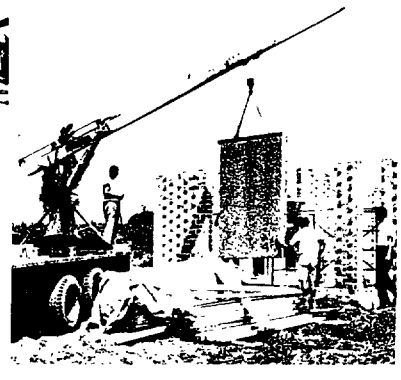
P.O. BOX 1561 / YORK, PA. 17405 / PHONE 717-843-0981



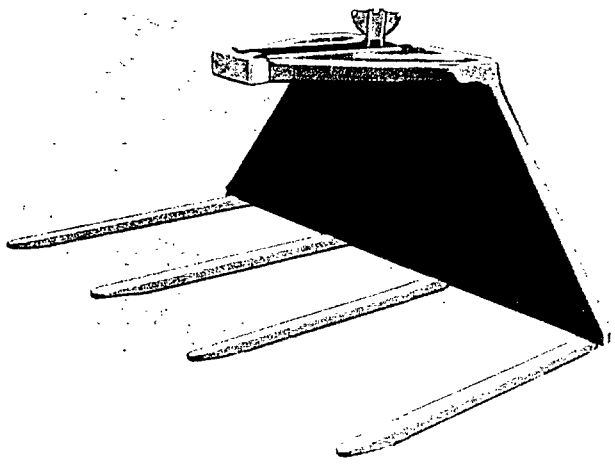




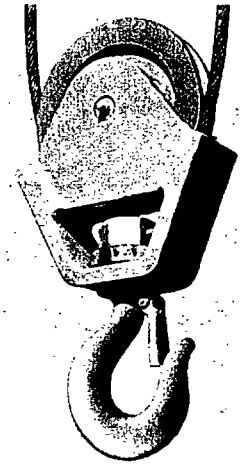




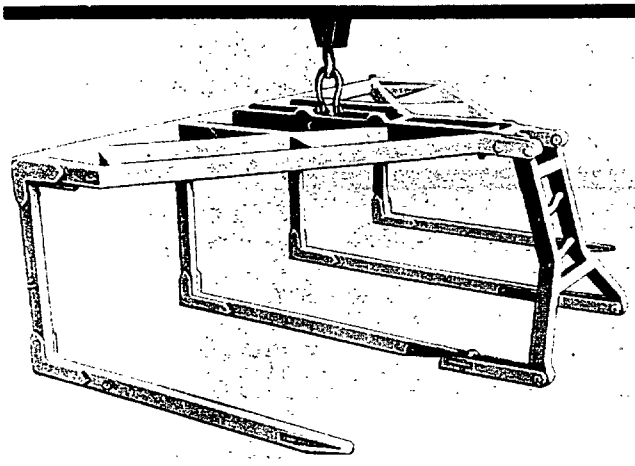
SIDE-O-MATIC FORKS



4-Tine, Solid Back Fork
Application: Bundles of Drywall or Other Building Materials.
Sizes: 28" throat x 42" tine x 6' outside tine center-to-center distance. Tines 1½" W x 2" H.
Capacity—4000 lbs. Weight—375 lbs.

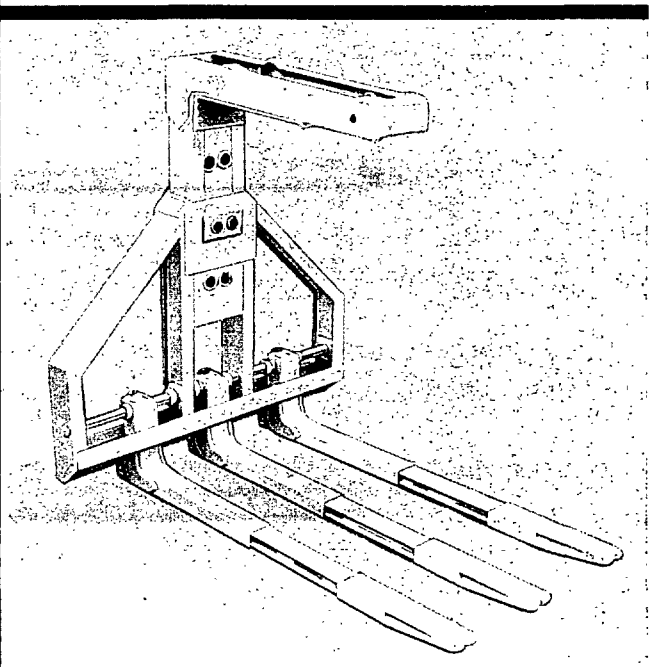


Swivel Lift Hook.
Size of Hook—1½" Throat.
Capacity—6000 lbs. Weight—20 lbs.



Drywall Fork, Variable Angle Style
Application: Bundles of Drywall or Other Building Materials

Sizes: 24" throat x 47" tine length x 90" outside to outside.
Tines: 1½" W x 2" H.
Capacity—4,000 lbs. Weight—600 lbs.



3-Way Adjustable Brick Fork.
Application: Banded or Palletized Brick.
Size: 36" to 50" adjustable throat height in 7" increments; 35" to 48" adjustable tine length in 2⅝" increments; 17" to 36" adjustable tine spread. Center tine detachable.
Capacity—4,000 lbs. Weight—275 lbs.

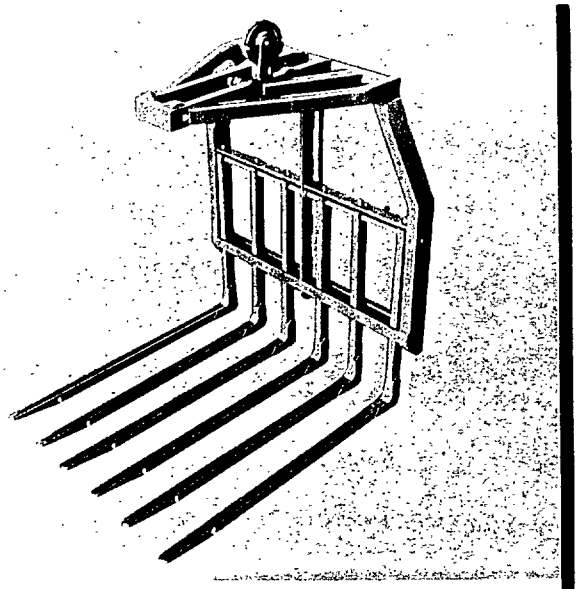
THE ORIGINAL BOOM UNLOADER

SGP 0028221

SIDE-O-MATIC UNLOADER CORP.

P.O. BOX 1561 YORK, PA 17405 PHONE 717—845-1555

SIDE-U-MATIC FORKS



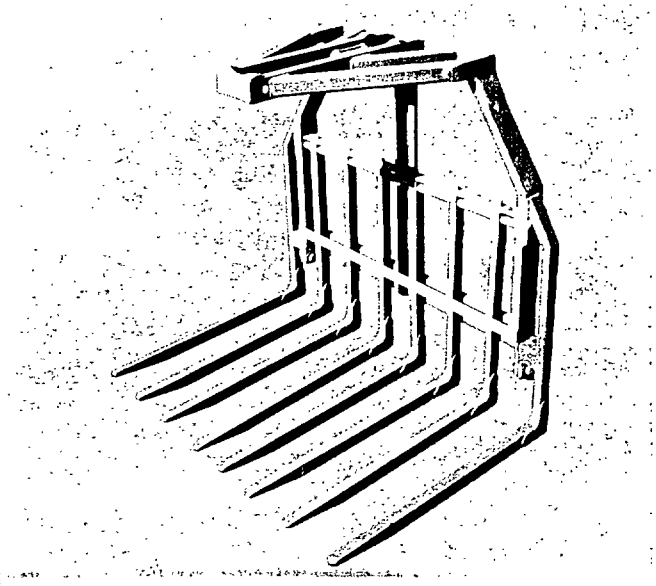
TYPE 1 Standard Six-Tine Adjustable Fork.
Application: Standard Block Cubes (40 x 48 or 48 x 48)

Type	Throat Height	Tines L x W x H	Capacity Lbs.	Weight Lbs.
1A	44"	39" x 1½" x 2"	6000	390
1B	44"	47" x 1½" x 2"	6000	410
1C	50"	39" x 1½" x 2"	6000	410
1D	50"	47" x 1½" x 2"	6000	425

Other sizes quoted on request.

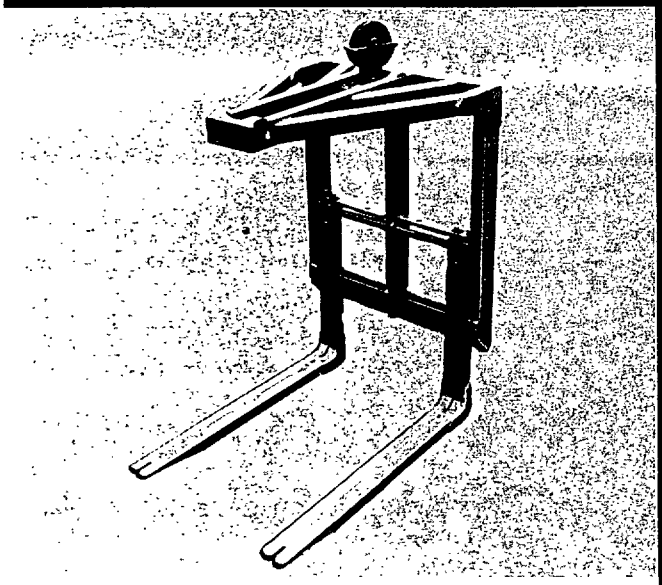
TYPE 2 Small Six-Tine Adjustable Fork.
Application: Small block cubes (40 x 48—4 Blocks High).

Type	Throat Height	Tines L x W x H	Capacity Lbs.	Weight Lbs.
2	36"	39" x 1½" x 2"	6000	375



TYPE 3 2 Add-On Tines. (One per side) Used with Standard 6-Tine Fork (Type 1).
Application: 4-Block Wide Cubes or for Bundles of Lumber.
Sizes: Outside Tines center-to-center distance 72" or to fit 4-block wide cubes. Tine length same as regular fork. Capacity of complete fork—6000 lbs. Total weight—75 lbs. plus weight of Type 1 Fork.

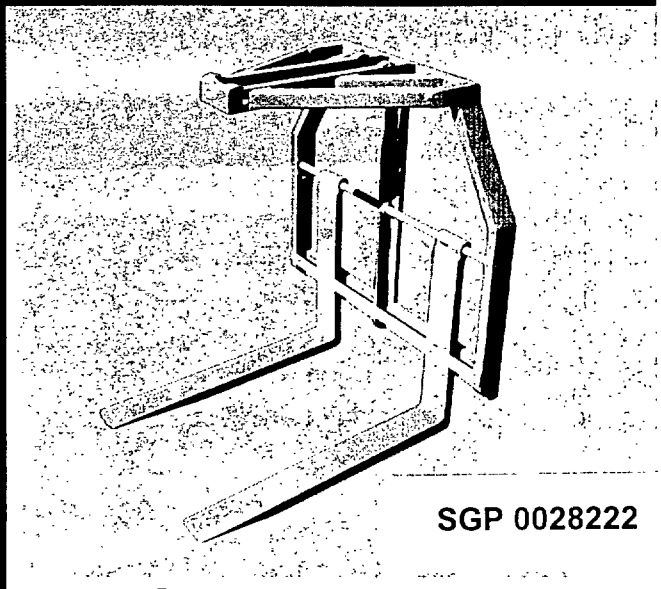
TYPE 4 4 Add-On Tines (2 per side). Used with Standard 6-Tine Fork (Type 1).
Application: 5-Block Wide Cube or for Extra Large Lumber Bundles.
Sizes: Outside Tines center-to-center distance 71" for removable tines and 96" for solid frames type. Tine spacing of add-on tines is fixed at time of manufacture.
Capacity of complete fork—6000 lbs. Total weight—150 lbs. plus weight of Type 1 Fork.



TYPE 5 Two-Tine Adjustable Fork.
Application: Packaged Brick and Pallets.

Type	Throat Height	Tines L x W x H	Capacity Lbs.	Weight Lbs.
5A	44"	38" x 3½" x 2"	4000	390
5B	36"	40" x 3½" x 2"	4000	375

Other sizes quoted on request.



SGP 0028222

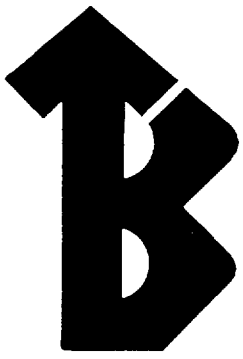
TYPE 6 Two Flat Tine Adjustable Fork.
Application: Low Clearance Pallets.

Type	Throat Height	Tines L x W x H	Capacity Lbs.	Weight Lbs.
6A	36"	30" x 3" x 1¼"	2000	375
6B	50"	48" x 4" x 1¾"	6000	390

(Other sizes on request varying from 2000 to 6000 lbs. capacity, 36" to 50" throat height, 30" to 48" tine length, 3" to 6" tine width, and 1¼" to 1¾" tine height.)

BUCK

automatic/manual portable medium and heavy-duty HOISTOWERS



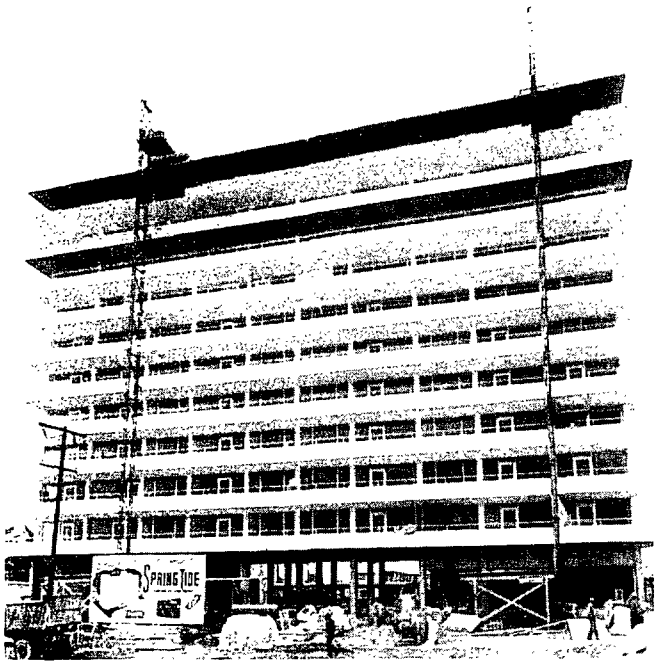
Manufactured By The

BUCK EQUIPMENT CORPORATION

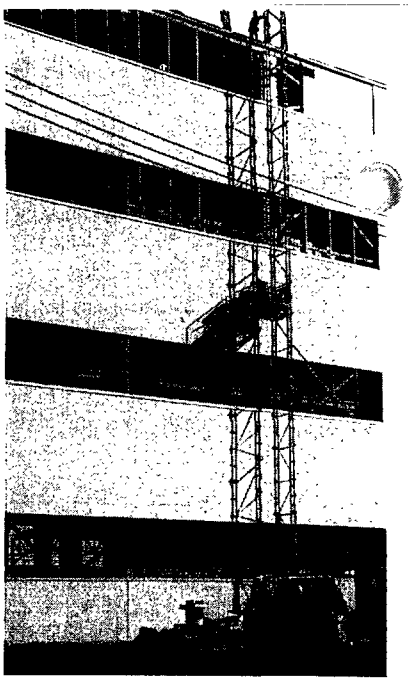
A Subsidiary of Royal Industries, Inc.

720 ANDERSON FERRY ROAD
CINCINNATI, OHIO 45238 • TELEPHONE: 471-8580
Cable Address: Buckhoist

SGP 0028223



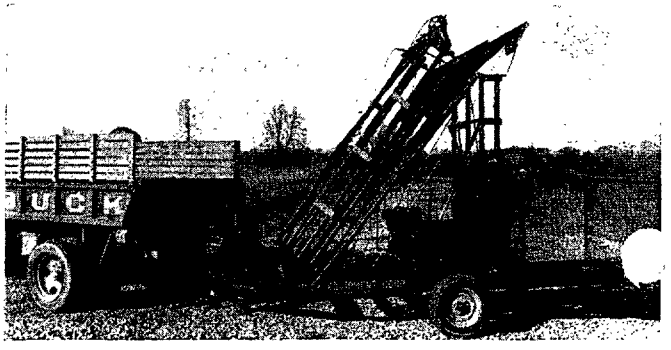
Two Buck Hoisting Machines, delivering pay loads that reached up to a height of ten stories in construction of a Ft. Lauderdale, Florida apartment building.



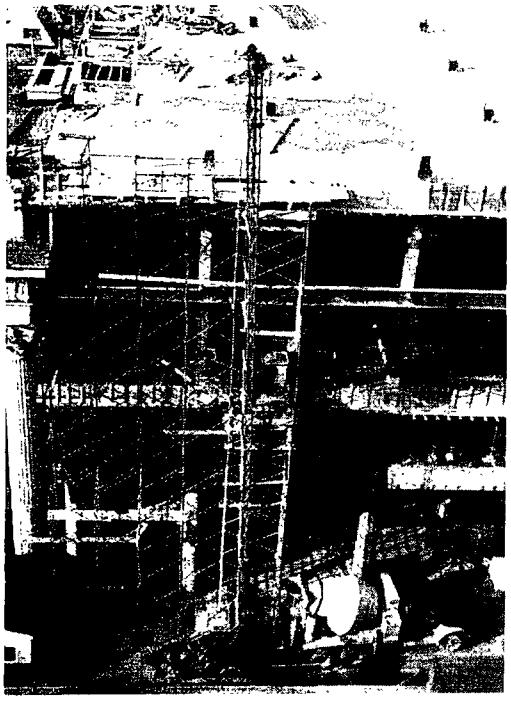
Sheet metal and roofing contractors, on the Allis-Chalmers job in Terre Haute, Indiana. Roofing gravel, roof insulation, felt, and hot roofing pitch all went up on the Buck.

on the job with BUCK HOISTOWERS

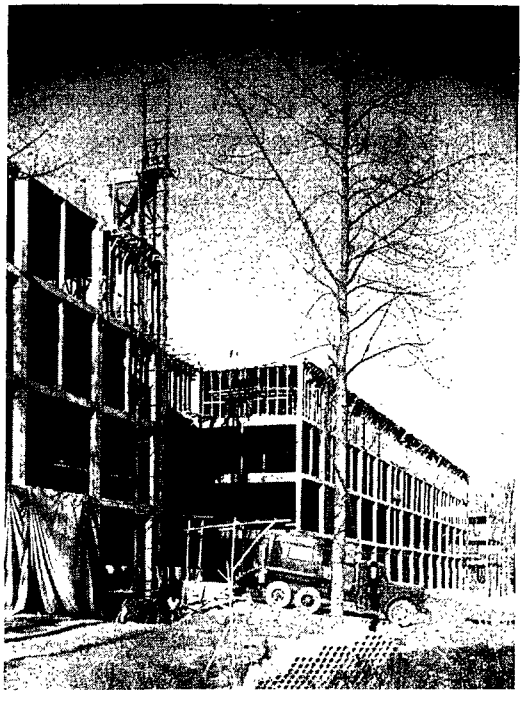
BUCK HOISTOWERS ARE READY TO GO ANYWHERE — FOR ANY JOB



Trailer mounted on its own base with retractable pneumatic tired wheels. Easily towed to job site.

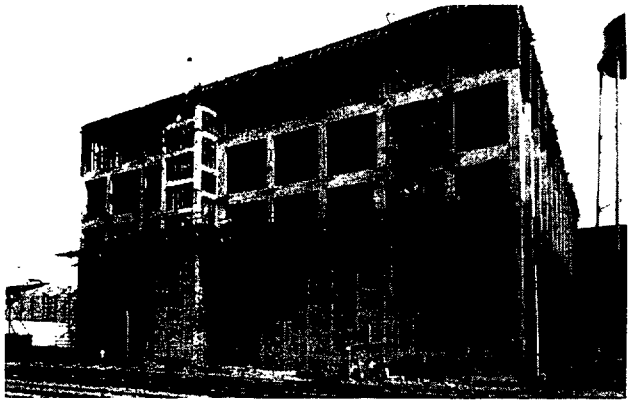


Austin Company pours 240 cubic yards slab in less than 8 hours in Dayton, Ohio.

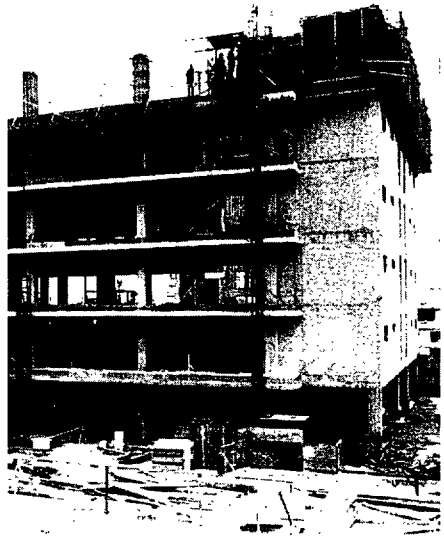


SGP 0028224

Buck Hoistowers in pits speed construction of the operations office building for the Government Employee Insurance Company of Bethesda, Maryland.

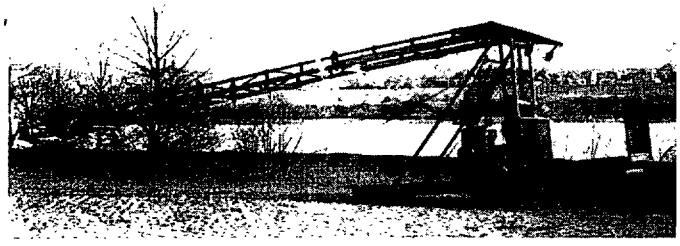


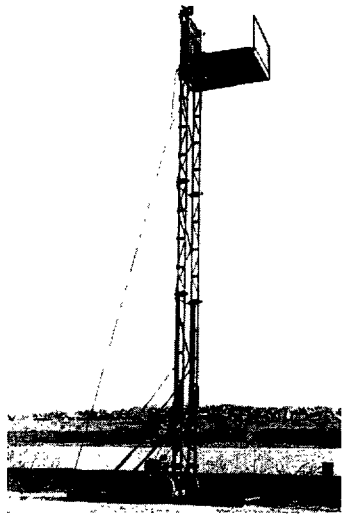
The job for Hiram Walker gets material to workmen on time and at top speed constructing a rack house for storage. The building itself, over 100 feet high and approximately 200 feet square, required a steady flow of brick and mortar to keep work moving. The tower of the hoist rose to 90 feet, servicing all completed floors rapidly.



The Buck Manhoist is particularly suited for multi story high rise buildings as the most efficient method of getting men and materials to the job.

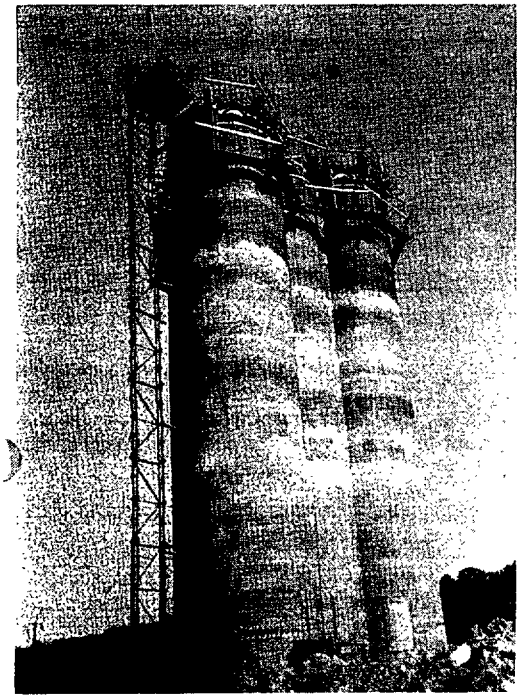
Self erecting—as tower goes up the retractable wheels automatically raise, lowering the base for operation of the Buck Hoistower—in minutes after arrival on the job.





Ready rigged—ready to go. All cables are galvanized and fitted with swedged fittings except hoisting cables.

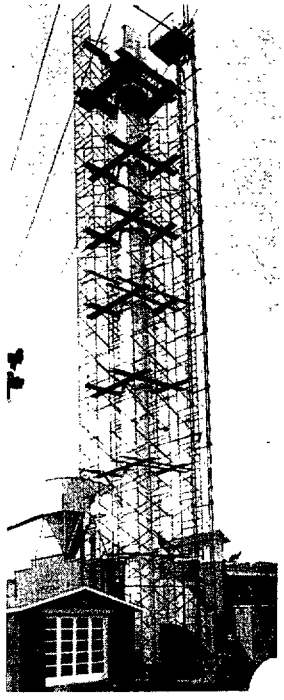
IT IS ALL DONE BY ONE MAN.



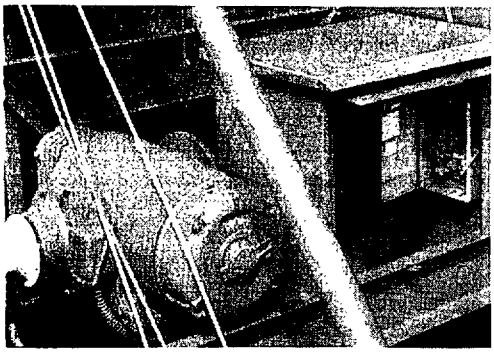
Building multiple silos is a specialty of a New York Contractor. Ranging from 14 ft. to 32 ft. in diameter. They have been erected by this company throughout North and South America and as far away as Australia.

SGP 0028225

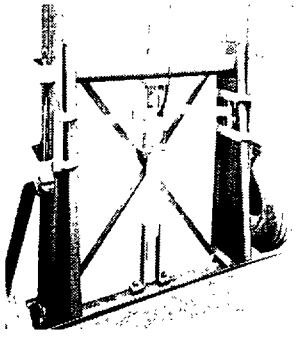
The job was raising the top of a smoke stack the diameter of which was 6 ft. The whole 165 ft. stack was in place by the next week-end.



MODEL AE2M

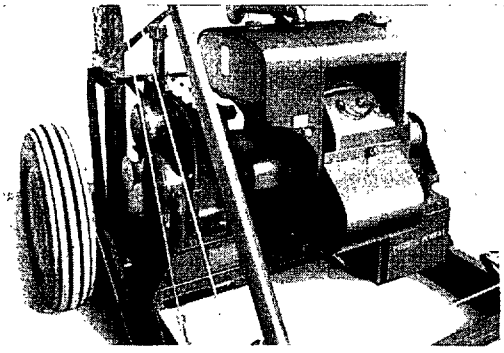


- ELECTRIC POWERED
- AUTOMATIC—ELECTRIC CONTROLLED
- 2000 TO 2500 LB. CAPACITY



SAFETY DEVICE: Spring loaded, serrated safety shoes are activated and will stop to hold platform in case of cable failure or whenever cable becomes slack.

MODEL GA25H

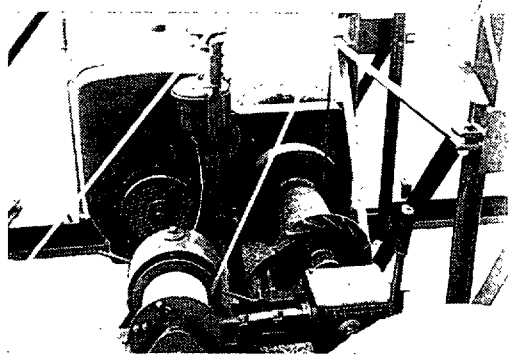


- GASOLINE POWERED
- AUTOMATIC—ELECTRIC CONTROLLED
- 2500 LB. CAPACITY

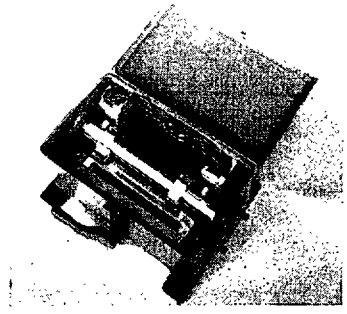


PUSH BUTTON OPERATION with stop locking switch.

MODEL GM20



- GASOLINE POWERED
- MANUALLY OPERATED
- 2000 LB. CAPACITY



FLOOR SELECTOR to and from any floor or height by simply pressing a button.

SPECIFICATIONS	AUTOMATIC		MANHOIST
MODEL	GA25H	AE2M	PC11M
POWER	Gasoline Wisconsin VH	Electric Specify Voltage	Electric 220/440/3/60
HP	25	5, 7½, or 15	15
PLATFORM CAPACITY	2500 Lbs.	2000 to 2500	8-11 Passengers 2000 Lbs.
HOISTING SPEED FPM	160	65-150	115
HOIST DRIVE	Electric Magnetic	Elec. Reversible Motor	Worm Gear
CONTROL	Automatic	Automatic	Automatic
PLATFORM SIZE	5'6" x 6'6"	5'6" x 6'6"	5' x 6'
FLOOR LOCKING DEVICE	Stop Locking Switch	Stop Locking Switch	Motor Brake - additional detailed specifications on request.
APPROX. WEIGHT WITH STD. 25' TOWER	5050	4300	7200
WHEELS	7:50 x 16	7:50 x 16	7:50 x 16 10 Ply
ROAD TRAVEL DIMENSIONS	W 6'10" x L 18' x H 12'3"	W 6'10" x L 18' x H 12'3"	W 7'2½" x L 20'10½" x H 12'1"
TOWER HEIGHT	Up to 200 Ft.*	Up to 200 Ft.*	Up to 300 Ft.*

GENERAL

*TOWER HEIGHT—100' and higher. Self erecting to 45' unloading height. Additional tower sections in 5' and 10' lengths.

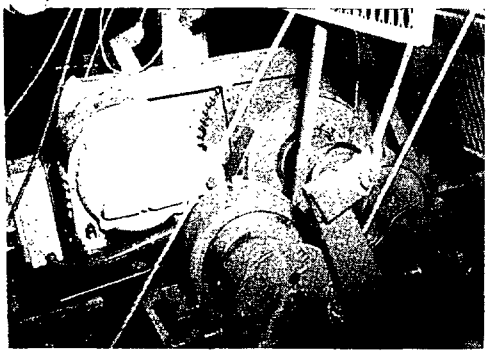
TOWER CONSTRUCTION—Constructed of steel tubing; electric steel castings. All sections electric steel welded.

READY RIGGED—All cables are in place . . . no need to re-rig . . . ready to go. All cables are galvanized and fitted with swaged fittings except material hoist cables.

SGP 0028226

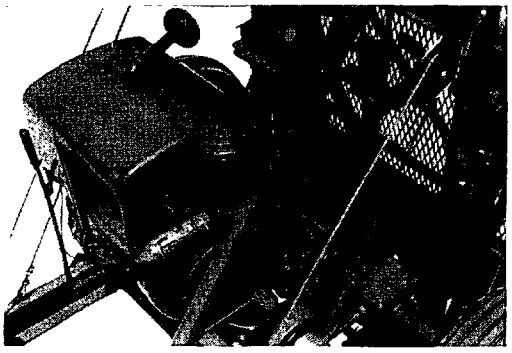
nually Controlled HOISTOWERS

MODEL E2M



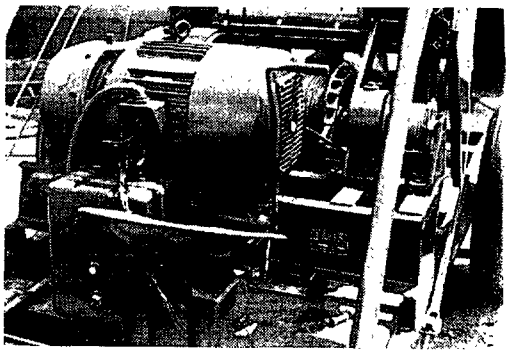
- ELECTRIC POWERED
- MANUALLY OPERATED
- 2000 TO 2500 LB. CAPACITY

MODEL V2M



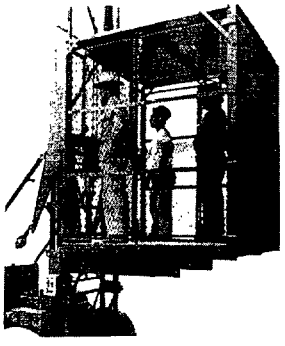
- GASOLINE POWERED
- MANUALLY OPERATED
- 2500 LB. CAPACITY

MODEL E-4M



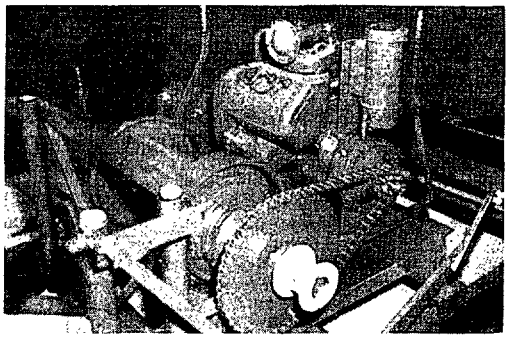
- ELECTRIC POWERED
- MANUALLY OPERATED
- 4000 LB. CAPACITY

MODEL PC11M



THE BUCK MANHOIST saves you valuable "paid for" workers' time on the job. (Brochure on request)

MODEL V4M



THE V4M HOIST ASSEMBLY with large grooved drum, oversized brake and 35 or 60 H.P. V-4 engine offers outstanding power and reliability.

MANUAL

GM-20	V2M	E2M	V4M35	V4M60
Gasoline Wisconsin TH	Gasoline Wisconsin VH	Electric Specify Voltage	Wisconsin VG-4-D	Wisconsin V-460-D
15	25	5, 7½, 10, or 15	35	60
2000 Lbs.	2500 Lbs.	2000 to 2500	4000 Lbs.	4000 Lbs.
125	170	65-150	150	240
Twin Disc Clutch	Twin Disc Clutch	Twin Disc Clutch	Twin Disc Clutch	Twin Disc Clutch
Manual	Manual	Manual	Manual	Manual
5' x 6'	5'6" x 6'6"	5'6" x 6'6"	6½ x 6½ Std.	6½ x 6½ Std.
Ratchet Lock w/Weighted Pawl	Ratchet Lock w/Weighted Pawl	Ratchet Lock w/Weighted Pawl	Ratchet Lock w/Weighted Pawl	Ratchet Lock w/Weighted Pawl
3775	4400	4200	6055	6150
6:50 x 16	7:50 x 16	7:50 x 16	7:50 x 16 10 Ply	7:50 x 16 10 Ply
W 6'6" x L 18' x H 12'3"	W 6'10" x L 18' x H 12'3"	W 6'10" x L 18' x H 12'3"	W 7'2½" x L 20'10½" x H 12'1"	W 7'2½" x L 20'10½" x H 12'1"
Up to 200 Ft.*	Up to 200 Ft.*	Up to 150 Ft.*	Up to 300 Ft.*	Up to 300 Ft.*

MODELS

SGP 0028227

PORTABLE—Mounted on its own trailer with retractable heavy duty pneumatic tires and wheels.

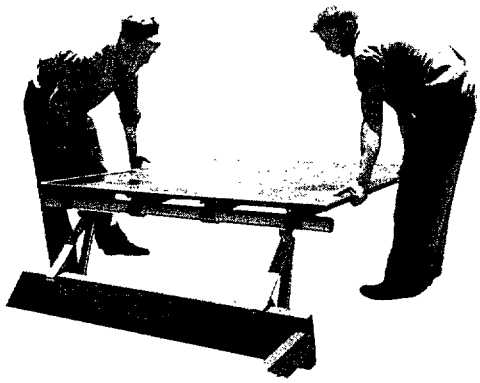
PELICAN MODELS—Mounted on your own truck.

SPECIAL CHARACTERISTICS—Consult Factory for special horsepower or speed requirements and oversized platforms.

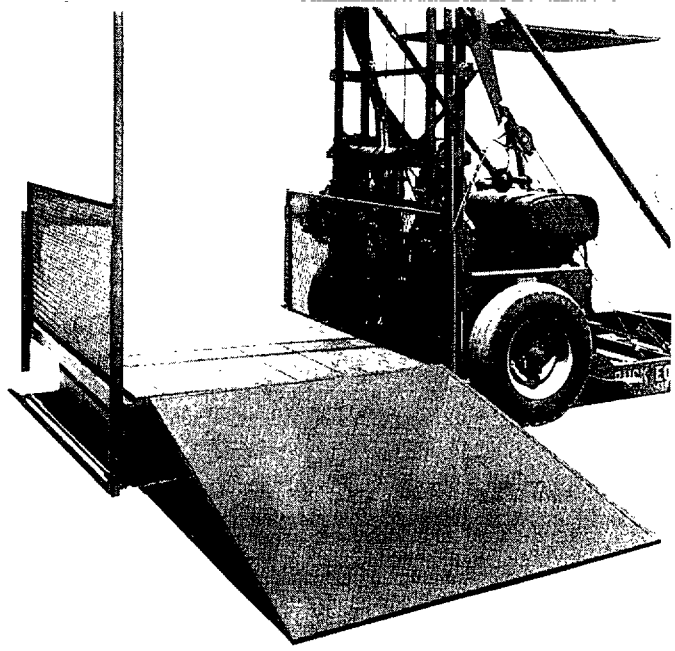
inest Construction Equipment

BUCK Pre-fabricated RAMP saves Time and Labor on the job

Standard loading ramp fits any trailer mounted Hoistower. Facilitates and speeds up platform loading. Hooks on either side of the machine base. Can be transported right along with the Hoi-stower.

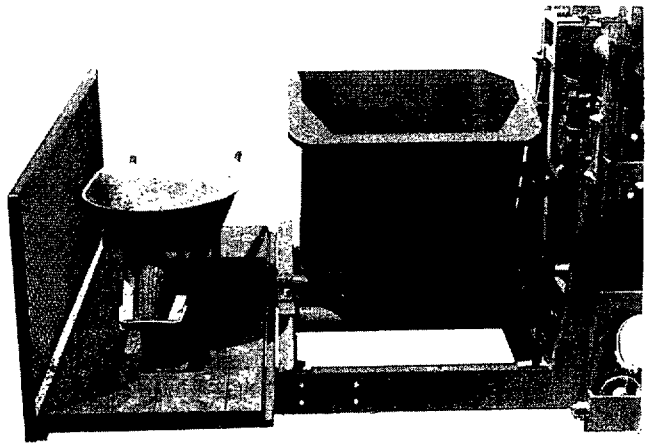


WORKS EASY Two men simply lift and hook the Ramp in place — no bolts or nuts necessary.



BUCK accessories

Get MORE SAFE and CONVENIENT man hours–when these job-minded BUCK ACCESSORIES save you time, cut *your* costs.

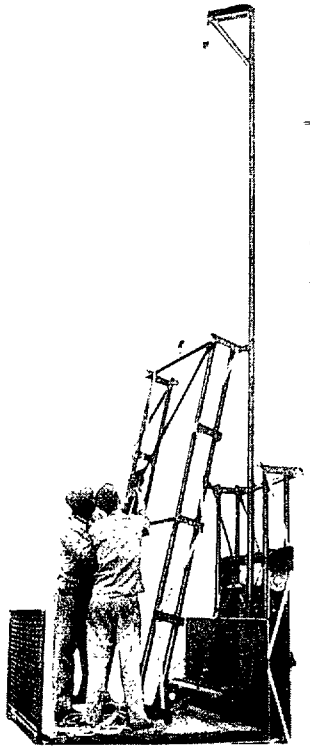


Doubleheader POOP DECK

Platform extension — easily added to the standard bucket undercarriage — forms a Poop Deck which makes the Hoistower doubly useful.

The Poop Deck, built of the same top-quality materials that go into the Buck Platform, is wide enough to accommodate one wheelbarrow.

Allows contractors to hoist loads of masonry and other materials between concrete loads . . . *without changing the Platform.*



Going up . . . 100 feet plus . . . with the GIN POLE!

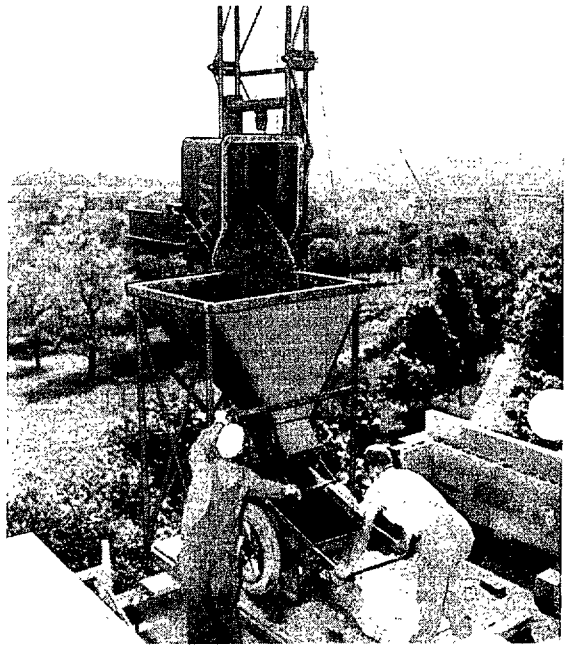
A working height of 100 ft. or more can be attained with your Buck Hoistower by adding 5 ft. or 10 ft. sections with the GIN POLE. Two men can do the job safely, efficiently. The GIN POLE slips into a platform bracket already provided.

CONCRETE . . . where and when you need it . . .

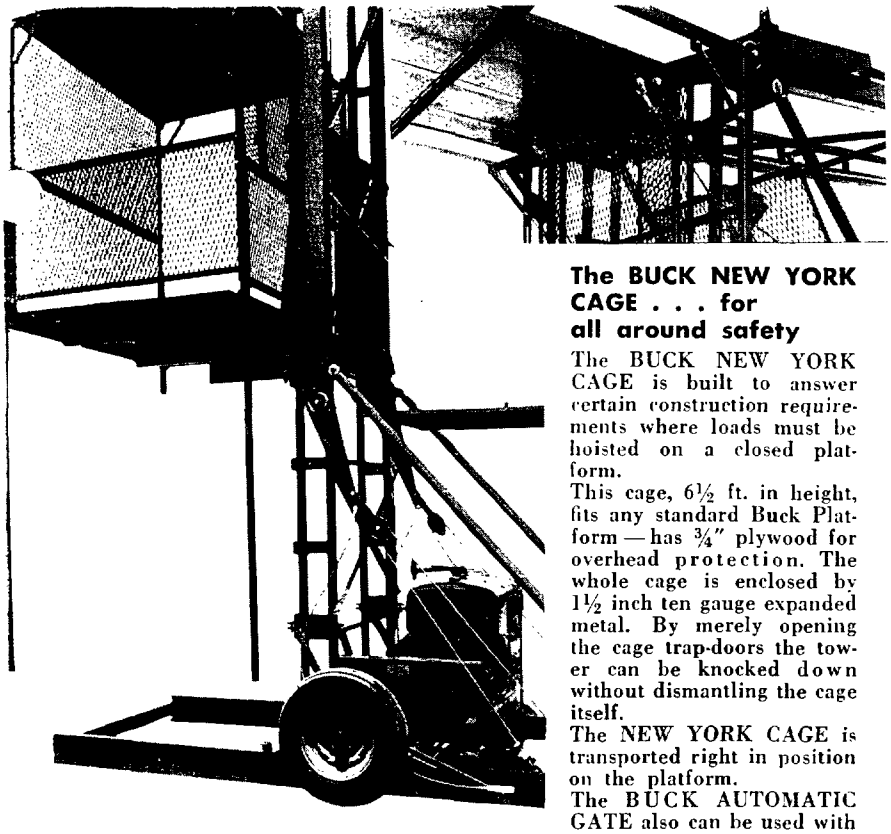
Automatic, clean-dumping CONCRETE BUCKET.

The "magic-hand" makes this a self-dumping bucket . . . allows concrete to be dumped at any pre-selected height.

Standard capacities: 14, 17, and 27 cu. ft.



SGP 0028228



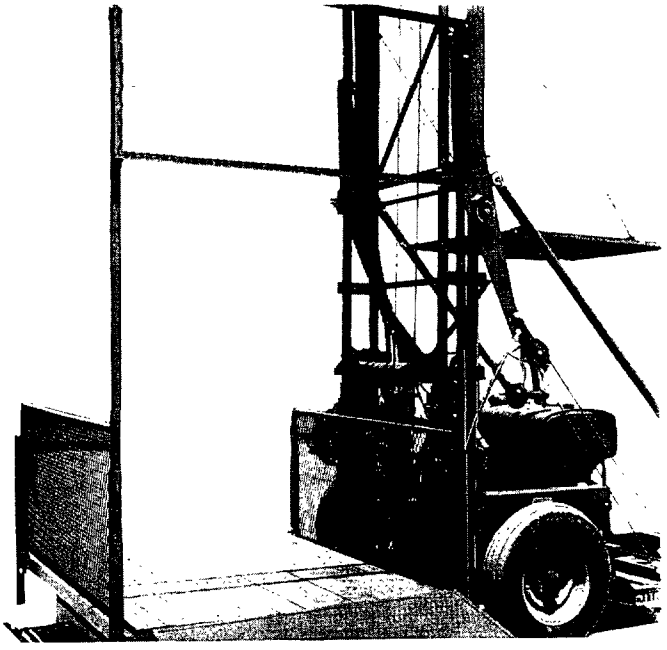
The BUCK NEW YORK CAGE . . . for all around safety

The BUCK NEW YORK CAGE is built to answer certain construction requirements where loads must be hoisted on a closed platform.

This cage, 6½ ft. in height, fits any standard Buck Platform — has ¾" plywood for overhead protection. The whole cage is enclosed by 1½ inch ten gauge expanded metal. By merely opening the cage trap-doors the tower can be knocked down without dismantling the cage itself.

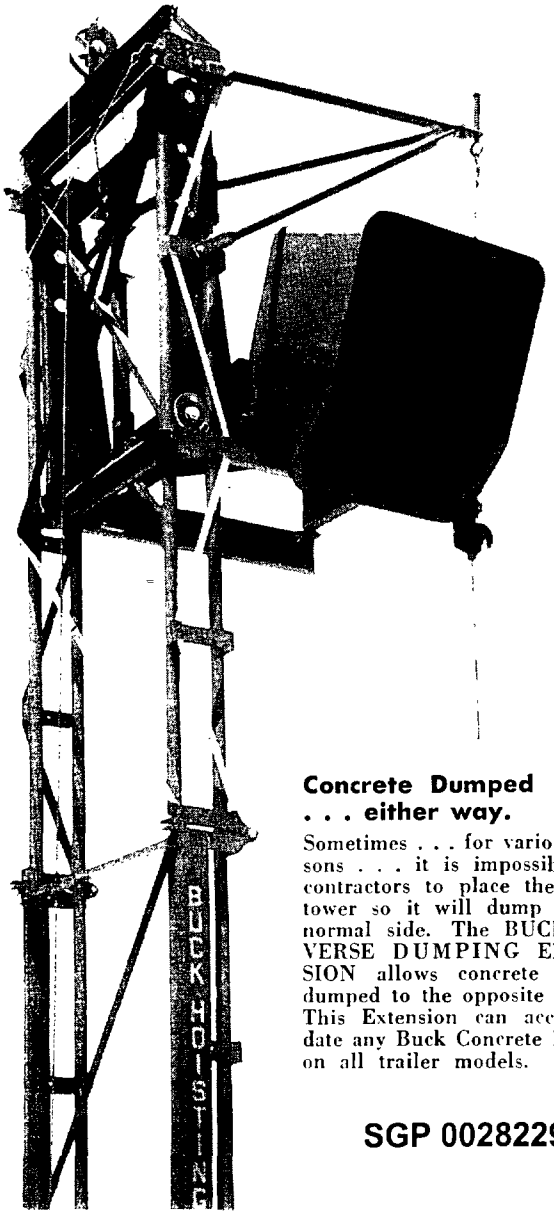
The NEW YORK CAGE is transported right in position on the platform.

The BUCK AUTOMATIC GATE also can be used with the cage.



BUCK AUTOMATIC GATE . . . built for hoisting safety

Closes *automatically* when the platform rises . . . opens *automatically* when the platform lowers. Fits either side of the Buck Platform. Can be installed to fit the Buck platform you are using right now. If ordered with the purchase of a machine the gate fittings will be installed at the factory. If ordered separately for field attachment the fittings will be supplied.

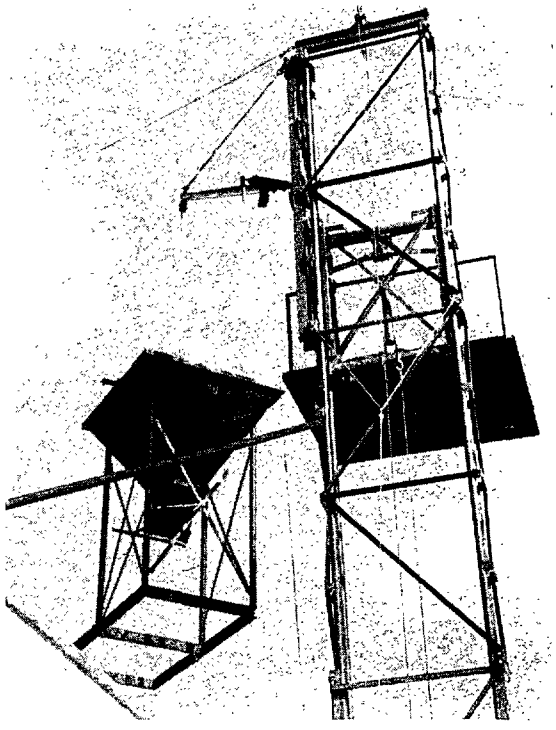


Concrete Dumped . . . either way.

Sometimes . . . for various reasons . . . it is impossible for contractors to place the Hoistower so it will dump to the normal side. The BUCK REVERSE DUMPING EXTENSION allows concrete to be dumped to the opposite side.

This Extension can accommodate any Buck Concrete Bucket on all trailer models.

SGP 0028229



The CHICAGO BOOM . . . the answer to extra-long material hoisting problems

Special loads of reinforcing rods, steel members, pipes, heating ducts and many other bulky items are easily handled with the BUCK job-tested CHICAGO BOOM. The Boom has a rated capacity of 1000# . . . will hoist materials to the height at which the machine is working.

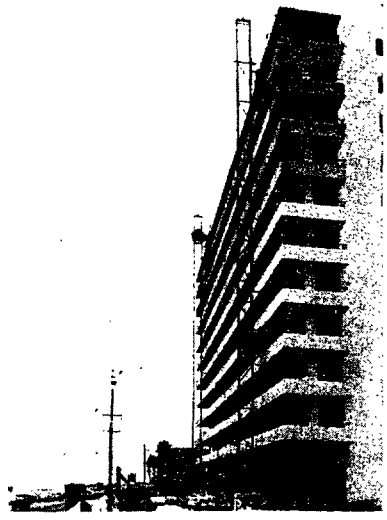
Versatility allows the Boom to be used with the platform in place, with the bucket and/or the Poop Deck installed.

Special Applications: Boom can be used for minor below-grade excavating . . . steel setting . . . machinery setting . . . tank relining.

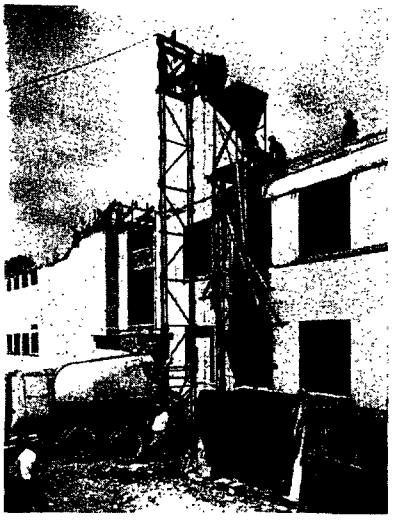
BUCK Heavy-Duty Hoistowers have hundreds of uses for:

- General Contractors
- Masonry Contractors
- Bricklayers
- Plasterers
- Flooring Contractors
- Roofing Contractors
- Salvage Companies
- Equipment Movers
- Wrecking Companies
- Ready Mix Concrete Companies
- Moving and Storage Companies

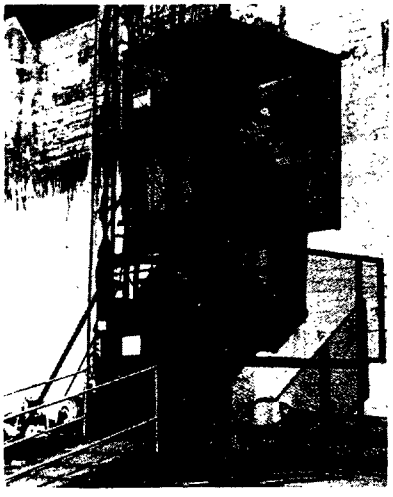
and many other industries where hoisting and lifting of men and material is required.



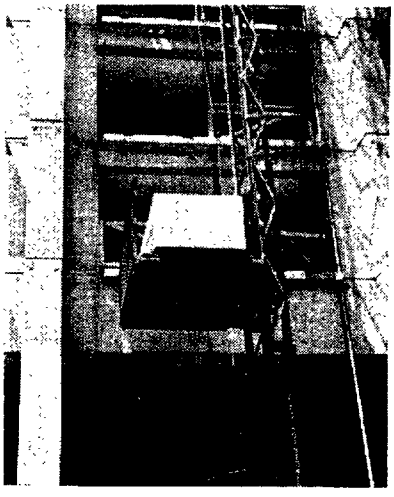
Skyscraping at the 10-story level. Self-erecting to 45 ft. Extra sections —added after tower is raised—take the loading height up to—you name it.



Concrete pouring with the 17 cu. ft. concrete bucket. Puts concrete where and when it's needed. Self dumping, it reduces manpower necessary to maintain steady flow of concrete.



Buck Manhoist descending to loading platform at a shipyard drydock installation.



Palletized Drywall. 4000 lb. Hoistower equipped with a 5½ ft. x 8½ ft. platform. Eliminates re-handling of full pallets of drywall.

SGP 0028230

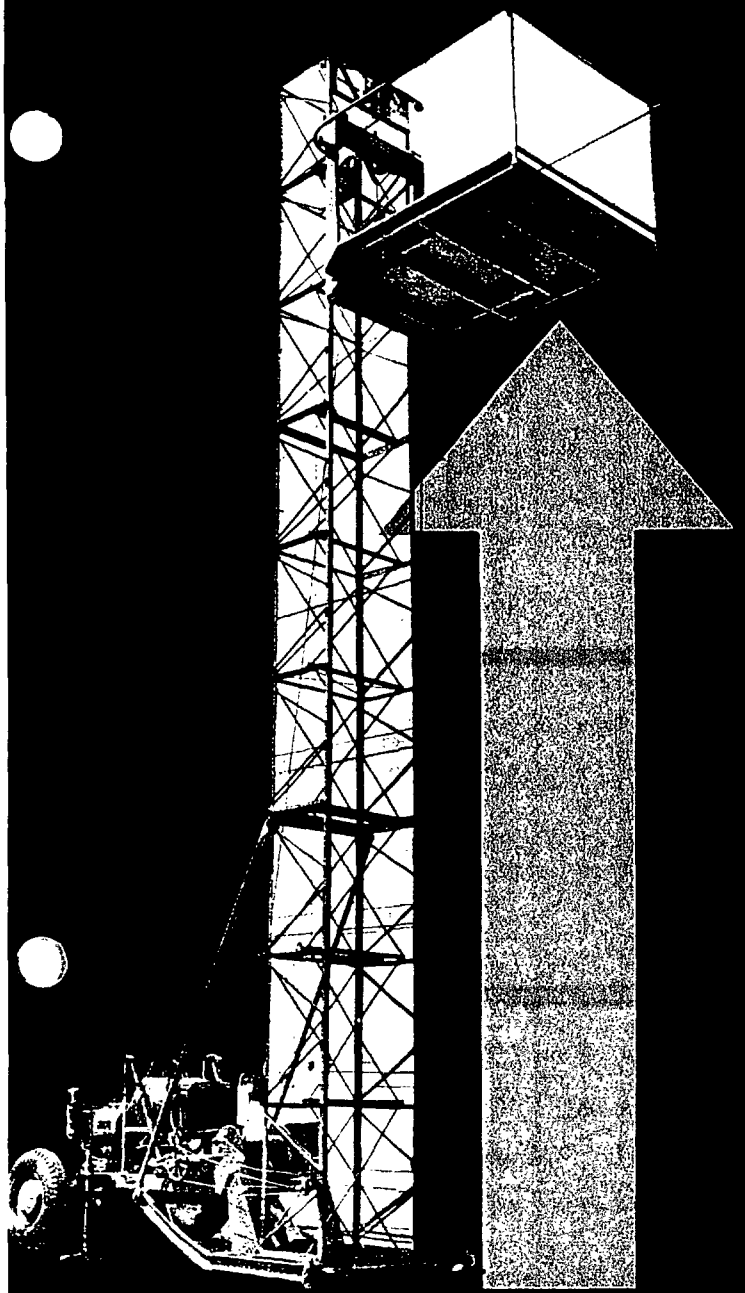
Your **BUCK** *Hoistower distributor is*

BUCK

© Buck Equipment Corp.

5-65 B & O

Printed in U. S. A.





Champion JUMBO HOIST

3000 lb. CAPACITY

Automatic Erection
Hydraulically Operated
Super Rigid Tower

A portable hoist for use to heights up to 170 feet or more

JUMBO

Champion MANUFACTURING COMPANY

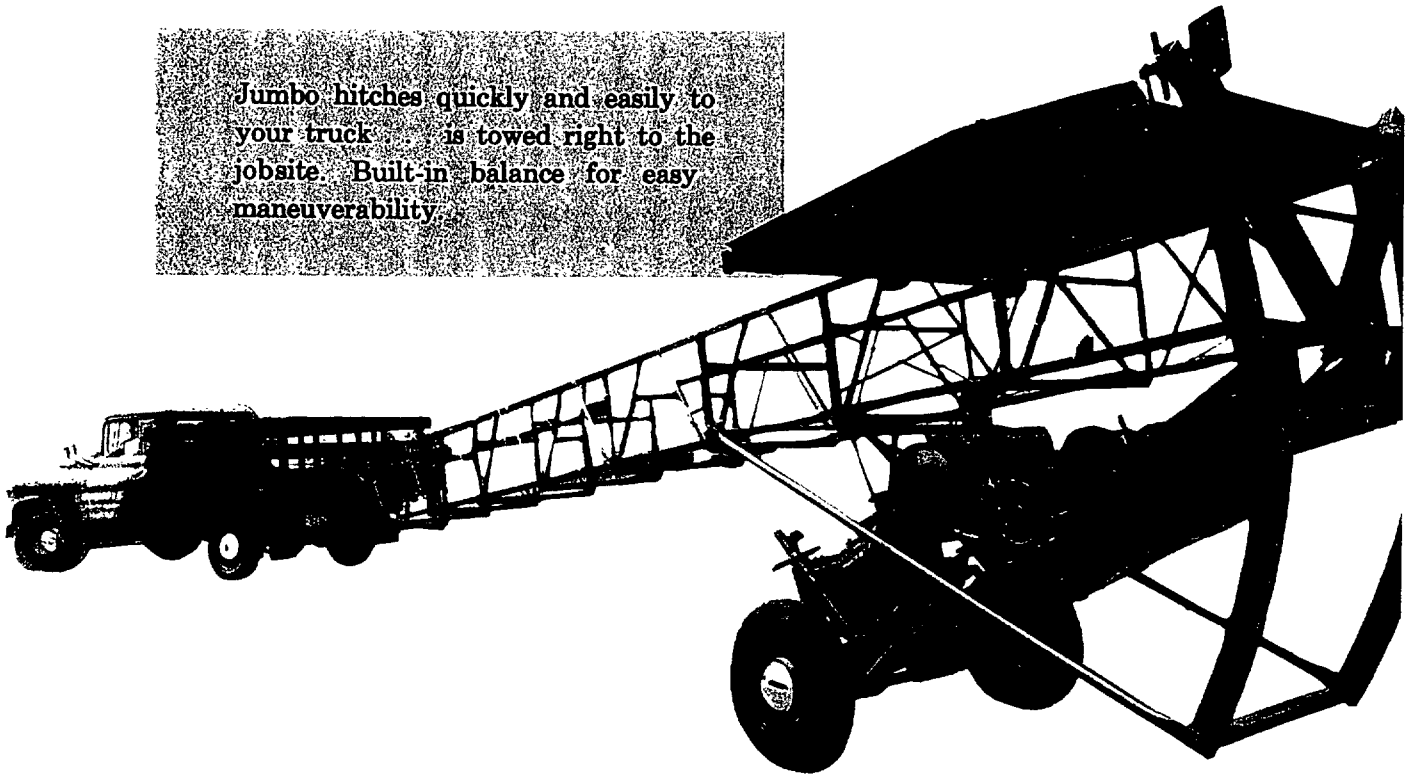
3700 FOREST PARK AVE. • ST. LOUIS 8, MISSOURI, U.S.A. • JEfferson 1-6688

A Product of Mayco Mfg.

SGP 0028231

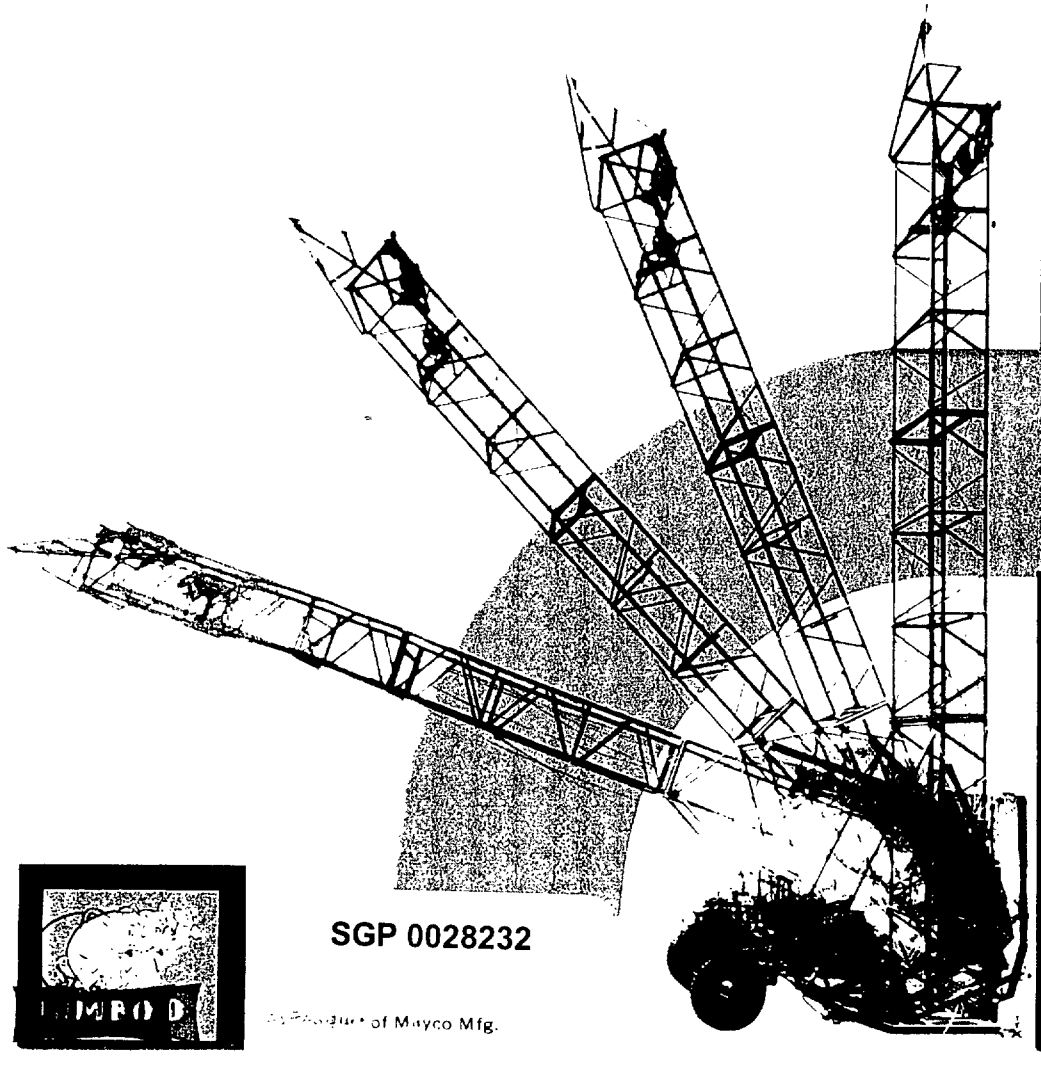
EASY PORTABILITY

Jumbo hitches quickly and easily to your truck . . . is towed right to the jobsite. Built-in balance for easy maneuverability.



AUTOMATIC ERECTION

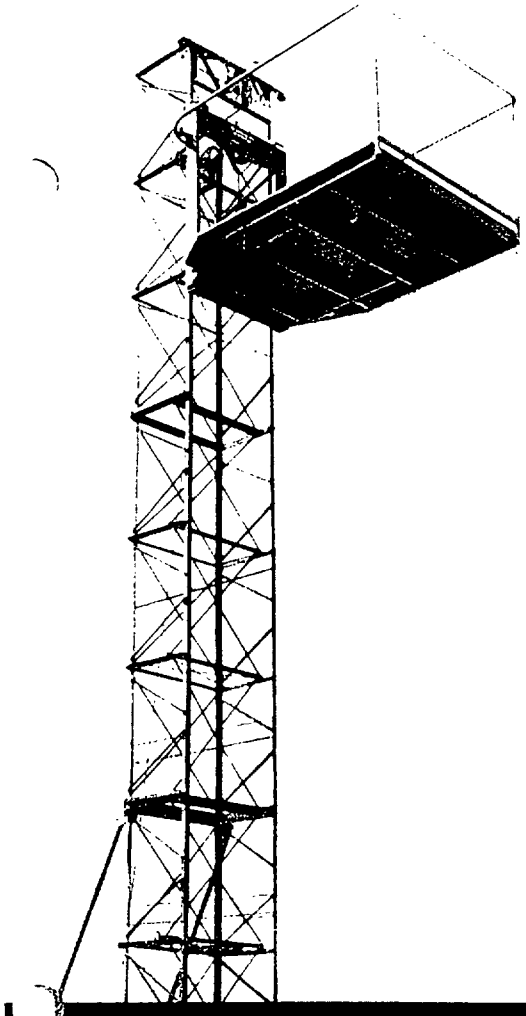
Turn on the engine . . . throw a lever . . . and Jumbo moves into operating position.





SGP 0028232

of Mayco Mfg.

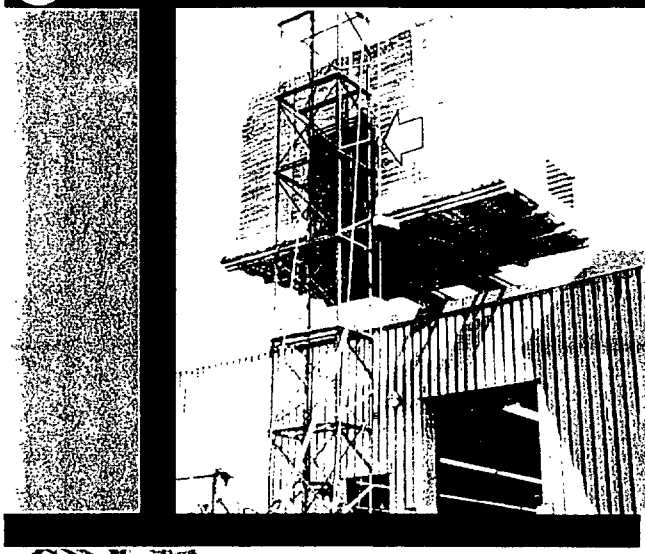


READY TO GO TO WORK

Release Jumbo's Platform from the tower. Set jacks. Put guard rails into position and Jumbo is all set to begin hoisting up to 3,000 lbs. Jumbo's 24"x36" tower eliminates twist and sway.

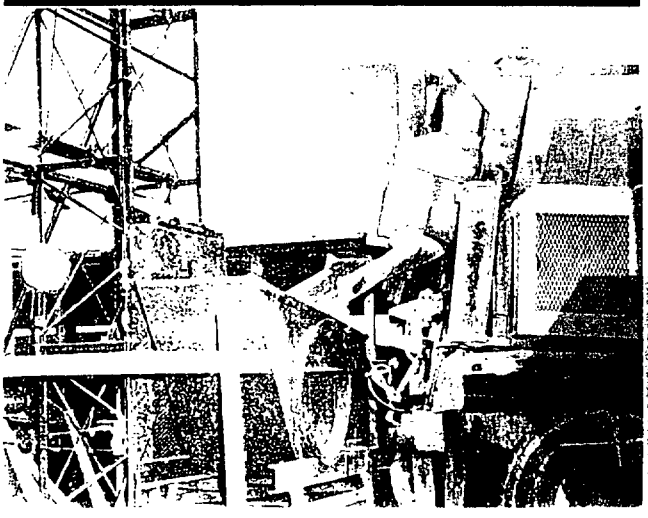


SGP 0028233



STOPS AUTOMATICALLY AT PRE-SET LEVELS

Set the "stop" on Jumbo's cable at any level. Jumbo will stop there automatically. Workers on upper floors can start Jumbo's platform down by a tug of the cable.



AUTOMATIC DUMPING CONCRETE BUCKET

Replace Jumbo's platform with concrete bucket in minutes. Dumps left or right smoothly, automatically at pre-set levels.

10 FOOT SECTION EASILY ADDED

Jumbo's basic height is 30 feet. Extra sections can be added for use up to 175 feet or more. A 2 man crew using an "A" frame, can erect 90 feet of hoist tower in one day. For stability, Jumbo should be "tied-in" to the building at each story (note pipes).

JUMBO - engineered for yo
safe, profitable operation

Jumbo was designed to meet contractors' demands for a fully automatic 3,000 lb. capacity, portable hoist. Jumbo's platform travels up at 175 feet per minute . . . down at 150. With the new Fast Down Speed Device, platform or bucket can be lowered at 500′ per minute.

Easily towed by car or truck with no sway or bounce, Jumbo can be moved from your yard and be in operation at the jobsite in minutes. Once on the job, the Jumbo base unit can be lifting materials in less than 10 minutes!

Jumbo features built-in protection against overload. When overloaded, the platform just won't move. A broken cable safety device holds the platform in place in the event of cable failure.

There's no clutch to burn out . . . no down brake to drag. Jumbo is completely hydraulically operated.

No one can damage a Ju through an error in op



Dry wall goes up 9 stories on a special rigged extended platform.

Roofing materials are hoisted to a 174 foot high take off point.

Concrete is dumped smoothly, automatically, on t

SGP 0028234

JUMBO PAYS FOR ITSELF

Cont on a



Jumbo is fast growing in popularity with

- general contractors
- dry wall contractors
- masonry contractors
- brick layers
- plasterers
- flooring contractors
- roofing contractors
- moving companies
- ready mix companies
- wrecking and salvage companies

and many others to whom economical, efficient hoisting is important.

SGP 0028235

bo hoist
ation



floor of this building.



Two wheelbarrows of plaster are being unloaded at the 8th floor of this 9 story apartment.



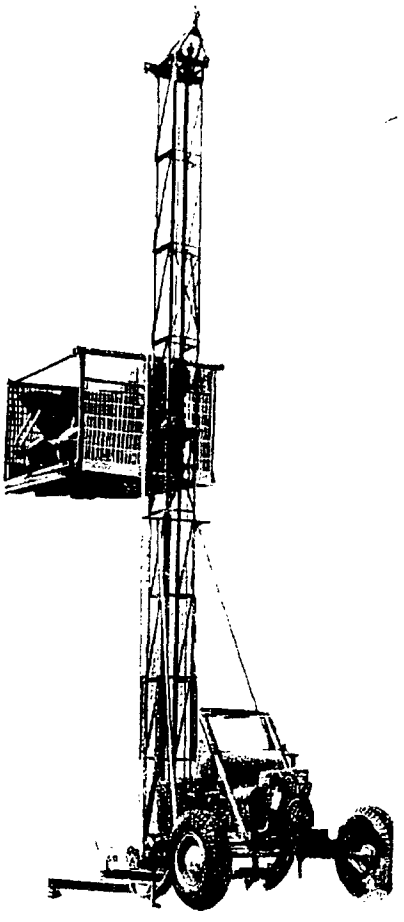
This 90 ft. high installation was put up by two men in one day.

port savings of from several hundred to several thousand dollars . A number of contractors own 5 or 6 Jumbos.

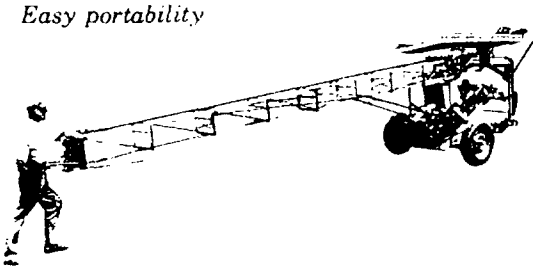
In most areas, Jumbo is available on a rental basis.

Champion's automatic TUSKY 1500-A HOIST

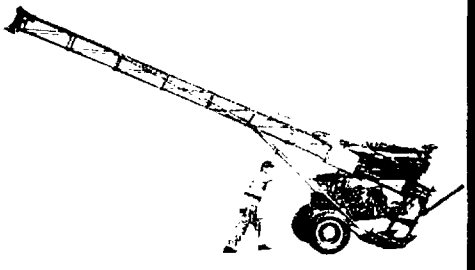
- 1,500 lb. capacity
- for use at heights up to 100 ft. or more
- erects in minutes
- operates by tug of cable or control handle
- lifts 2 wheelbarrows
- fully automatic with adjustable stops
- travels up at 125 ft. per minute — down at 125 ft. per minute
- hydraulic power — no clutch
- built-in emergency and slack cable brake
- overload preventer
- folding platform guard
- base unit 22′ high — 11′ extensions easily added
- adjustable automatic stops
- easily towed by car or truck

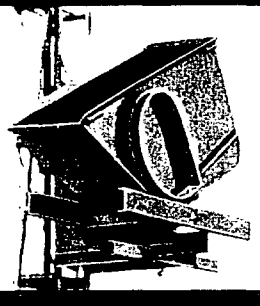


Easy portability



Built-in balance for easy erection





Concrete bucket available for Tusky. Replaces platform easily and quickly.

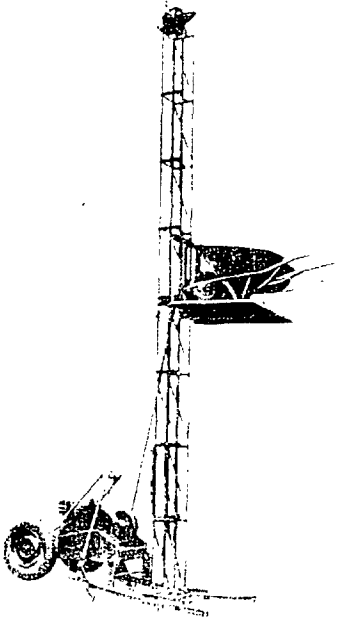
A Product of Mayco Mfg.

TUSKY

Champion's TUSKY 1000-A HOIST

fully automatic with adjustable stops

- 1,000 lb. capacity, or two wheelbarrows
- for use at heights up to 100 feet
- carefully balanced for easy erection
- slack cable safety device
- sturdy welded tower — tested to 6,000 lbs.
- base unit 22 ft. high — extra sections available in 11′ and 5′6″ lengths



TUSKY

A Product of Mayco Mfg

SGP 0028236

Champion HOIST SPECIFICATIONS

		JUMBO 3000-A	TUSKY 1500-A	TUSKY 1000-A
Capacity		3000#	1500#	1000#
Lifting Speed		175' Per Min.	125' Per Min.	100' Per Min.
Lowering Speed	Controlled	150' Per Min.	125' Per Min.	100' Per Min.
	Fast down speed	500' Per Min.		
Base Unit Height		30'	22'	22'
Takeoff — Unloading Height		24'	17'4"	17'4"
Additional Sections		10' / 6'6"	11' / 5'6"	11' / 5'6"
Platform Size		6'6" x 5'6"	5' x 5'	5' x 5'
Tower Dimensions		24" x 36"	12" x 13"	12" x 13"
Engine		30 H.P.	18 H.P.	12.5 H.P.
Concrete Bucket	Capacity	16 Cu. Ft.	9 Cu. Ft.	5 Cu. Ft.
	Fluid Measurement	¾ Yd.	13 Cu. Ft.	13 Cu. Ft.
Power Erection		Hydraulic	No	No
Automatic Operation		Yes	Yes	Yes
Recommended Maximum Height		170' Plus	Up to 100'	Up to 100'
Broken Cable Safety		Yes	Yes	Yes
Base length x width in operating position		17'3" x 5'10"	13' x 5'6"	13' x 5'6"
Shipping Weight		3620	2050	2000

All Champion Hoists are shipped ready for use

SGP 0028237

HO-1 Litho In U.S.A.—Revised 8/65


Contact us for a
Champion Hoist
demonstration...
in your yard or
at a jobsite
SGP 0028238

GYPSUM WALLBOARD IN HIGH RISE BUILDINGS

Special Hoisting Equipment
American Tubular Elevator

Here is another folder prepared by a company who developed a special tubular steel elevator designed for handling gypsum wallboard in these high rise buildings.

One of the most important problems a drywall contractor faces in going from conventional drywall in house construction and small commercial work is that of getting material onto the job and distributed to point of usage. This requires careful planning and scheduling, and most important, an economical means of getting the material up to the various floors. Those of you who have been exposed to this type of work long ago realized the conventional material hoist provided on high rise buildings was designed for smaller dimension materials and for bulk materials, but not for sheets 4' wide in 8 to 10' lengths.

The attached folder printed by the American Tubular Elevator Company, a division of the Universal Manufacturing Corporation of Zelienople, Pennsylvania, manufacturers of various types of scaffolding and elevator equipment, describes the tower that has been used on some of the jobs in Philadelphia very successfully. This type of equipment is distributed by the Equipment Corporation of America (see back of the folder).

This is sent to give additional information and assist in answering questions on this matter in the field. It in no way endorses this type or manufacturer's equipment to the exclusion of other equipment designed for the job. Applicators who are interested should contact the Universal Manufacturing Corporation in Zelienople, Pennsylvania for further information. We understand that the Equipment Corporation of America is one of the larger distributors for this organization, operating thrcugh much of the Country.

Several months ago we gave you information about the Buckhoist Elevator which is a different type having certain advantages and shortcomings. You realize, of course, that the board can be raised to the various floor levels in a high rise building by means of a long boom crane.

Where the drywall contractor puts such equipment as this tubular elevator on the job, he must approach other subs to use the equipment on a rental basis as this helps defray the cost of the equipment and the operator.

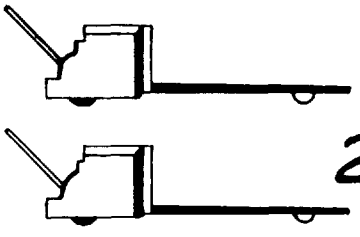
40th YEAR

DRYWALL GOES HIGH RISE
IN
AMERICAN TUBULAR ELEVATOR



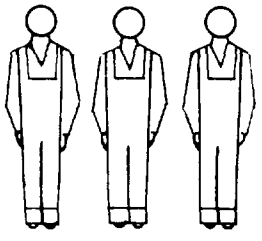
1 tower

+



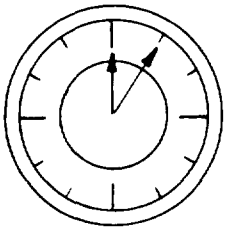
2 fork lifts

+



3 men

+



1 hour

=

1 truck load of drywall at 21st story



PARK CITY WEST
21 stories . . . 350 terraced luxury units . . . 200 car garage

SAMUEL I. OSHIVER AND ASSOCIATES of Philadelphia
Architects and Design Engineers

ARTHUR A. KOBER CO., INC., of Bala Cynwyd
General Contractor

HOLLENBECK AND JUELL, INC., of Philadelphia
Drywall Contractor



SGP 0028240

PROBLEM AND SOLUTION

Gypsum wall board has been making history in Philadelphia. It is being incorporated in three of the world's largest high rise apartment buildings: the Philadelphian, Penn Towers, and Park City West.

This has presented dry wall contractors, such as Hollenbeck & Juell, Inc., with the unique problem of raising these large sheets of dry wall to their proper floor, economically and with minimum breakage.

Working closely with Hollenbeck & Juell, American Tubular Elevator engineers came up with a tower specifically designed to handle large palletized material. This tower utilizes an oversize cage which permits loading and unloading with a small electric fork lift unit.

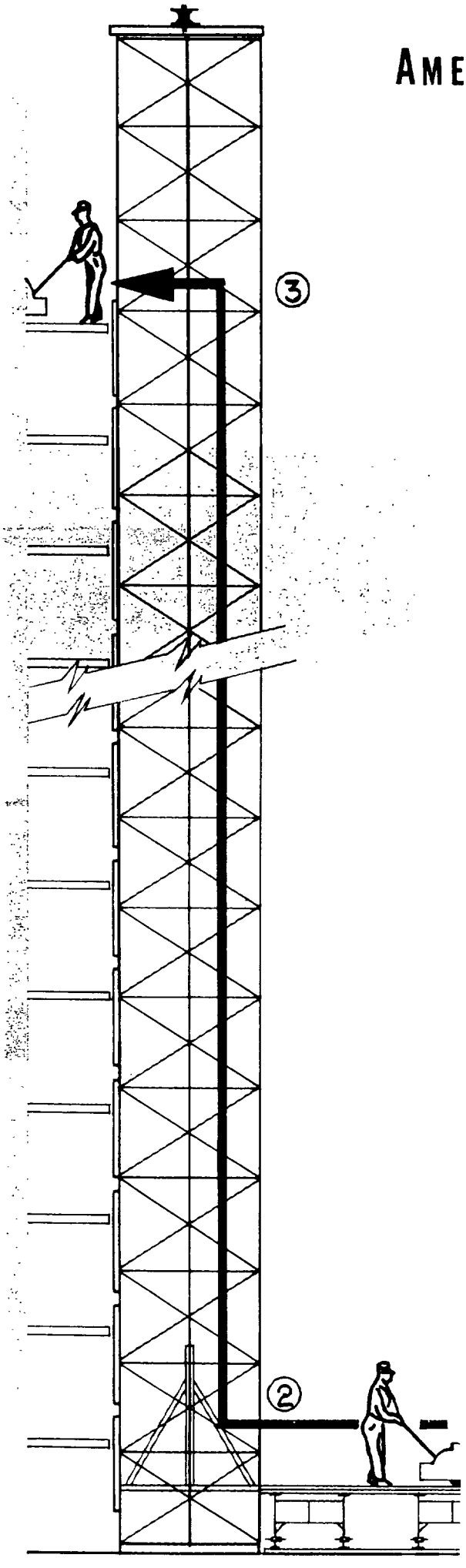
Typical Operation

Only three men are required for this bulk handling system:

1 hoisting engineer
1 fork lift operator @ loading area
1 fork lift operator @ discharge area

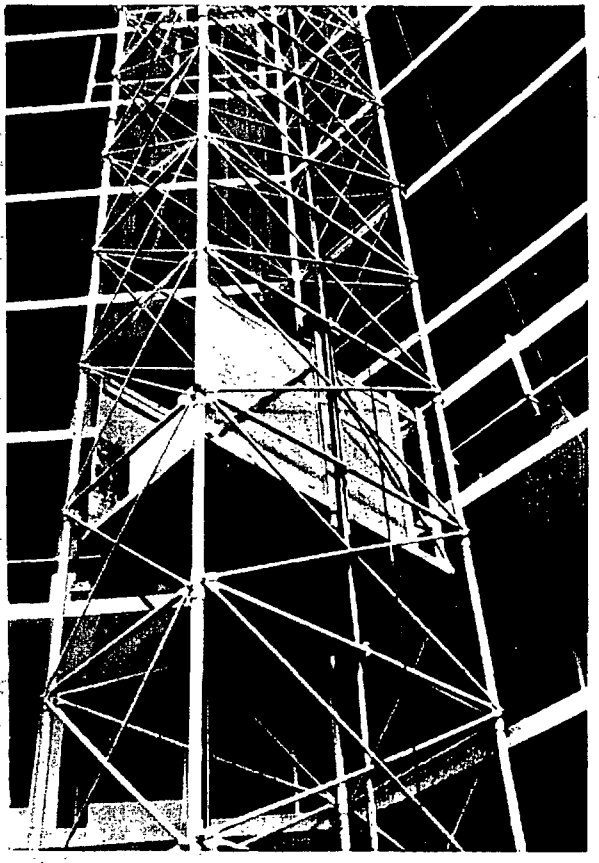
The dry wall material is delivered on flat bed trucks in quantities of either 4 or 8 pallets depending on job conditions. The trucks are backed up to the loading ramp which is constructed of standard scaffold to a height equal to that of the truck bed. This allows the fork lift to drive directly onto the truck to pick up the pallets which are then placed in the cage to be hoisted to the desired floor. At this point, the second fork lift removes the pallet from the cage and places it in its proper position on the floor. One complete cycle: loading, unloading and placing of each pallet requires only 5 minutes which means that a truck carrying eight pallets (15,800 sq. ft. of gypsum dry wall) can be handled in about 50 to 60 minutes. The periods between truck-loads are used to distribute the pallets around the floor being charged: raise dry wall paste and fasteners; and to relocate the loading ramps and fork lifts at the completion of each floor.

The picture story to the right illustrates how this specialized method of bulk handling can solve your hoisting problems with fantastic labor savings and maximum safety.

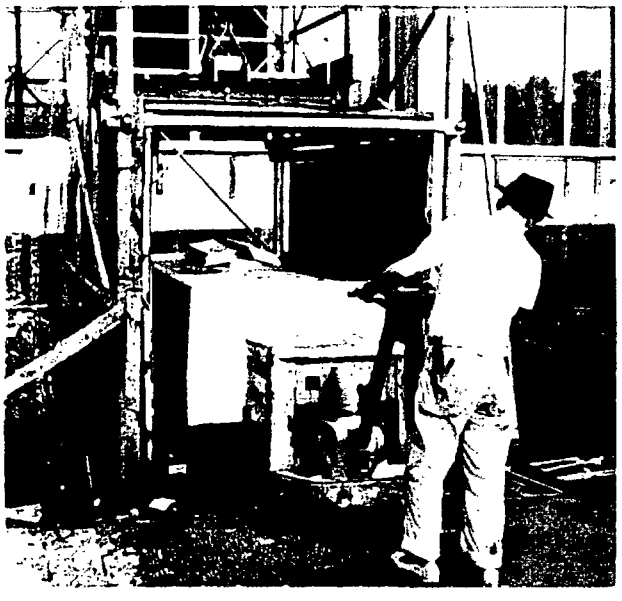


AN TOWER SOLVES DRYWALL OBLEM WITH BIG CAGE

Each pallet is then delivered to the proper floor where it is unloaded with a second fork lift unit. These towers are equipped with special landing brace frames which allow discharge at any floor without having to remove cross braces.



③



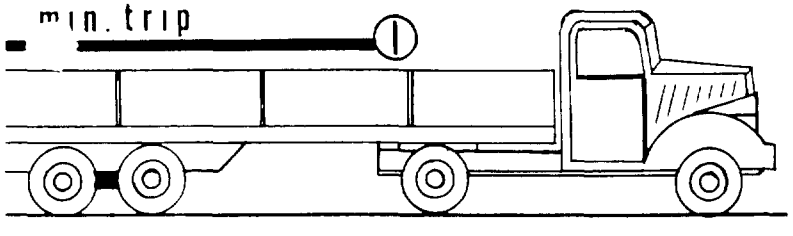
②

The huge cage easily accommodates these 4'x8' pallets containing 61 sheets of 5/8" dry wall.



①

The 4000# dry wall pallets are delivered in quantities of 8 to the job site. The trucks are backed up to the ramp which allows the fork lift to drive directly onto the flat bed for unloading.



SGP 0028242

DRY WALL TOWERS

Specifications

Maximum height—750′
Width—6′4″
Depth—10′4″
Cage Size—5′9″ x 10′0″ x 10′0″ high
Capacity—4000# Live Load
Recommended hoist size—4000# line pull (using 2-part line)

Erection

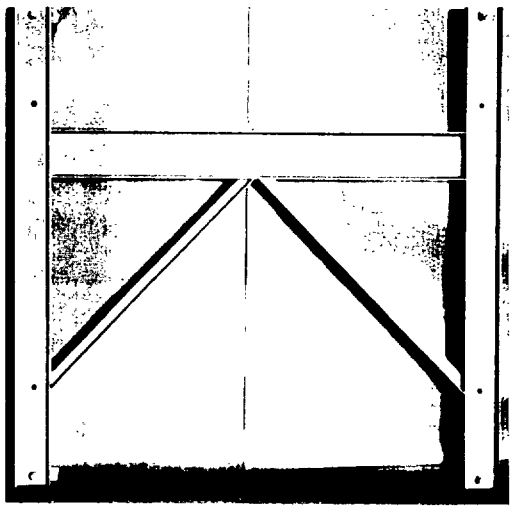
Despite its size, this tower can be erected in about the same amount of time as a standard AC Tower. Normally a 5 man crew is used which can put a 100′ tower in operation in about 2 days.

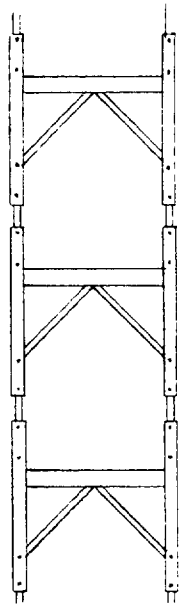
Previous Methods of Dry Wall Installation

A stiff leg derrick was used on one job which required at least 8 men. With this method the contractor had to build fly-decks at every floor upon which the pallets were placed; then rolled on conveyors into the building. A fork lift was then used to distribute the pallets around the floor. Using the dry wall tower, the contractor immediately realized a 60% savings in labor alone. This method also provided greater all-around safety in handling and minimized breakage of panels.

AMERICAN TUBULAR EXCLUSIVE

To increase the versatility of the dry wall tower. American Tubular Elevator Co. designed a combination landing frame and tower brace. When this "K" frame is properly assembled to the tower, it replaces practically all of the normal girts and cross braces on the side adjacent to the building. Its portal design permits loading and unloading at any floor without having to remove any tower components or relocate landing panels. The photo and sketch to the right shows a typical "K" frame and assembly.





SGP 0028243

American Tubular Elevator Co.

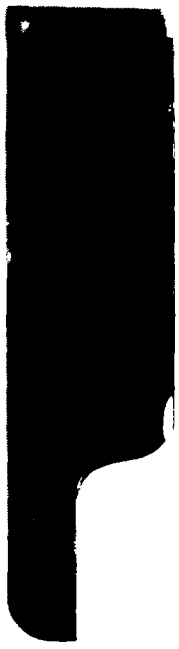
Manufacturers of Ezebilt Scaffolding • Heviduti Scaffolding
Endlok Clamp-Type Scaffolding • Uni-Stage Maintenance
Platform • Material Handling Towers

Division of
UNIVERSAL MANUFACTURING CORP.
ZELIENOPLE, PA.

PHONE: 412-452-8300

Litho in U.S.A.

DW-63





INCOMBUSTIBLE CEILING TILE
FIRESTOP-120 FIRE RATED TILE

GEORGIA-PACIFIC / BESTWALL GYPSUM DIVISION

SGP 0028245

INCOMBUSTIBLE CEILING TILE

. . . for lower cost Class A incombustibility and design freedom

DESCRIPTION

Bestwall Incombustible Ceiling Tile is a predecorated lay-in unit designed for use in exposed grid suspended ceilings where low cost fire safety is a primary factor. It meets Class A requirements for incombustibility and provides full 0.78 light reflection.

Bestwall Incombustible Tile is reinforced with glass fibers. These glass fiber filaments are of uniform length and strength, approximately ½" long and as strong as high strength steel of the same size.

Miles of glass fibers are dispersed in the gypsum core of Bestwall Incombustible Ceiling Tile to add greater strength, resiliency, and increased resistance to fire.

Bestwall Incombustible Tile is available through qualified and approved Georgia-Pacific/Bestwall Acoustical Contractors.

Dimensions: ⅜" thick, nominal 24" by 24" (23¾" by 23¾"), and ½", nominal 24" by 48" (23¾" by 47¾"). For design purposes a weight of 1.5 lbs. per sq. ft. may be used for the ⅜" ceiling tile; 2.0 lbs. per sq. ft. for the ½" ceiling tile.

Finish. Textured glarefree surface in white.

FIRESTOP-120

. . . on a rated exposed grid gives a system which results in the lowest cost membrane fire proofing currently available

The Bestwall Gypsum Division, a pioneer in gypsum building products for private and commercial construction, now makes available "Firestop-120" a new ceiling tile, to provide the lowest cost 2-hour fire-rated ceiling.

Tested in accordance with procedure set forth in ASTM E-119-61, "Firestop-120" gypsum ceiling tile achieved a 2-hour fire endurance rating in a rated ceiling assembly.

"Firestop-120" is listed by Underwriters Laboratories under Fire Resistance Classification as Design 208—2 hours. Product boxes carry the U L Label. A Firestop gypsum board product, "Firestop-120" is covered under the Fire Hazard Classification of 10-15.

Many advantages of Bestwall "Firestop-120" are beneficial to all architects, contractors and building owners.

"Firestop-120" is approved under National Model Building Codes as well as local Building Department Codes of large cities.

TO THE ARCHITECT

Provides a quick, low cost method of protecting incombustible floor systems.

Reduces sound transmission.

Glass fiber reinforcement adds strength and resiliency to the tile during handling and application, and after it is in place.

Each tile unit is removable for immediate access to pipes, ducts and utility lines above the ceiling.

The official fire test of "Firestop-120" included recessed light fixtures totaling 16 sq. ft. per 203 sq. ft. or 8% of ceiling area and openings for vents of 71 sq. in. per 100 sq. ft. of ceiling area. Thus the rating of 2 hours permits modern flat ceiling design with recessed fixtures.

Lighting and air conditioning facilities in the ceiling design may be easily changed when desired.

Easy to handle panels 24" x 24" x ⅝".

Packed 6 tiles to a carton insuring arrival in good condition, with minimum loss through breakage or soiling.

Saves construction time, as "lay-in" application is quick and economical, allows other trades to move in faster.

Factory finish insures uniform appearance.

Lowers construction costs as intermediate fire protection is eliminated, and clean-up operations are reduced.

Pre-decorated units eliminate need for on-site decoration.

TO THE BUILDING OWNER

Greater fire protection generally results in reduced insurance premiums.

Plain or textured finishes of the tile reflect light evenly and without glare.

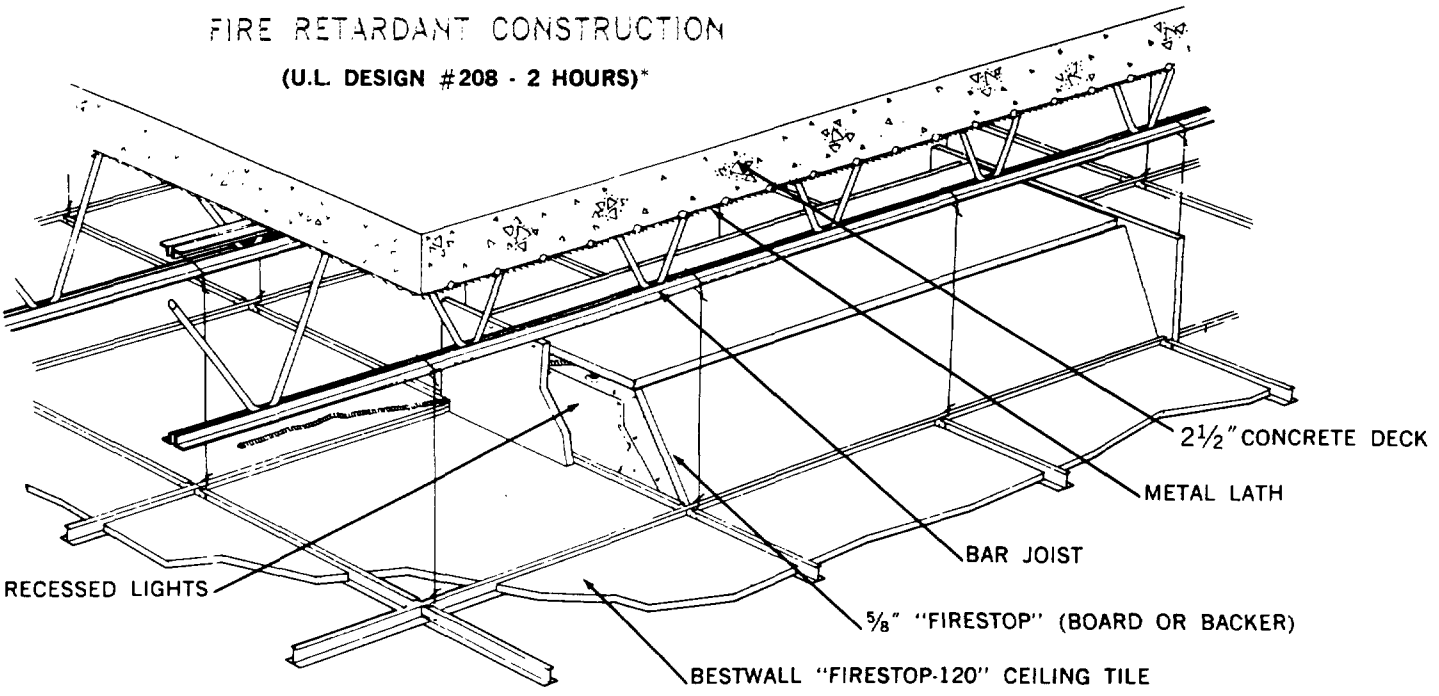
Heat and sound transmission are reduced.

Decorative finishes may be repainted economically by any conventional method.

SGP 0028246

FIRE RETARDANT CONSTRUCTION

(U.L. DESIGN #208 - 2 HOURS)*



*ENGINEERING EXPERIMENT STATION, THE OHIO STATE UNIVERSITY, FIRE ENDURANCE TEST REPORT, DESIGN T-2104 (NOT SHOWN) PROVIDES A 2-HOUR RATING, WITHOUT OPENINGS FOR UTILITIES USING A 2" CONCRETE DECK.

Easy to maintain and clean.

Accessibility to any area of pipes, ducts or utility lines above the ceiling.

Reduced construction time permits earlier occupancy.

"Firestop-120" offers all advantages of conventional types of exposed grid suspension systems plus the benefits of a 2-hour rated ceiling.

Bestwall "Firestop-120" is the **first** gypsum ceiling tile to be given a fire retardant time designated rating. It developed 2-hour fire resistance in an Official Fire Test when the assembly was constructed in accordance with the Standard Method of Fire Tests of Building Construction and Materials, ASTM Designation E-119-61.

REQUIREMENTS OF STANDARD FIRE TEST

SUSTAIN APPLIED LOAD

One of the requirements of the Standard Fire Test is that "the construction shall have sustained the applied load (theoretically the design load) during the fire endurance test . . . for a period equal to that for which classification is desired".

Where design loading is not feasible, there is an alternate requirement to determine the protection provided to steel beams. It states that the maximum temperature on the steel beams must not rise above 1200°F and the average temperature of a section of the beam must not exceed 1000° F. "Firestop-120" ceiling tile on a rated exposed grid provides this type of protection to structural steel.

In the Official Tests the assembly did not fail under load nor was a critical temperature even reached on the bar joists during the 2-hour fire test. Only the tile prevented heat from being transmitted to the plenum.

TEMPERATURE RISE ABOVE CONCRETE

The second condition of the Standard Fire Test is "transmission of heat through the construction during the fire endurance test shall not have been such as to raise the temperature on its unexposed surface (top of the deck or slab) more than 250° above its initial temperature".

The deck or floor construction plays an important role in meeting this requirement. Gypsum, Portland Cement concrete, and similar materials—because of their compositions—tend to restrain a temperature rise on the top of the slab.

ADVANTAGES OF BESTWALL "FIRESTOP-120"

Bestwall "Firestop-120" makes it possible, where design requirements permit, to specify lighter weight floor ceiling assemblies.

In instances where Bestwall "Firestop-120" provides greater protection to a building than codes require, the added protection may provide lower fire insurance rates on the building and contents.

BESTWALL "FIRESTOP-120" IS:

- **Strong**—Glass fiber reinforcement adds strength and resiliency to the tile during handling and application, and after it is in place.
- **Easy Working**—Easy to handle panels 24" x 24" x ⅝". "Firestop-120" is also easy to maintain and clean. Decorative finishes are tough, hard surfaces resistant to marking.
- **Fast Working**—Saves construction time as lay-in application is quick and economical.
- **Versatile**—Offers all the advantages of conventional types of exposed grid suspensions plus the benefits of a 2-hour fire rated floor and ceiling construction. Each "Firestop-120" unit is removable for immediate access to pipes, ducts, and utility lines above the ceiling.

SOUND ATTENUATION IN ALL FREQUENCIES

FREQUENCY	125	177	250	354	500	707	1000	1414	2000	2828	4000
ATTENUATION	28	33	30	33	37	41	42	44	45	44	41

AVERAGE 38 db

Tested by Geiger and Hamme Laboratories using the "Two Room Method"
5/8" material reported, 3/8" & 1 2" material tested with practically the same results.

SPECIFICATIONS FOR BESTWALL INCOMBUSTIBLE TILE

SHORT FORM

Tile shall be Bestwall Incombustible Tile* manufactured by the Georgia-Pacific, Bestwall Gypsum Division, Paoli, Pennsylvania. Tile shall be installed by the manufacturer's approved Acoustical Contractors and in accordance with manufacturer's specifications.

The suspension system used shall be from a reputable manufacturer, designed to carry the 24" by 24", or 24" by 48"† units and shall be erected according to the manufacturer's recommendations.

LONG FORM JOB CONDITIONS

1. The building should be fully enclosed.

2. The heating or air conditioning systems shall be in operation so proper conditions are maintained before, during, and after acoustical installation.

3. All poured roof decks, plaster, concrete, terrazzo or other "wet" operations shall be completed and thoroughly dry.

4. The plenum chamber shall be vented to the outside.

5. The Bestwall Incombustible Tile* shall be delivered to the job just prior to installation time.

SPECIAL CONDITIONS

Bestwall Incombustible Tile* shall be installed by an Acoustical Contractor approved by the Bestwall Gypsum Division.

MATERIALS

a. Tile shall be Bestwall Incombustible Tile* as manufactured by the Georgia-Pacific, Bestwall Gypsum Division, Paoli, Pennsylvania. The tile shall be factory painted, white (plain or textured), packed in suitable cartons and complying with Federal Specifications SS-A-118b, Type IIA, Class A, Incombustible.

b. Bestwall Tile* shall be installed on the flanges of an exposed rigid metal grid suspension system consisting of main carriers and interlocking cross tees. The grid system shall be installed to provide 24" x 24" or 24" by 48"† modules. The main carriers shall be hung from the ceiling slab or structure. Hangers and main runners shall be spaced in accordance with manufacturer's specifications and recommendations governed by the expected maximum load. Main runners shall be accurately leveled and spaced. Baked enamel finished or natural aluminum finish metal angle moulding, matching the exposed grid shall be installed where border units abut the walls or other vertical surfaces.

INSTALLATION

Bestwall Tile* and the suspension system shall be installed in accordance with standard practices by the Acoustical Contractor. (For "Firestop-120" an approved fire rated suspension system shall be used where one-hour or two-hour ratings are required.)

*In the above specifications insert the applicable tile:
Bestwall Incombustible Ceiling Tile
Bestwall "Firestop-120" Ceiling Tile

†In the above specifications insert the applicable dimensions:
Bestwall Incombustible Ceiling Tile,
3/8" thick, 24" x 24" or 1/2" thick, 24" x 48".
Bestwall "Firestop-120" Ceiling Tile,
5/8" thick, 24" x 24" only.

SALES OFFICES

ATLANTA
801 Peachtree 25th Building
1720 Peachtree, N.W.
Atlanta, Georgia 30309

BRUNSWICK
Foot of Union Street
Brunswick, Georgia 31521

CHICAGO
5544 W. St. Charles Road
Berkeley, Illinois 60162

CLEVELAND
3530 Warrensville Center Road
Shaker Heights
Cleveland, Ohio 44122

DALLAS
600 Exchange Bank Building
Dallas, Texas 75235

DETROIT
Suite 227, Officenter Building
Detroit, Michigan 48235

HOUSTON
Bayou Building
3322 Richmond Avenue
Houston, Texas 77019

KANSAS CITY
4233 Blue Ridge Boulevard
Kansas City, Missouri 64133

NEW ORLEANS
7800 Alamonaster Drive
New Orleans, Louisiana 70126

SAN FRANCISCO
301 El Cerito Plaza
El Cerito, California 94532

WESTERN
Room 404, Tribune Building
143 S. Main Street
Salt Lake City, Utah 84101

WILMINGTON
Wilmington Marine Terminal
Wilmington, Delaware 19899

GEORGIA-PACIFIC / BESTWALL GYPSUM DIVISION

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SGP 0028248

BW-65175

Printed on G-P Hopper Sonata

"FIRESTOP-120"

REPRINTS OF OFFICIAL FIRE TESTS OF BESTWALL "FIRESTOP-120" CEILING TILE

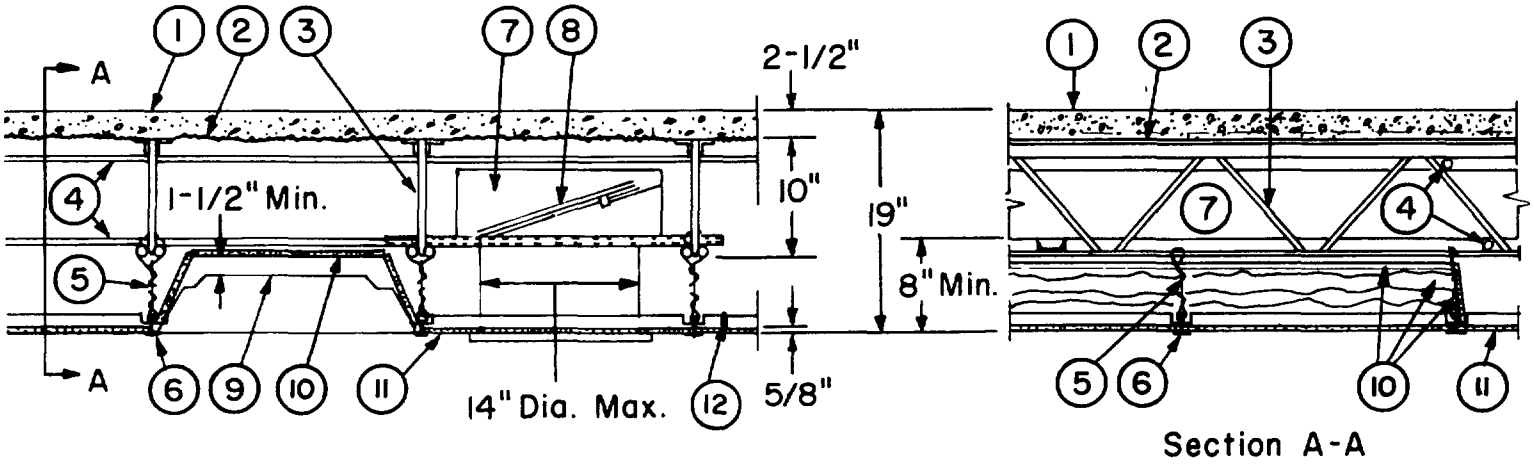
Project T-2104
Engineering Experiment Station, The Ohio State University

File R2717-32
Underwriters' Laboratories, Inc.

The tests reported herein were conducted in accordance with the Standard Method of Fire Tests of Building Construction and Materials, ASTM Designation E 119-61 and include Fire Endurance and Hose Stream Tests

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SGP 0028249



Class D-2 Designs
Design No. 208 – 2 Hour

Description of Numbered Items

1. Sand-Gravel Concrete – 1:3:3-3/4 mix, 4000-psi strength.

2. Metal Lath – 3.4 lb, 3/8-in. rib, expanded steel; tied to each joist 9 in. O.C. and side overlap tied midway between joists, with No. 18 SWG galvanized steel wire.

3. Steel Joists – Type 10J3; spaced 24 in. O.C. and welded to end supports.

4. Horizontal Bridging – 1/2 in. diameter continuous steel bar stock; welded to top and bottom chords of each joist.

5. Hanger Wire – No. 12 SWG galvanized steel; located 4 ft. O.C. along main runners. Hanger wires also located at ends of main runners and cross tees where butted against walls, at corners and midspan along 4-ft sides of light fixtures, and 24 in. O.C. around air-duct outlet.

6. Steel Framing Members – Listed by Und., Lab. Inc. (Building Materials List, Guide No. 40 U18.18). Main runners, nominally 12 ft long, located perpendicular to long dimension and at both ends of light fixtures and spaced 4 ft O.C. otherwise. Adjacent lengths of main runners secured together with main runner splices. Cross tees, nominally 4 ft long, installed (perpendicularly) between main runners and spaced 24 in. O.C. Cross tees, nominally 2 ft long, installed (perpendicularly) between 4-ft cross tees to complete 2 by 2-ft grid of ceiling. No minimum clearance required at walls.

7. Air Duct – Galvanized steel with air outlets not exceeding 76 sq. in. per each 100 sq. ft. of ceiling area. Air duct supported 48 in. O.C. on pieces of No. 16 gauge, 1-1/2 in. deep cold-rolled steel channels which are supported on lower chords of joists and tied in place with No. 18

SWG galvanized steel wire. Air outlet protected with 1/32-in. thick asbestos paper on outside surface.

8. Damper – No. 16 gauge galvanized steel cut to form 15-5/8 by 15-5/8-in. door. Protected on both surfaces with 1/16-in. thick asbestos paper and held open with fusible link listed by Und. Lab., Inc., (Building Materials List, Guide No. 120 UO).

9. Light Fixture – Recessed type with sheet steel housing, 2 by 4-ft. size; spaced to permit not more than 8 sq. ft. per each 100 sq. ft. of ceiling area. Listed by Und. Lab., Inc., (Electrical Construction Materials List, Guide No. 210 I2.18).

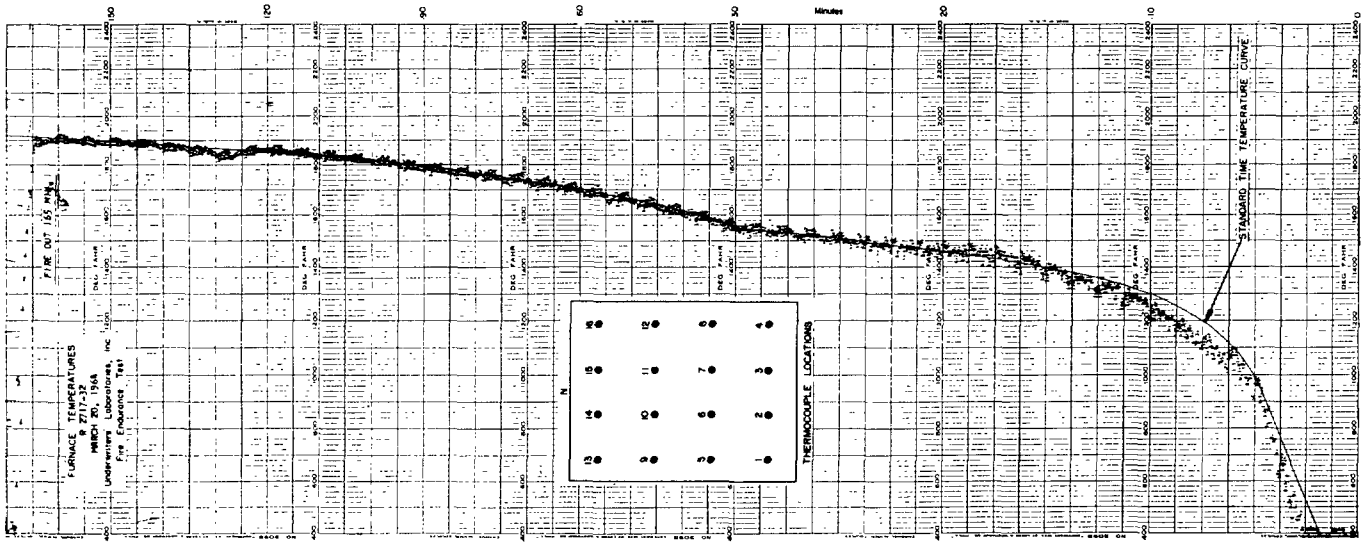
10. Light-Fixture Protection Shield – Made of 5/8-in. thick gypsum wallboard listed by Und. Lab., Inc., (Building Materials List, Guide No. 40 U18.23). One 30 by 48-in. piece scored on one side and broken to lay lengthwise over light fixture, forming diagonal sides 7 in. wide and top piece 16 in. wide. Ends of protection shield cut 6 by 26 in. in size and slotted to fit over cross tees at each end. End pieces secured to top and sides of shield with 8d common nails.

11. Wallboard, Gypsum – Nominal 2 by 2 ft., 5/8-in. thick lay-in tile units listed by Und. Lab., Inc., (Building Materials List, Guide No. 40 U18.23). Border pieces supported at walls by No. 25 gauge, 1-5/8 in. deep, sheet-steel channels with 1-in. bottom leg and 1/2-in. top leg.

12. Hold Down Clips – No. 26 gauge spring steel, 2 in. wide by 1 in. high by 3/8 in. deep, one hold-down clip uniformly spaced along each side of gypsum tile.

CONCLUSION – It is judged that floor and ceiling assemblies constructed of the materials and erected as previously described (illustrated) in this Report will afford 2-hr resistance to passage of flame or dangerous heat transmission. These assemblies will support the full design load during the resistance period.

This classification is based on the "Conditions of Acceptance" for tests of floors and roofs specified in the Standard, Fire Tests of Building Construction and Materials, UL263 (ASTM E 119, NFPA No. 251).



TESTS PROVE BESTWALL "FIRESTOP 120" CEILING TILE ADDS TWO-HOUR FIRE RATING TO CEILING STRUCTURES

The first low-cost two-hour fire rated ceiling assembly on the market.

To meet the challenge of rising costs and greater demands for fire safety, Bestwall research introduced the lowest-cost two hour fire rated ceiling assemblies on the market today . . . BESTWALL "FIRESTOP-120"!

"Firestop–120" gypsum ceiling tile has been thoroughly tested in accordance with procedure set forth in ASTM E-119-61 and has achieved a two-hour fire endurance rating when used in a rated ceiling assembly in conjunction with a concrete floor and bar joist construction. "Firestop-120" is also listed by Underwriters' Laboratories under Fire Resistance Classification as Design No. 208-2 hours. All product boxes carry the UL Label.

STRONG – Glass fiber reinforcement adds strength and resiliency to the tile during handling and application, and after it is in place.

EASY WORKING – Easy to handle panels 24" x 24" x 5/8". "Firestop-120" is also easy to maintain and clean. Decorative finishes are tough, hard surfaces resistant to marking.

FAST WORKING – Saves construction time as lay-in application is quick and economical.

VERSATILITY – Offers all the advantages of conventional types of exposed grid suspensions plus the benefits of a 2-hour fire rated floor and ceiling construction. Lighting and air conditioning facilities in the ceiling design may be changed easily when desired. Each "Firestop-120" unit is removable for immediate access to pipes, ducts, and utility lines above the ceiling. The UL listing covers 2 hour fire rating with recessed lights and air vent openings.

ECONOMICAL – "Firestop-120" is engineered to provide savings in two ways: on-the-job and year after year. Here's why:

- offers increased fire protection
- can earn low insurance rates
- simple installation on exposed grid systems
- reduces construction time
- provides low maintenance

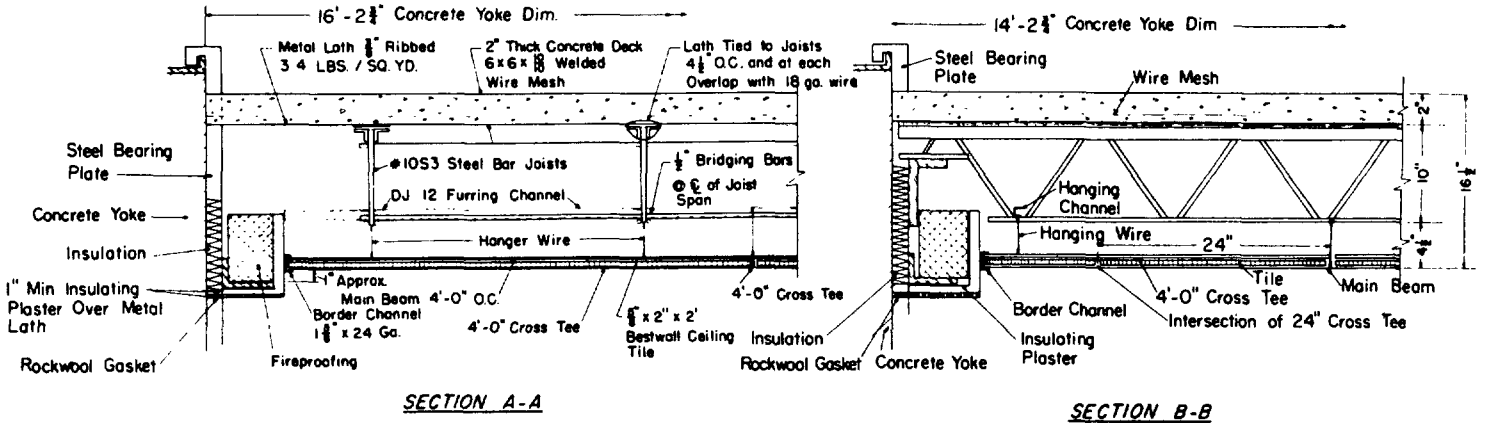
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SGP 0028252

BW-65125

Excerpts from ENGINEERING EXPERIMENT STATION, THE OHIO STATE UNIVERSITY, FIRE ENDURANCE TEST REPORT, PROJECT T-2104



Construction Details

CEILING TILE

The ceiling tile used was Bestwall "Firestop-120" Ceiling Tile lay-in units composed of fibered gypsum nominally 24 inches wide by 24 inches long by 5/8 inches thick. The formulation is on file as confidential data.

CONSTRUCTION

The concrete test yoke was assembled to form the 16 ft. 2-3/4 inch by 14 ft. 2-3/4 inch opening for the test specimen. Steel ledge angles measuring 7 inches by 4 inches by 7/8 inches thick were attached to hanger plates across each 16 ft. 2-3/4 inch end of the yoke frame to form the end supports for the joists. The 10S3 steel joists were placed 24 inches on center with the ends bearing on the ledge angles 2-7/8 inches and with bridging bars welded to both top and bottom chords on the centerline. The 3/8 inch rib lath was attached at right angles to the joists and was tied with No. 18 gauge wire 9 inches on center at the side laps of the selvage and every other 3/8 inch rib at the joist.

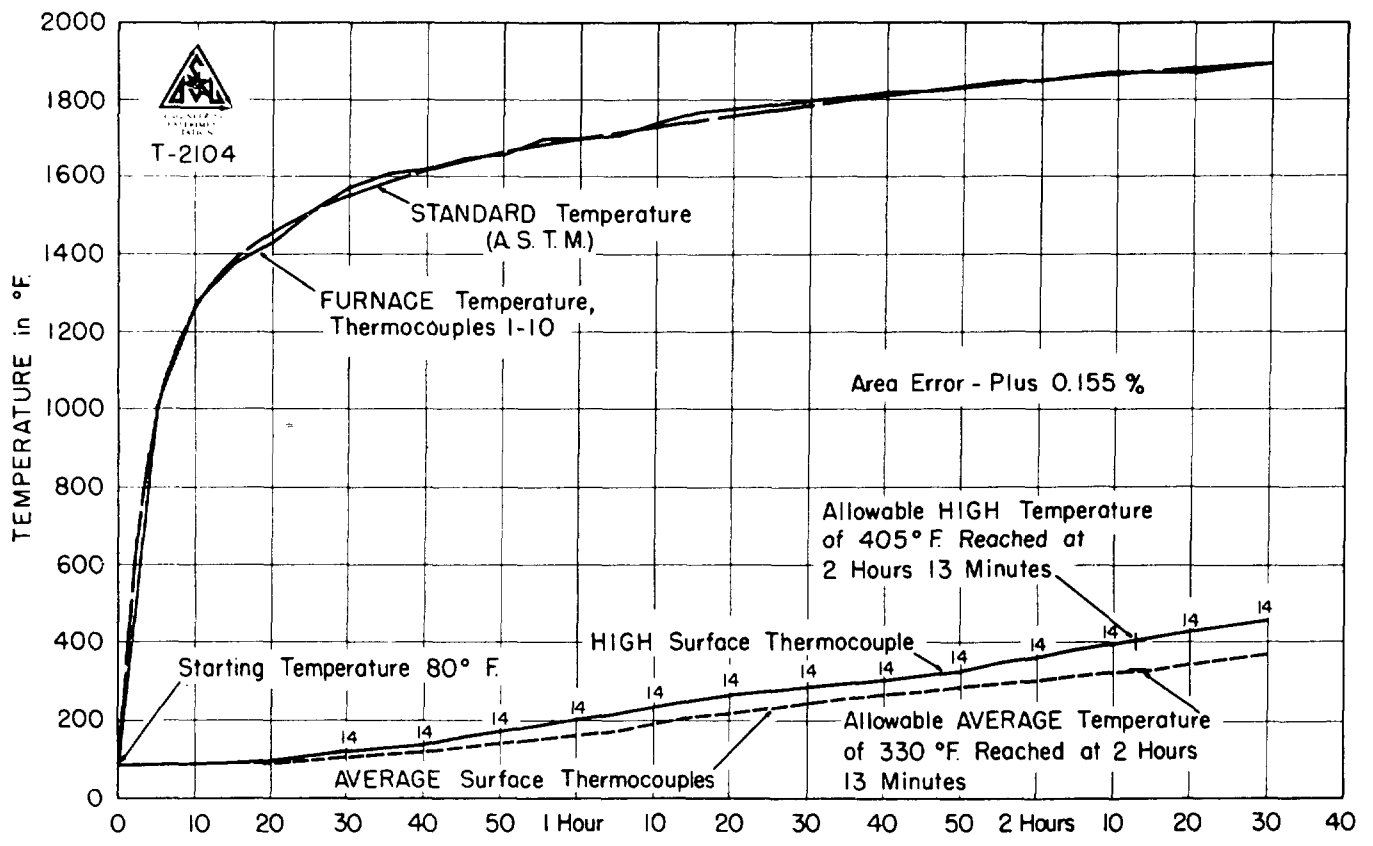
The end laps were approximately 2-7/8 inches. A concrete slab measuring two inches thick over the bar joists reinforced with 6 by 6 by No. 10 by 10 welded wire mesh was placed over the lath. The border channels were attached to the periphery with 3-1/2 inch long nails approximately 8 inches on center. The bottom leg of the channel was 16-1/2 inches below the surface plane of the concrete deck. The main beams were placed perpendicular to the joists 48 inches on center and were supported by No. 12 gauge single strand tie wire hangers. Cross tees 4 feet long were placed between the main beams 2 feet on center. The cross tees extending from the main beams to the border channels were supported by

No. 12 gauge wire hangers near the border channel. The hangers were suspended from 3/4 inch cold rolled furring channel that was placed on the top of the bottom chords of the open web joists. Cross tees 2 feet long were placed between the 4 foot long cross tees 2 feet on center. The ceiling tile was then laid in the suspension system. Spring steel hold-down clips were clipped on the cross tees approximately 24 inches on center holding the ceiling tile in place. The last tile to be placed was held down by a modified spring steel hold-down clip, since the plenum at this point was not accessible to complete the construction.

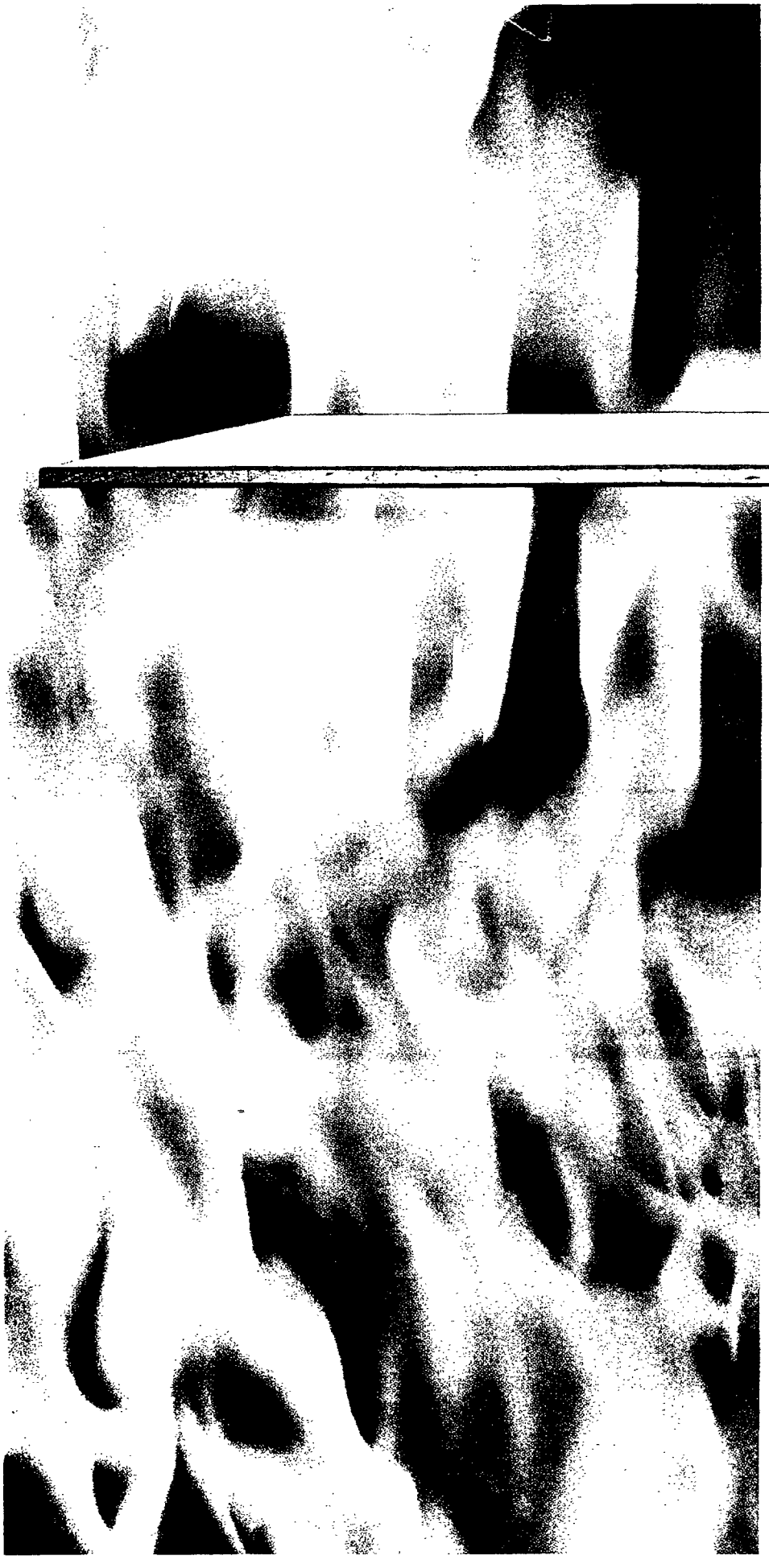
SUMMARIZATION OF TEST RESULTS

A floor and ceiling assembly constructed of 10 inch deep open web steel joists, a 2 inch thick concrete deck on metal lath and a Donn Fire Grid Suspension System supporting two feet wide by two feet long by 5/8 inch thick Bestwall "Fire-stop-120" Ceiling Tile, demonstrated an ASTM Fire Endurance Time of 2 hours and 13 minutes while subjected to a load calculated to impose design stresses. The test was conducted on April 27, 1962 in accordance with the Standard Method of Fire Tests of Building Construction and Materials, ASTM Designation E 119-61.

Time–Temperature Curve for Fire Endurance Test



SGP 0028254



INCOMBUSTIBLE CEILING TILE AND "FIRESTOP-120"

Now a low cost 3/8" tile that meets all Class A requirements —Bestwall *Incombustible* Ceiling Tile. Open new perspectives in design with greater application ease and planning. Save in maintenance costs and insurance rates. Here's an incombustible ceiling tile that offers the perfect combination—low cost incombustibility plus true design freedom.

For fire rated ceilings specify "Firestop-120" for use in the lowest-cost 2-hour fire rated ceiling assembly available today! Tested in accordance with ASTM E-119, "Firestop-120" Gypsum Ceiling Tile achieved a 2-hour fire endurance rating in a rated ceiling assembly. "Firestop-120" is listed by Underwriters Laboratories under Fire Resistance Classification as Design No. 208—2 hours. All product boxes carry the U.L. Label.

Reinforced with miles of glass fibers, Bestwall Incombustible and "Firestop-120" Ceiling Tile are pre-decorated, lay-in units, specially designed for use in exposed grid suspension systems. Available in plain or textured white finishes, they perform with unusual versatility in schools, warehouses, factories, supermarkets and other commercial structures.

BESTWALL

SGP 0028255

BESTWALL INCOMBUSTIBLE CEILING TILE AND "FIRESTOP-120"

. . . CHECK THESE PROVEN ADVANTAGES

FIRE PROTECTION — Bestwall Incombustible Ceiling Tile satisfies most building codes. It complies with Federal Specifications SS-A-118b Class A, Incombustible. "Firestop-120", when tested in accordance with procedure set forth in ASTM E-119, achieved a 2-hour fire endurance rating in an incombustible floor and ceiling assembly.

LOW COST—Lightweight, easy to handle 24" by 24" or 24" by 48" units go up fast. After-hours installation permits uninterrupted business operations, allowing other trades to move in faster.

GLASS FIBER REINFORCED—Bestwall Incombustible Ceiling Tile and "Firestop-120" are reinforced with interlocking textile glass filaments of uniform strength and length. This unique advantage adds strength and resilience, minimizing breakage in handling and installation. The gypsum core is further protected by a tough surface paper—over 10 percent heavier than standard paper.

HIGH LIGHT REFLECTION—Both Bestwall Incombustible Tile and "Firestop-120" offer a 0.78 light reflection. Plain and textured finishes reflect light evenly and without glare.

EASY MAINTENANCE—Prefinished surface may be cleaned with a cloth or sponge slightly dampened with a mild detergent. Tile can be economically repainted, if desired.

Bestwall Incombustible Ceiling Tile is available either 3/8" thick and 24" by 24" square or 1/2" thick and 24" by 48". "Firestop-120" is 5/8" thick and 24" by 24" square. Precision cutting at the plant assures uniform tile dimensions.

FAST INSTALLATION—Bestwall Incombustible Ceiling Tile and "Firestop-120" are available only through qualified and approved Acoustical Contractors. Their extensive experience insures quality installation. Both Bestwall Incombustible Ceiling Tile and "Firestop-120" units can be rapidly installed in conventional types of exposed grid suspension systems. "Hold down" clips assure snug alignment of the tile in the grid system. Extreme humidity conditions should be avoided.

DECORATION—Tile may be repainted by any conventional method. This feature permits color styling of the ceiling before or after installation.

VERSATILITY—Each tile unit is removable for immediate access to ducts, pipes and utility lines above the ceiling. Lighting and air conditioning fixtures may be incorporated into the ceiling design and changed when desirable at a minimum cost.

SPECIFICATIONS—Ceiling tile shall be Bestwall Incombustible Ceiling Tile (or "Firestop-120") manufactured by Georgia-Pacific, Bestwall Gypsum Division, Paoli, Pennsylvania. Tile shall be installed by the manufacturer's approved Contractors and in accordance with manufacturer's specifications. The suspension system used shall be from a reputable manufacturer, designed to carry the 24" by 24" units or the 24" by 48" units and shall be erected according to the manufacturer's recommendations. (Fire rated suspension systems shall be used with "Firestop-120" to obtain fire rating.)

For over half a century, Bestwall gypsum building materials have been accepted as a standard of quality everywhere. This recognition is earned through continued creative research which provides you with better building products and construction components. Witness Bestwall Incombustible Ceiling Tile and "Firestop-120", economical choices for functional, fireproof ceilings designed for unequaled service-life in your building.

Ask your Georgia-Pacific/Bestwall representative for complete details. Or write directly to us.

GEORGIA-PACIFIC / BESTWALL GYPSUM DIVISION

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PLANTS AND OFFICES THROUGHOUT THE UNITED STATES

SGP 0028256

GYPSUM WALLBOARD MANUAL

GYPSUM CEILING TILE

Bestwall Gypsum Acoustical and Ceiling Tile - made for non-residential use.

What is it? Size 2 x 2 x 3/8; 2 x 4 x 1/2" (Ceiling Board)
2 x 2 x 5/8" Firestop - 120 with UL label.

Pattern - Full Random Acoustical Tile - Textured Finish Ceiling Board

Light deflection 0.78

Noise reduction coefficient .70 Acoustical only

Functional Mechanism - Acoustical

a. Holes equal to 20% of area

b. Membrane designed porosity to transform sound energy to heat

c. Plenum - depth influences absorption characteristics

Core - Special Gypsum reinforced with glass fibers - heavier paper. Almost 10 miles per 2 x 2 piece.

Incombustible - Federal specifications SSA-118b

Installation - on suspended, exposed grid system

Who applies it?	Approved Acoustical Contractors - A contractor who has a franchise from a Major acoustical tile manufacturer.
Where made?	In Bestwall's Acoustical Tile Plant in Brunswick, Georgia
For Whom?	The commercial buildings, schools, offices, shopping centers, auditoriums, recreational buildings, discount stores, lobbies, cafeterias, etc.
How is it made?	A special formulated board run on our board machine is taken to tile plant where it is cut to size, drilled, painted, - (two finishes - flat and textured). (Acoustical only (Membrane paper applied, inspected, packaged - 40 sq. ft. to a carton (2 x 2) - 32 sq. ft. to a carton 2 x 4 x 1/2 and then warehoused - 24 sq. ft. to a carton 2 x 4 x 5/8 Firestop-120.
Where warehoused?	Brunswick, Georgia - stocked at Acme, Texas and Sigurd, Utah. This permits small orders to be top loaded in box cars of combined shipments. Also gives quick delivery to large metropolitan areas.
Trade factors?	Acoustical contractors, architects, owners, general contractors, and large national chains.

How advertised? In Sound Ideas - a trade magazine, Architectural Record, Chain Store Age, American School and University, School Product News, and Sweets Catalog Brochure.

Competitive Products: Glass Fibers - Owens Corning - Gustin Bacon, Celluler Glass, Pittsburgh Corning and others.

Mineral Fibers - U.S.G., Celotex, Armstrong Cork, Johns-Manville, National Gypsum, Simpson Logging Company, Baldwin Hill, Wood Conversion.

Wood Fiber Products - Same as for Mineral Fibers.

Gypsum Products - U.S.G., National, and Johns-Manville.

GENERAL THEORY OF ACOUSTICS

Sound is nothing more than vibrating air!

There are places where sound is wanted - (Noise is unwanted sound)

Class rooms, music rooms, lecture halls, auditoriums, conference rooms, and sound studios.

Here we need reinforcement and balanced distribution of clear, intelligible words so that the speaker can be understood.

And there are places where sound is unwanted -

Swimming pools, gyms, corridors, lobbies, cafeterias, and offices.

Here the main problem is eliminating echoes, flutters, and excessive reverberations.

Definitions:

REVERBERATION - Only a small portion of the energy from a sound source reaches the listener directly. Most of the sound is reflected back and forth between the room surfaces. In fact, small portions of succeeding bounces also reach the listener's ear.

The sound that comes directly from the source reaches the ear in the shortest time. The sound bouncing from other surfaces takes longer since it must travel a greater distance. Since the speed of sound is only 1100 feet/second, the time between successive bounces is easily measurable in an ordinary room. At each reflection, or "bounce" the sound loses some energy. The time it takes the sound to die down until its energy is reduced to one-one millionth, is called the reverberation time.

Reverberation time is a function of room geometry. It depends upon the size of the room, how absorbing the walls are and how much other absorption there is. Increased absorption in a room reduces the reverberation time because more energy is lost at each reflection.

DIFFUSION - If too much of the reflected sound reaches the listener from a single direction, the acoustics are not good. It is desirable that there be sufficient diffusion so that there is no identifiable second source of sound. Diffusion can be controlled by the distribution of absorption.

FREQUENCY - In most room acoustics we need not be concerned with anything lower than 70-100 c.p.s. (cycles per second) or anything higher than 7,000 c.p.s. Roughly, frequencies below 300 c.p.s. are referred to as low frequencies, those above 2,000 c.p.s. as high. The sound absorption of acoustical materials varies the frequency.

Measuring Acoustical Material Performance

The materials are tested in a room especially designed to have little absorption and good diffusion. The reverberation time of the untreated room is measured at a given frequency. Then a limited amount of absorption material is put into the room and the reverberation time measured again. From the difference between these two times, the absorption added to the room is calculated.

This experiment is repeated for a number of frequencies and the absorption as a function of frequency is obtained. The average of the absorption values for a specified number of standard frequencies, expressed on a square root basis is often used and is called the "Noise Reduction Coefficient".

SALES PLAN:

1. Contact all major acoustical contractors in your territory and select those with whom you feel you can work.

2. Solicit orders from these contractors for jobs, both large and small, that they control or have under contract.

3. Include ceiling tile and acoustical tile presentations on all appropriate job calls at all levels (architect, owner, contractor, sub-contractor.)

4. Ask for the order
To accomplish #1 above you must have a knowledge of who these specialty contractors are. Consult Dodge Reports and learn who is awarded acoustical contracts, consult yellow pages and other local directories to build your initial acoustical contractor prospect list.

To accomplish #2 you must qualify yourself to your prospect thru calls and demonstration of your own knowledge and integrity. Learn who your competition is, what they are promoting, their approximate pricing. Above all, you must know your local code requirements and equate them to the particular Bestwall tile needed. You will find your job easier if you go in armed with literature and samples, and as time goes on pictures of local jobs.

To implement #3 (job calls). Before going into a trade factor's office have a specific job in mind. Decide what Bestwall products could conceivably be required on the particular job, i.e. wallboard, sound deadening board, plaster, lath, roof deck, joint treatments, textures, partition systems, sheathing, and, of course, ACOUSTICAL AND CEILING TILES. You may in some cases promote all these with an architect or owner. If the trade factor is a contractor or sub-contractor your list of promotional items will obviously be tailored to his interests. Arm yourself with appropriate literature and samples and when possible demonstrations. Be prepared to discuss costs

SALES PLAN (CONT'D):

and the advantages of the Bestwall products involved. (i.e. in many sections of the country it is possible to offer a finished ceiling in storage areas with all the incidental advantages of a suspended system, access etc., at no premium over regular wallboard taped and painted. Where codes require a finished ceiling over food areas this has obvious sales appeal.)

To implement #4 Ask for the order at least three times on every call at the sub-contractor level. Don't waste some of your call time. Remember, Acoustical Contractors are prospects for other Bestwall products. Most could use at one time or another these products that you are charged with selling.

1. Acoustical tile
2. Ceiling tile
3. Grid board
4. 5/8" Firestop 120
5. Eternawall
6. C. T. Board
7. Lath
8. Sound deadening board

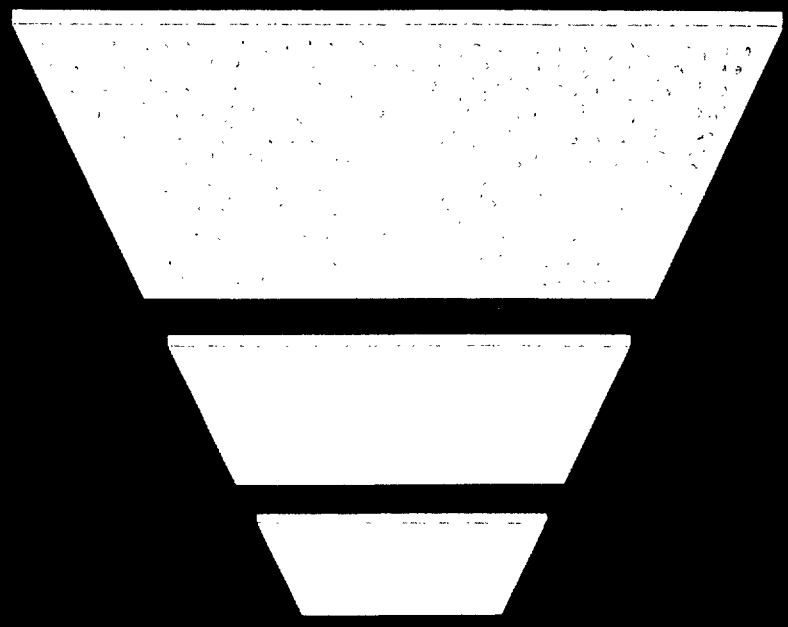
ASK FOR THE ORDER!!

SALES ADVANTAGES:

1. Numerous patterns and designs possible thru mix and match ceilings with acoustical and ceiling tiles.
2. Only 2-hour Fire-Resistant Gypsum Ceiling.
3. Low Cost - competitive with any ceiling.
4. Washable surface.
5. Excellent noise control qualities.
6. Fast delivery.
7. Job site delivery in trucking area.
8. Permits applicator to maintain small inventory.
9. Easy cutting - less waste.
10. Plenum area accessable.
11. U.L. label on Firestop 120
12. Mineral with all advantages of gypsum.

SERVICE - COST - APPEARANCE

BESTWALL HAS THEM.



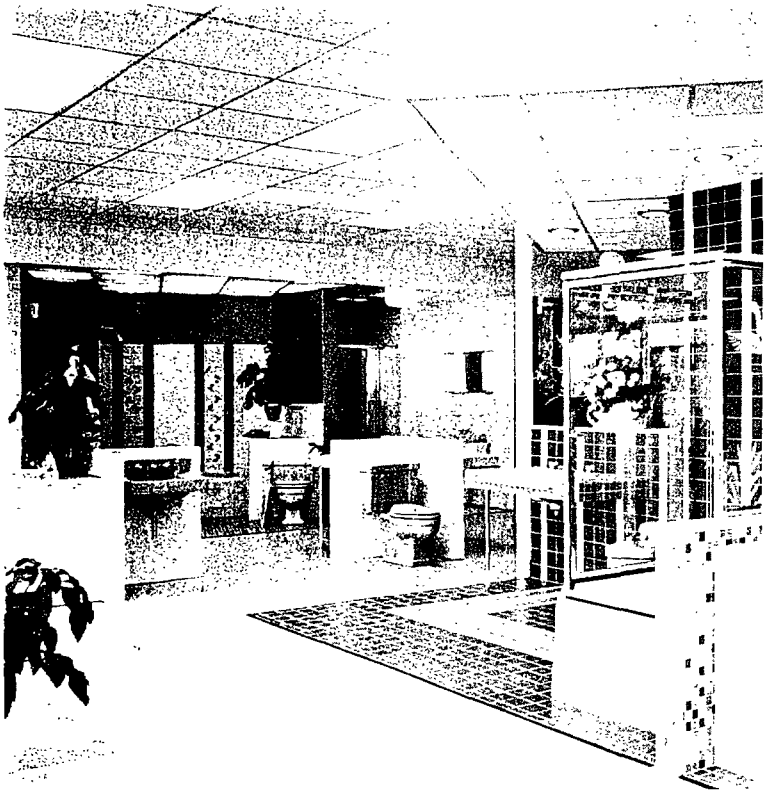
SPACIAL SILENCE® INCOMBUSTIBLE ACOUSTICAL TILE

INCOMBUSTIBLE CEILING TILE

FIRESTOP—120 FIRE RATED TILE

BESTWALL®

SGP 0028265



INCOMBUSTIBLE ACOUSTICAL TILE

. . . for lower cost sound control and incombustibility

DESCRIPTION

Bestwall Incombustible Acoustical Tile is an economical, incombustible lay-in unit designed for use in exposed grid suspended ceilings. The "Spacial Silence"® principle is utilized in obtaining high noise reduction coefficients. A perforated mineral tile, it provides the economical answer to acoustical treatment and incombustible requirements in schools, warehouses, factories, supermarkets and other commercial and industrial structures. It is available only through qualified and approved Bestwall Acoustical Contractors.

Dimensions: 3/8" thick, nominal 24" by 24" (23¾" by 23¾"). A weight of 1.5 lbs. per sq. ft. may be used for design purposes.

Finish: Full random drill pattern in textured white.

Precision Manufacture: The tile's gypsum core is reinforced with miles of interlocking glass fibers for added strength. Precision cutting at plant assures uniform tile dimensions, permitting easy installation.

SPACIAL SILENCE

"Spacial Silence"® is the principle of efficient sound absorption. Three functional elements achieve it: Full random perforations; a porosity controlled membrane on the back of the tile and the "Spacial Area" required above the tile.

INCOMBUSTIBILITY

Meets most building codes and complies with Federal Specifications SS-A-118b, Type II A, Class A, Incombustible. When tested according to ASTM E-84 it has a surface burning rating of 0 to 15, which under most Building Codes permits unlimited use.

ECONOMY

Lightweight, easy to handle units go up fast. After-hours installation permits uninterrupted business operations allowing other trades to move in faster.

GLASS FIBER REINFORCEMENT

This exclusive Bestwall development provides added strength and resilience. Breakage in handling and installation is minimized. Interlocking textile glass filaments are of uniform strength and length . . . up to 2.4 miles in every square foot of tile.

0.78 LIGHT REFLECTION

Textured white finish reflects light evenly and without glare.

EASY MAINTENANCE

Tile can be easily cleaned with a cloth or sponge slightly dampened with a mild detergent.

REDECORATION

Tile may be color styled before or after installation by any conventional painting method without impairment of acoustical qualities. Spray painting is not recommended.

EASY ACCESS

Each tile unit is removable for immediate access to ducts, pipes and utility lines above the ceiling. Lighting and air conditioning fixtures may be incorporated into the ceiling design at minimum cost.

ADDITIONAL INSULATION

The ceiling may be adequately insulated by use of 2" thick 24" wide fiber glass building insulation, rolled out on top of the tile and suspension system. In addition to providing insulation, a gain of about 10% in sound absorption also is obtained. (See chart on Sound Absorption Coefficients.)

SIMPLE INSTALLATION

Installation consists of Bestwall Incombustible Acoustical Tile units placed in an exposed grid suspension system.

LIMITATIONS

Relatively high humidity conditions above or below the tile should be avoided.

®Registered Trademark

SOUND ABSORPTION COEFFICIENTS OF BESTWALL INCOMBUSTIBLE ACOUSTICAL TILE

Mounting #7 (Mechanically Supported)	Thickness	125 Cycles	250 Cycles	500 Cycles	1,000 Cycles	2,000 Cycles	4,000 Cycles	NRC
Air Space— 5 inches	3/8 in.	.57	.70	.80	.72	.62	.47	.70*
Air Space—16 inches	3/8 in.	.58	.70	.53	.59	.60	.57	.60
*Riverbanks test #60-33 **With 2 in. Thick Fiber Glass Insulation Over Suspension System and Tile**								
Air Space— 5 inches	3/8 in	.49	.76	.79	.76	.68	.55	.75
Air Space—16 inches	3/8 in.	.53	.61	.65	.76	.68	.61	.68



INCOMBUSTIBLE CEILING TILE

. . . for lower cost Class A incombustibility and design freedom

DESCRIPTION

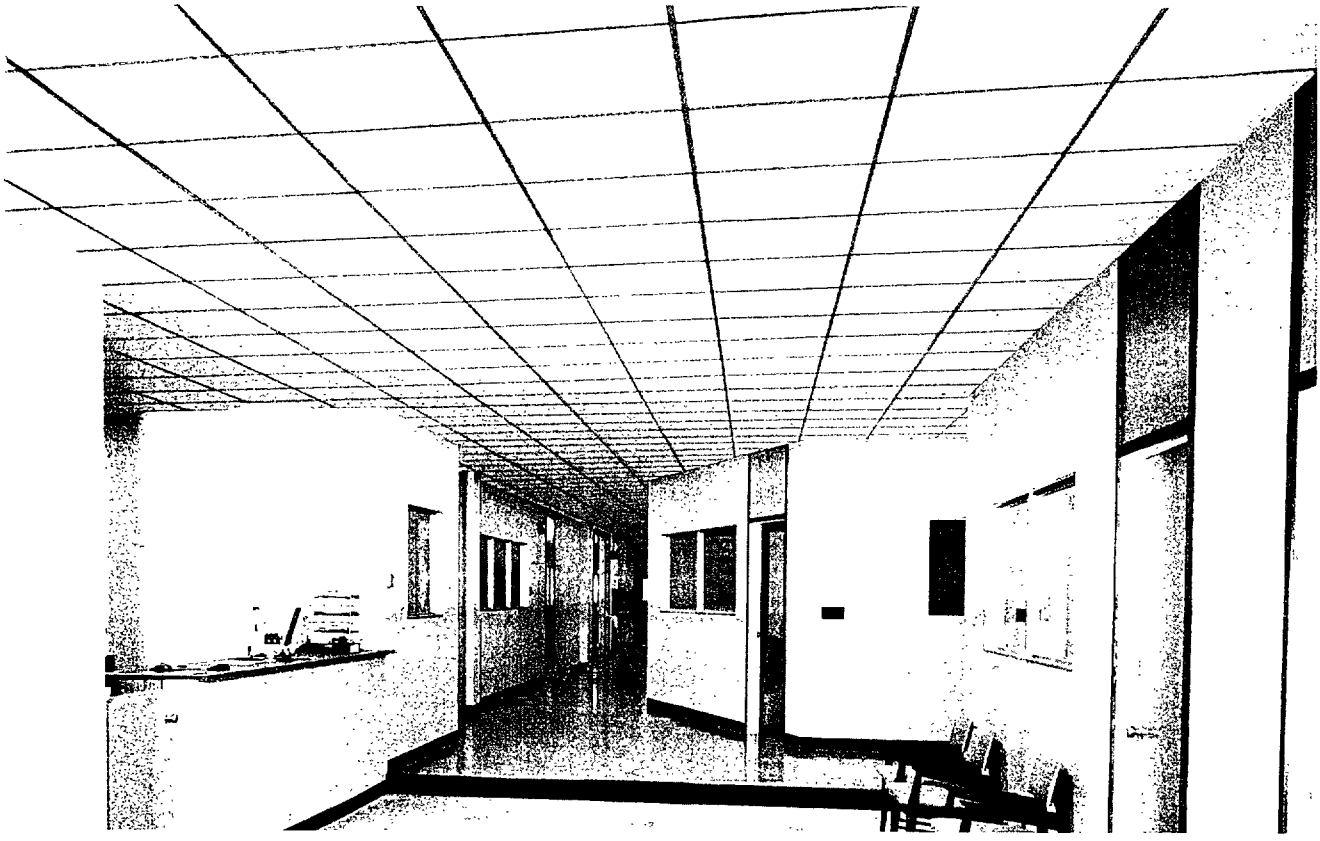
Bestwall Incombustible Ceiling Tile is a predecorated lay-in unit designed for use in exposed grid suspended ceilings where low cost fire safety is a primary factor. With the exception of acoustical qualities, it is similar to Bestwall Incombustible Acoustical Tile, meeting Class A requirements for incombustibility and providing full 0.78 light reflection. The flat or textured glarefree finishes of both Bestwall Incombustible Ceiling and Acoustical Tiles are compatible and may be combined to create attractive ceiling patterns. It is available only through qualified and approved Bestwall Acoustical Contractors.

Dimensions: 3/8" thick, nominal 24" by 24" (23 3/4" by 23 3/4"), and 1/2", nominal 24" by 48" (23 3/4" by 47 3/4"). For design purposes a weight of 1.5 lbs. per sq. ft. may be used for the 3/8" ceiling tile; 2.0 lbs. per sq. ft. for the 1/2" ceiling tile.

Finish: Plain or textured surface in white.

CUSTOM EFFECTS (Illustrated above)

Mixed or matched combinations with Bestwall Incombustible Acoustical Tile provide modulated ceiling designs without "custom built" cost. Tile can be repainted, if desired, to coordinate subsequent changes in color.



"FIRESTOP-120"

. . . on a rated exposed grid gives a system which results in the lowest cost membrane fire proofing currently available

Bestwall Gypsum Company, a pioneer in gypsum building products for private and commercial construction, now makes available "Firestop-120" a new ceiling tile, to provide the lowest cost 2-hour fire-rated ceiling.

Tested in accordance with procedure set forth in ASTM E-119-61, "Firestop-120" gypsum ceiling tile achieved a 2-hour fire endurance rating in a rated ceiling assembly.

"Firestop-120" is listed by Underwriters Laboratories under Fire Resistance Classification as Design 208—2 hours. Product boxes carry the U L Label. A Firestop gypsum board product, "Firestop-120" is covered under the Fire Hazard Classification of 10-15.

Many advantages of Bestwall "Firestop-120" are beneficial to all architects, contractors and building owners.

"Firestop-120" is approved under National Model Building Codes as well as local Building Department Codes of large cities.

TO THE ARCHITECT

Provides a quick, low cost method of protecting incombustible floor systems.

Reduces sound transmission.

Glass fiber reinforcement adds strength and resiliency to the tile during handling and application, and after it is in place.

Each tile unit is removable for immediate access to pipes, ducts and utility lines above the ceiling.

The official fire test of "Firestop-120" included recessed light fixtures totaling 16 sq. ft. per 203 sq. ft. or 8% of ceiling area and openings for vents of 71 sq. in. per 100 sq. ft. of ceiling area. Thus the rating of 2 hours permits modern flat ceiling design with recessed fixtures.

Lighting and air conditioning facilities in the ceiling design may be easily changed when desired.

Easy to handle panels 24" x 24" x 5/8".

Packed 6 tiles to a carton insuring arrival in good condition, with minimum loss through breakage or soiling.

Saves construction time, as "lay-in" application is quick and economical, allows other trades to move in faster.

Factory finish insures uniform appearance.

Lowers construction costs as intermediate fire protection is eliminated, and clean-up operations are reduced.

Pre-decorated units eliminate need for on-site decoration.

TO THE BUILDING OWNER

Greater fire protection generally results in reduced insurance premiums.

Plain or textured finishes of the tile reflect light evenly and without glare.

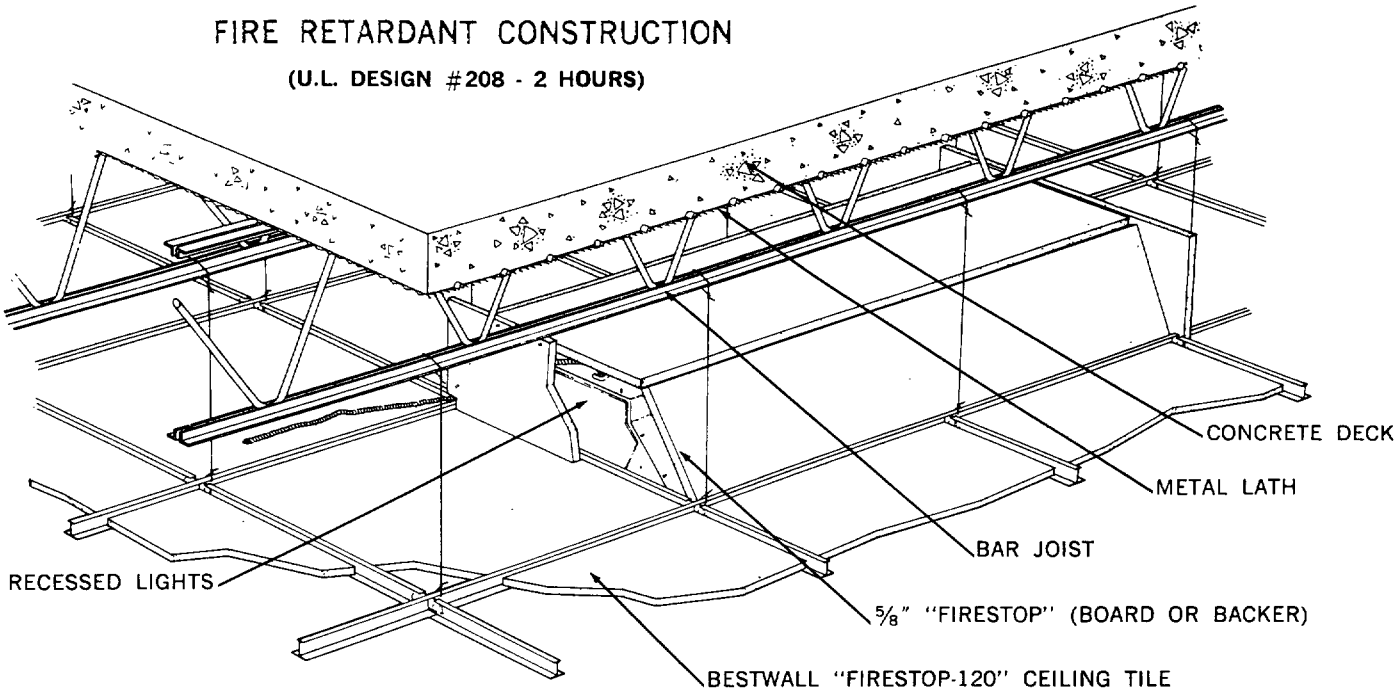
Heat and sound transmission are reduced.

Decorative finishes may be repainted economically by any conventional method.

SGP 0028268

FIRE RETARDANT CONSTRUCTION

(U.L. DESIGN #208 - 2 HOURS)



Easy to maintain and clean.

Accessibility to any area of pipes, ducts or utility lines above the ceiling.

Reduced construction time permits earlier occupancy.

"Firestop-120" offers all advantages of conventional types of exposed grid suspension systems plus the benefits of a 2-hour rated ceiling.

Bestwall "Firestop-120" is the **first** gypsum ceiling tile to be given a fire retardant time designated rating. It developed 2-hour fire resistance in an Official Fire Test when the assembly was constructed in accordance with the Standard Method of Fire Tests of Building Construction and Materials, ASTM Designation E-119-61.

REQUIREMENTS OF STANDARD FIRE TEST

SUSTAIN APPLIED LOAD

One of the requirements of the Standard Fire Test is that "the construction shall have sustained the applied load (theoretically the design load) during the fire endurance test . . . for a period equal to that for which classification is desired".

Where design loading is not feasible, there is an alternate requirement to determine the protection provided to steel beams. It states that the maximum temperature on the steel beams must not rise above 1200°F and the average temperature of a section of the beam must not exceed 1000° F. "Firestop-120" ceiling tile on a rated exposed grid provides this type of protection to structural steel.

In the Official Tests the assembly did not fail under load nor was a critical temperature even reached on the bar joists during the 2-hour fire test. Only the tile prevented heat from being transmitted to the plenum.

TEMPERATURE RISE ABOVE CONCRETE

The second condition of the Standard Fire Test is "transmission of heat through the construction during the fire endurance test shall not have been such as to raise the temperature on its unexposed surface (top of the deck or slab) more than 250° above its initial temperature".

The deck or floor construction plays an important role in meeting this requirement. Gypsum, Portland Cement concrete, and similar materials—because of their compositions—tend to restrain a temperature rise on the top of the slab.

ADVANTAGES OF BESTWALL "FIRESTOP-120"

Bestwall "Firestop-120" makes it possible, where design requirements permit, to specify lighter weight floor ceiling assemblies.

In instances where Bestwall "Firestop-120" provides greater protection to a building than codes require, the added protection may provide lower fire insurance rates on the building and contents.

BESTWALL "FIRESTOP-120" IS:

- **Strong**—Glass fiber reinforcement adds strength and resiliency to the tile during handling and application, and after it is in place.
- **Easy Working**—Easy to handle panels 24" x 24" x 5/8". "Firestop-120" is also easy to maintain and clean. Decorative finishes are tough, hard surfaces resistant to marking.
- **Fast Working**—Saves construction time as lay-in application is quick and economical.
- **Versatile**—Offers all the advantages of conventional types of exposed grid suspensions plus the benefits of a 2-hour fire rated floor and ceiling construction. Each "Firestop-120" unit is removable for immediate access to pipes, ducts, and utility lines above the ceiling.

SOUND ATTENUATION IN ALL FREQUENCIES

FREQUENCY	125	177	250	354	500	707	1000	1414	2000	2828	4000
ATTENUATION	28	33	30	33	37	41	42	44	45	44	41

AVERAGE 38 db

Tested by Geiger and Hamme Laboratories using the "Two Room Method"

5/8" material reported, 3/8" & 1/2" material tested with practically the same results.

SGP 0028269

SPECIFICATIONS FOR BESTWALL INCOMBUSTIBLE TILE

SHORT FORM

Tile shall be Bestwall Incombustible Tile* manufactured by the Bestwall Gypsum Company, Paoli, Pennsylvania. Tile shall be installed by the manufacturer's approved Acoustical Contractors and in accordance with manufacturer's specifications.

The suspension system used shall be from a reputable manufacturer, designed to carry the 24" by 24", or 24" by 48"† units and shall be erected according to the manufacturer's recommendations.

LONG FORM JOB CONDITIONS

1. The building should be fully enclosed.

2. The heating or air conditioning systems shall be in operation so proper conditions are maintained before, during, and after acoustical installation.

3. All poured roof decks, plaster, concrete, terrazzo or other "wet" operations shall be completed and thoroughly dry.

4. The "Spacial Area" or plenum chamber shall be vented to the outside.

5. The Bestwall Incombustible Tile* shall be delivered to the job just prior to installation time.

SPECIAL CONDITIONS

Bestwall Incombustible Tile* shall be installed by an Acoustical Contractor approved by the Bestwall Gypsum Company.

MATERIALS

a. Tile shall be Bestwall Incombustible Tile* as manufactured by the Bestwall Gypsum Company, Paoli, Pennsylvania. The tile shall be factory painted, white (plain or textured), packed in suitable cartons and complying with Federal Specifications SS-A-118b, Type II A, Class A, Incombustible.

b. Bestwall Tile* shall be installed on the flanges of an exposed rigid metal grid suspension system consisting of main carriers and interlocking cross tees. The grid system shall be installed to provide 24" by 24"†, or 24" by 48"† modules. The main carriers shall be hung from the ceiling slab or structure. Hangers and main runners shall be spaced in accordance with manufacturer's specifications and recommendations governed by the expected maximum load. Main runners shall be accurately leveled and spaced. Baked enamel finished or natural aluminum finish metal angle moulding, matching the exposed grid shall be installed where border units abut the walls or other vertical surfaces.

INSTALLATION

Bestwall Tile* and the suspension system shall be installed in accordance with standard practices by the Acoustical Contractor. For "Firestop-120" an approved fire rated suspension system shall be used where one-hour or two-hour ratings are required.

*In the above specifications insert the applicable tile:
Bestwall Incombustible Acoustical Tile
Bestwall Incombustible Ceiling Tile
Bestwall "Firestop-120" Ceiling Tile

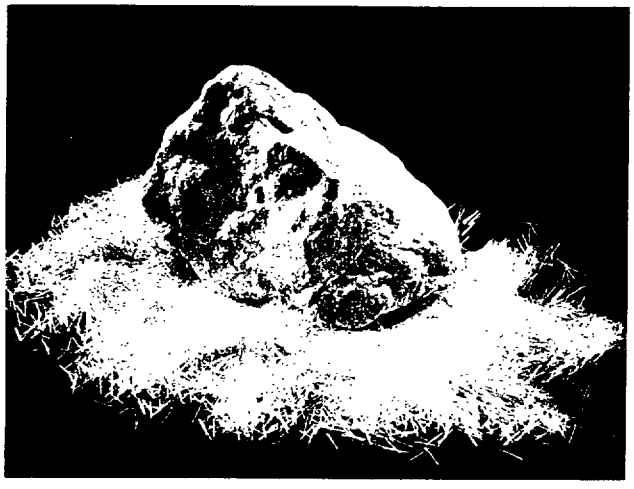
†Bestwall Incombustible Acoustical Tile available 3/8" thick, 24" by 24"

Bestwall Incombustible Ceiling Tile available 3/8" thick, 24" x 24";
1/2" thick, 24" x 48".

Bestwall "Firestop-120" Ceiling Tile, available 5/8" thick, 24" by 24" only.

SGP 0028270





BESTWALL INCOMBUSTIBLE TILE

Bestwall Incombustible Tile is reinforced with glass fibers as are most Bestwall Gypsum products. These glass fiber filaments of uniform length and strength, approximately ½" long, are as strong as high strength steel of the same size.

Miles of glass fibers are dispersed in the gypsum core of all Bestwall Incombustible Tile to add greater strength, resiliency, and increase resistance to fire.

COMPANY

For over half a century, Bestwall gypsum building materials have been accepted as a standard of quality everywhere. This recognition is earned through continued creative research which provides you with better building products and construction components.

FACILITIES

Strategically located plants across the nation utilize the most modern equipment and production techniques. In addition, research laboratories continuously check and control the performance of the finished product to meet highest quality standards. An efficient distribution network makes Bestwall a prompt and reliable source of supply.

SERVICES

Bestwall Technical Salesmen and Systems Engineers are qualified, ready and willing to assist you in ceiling assemblies.

SALES OFFICES

ATLANTA
801 Peachtree 25th Building
1720 Peachtree Street, N. W.
Atlanta, Georgia 30309

BRUNSWICK
P. O. Box 1379
Brunswick, Georgia 31521

CHICAGO
5544 W. St. Charles Road
P. O. Box 607
Berkeley, Illinois 60162

CLEVELAND
P. O. Box 845
Cleveland, Ohio 44122

DALLAS
600 Exchange Bank Building
Dallas 35, Texas

DETROIT
15800 W. McNichols Road
Suite 227, Officenter Bldg.
Detroit 35, Michigan

HOUSTON
P. O. Box 13397
Bayou Building, Allen Parkway
Houston, Texas 77019

KANSAS CITY
4233 Blue Ridge Boulevard
Kansas City, Missouri 64133

NEW ORLEANS
P. O. Drawer 26278
Chef Menteur Station
7800 Alamonaster Drive
New Orleans, Louisiana 70126

SAN FRANCISCO
301 El Cerrito Plaza
El Cerrito, California 94532

WESTERN
119 W. 2nd South
Salt Lake City, Utah 84101

WILMINGTON
Wilmington Marine Terminal
P. O. 310
Wilmington, Delaware 19899

FIREPROOF GYPSUM BESTWALL® BUILDING PRODUCTS

BESTWALL GYPSUM COMPANY
PAOLI, PENNSYLVANIA

SGP 0028272



BESTWALL

INCOMBUSTIBLE CEILING TILE

CLASS A COSTS NO MORE

Now a low-cost incombustible ceiling tile—that meets all Class A requirements—opens new perspectives in design with greater application ease and planning, plus impressive savings in maintenance costs and fire insurance rates.

Reinforced with miles of glass fibers, Bestwall Incombustible Ceiling Tile is a pre-decorated lay-in unit specially designed for use in conventional exposed grid suspended ceilings. It performs with unusual versatility in schools, warehouses, factories, supermarkets and other commercial structures. Available in plain or textured white finishes, it matches the finish of Bestwall Incombustible Acoustical Tile. It may be used in various combinations with the acoustical tile to achieve a greater freedom of design.

SGP 6028273

BESTWALL INCOMBUSTIBLE CEILING TILE

COMBINES HIGH FIRE SAFETY WITH PROVEN JOB ADVANTAGES

CLASS A—INCOMBUSTIBLE—Bestwall Incombustible Ceiling Tile satisfies most building codes. It complies with Federal Specifications SS-A-118b Class A, Incombustible, and when tested according to ASTM E-84 it has a surface burning rating of 0 to 15.

LOW COST—Lightweight, easy to handle 24 by 24 inch units go up fast. After-hours installation permits uninterrupted business operations, allowing other trades to move in faster.

GLASS FIBER REINFORCED—Bestwall Incombustible Ceiling Tile is reinforced with interlocking textile glass filaments of uniform strength and length—up to 2.4 miles in every square foot. This unique advantage adds strength and resilience, minimizing breakage in handling and installation. The gypsum core is further protected by a tough surface paper—over 10 percent heavier than standard paper.

HIGH LIGHT REFLECTION—Bestwall Incombustible Tile offers a 0.78 light reflection. Both plain and textured finishes reflect light evenly and without glare.

EASY MAINTENANCE—Bestwall Incombustible Tile's prefinished surface may be cleaned with a cloth or sponge slightly dampened with a mild detergent. Tile can be economically repainted, if desired.

Bestwall Incombustible Ceiling Tile is ⅜ inch thick and 24 by 24 inch square. A weight of 1.5 pounds per square foot may be used for design purposes. Precision cutting at the plant assures uniform tile dimensions.

FAST INSTALLATION—Bestwall Incombustible Ceiling Tile is available only through qualified and approved Acoustical Contractors. Their extensive experience insures quality installation. Bestwall Incombustible Ceiling Tile units can be rapidly installed in conventional types of exposed grid suspension systems. "Hold down" clips assure snug alignment of the tile in the grid system. Extreme humidity conditions should be avoided.

DECORATION—Bestwall Incombustible Ceiling Tile is so designed that it may be repainted by any conventional method. This feature permits color styling of the ceiling before or after installation.

VERSATILITY—Each tile unit is removable for immediate access to ducts, pipes and utility lines above the ceiling. Lighting and air conditioning fixtures may be incorporated into the ceiling design and changed when desirable at a minimum cost.

SPECIFICATIONS—Ceiling tile shall be Bestwall Incombustible Ceiling Tile manufactured by the Bestwall Gypsum Company, Ardmore, Pennsylvania. Tile shall be installed by the manufacturer's approved Contractors and in accordance with manufacturer's specifications. The suspension system used shall be from a reputable manufacturer, designed to carry the 24 x 24 inch units and shall be erected according to the manufacturer's recommendations.

For over half a century, Bestwall gypsum building materials have been accepted as a standard of quality everywhere. This recognition is earned through continued creative research which provides you with better building products and construction components. Witness Bestwall Incombustible Ceiling Tile, an economical choice for functional, fireproof ceilings designed for unequalled service-life in your building.

Ask your Bestwall representative for complete details. Or write directly to us.

FIREPROOF GYPSUM
BESTWALL
BUILDING PRODUCTS

BESTWALL GYPSUM COMPANY, Ardmore, Penna. Plants and Offices throughout the United States

SGP 0028274

Form No. BW 61135

THE SHERWIN-WILLIAMS CO.
560 BROAD STREET
NEWARK 1, N. J.

August 8, 1960

Mr. R. G. Megaw
Bestwall Certain-Teed
120 E. Lancaster Avenue
Ardmore, Pa.

Dear Mr. Megaw:

When we were asked to develop a tile coating for your company the main factor considered was the fire resistance of the coating. Some of your competitors in the tile field test for flame resistance against the ASTM spec CS4249. Under this test procedure the "charred" area must be under 12 sq. inches. We have noticed that some of these coatings run just under 12 square inches (11.7 square inches and sometimes as low as 10 square inches). The coating on your tile under the ASTM spec CS4249 runs between 3 and 4 square inches. Quite an improvement. Mr. W.O. Stoll can give you the wind tunnel test results that again speak for the excellent fire resistance of the coating.

Washability is another important factor. This test is run on a Gardner scrub machine that counts the strokes of a scrub brush (under pressure) on the tile surface that is fed a constant supply of soapy water. Your coating will withstand 200 strokes and I have seen competitive tile go only 100 strokes. In fact one of your competitors only requires 100 strokes.

We have combined excellent fire resistance with very good scrubability. This, as I explained to you, is quite unusual in that when you upgrade fire resistance you downgrade scrubability. You will normally see either one or the other -- not both. If the fire resistance is just passable, then the scrub resistance is good. You have both.

Our formula is a thermosetting type and is therefore non-blocking. This is important to your sales department in that when the tiles are packaged you need have no fear of your customers unpacking them and finding "block" marks on the surface of the tile where it stuck to the back of, or the face of, another tile.

The coating gives a tough, hard, and uniform flat surface to your tile. Many tiles are highly susceptible to marking by metal tools and equipment. The Bestwall coating is highly resistant to such marking. It will metal mark, but we believe it is much better than some of the competitive tiles.

The uniform matt finish of this coating is important from two standpoints.

1. It provides a softness on the eye and that is most important for ceiling tile.
2. It will not "polish". Polishing of a film is due to the surface being rubbed (thru washing or rubbing together during shipment or during installation).

Have your men look at the flat coated tile from various angles and you will notice the finish is flat. Some competitive tiles have a sheen. This is done to eliminate the "polishing" effect. Your formula provides a flat, matt, finish that does not polish - even when compared to tiles that have a slight sheen. Check your competition on this point and then use it as an effective sales tool.

The coating is also free from water spotting. It is not sensitive to water - many coatings are. This is important when cleaning the tile. We agree that the tile should be washed with a damp sponge or rag. This coating can take it; some cannot - they are water sensitive; your coating is not.

The color of the white tile coating can be on the blue side or red side. The sample we supplied to Mr. Stoll was unshaded and therefore the tiles in his possession are unshaded. The color can remain as it is or can be tinted slightly to your preference.

I sincerely hope that this information will contribute to your sales meeting. Your men can be proud of this tile coating.

Should you need additional information, please let me know.

Kindest personal regards.

Very truly yours,

A. J. Kopf
The Sherwin-Williams Company

AJK/gek
cc. Walter O.Stoll

BESTWALL GYPSUM COMPANY

GYPSUM WALLBOARD MANUAL Section 8

1965 EDITION

LIST OF MANUFACTURERS OF METAL COMPONENTS FOR SUSPENDED CEILINGS

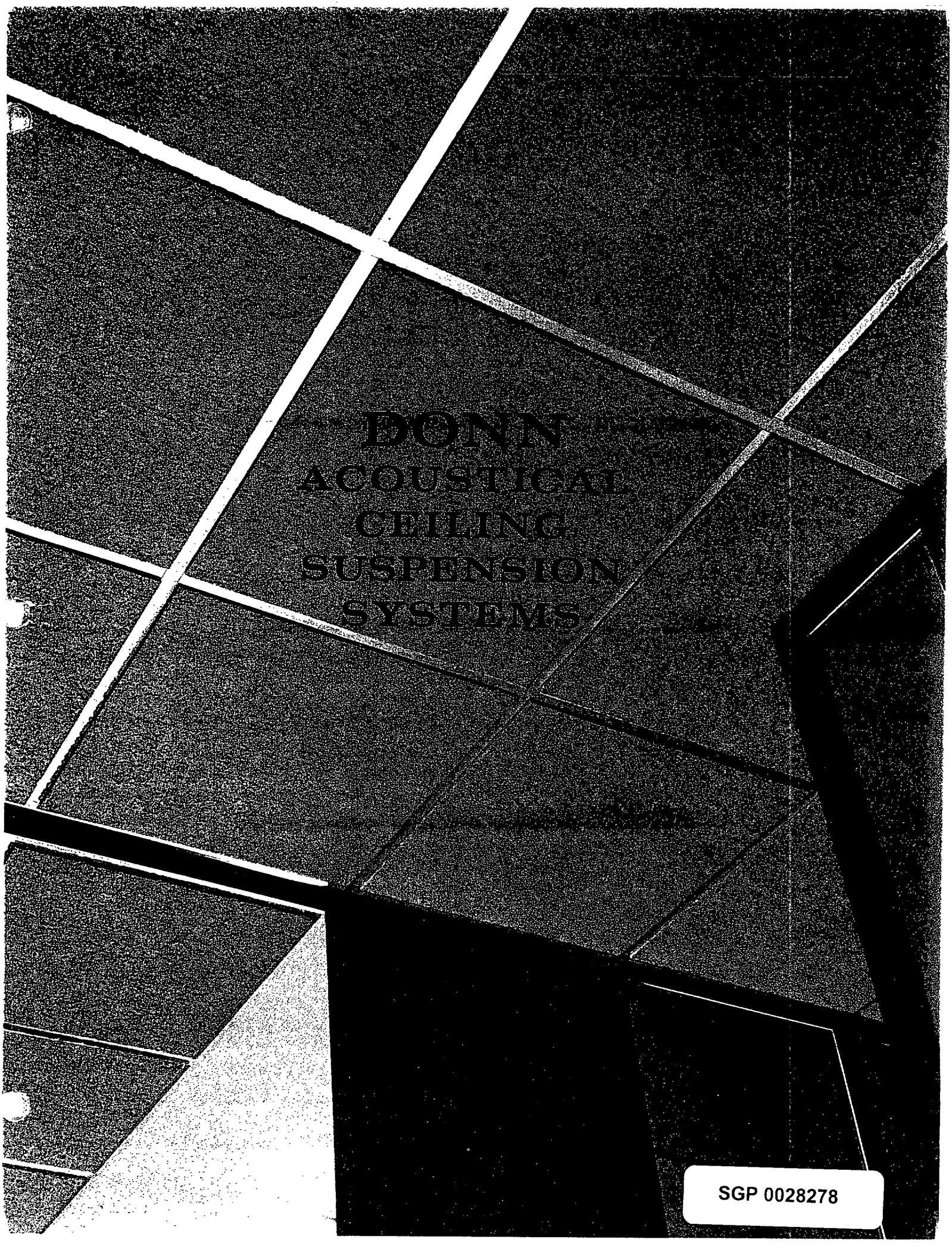
1. Donn Products, Inc.,
   700 Bassett Road
   Westlake, Ohio 44091
   Phone 216 871-1000

2. National Rolling Mill
   N. Morehall Road
   Malvern, Penna.

3. Eastern Products Corp.,
   1601 Wicomico Street,
   Baltimore, Md. 21230
   Phone 301 837-6700

4. Hastings Aluminum Products, Inc.
   Hastings, Michigan

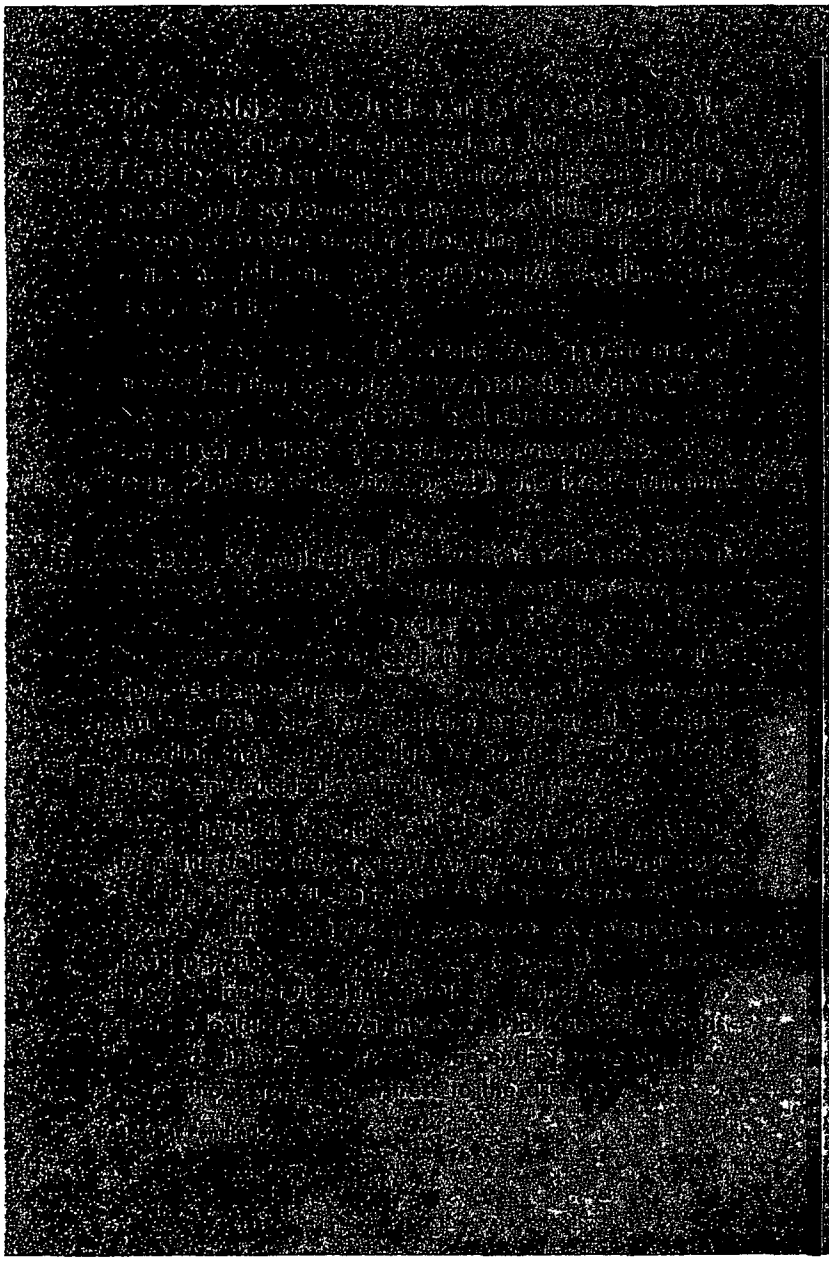
SGP 0028277

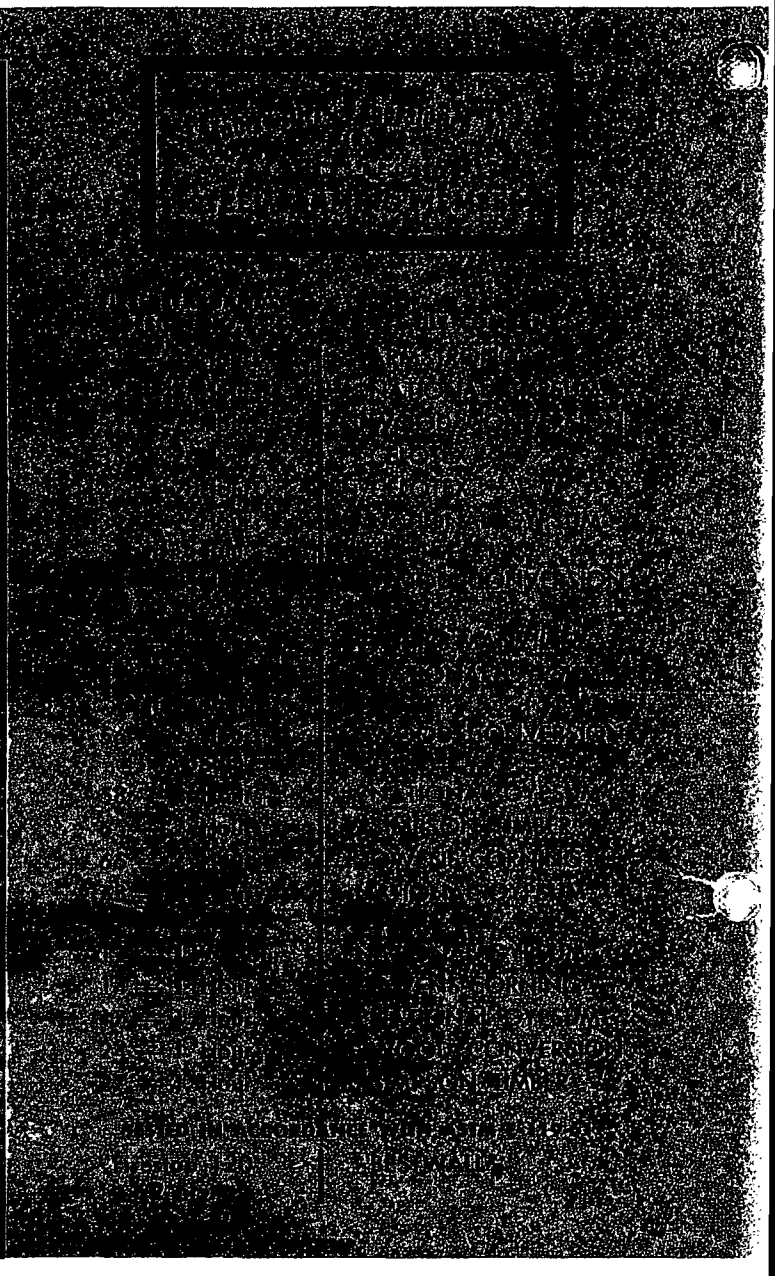


SGP 0028278

Fire-Rated Exposed Grid

DONN D-L SYSTEM





ARCHITECTURAL SPECIFICATIONS

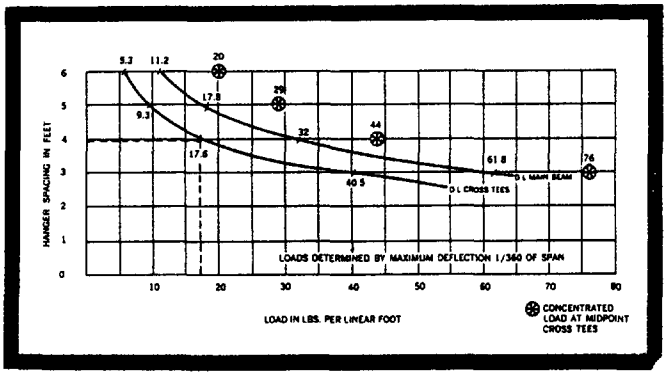
Suspension System: Shall be Donn D-L Fire Rated Suspension System as manufactured by Donn Products, Inc., Westlake, Ohio.

Requirements: Main beam shall be double web bulb section of not less than .021" steel. Beam shall have a height of not less than 1½"; bottom flange shall be faced with a continuous 1" roll formed cap. Beam shall have a maximum of one factory installed splice per 12' length.

Cross tees shall be double web bulb section of not less than .021" steel. Tees shall have a height of not less than 1½"; bottom flange shall be faced with a continuous 1" roll formed cap. Tees shall not be spliced, but shall have identical end detail to rest-on, automatically engage, level and lock to main beams. Molding shall be angle or box type.

Finish: Shall be pre-coated satin white steel cap or anodized natural aluminum cap.

Installation: Attach 12' D-L main beams suspended and level at 48" on centers, utilizing No. 12 galvanized wire spaced 48", on centers. Join 4' cross tees to main beams at 24" on centers and through slots in main beams, for 2' x 4' panels. Join 2' cross tees between 4' cross tees and through slots in 4' cross tees for 2' x 2' panels. Main beams and cross tees shall be supported at wall with angle mold.

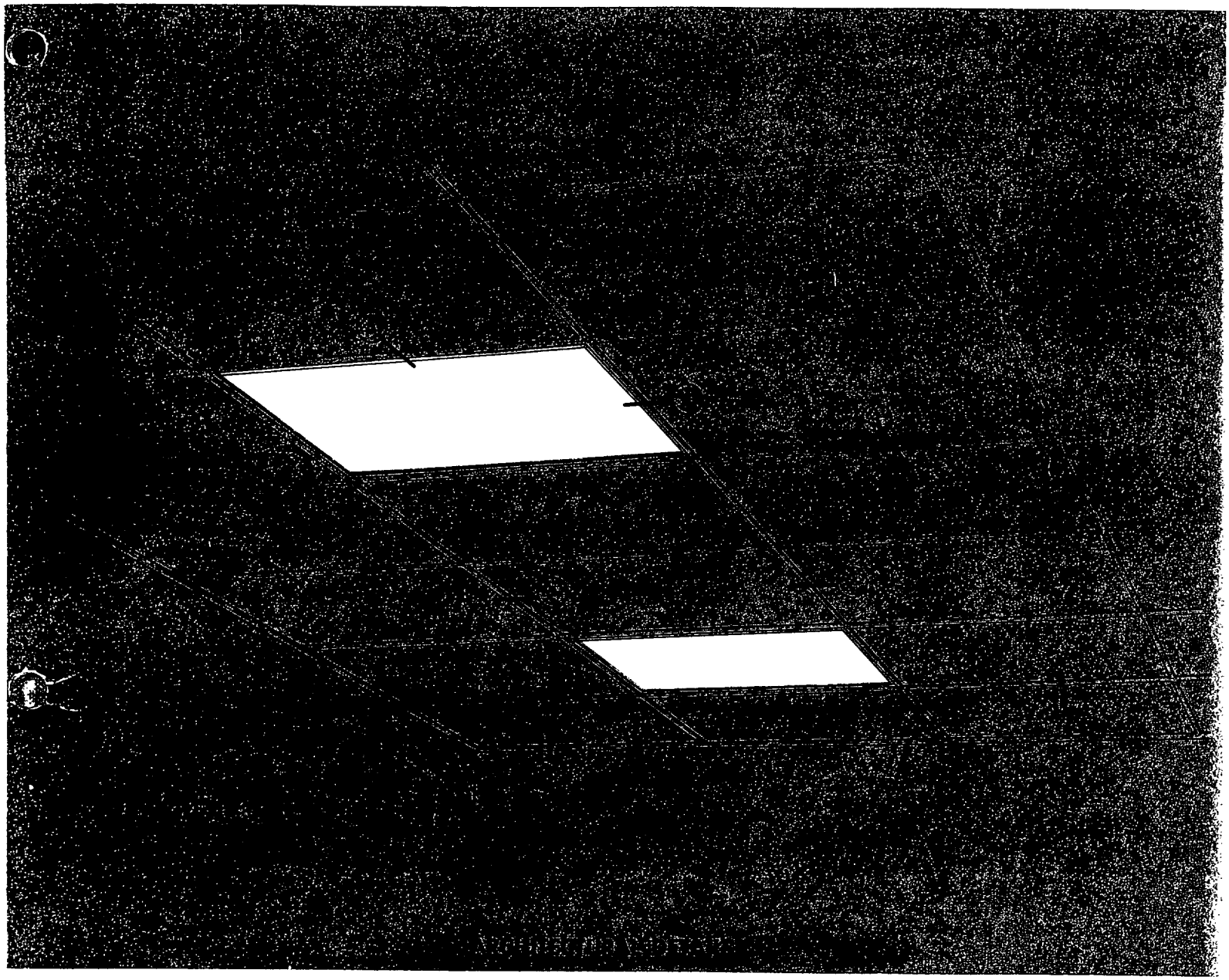


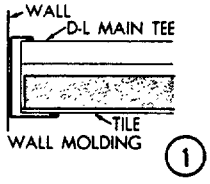
Allowable Load Graph. The loads above are limited by deflection 1/360 of the span. For unusual or special loading conditions, please request recommendations.

SGP 0028279

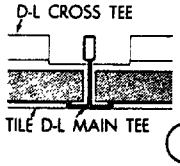
Fire-Rated Exposed Grid

DONN D-L SYSTEM

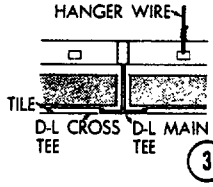




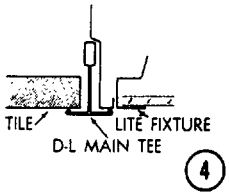
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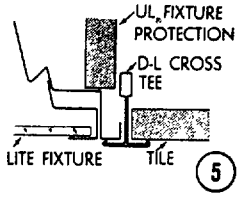
2



3



4

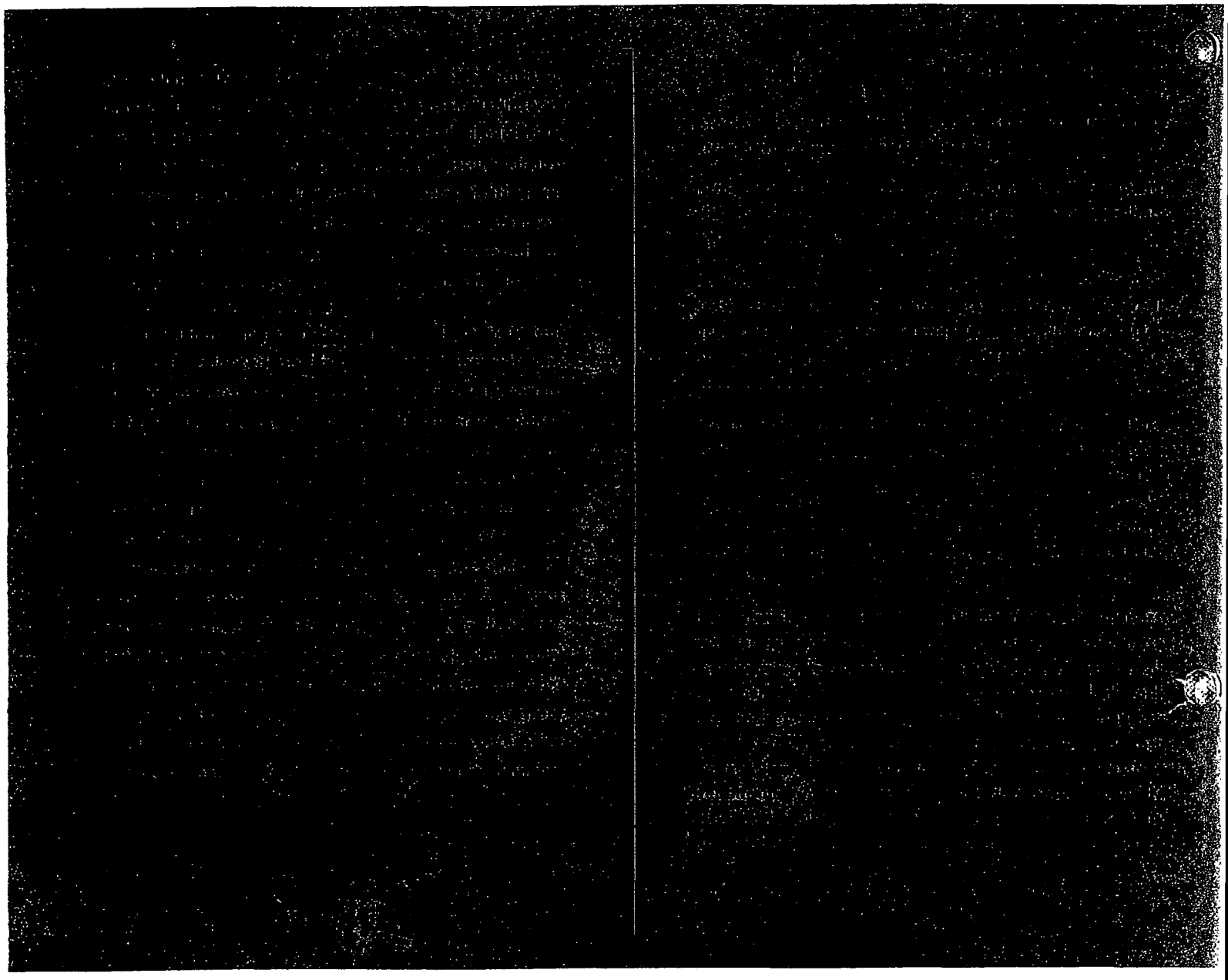


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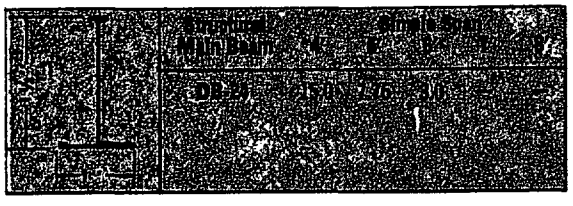
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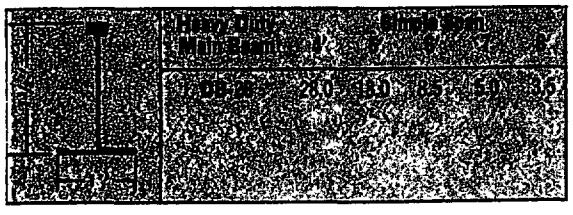
Exposed Tee Grid

DONN D-B & D-K SYSTEMS

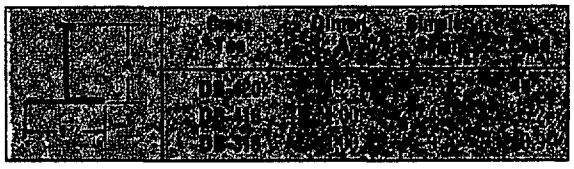


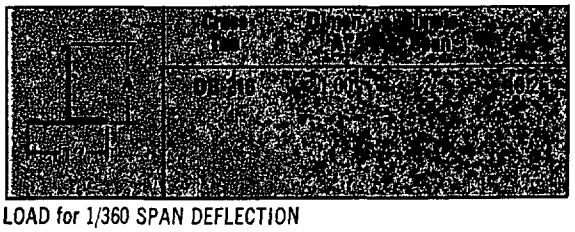
PHYSICAL DATA **STRUCTURAL DATA**





PHYSICAL DATA **STRUCTURAL DATA**



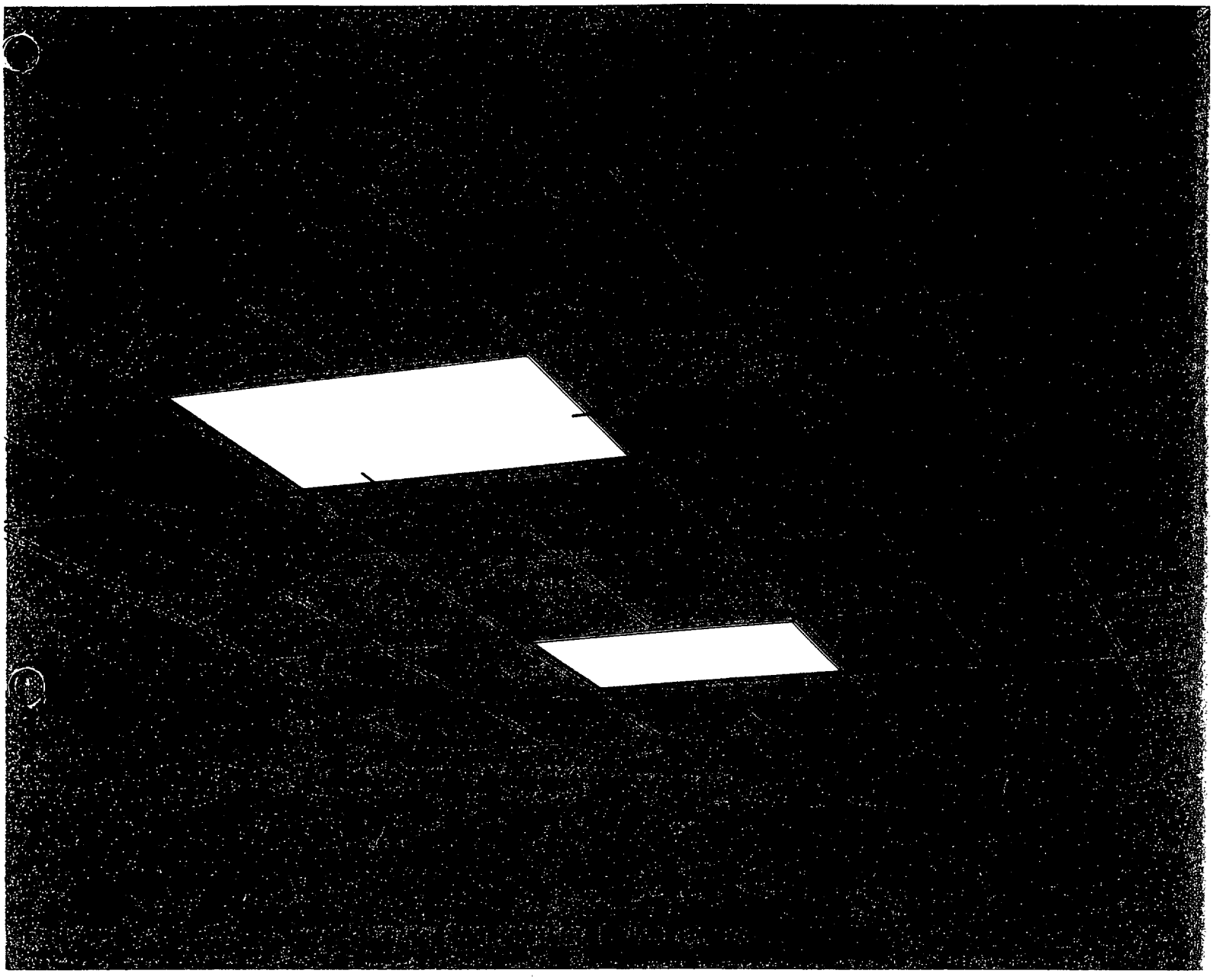


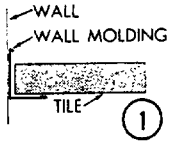
LOAD for 1/360 SPAN DEFLECTION

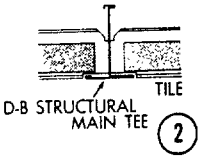
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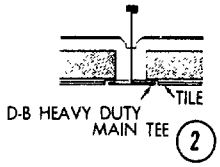
Exposed Tee Grid

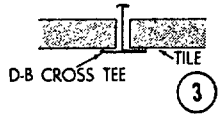
DONN D-B & D-K SYSTEMS



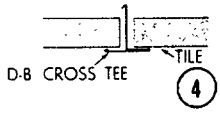


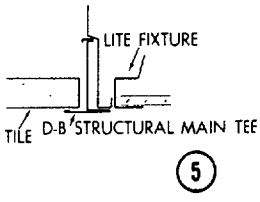


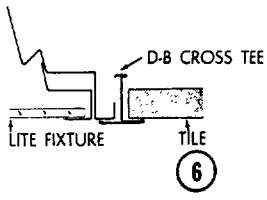




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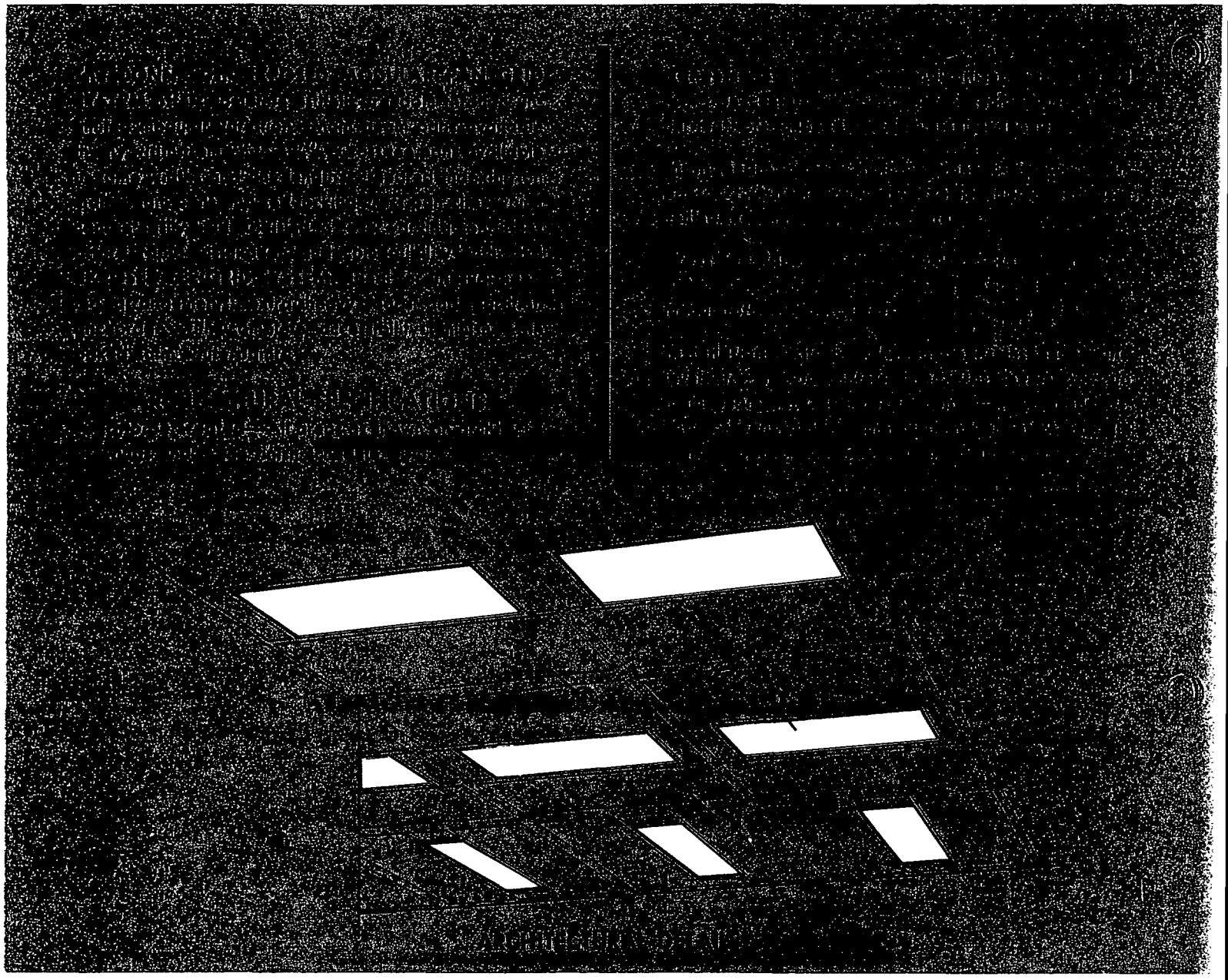


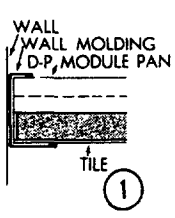


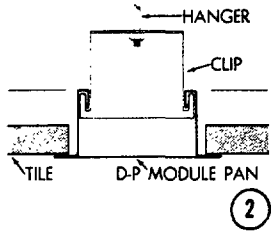


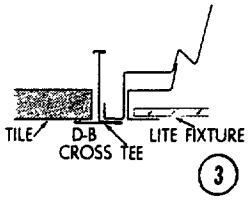
Exposed Modular Pan Grid

DONN D-P SYSTEM









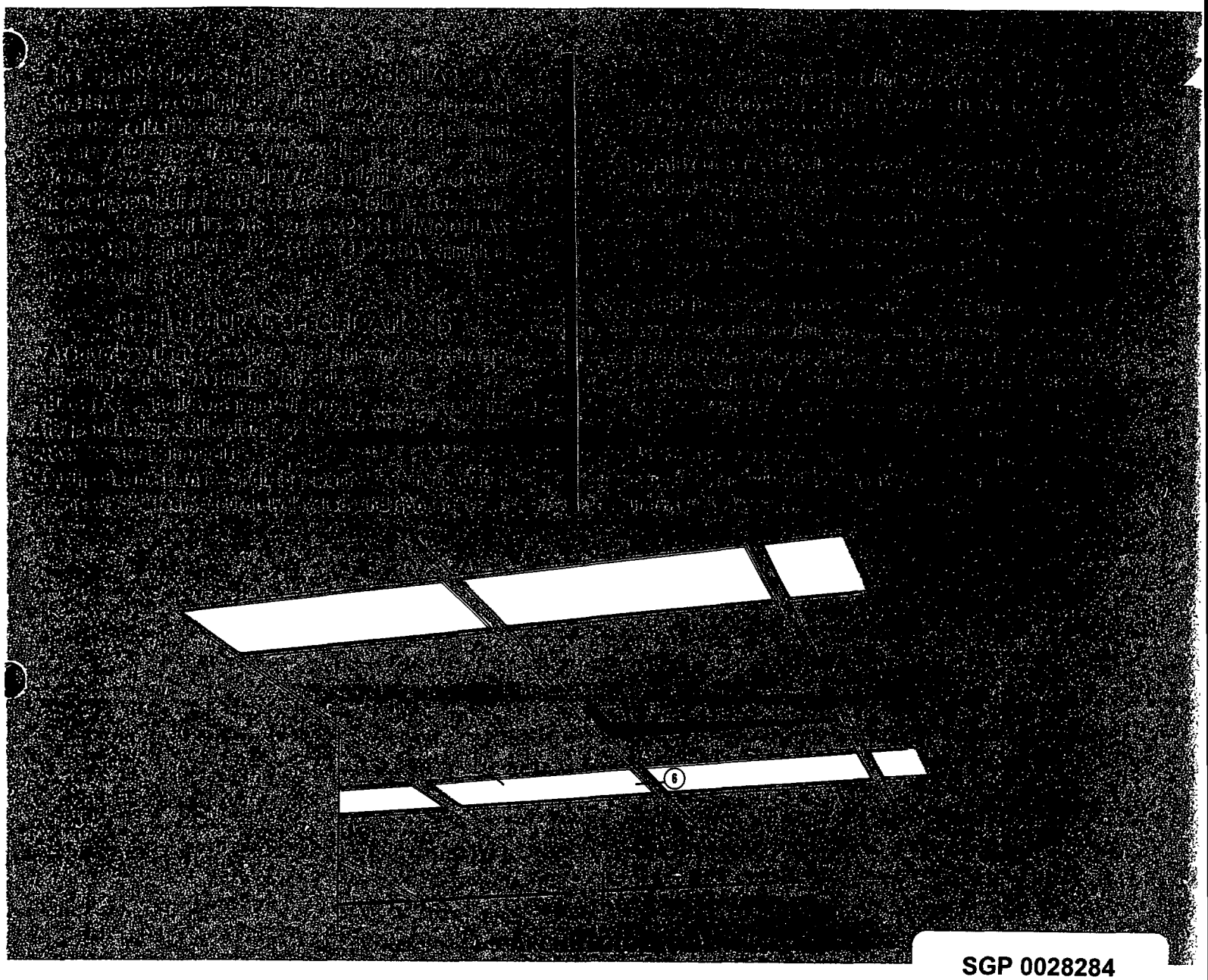
	PHYSICAL DATA	LOAD DATA
Part Number	Dim. H	Service Load
DP-2	2	
DP-2½	2½	
DP-3	3	
DP-3½	3½	
DP-4	4	
DP-7	4½	

LOAD for 1/360 SPAN DEFLECTION

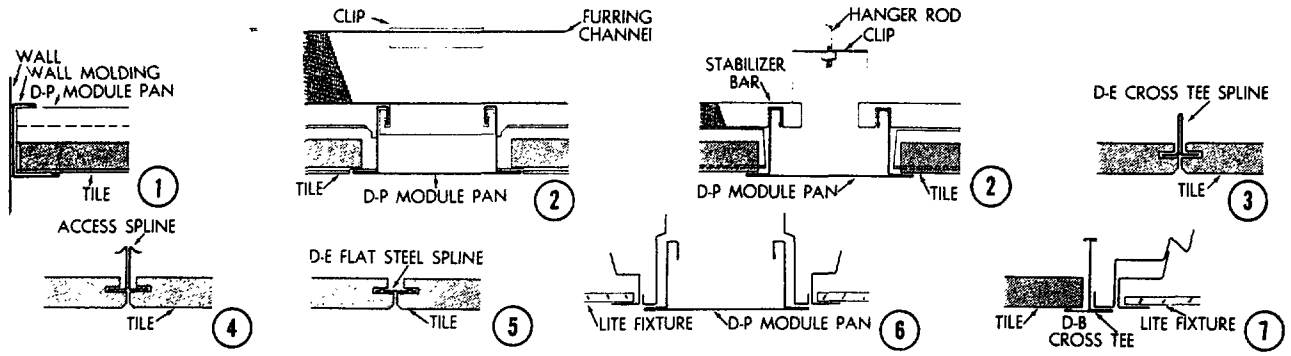
SGP 0028283

Semi-Exposed Modular Pan

DONN D-P SYSTEM



SGP 0028284



PHYSICAL DATA **LOAD DATA**

System Number	Dim. "A"	Simple Span	Load per Lin. Foot
DE-200	.500	24"	4.49
DE-300	.500	36"	1.35
DE-314	.875	36"	6.49
DE-414	.875	48"	2.73

LOAD for 1/360 SPAN DEFLECTION

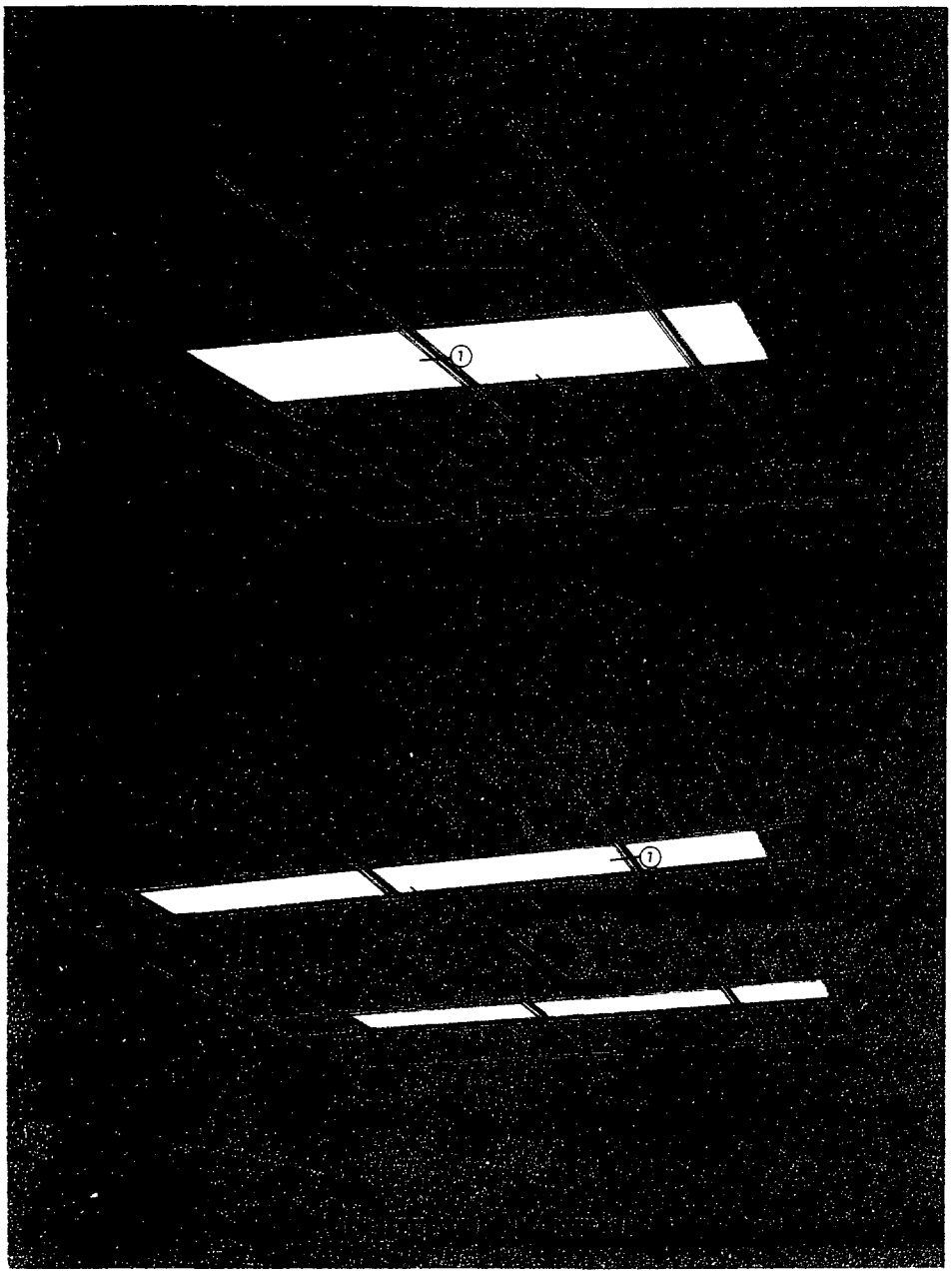
PHYSICAL DATA **LOAD DATA**

System Number	Dim. "A"	Simple Span	Load per Lin. Foot
DM-300	.50	2'	6.5
DM-314	.87	3'	6.5
DM-414	.87	4'	2.5

LOAD for 1/360 SPAN DEFLECTION

One Directional Exposed Tee

DONN D-M SYSTEM



The DONN® D-M EXPOSED TEE SYSTEM is a *directly suspended system providing great economy* and extremely rapid installation of exceptionally rigid exposed tee beams with excellent spanning characteristics. Stabilized over the top with utterly functional and secure stabilizer bars it offers unusual design possibilities yet is completely accessible. Finished in pre-coated satin white steel cap or anodized natural aluminum cap.

ARCHITECTURAL SPECIFICATIONS

Area to be Treated—All areas as shown on architect's drawings and in the finish schedule.

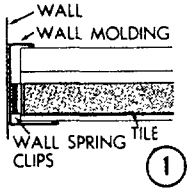
Hangers—Shall be No. .... galvanized wire spaced 48" on centers. (Dependent on ceiling load to be carried).

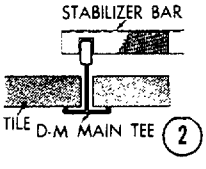
Main Tee Beams—Shall be Donn D-M main tee beams of double web bulb section not less than 1 ½" high and of not less than .021" steel. Integral snap-lock splice shall be factory installed.

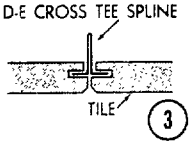
Stabilizer Bars—Shall be Donn D-M stabilizer bars notched to fit tightly on square main tee bulbs and of not less than .030" steel.

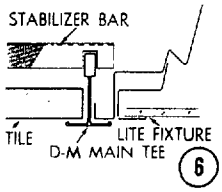
Concealed Cross Tee Splines and Access Splines—(Select from chart below and on page 7.)

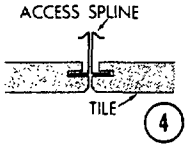
Installation—Attach Donn D-M main beams suspended and level at ..... on centers (12", 24" or 48" dependent on lighting design). Main beams to be ..... finish. Secure stabilizer bars to main beams in a staggered pattern 8' on centers and at each light fixture. Cross tee splines shall be inserted into kerfed tile perpendicular to main beams, when tile spanning characteristics require or where breathing is a consideration. Ends of main beams shall be mounted on top of M-6 edge molding. Use MK-11 aluminum molding with aluminum capped beams.

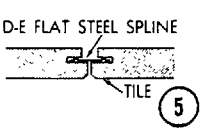


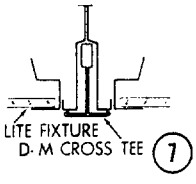




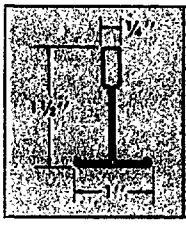








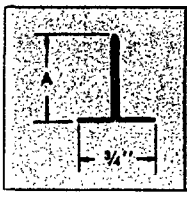
LOAD DATA



Span Between Hangers	Load per Lin. Foot
4'	32
5'	17.8
6'	12.9
7'	6.8
8'	4.6

LOAD for 1/360 SPAN DEFLECTION

PHYSICAL DATA **LOAD DATA**



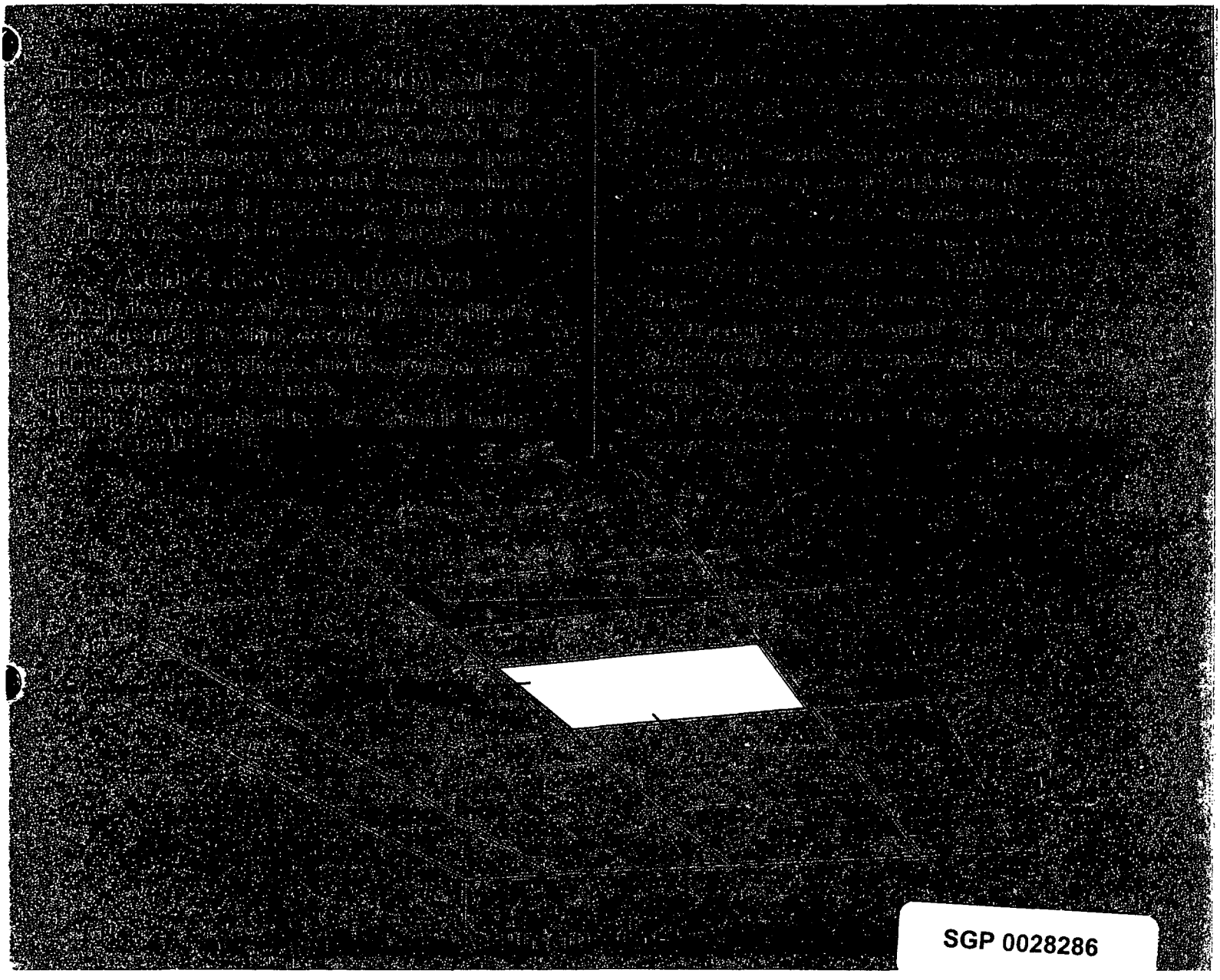
Spline Number	Dim. "A"	Simple Span	Load per Lin. Foot
DE-208	.500	24"	4.49
DE-308	.500	36"	1.35
DE-314	.875	36"	6.49
DE-414	.875	48"	2.73

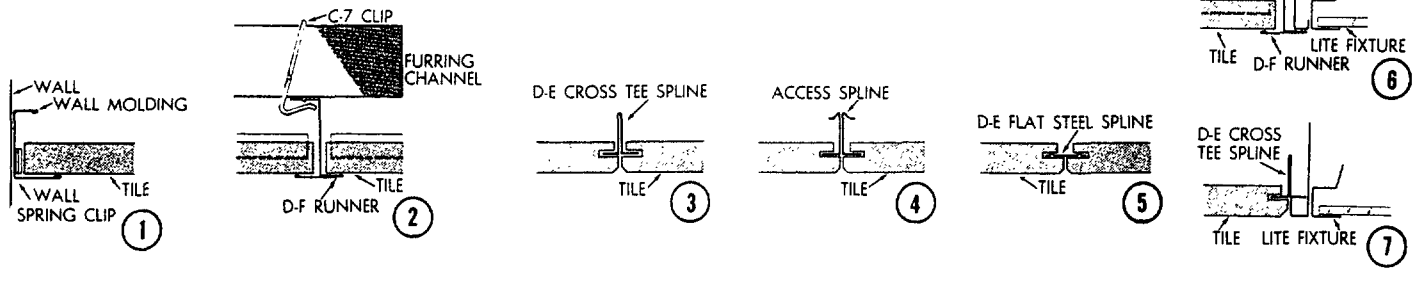
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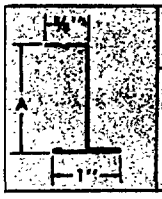
SGP 0028285

One Directional Exposed "Z"

DONN D-F SYSTEM



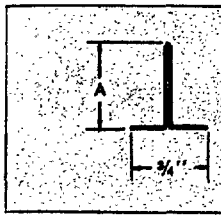




Runner Number	Dim. "A"	Runner Splice	4'	5'	6'	7'
DF-18	1.00"	F-1	8.2	4.08	2.36	
DF-22	1.38"	F-21	16.45	8.43	4.88	3.07
DF-25	1.56"	F-31	22.69	11.61	6.52	4.94
DF-28	1.75"	F-41	28.50	14.67	8.46	5.33

PHYSICAL DATA — LOAD DATA

LOAD for 1/360 SPAN DEFLECTION



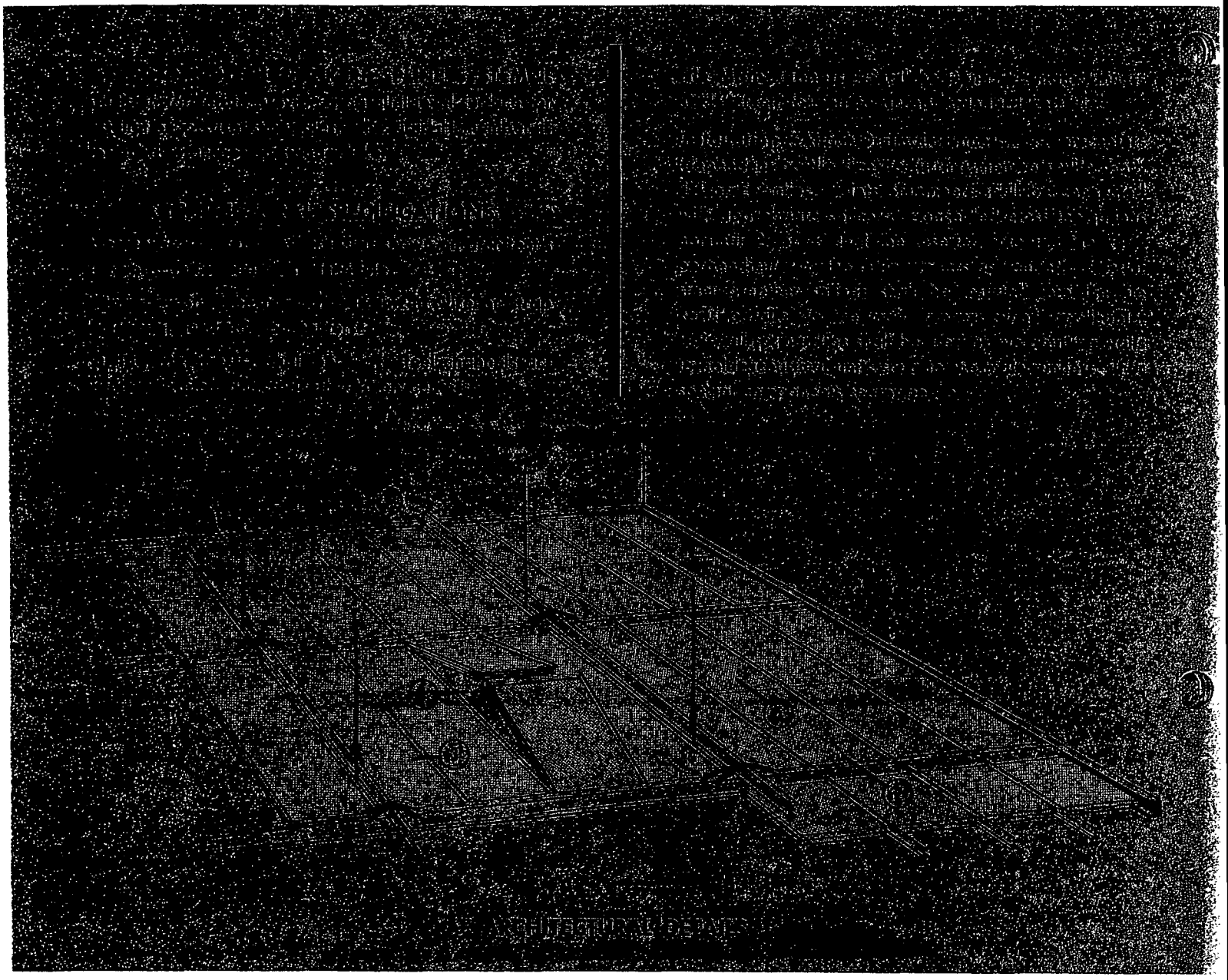
Spline Number	Dim. "A"	Simple Span	Load Lb. per Lin. Foot
DE-288	.500	24"	4.49
DE-308	.500	36"	1.35
DE-314	.875	36"	6.49
DE-414	.875	48"	2.73

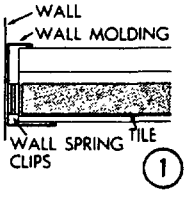
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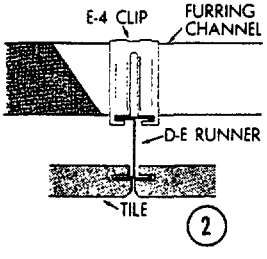
LOAD for 1/360 SPAN DEFLECTION *SEE PAGE 11 FOR ACCESS SLPINES

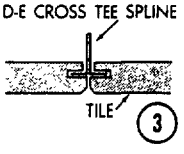
Concealed "H&T"

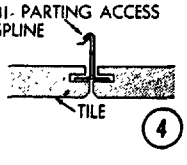
DONN D-E SYSTEM

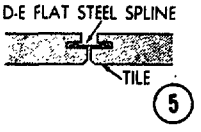












SGP 0028287

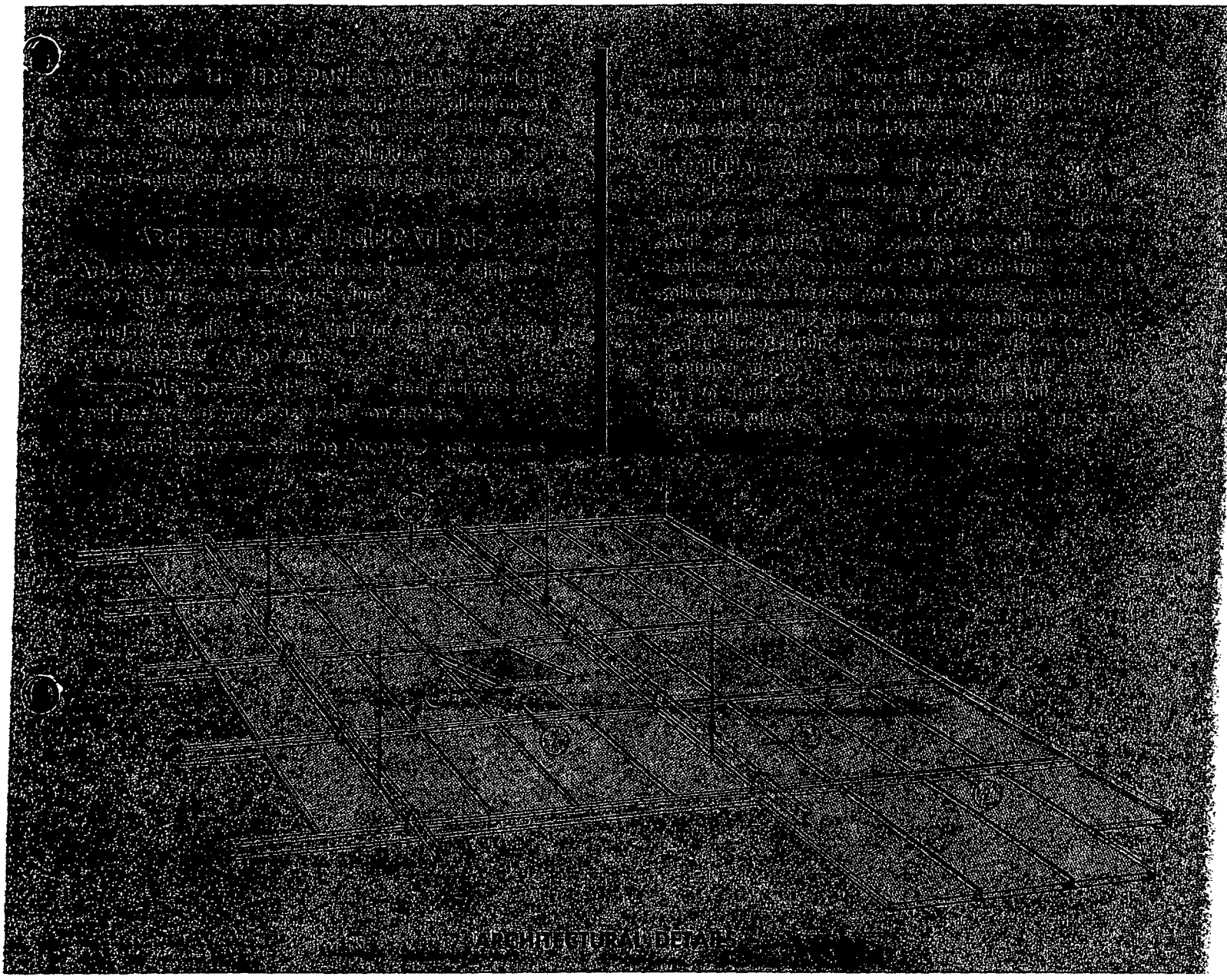
PHYSICAL DATA				LOAD DATA		
Runner Number	Dim. A	Runner Size	Weight Steel			
DE-10	1.00	25	0.5			
DE-20	1.50	25	0.5			
DE-30	1.00	25	0.5			
DE-40	1.50	25	0.5			

LOAD for 1/360 SPAN DEFLECTION

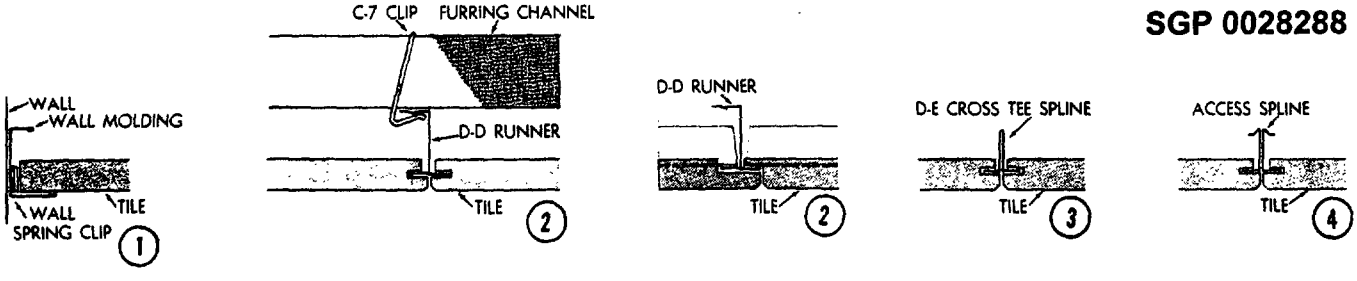
PHYSICAL DATA				LOAD DATA		
Runner Number	Dim. A	Runner Size	Weight Steel			
DE-10	1.00	25	0.5			
DE-20	1.50	25	0.5			
DE-30	1.00	25	0.5			
DE-40	1.50	25	0.5			

LOAD for 1/360 SPAN DEFLECTION *SEE PAGE 11 FOR ACCESS SPLINES

Concealed "Z"



SGP 0028288



	PHYSICAL DATA				LOAD DATA	
	Nominal Number	Dim. "A"	Dim. "B"	Number Gauge	Single Span Pounds	Uniform Load
	DD-15					
	DD-20					
	DD-24					
	DD-30					
	DD-36					
	DD-48					

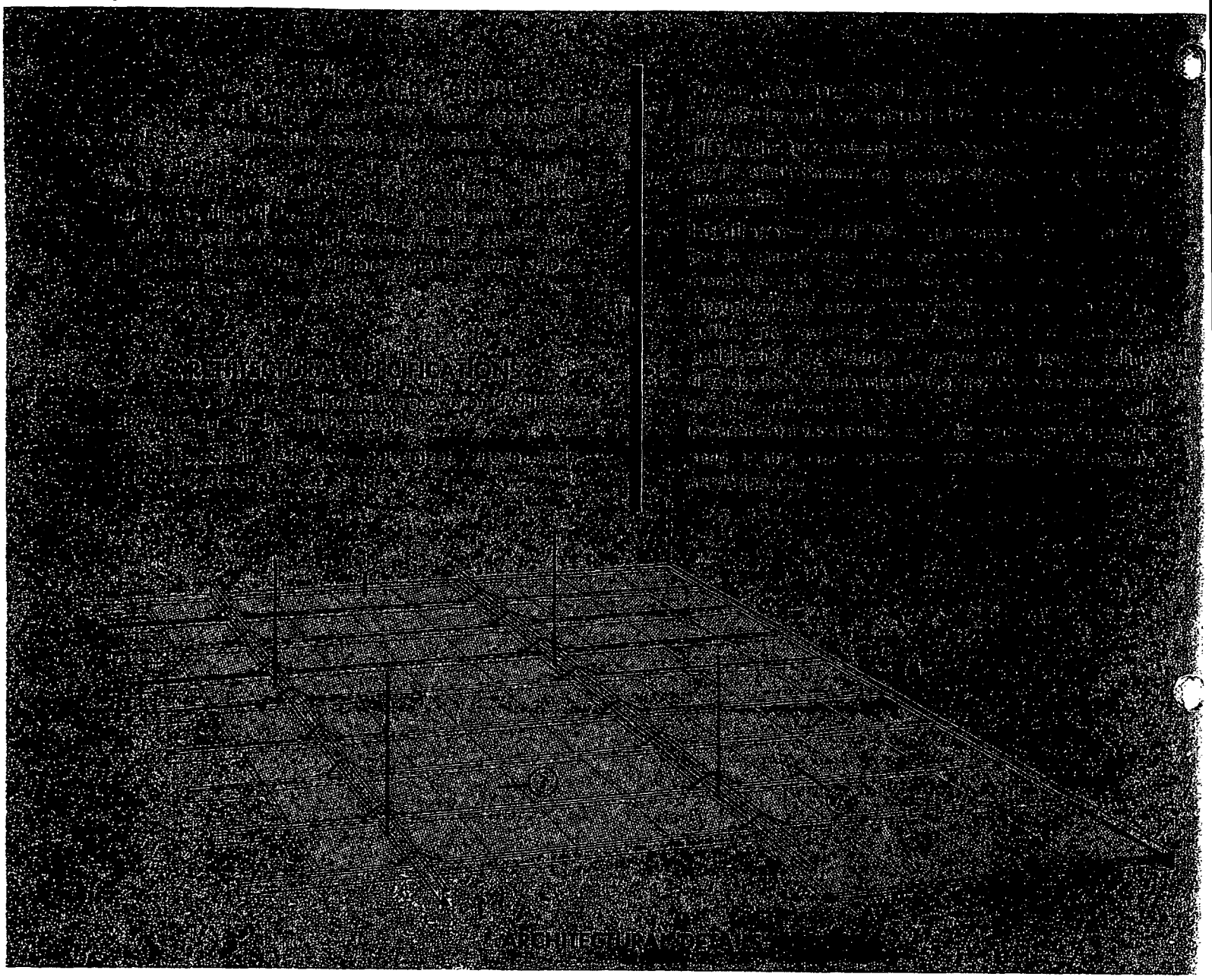
	PHYSICAL DATA			LOAD DATA	
	Nominal Number	Dim. "A"	Gauge	Single Span Pounds	Uniform Load
	DM-30				
	DM-36				
	DM-48				

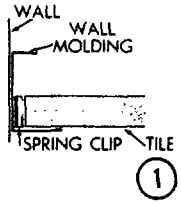
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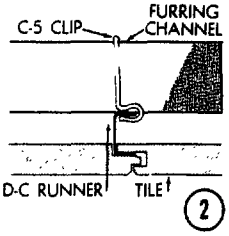
SEE PAGE 10 FOR CROSS TEE SPLINES

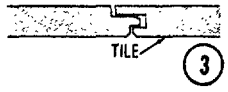
Concealed "T&G"

DONN D-C SYSTEM









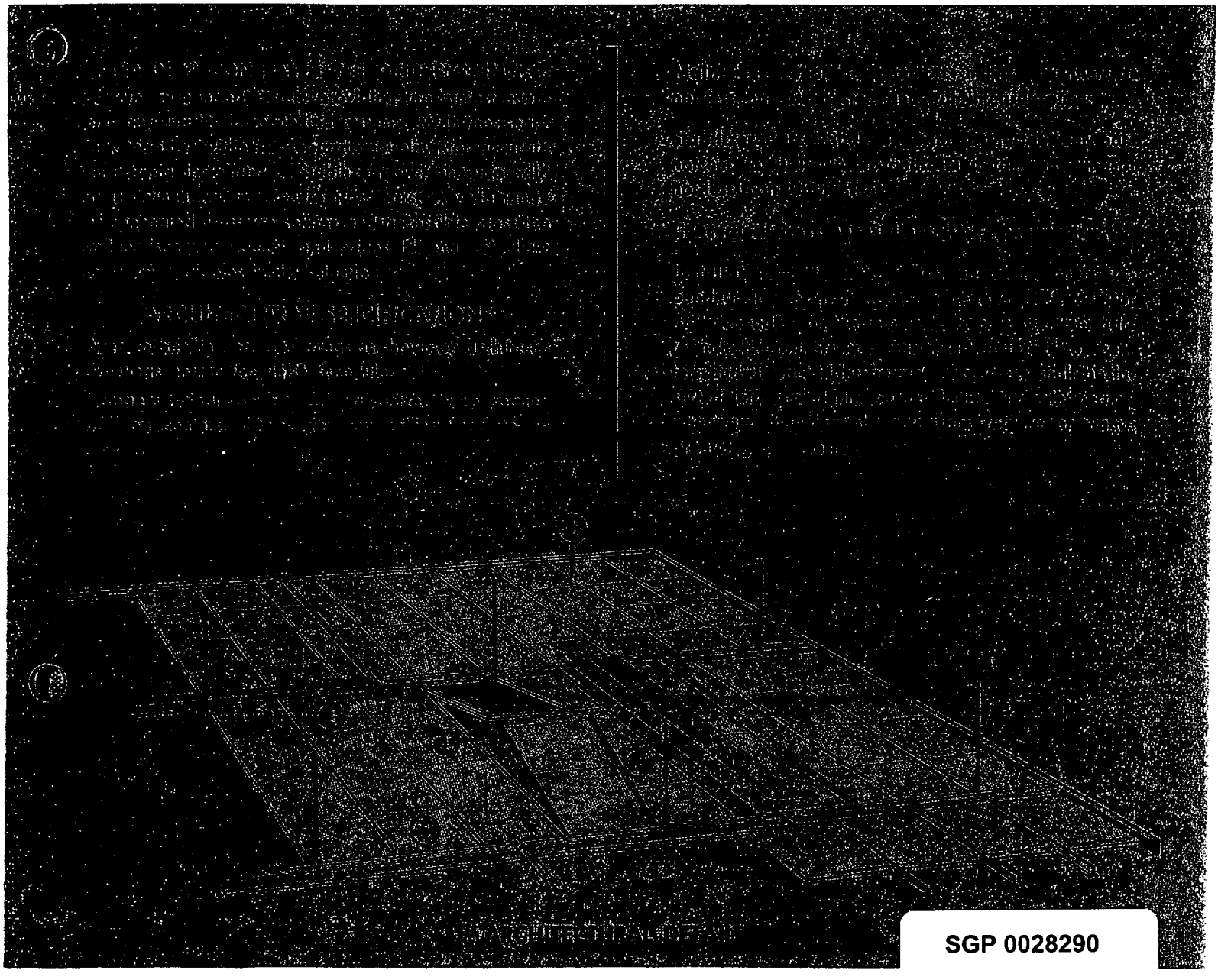
	PHYSICAL DATA		LOAD DATA
	Runner Number	Runner Spacing	Load Span (L)
	DC-15		
	DC-20		

LOAD for 1/360 SPAN DEFLECTION

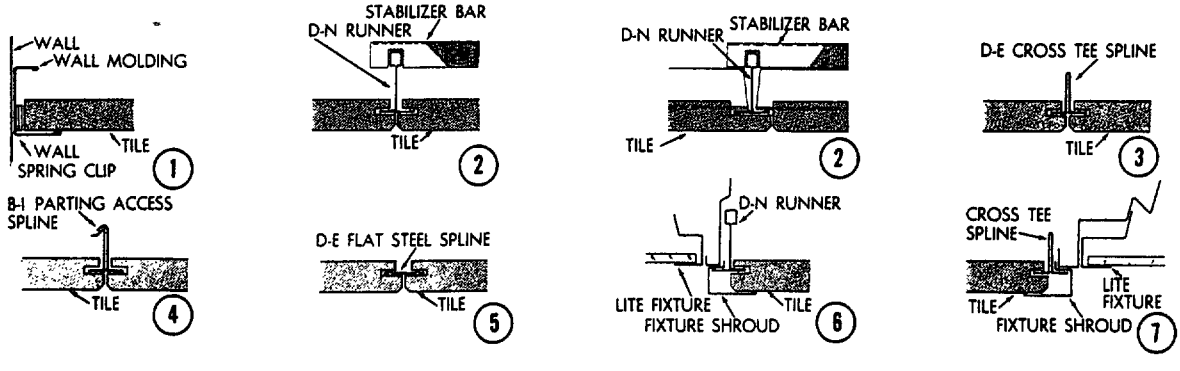
SGP 0028289

Concealed Tee Grid

DONN D-N SYSTEM



SGP 0028290



PHYSICAL DATA **LOAD DATA**

Catalog Number	Description	Depth A	Runner Spacing	Grid Spacing	Load Capacity Lbs./Sq. Ft.
DN24	1.50	1 5/8	24	24	7.0
DN48	1.25	1 5/8	48	24	3.5

OVERRIDE TOP SPLINE FOR ADDITIONAL STRENGTH

LOAD for 1/360 SPAN DEFLECTION

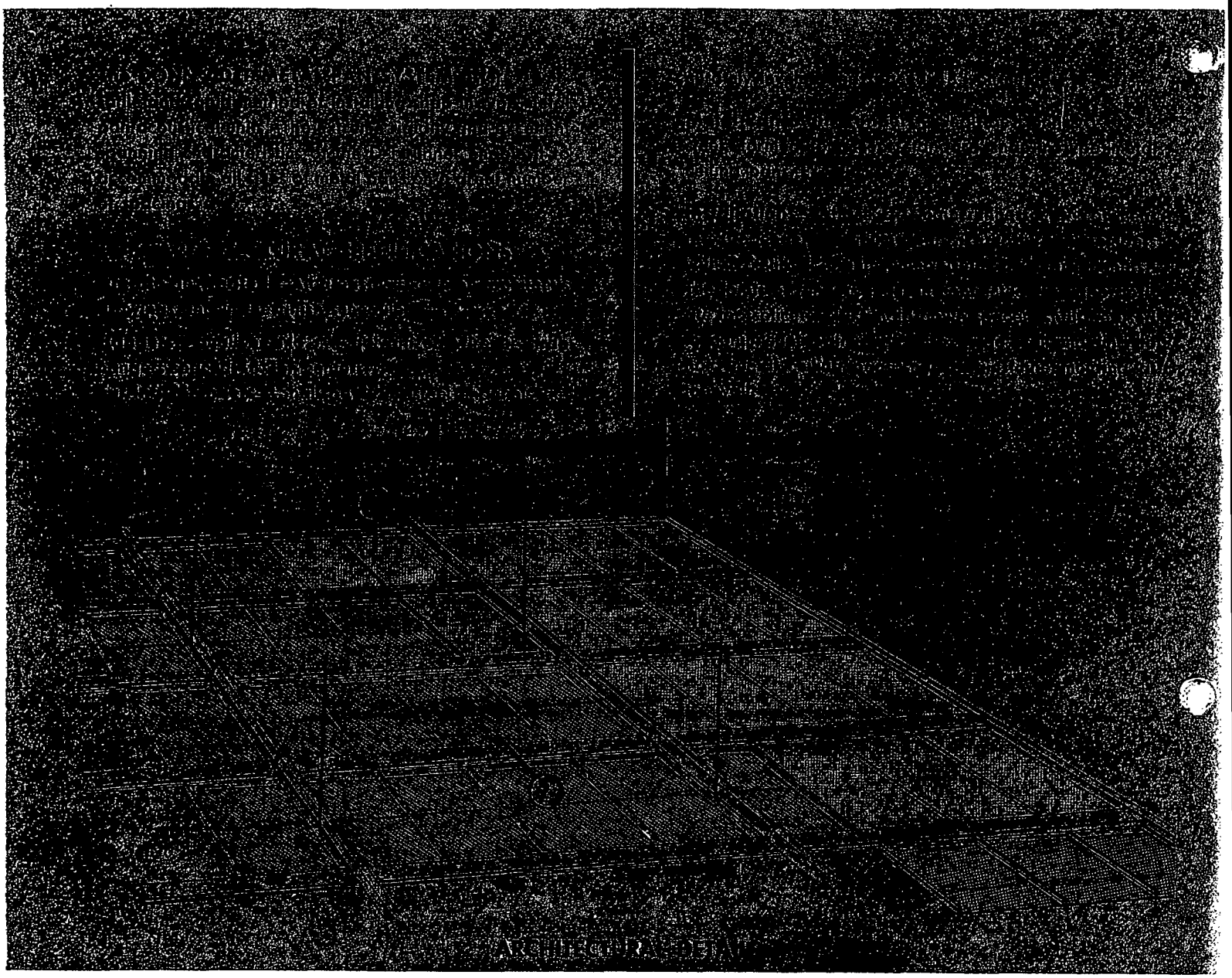
PHYSICAL DATA **LOAD DATA**

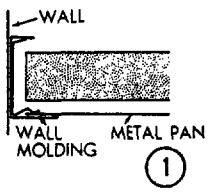
Catalog Number	Description	Depth A	Runner Spacing	Load Capacity Lbs./Sq. Ft.
DE-200	.020	2	48	7.0
DE-150	.015	2	48	5.0
DE-100	.010	2	48	3.5
DE-075	.008	2	48	2.5

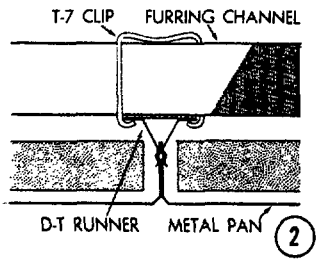
LOAD for 1/360 SPAN DEFLECTION

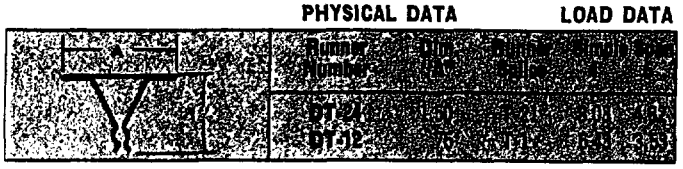
Metal Pan Tee Bar

DONN D-T SYSTEM







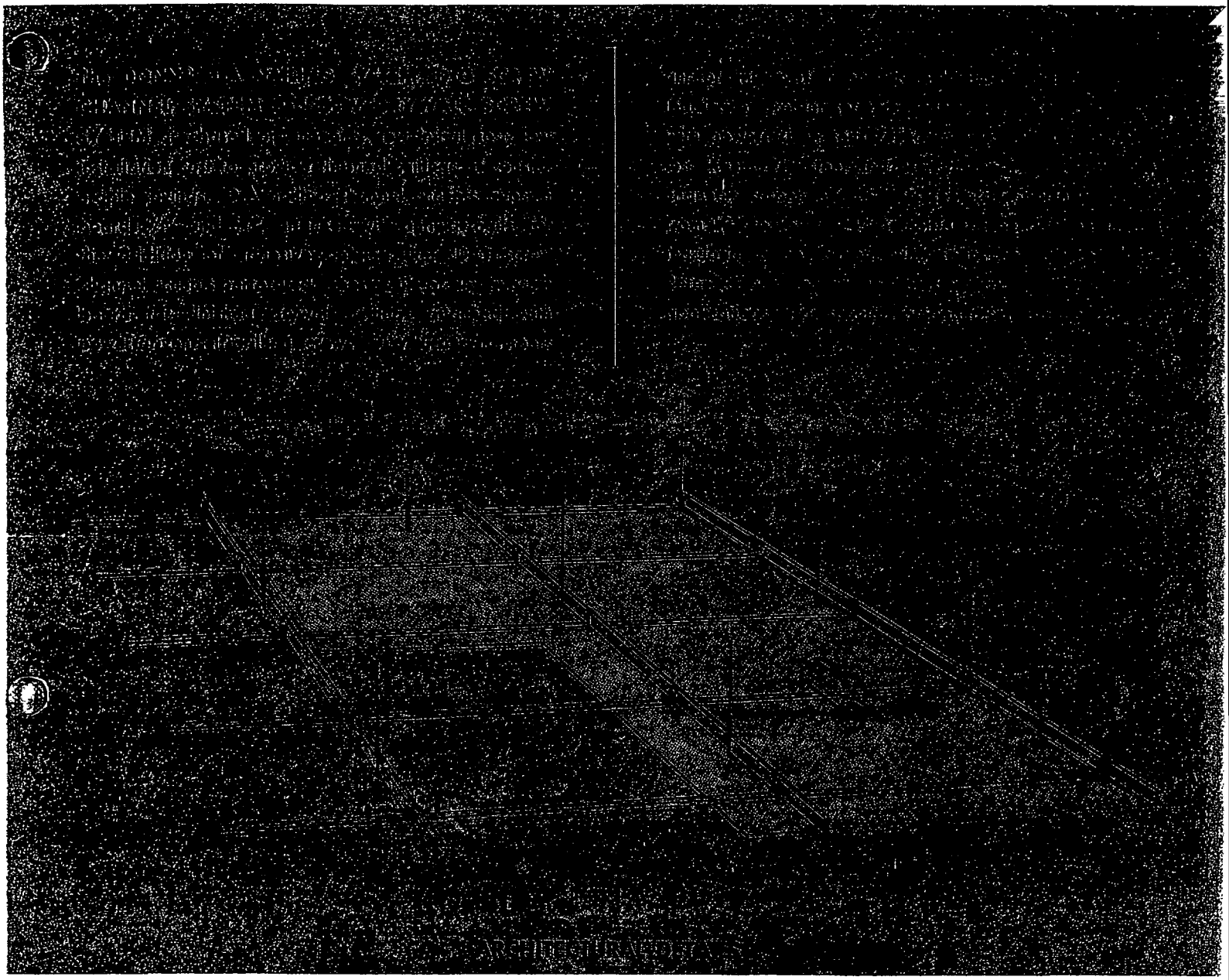


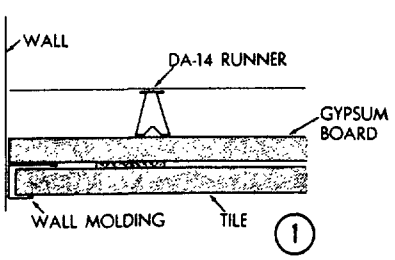
LOAD for 1/360 SPAN DEFLECTION

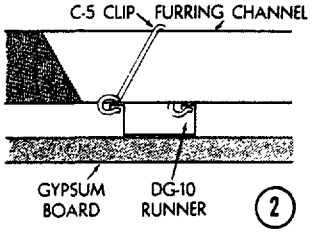
SGP 0028291

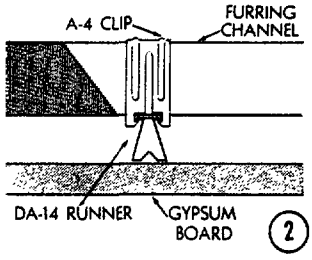
Ceiling Furring Members

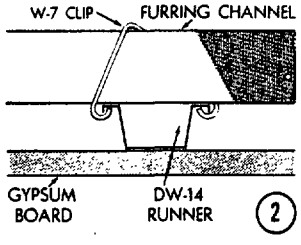
DONN D-A, D-G and D-W SYSTEMS



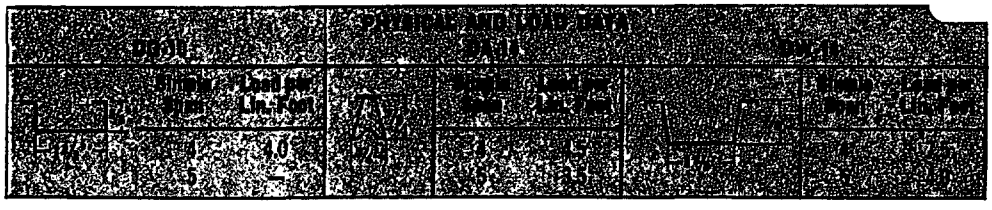






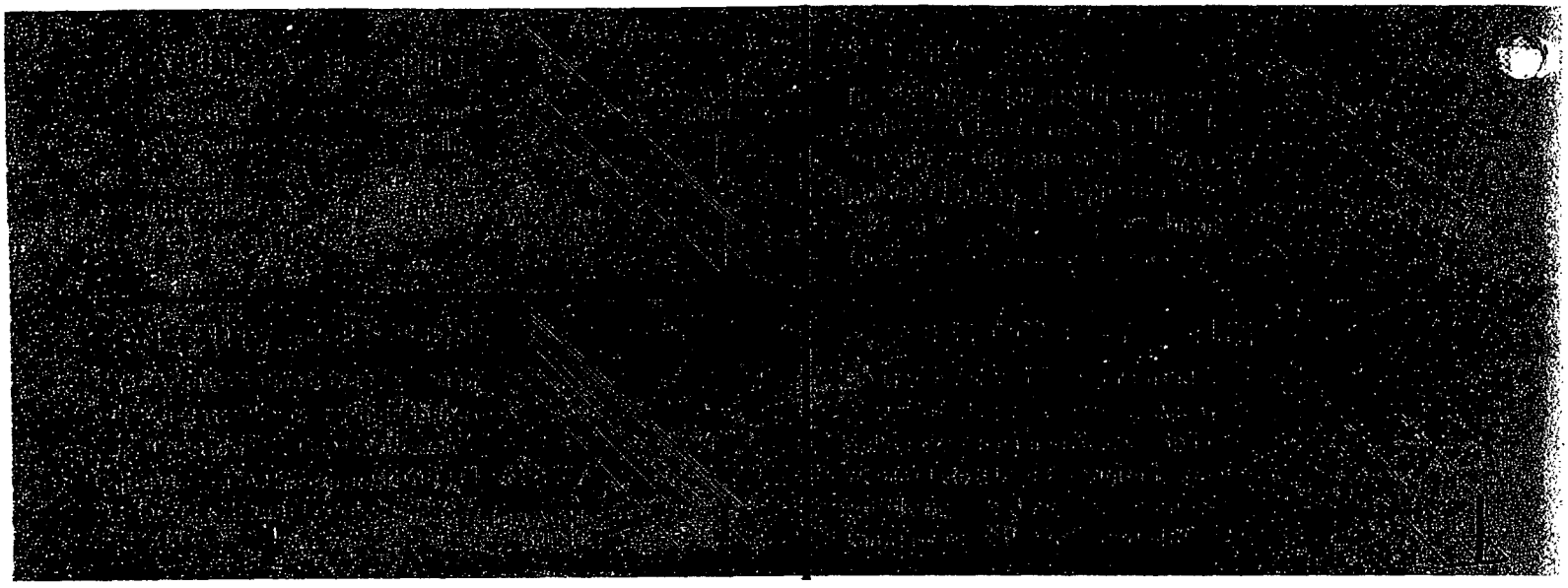


SGP 0028292



LOAD for 1/360 SPAN DEFLECTION

Special Components



Technical Data

SYSTEM	Concealed Cross Tee Spline	Concealed Access Spline	Bi-parting Access Spline	Flat Steel Spline	Stabilizer Bar	Exposed Cross Tee	Direct Suspend	OPTIONAL CLIPS: 1½" Furring Channel A-4	B-4	C-5	C-7	E-4	E-9	T-7	W-7	E-60	DE-24 ONLY D-2	E-2	Bar Joists A-12	C-6	C-12	E-18	Bar Joists or Wood Joists E-8	E-16	E-32	E-9	Wood Joists A-8	C-10	C-11
F. R. Exposed Tee Grid Donn D-L System						●	●																						
Exposed Tee Grid Donn D-B System						●	●		●																				
Exposed Modular Pan Donn D-P System						●	●																						
Semi-exposed Modular Pan Donn D-P System	●	●		●	●	●	●																						
One Direction Exposed Tee Donn D-M System	●	●		●	●	●	●																						
One Direction Exposed Tee Donn D-F System	●	●		●						●	●						●			●	●							●	●
Concealed H & T Donn D-E System	●		●	●								●	●			●		●				●	●	●	●	●			
Concealed Zee Donn D-D System	●	●	●	●						●	●						●			●	●							●	●
Concealed T & G Donn D-C System										●	●						●			●	●							●	●
Concealed Tee Grid Donn D-N System	●	●	●	●	●		●																						
Metal Pan Donn D-T System												●		●		●													
Ceiling Furring Donn D-A System								●					●			●			●							●	●		
Donn D-G System										●										●	●								
Donn D-W System															●														

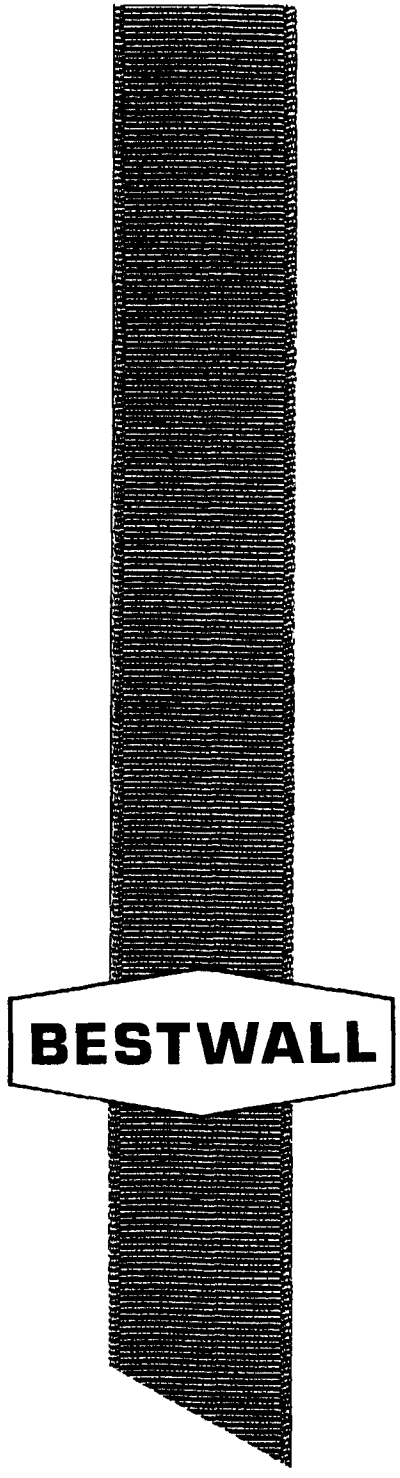
SGP 0028293

DONN products, Inc.

700 Bassett Road
Westlake, Ohio 44091
Area Code 216 • Phone 871-1000

Printed in U.S.A.





SGP 0028295

FIRE RESISTANT WALLS AND/OR CEILINGS HAVE BEEN PROVIDED IN THIS BUILDING BY INSTALLING

The Original Fire-Rated (Type "X") Gypsum Wallboard Reinforced with Glass Fibers.

Fire Hazard Classification: Flame Spread 10-15

Bestwall Firestop Gypsum Wallboard has been tested by the underwriters' Laboratories and Nationally Recognized Testing Agencies.

Bestwall Firestop Gypsum Wallboard meets FHA and VA requirements and is accepted under most building codes.

GEORGIA-PACIFIC

BESTWALL GYPSUM DIVISION

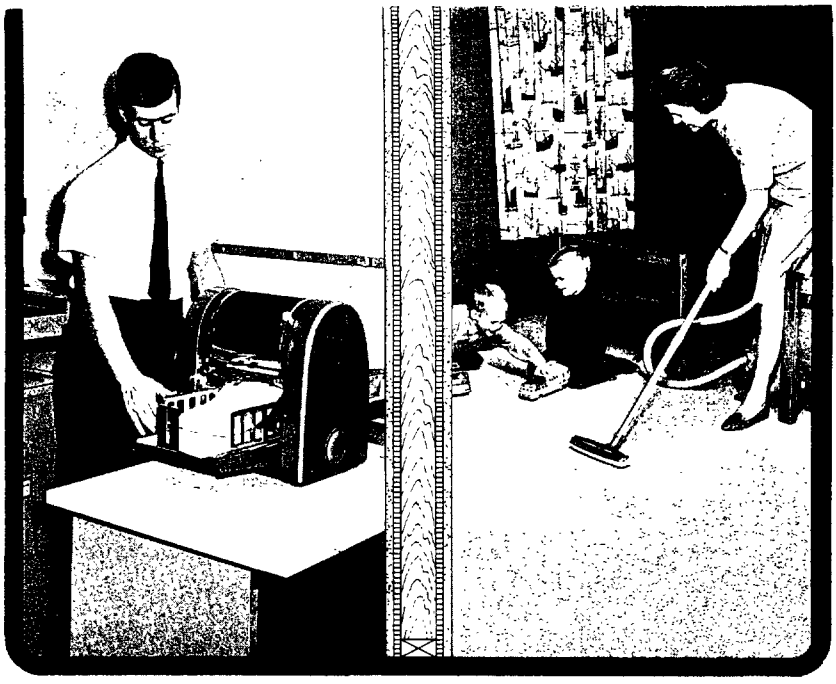
PAOLI, PENNSYLVANIA

BW-64138 REV.

A.I.A. FILE NO. 23-L
N.A.H.B. INDEX NO. 340

BESTWALL

SOUND DEADENING BOARD



Bestwall Sound Deadening Board is a low density, fiber board product. Made principally from wood or cane fiber, it is available ½" thick, with square edges, in 4' widths and a standard length of 8'. Bestwall Sound Deadening Board is designed for use in wall systems and in floor and ceiling systems where a reduction in the passage of sound from room to room is desired. Bestwall Sound Deadening Board is ideal for residential or apartment type construction.

• Excellent sound isolation properties • High ratings are available when used in various assemblies • Exclusive one hour fire rating with one layer of ⅝" Bestwall Firestop over Sound Deadening Board on each side of wood studs • Easy to install • Few fasteners needed • Easy to cut; can be sawed or scored and snapped • Large lightweight panels go up fast • Low cost.

Bestwall Sound Deadening Board is ideal for residential or apartment type construction, wherever effective sound control is desired.

Thickness: ½"

Length: Standard 8' (other lengths on special order)

Width: 4'

Edge: Square

Packaging: Wrapped 6 pieces (4' x 8') per bundle

Application Used for Exclusive One-Hour Fire Rating: Apply ½" x 4' x 8' Bestwall Sound Deadening Board vertically to each side of 2" x 4" wood studs spaced 16" o.c., with joints staggered on opposite sides. Nail with 5d coated nails spaced 24" o.c. at joints, edges and intermediate framing. Laminate Bestwall Firestop vertically to the Sound Deadening Board, using Bestwall Laminating Compound applied in 6" wide strips around the perimeter and vertical centerline of each full sheet. Stagger joints on opposite sides and nail 12" o.c. around the perimeter with one nail per stud in the field of the board.

A.I.A. FILE NO. 23-L
N.A.H.B. INDEX NO. 340

SGP 0028296

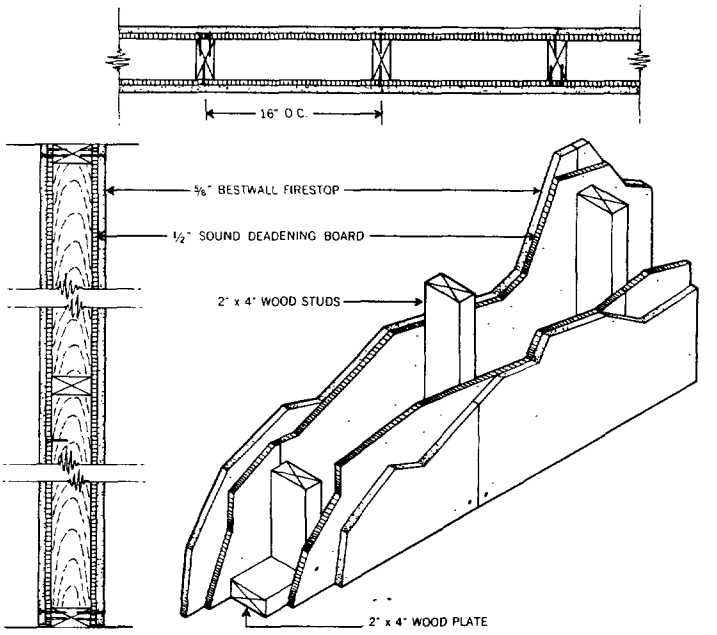
GEORGIA-PACIFIC / BESTWALL GYPSUM DIVISION
PAOLI, PENNSYLVANIA 19301

GP-65250

BESTWALL FIRESTOP OVER SOUND DEADENING BOARD

STC-46

FIRE RATING—1 HR. COMBUSTIBLE



PARTITION PROPERTIES

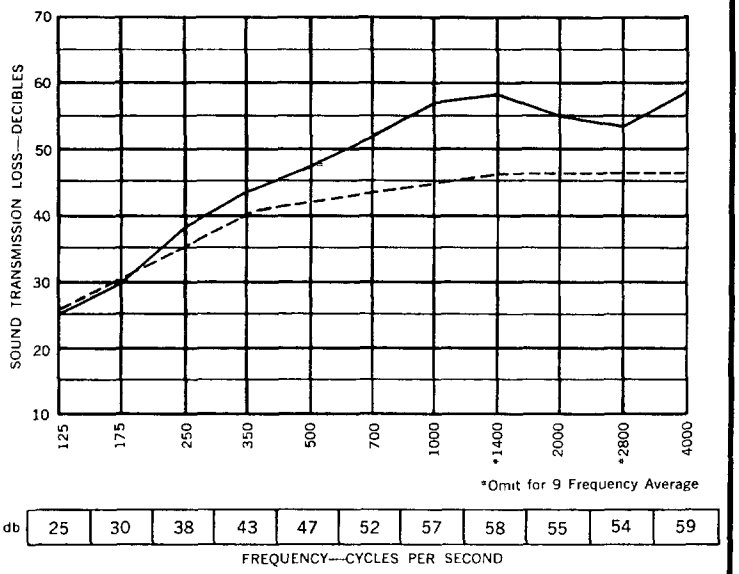
SOUND DATA

Test No.: OR 64-73
Dated: September 23, 1964
Conducted By: Ohio Research Corporation
Test Partition—Height: 9'
Width: 14'
Thickness: 5⅞"
Weight: 7.8 lbs./sq. ft.

9 Frequency Average	45 db.
Sound Transmission Class	46 db.
Speech Interference Zone	54 db.

FIRE DATA

Test No. T-3006
Dated: August, 1964
Conducted By: Engineering Experiment Station, Ohio State University



MATERIALS USED

1. 2" x 4" wood studs
2. 2" x 4" wood plates
3. ½" Bestwall Sound Deadening Board
4. ⅝" Bestwall Firestop Gypsum Wallboard
5. 5d coated nails and 8d box nails
6. Bestwall Laminating Compound

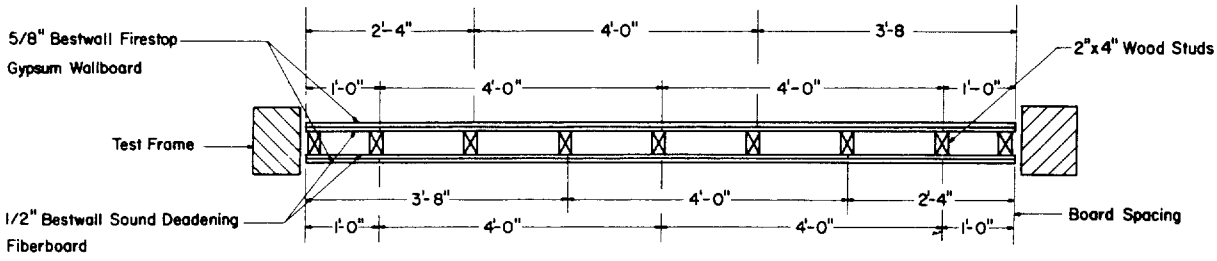
APPLICATION DETAILS

1. Nail 2" x 4" wood studs, 16" o.c., to 2" x 4" wood plates at floor and ceiling.
2. Provide 2" x 4" Firestop at mid-height.
3. Apply ½" Bestwall Sound Deadening Board vertically to both sides with 5d coated nails 24" o.c. in each stud.
4. Apply a single layer of ⅝" Bestwall Firestop to each side with three 4" strips of Bestwall Laminating Compound spaced on the centerline and 2" in from each edge. Space 8d box nails 12" o.c. to top and bottom plates and at perimeter and at mid-height in the intermediate studs.
5. Tape and finish in approved manner.

SUMMARIZATION OF TEST RESULTS

of Project T-3006, conducted at the
Engineering Experiment Station
The Ohio State University
Columbus, Ohio

The 5-7/8 inch thick load bearing Bestwall Sound Rated System constructed of nominal 2 by 4 inch Douglas Fir 1500f industrial light framing wood studs spaced 16 inches on center faced with 1/2 inch thick Bestwall Sound Deadening Fiberboard and 5/8 inch thick Bestwall Firestop Gypsum Wallboard demonstrated an ASTM Fire Endurance time of 1 hour while subjected to a superimposed load at 2000 lbs. per stud. The test was discontinued after one hour at the request of the sponsor althought no ASTM end point had been reached. A duplicate wall successfully met all hose stream requirements consistent with the endurance time. The test was conducted for Bestwall Gypsum Company on July 13 and 14, 1964, in accordance with the Standard Method of Building Construction and Materials, ASTM Designation E 119-61.



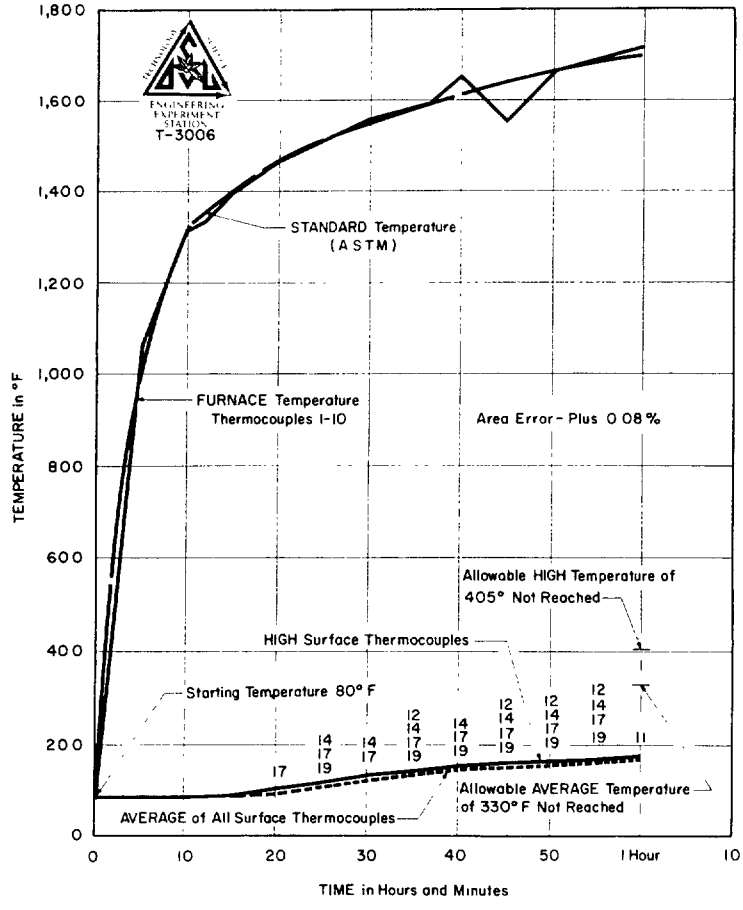


Figure 7. Time-Temperature curve for Fire Endurance Test

SGP 0028298

BESTWALL'S

IMPROVED

FIRESTOP

1/2" THICK

All Its

1- and 2-HOUR RATINGS

plus the old

45-MINUTE

on walls or ceilings

for BOCA requirements

PROVEN BY OFFICIAL FIRE TESTS

at

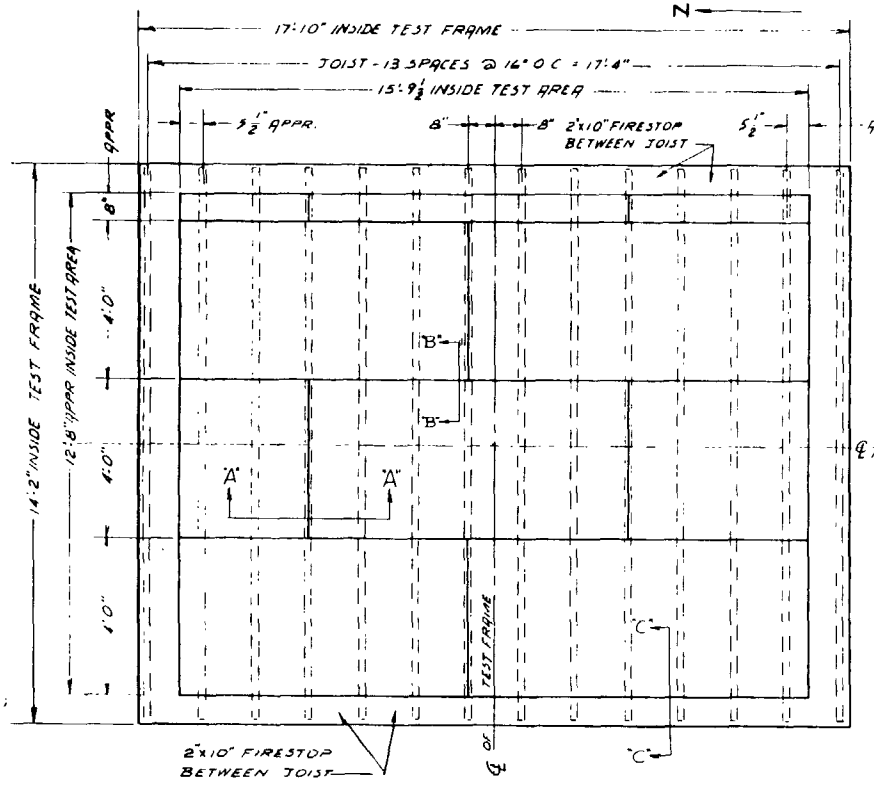
OHIO STATE UNIVERSITY
ENGINEERING EXPERIMENT STATION

and

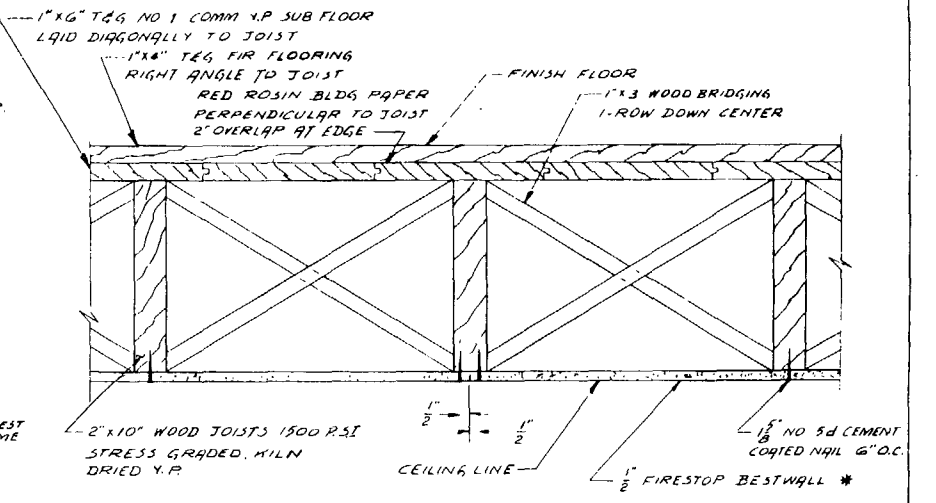
UNDERWRITERS' LABORATORY

SGP 0028299

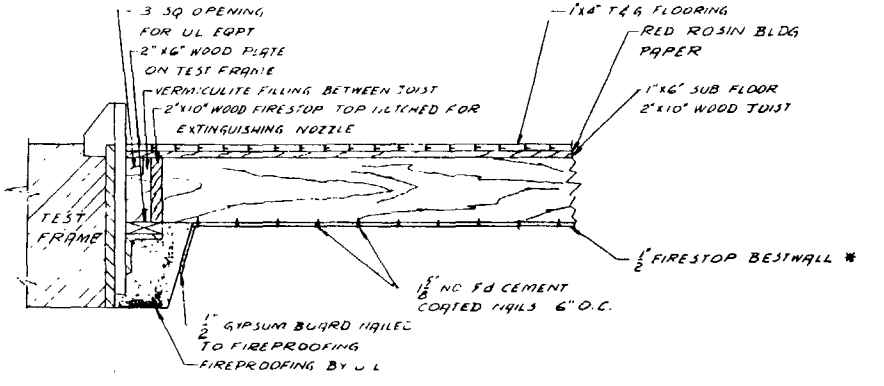
GEORGIA-PACIFIC / BESTWALL GYPSUM DIVISION



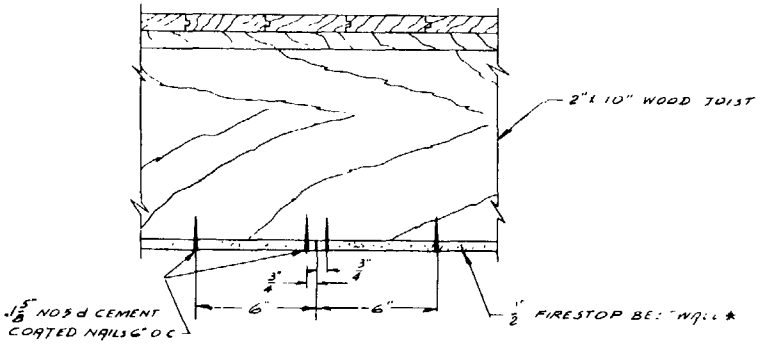
REFLECTED CEILING PLAN



SECTION "A-A"



SECTION "C-C"



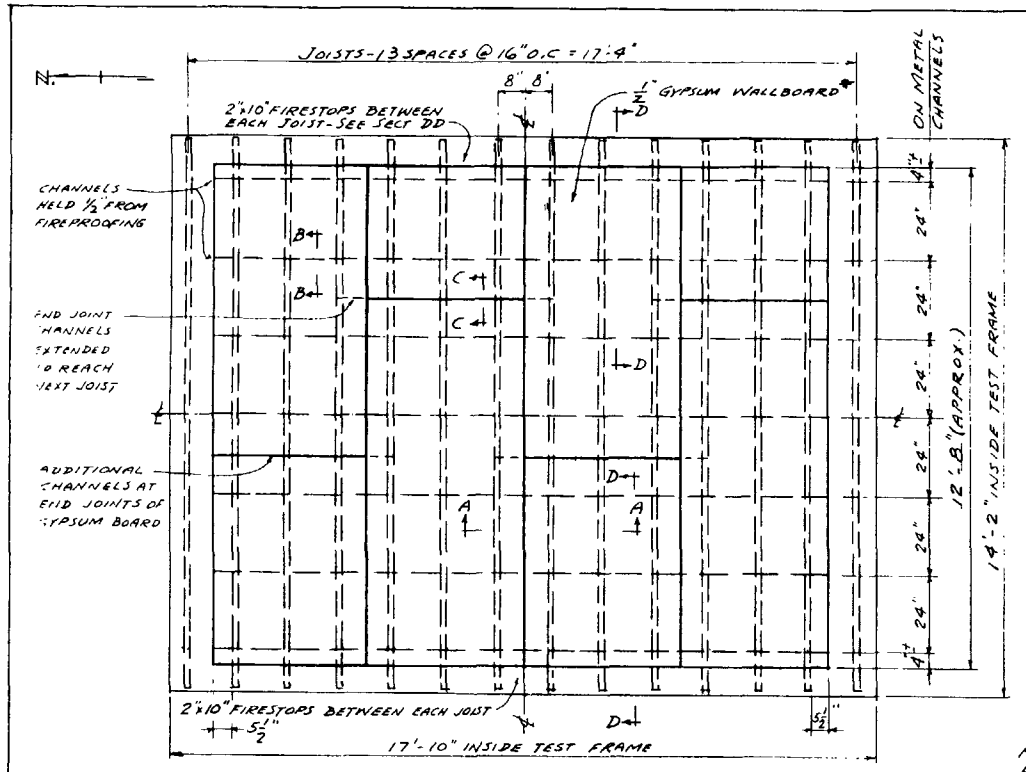
SECTION "B-B"

* LISTED BY U.L.
TESTED 5-7-65
DESIGN NO 46 - 1 HR (COMBUSTIBLE)

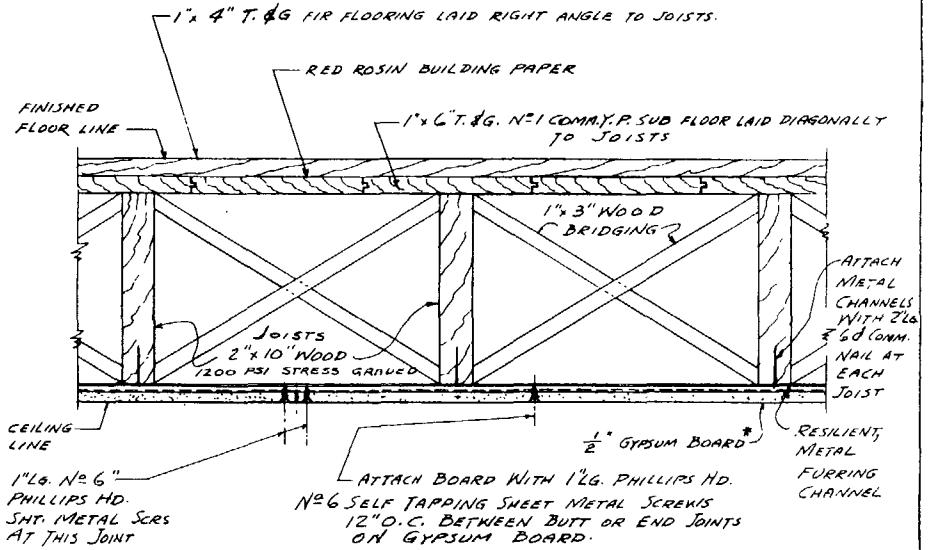
BESTWALL GYPSUM COMPANY PAOLI, PA.		
CEILING & FLOOR CONST. ON WOOD JOIST WITH ½" FIRESTOP BESTWALL		
RED-287		
DATE 2-26-65		SCALE ~
DRN TP	CKD	Dwg. No T-130-1

SGP 0028300

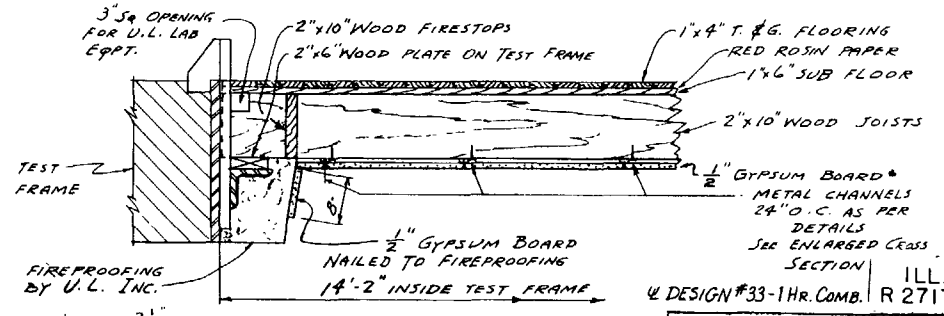
UL DESIGN No. 46 — 1 HOUR COMBUSTIBLE

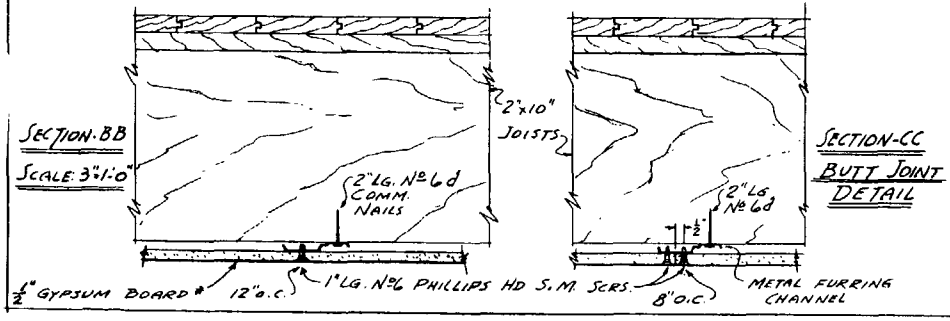


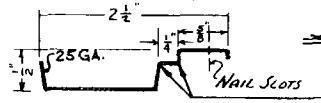
REFLECTED CEILING PLAN
SCALE ½" = 1'-0"



CROSS SECTION THRU STRUCTURE AT-AA
SCALE: 3" = 1'-0"







CROSS SECTION-METAL CHANNEL
FULL SIZE

SECTION-DD
SCALE: 1"=1'-0"

3½" LG. SLITS APPEAR IN BENDS INDICATED AT 4⅛" INTERVALS STAGERED BETWEEN BENDS

*LISTED BY UNDERWRITERS' LABORATORIES, INC.

ILL. I
℄ DESIGN #33-1 HR. COMB. | R 2717-29

BESTWALL GYPSUM COMPANY
ENGINEERING DEPT

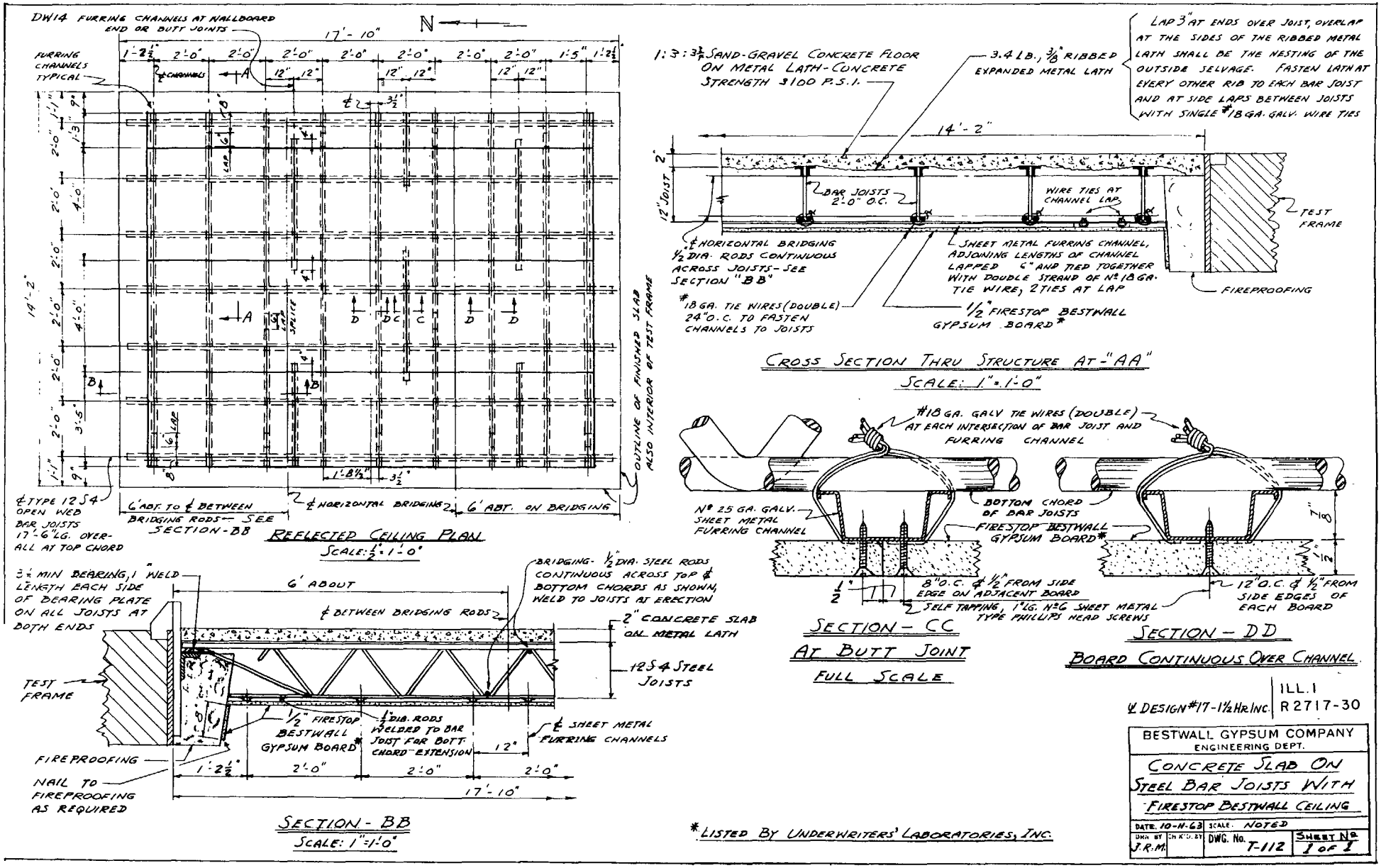
WOOD FLOOR CONSTRUCTION WITH FIRESTOP BESTWALL GYPSUM BOARD CEILING ON METAL FURRING CHANNELS

DATE	SCALE	DWG. No.	SHEET No.
10-30-63	NOTED	T-113	1 OF 1

DWN BY J.R.M. | CH'K D. BY

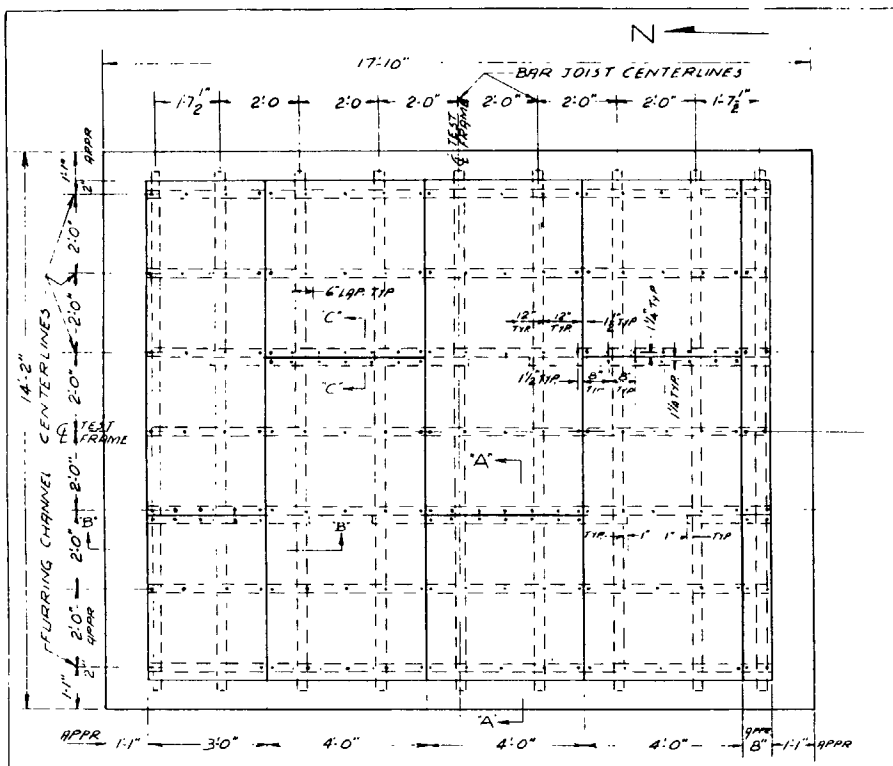
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UL DESIGN No. 33 — 1 HOUR COMBUSTIBLE

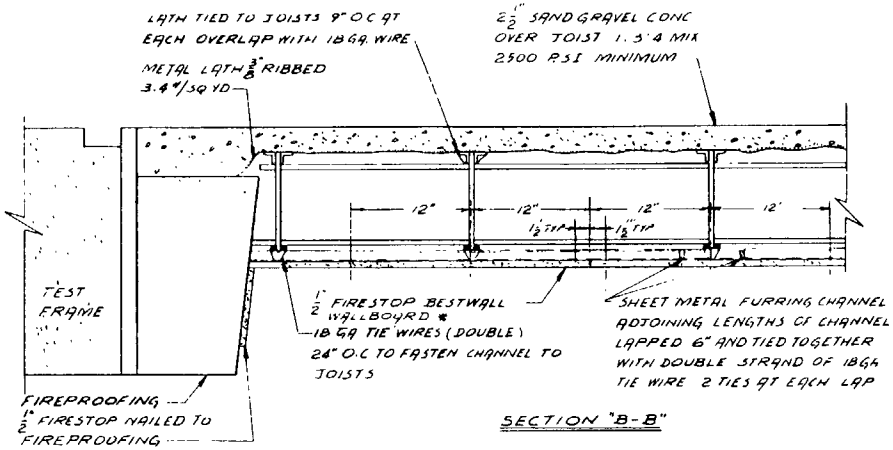


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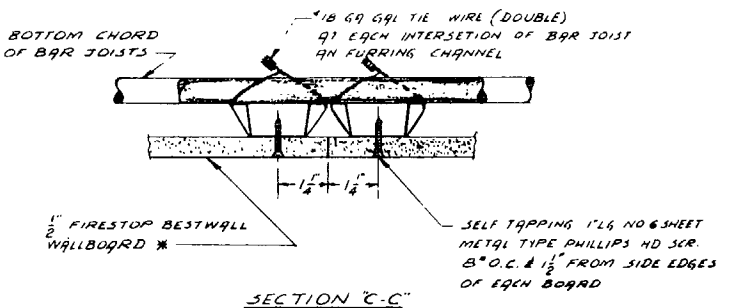
UL DESIGN No. 17 — 1½ HOURS INCOMBUSTIBLE



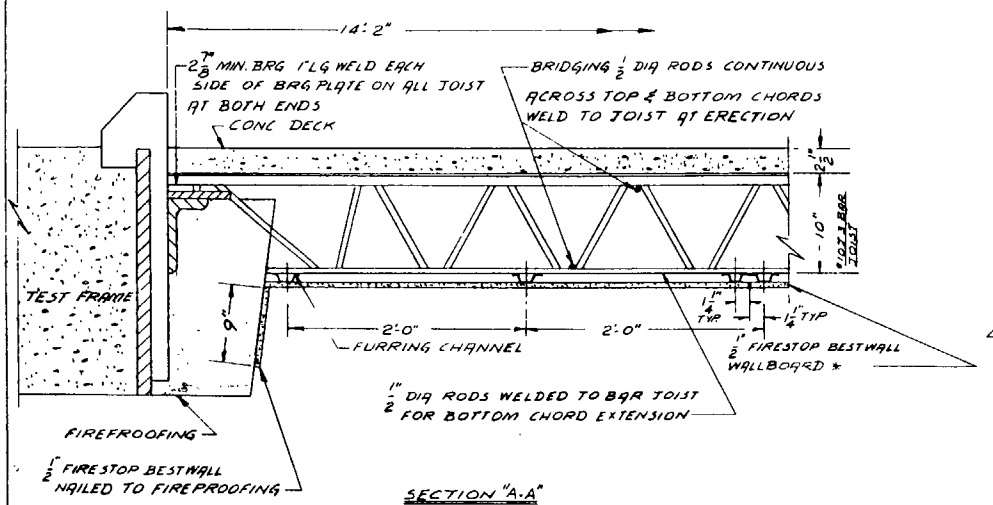
REFLECTED CEILING PLAN



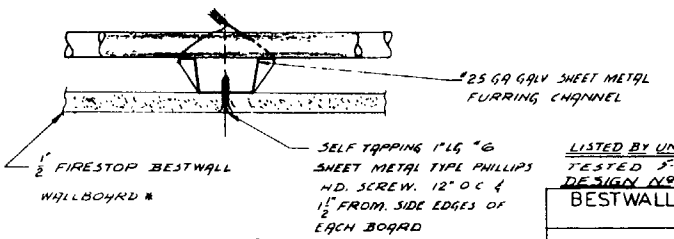
SECTION "B-B"



SECTION "C-C"



SECTION "A-A"



SECTION "D-D"

LISTED BY UNDERWRITERS LAB. INC. *
TESTED 5-11-65
DESIGN No 237 - 2 HOURS

BESTWALL GYPSUM COMPANY
PAOLI, PA.

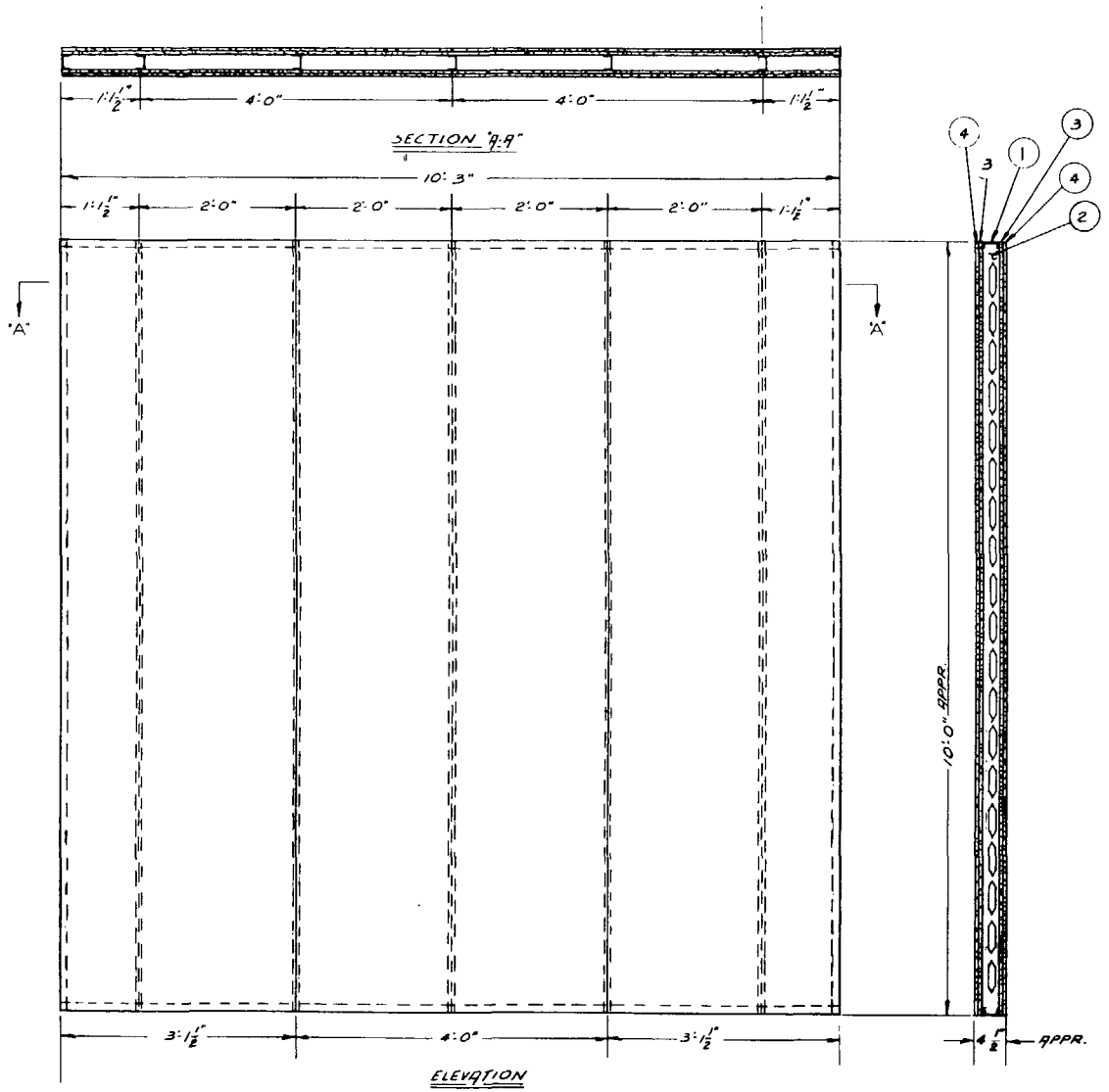
CONCRETE SLAB ON STEEL BAR JOISTS WITH ½" FIRESTOP BESTWALL GYPSUM BOARD.

RED 279

DATE	3-1-65	SCALE
DRN. TP	CKD.	DWG NO. T -129

SGP 0028303

III DESIGN No. 237 — 2 HOURS INCOMBUSTIBLE



① STUD : DONN DM 40 (2½") STEEL STUDS 24" O.C.

② TRACK : DONN DS 400 (2½") STEEL STUD TRACK

③ BOARD: ½" FIRESTOP BESTWALL GYP. BD. (VERTICAL) 1" LG. "G" DRYWALL SCREWS 12" O.C. AT JOINTS AND TRACK, AND THIRD PTS. IN CENTER STUD.

④ BOARD : ½" FIRESTOP BESTWALL GYP. BD. (VERTICAL) 1⅝" LG. "G" DRYWALL SCREWS 12" O.C. AT JOINTS AND TRACK. AND 16" O.C. CENTER STUD AND LAMINATED WITH 4" STRIPS, 2" FROM EDGES. AND 4" OFF CENTER WITH BESTWALL LAMINATING CPD. JOINTS TAPED & FINISHED WITH BESTWALL JOINT SYSTEM

O.S.U NO. T-3218 5-13-65

2 HR. INCOMBUSTIBLE

BESTWALL GYPSUM COMPANY
PAOLI, PA.

NON-BEARING STEEL STUD PARTITION
TWO LAYERS ½" FIRE STOP
BESTWALL GYP. BOARD.
RD 2868

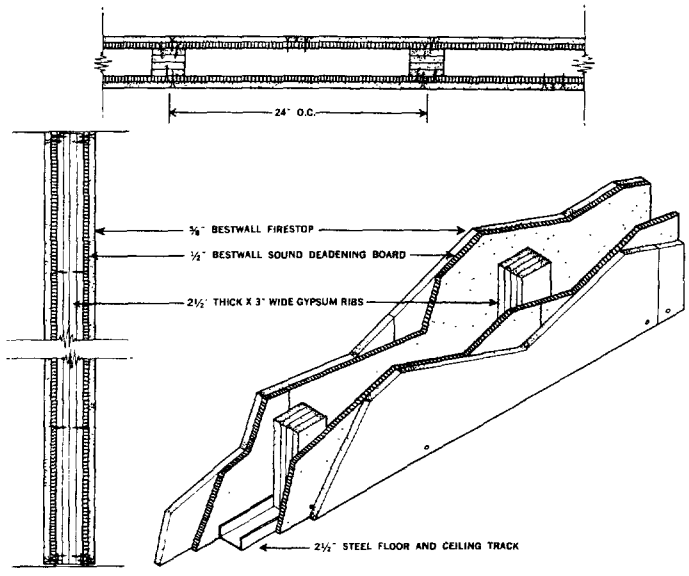
DATE:	3-9-65	SCALE: ~
DRN. BY T.P.	CKD BY	DWG NO T-131

SGP 0028304

2 HOURS INCOMBUSTIBLE NON-LOAD BEARING

BESTWALL FIRESTOP OVER SOUND DEADENING BOARD

STC-51
FIRE RATING — 1 HR. COMBUSTIBLE



PARTITION PROPERTIES

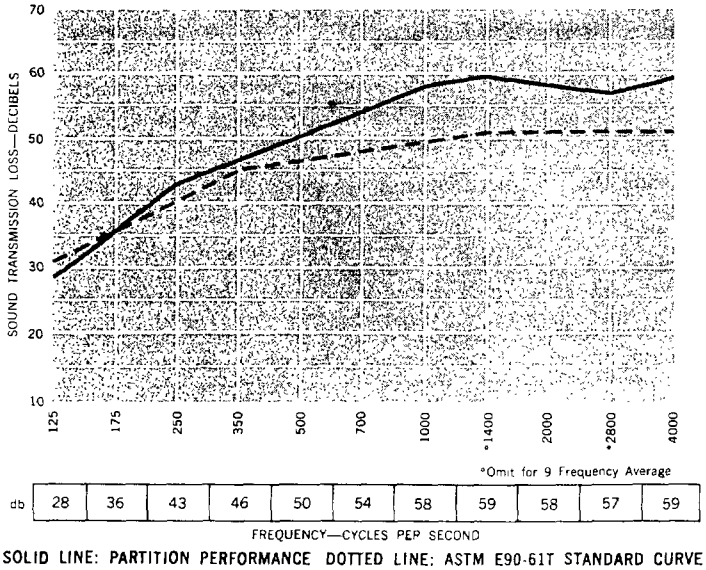
SOUND TEST DATA

Test No.: OR 64-57
Dated: June 16, 1964
Conducted By: Ohio Research Corporation
Test Partition—Height: 9'
Width: 14'
Thickness: 4¾"
Weight: 7.9 lbs./sq. ft.

9 Frequency Average	43 db
Sound Transmission Class	51 db
Speech Interference Zone	56 db

FIRE RESISTANCE TEST DATA

Test No.: T-3128
Dated: May 11, 1965
Conducted By: Engineering Experiment Station
Ohio State University



SOLID LINE: PARTITION PERFORMANCE DOTTED LINE: ASTM E90-61T STANDARD CURVE

MATERIALS USED

1. 2½" thick x 3" wide gypsum ribs (4 layers of ⅝" gypsum)
2. 2½" steel floor and ceiling track
3. ⅝" Bestwall Firestop Gypsum Wallboard
4. ½" Bestwall Sound Deadening Board
5. Bestwall Laminating Compound
6. 1½" drywall screws

APPLICATION DETAILS

1. Set 2½" x 3" gypsum ribs into 2½" steel track 24" o.c.
2. Apply ½" Bestwall Sound Deadening Board vertically to both sides with 1½" drywall screws spaced 12" o.c.
3. Apply ⅝" Bestwall Firestop vertically, joints staggered 12" o.c., to both sides with a 4" strip of Bestwall Laminating Compound around the perimeter and down the center. Keep compound 2" in from the edges and 4" off the centerline.
4. Hold face layers in place by the addition of 1½" drywall screws spaced 24" o.c. and 12" o.c. to the track.
5. Tape and finish in approved manner.

SGP 0028305



fatal fires spark

SGP 0028306

I've been scared to death since the other fire.

These houses just aren't safe, and I'm getting out.

The above statements are direct quotations from irate and frightened residents of a San Francisco community. The comments were published in the city's newspaper shortly after two fires took the lives of five people. The fires occurred within six months of each other—the second fire was only four houses away from the holocaust in which a mother and three of her children died, trapped in their second-floor bedroom.

This fire could happen again and again. It could happen tonight.

Builders cannot be blamed. They comply with the building codes.

The codes have no fireproofing requirements for single family homes . . . although they have strict rules for hotels and apartment buildings.

The danger will remain great until city building code and housing codes are changed.

The vital framing members surfaced with gypsum wallboard, were undamaged by the flames.

These statements were made by city officials. The first comment was made by a leader of the city fire department the day after the first fire. His prophecy, all too sadly, became a reality six months later when a young woman perished by fire in her sleep.

City officials have reflected on several "ifs" that they hope will prevent future tragic deaths:

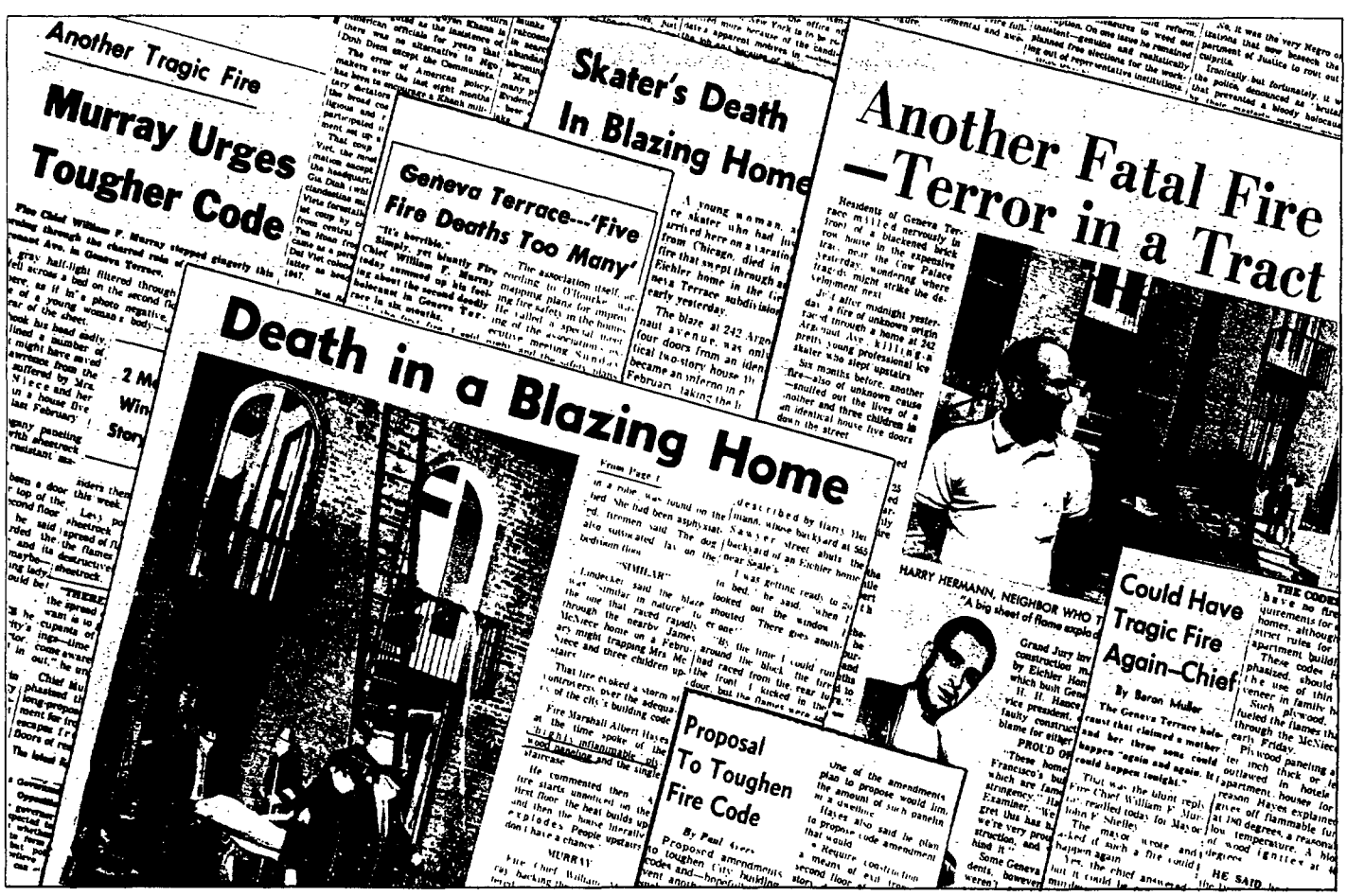
1. If windows were at least 2x2 ft. and within three ft. of the floor in all sleeping rooms.

2. If thin paneling used inside the homes were backed by gypsum wallboard at least one-half in. thick.

3. If requirements were established which prescribe noncombustible interior finish materials, such as gypsum.

These "ifs" became formal recommendations for code changes in San Francisco. They have now been adopted. It is evident now that these fatal fires and the subsequent requests for stricter codes will ultimately improve the standards of fire protection in the San Francisco area. But now the story is just beginning.

It is the responsibility of all public spirited citizens, city building officials and everyone within the building industry, to carry on the fight for fire protection in construction.



This montage of newspaper articles is evidence of the outcry for tighter regulations in building codes after two fatal fires in San Francisco.

The first step is communications—spreading the word about the importance of fire protection in all types of construction . . . industrial, commercial and residential.

Gypsum is one of the most well known and widely used fire protective materials in the building industry. Gypsum wallboard is essentially a gypsum core specially prepared in manufacturing into a sturdy panel.

The second step, of course, is education—what is fire protection, how can it be measured.

The three standard yardsticks for measuring this fire protection are noncombustibility, fire resistance and flamespread.

Noncombustibility is afforded by gypsum's unique chemical composition. Gypsum will not burn. Under any definition, gypsum is classified as a noncombustible material.

Fire resistance designates the ability of a construction assembly to contain fire at its source. The measurement of this ability is indicated by hourly ratings. Gypsum wallboard floor-ceiling and wall systems, for example, have passed two-hour tests.* These tests are conducted by leading independent laboratories.

Flamespread reveals, as the term indicates, the rapidity with which flame spreads over the surface of materials. Most building codes require a flamespread rating of not more than 25 in public areas. Gypsum wallboard qualifies with an excellent 10-15 flamespread rating.

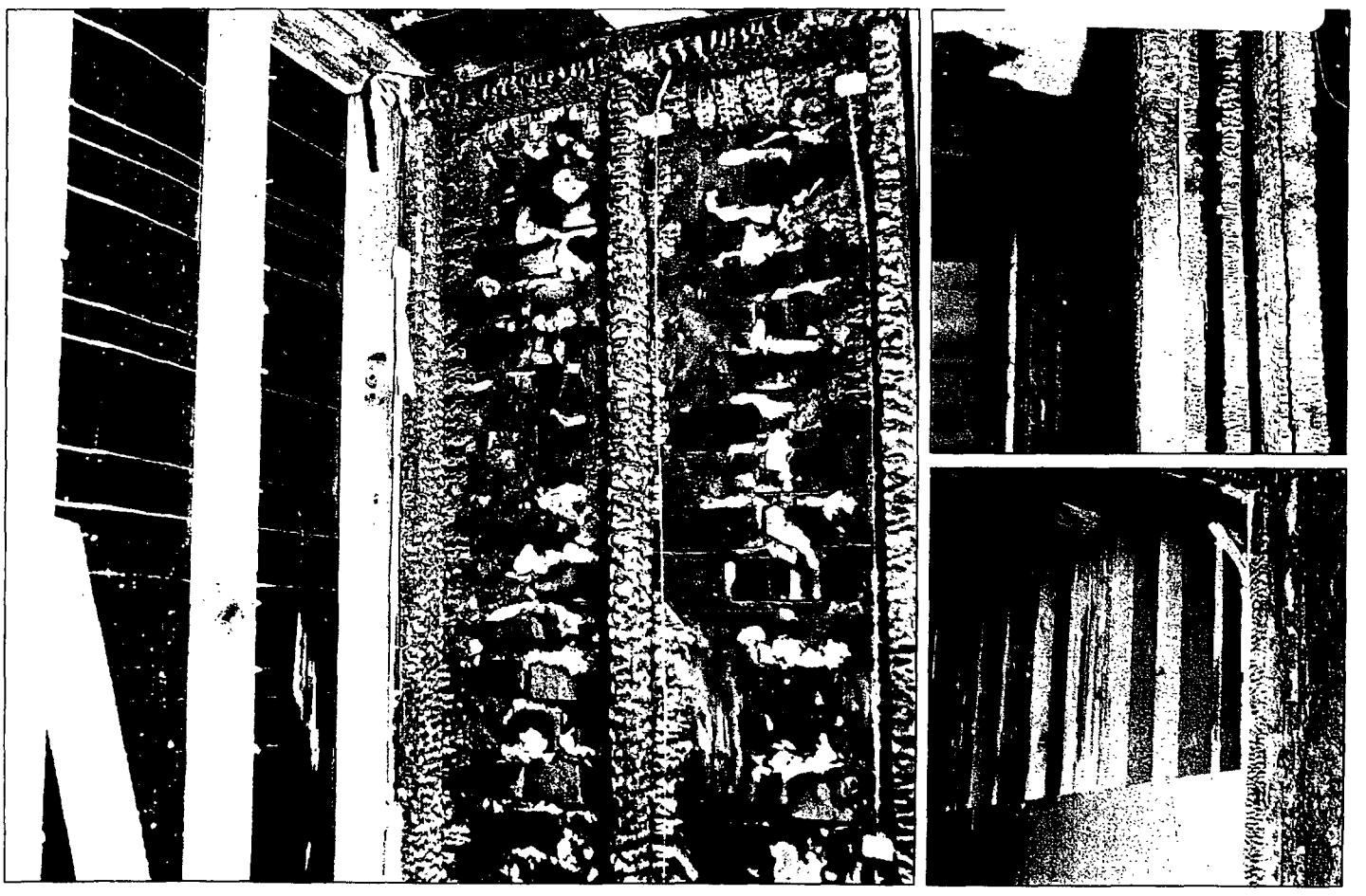
Fire is a friend of every family in many ways. Yet, uncontrolled it becomes a dreaded foe. Despite the number of destructive fires each year, fire protection in building construction is economical. Gypsum wallboard, with its fire protection, offers the added bonuses of sound control, fast erection, ease of handling . . . at low cost.

And gypsum wallboard is available in a variety of sizes, types and surface finishes.

The quick action by San Francisco city officials in the wake of the two fatal fires in their area is a tribute to their dedication and concern for the safety of lives and property.

The code changes they recommended should also become a stimulus for code officials and others within the building industry to investigate and re-evaluate the code in their area. The time for change is now.

SGP 0028308



These photos were taken shortly after firemen had extinguished the flames in two fatal fires. Thin combustible paneling covered the framing members which were nearly totally consumed by the flames. Moreover, paneling contributed fuel to the fire. Studs undamaged by the fire were protected with ½-in. gypsum wallboard.

Information regarding three-hour fire tests on gypsum wallboard assemblies is available from gypsum products manufacturers

fire resistance data for gypsum wallboard assemblies

FIRE RATING (Hour)	WEIGHT PER SQ. FT. (lb.)	DETAILS	FIRE TEST REFERENCE
1	6½	⅝ in. type "X" gypsum wallboard face panels laminated to both sides 1x6 in. gypsum cores, 2 ft. o.c. Non-load bearing.	U.L. R2717-19-21
1	11	⅝ in. type "X" gypsum wallboard nailed each side, 3⅝ in. nailable steel stud, 6d nails, 8 in. o.c. Load bearing.	Ohio State T-209
1	7—7½	One layer, ⅝ in. type "X" gypsum wallboard applied to each side, 6d nails, 7 in. o.c. Load bearing.	U.L.—B.M.L. Design No. 5
1	8—8½	Two layers, ⅜ in. regular gypsum wallboard applied to each side, 4d nails, 8 in. o.c. for second layer. Load bearing.	Ohio State T-118
1	6—6½	One layer, ½ in. regular gypsum wallboard applied to each side, 5d nails, 5 in. o.c., mineral wool batts nailed to studs. Load bearing.	BMS-92
1½	10—12	Two layers, ½ in. thick regular gypsum wallboard each side, 5d nails, 8 in. o.c. first layer; 8d nails, 8 in. o.c. second layer. Load bearing.	Unpub. Nos. 227 & 228
2	8—9	One in. gypsum board core (solid or laminated) ½ in. type "X" gypsum wallboard face panels, metal runners. Non-load bearing.	U.L. R3564
2	12-14	Two 1 in. gypsum coreboards, spaced minimum of one in. apart, ½ in. gypsum wallboard laminated to coreboards, metal runners, non-load bearing.	University of California
2	12—14	Two layers ⅝ in. type "X" gypsum wallboard each side. Load bearing.	U.L. R1319-11, 12. Ohio State T-194
1	2.2	Two in. concrete floor, one layer ⅝ in. type "X" gypsum wallboard nailed to ⅞ in. nailing channels, spaced 16 in. o.c., 1¼ in. barbed nails, 7 in. o.c.	U.L. R1319-14 U.L. R3501-18
2	2.2	Two and a half in. concrete floor, one layer ⅝ in. type "X" gypsum wallboard screw applied to ⅞ in. furring channel, spaced 12 in. o.c., one in. gypsum wallboard screws, 8 in. o.c.	UL R4024-3
1	2½	Ceiling one layer of ⅝ in. type "X" gypsum wallboard, 1⅞ in. nails, 6 in. o.c.	U.L.—B.M.L. Design No. One
1	4	Ceiling of two layers ½ in. regular gypsum wallboard. First layer applied with 1⅝ in. nails 18 in. o.c., one in. 20 gage galvanized hexagonal mesh applied with 8d nails 7 in. o.c. Second layer of gypsum wallboard applied with 8d box nails, 7 in. o.c.	Unpub. No. 250
1	14 Per Lin. Ft.	2-layers of ½ in. gypsum wallboard adhesively attached together and to column. First layer wire tied to column.	Unpub. Test No. 303
1½	1½ Per Lin. Ft.	3-layers of ½ in. gypsum wallboard adhesively attached together and to column. Second layer wire tied to column.	Unpub. Test No. 304
2	32 Per Lin. Ft.	4-layers of ½ in. gypsum wallboard adhesively attached to column and preceding layers. Third layer wire tied to column.	Unpub. Test No. 315

Gypsum Association

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CHICAGO, ILLINOIS 60606

1350 N. HIGHLAND AVENUE
HOLLYWOOD, CALIFORNIA 90028

SGP 0028309

Printed in U.S.A. Form Code 3-65



Sigurd
J. Clark

PAOLI, PENNSYLVANIA

April 26, 1966

General Sales Bulletin #29-66

TO: All Regional Sales Managers
All Area Managers
All Salesmen
Distribution Division Sales Personnel

CC: K. A. McCaskill, Paoli
R. L. Fredericks, Paoli

SUBJECT: 1/2" BESTWALL FIRESTOP

RE: One Hour Partition Assembly

BY: G. C. Moore-jw

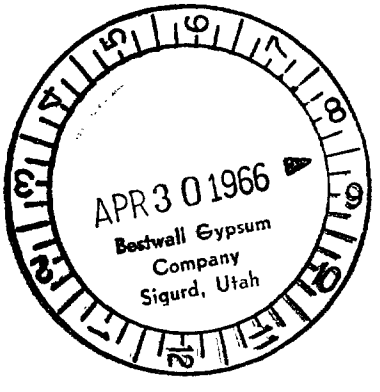
FILE: Gypsum Product Manual No.2 - Section 9A

A one hour fire resistant rating has been proven for a non-loadbearing partition assembly consisting of 2-1/2" steel studs 24" o.c. and one layer 1/2" Bestwall Firestop on both sides, with one layer of 7/16" Owens-Corning Noisestop Board attached to the steel studs under the Firestop on one side and 2" Fiberglas Insulation in the stud space.

The partition assembly was fire tested at the Engineering Experiment Station, Ohio State University, for the Georgia-Pacific Corporation, Bestwall Gypsum Division and Owens-Corning Fiberglas Corporation on November 18 and December 9, 1965, and covered in Report No. T-3500. The sound characteristics of this assembly will have an estimated STC rating of 45-48.

The partition assembly will be included in the new printing of "Sound Advice" that will go to press in two weeks.

The official reports of the fire test are in stock at Paoli, Pennsylvania and are available for use in requesting building code approvals.



Sigurd Hart
E.M. Rigby

PAOLI, PENNSYLVANIA

1 October 1965

To: All Regional Sales Managers
All Area Sales Managers
All Salesmen

General Sales Bulletin #92-65

Subject: EXTERIOR WALL WITH 1/2" GYPSUM SHEATHING - 2 HOURS

Cc: Mr. R.I. Fredericks Paoli
Mr. K.A. McCaskill Paoli

Re: UL Design #23

By: G.C. Moore /ghp

File - Gypsum Wallboard Product Manual#2
Section 9-A

The National Lumber Manufacturers Association, Washington, D.C. recently conducted a fire test on an exterior loadbearing wall assembly at the Underwriters' Laboratories. The test is covered under file #R1505-1-2 or UL Design #23 - 2 hours (dated April 22, 1965).

The fire test was conducted on a loadbearing wall assembly consisting of nominal 2" x 4" wood studs faced interior side with two layers of 5/8" (Type "X" gypsum wallboard) and the exterior side one layer of 1/2" thick exterior gypsum sheathing plus a clay faced brick wall.

Wood Studs, Bearing Plates and Firestops

The 2" x 4" stud members were cut into 9', 7-5/16" lengths, and three bearing plates cut in 10' lengths. The studs were nailed at the top and bottom to a bearing plate with two 12d x 3-1/4" long common coated steel nails at each end. A second bearing plate was nailed to the bottom bearing plate with 12d nails spaced 16" o.c. The studs were spaced 16" o.c. with the two end studs spaced 12" o.c. to accomodate the test frame dimension. The end studs were spaced about 3/4" in from the sides of the test panel to avoid side restraint. The 2" x 4" firestops were cut to length to fit the stud spacing and nailed in place along the horizontal center line with two 8d x 2-3/8" long cement coated steel nails in each end. The firestops were staggered to permit end nailing.

Gypsum Wallboard

The sheets of 5/8" Type "X" gypsum wallboard forming the inner layer were placed horizontally on the interior side of the wall and attached to the studs with 6d x 1-7/8" long cement coated steel nails spaced vertically 8" o.c. The sheets were cut into 28" and 92" lengths and the vertical joints between adjacent wallboards were staggered at opposite ends of the assembly. The top wallboard sheet was cut into a 24" width to accomodate the height of the opening. The sheets of gypsum wallboard forming the outer layer were placed horizontally and attached to the studs with 8d x 2-3/8" long cement coated steel nails spaced vertically 8" o.c. Full

(continued on page 2)

length sheets were used at the top and bottom, with the center sheet cut into 44" and 76" lengths. The half width sheet was located at the bottom of the wall such that the horizontal joints between the inner and outer layers were staggered. The outer layer joints were covered with 2" wide joint tape and compound and finished with two coats of joint compound. Nailheads were covered with joint compound.

Gypsum Sheathing

The sheets of 1/2" thick gypsum sheathing were placed horizontally and nailed to the studs with 11d x 1-3/4" long, 7/16" diameter flathead, galvanized roofing nails spaced vertically 6" o.c. The sheets were nailed to the top and bottom bearing plates with 11d x 1-3/4" long roofing nails spaced 8" o.c. The sheets were cut into various lengths such that the vertical joints between adjacent rows were staggered.

Face Bricks

The brick wall was laid up using full mortar joints, 3/8" to 1/2" thick. A-1" air space was allowed between the brick wall and exterior sheathing. The corrugated wall ties were attached to every stud over the sheathing with two 8d x 2-3/8" long cement coated steel nails, with the ties located at every sixth course of bricks.

Attached are two copies of UL Design #23 for your ready reference and description detail of this exterior wall design.

UL Design #23 is shown on UL Design #'s and the Bestwall Gypsum Division can promote this assembly through (G.A.) and UL Design #23. Please refer to the exterior wall - 1 hour fire rating that is covered under #T-99 BMS-191-192. Both the 1 hour and the 2 hour exterior wall construction assemblies are approved by the Gypsum Association and the 1 hour assembly is in the Gypsum Association literature, "Fire Resistance Design Data", please refer to page 11, Gypsum Wallboard Products Manual #2 (Section 9-A).

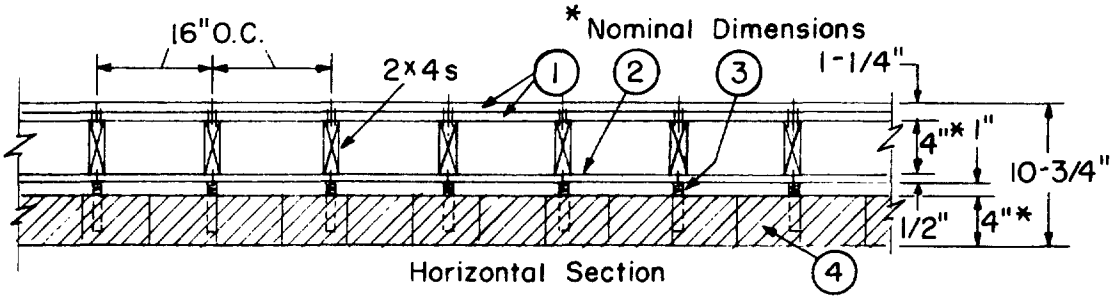
Guide No. 40 U 18

Walls and Partitions

Part 1 - See Part 2 for Description of Numbered Items

Class D-2 Designs

Design No. 23—2 Hr. Combustible (Bearing Wall)



Top and Bottom of Wall Effectively Firestopped

SGP 0028314

R 1505-1

AIA FILE NUMBERS 21-A-2 20-B-2 23-L

GEORGIA-PACIFIC
GYPSUM DIVISION

Information on the
Fire Resistance of Gypsum Products

Design Data

FIRE RESISTANCE

1967 EDITION



GYPSUM ASSOCIATION
201 North Wells Street • Chicago, Illinois 60606
1800 No. Highland Ave. • Hollywood, Calif. 90028

SGP 0028315

AIA FILE NUMBERS 21-A-2 20-B-2 23-L

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Characteristics, properties or performance of materials or systems herein described are based on data obtained under controlled test conditions. The Gypsum Association and the member companies make no warranties or other representations as to their characteristics, properties or performance under any variation from such conditions in actual construction. Test condition details will be furnished by the Gypsum Association or the appropriate member company on request.

SGP 0028316

USE OF MANUAL

This manual is intended to provide the designer with essential performance characteristics of a wide list of construction assemblies so that he may see at a glance their relative performance characteristics and his selection may be more accurate in meeting specific design criteria.

Since fire resistance is one of the basic considerations of design, the assemblies are arranged in tabular form according to their hourly fire resistance rating and construction use. The data also includes thickness and weight of the assemblies and, when available and applicable, test data on airborne and impact sound isolation.

The tests listed in this manual have been conducted by recognized independent laboratories for the Gypsum Association or member companies. Fire ratings are the result of tests on assemblies made up of specific materials. In some cases, either the assembly or one or more of the specific materials are considered by the member company to be proprietary and are so identified by a member company identification code letter.

The fire resistive ratings shown herein are based on full scale fire tests conducted in accordance with the requirements of ASTM E 119. These ratings are generally recognized by building code authorities and fire insurance rating bureaus.

When designing and building to meet a given fire resistive requirement, caution must be exercised to insure that each component material is the one specified in the test reference listed by number and laboratory and that the assembly is constructed in accordance with the assembly as fire tested or meets the requirements of the rated assembly.

Since lightweight plaster aggregates are superior in fire resistance to sand aggregates, most authorities permit substitution of lightweight aggregates for sand. Also, a lower ratio of sand to plaster than that used in the fire test assembly is usually permitted.

Different types of gypsum board products are available for use in fire rated assemblies. These types are identified both herein and by ASTM Standard Specifications as either regular or type "X" (special fire retardant types). Type "X" gypsum wallboard may be substituted for regular type and/or thicker gypsum boards may be substituted for thinner boards of the same type.

The appendix section of this manual contains information on the fire resistive properties of gypsum, general requirements for fire protection, and interpretation and application of the sound isolation data.

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LABORATORY IDENTIFICATIONS AND ABBREVIATIONS

The laboratories or testing groups which performed the fire and sound tests listed in this manual are identified as follows:

Fire Resistance Tests

BMS — Building Materials & Structures (NBS)
FM — Factory Mutual (Engineering Divn.)
FPL — Forest Products Laboratory
NBS — National Bureau of Standards
SFT — Fire Prevention Research Institute
T — Ohio State University
or
OSU — Ohio State University
UC — University of California
UL — Underwriters' Laboratories, Inc.

Sound Transmission Tests

ACI — Acoustical Consultants Inc. (K.S.O.)
CK — Cedar Knolls Acoustical Laboratories
G&H — Geiger & Hamme
NBS — National Bureau of Standards
OR — Ohio Research Corp.
RAL — Riverbank Acoustical Laboratories
WEAL— Western Electro-Acoustical Lab.

ABBREVIATIONS

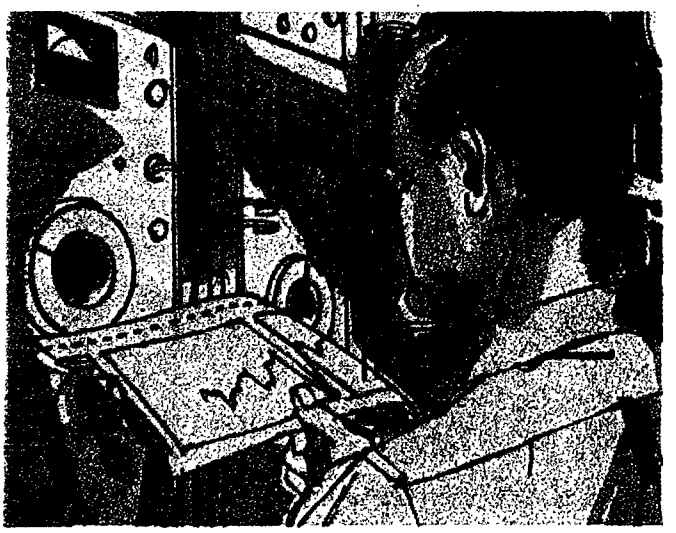
In the test analyses following, the abbreviation "est" in the Fire and Sound Rating columns indicates **estimated;** the abbreviation **N/A** indicates **not applicable** or **not available.**

atten.	attenuation
ft.	foot
ga.	gauge
INR	Impact Noise Rating
lab.	laboratory
lb.	pound
L.B.	load bearing assembly (fire tested under load)
N/A	not applicable or not available
N.L.B.	non-load bearing assembly
o.c.	on center
pfs	pounds per square foot
sq.	square
STL	sound transmission loss
suspend.	suspended
unpub.	unpublished

Plaster mixes are given by weight in lbs. of plaster, aggregates by volume in cubic feet.



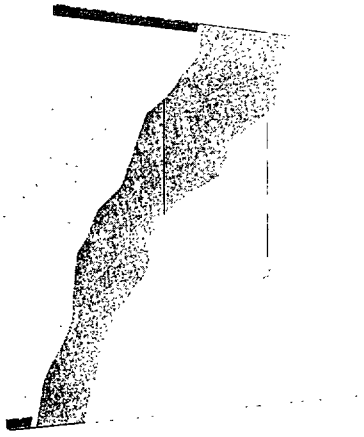
Gypsum products and assemblies provide superior fire protection, and are rated in compliance with a battery of scientific tests. Fire resistance, or the capacity to confine fire at its source, is indicated by hourly measurements; flame spread, or the time it takes for the flame to travel over the material's surface, is numerically rated.



A wide range of gypsum assemblies offer superior sound control. Rigorous laboratory and field testing determine their sound transmission properties, which are charted by single-number ratings or sound transmission classes (STC). The higher numbers listed indicate better sound control performance.

SGP 0028318

PARTITIONS



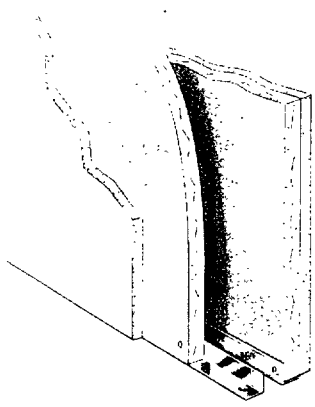
SOLID GYPSUM WALLBOARD

Gypsum wallboard face panels laminated to gypsum wallboard core panels – non-load bearing.



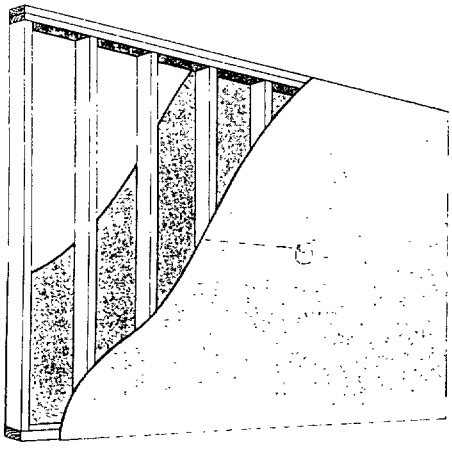
SEMI-SOLID GYPSUM WALLBOARD

Gypsum wallboard face panels laminated to narrow gypsum ribs, single or multi-layer each side – non-load bearing.



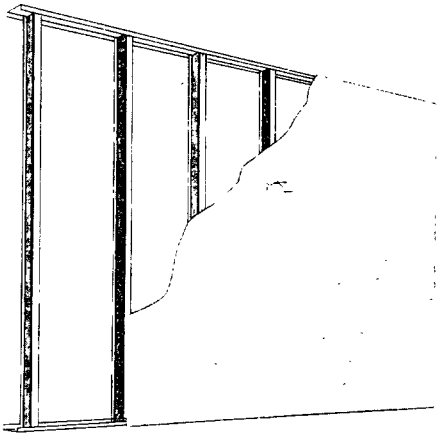
DOUBLE SOLID GYPSUM WALLBOARD

Gypsum wallboard face panels laminated to gypsum core panels – non-load bearing.



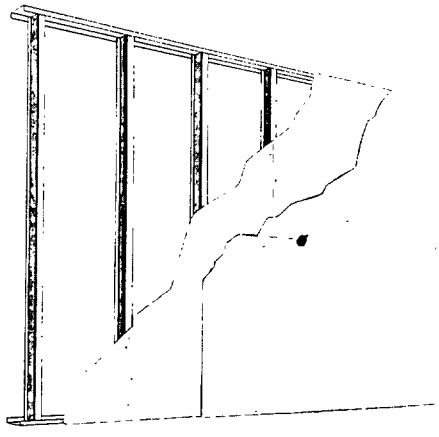
GYPSUM WALLBOARD ON WOOD STUDS

Single layer each side – load or non-load bearing.



GYPSUM WALLBOARD ON METAL STUDS

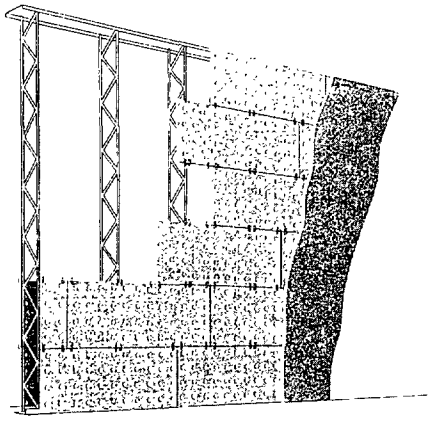
Single layer each side of non-load bearing steel screw studs or nailing studs, or load bearing 16 ga. studs.



DOUBLE LAYER GYPSUM WALLBOARD

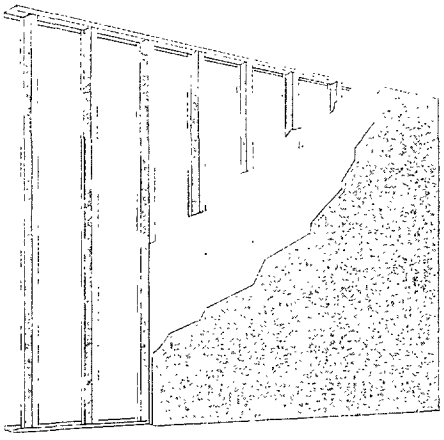
2 ply one or both sides of wood or metal studs (metal studs shown) – load or non-load bearing.

PARTITIONS



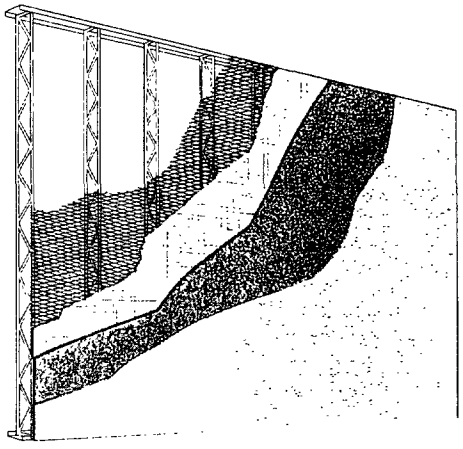
GYPSUM LATH AND PLASTER

Lath clip attached to steel studs 1⅝ to 6 inches wide — non-load bearing.



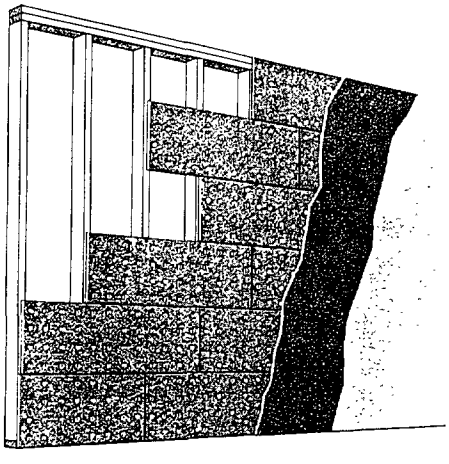
VENEER PLASTER OVER GYPSUM BASE

Single or double layer gypsum base on wood or metal studs (single on metal studs shown) — non-load bearing.



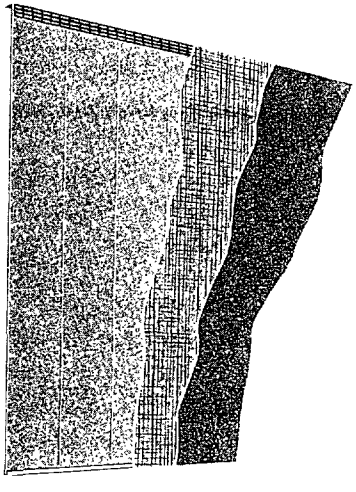
METAL LATH AND PLASTER ON WOOD OR METAL STUDS

Metal lath nailed to wood or metal nailing studs or wire tied to open web steel studs — load or non-load bearing.



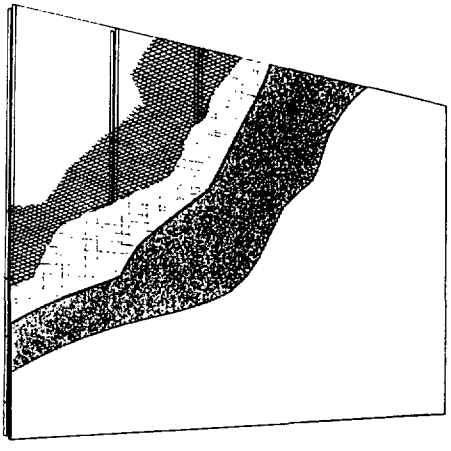
LATH AND PLASTER ON WOOD STUDS

Gypsum plaster each side on metal or gypsum lath (perforated gypsum lath shown) — load or non-load bearing.



SOLID GYPSUM LATH AND PLASTER WITH ½ INCH OR 1 INCH LATH

2 to 2½ inches finished thickness — non-load bearing.



SOLID METAL LATH AND PLASTER WITH STUDS OR STUDLESS

2 to 2½ inches finished thickness —non-load bearing.

1-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
2"	14-16	30 to 34	RAL	½" thick long length gypsum lath, ¾" thick 1:1—1:2 gypsum-sand plaster both sides (N.L.B.)	T-117 T-118 T-216	
2"	14-16	30 to 34	RAL	1" thick long length gypsum lath, ½" thick 1:2—1:2 gypsum-sand plaster both sides (N.L.B.)	T-737	p
2"	18	35 to 39	NBS	2" solid metal lath and plaster with ¾" steel channel studs 16" o.c., 1:2—1:2 gypsum-sand plaster (N.L.B.)	T-129	
2"	18	35 to 39	NBS	2" metal lath and plaster, studless, ⅜" rib lath, 1:2—1:2 gypsum-sand plaster (N.L.B.)	T-162	
1¾"	7-8	30 to 34	EST	1" gypsum coreboard with 1 layer of ⅜" thick regular gypsum wallboard laminated to each face (N.L.B.)	UL Design No. 9	p
2"	8-9	30 to 34	EST	1" gypsum tongue and groove coreboard with 1 layer of ½" regular gypsum wallboard laminated to each side (N.L.B.)	UC 4/4/61 T-1175	
2¼" to 2⅞"	6-8	30 to 34	EST	⅝" thick type "X" gypsum wallboard face panels laminated to each side of 1" x 6" or 1⅝" x 6" gypsum ribs spaced 24" o.c. (N.L.B.)	UC 5/18/60 UL Design No. 10 & 16 R1319-84	
2¼"	7-8	30 to 34	EST	2 layers of ⅜" thick gypsum wallboard face panels laminated to each side of ¾" x 6" gypsum ribs spaced 24" o.c. (N.L.B.)	T-1276	
4¾"	9-10	50 to 54	OR	⅝" thick type "X" gypsum wallboard strip laminated and screw-attached to ½" thick wood fiber sound deadening board both sides on 2½" x 3" gypsum ribs spaced 24" o.c. (N.L.B.)	T-3128	k, e, g, j, h, m, q, s
3⅜" to 5⅜"	13	40 to 44	RAL	⅜" thick perforated gypsum lath clip-attached both sides to 2½" open web metal studs spaced 16" o.c., ½" thick 1:2—1:2 gypsum-sand plaster (N.L.B.)	T-118, T-309, T-887, T-1330, T-1332 UC 11/27/57	
4¼"	9-10	40 to 44	RAL	⅜" thick perforated gypsum lath screw-attached both sides to 2½" metal screw type studs spaced 24" o.c., ½" thick 1:2—1:2 gypsum-sand plaster (N.L.B.)	T-2349 UC 12/21/65	
4¼"	12-13	40 to 44	RAL	⅜" thick perforated gypsum lath nailed or stapled both sides to 2½" metal nailable type studs spaced 16" o.c. ½" thick 1:2—1:2 gypsum-sand plaster (N.L.B.)	T-1578 T-1579	p

1-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
4¼"	9-10	35 to 39	RAL	⅜" thick plain gypsum lath nailed or stapled both sides to 2½" metal nailable type studs spaced 16" or 24" o.c., ½" thick mill mixed gypsum-perlite plaster (N.L.B.)	T-1580 T-1581	p
4¼"	10	40 to 44	RAL	⅜" thick type "X" gypsum lath nailed both sides to 3½" metal nailable type studs spaced 24" o.c. with 3 nails per lath per stud, ½" thick 1:2—1:3 gypsum-sand plaster (N.L.B.)	UC	j
5"	13	45 to 49	ACI	⅜" thick perforated gypsum lath resiliently clipped to both sides of a 2½" open web metal stud spaced 16" o.c., ½" thick 1:2—1:2 gypsum-sand plaster each face (N.L.B.)	UL Design No. 24-1	
4⅛"	13	45 to 49	G&H	⅜" thick perforated gypsum lath resiliently clipped to both sides of a 1⅝" open web metal stud spaced 16" o.c., ½" thick 1:2—1:2 gypsum-sand plaster each face (N.L.B.)	T-1559	
4¼"	13	35 to 39	RAL	⅜" thick perforated gypsum lath screw-attached both sides to 2½" metal screw type stud spaced 24" o.c., ½" thick 1:2—1:2 gypsum-sand plaster each face, 2" mineral wool blankets in the stud space (N.L.B.)	T-1974	
4¼" to 7¾"	9-10	35 to 39	EST	⅜" thick plain gypsum lath clip-attached both sides to 2½" open web metal studs spaced 16" o.c., ½" thick 1:2 gypsum-perlite plaster (N.L.B.)	T-1450	p
4¼" to 7¾"	13	40 to 44	EST	⅜" thick plain gypsum lath clip-attached both sides to 2½" open web metal studs spaced 16" o.c., ½" thick 1:2 gypsum-sand plaster (N.L.B.)	FM WP-65	p
4½" to 6"	13	40 to 44	EST	½" thick plain gypsum lath clip-attached both sides to 2½" screw type metal studs spaced 24" o.c., ½" thick 1:2 gypsum-sand plaster (N.L.B.)	FM WP-53	p
3¾" to 5¾"	18	45 to 49	RAL	3.4 lb. metal lath attached to 2½" open web metal studs spaced 16" o.c., ¼" pencil rods and resilient clips attached to one or both sides, ⅝" thick 1:2—1:3 gypsum-sand plaster (N.L.B.)	T-650 T-1236	
4¾" to 5¾"	18-21	40 to 44	NBS	3.4 lb. metal lath attached both sides to 3¼" open web metal studs spaced 16" o.c., ¾" thick 1:2—1:2 gypsum-sand plaster (N.L.B.)	BMS-92	

*NOTE: Stud spacing of not more than 16" o.c. is recommended by the Gypsum industry for better performance.

1-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
4"	12-14	35 to 39	RAL	3.4 lb. metal lath nailed or stapled both sides to 2½" nailable metal studs spaced 16" o.c., ⅝" thick 1:2—1:2 gypsum-sand plaster (N.L.B.)	T-1576 T-1577	p
3⅛" to 7½"	12-14	35 to 39	RAL	3.4 lb. metal lath attached both sides to 1⅝" punched metal channel studs spaced 16" o.c., ⅝" thick 1:2—1:3 gypsum-sand plaster (N.L.B.)	T-1511	
3½"	19	35 to 39	EST	3.4 lb. diamond mesh metal lath tied both sides to 1⅝" open web metal studs spaced 16" o.c., 7/16" thick 1:2 gypsum-sand plaster each side (N.L.B.)	T-886	
3⅝"	5-6	40 to 44	ACI	½" thick type "X" gypsum base attached both sides to 2½" screw type metal studs spaced 24" o.c., with 1" screws spaced 9" o.c. along tapered edges and 12" o.c. on the intermediate stud. Not less than 1/16" gypsum veneer plaster (N.L.B.)	UC 11/1/63	
		40 to 44	EST	Same as above except horizontal application of board.	UC 5/31/66	h
		45 to 49	EST	Same as above except 1½" glass fiber insulation added to stud space.	UC 5/31/66	h
3⅝" 4½" 5⅝"	10-12	45 to 49	ACI	Two layers of ½" thick regular gypsum base attached both sides to 1⅝", 2½" or 3⅝" screw type metal studs 24" o.c. with 1" and 1⅝" gypsum wallboard screws 12" o.c., not less than 1/16" gypsum veneer plaster (N.L.B.)	UC 9/21/64	h
3⅝" 4½" 5⅝"	10-12	50 to 54	ACI	Same as above except 1½" glass fiber insulation added in stud space (N.L.B.)	UC 9/21/64	h
5½" to 6⅝"	8-10	45 to 49	ACI	½" thick type "X" gypsum base over ¼" thick gypsum sound control board attached both sides to 2½" or 3⅝" metal studs 24" o.c. with 1" and 1⅝" No. 6 screws 12" o.c. Not less than 1/16" gypsum veneer plaster (N.L.B.)	UC 12/28/65	h
5½" to 6⅝"	8-10	50 to 54	ACI	Same as above except 1½" glass fiber insulation added in stud space (N.L.B.)	UC 12/28/65	h
4" to 5⅛"	8-10	50 to 54	ACI	Two layers of ½" thick type "X" gypsum base one side and one layer on other side attached both sides to 2½" or 3⅝" metal studs, spaced 24" o.c., with 1" and 1⅝" No. 6 screws 12" o.c. and not less than 1/16" gypsum veneer plaster. 1½" glass fiber insulation in stud space (N.L.B.)	UC 8/12/65	

1-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
2⅞" to 4⅞"	5-7	35 to 39	RAL	⅝" thick type "X" gypsum base attached both sides to 1⅝" or 3⅝" screw type metal studs with 1" long gypsum wallboard screws 12" o.c. and not less than 1/16" gypsum veneer plaster.	T-1174 T-3296	
4¾"	8	45 to 49	CK ACI	½" thick type "X" gypsum base screw-attached vertically both sides to 3⅝" screw type metal studs spaced 24" o.c. not less than 1/16" gypsum veneer plaster each face, 1" 2 to 3 lb. density sound attenuation wool stapled one side (N.L.B.)	T-3124 UC	
5" to 5½"	5-7	40 to 44	EST	⅝" thick type "X" gypsum base attached horizontally both sides to 3⅝" screw type metal studs spaced 24" o.c. with 1" gypsum wallboard screws spaced 8" o.c. along vertical edges and 12" o.c. on intermediate studs. Gypsum veneer plaster not less than 1/16" thick (N.L.B.)	FM WP-45	p
4⅞"	5-7	40 to 44	RAL G&H	⅝" thick type "X" gypsum wallboard nailed each side to 3⅝" nailable metal studs 24" o.c. with 6d nails 8" o.c. (L.B.)	T-209	
2⅞" to 4⅞"	5-7	40 to 44	RAL	⅝" thick type "X" gypsum wallboard attached both sides to 1⅝" screw type metal studs spaced 24" o.c. with 1" gypsum wallboard screws spaced 8" o.c. around the perimeter and 12" o.c. on the intermediate studs (N.L.B.)	T-3296 UC 4/18/66	
3¾"	6	45 to 49	G&H	⅝" thick type "X" predecorated gypsum wallboard both sides of 2½" screw type metal studs spaced 24" o.c., secured by battens with 1" gypsum wallboard screws spaced 9" o.c. (3" glass fiber insulation in stud space for sound test only) (N.L.B.)	UL Design No. 20	p
3½"	6	45 to 49	RAL	½" thick type "X" predecorated gypsum wallboard secured by battens both sides to 2½" metal screw type studs, spaced 24" o.c., with 1" gypsum wallboard screws spaced 12" o.c., 2" 2-3 lb. sound attenuation mineral wool insulation in stud space (N.L.B.)	UL Design No. 21 UC	
3⅝"	7	45 to 49	G&H	½" thick type "X" gypsum wallboard, ½" thick mineral fiber sound deadening board attached both sides to 1⅝" screw type metal studs spaced 24" o.c. with 1⅝" gypsum wallboard screws spaced 12" o.c. (N.L.B.)	UL Design No. 23	

1-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
4"	8-9	40 to 44	OR	½" thick type "X" gypsum wallboard and ½" mineral fiber sound deadening board, one side only, attached to 2½" screw type metal studs 24" o.c. ½" thick type "X" gypsum wallboard opposite side. Mineral insulation batts in stud space (N.L.B.)	T-3500	k, e, g, h, j, m, q, s
3½" to 4⅜"	6	45 to 49	EST	½" thick type "X" gypsum wallboard attached both sides to 2½" or 3⅝" screw type metal studs 24" o.c. with 1" gypsum wallboard screws 8" o.c. along vertical edges and 12" o.c. on intermediate studs. 2" 2-3 lbs. mineral insulation batts in stud space (N.L.B.)	UC 9/20/66 FM WP-51	
3⅝"	9	40 to 44	EST	Two layers ½" thick type "X" gypsum wallboard attached both sides to 1⅝" screw type metal studs 24" o.c. First layer attached with 1" gypsum wallboard screws 12" o.c. Face layer attached 1⅝" long screws 12" o.c. (N.L.B.)	UC 6/15/65	
4" to 5⅛"	7	50 to 54	RAL ACI	Two layers of ½" thick type "X" gypsum wallboard screw-attached to one side of 3⅝" screw type metal stud 24" o.c. One layer of ½" thick type "X" gypsum wallboard screw-attached on the opposite side. 1" 2-3 lbs. sound attenuation mineral wool stapled in stud space (N.L.B.)	T-3362 UC	t h p
4"	5	45 to 49	G&H	Two layers gypsum wallboard each side. Base layer ¼" thick gypsum sound deadening board attached each side of 2½" screw type metal studs 24" o.c. with 1" gypsum wallboard screws 12" o.c. edges and ends. Face layer ½" thick type "X" gypsum wallboard each side attached with 1⅜" long screws 12" o.c. edges and ends, 24" o.c. in field. No laminating compounds. (N.L.B.)	T-3854 UC 12/28/65	e, g, h, j, k, m, q, s
3⅝" 5½" 7⅝"	10-12	45 to 49	ACI	Two layers ½" thick regular gypsum wallboard attached both sides to 1⅝", 2½", or 3⅝" screw type metal studs 24" o.c. with 1" gypsum wallboard screws 12" o.c. Face layer attached with 1⅝" screws 12" o.c. (N.L.B.)	UC	
3⅝" 5½" 7⅝"	10-12	50 to 54	ACI	Same as above, except 1½" glass fiber insulation added in stud space.	UC 9/21/64	h
3½" 4⅝"	5-6	45 to 49	ACI	½" thick type "X" gypsum wallboard attached both sides to 2½" or 3⅝" screw type metal studs 24" o.c. with 1" gypsum wallboard screws 12" o.c. 1½" glass fiber insulation in stud space (N.L.B.)	T-3362 UC 8/12/65	h t

1-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
4⅞" to 5¼"	5-7	40 to 44	EST	⅝" thick type "X" gypsum wallboard applied horizontally, attached both sides to 3⅝" screw type metal studs 24" o.c. with 1" gypsum wallboard screws 8" o.c. vertical edges and 12" o.c. on intermediate studs (N.L.B.)	FM WP-45 UC 4/18/61	p n
4" to 5½"	7	45 to 49	EST	Two layers one side, one layer opposite side, of ½" thick type "X" gypsum wallboard plain or predecorated, attached to 2½" screw type metal studs spaced 24" o.c. On single ply side, gypsum wallboard attached to studs with 1" gypsum wallboard screws along vertical edges and with adhesive to intermediate stud. On two-ply side, inner ply attached to studs with 1" gypsum wallboard screws spaced 8" o.c. along vertical edges and 12" o.c. to intermediate stud, face ply attached to studs at vertical edges with 1⅝" gypsum wallboard screws spaced 8" o.c. and to inner ply in area of intermediate stud with vertical adhesive bead (N.L.B.)	FM WP-66	p
4"	5-6	36 to 40	CK	½" thick type "X" gypsum wallboard attached to 3" exterior L.B. 19 gauge screw type metal studs 24" o.c. with 1" gypsum wallboard screws spaced 12" o.c. for edge studs, 8" o.c. on intermediate studs. 2" mineral insulation in stud space (L.B.)	T-3708	
3¾"	5-6	45 to 49	G&H	⅝" thick type "X" gypsum wallboard attached both sides to 2½" or 3⅝" metal screw type studs 24" o.c. with 1" gypsum wallboard screws spaced 12" o.c. 1½" glass fiber insulation in stud space (N.L.B.)	UC 8/12/65	h
3⅛"	7-8	45 to 49	ACI	½" thick type "X" gypsum wallboard attached over ¼" thick gypsum sound control board both sides with 1" to 1⅝" gypsum wallboard screws to 2½" or 3⅝" screw type metal studs 24" o.c. (N.L.B.)	UC 12/28/65	h
4"	7-8	50 to 54	ACI	Same as above except 1½" mineral insulation added in stud space (N.L.B.)	UC 12/28/65	h
5⅜"	14-15	35 to 39	NBS	⅜" thick plain or perforated gypsum lath nailed 4" o.c. to 2" x 4" wood studs 16" o.c. ½" thick 1:2 gypsum-sand plaster each side (L.B.)	T-948 T-1380	
5⅜"	10-11	30 to 34	EST	⅜" thick perforated gypsum lath nailed 3" o.c. to 2" x 4" wood studs 16" o.c., ½" thick 1:2 gypsum-perlite or vermiculite plaster each side (L.B.)	NBS Test Nos. 251, 252, 253, 254 UL Design No. 6	

SGP 0028326

1-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
5⅜"	13-14	35 to 39	EST	⅜" thick plain gypsum lath, 2" x 4" wood studs 16" o.c., ½" thick wood-fibered gypsum plaster each side (L.B.)	BMS-92 Table 30	
5⅜"	14-15	35 to 39	EST	⅜" thick type "X" gypsum lath nailed 5" o.c. to 2" x 4" wood studs 16" o.c. ½" thick gypsum-sand plaster each side (L.B.)	T-1234 T-1429 T-1488	
6"	10-11	40 to 47	EST	⅜" thick perforated gypsum lath attached with resilient clips to 2" x 4" wood studs 16" o.c. ½" thick mill-mixed gypsum-perlite plaster (L.B.)	T-1449	p
6⅛"	15	45 to 49	RAL	⅜" thick perforated gypsum lath attached with resilient clips to 2" x 4" wood studs 16" o.c., ½" thick 1:2 gypsum-sand plaster (L.B.)	T-1019 T-1329	
5⅞"	15-16	45 to 49	RAL	⅜" thick type "X" gypsum lath attached to resilient strip attached at right angles to studs 16" o.c. 3 screws per lath per bearing. ⅜" lath nailed direct to studs on opposite side. ½" thick 1:2—1:3 gypsum-sand plaster (N.L.B.)	UC	
5⅛"	14-16	35 to 39	EST	⅝" thick 1:2—1:3 gypsum-sand plaster on metal lath each side. Nail attached. (L.B.)	UL Design No. 1 R1355	
5⅛"	10	30 to 34	EST	⅝" thick 1:2—1:2 gypsum-perlite or vermiculite plaster on metal lath each side Nail attached. (L.B.)	UL Design No. 3 R2773	
5⅜"	20	40 to 44	EST	¾" thick 1:2—1:3 gypsum-sand plaster on metal lath each side. Nail attached. (L.B.)	BMS-92	
5"	7-8	35 to 39	EST	⅝" thick type "X" gypsum plaster base nailed 7" o.c. with 6d nails to 2" x 4" wood studs. Not less than 1/16" gypsum veneer plaster (L.B.)	UL Design No. 5	
4⅞"	7	30 to 34	EST	½" thick type "X" gypsum plaster base nailed 7" o.c. with 6d nails, not less than 1/16" gypsum veneer plaster (L.B.)	UC 1/12/66 8/22/64	
5½"	8-9	50 to 54	ACI	½" thick type "X" gypsum plaster base strip laminated over ¼" thick gypsum sound control board nailed to 2" x 4" wood studs 16" o.c. Not less than 1/16" gypsum veneer plaster (L.B.)	UC	n
5½"	7	45 to 49	GH	⅝" thick type "X" gypsum base attached to resilient channels 24" o.c. one side of 2" x 4" wood studs 16" o.c. ⅝" thick type "X" gypsum base nailed direct to studs other side. Not less than 1/16" gypsum veneer plaster. 3" mineral insulation added to stud space (L.B.)	T-1396	t

1-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
6⅛"	9	50 to 54	CK	Two layers ⅝" thick type "X" gypsum base attached one side 2" x 4" wood studs 16" o.c. One layer ⅝" thick type "X" gypsum base attached to resilient channels 24" o.c. on the other side. Minimum 1/16" gypsum veneer plaster. 3" mineral insulation added to stud space. (L.B.)	T-1396	
5"	7-8	35 to 39	NBS	One layer ⅝" thick type "X" gypsum wallboard applied to both sides 2" x 4" wood studs 16" o.c. with 6d nails spaced 7" o.c. (L.B.)	UL Design No. 5	
5⅛"	8-8½	35 to 39	NBS	Two layers ⅜" thick regular gypsum wallboard applied both sides 2" x 4" wood studs 16" o.c. with 4d nails 8" o.c. first layer and 5d nails 8" o.c. second layer. (L.B.)	T-118	
4⅝"	6-6½	35 to 39	EST	One layer ½" thick regular gypsum wallboard applied both sides 2" x 4" wood studs 16" o.c. with 5d nails 5" o.c. Mineral wool batts nailed to studs (L.B.)	BMS-92	
5⅞"	8-9	45 to 49	OR	Face layer both sides ⅝" thick type "X" gypsum wallboard strip laminated to base layer ½" thick wood fiber sound deadening board attached to both sides of 2" x 4" wood studs, spaced 16" o.c. with 6d nails (L.B.)	T-3006 T-3533	e, g, h, j, k, m, q, s
8¼"	8-9	45 to 49	G&H	One layer ½" thick type "X" gypsum wallboard over ½" thick wood fiber sound deadening board attached both sides with 6d nails 12" o.c. to 2" x 3" staggered wood studs spaced 24" o.c. on separate wood plates spaced 1" apart. (L.B.)	UL Design No. 26	p
8½"	8-9	50 to 54	G&H	Face layer both sides ⅝" thick type "X" gypsum wallboard attached both sides with 7d nails 7" o.c. over ½" thick wood fiber sound deadening board attached to 2" x 3" staggered wood studs with separate plates spaced 1" apart. (L.B.)	UL Design No. 17	
5⅜"	7	50 to 54	G&H	One layer ⅝" thick type "X" gypsum wallboard attached to resilient channel spaced 24" o.c. horizontal, attached both sides to 2" x 4" wood studs spaced 16" o.c. with mineral insulation. (L.B.)	T-1396	t
4⅞"	6-7	35 to 39	G&H	One layer ⅝" thick type "X" gypsum wallboard attached to both sides of 2" x 4" wood studs spaced 24" o.c. with 6d nails spaced 7" o.c. (L.B.)	UL Design No. 25	p

1-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
5⅜"	7-8	50 to 54	OR	One layer ⅝" thick type "X" gypsum wallboard screw-attached to resilient furring channel one side only with 1" gypsum wallboard screws. Furring channels spaced 24" o.c., horizontally attached to wood studs, spaced 16" o.c. Opposite side, wallboard nailed to wood studs, 1½" glass fiber insulation in stud space (L.B.)	T-3127	k, e, h, j, g, m, q, s
5⅜"	7-8	40 to 44	RAL	One layer of ⅝" thick type "X" gypsum wallboard attached to resilient furring channel, one side only, with 1" gypsum wallboard screws spaced 12" o.c. Furring channel spaced 24" o.c., horizontally attached to wood studs spaced 16" o.c. Opposite side, wallboard nailed with 6d nails to wood studs 7" o.c. (L.B.)	T-3376 UC 3/1/62	h j p
5⅜"	7	50 to 54	G&H	2" x 4" wood studs 16" o.c., a resilient channel spaced 24" o.c. on one side only. ⅝" thick type "X" gypsum wallboard both sides. 3" insulation in the stud space (L.B.)	UL Design No. 27 R1319-93-94	t
5⅝"	8	45 to 49	ACI	One layer ⅝" thick type "X" gypsum wallboard on ⅜" thick regular gypsum wallboard attached both sides to 2" x 4" wood studs 16" o.c. with 5d nails spaced 12" o.c. Face layer attached with laminating compound and 6d nails spaced 24" o.c. (L.B.)	UC	
4⅞"	5	35 to 39	EST	2" x 4" fire retardant treated wood studs 24" o.c. One layer ⅝" thick type "X" gypsum wallboard both sides nailed horizontally and joints finished (N.L.B.)	FPL 8/31/65	
4⅛"	5	35 to 39	EST	2" x 3" fire retardant treated wood studs 24" o.c. One layer ⅝" thick type "X" gypsum wallboard nailed both sides and joints finished (N.L.B.)	UC 1/20/66	
5⅝"	9-10	50 to 54	ACI	⅝" thick type "X" gypsum wallboard strip laminated over ¼" thick sound control gypsum wallboard nailed 12" o.c. both sides to 2" x 4" wood studs 16" o.c. (L.B.)	UC 1/20/66	h
5⅜"	8-9	45 to 49	ACI	½" thick type "X" gypsum wallboard strip laminated over ¼" thick sound control gypsum wallboard nailed 12" o.c. both sides to 2" x 4" wood studs 16" o.c. (L.B.)	UC 1/20/66	h
5⅝"	4	40 to 44	EST	7/16" thick wood particle board, attached both sides with 6d finish nails 7" o.c. over ½" thick type "X" gypsum wallboard nailed with 5d nails 7" o.c. to 2" x 4" wood studs 16" o.c. (L.B.)	UL Design No. 4	

1-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
5⅜"	8-9	40 to 44	EST	Two layers. Base layer ⅜" thick regular gypsum wallboard attached both sides with 5d nails 24" o.c. Face layer ½" thick regular gypsum wallboard attached with 8d nails 12" o.c. on edges and 24" o.c. in field. (L.B.)	UC 1/5/65	n
2⅞" to 4⅞"	5-6	40 to 44	RAL	One layer ⅝" thick type "X" gypsum wallboard each side of metal studs 24" o.c. with batten strips at joints. Movable partition (N.L.B.)	UL Design No. 20 T-2069	p
3¾"	5	35 to 39	OR	One layer ⅝" thick type "X" vinyl covered gypsum wallboard screw-attached both sides to 2½" metal studs 24" o.c., and covered with batten, 1¼" screws 12" o.c. at top and bottom plate and ¼ points vertically on framing members (N.L.B.)	T-2898	k f
3½"	5	N/A		One layer ⅝" thick type "X" gypsum wallboard screw-attached both sides to metal studs 24" o.c. at ⅓ points. Joints covered with batten strip with screws 12" o.c. (N.L.B.)	T-3658	s
2¼"	9	35 to 39	RAL	Prefabricated gypsum wallboard panels, 24" panel tongue and grooved, consisting of 1" gypsum coreboard and ⅝" thick gypsum wallboard face panels. Laminated using contact adhesive. (N.L.B.)	UC	h n, t
2¼"	7	35 to 39	RAL	Prefabricated gypsum wallboard panels, 24" tongue and grooved, consisting of 1" core strips and ⅝" thick gypsum wallboard face panels. Laminated using contact adhesives. (N.L.B.)	UL Design No. 22 R1319-63-64	n t
3"	10	25 to 29	EST	3" thick hollow gypsum block or tile, unplastered (N.L.B.)	BMS-92	
2"	11	N/A		2" thick solid gypsum block, unplastered (N.L.B.) (For short runs and vent shafts)	BMS-92 Table 24	
4¼"	28	45 to 49	BMS-144	3" thick medium burned clay tile, one cell in wall thickness, units 50% solid, ⅝" thick 1:3 gypsum-sand plaster both sides. (N.L.B.)	BMS-92	
4½"	31	45 to 49	RAL	4" thick ceramic glazed tile, ¾" shells (one cell), ¾" thick 1:3 gypsum-sand plaster on unglazed side (N.L.B.)	T-38	
5¼"	34	40 to 44	BMS-144	4" thick medium burned clay tile, one cell in wall thickness, units 40% solid, ⅝" thick 1:3 gypsum-sand plaster on both sides. (N.L.B.)	BMS-92	

(d) These ratings are intended to show the designer what thickness, weights, sound transmission loss and fire resistance can be expected with these materials. For additional ratings and information consult building codes or manufacturers' literature.

1-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
6⅝"	37	40 to 44	BMS-144	6" thick medium burned clay tile, one cell in wall thickness, units 30% solid, ⅝" thick 1:3 gypsum-sand plaster on exposed side only (N.L.B.)	BMS-92 UL Design No. 4	
5"	35	N/A		4" thick siliceous gravel aggregate units, 74% solid, ½" thick 1:3 gypsum-sand plaster on both sides. (N.L.B.)	BMS-120	
5⅝"	14-16	N/A		⅜" thick perforated gypsum lath, 2" x 4" wood studs 16" o.c., ½" thick 1:2 gypsum-sand plaster one side; ½" thick gypsum sheathing and wood siding on opposite side. (L.B.)	Unpub. No. 191, 192	

1½-HOUR FIRE RESISTANT PARTITIONS

2"	11	30 to 34	RAL	½" thick long length gypsum lath, ¾" 1:2—1:2 gypsum-perlite or vermiculite plaster both sides (N.L.B.)	Unpub. No. 282 UL R4459-1-2-5 R2851-8-9	
2"	16	35 to 39	EST	2" solid metal lath and plaster with ¾" metal channel 16" o.c., 1:½—1:½ gypsum-sand plaster (N.L.B.)	BMS-92	
2½"	20	40 to 44	EST	2½" solid metal lath and plaster, studless, ⅜" rib lath, 1:1—1:1 gypsum-sand plaster (N.L.B.)	BMS-92	
2"	8	30 to 34	EST	1" thick gypsum coreboard with one layer of ½" thick regular gypsum wallboard laminated to each face (N.L.B.)	T-1175	
4¼" to 7¾"	13½ to 15½	40 to 44	G&H RAL	⅜" thick perforated gypsum lath clip attached both sides to 2½" open web metal studs, spaced 16" o.c., ½" thick 1:2 gypsum-sand plaster each side (N.L.B.)	T-347	
5¼"	13-15	45 to 49	OR	⅜" thick type "X" gypsum lath attached to both sides. 2½" open web metal studs, spaced 24" o.c., with resilient clips, ½" thick 1:2 gypsum-sand plaster each side (N.L.B.)	T-3125	
4" to 7½"	16-18	40 to 44	EST	Metal lath attached to both sides metal studs, 16" o.c., ⅝" thick gypsum wood-fibered plaster each side (N.L.B.)	BMS-92 Table 30	
5½"	8	45 to 49	RAL	⅝" thick type "X" gypsum wallboard attached to 3⅝" metal studs spaced 24" o.c. First layer attached to both sides with 1" long gypsum wallboard screws 8" o.c. around the perimeter and 12" o.c. on the intermediate stud. Second layer of wallboard applied to one side only with 1⅝" screws, same spacing (N.L.B.)	T-3240	

1 1/2-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
5½"	8-10	50 to 54	OR	5/8" thick type "X" gypsum wallboard attached to 3 5/8" metal studs spaced 24" o.c. First layer attached to both sides with 1" long gypsum wallboard screws 8" o.c. around the perimeter and 12" o.c. on the intermediate stud. Second layer of wallboard applied to one side only with 1 5/8" screws, same spacing. 3" mineral insulation in stud space. (N.L.B.)	T-3126	k, e, g, h, j, m, q, s
5 3/8"	10-11	35 to 39	EST	3/8" thick perforated gypsum lath, attached both sides to 2" x 4" wood studs 16" o.c. ½" thick 1:2 gypsum-perlite or vermiculite plaster each side (L.B.)	Unpub. Nos. 251, 252, 253, 254 UL R4459-1-2-5 R2851-8-9	
6⅛"	15	45 to 49	RAL	3/8" thick perforated gypsum lath attached to 2" x 4" wood studs spaced 16" o.c. with resilient clips both sides. ½" thick 1:2 gypsum-sand plaster (L.B.)	T-1329	
5⅛"	18	40 to 44	EST	Metal lath, 5/8" thick 1:2—1:2 gypsum-sand plaster each side, mineral wool fill between studs (L.B.)	BMS-92 Table 30	
5 5/8"	10-12	35 to 39	NBS	2 layers of ½" thick regular gypsum wallboard both sides, 5d nails 8" o.c. first layer, 8d nails 8" o.c. second layer (L.B.)	Unpub. Nos. 227-228	
3½"	15-16	N/A		3" thick hollow gypsum block, ½" thick gypsum-sand plaster on exposed side (N.L.B.)	T-118	
4"	24	N/A		3" thick expanded shale aggregate units, 76% solid, ½" thick gypsum-sand plaster on both sides (N.L.B.)	BMS-117	
6"	27	N/A		6" thick expanded shale aggregate units, 61% solid, unplastered (N.L.B.)	BMS-117	
4½"	27	N/A		4" thick expanded slag aggregate units, 63% solid, ½" thick gypsum-sand plaster on exposed side only (N.L.B.)	BMS-117	
5"	37	N/A		4" thick calcareous gravel aggregate units, 63% solid, ½" thick gypsum-sand plaster on both sides (N.L.B.)	BMS-120	
6"	31	N/A		6" thick cinder aggregate units, 61% solid, unplastered (N.L.B.)	BMS-117	

(d) These ratings are intended to show the designer what thickness, weights, sound transmission loss and fire resistance can be expected with these materials. For additional ratings and information consult building codes or manufacturers' literature.

2-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
2½"	12	35 to 39	EST	½" thick long length gypsum lath, 1" 1:2—1:2 gypsum-perlite or vermiculite plaster each side (N.L.B.)	Unpub. No. 300 UL R4459-1-2-5 R2851-8-9	
2½"	12	30 to 34	EST	Metal lath attached to ¾" channels, 1:2—1:2 gypsum-perlite or vermiculite plaster (N.L.B.)	UL R3453 R4459-1-2-5 R2851-8-9	
2"	15	35 to 39	EST	Metal lath attached to ¾" channels, gypsum wood-fibered plaster (N.L.B.)	Unpub. No. 116	
2"	8-9	30 to 34	RAL	1" thick gypsum board core (solid or laminated), ½" thick regular gypsum wallboard face panels, metal runners (N.L.B.)	UL Design No. 3	p
2¼"	9-10	30 to 34	EST	1" thick gypsum board core (solid or laminated) with ⅝" thick type "X" gypsum wallboard face panels, metal runners (N.L.B.)	UL Design No. 21	
2"	8	30 to 34	EST	½" thick type "X" gypsum wallboard laminated each side of a 1" thick gypsum coreboard (N.L.B.)	T-1339	t
3¼"	11	40 to 44	G&H	½" thick type "X" gypsum wallboard laminated to a layer of ⅝" thick type "X" gypsum wallboard laminated to 1" x 6" gypsum ribs spaced 24" o.c. The ⅝" thick type "X" gypsum base was laminated to the ribs and 2" screws were installed at quarter points, 1" metal channels around perimeter opening (N.L.B.)	UC	
4" min.	12	40 to 44	EST	½" thick regular gypsum wallboard laminated to a 1" thick gypsum board core, attached to both sides of a 1" minimum channel anchored around the perimeter. Core space may be adjusted as required. Backing board attached to runner at top and bottom with 1¼" screws 12" o.c. (N.L.B.)	UC T-1310 T-1747	
6"	12	40 to 44	RAL	½" thick regular gypsum wallboard laminated to a 1" thick gypsum board core attached to both sides of a 1⅝" x 3" wood runner anchored around the perimeter. Core board attached to runner at top and bottom with 6d cement coated nails 12" o.c. (N.L.B.)	T-2575	

2-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
3⅝"	10	35 to 39	EST	½" thick type "X" gypsum wallboard laminated to a layer of ½" thick type "X" gypsum wallboard attached to 1⅝" gypsum ribs spaced 24" o.c. The base layer was laminated to the ribs and 2" screws applied 24" o.c. vertically and horizontally. 1⅝" metal channels around perimeter opening (N.L.B.)	UC	
6¾"	14		N/A	Two layers ⅝" thick regular gypsum wallboard laminated to each side of ⅝" gypsum wallboard ribs 24" o.c. A double wall assembly with 3" separation between walls (N.L.B.)	UL Design No. 24	f e, g, h, j, k, m, q, s
4"	12	45 to 49	G&H	½" thick regular gypsum wallboard laminated to 1" gypsum coreboard each side of a 1" air space (N.L.B.)	UC 4/25/61	n
3¼"	8-10	35 to 39	G&H	Two layers. Base layer ⅝" thick type "X" gypsum wallboard to 1" x 6" gypsum ribs 24" o.c. with No. 8—2" screws 36" o.c. Face layer ½" thick type "X" gypsum wallboard laminated plus 6d finish nails 24" o.c. horizontal and 12" o.c. vertical (N.L.B.)	UC 1/19/61	n
6"	13	55 to 59	G&H	½" thick regular gypsum wallboard laminated each face to two rows of 1" gypsum coreboard spaced 3" apart, formed by a metal angle attachment track at the periphery. 1½" 2-3 lbs. sound attenuation wool secured to one face of air space (N.L.B.)	T-118 T-27 T-30 UL R1319-89-95	
4⅛"	12	50 to 54	RAL	⅝" thick type "X" gypsum wallboard laminated to a layer of ⅝" thick type "X" gypsum wallboard and attached both sides of 1" x 6" gypsum ribs spaced 24" o.c. (N.L.B.)	UL Design No. 17 R1319-42	
6½"	13	50 to 54	ACI	½" thick gypsum plaster base laminated to 1" gypsum coreboard each side of a 3" air space formed by metal attachment angles at periphery. Not less than 1/16" gypsum veneer plaster each face. 2" 3 lbs. density sound attenuation wool attached to one face of void (N.L.B.)	T-1310	t n
4¾"	13-15	40 to 44	EST	⅜" thick perforated gypsum lath clip-attached to 2½" open web metal studs spaced 16" o.c., ¾" thick 1:2—1:2 gypsum-perlite plaster each side (N.L.B.)	T-1813	
4¼"	16-18	40 to 44	EST	Metal lath attached to 2½" open web metal studs 16" o.c. ¾" thick gypsum wood fiber plaster each side (N.L.B.)	BMS-92 Table 31	

2-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
3¾" to 4¾"	10-11	45 to 49	RAL	Two layers of ½" thick type "X" gypsum base screw-attached each side to 1⅝" or 2½" metal studs 24" o.c., not less than 1/16" thick gypsum veneer plaster (N.L.B.)	T-3370 UC 6/15/65	
4¾"	10	50 to 54	CK	Two layers of ½" thick type "X" gypsum base screw-attached each side of 2½" metal studs, not less than 1/16" thick gypsum veneer plaster. 1" 2-3 lbs. density sound attenuation wool in stud space (N.L.B.)	UL R5085-7	t
4¾" to 6⅜"	10-11	50 to 54	EST	Two layers ½" thick type "X" gypsum base screw-attached to metal studs, 2½" or 3⅝", 24" o.c. Base layer vertical attached with 1" screws 12" o.c. along vertical edges and at the third points on intermediate stud. Face layer horizontally attached with 1⅝" screws spaced 8" o.c. along vertical edges and 12" o.c. on intermediate studs. Not less than 1/16" thick gypsum veneer plaster. (3" thick mineral insulation in stud space for STC rating only) (N.L.B.)	FM WP-47	p
4¾" to 6⅜"	9-10	50 to 54	ACI	Two layers ½" thick type "X" gypsum base screw-attached with 1" and 1⅝" No. 6 screws 12" o.c. to each side of 2½" or 3⅝" metal studs 24" o.c. Not less than 1/16" thick gypsum veneer plaster. 1½" thick glass fiber insulation in stud space (N.L.B.)	UC 12/17/64	h
6⅛"	12	45 to 49	RAL	Two layers ⅝" thick type "X" gypsum wallboard attached both sides to 3⅝" screw type metal studs spaced 24" o.c. ⅝" thick type "X" base layer attached to studs with 1" long screws spaced 8" o.c. on the intermediate stud. Face layer laminated (N.L.B.)	UL Design No. 11 T-1771	
5"	10-11	45 to 49	G&H	Two layers ⅝" thick type "X" gypsum wallboard attached both sides to 2½" screw type metal studs spaced 24" o.c. First layer attached with 1" gypsum wallboard screws spaced 8" o.c. around perimeter and 12" o.c. on intermediate stud, second layer applied with adhesive and 1¾" long screws 24" o.c. around perimeter only (N.L.B.)	T-2557	
5¾"	11-12	40 to 44	RAL	Two layers of ⅝" thick type "X" gypsum wall-board attached both sides to 3¼" minimum nailable metal studs spaced 24" o.c. Base layer attached to studs with nails 12" o.c., face layer laminated to base (N.L.B.)	T-1620	p

2-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
4½"	9-10	40 to 44	EST	Two layers of ½" thick type "X" gypsum wallboard screw-attached both sides to 2½" metal studs spaced 24" o.c. (N.L.B.)	T-3370 UC 6/15/65	
4½"	9-10	45 to 49	G&H	Two layers of ½" thick type "X" gypsum wallboard screw-attached both sides to 2½" metal studs spaced 24" o.c. 2" thick glass fiber insulation in stud space (N.L.B.)	T-3218	e, g, h, j, m g, s
4¾"	6-8	45 to 49	EST	One layer ⅝" thick type "X" gypsum wallboard over one layer of ½" thick mineral insulation board screw-attached both sides to 2½" screw type metal studs 24" o.c. 1" and 1⅝" No. 6 screws 12" o.c. (N.L.B.)	UC	
4⅛"	12	45 to 49	EST	Two layers of ⅝" thick type "X" gypsum wallboard on 1⅝" screw type metal studs spaced 24" o.c. Base layer attached with 1" gypsum wallboard screws 12" o.c. on all studs. Face layer attached with 1⅝" wallboard screws 9" o.c. at the board joints and 12" o.c. on the intermediate stud (N.L.B.)	UC	
3⅞"	10-11	50 to 54	G&H	One layer of ⅝" thick type "X" gypsum wallboard on ½" thick mineral insulation board on 1⅝" screw type metal studs, 24" o.c. ½" thick insulation board attached to studs with 1" wallboard screws 12" o.c. Gypsum wallboard attached with 1⅝" wallboard screws spaced 9" o.c. around the perimeter and 12" o.c. on intermediate studs (N.L.B.)	UC	t
3⅝" to 4½" to 5⅝"	10-12	45 to 49	G&H	Two layers of ½" thick type "X" gypsum wallboard screw attached to 1⅝", 2½" or 3⅝" screw type metal studs 24" o.c. Base layer attached with 1" screws spaced 12" o.c. Face layer attached with 1⅝" screws spaced 12" o.c. (N.L.B.)	UC FM WP-47	h j
4½" to 5⅝"	10-12	50 to 54	RAL	Same as above except 1½" 2-3 lb. sound attenuation wool in stud space or 3" of mineral insulation (N.L.B.)	UC FM WP-47 UL Design No. 28 R1319-101-105	
3⅞"	7-8	40 to 44	G&H	⅝" thick type "X" gypsum wallboard strip laminated to a base layer of ½" thick mineral sound deadening board screw-attached to 1⅝" screw type metal studs 24" o.c. with 1" screws 12" o.c. (N.L.B.)	UC 11/27/62	n

2-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
5"	10-12	46 to 50	EST	Two layers 5/8" thick type "X" gypsum wallboard attached to each side screw type metal stud 24" o.c. First layer 5/8" thick type "X" gypsum backer board screw-attached with 1" screws 12" o.c. Face layer 5/8" thick type "X" vinyl-surfaced gypsum wallboard laminated, fasteners in top and bottom plates only (N.L.B.)	T-2406	e, g, h, j, k, m, q, s
5"	10-12	45 to 49	EST	Two layers 5/8" thick type "X" gypsum wallboard attached both sides to 2½" screw type metal studs 24" o.c. First layer 5/8" thick type "X" gypsum backer board screw-attached with 1" screws 12" o.c. Face layer 5/8" thick type "X" gypsum wallboard laminated (with a contact type adhesive). Fasteners in top and bottom plates only (N.L.B.)	T-2557	
4½"	9-10	45 to 49	G&H	Two layers of ½" thick type "X" gypsum wallboard attached to 2½" screw type metal studs 24" o.c. First layer attached with 1" wallboard screws 12" o.c. Face layer attached with laminating compound, 4" wide strips top and bottom, both edges and down center, and 1¾" long screws 12" o.c. (N.L.B.)	T-3218	e, g h, j k, m q, f s
6⅜"	14	40 to 44	EST	⅜" thick perforated gypsum lath, 1" galvanized hexagonal 20 gauge wire mesh applied with 1¾" long ⅜" furring nails 8" o.c., 1" thick 1:2—1:2 gypsum-perlite or vermiculite plaster each side (L.B.)	T-961 UL R4459-1-2-5 R2851-8	
5⅝"	16	40 to 44	EST	Metal lath, ⅞" thick gypsum wood-fibered plaster each side (N.L.B.)	BMS-92 Table 32	
6⅛"	12-14	40 to 44	OR	Two layers of 5/8" thick type "X" gypsum plaster base nail-attached both sides to 2" x 4" wood studs 16" o.c. Base layer attached with 6d nails spaced 6" o.c., face layer 6d nails 12" o.c., and not less than 1/16" thick gypsum veneer plaster (L.B.)	UL Design No. 4	
6⅛"	12-14	40 to 44	OR	Two layers 5/8" thick type "X" gypsum wallboard nail-attached both sides to 2" x 4" wood studs spaced 16" o.c. Base layer attached with 6d nails spaced 6" o.c. Face layer laminated or nailed (L.B.)	T-194 UL Design No. 4 R1319-84	

2-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
5⅛"	13	45 to 49	RAL	Fabricated hollow core partitions of two layers of ⅝" thick type "X" gypsum wallboard laminated to ⅝" thick gypsum wallboard ribs to form tongue and grooved panels. Two rows of panels spaced 1½" to 3" apart. Aluminum trim and components (N.L.B.)	UL R1319-82-83	t
2¼"	9			Two layers ⅝" thick type "X" gypsum wallboard laminated to one side of 1" thick gypsum coreboard. Horizontal 22 gauge ¾" x 1¼" angles on shaft side at 5'-0" o.c. Board erected and screwed to channels from outside (N.L.B.)	UL Design No. 21 R1819-58-74	
2⅜"	10			Two layers of ⅝" thick type "X" gypsum plaster base laminated to 1" thick gypsum coreboard. Minimum ⅛" thick gypsum veneer plaster on exposed surface. Horizontal 22 ga. ¾" x 1¼" angles on shaft side at 5'-0" o.c. Board erected and screwed to channels from outside (N.L.B.)	UL R3822	
3⅝"	15-16	N/A		3" thick hollow gypsum block, ⅝" thick 1:3 gypsum-sand plaster on unexposed side (N.L.B.)	T-1101	
6½"	24	51 to 55	G&H	3" thick hollow gypsum block, ⅝" thick 1:3 gypsum-sand plaster one side. 2" X 2" wood furring 16" o.c., resilient clips, ⅜" thick gypsum lath and ½" thick 1:2 gypsum-sand plaster on the opposite side. 1½" thick mineral wool blanket between furring strips (N.L.B.)	T-1101	
4⅞"	24		N/A	3" thick hollow gypsum block, ⅝" thick 1:3 gypsum-sand plaster one side. Resilient clips, ⅜" thick gypsum lath, ½" thick 1:2—1:2 gypsum-sand plaster opposite side (N.L.B.)	T-1101	
4½"	35	45 to 49	RAL	4" thick ceramic glazed tile units at least 75% solid, ¾" thick 1:2 gypsum-sand plaster two sides (N.L.B.) (c)	OSU No. 1	
4¾"	49	50 to 54	RAL	4" thick brick wall units at least 75% solid, ½" thick 1:2 gypsum-sand plaster two sides (N.L.B.) (c)	BMS-92	
5¼"	37	45 to 49	BMS-144	4" thick medium burned clay tile, 2 cells in wall thickness, units 60% solid, ⅝" thick 1:2 gypsum-sand plaster on both sides (N.L.B.) (c)	BMS-92	

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2-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
5½"	45 to 46	55 to 59	RAL	6" thick brick wall, units at least 76% solid, no plaster (N.L.B.) (c)	OSU No. 2	
7¼"	39	45 to 49	BMS-144	6" thick medium burned clay tile, 2 cells in wall thickness, units 45% solid, ⅝" thick 1:3 gypsum-sand plaster on both sides (N.L.B.)	BMS-92	
8⅝"	46	45 to 49	BMS-144	8" thick load bearing tile, 2 cells in wall thickness, units 40% solid, ⅝" thick 1:3 gypsum-sand plaster one side (c)	BMS-92	
4½"	25	N/A		4" thick expanded shale aggregate units 76% solid, ½" thick 1:3 gypsum-sand plaster on exposed side only (N.L.B.)	BMS-117	
6½"	35	N/A		6" thick cinder aggregate units, 61% solid, ½" thick 1:3 gypsum-sand plaster on exposed side only (N.L.B.)	BMS-117	
7"	34	N/A		6" thick cinder aggregate units, 50% solid, ½" thick 1:3 gypsum-sand plaster on both sides (N.L.B.)	BMS-117	
10⅛"	38-40	N/A		Two layers of ⅝" thick type "X" gypsum wallboard nailed to 2" x 4" wood studs 16" o.c. with 6d and 8d cement-coated nails 8" o.c., ½" thick gypsum sheathing, 1" air space and 3¾" thick brick veneer (L.B.)	UL Design No. 23 UL R1505-1-2	
2½"	10	N/A		Four layers of ½" thick regular gypsum wallboard between steel facings (N.L.B.)	UL Design Nos. 5, 8, 10	
3"	12	N/A		Five layers of ½" thick regular gypsum wallboard between aluminum facings (N.L.B.)	U.L. Design No. 9	
2½"	10	N/A		Four layers of ½" thick regular gypsum wallboard between steel facings (N.L.B.)	UL Design Nos. 12, 14	

(c) Noncombustible or no framed in members permitted.

(d) These ratings are intended to show the designer what thickness, weights, sound transmission loss and fire resistance can be expected with these materials. For additional ratings and information consult building codes or manufacturers' literature.

3-HOUR FIRE RESISTANT PARTITIONS

Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
4½"	19-21	N/A		4" thick hollow gypsum block, ½" thick 1:3 gypsum-sand plaster on one side only (N.L.B.)	T-99 and T-118	
4"	21-22	N/A		3" thick hollow gypsum block, ½" thick 1:3 gypsum-sand plaster both sides (N.L.B.)	T-118	
3"	12-13	N/A		3" thick solid gypsum block, no plaster required (N.L.B.)	T-26	
6"	27	46 to 50	G&H	4" thick hollow gypsum block, ⅝" thick 1:3 gypsum-sand plaster one side, resilient clips, ⅜" thick gypsum lath and ½" thick 1:2½ gypsum-sand plaster on the opposite side (N.L.B.)	T-118 T-29 and T-30	
4¼"	23	36 to 40	NBS	3" thick hollow gypsum block or tile, ⅝" thick gypsum-sand plaster 1:3 each side (N.L.B.)	T-26-5	
3⅝"	16	N/A		3" thick hollow gypsum block or tile, ⅝" thick gypsum-sand plaster 1:3 on exposed side only (N.L.B.)	T-1315	
6¼"	11-13	N/A		Two layers of ⅝" thick type "X" gypsum wallboard attached to 1" thick gypsum ribs with screws and laminating compound. Two walls separated by 1⅝" runners (N.L.B.)	UL Design No. 5	e, g, h, j, k, m, q, s
12"		N/A		Two layers ½" thick type "X" gypsum wallboard attached to structural steel supports 10" wide, with steel facings (N.L.B.)	UL Design No. 8	
2¾"	11	N/A		Five layers ½" thick type "X" gypsum wallboard with steel facings (N.L.B.)	UL Design No. 7	
3"	12	N/A		One layer ⅝" thick type "X" gypsum wallboard and four layers of ½" thick gypsum wallboard with steel facings (N.L.B.)	UL Design No. 9	
6½"	49	45 to 49	EST	6" thick tile partition, 2" glazed tile soaps and 4" medium tile units at least 60% solid, ¾" thick gypsum-sand plaster 1:3 (N.L.B.) (c)	OSU No. 37	
9¼"	48	45 to 49	BMS-144	8" thick load bearing clay tile, 2 cells in wall thickness, units 40% solid, ⅝" thick gypsum-sand plaster 1:3 both sides (c)	BMS-92	

(c) Noncombustible or no framed in members permitted.

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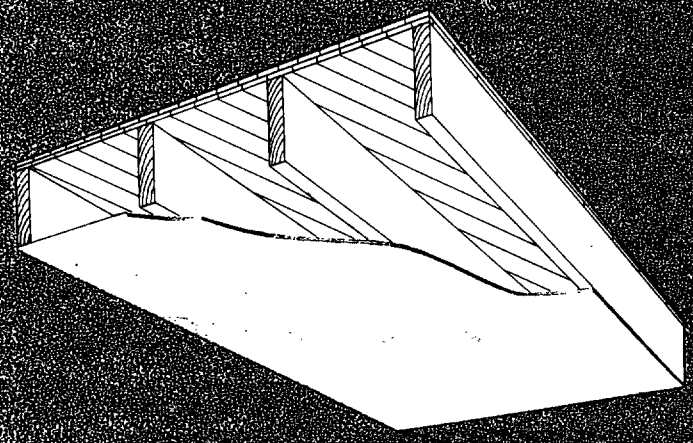
4-HOUR FIRE RESISTANT PARTITIONS

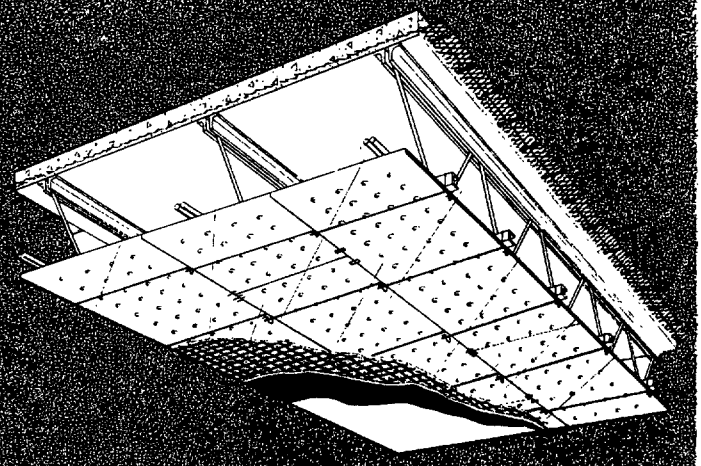
Total Thickness	Weight lbs/ Sq. Ft.	Sound STC	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
5"	23-25	N/A		4" thick hollow gypsum block or tile, ½" thick 1:3 gypsum-sand plaster on both sides (N.L.B.)	T-118	
6⅝"	28	N/A		6" thick hollow gypsum block or tile, ⅝" thick gypsum-sand plaster 1:3 on one side only (N.L.B.)	T-26-1	
9¼"	58	45 to 49	BMS-144	8" thick load bearing clay tile, 2 cells in wall thickness, units 49% solid, ⅝" thick 1:3 gypsum-sand plaster both sides (c)	BMS-92	
13¼"	70	45 to 49	EST	12" thick load bearing clay tile, 3 cells in wall thickness, units 40% solid, ⅝" thick 1:3 gypsum-sand plaster both sides (c)	BMS-92	
13"	77	N/A		12" thick siliceous gravel aggregate units, 58% solid, ½" thick 1:3 gypsum-sand plaster on both sides (c)	BMS-120	

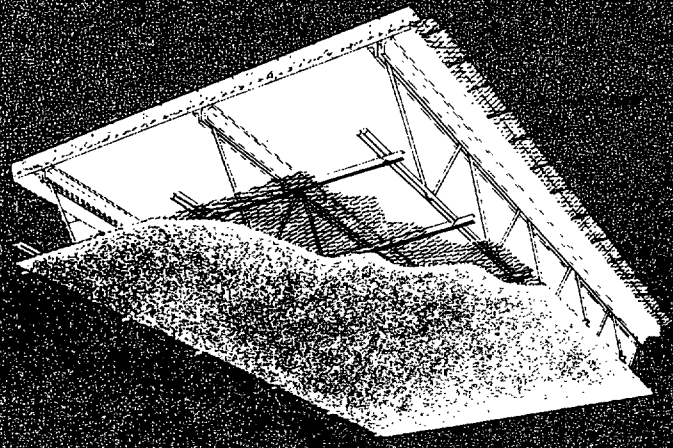
(c) Noncombustible or no framed in members permitted.

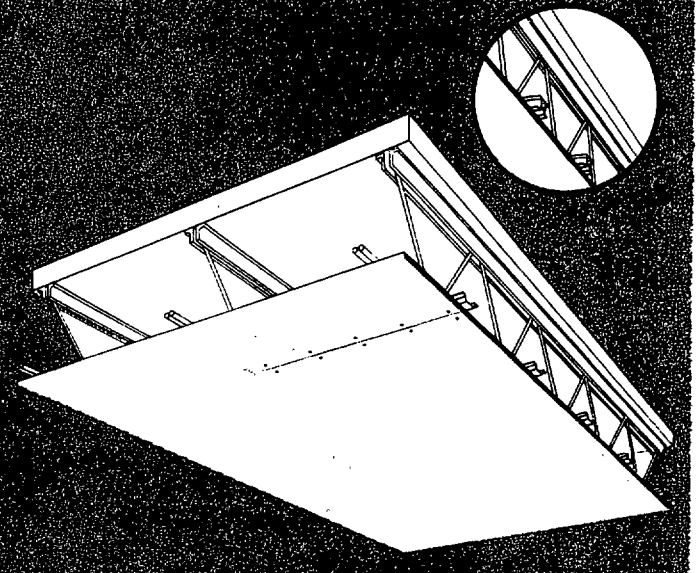
FIRE RESISTANT FLOOR-CEILING ASSEMBLIES

FLOOR-CEILING ASSEMBLIES









FIRE RESISTANT FLOOR-CEILING ASSEMBLIES

Ceilings, when used as membrane fireproofing, usually consist of gypsum or metal lath and gypsum plaster, or gypsum wallboard furred or suspended from the steel beams or joists.

The type and thickness of wallboard or the plaster thickness, the type of plaster aggregate and type of lath are the principal determinants for fire resistance. Sand may be used as the plaster aggregate for fire resistance ratings up to two hours and perlite or vermiculite aggregated plaster for ratings to four hours. Either gypsum or metal lath can be used.

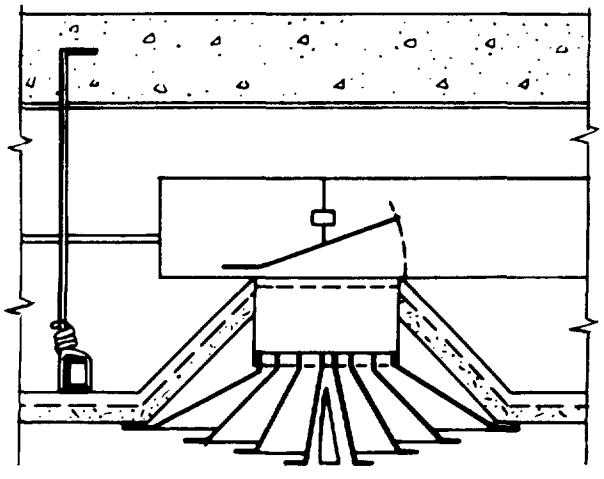
FIRE STOPPING

Many building codes and fire insurance rating regulations require that the plenum space between fire resistant ceilings and floor slabs above be fire stopped (vertically) at stated intervals. Such fire stopping must be continuous from the ceiling to the slab above as well as across the area (horizontally).

Beams or girders having solid webs provide acceptable vertical fire stopping if the ceiling or a fire rated partition is in contact with the lower flange of such structural members. Where the supporting steel cannot be used for fire stopping, partitions may be extended to the floor slab above, or a gypsum fireproofing vertical barrier from the ceiling to the floor construction above may be installed.

CEILING OPENINGS

Numerous tests have been conducted to determine the effect of openings, such as air ducts and electrical outlets, on the fire resistance of a ceiling assembly.



Tests on ceilings of lath and gypsum plaster show that such openings have little or no effect on the fire resistance, provided the aggregate area of openings in a given ceiling does not exceed 100 sq. in. per 100 sq. ft. of ceiling area. Most building codes permit openings when so limited. In addition, air duct openings should be equipped with a 14-gauge steel damper having a 160°F. fusible link.

The area of electrical outlets should not exceed 16 sq. in. per outlet.

USE OF PLENUM SPACE

If the plenum space formed by the floor slab and ceiling is used as a duct to supply or exhaust conditioned air through ceiling openings, the air temperature should not exceed 125°F. Condensation within the plenum space should be avoided. Where contact, furred or suspended ceilings occur under roof construction, the plenum should be vented according to recommended engineering practices.

STRUCTURAL PERFORMANCE OF PLASTER

The Gypsum Association has prepared certain recommendations to provide the designer with information that will permit him to predict ultimate performance of lathing and plastering systems with a much higher degree of accuracy. They are presented as guideposts to increase the crack resistance of plaster.

These guideposts are not intended to be all-inclusive. Nevertheless, the basic design principles that influence performance are quite clear. A knowledge of their relative contributions to performance will more accurately reflect the degree of integrity that is expected of the plaster surface.

The guideposts referred to above are contained in the following Gypsum Association publications:

Recommended Specifications—Gypsum Plastering, AIA File No. 21-A-2

Performance of Lath and Plaster, AIA File No. 21-A-2

Good plaster membrane fireproofing performance is based on full compliance with the recommendations and use of the performance data compiled from the gypsum industry's long and extensive laboratory and field experience.

Obviously, job performance is affected by several factors in addition to those covered in the publications referenced above, such as extreme weather conditions, poor or no ventilation, thermal shock, unusual framing or framing loading, etc. Precautions to prevent these factors from affecting performance must be made.

SGP 0028343

1-HOUR FIRE RESISTANT FLOOR-CEILING ASSEMBLIES

Weight (a) lbs/ Sq. Ft.	Sound STC	Sound INR	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
4				2" concrete floor, 3/8" thick perforated gypsum lath clip attached to 3/4" channels 16" o.c., 1/2" thick 1:2—1:2 gypsum-perlite or vermiculite plaster.	Unpub. No. 317 BMS-141	
4				2" concrete floor, 3/8" thick perforated gypsum lath attached to 7/8" nailing channels spaced 16" o.c., 1/2" thick 1:2—1:2 gypsum-perlite or vermiculite plaster.	T-3693 UL Design No. 10	
5				2 1/2" concrete floor, 3/8" thick perforated gypsum lath clip attached to 3/4" channels 16" o.c., 5/8" thick mill mixed gypsum-perlite plaster.	Unpub. No. 261	
2 1/2				2" concrete floor, 1 layer 5/8" thick type "X" gypsum wallboard nailed to 7/8" nailing channels spaced 16" o.c., 1 1/4" annular ring shank nails 7" o.c.	UL Design No. 2 R1319-14 R3501-18	
2 1/2				2" concrete floor, 1 layer 5/8" thick type "X" gypsum wallboard screw attached to furring channels spaced 24" o.c. with 1" gypsum wallboard screws spaced 12" o.c.	T-1936 T-3694 UL Design No. 19	
4				Floor (c) ceiling of 3/8" thick perforated gypsum lath nailed 5" o.c., 1/2" thick 1:2 gypsum-perlite or vermiculite plaster.	Unpub. No. 258 UL R4459-1-2-5 R2851-8-9	
6				Floor (c) ceiling of 3/8" thick perforated gypsum lath nailed 4" o.c., 3" wide strips of metal lath applied with 1 1/8" long, 1/2" diameter head roofing nails (2 nails at each joist longitudinally and 3 nails at end joints), 1/2" thick 1:2 gypsum-sand plaster.	BMS-92 Table 42	
4				Floor (c) ceiling of 3/8" thick type "X" gypsum lath nailed or stapled 5" o.c., 5/8" thick 1:2 gypsum-perlite or vermiculite plaster.	T-2134-1	
6				Floor (c) ceiling of 3/8" thick type "X" gypsum lath nailed 5" o.c., 3" wide strips of metal lath applied to each joist with 1 1/2" long, 7/16" diameter head galvanized roofing nails 16" o.c., 7/16" thick 1:2 gypsum-sand plaster.	SFT-6 SFT-8 SFT-11 SFT-12 SFT-13	
5 7/8				Floor (c) ceiling of 1/2" thick type "X" gypsum lath nailed with 1 3/4" lath nails 5" o.c. End joints reinforced with end joint clips at each lath corner, 1/2" thick 1:2 gypsum-sand plaster.	FM FC30	p

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1-HOUR FIRE RESISTANT FLOOR-CEILING ASSEMBLIES

Weight (a) lbs/ Sq. Ft.	Sound STC	Sound INR	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
2				Floor (c) ceiling of ½" thick type "X" gypsum base attached with 5d nails 6" o.c. and not less than 1/16" thick gypsum veneer plaster.	UL Design No. 44 & 46	k, e, f, g, h, j, m, q, s
2	35 to 39	20	EST	Floor (c) ceiling of ½" thick type "X" gypsum base attached with 6d coated nails spaced 6" o.c. and not less than 1/16" thick gypsum veneer plaster.	FPRI	h
3				Floor (c) ceiling ½" thick type "X" gypsum base nailed 6" o.c. with 5d coated nails, not less than 1/16" thick gypsum veneer plaster.	R1319-65 UL Design No. 42	
3½	45 to 49	10	EST	Floor (c) ceiling of resilient channels spaced 16" o.c., ½" thick type "X" gypsum base screw attached with 1" screws 12" o.c., not less than 1/16" thick gypsum veneer plaster.	R1319-65 UL Design No. 41	t h
9				Floor (c) ceiling of metal lath nailed with 1½" long, 7/16" diameter head barbed roofing nails 6" o.c., ⅝" thick 1:2—1:3 gypsum-sand plaster.	BMS-92 Table 42	
2½				Floor (c) ceiling of one layer ⅝" thick type "X" gypsum wallboard, 1⅞" long nails 6" o.c.	UL Design No. 1	
4				Floor (c) ceiling of two layers ½" thick regular gypsum wallboard, first layer applied with 1⅝" long nails 18" o.c., 1" 20 gauge galvanized hexagonal mesh applied with 8d box nails 7" o.c., second layer of gypsum wallboard applied with 8d nails 7" o.c.	Unpub. No. 250	
2	45 to 49		RAL	Floor (c) ceiling of ½" thick type "X" gypsum wallboard screw attached to resilient furring channels spaced 24" o.c.	UL Design No. 33, 34, 41	
2				Floor (c) ceiling of ½" thick type "X" gypsum wallboard attached with 5d nails 6" o.c.	UL Design No. 42, 44, 46	
				Floor (c) ceiling of one layer of ⅝" thick type "X" gypsum wallboard screw attached to 25 gauge resilient channel spaced 24" o.c.	R1319-46 UL Design No. 25	t
2½				1⅛" thick tongue and groove plywood floor on 4" x 10" joists 48" o.c., ceiling of ⅝" thick type "X" gypsum wallboard screw attached 12" o.c. to metal furring channels spaced 24" o.c.	UL Design No. 28	

1-HOUR FIRE RESISTANT FLOOR-CEILING ASSEMBLIES

Weight (a) lbs/ Sq. Ft.	Sound STC	Sound INR	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
3½				Stressed skin factory built plywood panel consisting of ⅝" thick plywood laminated to wood joists. Ceiling of ½" thick wood fiberboard and ½" thick type "X" gypsum wallboard nailed to underside of wood framing.	UL Design No. 47	
5½				½" thick type "X" gypsum wallboard attached over galvanized steel screen cloth attached to wood joist. With mineral wool insulation in joist space. Wood joists 16" o.c., ⅝" thick plywood combination subfloor underlay, 2" x 4" wood blocking at side joists.	UL Design No. 53	
36				3" slab with limestone aggregate, ¾" thick protection to steel reinforcement.	UL R3390-19	
48				4" slab with siliceous gravel aggregate, ¾" thick protection to steel reinforcement.	(NBS) TRBM44	

(a) Includes weight of gypsum lath and plaster or gypsum wallboard only. Does not include suspension system, furring, joist, or floor weight.

(c) Wood floor consisting of not less than 2" x 10" joists spaced 16" o.c. and ¾" thick sub and finish tongue and groove flooring with building paper between, ⅝" thick Douglas fir tongue and groove plywood on a ½" thick Douglas fir plywood subfloor with building paper between, unless otherwise noted.

SGP 0028346

1½-HOUR FIRE RESISTANT FLOOR-CEILING ASSEMBLIES

Weight (a) lbs/ Sq. Ft.	Sound STC	Sound INR	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
5½				2" concrete floor, ⅜" thick perforated gypsum lath clip attached to ¾" channel spaced 16" o.c., 1" thick 1:2—1:2 gypsum-perlite or vermiculite plaster.	BMS-141 Test No. 295 UL R4459-1-2-5 R2851-8-9	
9				2" concrete floor, metal lath wire tied 5" o.c. with 18 gauge tie wire, ⅝" thick 1:2—1:3 gypsum-sand plaster.	BMS-92 Table 43	
13				Rib type steel roof deck with 1½" thick wood fiber insulation, suspended 3.4 lb. metal lath and 1" thick 1:2 gypsum-sand plaster.	NBS Test No. 58	
9				Rib type steel roof deck with 1" thick wood fiber insulation, suspended 3.4 lb. diamond metal lath and ¾" thick 1:2—1:3 gypsum-sand plaster.	NBS Test No. 57	
2½				2" concrete floor, one layer ½" thick type "X" gypsum wallboard screw attached to furring channels spaced 24" o.c. with 1" gypsum wallboard screws spaced 12" o.c.	UL Design No. 17	k, e, f, g, h, j, m, q, s
3				2" concrete floor, furred or suspended ceiling of one layer ⅝" thick type "X" gypsum wallboard screw attached to furring channels spaced 24" o.c. with 1" gypsum wallboard screws spaced 12" o.c.	UL Design No. 4 & No. 13	
5				2" concrete floor, two layers of ⅝" thick regular gypsum wallboard attached to nailing channels spaced 16" o.c. Base layer attached with 1¼" annular ring nails 8" o.c. Face layer attached with 1½" annular ring nails 12" o.c.	UL Design No. 3	
3½				Floor (c) ceiling of ⅜" thick plain gypsum lath nailed 4" o.c., 1" 20 gauge galvanized hexagonal mesh applied over lath with 8d box nails 7" o.c., ½" thick 1:2 gypsum-perlite or vermiculite plaster.	Unpub. No. 256 UL R4459-1-2-5 R2851-8-9	
4				Floor (c) ceiling of metal lath nailed with 1½" long, 7/16" diameter head barbed roofing nails 5" o.c., ⅝" thick 1:2 gypsum-perlite or vermiculite plaster.	Unpub. No. 272 & No. 281 UL R4459-1-2-5 R2851-8-9	

1½-HOUR FIRE RESISTANT FLOOR-CEILING ASSEMBLIES

Weight (a) lbs/ Sq. Ft.	Sound STC	Sound INR	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
4	46 to 49	10	EST	Floor (c) ceiling two layers ½" thick type "X" gypsum wallboard, first layer nailed to wood joists. Resilient channels 24" o.c. second layer screw attached 12" o.c.	UL Design No. 22 R1319-90	t
5	46 to 49		EST	Floor (c) ceiling ½" thick type "X" gypsum base nailed to wood joist. Resilient channel spaced 24" o.c., second layer ½" thick type "X" gypsum base screw applied with 1" gypsum wallboard screws 12" o.c., not less than 1/16" thick gypsum veneer plaster.	UL Design No. 22 R1319-90	t

(a) Includes weight of gypsum lath and plaster or gypsum wallboard only. Does not include suspension system, furring, joist, or floor weight.

(c) Wood floor consisting of not less than 2" x 10" joists spaced 16" o.c. and ¾" thick sub and finish tongue and groove flooring with building paper between, ⅝" thick Douglas fir tongue and groove plywood on a ½" thick Douglas fir plywood subfloor with building paper between, unless otherwise noted.

SGP 0028348

2-HOUR FIRE RESISTANT FLOOR-CEILING ASSEMBLIES

Weight (a) lbs/ Sq. Ft.	Sound STC	Sound INR	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
4				2" concrete floor, 3/8" thick perforated gypsum lath clip attached to 3/4" channels spaced 16" o.c., 14 gauge diagonal wire reinforced. 1/2" thick 1:2 gypsum-perlite or vermiculite plaster.	BMS-141 Test No. 318 UL R4459-1-2-5 R2851-8-9	
7				2" concrete floor, furring channels 12" o.c., 3/8" thick perforated gypsum lath, 14 gauge diagonal wire reinforcement, 5/8" thick 1:2—1:3 gypsum-sand plaster.	Unpub. No. 345	
5-6				2 1/2" concrete floor, 1/2" thick type "X" gypsum lath screw attached to furring channels spaced 16" o.c. with 1" screws spaced 7" o.c. End joints supported by clips at lath corners, 1/2" thick 1:2 gypsum-sand plaster.	FM FC-33	p
2				2 1/2" concrete floor, suspended or furred ceiling of one layer of 1/2" thick type "X" gypsum base screw attached to 25 gauge furring channels spaced 24" o.c. with 1" screws spaced 12" o.c. and not less than 1/16" thick gypsum veneer plaster.	UL Design No. 94 No. 221 No. 237	
5-9				2" concrete floor, 3.4 lb. metal lath wire tied 5" o.c. with 18 gauge tie wire, 5/8" thick 1:2—1:3 gypsum-perlite or vermiculite plaster, or 7/8" thick gypsum wood-fibered plaster.	BMS-92 Table 43	
7				2 1/2" concrete floor, 3.4 lb. metal lath wire tied with 18 gauge wire 6" o.c. to 3/4" furring channels attached 13 1/2" o.c. to bar joists, 3/4" thick 1:1—1:1 sanded wood fiber plaster.	UL R5429-1	
2 1/2				2 1/2" concrete floor, one layer 5/8" thick type "X" gypsum wallboard screw attached to 25 gauge furring channels spaced 12" o.c. with 1" gypsum wallboard screws spaced 8" o.c., furring channels may be suspended or attached to bottom chord of bar joists.	UL Design No. 63	
2				2 1/2" concrete floor, suspended or furred ceiling, one layer 1/2" thick type "X" gypsum wallboard screw attached to furring channels spaced 24" o.c. with 1" gypsum wallboard screws spaced 12" o.c.	UL Design No. 94 No. 221 No. 237	
2				2 1/2" concrete floor, suspended ceiling of one layer 1/2" thick type "X" gypsum wallboard screw attached to 25 gauge furring channels spaced 24" o.c. with 1" gypsum wallboard screws spaced 12" o.c., clipped to 1 1/2" cold rolled channels 48" o.c.	UL Design No. 236	p
2 1/2				2" concrete floor, one layer of 5/8" thick type "X" gypsum wallboard screw attached to furring channel spaced 24" o.c. with 1" gypsum wallboard screws 12" o.c.	UL Design No. 259	e, g, h, j, k, m, q, s

3-HOUR FIRE RESISTANT FLOOR-CEILING ASSEMBLIES

Weight (a) lbs/ Sq. Ft.	Sound STC	Sound INR	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
2½				2¾" thick concrete over cells with special gypsum plaster spray-applied to undersurface of steel deck; ⅜" thick gypsum plaster with flutes filled.	UL Design No. 16	p
2½				2½" thick concrete over blend deck (trench header duct included) with special gypsum plaster spray-applied to undersurface of steel deck; 11/16" thick gypsum plaster along bottom of deck, 13/16" thick gypsum plaster in flutes and 1 5/16" to 2 13/16" thick gypsum plaster below area of trench header duct.	UL Design No. 87	p
2				2½" thick concrete over cells with special gypsum plaster spray-applied to undersurface of steel deck; ⅝" thick gypsum plaster following deck contour, 1" thick gypsum plaster under header ducts.	T-1680	p
1-2				2½" thick concrete deck on cellular steel floor, special gypsum plaster spray-applied direct to underside; ⅝" thick gypsum plaster below cells, ¾" thick gypsum plaster between cells, 1⅜" thick gypsum plaster below header duct.	UL Design No. 22 R4142-3	t
1-2				2½" thick concrete on cellular steel floor, special gypsum plaster spray-applied direct to underside; ⅝" thick gypsum plaster below cells, ¾" thick gypsum plaster between cells, 1" thick gypsum plaster below header ducts.	UL Design No. 23 & 24 R4142-4	t
1-2				2½" thick concrete deck on ribbed cellular steel floor, special gypsum plaster, spray-applied direct to underside; ¾" thick gypsum plaster on ribs, 1" thick below header ducts.	UL Design No. 32 R4142-7	t
4				2½" thick concrete over cells, furring channels 12" o.c., ⅜" thick perforated gypsum lath clip attached, 14 gauge diagonal wire reinforced, ½" thick 1:2 gypsum-vermiculite plaster.	Unpub. No. 337 UL R2851-8-9	
5				2½" thick concrete over cells, furring channels 12" o.c., ⅜" thick perforated gypsum lath clip attached, 14 gauge diagonal wire reinforced, 5/16" thick 1:2 gypsum-perlite plaster.	Unpub. No. 337 UL R4459-1-2-5	
5				2" thick concrete over cells, furring channels 12" o.c., metal lath 15⅜" below deck, ⅞" thick 1:2—1:2 gypsum-vermiculite plaster.	UL R2689 R2851-8-9	

2-HOUR FIRE RESISTANT FLOOR-CEILING ASSEMBLIES

Weight (a) lbs/ Sq. Ft.	Sound STC	Sound INR	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
15				2" gypsum concrete on ½" thick gypsum formboard reinforced with 48-1214 welded wire fabric and sub-purlins (bulb tees) over bar joists 48" o.c. with a suspended acoustical ceiling, having air ducts and lighting fixtures incorporated.	FM FC-39-2	p
6				Floor (c) ceiling, two layers of ⅝" thick type "X" gypsum wallboard with resilient channels between layers 24" o.c. Base layer attached to wood joists with 8d nails 7" o.c., face layer attached to furring channels with 1" gypsum wallboard screws 12" o.c.	UL Design No. 217	k, e, f, g, h, j, m, q, s
57				4¾" thick slab with traprock or siliceous gravel aggregate, ¾" thick protection to steel reinforcement.	UL R3390-9 R3390-8	
57				4¾" thick slab with calcareous gravel or crushed limestone aggregate, 1" thick protection to steel reinforcement.	UL R3390-3 R3390-4	
2½				2½" thick concrete over metal deck, special gypsum plaster spray-applied to under-surface of steel deck, ¾" thick plaster following deck contour.	UL Design No. 51	p
2				2½" thick concrete over cells (trench header duct included) with special gypsum plaster spray-applied to undersurface of steel deck; ⅝" thick plaster following deck contour, 1¼" thick gypsum plaster (solid) below area of trench header duct.	UL Design No. 97	p
1¾				2½" thick concrete over metal deck (header ducts included), special gypsum plaster spray-applied to undersurface of steel deck; ⅜" thick gypsum plaster along bottom of deck, ½" thick gypsum plaster in flutes, and ¾" thick gypsum plaster (solid) below area of header duct.	UL Design No. 245	p
				2½" thick concrete floor on 3" fluted and cellular deck, special gypsum plaster spray applied to a uniform thickness of ¾".	UL Design No. 68 R4142-16	t
				2½" thick concrete floor on a 1½" fluted or cellular deck. Special gypsum plaster spray-applied to a uniform thickness of ⅜" thick along bottom of deck and ¾" thick under header ducts.	UL Design No. 229 R4142-14	t

(a) Includes weight of gypsum lath and plaster or gypsum wallboard only. Does not include suspension system, furring, joist, or floor weight.

(c) Wood floor consisting of not less than 2" x 10" joists spaced 16" o.c. and ¾" thick sub and finish tongue and groove flooring with building paper between, ⅝" thick Douglas fir tongue and groove plywood on a ½" thick Douglas fir plywood subfloor with building paper between, unless otherwise noted.

3-HOUR FIRE RESISTANT FLOOR-CEILING ASSEMBLIES

Weight (a) lbs/ Sq. Ft.	Sound STC	Sound INR	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
5				2" thick concrete over cells, furring channels 12" o.c., metal lath 15⅜" below deck, 1" thick 1:2—1:2 or 1:2—1:3 gypsum-perlite plaster.	UL R2689 R4459-1-2-5	
5				Fluted cellular floor, 2" thick concrete over ¾" channels 13" o.c. suspended 15½" below floor, 3.4 lb. diamond mesh metal lath and ⅝" thick mill mixed gypsum-perlite plaster.	UL Design No. 11	
5				2" thick concrete floor, furring channels 12" o.c., ⅜" thick perforated gypsum lath clip attached, 14 gauge diagonal wire reinforced, ⅝" thick 1:2—1:2 gypsum-perlite plaster.	BMS-141 Test No. 313 UL R2851-8-9	
5				2" thick concrete floor, furring channels 12" o.c., ⅜" thick perforated gypsum lath clip attached, 14 gauge diagonal wire reinforced, 11/16" thick 1:2—1:2 gypsum-perlite plaster.	BMS-141 Test No. 313 UL R4459-1-2-5	
4				2" thick concrete floor, ⅜" thick perforated gypsum lath clip attached, ¾" channels spaced 16" o.c., 1" 20 gauge galvanized hexagonal mesh, ½" thick 1:2 gypsum-vermiculite plaster.	BMS-141 Test No. 312 UL R2851-8-9	
5				2" thick concrete floor, ⅜" thick perforated gypsum lath clip attached, ¾" channels spaced 16" o.c., 1" 20 gauge galvanized hexagonal mesh, 5/16" thick 1:2 gypsum-perlite plaster.	BMS-141 Test No. 312 UL R4459-1-2-5	
3				3" thick concrete floor over steel joists 24" o.c., 25 gauge furring channels spaced 24" o.c., ⅝" thick type "X" gypsum wallboard screw attached 12" o.c.	UL Design No. 82 R1319-79	n, t
4				2½" thick concrete floor, metal lath tied 5" o.c. with 18 gauge tie wire, ⅞" thick gypsum wood-fibered plaster or ⅝" thick 1:2—1:2 gypsum-vermiculite plaster.	BMS-92 Table 43 UL R2851-8-9	
4				2½" thick concrete floor, ⅞" thick gypsum wood-fibered plaster on metal lath or 11/16" thick 1:2—1:2 gypsum-perlite plaster.	BMS-92 Table 43 R4459-1-2-5	
72				6" thick slab with traprock, crushed limestone, calcareous or siliceous gravel aggregate, 1" thick protection to steel reinforcement.	UL R3390-5-6-10-17-18	
				2½" thick concrete over fluted and circular floor, special gypsum plaster sprayed direct to concrete to a ¾" uniform thickness.	UL Design No. 70 R4142-12	t

(a) Includes weight of gypsum lath and plaster only. Does not include suspension system, furring, joist, or floor weight.

4-HOUR FIRE RESISTANT FLOOR-CEILING ASSEMBLIES

Weight (a) lbs/ Sq. Ft.	Sound STC	Sound INR	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
5				2" thick concrete over cells, ¾" furring channels 12" o.c., metal lath 15½" below steel deck, ⅞" thick 1:2—1:2 gypsum-vermiculite plaster.	UL R2851-8-9 R3355	
5				2" thick concrete over cells, ¾" furring channels 12" o.c., metal lath 2¼" below steel deck, ⅞" thick 1:2—1:2 gypsum-vermiculite plaster.	UL R2851-8-9 R2689	
6				2½" thick concrete over cells, metal lath 7¼" below steel deck on ¾" furring channels spaced 12" o.c., metal lath wire tied 5" o.c. with 18 gauge tie wire, ⅝" thick 1:2—1:3 gypsum-perlite or vermiculite plaster plus ½" thick gypsum acoustical plaster.	Unpub. No. 338	
5				2" thick concrete over cells, furring channels 12" o.c., metal lath 15½" below steel deck, 1" thick 1:2—1:3 gypsum-perlite plaster.	UL R3355 R4459-1-2-5	
5				2" thick concrete over cells, furring channels 12" o.c., metal lath 2¼" below steel deck, 1" thick 1:2—1:3 gypsum-perlite plaster.	UL R2689 R4459-1-2-5	
6				Fluted cellular floor, 2" thick concrete, ¾" channels spaced 13" o.c. 3½" below beam, 3.4 lb. diamond mesh metal lath and ⅞" thick mill mixed gypsum-perlite plaster.	UL Design No. 12 R3574-4	
5½				2" thick concrete floor, ¾" furring channels 12" o.c., ⅜" thick perforated gypsum lath clip attached, 1" thick 1:2—1:3 gypsum-perlite or vermiculite plaster reinforced with 1" hexagonal mesh.	BMS-141 Test No. 311	
5				2½" thick concrete floor, ⅞" thick 1:2—1:2 gypsum-perlite or vermiculite plaster.	BMS-92 UL R2851-8-9	
5				2½" thick concrete floor, 1" thick 1:2—1:3 gypsum-perlite plaster.	BMS-92 UL R4459-1-2-5	
39				4½" thick slab with expanded slag aggregate, ¾" thick protection to steel reinforcement.	UL R3390-7	
70				6" thick slab with air cooled slag aggregate, 1" thick protection to steel reinforcement.	UL R3390-12	

4-HOUR FIRE RESISTANT FLOOR-CEILING ASSEMBLIES

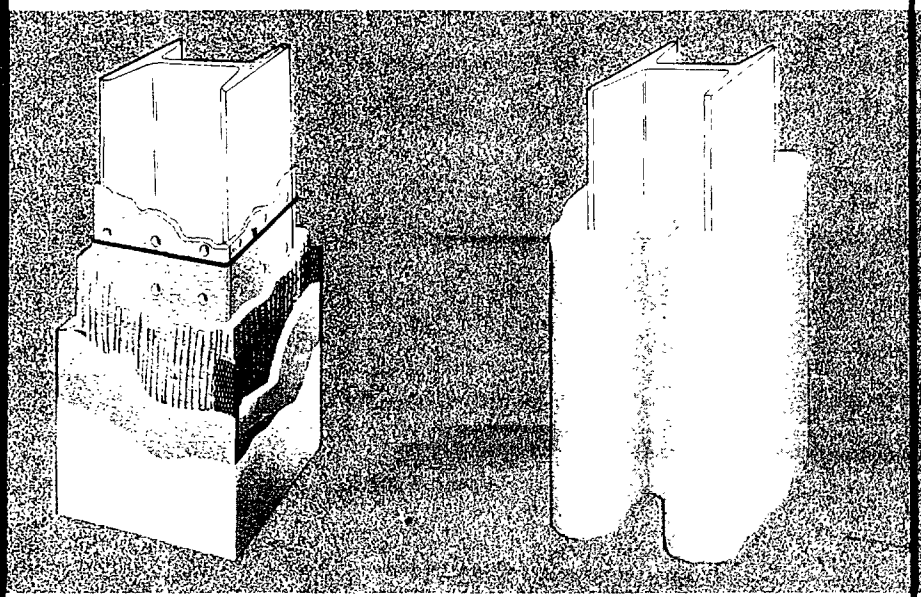
Weight (a) lbs/ Sq. Ft.	Sound STC	Sound INR	Sound Lab	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
3				2½" thick concrete over cells with special gypsum plaster spray applied to undersurface of steel deck; ⅝" thick gypsum plaster below cells with flutes filled.	UL Design No. 24	p
2½				3¼" thick reinforced concrete over floor units with special gypsum plaster spray-applied to undersurface of floor units; ¾" thick gypsum plaster following deck contour, 2⅛" thick gypsum plaster (solid) below header ducts.	UL Design No. 23	p

(a) Includes weight of gypsum lath and plaster only. Does not include suspension system, furring, joist, or floor weight.

SGP 0028354

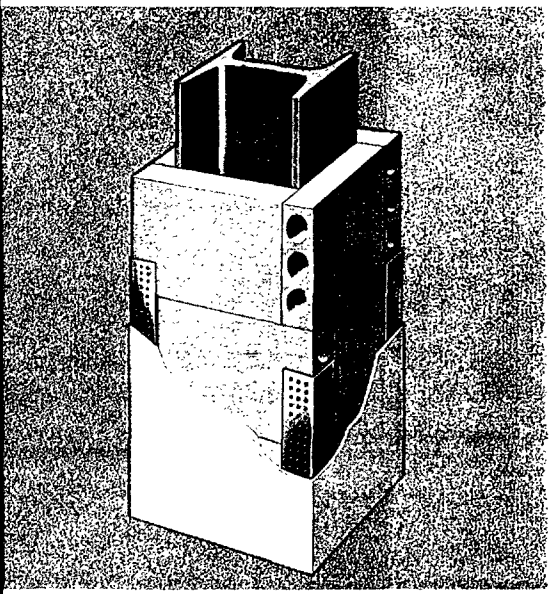
FIRE RESISTANT STEEL COLUMNS

Membrane fireproofing provides a fast, efficient and economical method of fire protecting steel columns. A dead load saving of from 50 to 75% can be realized as compared to other column fireproofing. It reduces the cross-sectional area, saves construction time, and provides a ready surface for decoration.



GYPSUM LATH AND PLASTER

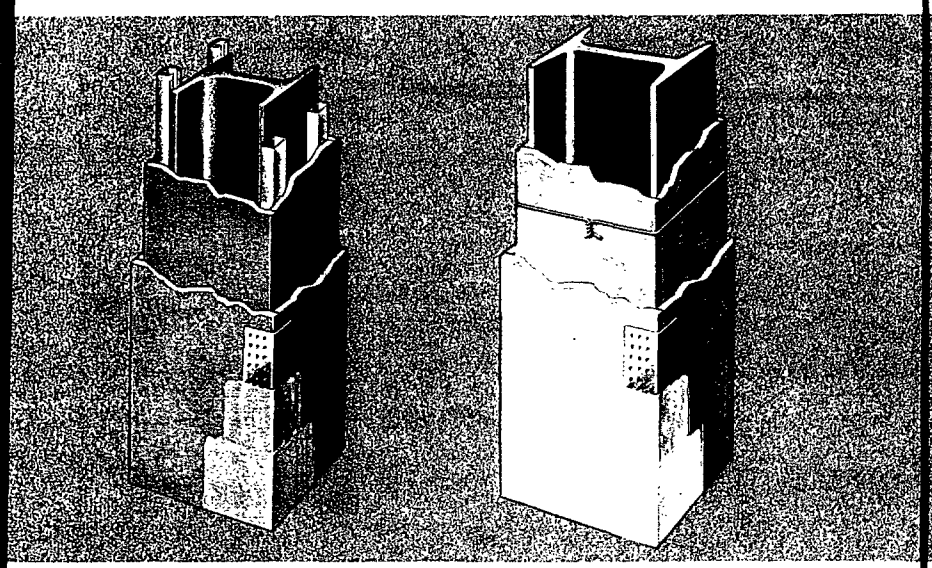
1 to 3 hour fire resistance ratings with sand, perlite or vermiculite aggregated plaster of appropriate thickness applied to a single layer of $\frac{3}{8}$" thick perforated gypsum lath. 4 hour protection with two layers of $\frac{1}{2}$" thick gypsum lath, plaster and supplementary reinforcement.



MASONRY GYPSUM BLOCK (TILE)

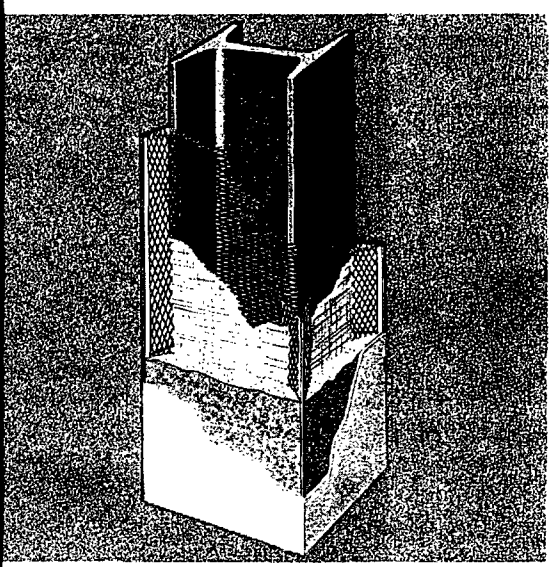
1 to 4 hour fire resistance ratings — plastered as required — non-load bearing.

SGP 0028355



GYPSUM WALLBOARD

Up to 4 hour fire resistance ratings can be obtained by using specific types of gypsum wallboard and specific types of construction.



METAL LATH AND PLASTER

1 to 4 hour fire resistance ratings with sand, perlite or vermiculite aggregated plaster of appropriate thickness, applied to a self-furring metal lath or diamond mesh metal lath furred from column.

1-HOUR FIRE RESISTANT COLUMNS

Thickness (from Column Face)	Weight of Protection (Lbs. per Lin. Ft. of Column) (a)	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
7/8"	22	3/8" thick perforated gypsum lath plaster base, 1/2" thick 1:2½ gypsum-sand plaster.	BMS-135 Test No. 273	
3/4"	26	3.4 lb. diamond mesh metal lath wrapped around column, 3/4" thick gypsum-sand plaster.	BMS-92	
1"	14	Two layers of 1/2" thick gypsum wallboard adhesively attached together and to column. First layer wire-tied to column.	Unpub. Test No. 303	
2 3/4"	81	2" thick hollow clay tile with 3/4" thick mortar between column and tile.	BMS-92	

(a) Based on a 10" wide flange column unless otherwise noted.

1 1/2-HOUR FIRE RESISTANT COLUMNS

Thickness (from Column Face)	Weight of Protection (Lbs. per Lin. Ft. of Column) (a)	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
1"	26	3/8" thick perforated gypsum lath, 5/8" thick 1:2½ gypsum-sand plaster.	BMS-135 Test No. 274	
1½"	23	Three layers of 1/2" thick gypsum wallboard adhesively attached together and to column. Second layer wire-tied to column.	Unpub. Test No. 304	

(a) Based on a 10" wide flange column unless otherwise noted.

SGP 0028356

2-HOUR FIRE RESISTANT COLUMNS

Thickness (from Column Face)	Weight of Protection (Lbs. per Lin. Ft. of Column) (a)	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
1¾"	52	⅜" thick perforated gypsum lath, 1⅜" thick 1:2—1:3 gypsum-sand plaster.	Unpub. Test No. 351	
1⅜"	22	⅜" thick perforated gypsum lath, 1" thick 1:2½ gypsum-perlite or vermiculite plaster.	BMS-135 Test No. 275	
1⅜"	22	Self-furring metal lath, 1" thick 1:2—1:3 gypsum-perlite or vermiculite plaster.	UL R3187-4-5	
2¼"	12	3.4 lb. metal lath, lapped 1" and tied 6" o.c. with 18 gauge tie wire over ½" x ¾" spacers at each corner of column, 1⅝" thick 1:1—1:1 gypsum sanded wood fiber plaster.	UL R4024-9-10	
1⅛" & 2¾"	19	Two layers of ½" thick type "X" gypsum base attached to 1⅝" screw type metal studs located at each corner of column. Gypsum base layer attached to studs with 1" screws spaced 24" o.c. Second layer attached to studs with 1⅝" screws 12" o.c. Gypsum veneer plaster not less than 1/16" thick.	UL Design No. 15 & No. 10 R3501-53 R1319-80	p t
1⅜"		Special gypsum plaster sprayed direct to steel column to a uniform thickness	UL Design No. 12 R4142-17-18	t
2"	32	Four layers of ½" thick gypsum wallboard adhesively attached to column and additional layers. Third layer wire-tied to column.	Unpub. Test No. 315	
2⅝"	20	Two layers of ⅝" thick type "X" gypsum wallboard attached to 1⅝" screw type metal studs located at each corner of column. Base layer of gypsum wallboard attached to studs with 1" gypsum wallboard screws 24" o.c., second layer attached to studs with 1⅝" screws 12" o.c.	UL Design No. 8	e, g, h, k, j, m, f, q, s
3"	30	Three layers of ⅝" thick type "X" gypsum wallboard first and second layers held in place by ring shank nails 24" o.c. at corners. Metal strapping around second layer at center and 18" from each end of column. Third layer attached with 1" gypsum wallboard screws 12" o.c. at corners.	UL Design No. 5	

2-HOUR FIRE RESISTANT COLUMNS

Thickness (from Column Face)	Weight of Protection (Lbs. per Lin. Ft. of Column) (a)	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
1" to 2⅝"	19	Two layers of ½" thick type "X" gypsum wallboard attached to 1⅝" screw type steel studs located at each corner of column. Base layer of gypsum wallboard attached to studs with 1" gypsum wallboard screws spaced 24" o.c. Second layer attached to studs with 1⅝" screws 12" o.c.	UL Design No. 10 and 15 R3501-53 R1319-80	
3"	40	3" thick hollow gypsum tile, ⅞" 12 gauge metal clamps tying adjacent blocks together.	BMS-92	

(a) Based on a 10" wide flange column unless otherwise noted.

SGP 0028358

3-HOUR FIRE RESISTANT COLUMNS

Thickness (from Column Face)	Weight of Protection (Lbs. per Lin. Ft. of Column) (a)	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
1¾"	28	⅜" thick perforated gypsum lath, 1⅜" thick 1:2—1:3 gypsum-perlite or vermiculite plaster.	Unpub. Test No. 321	
2⅜"	71	⅜" thick perforated gypsum lath, 2" thick 1:2—1:3 gypsum-sand plaster.	Unpub. Test No. 344	
1¾"	28	Self-furring metal lath, 1⅜" thick 1:2—1:3 gypsum-perlite or vermiculite plaster.	UL R2851-5-6	
2¼"	28	Metal lath furred out from column 1½" and filled with gypsum plaster between column flanges and metal lath, 1" thick 1:2—1:3 gypsum-perlite or vermiculite plaster.	UL R2851-1 R3187-1	
1⅝" & 3¼"	25	Three layers of ½" thick type "X" gypsum base attached to 1⅝" screw type metal studs located at each corner of column. Base layer of gypsum base attached with 1" screws spaced 24" o.c. Second layer of gypsum base attached with 1⅝" screws spaced 24" o.c. Third layer attached with 2¼" screws spaced 12" o.c. Gypsum veneer plaster not less than 1/16" thick.	UL Design No. 29	p
3½"	32	Three layers of ⅝" thick type "X" gypsum base attached to 1⅝" screw type metal studs located at each corner of column. The base layer attached to studs with 1" screws spaced 24" o.c., second layer attached with 1⅝" screws 12" o.c. and tied in place with wire ties spaced 24" o.c., third layer of gypsum base attached with 2¼" screws spaced 12" o.c. Gypsum veneer plaster not less than 1/16" thick.	UL Design No. 20	p
⅞"	10	Special gypsum plaster sprayed direct to heavy steel column, 14WF228, to a uniform thickness on column	UL Design No. 24 R4197-22 UL Design No. 23 R4142-19-20	p t
2⅛"	23	Special gypsum plaster sprayed direct to a light steel column, 10WF49, to a uniform thickness on column	UL Design No. 13 R4142-19-20	t

3-HOUR FIRE RESISTANT COLUMNS

Thickness (from Column Face)	Weight of Protection (Lbs. per Lin. Ft. of Column) (a)	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
1⅞"	21	Special gypsum plaster sprayed direct to a light steel column, 10WF49, to a uniform thickness	UL Design No. 25 R4142-17-18 UL Design No. 17 No. 215 R4197-22	t p
⅞"		Special gypsum plaster sprayed direct to heavy steel column, 14WF228, to a uniform thickness	UL Design No. 34 R4197-22	p
3½"	32	Three layers of ⅝" thick type "X" gypsum wallboard attached to 1⅝" screw type metal studs located at each corner of column. The base layer attached to studs with 1" gypsum wallboard screws 24" o.c., second layer attached with 1⅝" screws 12" o.c. and tied in place with wire ties spaced 24" o.c., third layer of gypsum wallboard attached with 2¼" screws spaced 12" o.c.	UL Design No. 18 & 20	k, e, t, g, n, j, m, q, s p
2"	30	Three layers of ⅝" thick type "X" gypsum wallboard, first and second layers wire tied 6" from each end and at 21" intervals. Second and third layers screw attached at corners with 1" gypsum wallboard screws spaced 12" o.c.	UL Design No. 14	
1½" & 3⅛"	25	Three layers of ½" thick type "X" gypsum wallboard attached to 1⅝" screw type metal studs located at each corner of column. Base layer of gypsum wallboard attached with 1" gypsum wallboard screws spaced 24" o.c. Second layer of gypsum wallboard attached with 1⅝" screws spaced 24" o.c. Third layer attached with 2¼" screws spaced 12" o.c.	UL Design No. 29	p

(a) Based on a 10" wide flange column unless otherwise noted.

SGP 0028360

4-HOUR FIRE RESISTANT COLUMNS

Thickness (from Column Face)	Weight of Protection (Lbs. per Lin. Ft. of Column) (a)	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
2½"	36	Two layers of ½" thick gypsum lath, 1" 20 gauge hexagonal wire mesh, 1½" thick 1:2—1:3 gypsum-perlite or vermiculite plaster.	BMS-135 Test No. 278 and 294	
2⅛"	33	Metal lath furred out from column ⅞" with ¾" channels, 1½" thick 1:2—1:3 gypsum-perlite or vermiculite plaster.	UL R3187-6	
2⅛"	33	Self-furring metal lath, 1¾" thick 1:2—1:3 gypsum-perlite or vermiculite plaster.	UL R2851-5-6 R3187-4-5-7	
2⅛"	13	2" thick solid gypsum block, ⅝" thick type "X" gypsum lath screw-attached to light gauge sheet metal corner angles. Gypsum veneer plaster not less than 1/16" thick.	UL Design No. 31 R1319-103	
3⅛"	13	3" thick hollow gypsum block, ⅝" thick type "X" gypsum lath screw-attached to light gauge sheet metal corner angles. Gypsum veneer plaster not less than 1/16" thick.	UL Design No. 34 R1319-103	
1¼"		Special gypsum plaster sprayed direct to steel column, 14WF228, to a uniform thickness	UL Design Nos. 4 & 27 R4142-19-20 R4197-23	p t
2¼"	35	Special gypsum plaster sprayed direct to steel column to a uniform thickness	UL Design No. 30 R4142-17-18	t
2¼"	35	Special gypsum plaster sprayed direct to steel column to a uniform thickness	UL Design No. 24	p
3"	72	2" thick solid gypsum tile with wire lath strips laid in horizontal joints, 1" thick mortar fill between column and tile, ½" thick 1:3 gypsum-sand plaster.	BMS-92	t
2½"	58	2" thick solid gypsum tile with ⅞" 12 gauge metal cramp block ties, ½" thick 1:3 gypsum-sand plaster. No fill.	BMS-92	
3¾"	64	3" thick hollow gypsum tile with ⅞" 12 gauge metal cramp block ties, ¼" thick mortar fill between column and tile, ½" thick 1:3 gypsum-sand plaster.	BMS-92	
2⅝"	60	2" thick solid gypsum tile and ⅝" thick 1:3 gypsum-sand plaster.	BMS-92 Table 40	
3⅝"	62	3" thick hollow gypsum tile and ⅝" thick gypsum-sand plaster.	BMS-92 Table 40	

4-HOUR FIRE RESISTANT COLUMNS

Thickness (from Column Face)	Weight of Protection (Lbs. per Lin. Ft. of Column) (a)	CONSTRUCTION DETAILS	Fire Test Reference	Company Code
2⅝"	13	2" thick solid gypsum block, ⅝" thick type "X" gypsum wallboard screw-attached to light gauge sheet metal angles at the corners.	UL Design No. 31 R1319-103	
3⅝"	13	3" thick hollow gypsum block, ⅝" thick type "X" gypsum wallboard screw-attached to light gauge sheet metal angles at the corners.	UL Design No. 34 R1319-103	
5"	279	Two layers of 2" thick hollow clay tile with ⅜" metal mesh in horizontal joints. Tile fill in web of column and ½" thick mortar between column and tile.	BMS-92	
3½"	263	2" thick hollow clay tile with ⅜" metal mesh in horizontal joints. Limestone concrete fill, ¾" thick mortar between column and tile, ¾" thick 1:3 gypsum-sand plaster.	BMS-92	

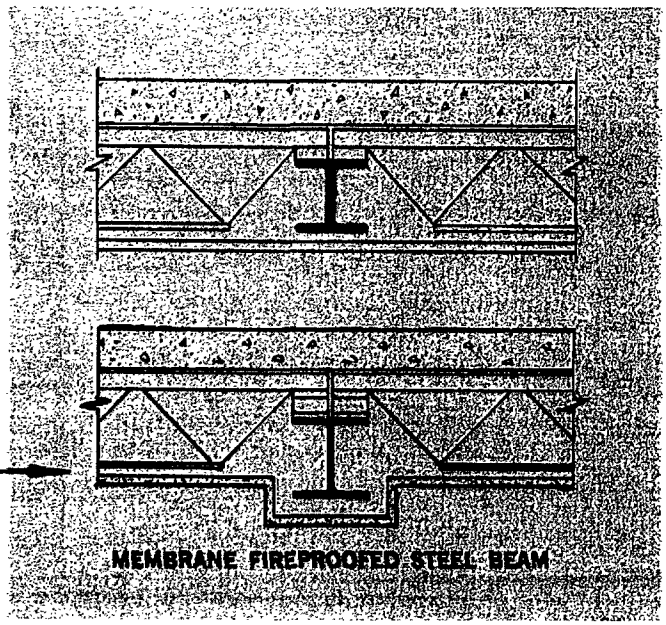
(a) Based on a 10" wide flange column unless otherwise noted.

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PROTECTION OF BEAMS, GIRDERS AND TRUSSES

Most building codes and fire insurance rating regulations allow beams, girders and trusses to be membrane fireproofed. Lath and plaster fireproofing of beams, etc., generally weighs about 10 lbs. per sq. ft. of surface area of the shell. To accomplish the same degree of protection with concrete, it would require a much greater thickness – with weights up to 150 lbs. per cubic ft. The saving in weight is significant to the ultimate design.

Beams, girders and trusses may be protected by either a continuous ceiling membrane of gypsum lath and plaster or gypsum wallboard or by enclosing them individually.

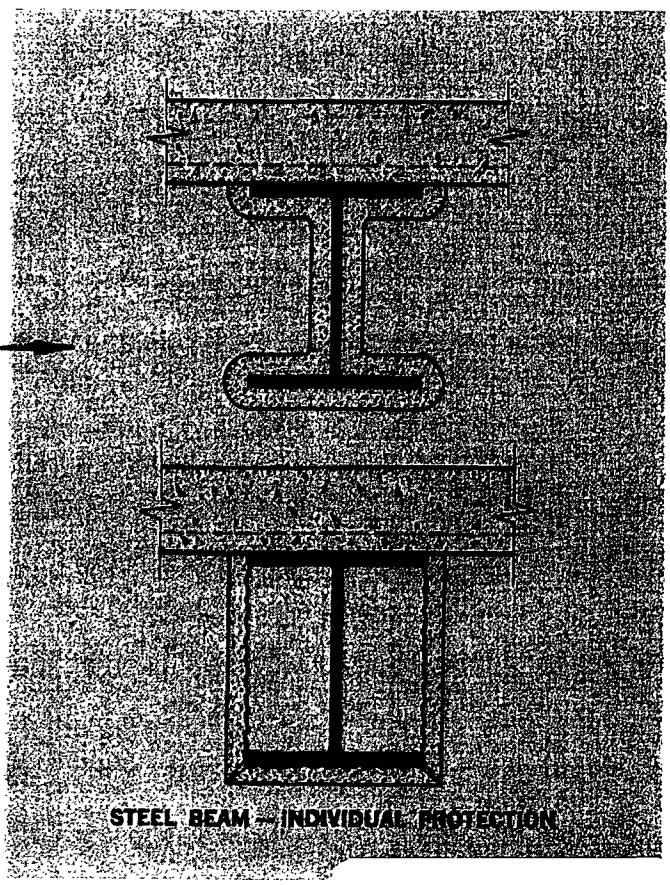


CONTINUOUS CEILING PROTECTION

The American Insurance Association and most building codes allow for use of gypsum wallboard or gypsum lath and plaster ceilings, as described in Section V, Fire Resistant Floor-Ceiling Assemblies, for beam or girder protection. The ceiling must carry the same rating as required for the structural member.

If the bottom of the beam extends not more than 6 inches below the plane of the ceiling, the ceiling is furred down and around the structural member. If the projection is more than 6 inches, the gypsum lath and plaster beam protection should extend from ceiling to floor above (individually protected).

When the ceiling fireproofing is in contact with the bottom of a solid web structural member, the structural member can be considered to be a fire stop. Care must be taken, however, that no combustible material is present in the plenum space.



INDIVIDUAL ENCASEMENT PROTECTION

The individual encasement of beams, girders, etc., with a shell of gypsum lath and plaster is generally accepted by regulatory bodies, and may be desirable:

(1) When the fire protection for such members, usually higher than for floors, would unduly increase the cost of the ceiling. If there are relatively few 3 or 4 hour protected beams, girders, etc., and only a 2-hour ceiling is required, it is generally uneconomical to use a 3 or 4 hour ceiling throughout.

(2) Where no ceiling is required or where a non-rated ceiling is to be used. Individual encasement of heavy beams, girders, etc., is usually accomplished by application of gypsum plaster to self-furring metal lath which has been formed to box the beam, or gypsum plaster may be applied directly to the member itself.

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PROTECTION OF BEAMS, GIRDERS AND TRUSSES

Ceilings — Membrane Fireproofing

DESCRIPTION OF PROTECTION	Fire Test Reference	Company Code
Suspended metal lath ceiling, 2½" air space between lath and protected structural member, 1" thick 1:2—1:3 gypsum-vermiculite plaster (12" o.c. furring channel spacing).	UL R2773	
Suspended metal lath ceiling, 3½" air space between lath and protected structural member, ⅞" thick 1:2—1:3 gypsum-perlite plaster.	UL R3355	
Suspended metal lath ceiling, 3½" airspace between lath and structural member, ⅝" thick 1:2 mill mixed gypsum-perlite plaster (type R).	UL Design No. 11-3 Hr (Beam 4 Hr)	t
Suspended perforated gypsum lath ceiling, 2¾" air space between lath and protected structural member, ⅞" thick 1:2½ gypsum-perlite or vermiculite plaster around beam, ½" thick gypsum plaster on ceiling (12" o.c. furring channel spacing, 14 ga. diagonal wire reinforcing over lath).	Unpub. No. 337	
Suspended ceiling of ½" thick type "X" gypsum wallboard attached to furring channels spaced 24" o.c. with 1" gypsum wallboard screws spaced 12" o.c.	UL Design No. 94-2 Hr (Beam 3 Hr)	p
Suspended ceiling of ½" thick type "X" gypsum base attached to furring channels spaced 24" o.c. with 1" screws spaced 12" o.c. Gypsum veneer plaster not less than 1/16" thick.	UL Design No. 94-2 Hr (Beam 3 Hr)	p
Suspended ceiling of two layers of ⅝" thick type "X" gypsum wallboard attached to a suspension system of 24 gauge metal channels with 1" screws 16" o.c. for base layer and 1⅝" screws 8" o.c. for face layer.	UL Design Nos. 254 & 255	
Any ceiling protection described under "Floor-Ceiling Assemblies" (noncombustible) if the beams, girders or trusses do not extend below the level of the ceiling surface more than 6". (The ceiling construction must be brought down and around the structural member.)	National Board of Fire Underwriters "Fire Resistant Ratings" April 1959 page 10	

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PROTECTION OF BEAMS, GIRDERS AND TRUSSES

Individual Protection

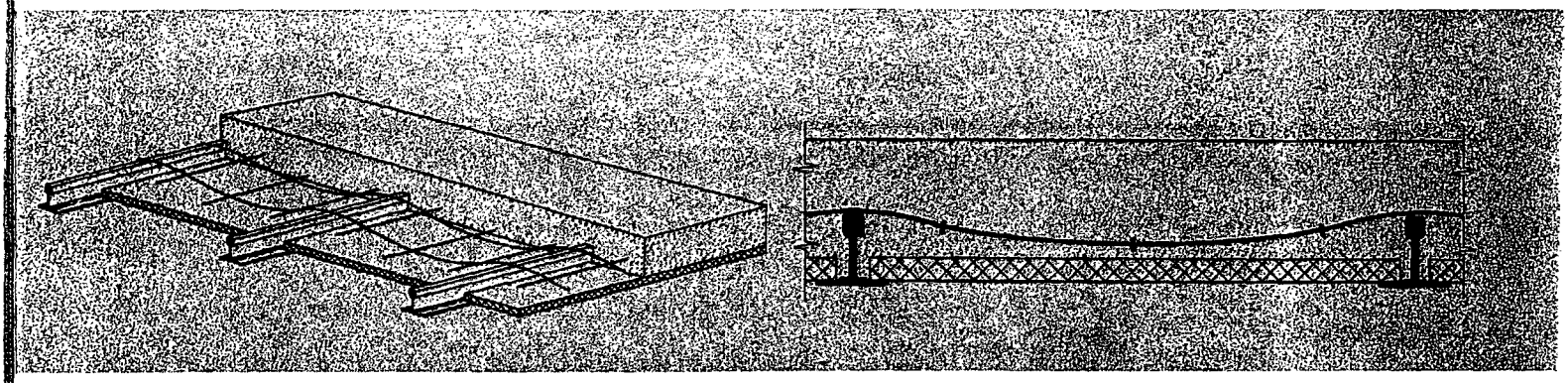
DESCRIPTION OF PROTECTION	Fire Test Reference	Company Code
1½" thick 1:2½—1:2½ gypsum-perlite or vermiculite plaster on self-furring metal lath.	UL Design No.15-5 Hr	
1½" thick 1:2—1:2 gypsum-perlite or vermiculite plaster on self-furring metal lath.	UL Design No. 5-3 Hr	
1½" thick 1:2½—1:2½ gypsum-perlite or vermiculite plaster on self-furring metal lath wrapped around three sides of beam and attached to flanges with special clips 9" o.c.	UL R4197-1	p
1½" thick 1:2—1:3 gypsum-perlite or vermiculite plaster on self-furring metal lath.	UL Design No. 19-4 Hr	
1¼" thick 1:2½—1:2½ gypsum-perlite or vermiculite plaster on self-furring metal lath wrapped around three sides of beam and attached to flanges with special clips 9" o.c.	UL R4197-1	p
One layer of ⅝" thick type "X" gypsum wallboard screw-applied to metal furring channels spaced 24" o.c. with 1" screws 12" o.c. minimum space from gypsum wallboard to structure member ⅜".	UL Design 82-3 Hr (Beam 3 Hr)	t
⅞" thick 1:2—1:2 gypsum-perlite or vermiculite plaster on metal lath supported by wire hangers.	UL Design No. 7-3 Hr UL R4459-1-2-5 UL R2851-8-9	
1⅛" thick 1:2—1:2 gypsum-perlite or vermiculite plaster on self-furring metal lath wrapped around three sides of beam. Lath 1" below bottom flange. Lath attached to flanges with special clips 9" o.c.	UL R4197-1 UL R4459-1-2-5 UL R2851-8-9	
Two layers of ⅝" thick type "X" gypsum wallboard attached to steel furring channels or angles spaced 24" o.c. Base layer attached with 1" long gypsum wallboard screws 16" o.c. Face layer attached with 1⅝" gypsum wallboard screws 8" o.c.	UL R4024-5	
1" thick 1:2—1:2 gypsum-perlite or vermiculite plaster on self-furring metal lath.	UL Design No. 2-2 Hr	

PROTECTION OF BEAMS, GIRDERS AND TRUSSES

Spray Application

Thick-ness	DESCRIPTION OF PROTECTION	Fire Test Reference	Com-pany Code
1¼"	Special gypsum plaster sprayed direct to steel beam to a uniform thickness	UL Design No. 37 R4142-15	t
1½"	Special gypsum plaster spray-applied to a 3.4 lb. self-furring metal lath, lath attached to flanges with clips spaced 9" o.c.	UL Design No. 24	p
1"	Special gypsum plaster sprayed direct to steel beam to a uniform thickness	UL Design No. 23	p
1"	3.4 lb. diamond mesh metal lath attached to 9 ga. galvanized wire. Special gypsum plaster spray-applied to 1" uniform thickness (beam)	UL Design No. 23 R4142-4	t
½"	Special gypsum plaster sprayed direct to steel beam to a uniform thickness	UL Design No. 41 (Beam only)	p
¾"	Special gypsum plaster sprayed direct to steel beam to a uniform thickness	UL Design No. 229 R4142-14	t

FIRE RESISTANT GYPSUM CONCRETE ROOF DECKS



A poured-in-place gypsum concrete roof deck consists of a noncombustible gypsum formboard or mineral fiberboard formboard supported on the flanges of steel tees welded to the structural frame. A 2 inch minimum thick gypsum concrete slab (1½ inch minimum where framing spacing does not require structural tee subpurlins) is cast-in-place over the formboard.

Several fire rated gypsum deck designs do not require any protection for the bottom flanges of the steel tee subpurlins.

Gypsum decks with gypsum formboard, or other noncombustible formboards such as asbestos or mineral fiber formboard, are classed as noncombustible.

Gypsum formboard tested in accordance with the current ASTM Specification E 84 provided a 15-20 flame spread rating.

Gypsum concrete is available in regular or lightweight (insulating) densities and in two compressive strength classes – 500 psi (Class A) and 1000 psi (Class B). Regular gypsum concrete is available in both Class A and B, lightweight is Class A only. Most code and fire insurance authorities accept use of Class B for Class A in fire rated constructions.

Weight, psf Slab and (a) Formboard	CONSTRUCTION	Fire Test Reference	Company Code
13	2½" thick gypsum concrete, reinforced with 48-1214 welded wire fabric (½" self-furring or furred ½" above formboard) on ½" thick gypsum formboard, on subpurlins (bulb-tees) exposed.	Unpub. No. 406	
8	2" thick lightweight gypsum concrete reinforced with woven wire mesh on 1" mineral fiber acoustical formboard, listed by UL for this design, on trussed tee subpurlins.	UL Design RC-15	t
8 to 13	2" thick lightweight or regular gypsum concrete reinforced with 48-1214 welded wire fabric on ½" thick gypsum formboard, supported by bulb tee subpurlins on bar joists. Suspended ceiling of acoustical ceiling tile.	FM FC-39 UL Design RC-13 R4351-17	p t
8.5	1½" thick gypsum concrete reinforced with 48-1214 welded wire fabric on ½" thick gypsum formboard on steel tees welded or sheet metal tees clipped to bar joists. Suspended ceiling of acoustical ceiling board, listed by UL for this design.	UL Design RC-6 R4351-6	t
11	2" thick gypsum concrete reinforced with 48-1214 welded wire fabric on ½" thick gypsum formboard, on subpurlins (bulb-tees) exposed.	Unpub. No. 400	

(a) Not including roof.

THE FIRE RESISTANT PROPERTIES OF GYPSUM

Gypsum is one of the nation's most widely used fire resistive materials. It is extracted from the earth's surface in rock form by the usual mining and quarrying processes.

Gypsum rock, known chemically as $CaSO_4.2H_2O$, is calcium sulphate combined with two molecules of water. Thus, 100 pounds of gypsum rock contains about 21 pounds, or ten quarts, of chemically combined water.

In the manufacturing process, the rock is crushed or pulverized and then subjected to high temperatures. The heat removes about three-fourths of the chemically combined water and the resulting product is calcined gypsum, $CaSO_4.1/2H_2O$. In this form it is often known as plaster of Paris, a name derived from the vast beds of pure white gypsum underlying the City of Paris.

Calcined gypsum is the base material from which most finished gypsum products are made and in this form has a great affinity for water. When water is added, the calcined gypsum rapidly reverts to its original chemical composition and rock-like hardness by the process known as "setting."

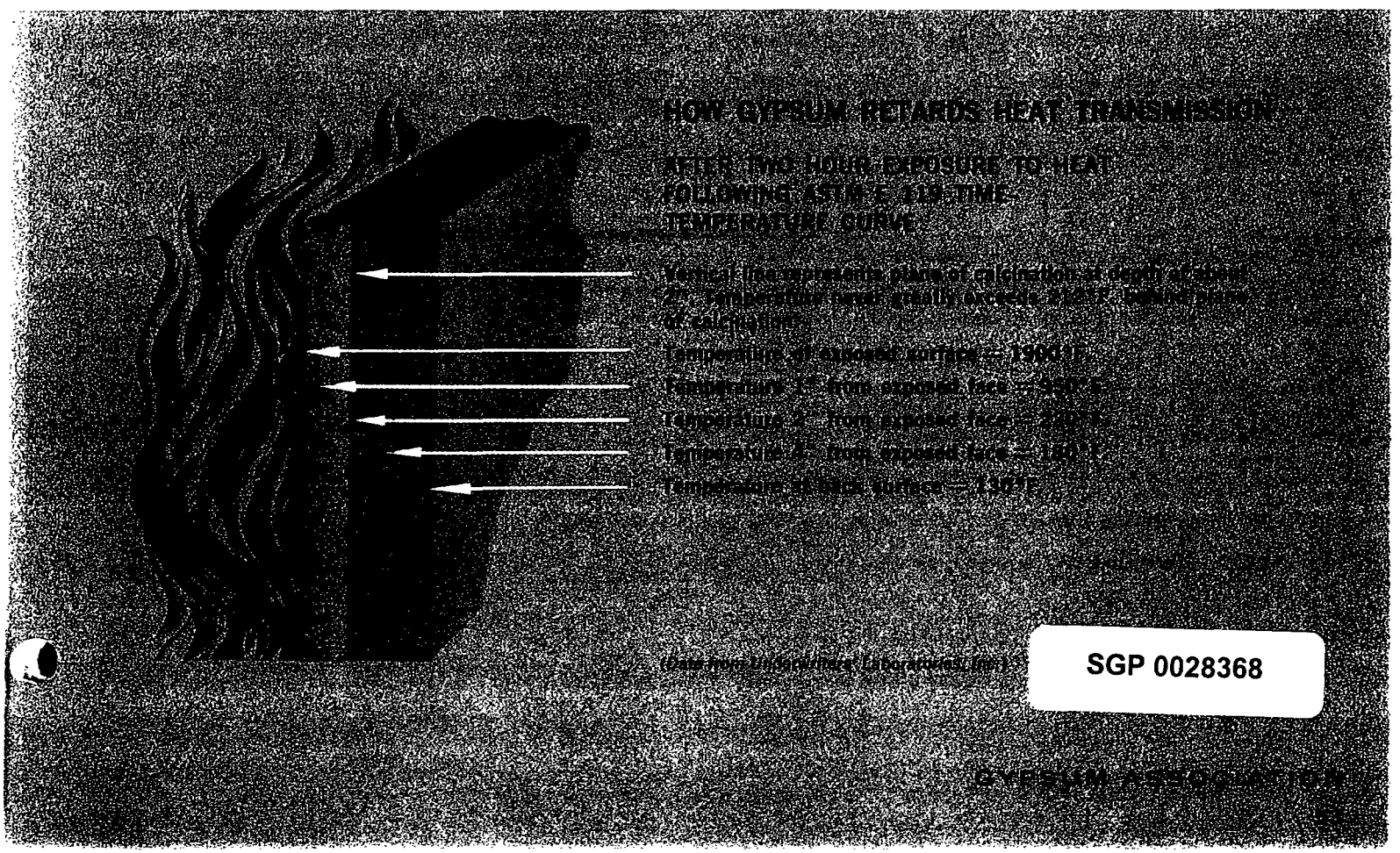
It is the combined water in gypsum that makes it such an effective fire barrier. When exposed to fire, the water of crystallization is slowly released as steam which effectively retards heat transfer, a phenomenon called calcination.

The manner in which gypsum insulates against the transfer of high temperatures is best likened to what happens when the intense heat from a blow torch is directed against a solid block of ice.

Even though the ice melts, one may safely hold his hand on the opposite side. The low temperature on that side is maintained until the heat has melted all of the ice. Even when only one-quarter inch thick, the ice will not transmit the intense heat until it has completely melted.

When steel columns or other structural members protected by gypsum are exposed to fire, the chemically combined water acts as a heat barrier until the slow process of calcination is completed. The temperature immediately behind the plane of calcination does not greatly exceed the boiling point of water (212°F.) – a temperature far below the point at which steel begins to lose its strength. After the gypsum has been completely calcined, a white chalky material remains to insulate against direct contact with the flames.

In addition to its marked ability to retard the transfer of intense heat, gypsum is noncombustible.



REQUIREMENTS FOR FIRE PROTECTION

Although desirable, it is not feasible to construct completely fireproof structures. The designer is confronted with integrating those fire protection measures required by law (building codes) and such additional measures that make the building more economical from the standpoint of fire insurance costs. All of this must be done within his over-all design concept.

Building codes are concerned with safety to life and, in regard to fire protection, are primarily concerned with:

1. Noncombustibility of materials
2. Fire resistance
3. Flame spread

The fire insurance industry is concerned with these, plus possible fire damage to the structure itself.

NONCOMBUSTIBILITY

Most building codes require the use of noncombustible construction materials in Type I and II buildings and, to a limited degree, in many less fire resistive structures.

Several definitions of noncombustibility are in use today. The more widely used definitions, such as that found in the American Insurance Association's National Building Code, classify gypsum concrete, tile, plank, plaster, lath, backer board, coreboard, wallboard, and sheathing as noncombustible.

This noncombustibility definition, also promulgated by the Gypsum Association, is as follows:

"Noncombustible as applied to a building construction material means a material which, in the form in which it is used, falls in one of the following groups a. through c. It does not apply to surface finish materials nor to the determination of whether a material is noncombustible from the standpoint of clearances to heating appliances, flues or other sources of high temperature. No material shall be classed as noncombustible which is subject to increase in combustibility or flame spread rating beyond the limits herein established, through the effects of age, moisture or other atmospheric condition. Flame spread rating as used herein refers to ratings obtained according to the Standard Test Method for Fire Hazard Classification of Building Materials, ASTM E 84.

"a. Materials no part of which will ignite when subjected to fire. Any material which liberates flammable gas when heated to any temperature up to 1380 F. for five minutes shall not be considered noncombustible within the meaning of this paragraph.

"b. Materials having a structural base of noncombustible material, as defined in a. with a surfacing not over ⅛-inch thick which has a flame spread rating not higher than 50.

"c. Materials in the form and thickness used, other than as described in a. or b., having a flame spread not higher than 25 without evidence of continued progressive combustion and of such composition that surfaces that would be exposed by cutting through the material in any way would not have a flame spread rating higher than 25 without evidence of continued progressive combustion."

FIRE RESISTANCE

Fire resistance is the term used to designate the ability of a construction assembly to contain the fire at its source and to prevent its spread through the assembly to adjacent rooms. The degree to which such assemblies contain the fire is indicated by hourly ratings. If an assembly is known to contain the fire at its source for two hours, when tested, it is accorded a two hour fire resistance rating.

Fire resistance ratings are determined by full scale fire tests conducted at nationally recognized laboratories in accordance with procedures outlined in ASTM Standard E 119, Fire Tests of Building Construction and Materials. The conditions of these tests are well defined and failure is indicated by such end points as excess heat transmission, passage of flame, load failure, etc.

Comprehensive research by fire protection engineers has determined the average of the combustible contents to be expected for a given occupancy; also the time required for the contents to be consumed by fire and the resulting temperature. Thus the average fire load is predictable for a given occupancy and fire resistance ratings are assigned accordingly.

FLAME SPREAD

Flame spread requirements are intended to regulate the use of finishing materials and the rapidity with which flames spread over their surfaces. The most widely accepted test to determine the flame spread characteristics of a material is defined by ASTM Specification E 84, a test commonly known as the Tunnel Test. It provides a means for measuring relative flame spread, fuel contribution and the amount of smoke developed from the material.

Some building codes require the use of interior finish materials having a flame spread rating of not more than 25 where the life hazard is high, such as schools, public assembly rooms, corridors, exitways, etc. As the exposure hazard decreases, correspondingly higher flame spread ratings are permitted.

A numerical classification has been established by ASTM by which the performance of the material may be compared with that of asbestos-cement board and select-grade red flooring oak, which have been arbitrarily established as 0 and 100, respectively.

Following is a list of commonly used materials, with their representative flame spread ratings, as tested according to ASTM Specification E 84.

Asbestos-Cement Board	0
Gypsum Plaster	0
Painted Steel	7 to 8
Gypsum Lath	10
Gypsum Wallboard	10 to 15
Vermiculite Acoustical Plaster	10 to 15
Acoustical Tile (Mineral)	10 to 15
Gypsum Sheathing	15 to 20
Gypsum Formboard	15 to 20
Fiberboard Tile (plain finish)	76 to 122
Fiberboard Tile (acoustical)	82 to 164
Red Oak	100
Douglas Fir	100 to 110
Birch	105 to 110
Pine	105 to 215
Douglas Fir Plywood	125 to 195
Yellow Poplar	170 to 185

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INSURANCE ECONOMICS

Although a building may be designed to meet the fire resistance requirements of the local building code, these minimum requirements may not result in the most economical fire insurance rates. Often, design to incorporate higher fire rated systems than required to meet the code will result in premium reduction, more than offsetting the increased initial building cost. This is particularly true of other than Type I and II buildings which generally have code requirements resulting in most economical insurance rates.

The local insurance rating bureaus and fire insurance engineers stand ready and willing to advise the means by which these lower insurance rates may be obtained on any structure, and the designer is urged to avail himself of such professional advice.

Member	Company Code Letter
ALLIED CHEMICAL CORPORATION Fabricated Products Division 40 Rector Street New York, New York 10006	e
AMERICAN GYPSUM COMPANY P.O. Box 6345, Station B Albuquerque, New Mexico 87107	f
THE CELOTEX CORPORATION 1500 North Dale Mabry Tampa, Florida 33607	g
FIBREBOARD CORPORATION Pabco Gypsum Division 475 Brannan Street San Francisco, California 94119	h
THE FLINTKOTE COMPANY 30 Rockefeller Plaza New York, New York 10020	j
GEORGIA-PACIFIC CORPORATION Bestwall Gypsum Division Commonwealth Building P.O. Box 311 Portland, Oregon 97207	k
GRAND RAPIDS GYPSUM COMPANY P.O. Box 1674 Grand Rapids, Michigan 49501	m
KAISER GYPSUM COMPANY, INC. 300 Lakeside Drive Oakland, California 94612	n
NATIONAL GYPSUM COMPANY 325 Delaware Avenue Buffalo, New York 14202	p
REPUBLIC GYPSUM COMPANY P.O. Box 949 Lubbock, Texas 79408	q
THE RUBEROID CO. 733 Third Avenue New York, New York 10017	r
TEXAS GYPSUM COMPANY, INC. P.O. Box 768 Irving, Texas 75061	s
UNITED STATES GYPSUM COMPANY 101 South Wacker Drive Chicago, Illinois 60606	t

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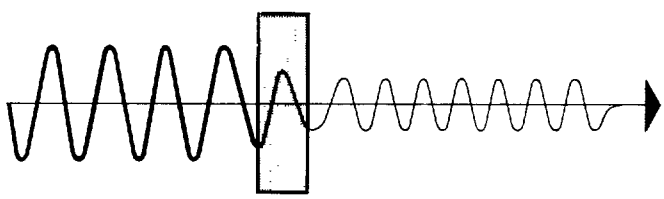
SOUND CONTROL DATA

Building code regulations with respect to control of unwanted noise are almost nonexistent. However, the demands for relief by tenants and owners from oppressive noise are being registered with mortgage lending institutions, all of which introduce another dimension in design criteria for the architect. Thus, the designer must select systems that not only meet building code and/or fire insurance requirements, but he must also consider privacy from excessive noise.

After several years of intensive research, the gypsum industry has developed a vast array of systems with sound isolation data. This manual is intended to provide a single source for authentic test data for fire protection and sound isolation (including airborne and impact noise).

Caution should be exercised in deviating from the materials specified in sound rated constructions, particularly in substitution of lightweight plaster aggregate for sand and reduction of sand proportioning in plaster, which will cause a reduction in sound transmission loss.

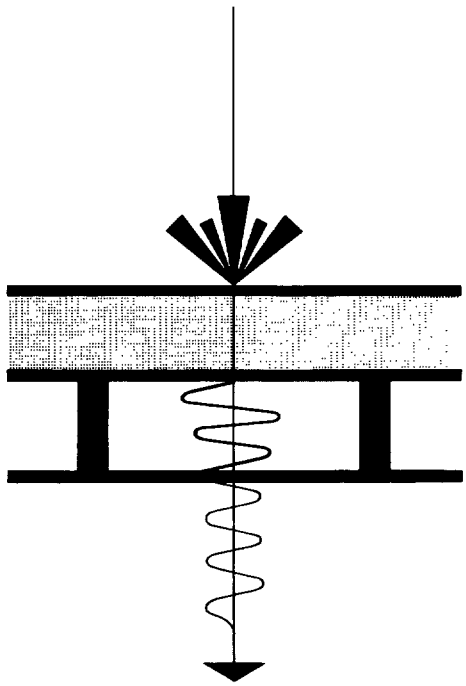
The difference between the sound energy in the source room and the sound energy in the receiving room is the Sound Transmission Loss value of the separating assembly, and is measured in decibels (db) in a sound test laboratory, where tests are conducted in accordance with accepted standards and reported as a single number rating (STC).



A single number rating is the preferred system for evaluating the effectiveness of a partition, floor, ceiling or construction systems in resisting transmission of airborne sound. The rating is given in terms of a Sound Transmission Class (STC) rating in accordance with ASTM Standard E 90-61T or E 90-66T. The STC rating is used exclusively in this manual, unless otherwise stated.

Similarly, a single number rating is used, at present, to evaluate the effectiveness of floor-ceiling assemblies in resisting structure-borne and impact noise. The rating usually is given as an Impact Noise Rating (INR) in accordance with the ISO method of test. The concern here is limited to floor-ceiling constructions.

Although the STC is the preferred single number airborne sound transmission loss rating for a wall or partition, floor, ceiling or construction systems wherever possible the entire sound transmission loss curve should be used. The STC rating based on ASTM E 90-61T is used in this manual, unless otherwise stated.



The sound transmission class of a partition, floor, ceiling or construction systems based on ASTM E 90-61T consists of a comparison of the test results plotted on ½ octave paper and a standard curve consisting of a flat portion from 4000 to 1414 cps (cycles per second), a 6 db slope down to 354 cps, and then a further 14 db slope to 125 cps. Over the first three frequencies and also over the last three, the test curve could be a total of 3 db under the standard curve. No deficiency is allowed between 354 and 1414 cps. The STC is determined by the db level at the flat portion of the standard curve.

The new test method, ASTM E 90-66T, calls for ⅓ octave test frequencies. Consequently, the standard curve had to be changed to correspond with the new test frequencies. The flat portion now is between 1250 and 4000 cps, the line drops 5 db to 400 cps, and another 15 db to 125 cps. The rules for classification are as follows:

1. The STL curve may dip a maximum of 8 db below the standard contour curve at any test frenquency.
2. The sum of the differences at the test frequencies between the contour curve and where the STL curve is below it shall not be greater than 32.
3. The STC is the value of the standard contour at 500 cps when the preceding two conditions are satisfied.

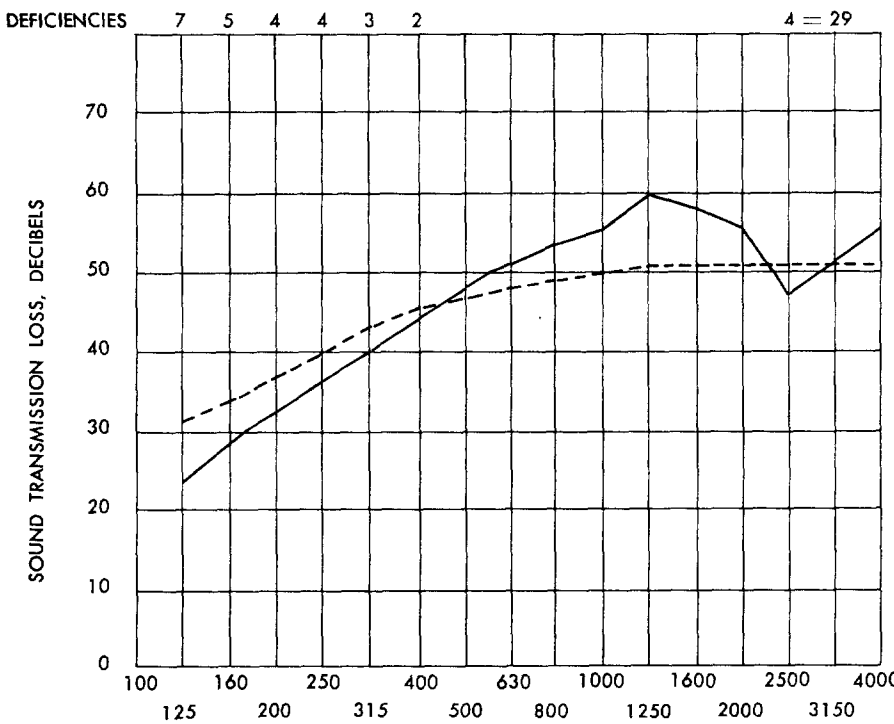
The question that immediately arises is what difference may be expected in the STC values under these two different test methods. In a majority of cases, there will be no change or a minor increase, usually not exceeding 1 STC, even though there is a possibility of an increase up to 4 STC, or a minor decrease due to the extra detail in the curves based on greater number of test frequencies.

The graphs following illustrate the STC determination of a single partition by each of the test methods.

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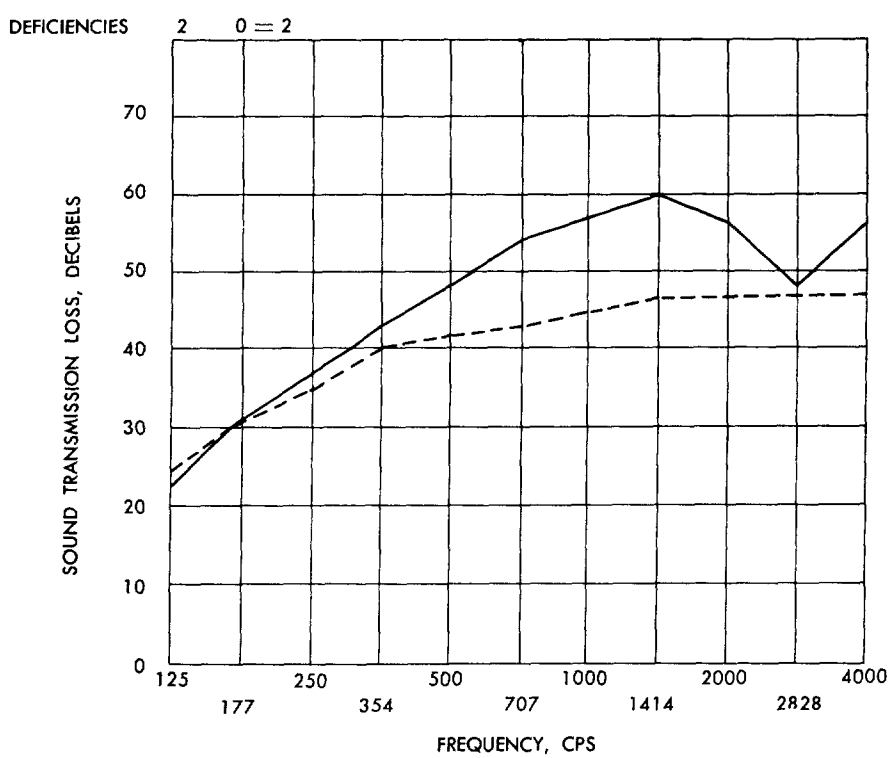
SOUND CONTROL DATA

TEST METHOD: ASTM E 90—66T



STL, db	
100	*
125	24
160	29
200	33
250	36
315	40
400	44
500	48
630	51
800	54
1000	56
1250	60
1600	59
2000	56
2500	47
3150	51
4000	55
S.T.C.	47

TEST METHOD: ASTM E 90—61T



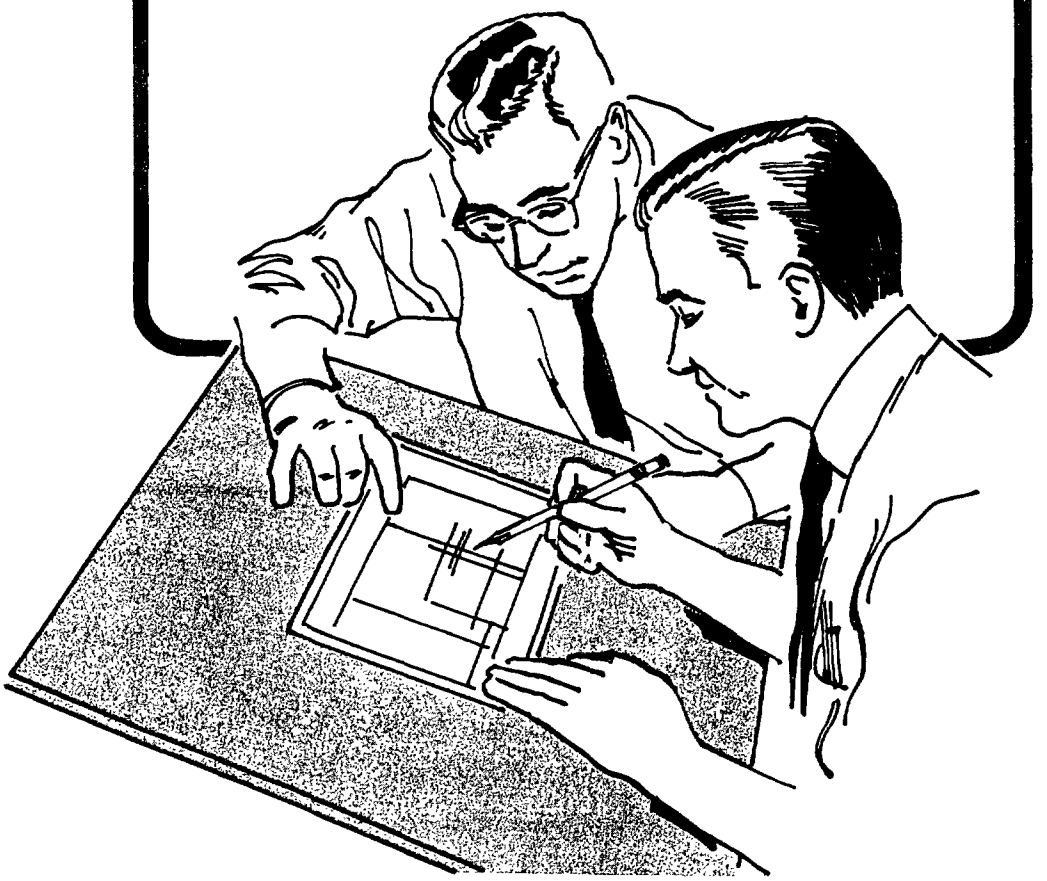
STL, db	
125	24
177	31
250	36
354	42
500	48
707	53
1000	56
1414	60
2000	56
2828	49
4000	55
S.T.C.	46

SGP 0028372

AIA FILE NUMBERS 20-B-2
21-A-2
23-L

Design Data

FIRE RESISTANCE



GYPSUM ASSOCIATION
201 North Wells Street • Chicago, Illinois 60606
1800 No. Highland Ave. • Hollywood, Calif. 90028

SGP 0028373

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SOUND ADVICE

PRACTICAL SYSTEMS FOR NOISE CONTROL IN HOMES · APARTMENTS · MOTELS · OFFICES

BESTWALL GYPSUM COMPANY · PAOLI, PENNSYLVANIA

SGP 0028374

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	50	Bestwall Firestop on resilient channel with fiberglass insulation in the cavity	10
Steel Studs	47	2 layers of Bestwall Firestop both sides	11
	50	2 layers Bestwall Firestop one side, one layer on other side with fiberglass insulation in the cavity	12
	52	Bestwall Firestop and Coreboard with fiberglass insulation in the cavity	13
	52	2 layers of Bestwall Firestop both sides with fiberglass insulation in the cavity	14
Gypsum Stud	51	Bestwall Firestop over Sound Deadening Board	15
Double Solid	47	Bestwall Gypsum Wallboard over Coreboard	16
Triple Solid	57	1 layer of ½" Bestwall Gypsum Wallboard over Coreboard with fiberglass insulation in one cavity	17
Wood Floor and Ceiling Assembly	47	Bestwall Firestop applied to resilient metal furring	18
GLOSSARY OF TERMS			19

INTRODUCTION

In recent years, we have seen the development of a myriad of new conveniences. These modern day miracles have enriched our lives and benefitted us in many ways. They have, however, introduced one big disadvantage. These conveniences create unwanted sound in performing their functions. Consider the increase in the number of radios, the increased number of motor vehicles, the five and one-half million television sets, plus other noisemakers such as dishwashers, stereo sets and air conditioning units. Occupants and tenants of homes, apartments and motels demand isolation from these unwanted sounds. Since in most cases it is not feasible to eliminate these noise sources, an immense challenge has been presented to the architect, builder, contractor, and building material and equipment manufacturer to control our acoustic environment.

WHAT IS SOUND?

Before sound can be effectively controlled, its general nature must be understood. Sound is a pressure wave that travels outward in all directions from its source at a speed of 1,120 feet per second. It exists in a range of audible frequencies from 20 cycles or vibrations per second to 20,000 cycles per second. At 20 cycles, the sound is very low pitched or dull, and at 20,000 cycles the sound is very high pitched or shrill. Most speech falls in the 350 to 4000 cycle range. The loudness of sound, regardless of frequency, is measured in units called decibels. A range of about 10 to 120 decibels covers the intensity of sound from a faint whisper to a deafening roar. Average conversation is at the 40 to 60 decibel level. Sound may be pleasant and necessary. When it becomes annoying and unwanted we call it noise.

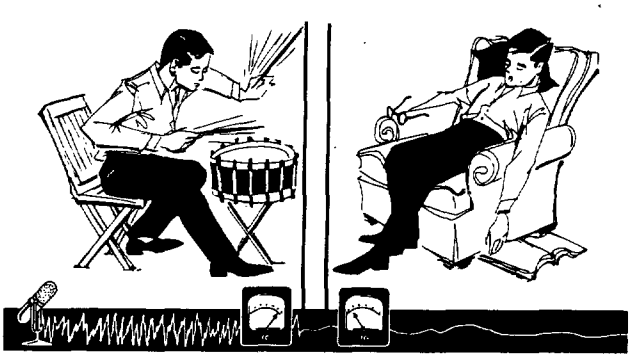
THREE WAYS TO CONTROL SOUND

Basically, unwanted sound can be reduced in three ways: The first is to reduce the sound level within a room or other undivided space. Sound absorbing materials are very effective for this purpose. These materials absorb the noise instead of reflecting it back into the room. Hard walls, floors and ceiling surfaces will reflect sounds and increase noise problems. Carpeting, drapes and upholstered furniture will absorb sound and help control it within a room. Acoustical tile and acoustical plasters are also used to absorb sound. The second way to limit the noise within a room or other interior area is to prevent sound waves from being transmitted from an adjacent room or occupancy by providing effective sound barrier construction for the walls, floors and ceilings which separate the rooms. The third method is to isolate the sound source. Considerable sound energy may be transmitted through the legs of a piano or radio into the floor. This can be partly eliminated by putting the legs in castor cups or inserting any type of cushion under the legs. Sound may also be caused by machinery which communicates its own vibration to the building structure by direct mechanical contact. In this case a resilient mounting placed under the machine or a separate floating foundation may be used.

SOUND ISOLATION

Reduction in the intensity of sound is called sound isolation. Like sound intensity, it is measured in decibels (db). If a sound level of 70 db is generated in one room and the sound level in the second room is 30 db, the difference between the sound levels is a measure of the isolation provided by the wall, and the wall is referred to as having a 40 db Sound Transmission Loss. A factor that must be considered is the background noise level that will mask an equivalent amount of sound. Background noises can be caused by street traffic, trains, mechanical equipment, etc.; thus the level of this background noise is dependent upon the building and room location. The basic objective in sound isolation is to reduce the transmitted noise level below that of the background noise level or to an acceptable level, whichever is greater.

THE TWO-ROOM TEST METHOD



To compare the effectiveness of wall construction in preventing the passage of sound, a two-room sound

INTRODUCTION

test method is generally used. In this method, a steady sound is generated on one side of the wall and then measured on both sides. This is generally done at eleven frequencies from 125 to 4000. The difference in sound level is called the transmission loss of the wall. It may refer to one frequency or the arithmetic average of 9 or 11 frequencies. In the illustration previously used, a sound level of 70 db is generated in one room and a level of 30 db is measured in the adjoining room. Therefore the transmission loss of the wall is 40 db.

SOUND TRANSMISSION CLASS

In the past, several different means were used for rating walls. Arithmetical averages frequently used were sometimes unfair, in that they allowed a good rating to be given a wall that performed poorly at an important frequency. In the recently revised ASTM Designation E90-61 T, "Tentative Recommended Practice for LABORATORY MEASUREMENT OF AIRBORNE SOUND TRANSMISSION LOSS OF BUILDING FLOORS AND WALLS", provision is made for rating walls and other partitions by a single number called the Sound Transmission Class (STC). This system measures the performance of a wall in conformance to certain predetermined standards at all frequencies. The STC rating is easy to use and is currently the most realistic means for comparing performance. The higher the STC value, the better the assembly will resist sound passage.

WHAT PARTITION DO YOU CHOOSE?

Before choosing a partition for a building, whether it be high rise, industrial or residential, you must clearly define the sound control problem you face. First, what is the background noise level? The higher the background noise, the more transmitted noise can be tolerated. Background noise is an exceedingly important element in all noise control situations, for it helps mask sporadic intruding sounds. For example, an intruding noise which would be intolerable in a quiet country village might go completely unnoticed in an apartment on a busy street, where the continuous hum of traffic masks out the noises from the adjoining room without itself seeming unpleasant. Next, how critical is the situation in regard to sound isolation? Naturally certain rooms will require more privacy than others, depending upon their use.

PROPER INSTALLATION

After the wall and floor-and-ceiling constructions have been selected, it is important that they be installed properly. The following precautions should be taken during installation to avoid situations or conditions which will detract from the sound control properties of the assembly:

1. Caulk between top and bottom member and floor or ceiling line. Leaks allow sound to pass through.
2. Avoid back-to-back electrical outlets, plumbing outlets, etc. Sound can pass directly through the wall at these locations.
3. Do not use unnecessary fasteners. Fasteners recommended are optimum, and additional fasteners may reduce the separation effect and cause the wall to lose some of its isolation properties.
4. When laminating full size sheets, apply laminating adhesive in narrow bands around the perimeter and down the center of each sheet. Full lamination reduces sound barrier properties.
5. Use gasketing at areas where partitions join windows or other difficult to seal areas. Sound can travel around a partition if given the opportunity to do so.
6. Avoid connecting plenum chambers, ducts, vents, etc. These permit the unrestricted flow of sound. Corrective measures are to make partitions full height, and use ducts lined with absorbent material.

SOUND CONTROL . . . NOT A MATTER OF CHANCE

You can readily see from this introduction that partitions with good sound isolation properties do not happen by chance. It takes a basic understanding of sound, careful planning, careful selection of materials, and proper installation.

The Bestwall Systems shown in this booklet are the result of intensive research by our engineers into the problem of noise control. Some of these systems have better sound control properties than others, but all, to some extent, give us the ability to control our acoustic environment. The system you choose will depend upon your budget limitations and upon the acoustical requirements you must meet.

GENERAL OBSERVATIONS

There are some important factors affecting sound transmission loss of partitions that have not been previously mentioned. They should however, be given careful consideration.

One way to reduce sound transmission is to reduce the amount of fasteners used. This makes the attachment less rigid, which is desirable from the standpoint of sound isolation. An improvement also occurs if a resilient attachment is used between the stud and the wallboard. This allows some relative movement between the board and the stud. Another method to consider is complete separation. This can be accomplished in partitions by staggering the studs. Staggered studs tend to break the continuity of sound because, being independent, they transmit less sound from one wall surface to another. Unequal sides, such as two sheets of gypsum wallboard on one side and one sheet on the other, reduce sound transmission by preventing the faces from vibrating sympathetically. The use of sound absorbent materials such as mineral wool or other fibrous material and/or sound deadening board in an assembly can also play an important role in sound control.

All of the test results on the following pages are results obtained under laboratory testing conditions where controlled conditions reduce variables to a minimum. In the field, these laboratory conditions are not always met, since many other variables are introduced. Laboratory results will generally exceed results of field tests, but the tests under controlled conditions are the only logical way to compare the performance of different assemblies.

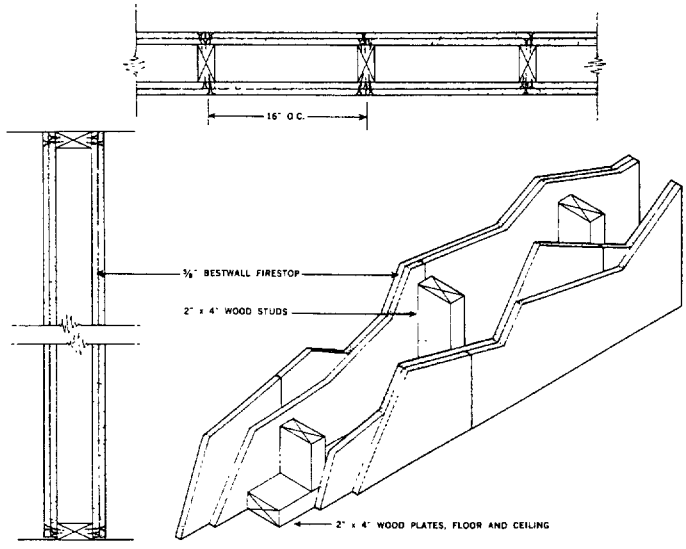
PARTITION SELECTOR GUIDE

LOCATION	DEGREE OF PRIVACY	STC REQUIREMENT	EXAMPLE OF WALL CONSTRUCTION NEEDED
RURAL (20 db. background noise level)	High	60 or over	Solid dense masonry min. 12″ thick.
	Moderate	50 to 60	3⅝″ metal studs, 2 layers of ⅝″ Bestwall Firestop each side, 1½″ fiber glass insulation in cavity.
	Low	45 to 50	Bestwall Double solid partition.
SUBURBAN (30 db. background noise level)	High	55 or over	Bestwall Triple solid partition.
	Moderate	45 to 55	2″ x 4″ wood studs, resilient channel one side, ⅝″ Bestwall Firestop both sides, 1½″ fiber glass insulation in cavity.
	Low	40 to 45	2″ x 4″ wood studs, resilient channel one side, ⅝″ Bestwall Firestop both sides.
CITY (40 db. background noise level)	High	45 or over	2½″ x 3″ gypsum ribs, 2½″ steel track, ½″ Bestwall Sound Deadening Board both sides, ⅝″ Bestwall Firestop each side.
	Moderate	40 to 45	2″ x 4″ wood studs, 2 layers ⅝″ Bestwall Firestop each side.
	Low	35 to 40	2″ x 4″ wood studs, 2 layers ⅝″ Bestwall Firestop one side, 1 layer ⅝″ Firestop other side.

The above chart is presented only as a guide. It gives a general indication of partition performance required to meet specific sound control needs with regard to ambient noise. It does not incorporate the effects of flanking, interconnecting ducts, wiring, and plumbing. These are special problems that should be considered in choosing a wall.

2 LAYERS BESTWALL FIRESTOP BOTH SIDES

STC-41
FIRE RATING—2 HRS. COMBUSTIBLE



PARTITION PROPERTIES

SOUND TEST DATA

Test No.: OR 64-12

Dated: February 10, 1964

Conducted By: Ohio Research Corporation

Test Partition—Height: 9'
Width: 14'
Thickness: 6⅛"
Weight: 11.2 lbs./sq. ft.

9 Frequency Average 32 db

Sound Transmission Class 41 db

Speech Interference Zone 46 db

FIRE RESISTANCE TEST DATA

First Test No.: T-194

Dated: April 12, 1952

Conducted By: Engineering Experiment Station, Ohio State University



*Omit for 9 Frequency Average

db	26.5	22	36	37	42	43.5	48	49.5	45	44.5	51

FREQUENCY—CYCLES PER SECOND

SOLID LINE: PARTITION PERFORMANCE • DOTTED LINE: ASTM E90-61T STANDARD CURVE

MATERIALS USED

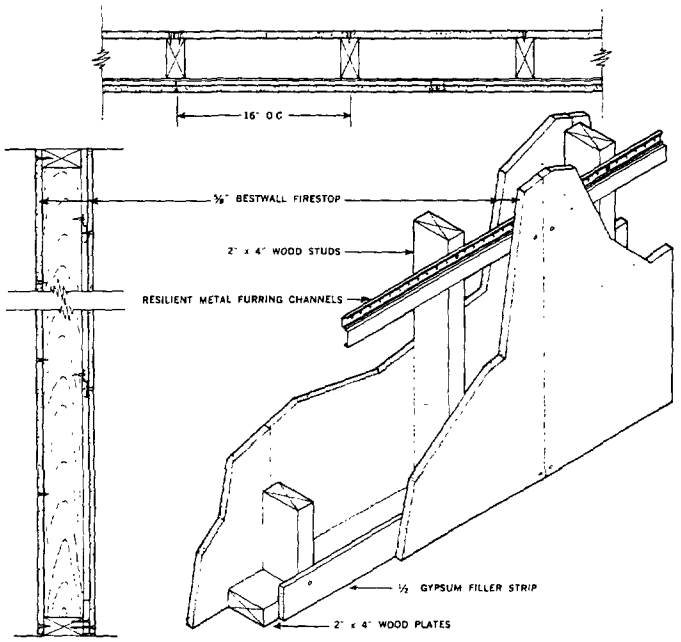
1. 2" x 4" wood studs
2. 2" x 4" wood plates
3. ⅝" Bestwall Firestop Gypsum Wallboard
4. 1" drywall screws
5. Bestwall Laminating Compound

APPLICATION DETAILS

1. Nail 2" x 4" wood studs, 16" o.c., to 2" x 4" wood plates at floor and ceiling.
2. Apply a single layer of ⅝" Bestwall Firestop vertically to both sides with 1" drywall screws spaced 8" o.c. along the edge joints and 12" o.c. in the field.
3. Apply a second layer of ⅝" Bestwall Firestop vertically, with joints offset 16" from those in first layer, by laminating with Bestwall Laminating Compound. Hold in place with 2" screws spaced 12" o.c. along the edge joints and in the field and top and bottom plates.
4. Taped joints not required to obtain fire rating.

BESTWALL FIRESTOP ON RESILIENT CHANNEL

STC-44
FIRE RATING—1 HR. COMBUSTIBLE EST.



PARTITION PROPERTIES

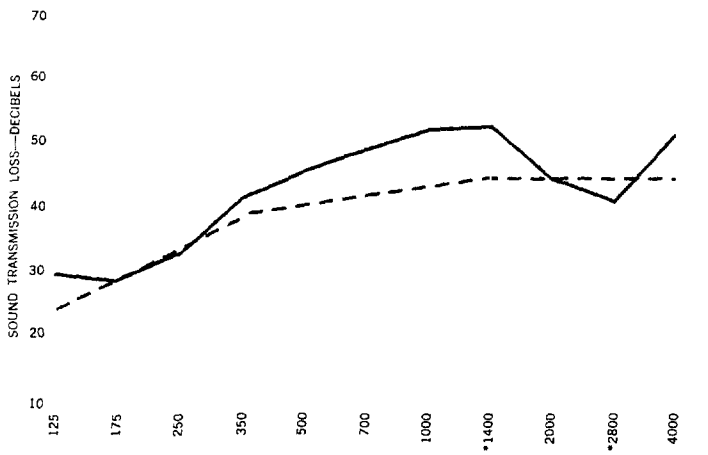
SOUND TEST DATA

Test No.: OR 64-7
Dated: January 31, 1964
Conducted By: Ohio Research Corporation
Test Partition—Height: 9'
Width: 14'
Thickness: 5⅜"
Weight: 6.3 lbs./sq. ft.

9 Frequency Average	41 db
Sound Transmission Class	44 db
Speech Interference Zone	48 db

FIRE RESISTANCE TEST DATA

The fire rating of 1 hour is an estimate.



SOLID LINE: PARTITION PERFORMANCE • DOTTED LINE: ASTM E90-61T STANDARD CURVE

MATERIALS USED

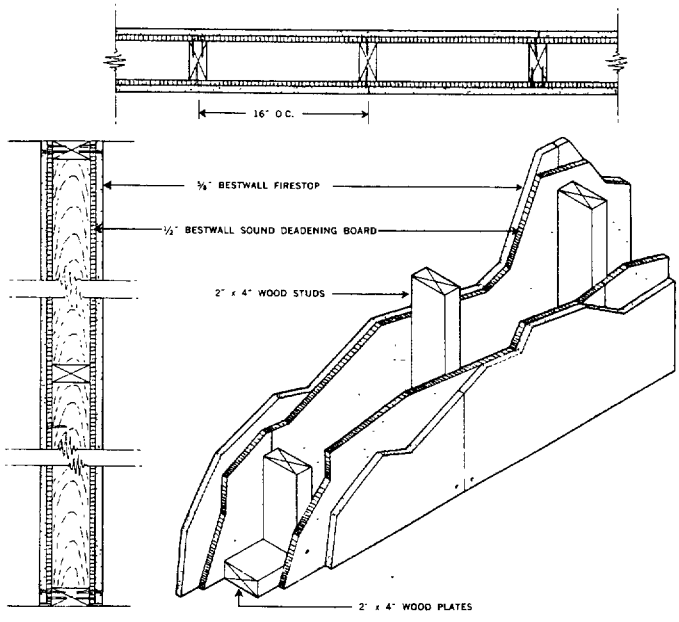
1. 2" x 4" wood studs
2. 2" x 4" wood plates
3. ⅝" Bestwall Firestop Gypsum Wallboard
4. Donn DG-8 Resilient Channels
5. 1" drywall screws

APPLICATION DETAILS

1. Nail 2" x 4" wood studs, 16" o.c., to 2" x 4" wood plates at floor and ceiling.
2. Apply a single layer of ⅝" Bestwall Firestop vertically to one side with 1" screws spaced 8" o.c. at the edges and 12" o.c. in the field and top and bottom plates.
3. Attach Donn DG-8 resilient channel horizontally, 24" o.c., to the second side with 1" screws at the stud intersections.
4. Apply a single layer of ⅝" Bestwall Firestop vertically over the channel with joints staggered 24" o.c. and with 1" screws spaced 16" o.c.
5. Tape and finish in approved manner.

BESTWALL FIRESTOP OVER SOUND DEADENING BOARD

STC-46
FIRE RATING—1 HR. COMBUSTIBLE



PARTITION PROPERTIES

SOUND TEST DATA

Test No.: OR 64-73
Dated: September 23, 1964
Conducted By: Ohio Research Corporation
Test Partition—Height: 9'
Width: 14'
Thickness: 5⅞"
Weight: 7.8 lbs./sq. ft.

9 Frequency Average	45 db
Sound Transmission Class	46 db
Speech Interference Zone	54 db

FIRE RESISTANCE TEST DATA

Fire Test No.: T-3006
Dated: August 1964
Conducted By: Engineering Experiment Station, Ohio State University



SOLID LINE: PARTITION PERFORMANCE • DOTTED LINE: ASTM E90-61T STANDARD CURVE

MATERIALS USED

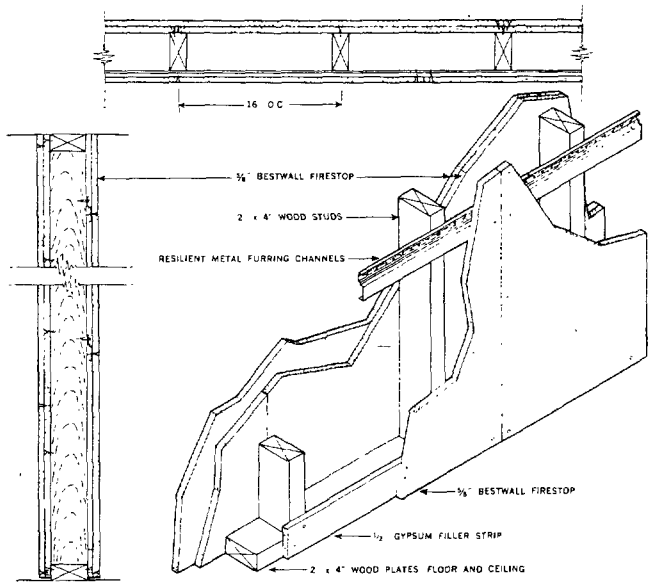
1. 2" x 4" wood studs
2. 2" x 4" wood plates
3. 2" x 4" wood fire blocks
4. ½" Bestwall Sound Deadening Board
5. ⅝" Bestwall Firestop Gypsum Wallboard
6. 5d coated nails and 8d box nails
7. Bestwall Laminating Compound

APPLICATION DETAILS

1. Nail 2" x 4" wood studs, 16" o.c., to 2" x 4" wood plates at floor and ceiling.
2. Provide 2" x 4" fire blocks at mid-height
3. Apply ½" Bestwall Sound Deadening Board vertically to both sides with 5d coated nails 24" o.c. in each stud.
4. Apply a single layer of ⅝" Bestwall Firestop to each side with three 4" strips of Bestwall Laminating Compound spaced on the centerline and 2" in from each edge. Space 8d box nails 12" o.c. in top and bottom plates and at vertical edge joints and at mid-height on the intermediate studs.
5. Tape and finish in approved manner.

2 LAYERS BESTWALL FIRESTOP ONE SIDE, 1 LAYER ON RESILIENT CHANNEL OTHER SIDE

STC-48
FIRE RATING — 1½ HRS. COMBUSTIBLE EST.



PARTITION PROPERTIES

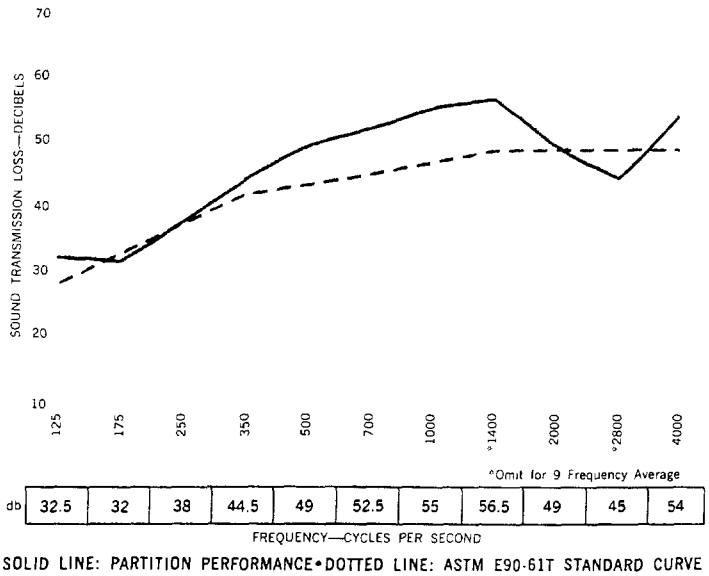
SOUND TEST DATA

Test No.: OR 64-15
Dated: February 14, 1964
Conducted By: Ohio Research Corporation
Test Partition—Height: 9'
Width: 14'
Thickness: 6"
Weight: 8.8 lbs./sq. ft.

9 Frequency Average	45 db
Sound Transmission Class	48 db
Speech Interference Zone	51 db

FIRE RESISTANCE TEST DATA

The fire rating of 1½ hours is an estimate.



SOLID LINE: PARTITION PERFORMANCE • DOTTED LINE: ASTM E90-61T STANDARD CURVE

MATERIALS USED

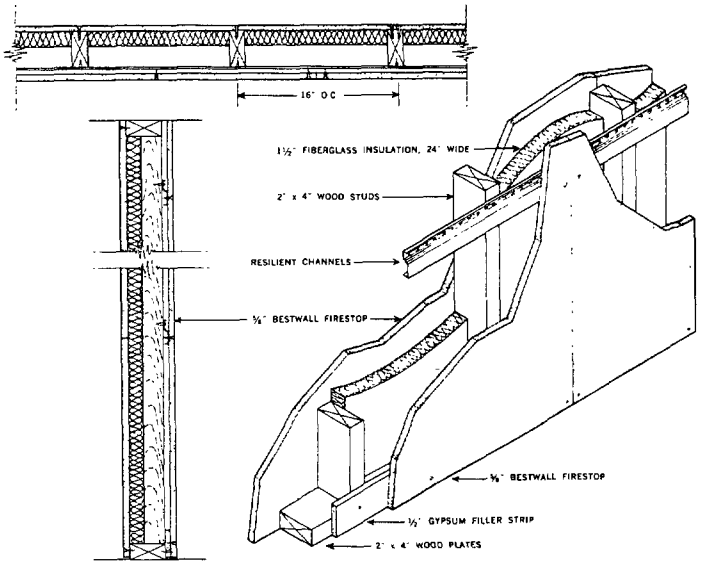
1. 2" x 4" wood studs
2. 2" x 4" wood plates
3. ⅝" Bestwall Firestop Gypsum Wallboard
4. Donn DG-8 Resilient Channels
5. 1" and 2" drywall screws

APPLICATION DETAILS

1. Nail 2" x 4" wood studs, 16" o.c., to 2" x 4" wood plates at floor and ceiling.
2. Apply a single layer of ⅝" Bestwall Firestop vertically to one side with 1" screws spaced 8" o.c. at the edge joints and 12" o.c. in the field.
3. Apply a second layer of ⅝" Bestwall Firestop vertically over the first with joints staggered 24", using Bestwall Laminating Compound and 2" screws at the same spacing as in first layer.
4. Attach Donn DG-8 resilient channels horizontally, 24" o.c., to the second side with 1" screws at the stud intersections. Space the top channel face 6" down from the top of the partition.
5. Apply a single layer of ⅝" Bestwall Firestop vertically over the channel with 1" screws spaced 24" o.c.
6. Tape and finish in approved manner.

BESTWALL FIRESTOP ON RESILIENT CHANNEL WITH FIBERGLASS INSULATION IN THE CAVITY

STC-50
FIRE RATING—1 HR. COMBUSTIBLE EST.



PARTITION PROPERTIES

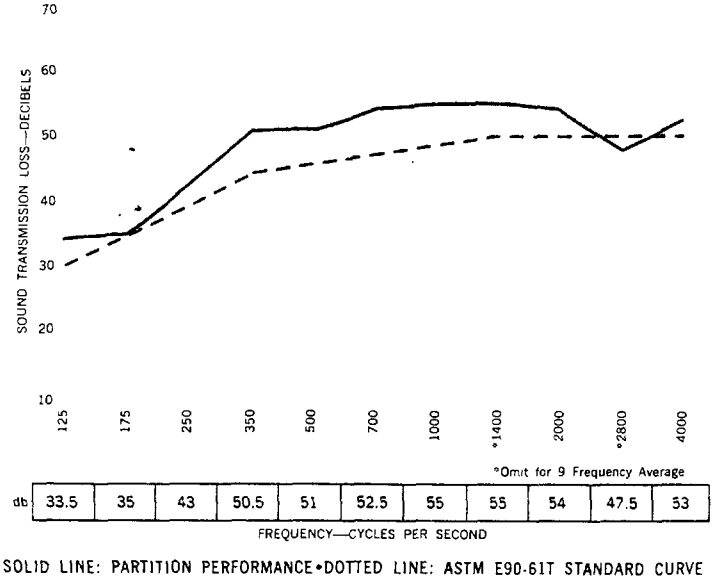
SOUND TEST DATA

Test No.: OR 64-16
Dated: February 24, 1964
Conducted By: Ohio Research Corporation
Test Partition—Height: 9'
Width: 14'
Thickness: 5⅜"
Weight: 6.4 lbs./sq. ft.

9 Frequency Average	48 db
Sound Transmission Class	50 db
Speech Interference Zone	53 db

FIRE RESISTANCE TEST DATA

The fire rating of 1 hour is an estimate.



SOLID LINE: PARTITION PERFORMANCE • DOTTED LINE: ASTM E90-61T STANDARD CURVE

MATERIALS USED

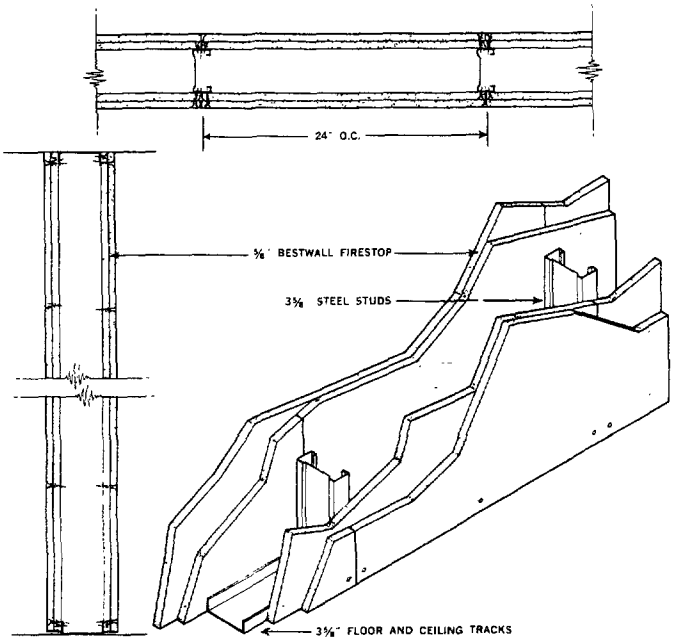
1. 2" x 4" wood studs
2. 2" x 4" wood plates
3. ⅝" Bestwall Firestop Gypsum Wallboard
4. 1½" fiberglass insulation
5. Donn DG-8 Resilient Channels
6. 1" drywall screws

APPLICATION DETAILS

1. Nail 2" x 4" wood studs, 16" o.c., to 2" x 4" wood plates at floor and ceiling.
2. Apply a single layer of ⅝" Bestwall Firestop vertically to one side with 1" screws spaced 8" o.c. at the edge joints and 12" o.c. in the field and to the plates.
3. Attach Donn DG-8 resilient channel horizontally, 24" o.c. to the second side with 1" screws at the stud intersections. Space the top channel face 6" down from the top of the partition.
4. Apply a single layer of ⅝" Bestwall Firestop vertically over the channel with joints staggered 24" o.c. and with 1" screws spaced 16" o.c.
5. During construction add 1½" fiberglass insulation to the cavity.
6. Tape and finish in approved manner.

2 LAYERS BESTWALL FIRESTOP BOTH SIDES

STC-47
FIRE RATING—2 HRS. INCOMBUSTIBLE EST.



PARTITION PROPERTIES

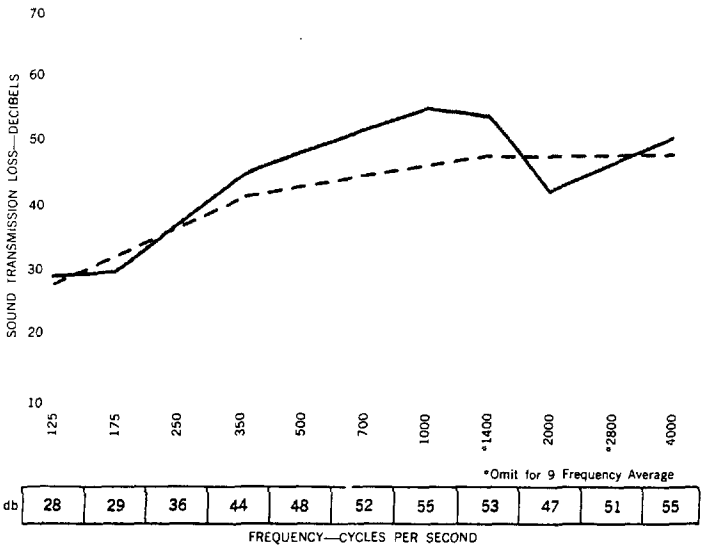
SOUND TEST DATA

Test No.: OR 64-52
Dated: June 6, 1964
Conducted By: Ohio Research Corporation
Test Partition—Height: 9'
Width: 14'
Thickness: 6⅛"
Weight: 10.3 lbs./sq. ft.

9 Frequency Average	44 db
Sound Transmission Class	47 db
Speech Interference Zone	51 db

FIRE RESISTANCE TEST DATA

The fire rating of 2 hours is an estimate.



SOLID LINE: PARTITION PERFORMANCE DOTTED LINE: ASTM E90-61T STANDARD CURVE

MATERIALS USED

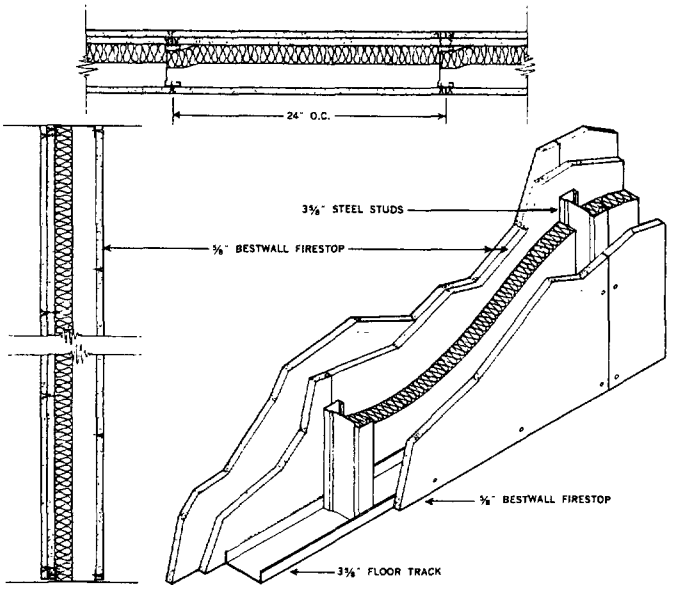
1. Donn DW-58 (3⅝") steel studs
2. Donn DS-580 (3⅝") track
3. ⅝" Bestwall Firestop Gypsum Wallboard
4. Bestwall Laminating Compound
5. 1" and 1¾" drywall screws

APPLICATION DETAILS

1. Set Donn DW-58 steel studs, spaced 24" o.c., into Donn DS-580 floor and ceiling track.
2. Vertically secure a single layer of ⅝" Bestwall Firestop to both sides with 1" drywall screws spaced 48" o.c.
3. Laminate a second layer of ⅝" Bestwall Firestop vertically to both sides with a 4" strip of Bestwall Laminating Compound around the perimeter and down the center. Keep the compound 2" in from the edges and 4" off the centerline. Hold this layer in place by the further addition of 1¾" drywall screws spaced 12" o.c. along the edge joints and track, and 16" o.c. in the field.
4. Tape and finish in approved manner.

2 LAYERS BESTWALL FIRESTOP ONE SIDE, 1 LAYER ON OTHER SIDE WITH FIBERGLASS INSULATION IN THE CAVITY

STC-50
FIRE RATING—1½ HRS. INCOMBUSTIBLE



PARTITION PROPERTIES

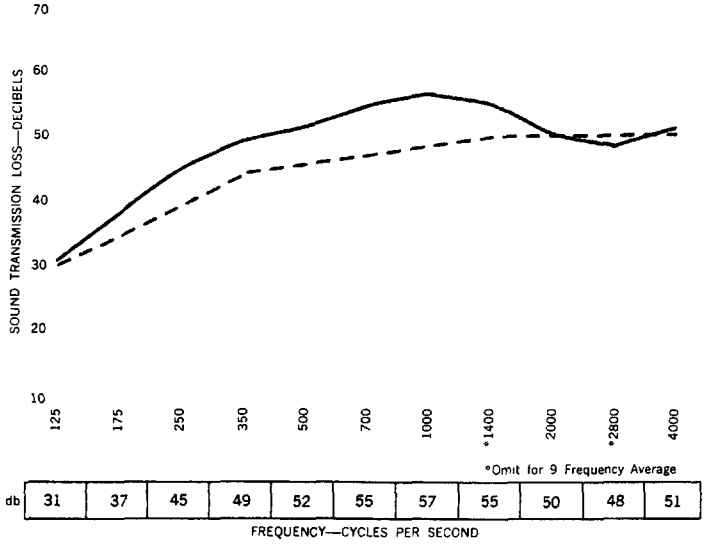
SOUND TEST DATA

Test No.: OR 64-51
Dated: June 4, 1964
Conducted By: Ohio Research Corporation
Test Partition—Height: 9'
Width: 14'
Thickness: 5½"
Weight: 8 lbs./sq. ft.

9 Frequency Average	47 db
Sound Transmission Class	50 db
Speech Interference Zone	53 db

FIRE RESISTANCE TEST DATA

Fire Test No.: T-3126
Dated: February 1965
Conducted By: Engineering Experiment Station, Ohio State University



SOLID LINE: PARTITION PERFORMANCE • DOTTED LINE: ASTM E90-61T STANDARD CURVE

MATERIALS USED

1. Donn DW-58 (3⅝") steel studs
2. Donn DS-580 (3⅝") track
3. ⅝" Bestwall Firestop Gypsum Wallboard
4. 3" fiberglass insulation
5. Bestwall Laminating Compound
6. 1" and 1¾" drywall screws

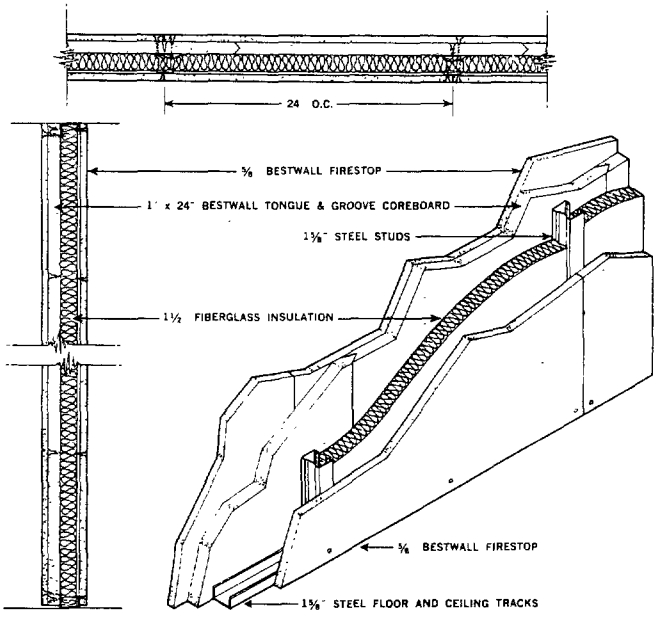
APPLICATION DETAILS

1. Set Donn DW-58 steel studs, spaced 24" o.c., into Donn DS-580 floor and ceiling track.
2. Apply a single layer of ⅝" Bestwall Firestop vertically with 1" screws spaced 48" o.c.
3. Apply a second layer of ⅝" Bestwall Firestop vertically, joints staggered 24" o.c., with a 4" strip of Bestwall Laminating Compound spaced 2" in from the edges and 4" off the centerline. Hold in place with 1¾" drywall screws spaced 12" o.c. at the edge joints and track, and 16" o.c. in the field.
4. Place fiberglass insulation between the studs and staple.
5. Apply a single layer of ⅝" Bestwall Firestop to the other side with 1" screws spaced 8" o.c. at the edge joints and 12" o.c. in the field.
6. Tape and finish in approved manner.

SGP 0028385

BESTWALL FIRESTOP AND COREBOARD WITH FIBERGLASS INSULATION IN THE CAVITY

STC-52
FIRE RATING—1½ HR. INCOMBUSTIBLE EST.



PARTITION PROPERTIES

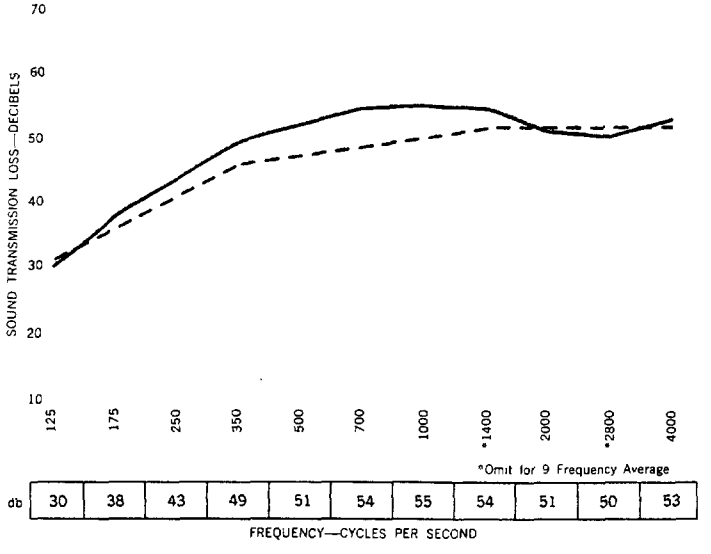
SOUND TEST DATA

Test No.: OR 64-61
Dated: June 29, 1964
Conducted By: Ohio Research Corporation
Test Partition—Height: 9'
Width: 14'
Thickness: 3⅞"
Weight: 9.4 lbs./sq. ft.

9 Frequency Average	47 db
Sound Transmission Class	52 db
Speech Interference Zone	52 db

FIRE RESISTANCE TEST DATA

The fire rating of 1½ hours is an estimate.



SOLID LINE: PARTITION PERFORMANCE • DOTTED LINE: ASTM E90-61T STANDARD CURVE

MATERIALS USED

1. 1⅝" steel studs
2. 1⅝" steel floor and ceiling tracks
3. 1" x 24" Tongue & Groove Bestwall Coreboard
4. ⅝" Bestwall Firestop Gypsum Wallboard
5. 1½" fiberglass insulation
6. Bestwall Laminating Compound
7. 1", 1½" and 2" drywall screws

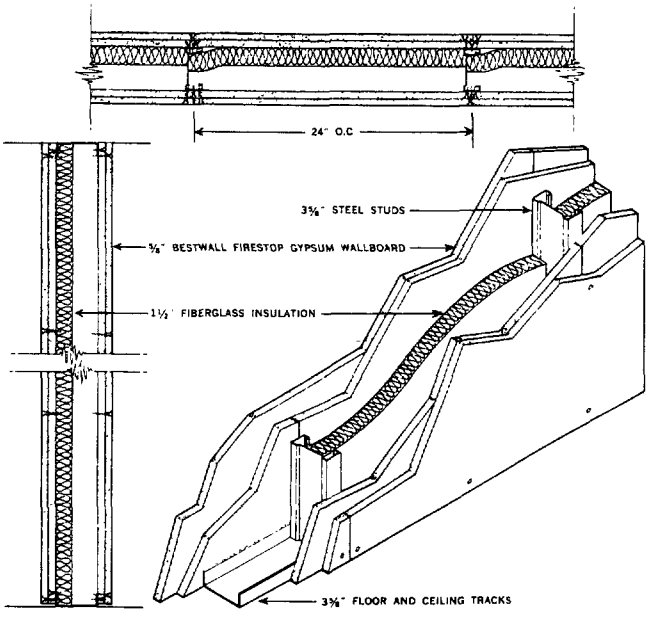
APPLICATION DETAILS

1. Set 1⅝" steel channel studs, spaced 24" o.c., into 1⅝" steel floor and ceiling track.
2. Fasten 1" x 24" Tongue & Groove Bestwall Coreboard vertically, with 1½" screws 12" o.c., to the track and 24" o.c. to the studs.
3. Laminate face layer of ⅝" Bestwall Firestop with joints staggered 6" to the 1" core with three 4" strips of Bestwall Laminating Compound. Attach to the studs with 2" screws spaced 24" o.c. and 12" o.c. to track.
4. Fasten a face layer of ⅝" Bestwall Firestop to the studs with 1" screws spaced 12" o.c. at the edges and in the field.
5. Tape and finish in approved manner.

SGP 0028386

2 LAYERS BESTWALL FIRESTOP BOTH SIDES WITH FIBERGLASS INSULATION IN THE CAVITY

STC-52
FIRE RATING—2 HRS. INCOMBUSTIBLE EST.



PARTITION PROPERTIES

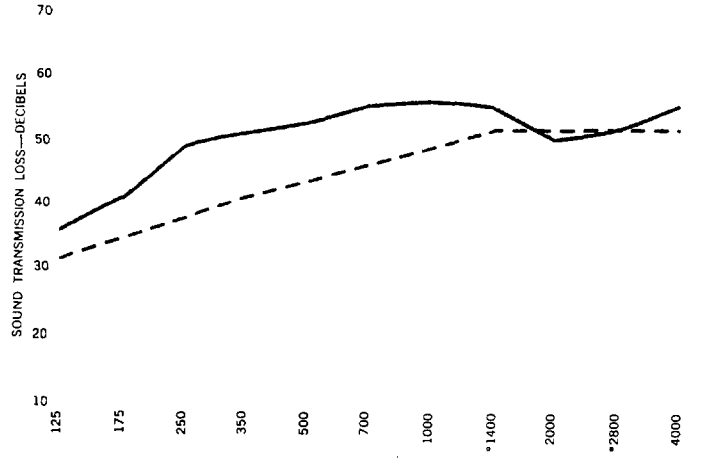
SOUND TEST DATA

Test No.: OR 64-50
Dated: June 3, 1964
Conducted By: Ohio Research Corporation
Test Partition—Height: 9'
Width: 14'
Thickness: 6⅛"
Weight: 10.5 lbs./sq. ft.

9 Frequency Average	50 db
Sound Transmission Class	52 db
Speech Interference Zone	54 db

FIRE RESISTANCE TEST DATA

The fire rating of 2 hours is an estimate.



SOLID LINE: PARTITION PERFORMANCE DOTTED LINE: ASTM E90-61T STANDARD CURVE

MATERIALS USED

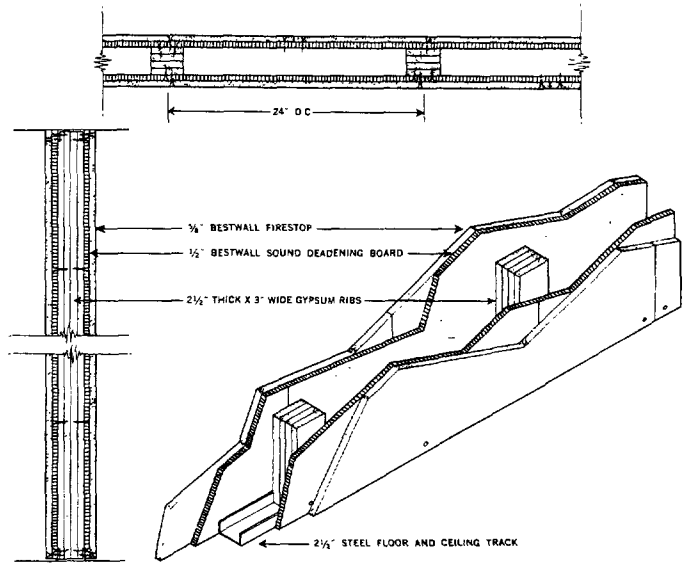
1. Donn DW-58 (3⅝") steel studs
2. Donn DS-580 (3⅝") track
3. ⅝" Bestwall Firestop Gypsum Wallboard
4. 1½" fiberglass insulation
5. Bestwall Laminating Compound
6. 1" and 1¾" drywall screws

APPLICATION DETAILS

1. Set Donn DW-58 steel studs, spaced 24" o.c. into Donn DS-580 floor and ceiling track.
2. Apply a single layer of ⅝" Bestwall Firestop vertically to both sides with 1" drywall screws spaced 48" o.c.
3. Laminate a second layer of ⅝" Bestwall Firestop vertically to both sides with a 4" strip of Bestwall Laminating Compound around the perimeter and down the center. Keep compound 2" in from the edges and 4" off the centerline. In addition, use 1¾" drywall screws spaced 12" o.c. along the edge joints and track, and 16" o.c. in the field to hold this layer in place.
4. Prior to erection of second side, add 1½" fiberglass insulation to the cavity and staple.
5. Tape and finish in approved manner.

BESTWALL FIRESTOP OVER SOUND DEADENING BOARD

STC-51
FIRE RATING—1 HR. COMBUSTIBLE EST.



PARTITION PROPERTIES

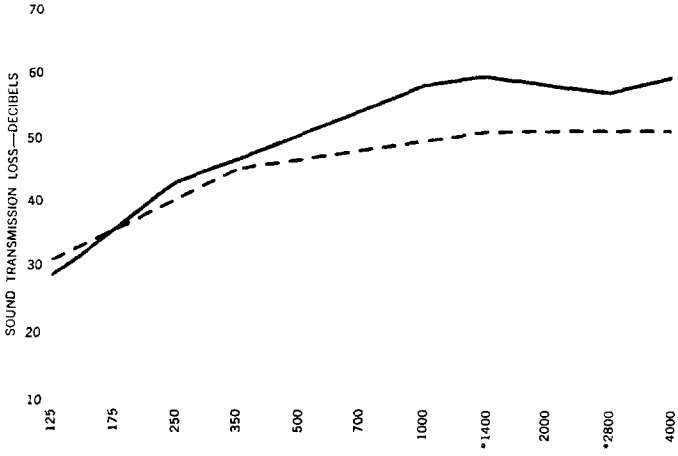
SOUND TEST DATA

Test No.: OR 64-57
Dated: June 16, 1964
Conducted By: Ohio Research Corporation
Test Partition—Height: 9'
Width: 14'
Thickness: 4¾"
Weight: 7.9 lbs./sq. ft.

9 Frequency Average	48 db
Sound Transmission Class	51 db
Speech Interference Zone	56 db

FIRE RESISTANCE TEST DATA

The fire rating of 1 hour is an estimate.



*Omit for 9 Frequency Average

db	28	36	43	46	50	54	58	59	58	57	59

FREQUENCY—CYCLES PER SECOND

SOLID LINE: PARTITION PERFORMANCE DOTTED LINE: ASTM E90-61T STANDARD CURVE

MATERIALS USED

1. 2½" thick x 3" wide gypsum ribs (4 layers of ⅝" gypsum)
2. 2½" steel floor and ceiling track
3. ⅝" Bestwall Firestop Gypsum Wallboard
4. ½" Bestwall Sound Deadening Board
5. Bestwall Laminating Compound
6. 1½" drywall screws

APPLICATION DETAILS

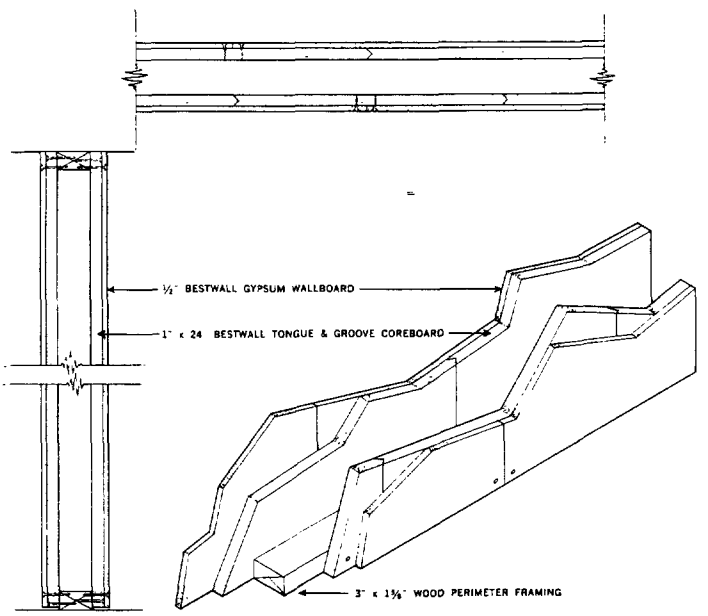
1. Set 2½" x 3" gypsum ribs into 2½" steel track 24" o.c.
2. Apply ½" Bestwall Sound Deadening Board vertically to both sides with 1½" drywall screws spaced 12" o.c.
3. Apply ⅝" Bestwall Firestop vertically, joints staggered 12" o.c., to both sides with a 4" strip of Bestwall Laminating Compound around the perimeter and down the center. Keep compound 2" in from the edges and 4" off the centerline.
4. Hold face layers in place by the addition of 1½" drywall screws spaced 24" o.c. and 12" o.c. to the track.
5. Tape and finish in approved manner.

SGP 0028388

DOUBLE SOLID PARTITION—non-load bearing

BESTWALL GYPSUM WALLBOARD OVER COREBOARD

STC-47
FIRE RATING—2 HRS. COMBUSTIBLE*



PARTITION PROPERTIES

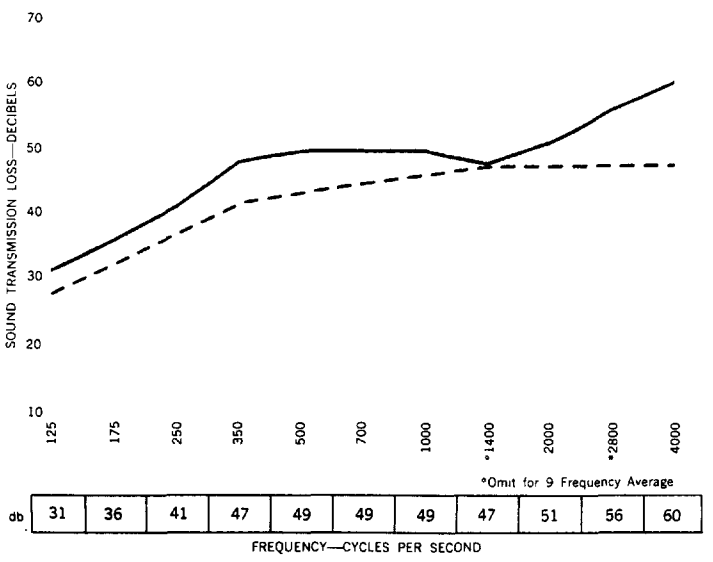
SOUND TEST DATA

Test No.: OR 64-39
Dated: May 20, 1964
Conducted By: Ohio Research Corporation
Test Partition—Height: 9'
Width: 14'
Thickness: 6"
Weight: 12.5 lbs./sq. ft.

9 Frequency Average	46 db
Sound Transmission Class	47 db
Speech Interference Zone	52 db

FIRE RESISTANCE TEST DATA

Test No.: T-2575
Dated: April 15, 1963
Conducted By: Engineering Experiment Station, Ohio State University



SOLID LINE: PARTITION PERFORMANCE DOTTED LINE: ASTM E90-61T STANDARD CURVE

MATERIALS USED

1. 3" x 1⅝" wood perimeter framing
2. 1" Bestwall Tongue & Groove Coreboard
3. ½" Bestwall Gypsum Wallboard
4. Bestwall Laminating Compound
5. 8d nails

APPLICATION DETAILS

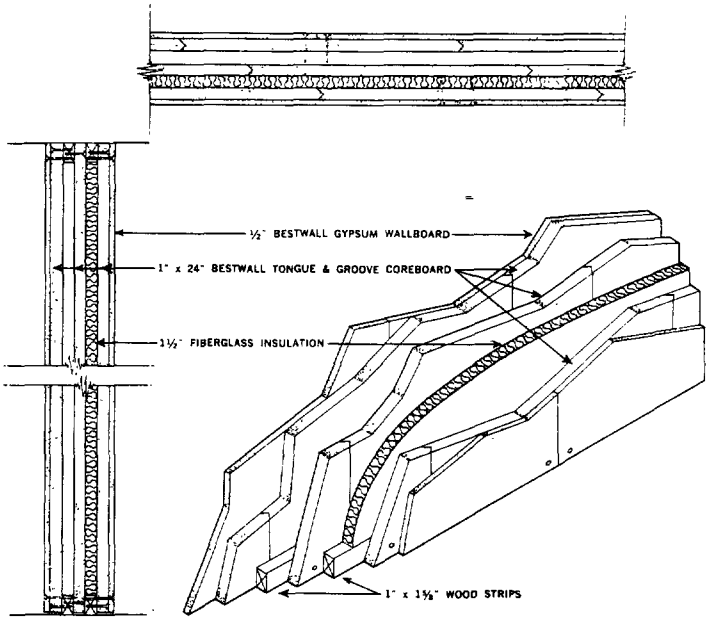
1. Nail 1" sheets of Bestwall Tongue and Groove Coreboard to each side of 3" x 1⅝" wood perimeter with 8d nails 24" o.c.
2. Apply face layer of ½" Bestwall Gypsum Wallboard with Bestwall Laminating Compound vertically to each side of the partition, joints staggered, with 8d finishing nails spaced 24" o.c. and nailed around the perimeter with 8d box nails 24" o.c.
3. Taped joints not required to obtain fire rating.

SGP 0028389

*This assembly is combustible with wood runners and incombustible with metal track.

1 LAYER ½" BESTWALL GYPSUM WALLBOARD OVER COREBOARD WITH FIBERGLASS INSULATION IN ONE CAVITY

STC-57
FIRE RATING—3 HRS. COMBUSTIBLE* EST.



PARTITION PROPERTIES

SOUND TEST DATA

Test No.: OR 64-59
Dated: June 23, 1964
Conducted By: Ohio Research Corporation
Test Partition—Height: 9'
Width: 14'
Thickness: 6"
Weight: 16.3 lbs./sq. ft.

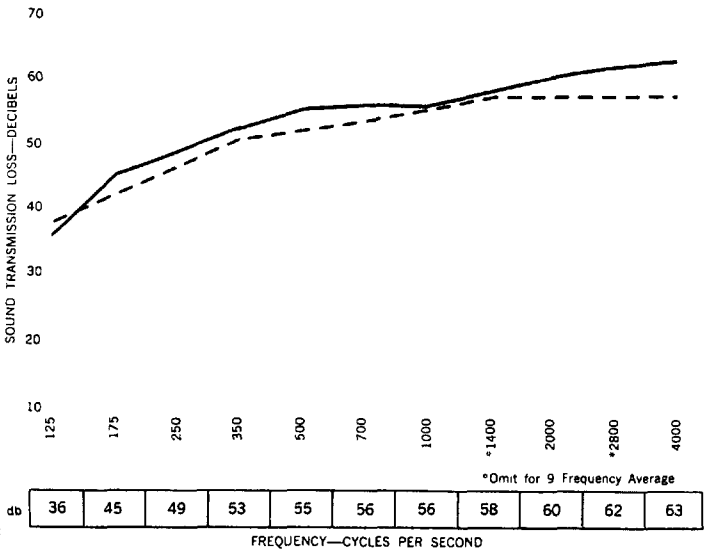
9 Frequency Average	53 db
Sound Transmission Class	57 db
Speech Interference Zone	58 db

FIRE RESISTANCE TEST DATA

The fire rating of 3 hours is an estimate.

MATERIALS USED

1. 1" x 1⅝" wood strips
2. 1" x 24" Bestwall Tongue & Groove Coreboard
3. ½" Bestwall Gypsum Wallboard
4. 1½" fiberglass insulation
5. Bestwall Laminating Compound
6. 5d and 8d nails



SOLID LINE: PARTITION PERFORMANCE DOTTED LINE: ASTM E90-61T STANDARD CURVE

APPLICATION DETAILS

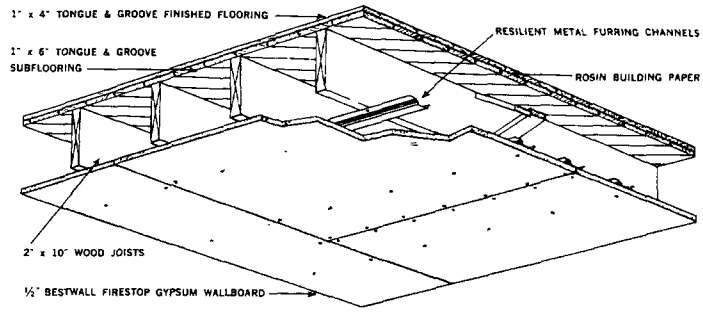
1. Fasten 1" x 1⅝" wood strips 1" off center of partition on floor and ceiling and side walls.
2. Erect 1" x 24" Bestwall Tongue & Groove Coreboard vertically on both sides of wood strip and nail with 5d coated nails to wood strip 12" o.c.
3. Secure a second 1" x 1⅝" wood spacer around the perimeter of the core.
4. Erect 1" x 24" Bestwall Tongue & Groove Coreboard vertically, joints staggered 12" o.c. and nail to the wood spacers with 5d coated nails spaced 24" o.c. giving two 1" cavities.
5. Apply a face layer of ½" Bestwall Gypsum Wallboard vertically, joints staggered 12" to both sides. Secure the layers with a 4" strip of Bestwall Laminating Compound around the perimeter and down the center of each board. Nail with 8d box nails spaced 12" o.c. to the wood track and 8d finishing nails spaced vertically 24" o.c. at the edges and in the field.
6. During construction staple 1½" x 24" strips of fiberglass insulation in one cavity.
7. Tape and finish in approved manner.

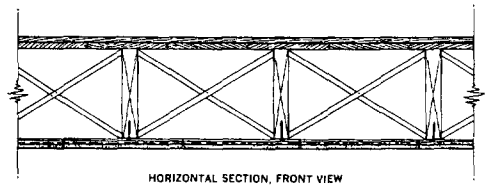
SGP 0028390

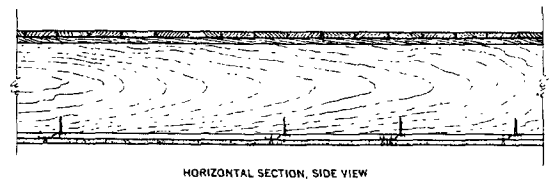
*This assembly is combustible with wood runners and incombustible with metal track.

WOOD FLOOR AND CEILING ASSEMBLY WITH BESTWALL

STC-47
FIRE RATING—1 HR.




HORIZONTAL SECTION, FRONT VIEW


HORIZONTAL SECTION, SIDE VIEW

PARTITION PROPERTIES

SOUND TEST DATA

Test No.: TL 64-155
Dated: February 7, 1964
Conducted By: Riverbank Acoustical Laboratories
Test Partition—Height: 7'
Width: 5'8"
Thickness: 12"
Weight: 8.6 lbs./sq. ft.

9 Frequency Average 44 db
Sound Transmission Class 47 db
Speech Interference Zone 49 db

FIRE RESISTANCE TEST DATA

Test No.: TL-64-155
Dated: January 24, 1964
Conducted By: Underwriters' Laboratories Inc.



SOLID LINE: PARTITION PERFORMANCE • DOTTED LINE: ASTM E90-61T STANDARD CURVE

MATERIALS USED

1. 2" x 10" wood joists
2. Rosin building paper
3. 1" x 6" tongue and groove subflooring
4. 1" x 4" tongue and groove finished flooring
5. Resilient metal furring channels
6. ½" Bestwall Firestop Gypsum Wallboard
7. 1" drywall screws and 8d nails

APPLICATION DETAILS

1. Fasten resilient channels on the under side of wood joists 16" o.c., perpendicular to joists and spaced 24" o.c. with an additional short section at the wallboard joint.
2. Attach ½" Bestwall Firestop to these channels with joints perpendicular to joists, and fasten with 1" drywall screws 12" o.c.
3. Taped joints not required to obtain fire rating.

ATTENUATION (SOUND ISOLATION, SOUND INSULATION)—The reduction in the intensity of sound. Attenuation is measured in decibels.

BACKGROUND NOISE LEVEL—Noise level of the environment, created by street traffic, trains, mechanical equipment, etc. An objective of noise control is to reduce the sound transmitted to a level below the background noise level.

DECIBEL—A unit used for measuring the intensity (loudness) of sound. The easiest way to identify sound pressure levels is to compare them to sounds which we recognize readily. For example, the sound heard in a quiet home or soft radio music would be at approximately the 35 decibel level. The sound in a noisy office or department store would be at approximately the 60 decibel level. Average conversation is in the 35 to 65 decibel range.

FREQUENCY—The number of sound waves per second produced by the source of sound. Audible frequencies range from 20 cycles per second (cps) to 20,000 cps. Middle "C", for example, is 262 cps.

NOISE—Unwanted sound.

SOUND—A pressure wave that travels outward in all directions from its source at a speed of 1,120 feet per second. Sound may also be the source, or the sensation experienced in the ears when pressure waves strike the eardrums.

SOUND ABSORPTION—The absorption of the energy of sound waves by a porous or soft, limp material. Carpeting and upholstered furniture will help absorb sound within a room, whereas hard walls, floors and ceiling surfaces will reflect sound.

SOUND DEADENING BOARD—A low density fiber board product designed to reduce sound transmission in wall and floor-and-ceiling systems.

SOUND LEVEL—The loudness or intensity of sound, measured in decibels.

SOUND TRANSMISSION CLASS (STC)—The sound transmission loss performance of a partition designated by a single number. The STC rating provides a reliable means of comparing the noise reduction properties of wall systems. The STC rating, by use of a standard curve, lowers the rating of a partition with poor sound characteristics at isolated frequencies which is not done by the arithmetical average.

SPEECH INTERFERENCE ZONE — The frequency range (500-2800 cps) which includes average conversation. The Speech Interference Zone number is obtained by averaging the transmission loss curve between 500 and 2800 cps.

TRANSMISSION LOSS — The difference in sound levels (measured in decibels) obtained by measuring the sound intensity on both sides of a wall assembly with a noise source on one side.

TRANSMITTED NOISE LEVEL — The sound that passes through a wall.



BESTWALL GYPSUM COMPANY

2 INDUSTRIAL BOULEVARD PAOLI, PENNSYLVANIA 19301

SGP 0028393

BW-6505 10M 3/65

Fire Tests are conducted for the Bestwall Gypsum Company by the following:

1 -- Underwriters Laboratories, Inc., Chicago, Illinois

2 - Ohio State University - Building Research Laboratory
Columbus, Ohio.

For the results of the fire tests of various types of partition and ceiling assemblies refer to the Building Materials List, published yearly by the Underwriters Laboratories, Inc. sponsored by the National Board of Fire Underwriters and reprints from the Official Fire Tests conducted by the Ohio State University Building Research Laboratories.

Results of Fire Tests are listed by the following:

1 - Sweet's - Bestwall Gypsum Wallboard Products Literature

2 - Sweet's - Bestwall Gypsum Lath and Plaster Literature

3 - Sweet's - Gypsum Association Literature-Fire Resistance - Design Data

4 - Gypsum Association Literature, Manual of Gypsum - Lathing and Plastering

B E S T W A L L G Y P S U M C O M P A N Y

GYPSUM WALLBOARD MANUAL

1965 EDITION

SOUND CONTROL

Tests for solutions to noise control problems are conducted for the Bestwall Gypsum Company by the following:

1 - Geiger and Hamme Acoustical Laboratories
Ann Arbor, Michigan

2 - Ohio Research Corp.
Avon, Ohio

3 - Riverbank Laboratories - Geneva, Illinois

Results of Sound Tests are listed by the following:

1 - Sound Advice - Bestwall Gypsum Literature

2 - Sweet's - Bestwall Gypsum Wallboard Products

3 - Owens - Corning Fiberglas - Solutions to noise control problems in the construction of houses, apartments, motels and hotels (second edition-February 1964)

4 - Gypsum Association - Fire Resistance - Design Data.

5 - I B I Publications - Noise Control with insulation board for homes, apartments, motels and offices.

6 - F H A Publications

7 - Sweet's - Bestwall Gypsum Lath and Plaster Literature

8 - Sweet's - Bestwall - Incombustible Acoustical Tile - Incombustible Ceiling Tile - Fire Rated Tile

9 - Sound Tests of Wall and Ceiling Assemblies

B E S T W A L L G Y P S U M C O M P A N Y

GYPSUM WALLBOARD MANUAL
1965 EDITION

Section 9
Sub-Section B

SOUND TESTS OF WALL and CEILING ASSEMBLIES

This table is a summary only, based on sound characteristics of assemblies with specific details as covered in Official Test Reports and/or publications of the National Bureau of Standards, Ohio Research Corporation, Geiger and Hamme, Riverbank Laboratories and/or the Bestwall Gypsum Company.

Official Test Reports for sound tests sponsored by the Bestwall Gypsum Company are available from the Bestwall Gypsum Company, Paoli, Pennsylvania.

The table is not meant as a complete listing of all sound tests in the Industry, but you will find some of the latest sound tests reported by the Industry and the Bestwall Gypsum Company.

1.	Partition - Gypsum Wallboard	--	Wood Framing
2.	Partition - Gypsum Wallboard	--	Nailable Metal Stud
3.	Partition - Gypsum Wallboard	--	Clips & Metal Stud
4.	Partition - Gypsum Wallboard	--	Metal Screw Stud
5.	Partition - Gypsum Wallboard	--	Donn Movable Metal Stud
6.	Partition - Gypsum Wallboard	--	Semi-Solid Lamination
7.	Partition - Gypsum Wallboard	--	Solid Lamination
8.	Partition - Gypsum Wallboard	--	Double Solid Lamination
9.	Floor and Ceiling Construction	--	Gypsum Wallboard Wood Joists
10.	Partition - Plaster	---	Wood Framing
11.	Partition - Plaster	---	Nailable Metal Stud
12.	Partition - Plaster	---	Solid (Gypsum LATH and METAL LATH)

PARTITION CONSTRUCTION S.(1)	WOOD FRAMING	STUD SPACE O.C.	PANEL THICK-NESS	TEST REF.	YEAR OF TEST	WT. LB. SQ.FT.	WALL SURFACE
WOOD STUDS	1" x 3"	16"	3-1/8"	BS-211	1943	2.5	1/4"-PLYWOOD - GLUED - BOTH SIDES
WOOD STUDS STAGGERED	1" X 3"	8" 16"	4-1/8"	BS-214	1943	2.9	1/4" PLYWOOD - GLUED - BOTH SIDES
WOOD STUDS	2" X 4"	16"	4-5/8"	---		6.0	1/2" BWG - BOTH SIDES NAILED W/MINERAL WOOL IN STUD SPACE
WOOD STUDS	2" X 4"	16"	4-5/8"	BS-234	1953	5.6	1/2" BWG - BOTH SIDES - NAILED
WOOD STUDS STAGGERED	2" X 4"	8" 16"	4-5/8" 4-5/8"	BS-242	1957	6.2	1/2" BWG - BOTH SIDES - NAILED
BWG - RIB	- - - -	24"	4"	RVB	1957	4.1	1/2" BWG - BOTH SIDES - SCREWED
WOOD STUDS	2" X 4"	16"	4-7/8"	OR-64-8		7.0	5/8" F/S - BOTH SIDES - NAILED
WOOD STUDS STAGGERED	2" X 3"	8" 16"	4-7/8" 4-7/8"	BS-243 1956-14	1957 1956	7.7 8.7	5/8" BWG - BOTH SIDES - NAILED
WOOD STUDS	2" X 4"	16"	5-1/2"	OR 64-11		9.5	5/8" F/S - 1 LAYER ONE SIDE - 2 LAYERS OTHER SIDE
WOOD STUDS	2" X 4"	16"	5-1/8"	BS-225	1948	8.2	2 LAYERS - 3/8" BWG. - NAILED EACH SIDE - HUMMER SYSTEM "A"
WOOD STUDS STAGGERED	2" X 3"	8" 16"	5-5/8"	BS-235	1953	11.0	2 LAYERS - 1/2" BWG - EACH SIDE NAILED
WOOD STUDS	2" X 4"	16"	6-1/8"	OR-64-12		12.0	2 LAYERS - 5/8" F/S - EACH SIDE NAILED
WOOD STUDS	2" X 3"	8"	6-1/8"	BS-244	1957	13.4	2 LAYERS - 5/8" BWG - EACH SIDE NAILED
STAGGERED		16"		"	"	"	" " " " " " "
WOOD STUDS	2" X 4"	16"	9"	BS-244		13.4	2 LAYERS 5/8" F/S - EACH SIDE NAILED
WOOD STUDS	2" X 4"	16"	5-7/8"	OR-64-67		13.4	5/8" F/S - 1/2" SOUND DEADENING BOARD - BOTH SIDES
WOOD STUDS	2" X 4"	16"	5-3/8"	OR-64-19		7.1	1 LAYER - 5/8" F/S - NAILED - 1 LAYER SCREWED TO RESILIENT CHANNEL OTHER SIDE
WOOD STUDS	2" X 4"	16"	5-3/8"	OR-64-16		7.2	1 LAYER - 5/8" F/S - NAILED - 1 LAYER - SCREWED TO RESILIENT CHANNEL OTHER SIDE - PLUS FIBERGLASS INSULATION IN STUD SPACE
WOOD STUDS	2" X 4"	16"	6"	OR-64-15		9.6	2 LAYERS - 5/8" F/S - NAILED ONE SIDE - 1 LAYER 5/8" F/S - SCREWED TO RESILIENT CHANNEL OTHER SIDE
WOOD STUDS	2" X 4"	16"	5-5/8"	-----		9.9	2 LAYERS - 1/2" BWG - BOTH SIDES
WOOD STUDS STAGGERED	2" X 4"	16"	5-5/8"	-----		11.0	2 LAYERS - 1/2" BWG - BOTH SIDES
WOOD STUDS	2" X 4"	16"	5-1/4"	TR 59-9	1958	8.2	1 LAYER - 3/8" BACKER BD. WITH RL CLIPS - 1 LAYER 3/8" BWG - BOTH SIDES

** BWG - BESTWALL GYPSUM
F/S - BESTWALL FIRESTOP
BS - BUREAU OF STANDARDS
OR - OHIO RESEARCH

TN, TR, TL — RIVERBANK

SGP 0028398

S.(1)

SOUND TRANSMISSION CHARACTERISTICS INDIVIDUAL FREQUENCIES-CPS											STC	D. B. AVER. 128 TO	SPEECH PRIV. RANGE	AVER. PLUS	LOAD BEARING	NON LOAD BEARING
125 128	175 192	250 256	350 384	500 512	700 768	1000 1024	1400 1414	2000 2048	2800 2828	4000 4096	5	4096	6	5		
16	16	18	20	26	27	28	-	37	-	33	-	24	-	-	-	X
14	17	20	23	28	30	33	-	40	-	30	-	29	-	-	-	X
-	-	-	-	-	-	-	-	-	-	-	-	40	-	-	-	-
22	23	28	32	33	41	44	-	46	-	39	-	34	-	-	-	-
36	31	36	40	40	46	47	-	52	-	45	-	42	-	47	-	-
26	27	33	37	40	44	41	48	50	42	40	-	38	-	-	-	-
22	16	29	31	33	38	41	41.5	36	36.5	-	34	32	38	-	-	-
43	44	37	38	40	46	48	-	51	-	50	-	43	-	48	-	-
-	-	-	-	-	-	-	-	-	-	-	-	43	-	-	-	X
23.5	19.5	33	34.5	36	40	43	45	40	40	47	37	35	41	-	-	-
27	24	31	35	40	42	46	-	53	-	48	-	38	-	-	-	-
42	40	39	40	45	42	45	-	41	-	53	-	43	-	-	-	-
26.5	22	36	37	42	43.5	48	49.5	45	44.5	51	41	39	46	-	-	-
41	41	41	43	46	48	49	-	41	-	54	-	45	-	50	-	-
-	-	-	-	-	-	-	-	-	-	-	-	45	-	-	-	X
-	-	-	-	-	-	-	-	-	-	-	-	45	-	-	-	X
25	30	38	43	47	52	57	58	55	54	59	46	45	54	-	-	X
27.5	26	33	41	43	49	51	51	42	41.5	51	43	40	46	-	-	-
33.5	35	43	50.5	51	54	55	53	54	47.5	53	50	48	53	-	-	-
32.5	32	38	44.5	49	52.5	55	56.5	49	45	54	48	45	51	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-
42	40	39	40	45	42	45	-	41	-	53	-	43	-	-	-	X
34	36	40	44	44	44	46	-	48.5	-	46	-	42	-	47	-	-

PARTITION CONSTRUCTION	WOOD FRAMING	STUD SPACE O.C.	PANEL THICK-NESS	TEST REF.	YEAR OF TEST	WT. LB. SQ.FT.	WALL SURFACE
WOOD STUDS DONN - DG -8 RESIL.CHANNEL	2" X 4"	16"	--	--	--	---	1/2" F/S - NAILED - ONE SIDE DG - 8 @ 24" O.C. - HORIZONTALLY - 1/2" F/S - SCREWED To DG - 8 -
WOOD STUDS DONN - DG -8 RESIL.CHANNEL	2" X 4"	16"	--	--	---	---	5/8" F/S - NAILED - ONE SIDE DG - 8 @ 24" O.C.- HORIZONTALLY - 5/8" F/S - SCREWED To DG - 8
WOOD STUD DONN - DG - 8 RESIL.CHANNEL	2" X 4"	16"	--	--	---	---	5/8" F/S - NAILED - ONE SIDE DG - 8 @ 24" O.C. HORIZ. - 5/8" F/S - SCREWED TO - DG - 8 - 1-1/2" FIBERGLAS - ECCM. BLANKET IN STUD SPACE
WOOD STUD DONN - DG - 8 RESIL.CHANNEL	2" X 4"	16"	--	--	---	---	2 LAYER - 1/2" F/S - ONE SIDE DG - 8 @ 24" O.C. HORIZ.- 1 LAYER SCREWED TO OTHER SIDE
WOOD STUD DONN - DG - 8 RESIL.CHANNEL	2" X 4"	16"	--	--	---	---	2 LAYER - 5/8" F/S - ONE SIDE DG - 8 @ 24" O.C. - HORIZ.- 1 LAYER 5/8" F/S - SCREWED TO - R. CHANNEL OTHER SIDE
DENS-COTE BASE OVER WOOD STUDS 2" X 4" W.STUDS	1/2"	16"	--	--	---	---	1/2" DENS-COTE BASE WITH 3/32" - DENS-COTE EACH SIDE
(2) WALLBOARD NAILING STUD	METAL FRAMING						
F & H NAILING STUDS	3-1/4"	24"	4-3/4"	TR 56-43	1956	6.1	5/8" BWG - EACH SIDE
NAILING STUD	3-5/8"	24"	4-7/8"	-----	--	6.5	5/8" F/S - EACH SIDE
NAILING STUD	3-5/8"	24"	6-1/8"	-----	--	11.5	2 LAYERS 5/8" F/S EACH SIDE
F&H NAILING STUD	3-1/2"	12"	5-1/2"	TR-56-44	1956	6.6	5/8" BWG - EACH SIDE
(STAGGERED)		24"					
PENN METAL NAILING STUD		24"	5-5/8"	TR 55-50	1955	12.8	5/8" BWG - PLUS 3/8" BWG - EACH SIDE
(STAGGERED)		24"	5-5/8"	TR 55-51	1955	12.8	(SAME)
PENN METAL NAILING STUD	3-5/8"	24"	4-7/8"	TN-F103 -655	1960	6.1	5/8" F/S - FINISHED
DONN DS-40 STUD RESILIENT		16"	4-3/8"	DON-1 FT.	9/22 1961	5	1/2" BWG
DONN - DS - 40 STUD RESILIENT		16"	4-3/8"	OC 53 FT.	9/23 1961	5	1/2" BWG - 2 LAYERS OCF - SOUND BLANKET
DONN - DS - 40 - STUD RESILIENT		16"	5-5/8"	TL 59-68	4/9 1959	12	5/8" BWG - 2 LAYERS EACH SIDE
(3) WALLBOARD CLIP & STUD	METAL FRAMING						
PENN METAL CLIP STUD	2-1/2"	24"	3-3/4"	TN-F103 -656	1960	6.4	5/8" F/S PANELED
PENN METAL CLIP STUD	2-1/2"	24"	3-3/4"	TL-61 -144	1961	7.0	5/8" F/S - ETERNAWALL

SGP 0028400

SOUND TRANSMISSION CHARACTERISTICS INDIVIDUAL FREQUENCIES-CPS											STC	D. B. AVER.	SPEECH PRIV.	AVER.	LOAD BEAR-	NON LOAD
125	175	250	350	500	700	1000	1400	2000	2800	4000						
128	192	256	384	512	768	1024	1414	2048	2828	4096	5	128 TO 4096	RANGE 6	PLUS 5	INGS	BEARING
-	-	-	-	-	-	-	-	-	-	-	39	37	47	-	-	-
-	-	-	-	-	-	-	-	-	-	-	43	40	46	-	-	-
-	-	-	-	-	-	-	-	-	-	-	50	48	53	-	-	-
-	-	-	-	-	-	-	-	-	-	-	46	43	51	-	-	-
-	-	-	-	-	-	-	-	-	-	-	48	45	51	-	-	-
-	-	-	-	-	-	-	-	-	-	-	41	39	45	-	-	-
(2) WALLBOARD NAILING STUD																
28	38.5	41.5	44.5	47	49.5	53.5	51	53.5	45	48.5	-	45	-	-	-	X
-	-	-	-	-	-	-	-	-	-	-	42	38	-	-	-	X
-	-	-	-	-	-	-	-	-	-	-	47	44	-	-	-	X
30.5	36	41.5	47.5	50	50	52	-	53.5	-	51.5	-	45	-	-	-	X
31.5	33.5	41	47	47.5	46.5	51	-	55	-	51.5	-	45	-	-	-	X
33	35	42	47	48.5	47.5	51	-	58	-	52	-	46	-	-	-	X
25	30	27	30	34	37	39	-	36	-	41	-	34	-	39	-	X
-	-	-	-	-	-	-	-	-	-	-	50	37	-	-	-	X
-	-	-	-	-	-	-	-	-	-	-	45	45	-	-	-	X
-	-	-	-	-	-	-	-	-	-	-	49	45	-	-	-	X
(3) WALLBOARD CLIP & STUD																
24	26	36	28	32	38	42	-	36	-	42	-	34	-	39	-	X
26	28	35	38	42	43	45	-	35	-	47	-	38	-	43	-	X

SGP 0028401

PARTITION CONSTRUCTION	METAL FRAMING	STUD SPACE O.C.	PANEL THICK-NESS	TEST REF.	YEAR OF TEST	WT. LB. SQ.FT.	WALL SURFACE
WALLBOARD CLIP & STUD							
CLIP	3-1/4"	16"	5"	BS-247		7.5	3/8" GYP. BACKER BD.- CLIPPED TO STUD - PLUS 3/8" BWG LAMINATED
MOLDED IRON	3-1/4"	16"	6-1/4"	G - H	1961	8.5	3/8" GYP. LATH - CLIPPED TO STUD - 1/2" F/S LAMINATED
HOLLOW STUD	3-1/4"	16"	6-1/8"	G - H NES-1 FT.	1961	8.1	5/8" BWG - LAMINATED TO 3/8" GYPSUM LATH
OLSEN CLIP - Z - STUD	3-5/8"	24"	4-7/8"	G - H NES-2 FT.	1961	7.0	5/8" ETERNAWALL - 4"
OLSEN CLIP - Z - STUD	3-5/8"	24"	4-7/8"	G--H NES-4 FT.	1961	7.0	5/8" ETERNAWALL - 4" G/F - Z STUD - STAGGERED JOINTS & 3" G/F INSUL.
OLSEN CLIP - Z - STUD	3-5/8"	24"	4-7/8"	G - H NES-5 FT.	1961	7.0	5/8" ETERNAWALL - 2" Z STUDS - 3" G/F INSUL.
(4) WALLBOARD SCREW STUD							
SCREW STUD	1-5/8"	24"	2-7/8"	TL-62-72		5.7	5/8" F/S - EACH SIDE
SCREW STUD	3-5/8"	24"	4-5/8"	OR-63-11		6.0	5/8" F/S - EACH SIDE
SCREW STUD	3-5/8"	24"	5-1/2"	OR-64-32		8.5	5/8" F/S - 1 LAYER ONE SIDE - 2 LAYERS OTHER SIDE
SCREW STUD	3-5/8"	24"	5-1/2"	OR-64-51		8.6	5/8" F/S - 1 LAYER ONE SIDE 2 LAYERS OTHER SIDE - FIBERGLASS - INSUL. IN STUD SPACE
SCREW STUD	1-5/8"	24"	3-7/8"	OR-64-61		8.4	5/8" F/S - 1 LAYER ONE SIDE -FIBERGLASS INSULATION IN STUD SPACE - 1 LAYER 5/8" F/S OVER - 1" COREBD. - OTHER SIDE
SCREW STUD	3-5/8"	24"	6-1/8"	OR-64-52		11.0	5/8" F/S - 2 LAYERS EACH SIDE
SCREW STUD	3-5/8"	24"	6"	OR-64-34		8.8	5/8" F/S - 2 LAYERS ONE SIDE 1 LAYER OVER 1/2" FIBER-GLASS BOARD - OTHER SIDE
SCREW STUD	3-5/8"	24"	6-1/8"	OR-64-50		11.1	5/8" - F/S - 2 LAYERS EACH SIDE -FIBERGLASS IN STUD SPACE
DG - 40 METAL STUD	2-1/2"	24"	---	DG-404 TL		--	1/2" BWG - EACH SIDE
DONN D-W-26 METAL STUD	1-5/8"	24"	2-7/8"	TL 62-72	12/13 1961	5.6	5/8" BWG - EACH SIDE
DONN D-W-48 METAL STUD	3"	24"	4"	TL 62-18	9/22 1961	4.55	1/2" BWG - EACH SIDE
DONN D-W-58 METAL STUD	3-5/8"	16"	4-7/8"	TL 61 -208	6/30 1961	7.0	5/8" BWG - EACH SIDE
DONN D-W-58 METAL STUD	3-5/8"	16"	5-1/2"	TL 62-19	10/5 1961	8.9	2 LAYERS - 5/8" BWG - ONE SIDE 1 LAYER 5/8" BWG - OTHER SIDE
DONN D-W-58 METAL STUD	3-5/8"	16"	6-1/8"	TL 61 -237	7/26 1961	11.9	2 LAYERS - 5/8" BWG - LAMIN. BOTH SIDES
(5) WALLBOARD MOVABLE PARTITION							
DONN - D-H-945 METAL STUDS		22"	2-3/4"	TL 61 -177	1961	6.25	5/8" BWG - DONN D-H-945 - M. STUD - SYS."A" MOVABLE

SGP 0028402

SOUND TRANSMISSION CHARACTERISTICS INDIVIDUAL FREQUENCIES-CPS											STC	O. B. AVER.	SPEECH PRIV.	AVER.	LOAD	NON
125	175	250	350	500	700	1000	1400	2000	2800	4000					BEAR-	LOAD
128	192	256	384	512	768	1024	1414	2048	2828	4096	5	128 TO 4096	RANGE 6	PLUS 5	ING	BEARING
35	34	39	43	44	49	50	-	50	-	51	-	45	-	-	-	X
27	31	34	40	44	54	55	59	58	58	61	-	47.2	-	-	-	X
27	31	34	40	44	54	55	57	58	58	61	-	47.1	-	-	-	X
30	34	41	45	46	44	43	43	51	47	49	-	43.0	-	-	-	X
31	35	42	46	49	44	46	47	53	51	50	-	45.0	-	-	-	X
32	36	38	43	46	45	46	47	53	58	49	-	43.8	-	-	-	X
(4) WALLBOARD SCREW STUD																
25	29	35	35	40	41	44	43	33	36	44	35	36	-	-	-	X
-	-	-	-	-	-	-	-	-	-	-	42	38	45	-	-	X
24	25	33	40	46	49	52	51	44	45	50	43	40	48	-	-	X
31	37	45	49	52	55	57	55	50	48	51	50	47	53	-	-	X
30	38	43	49	51	54	55	54	51	50	53	52	47	53	-	-	X
28	29	36	44	48	52	55	53	47	51	55	47	44	51	-	-	X
25	33	41	47	52	54	56	55	50	51	55	48	46	53	-	-	X
36	41	49	51	55	55	56	55	50	52	55	52	50	54	-	-	X
25	26	34	36	40	42	46	47	46	36	41	38	37	-	-	-	X
-	-	-	-	-	-	-	-	-	-	-	35	36	-	-	-	X
26	27	33	37	40	44	47	48	50	42	40	42	39.4	-	-	-	X
32	32	38	40	43	44	49	51	46	45	51	44	42	-	-	-	X
-	-	-	-	-	-	-	-	-	-	-	45	42	-	-	-	X
32	34	41	42	44	46	46	40	45	50	59	40	43	-	-	-	X
(5) WALLBOARD MOVABLE PARTITION																
25	26	29	32	35	38	40	41	36	37	41	-	34.5	-	-	-	X

SGP 0028403

	PARTITION CONSTRUCTION	METAL FRAMING	STUD SPACE O.C.	PANEL THICK-NESS	TEST REF.	YEAR OF TEST	WT. LB. SQ.FT.	WALL SURFACE
	WALLBOARD MOVABLE PARTITION (CONTINUED)							
	DONN - DH-326 STUD TRACKS	"	22"	2-3/4"	TL 61 -211	1961	6.70	5/8" BWG - DONN - DH-326 STUD TRACKS - SYSTEM "B"
	DONN - DH-326 STUD TRACKS	"	22"	2-3/4"	TL 61 -212	1961	6.4	5/8" BWG - DONN - DH-326 STUD TRACKS - SYSTEM "C"
	DONN - DH-445 METAL STUDS	"	22"	4-5/32"	TL 61 -238	1961	12.0	2 LAYERS 5/8" BWG - LAMINATED- - BOTH SIDES
	DONN - DH-444 METAL STUD (STAGGERED)	"	24"	3-1/2"	TL 62 -174	3/8 1962	4.8	1/2" BWG - DONN - DH-444 EACH SIDE
(6)	WALLBOARD SEMI-SOLID							
	SEMI-SOLID	2-1/4"	--	2-1/4"	BW-8 FT.	--	7.2	BESTWALL HUMMER SYSTEM "B" 5/8" F/S - EACH SIDE OF 1" X 6" GYPSUM RIB.
	SEMI-SOLID	4-3/4"	--	4-3/4"	OR-64-57	--	10.0	BESTWALL HUMMER SYSTEM "B" 5/8" F/S - OVER 1/2" SOUND DEADENING BOARD - EACH SIDE OF 2-1/2" X 3" GYPSUM RIB.
	SEMI-SOLID	2-1/4"	---	2-1/4"	TL-60 -131	1960	7.8	BESTWALL HUMMER SYSTEM "C"
	SEMI-SOLID 2' PREFAB. PARTITION	2-1/4"	---	2-1/4"	GH-BW-9 FT.	1962	7.3	5/8" BWG - EACH SIDE - OVER 1" GYPSUM RIB - FACE 2' MODULE.
	SEMI-SOLID 4' PREFAB. PARTITION	2-1/4"	---	2-1/4"	GH-BW-8 FT.	1962	6.4	BESTWALL HUMMER SYSTEM "B" 5/8" F/S - EACH SIDE OVER 1" GYPSUM RIB - FACE 4' MODULE.
	SEMI-SOLID		---	4"	TR 57 -42	1957	15.0	BESTWALL HUMMER SYSTEM "B" (2 LAYERS)
	SEMI-SOLID		---	5"	TR 57 -43	1957	15.5	BESTWALL HUMMER SYSTEM "B" (2 LAYERS)
(7)	WALLBOARD SOLID LAMINATED							
	2" SOLID PARTITIONS		---	2"	---	---	8.1	1/2" BWG - EACH SIDE OF 1" CORE BOARD- LAMINATED.
	2-1/4" SOLID PARTITION		---	2-1/4"	---	---	9.1	5/8" F/S - EACH SIDE OF 1" CORE BOARD- LAMINATED.
	2 LAYERS 1/2" BWG GLUED		---	1"	BS-528	1942	4.5	-------
	4 LAYERS 1/2" BWG GLUED		---	2"	BS-522	1949	8.9	-------
	4 LAYERS 1/2" BWG GLUED		---	2"	TR 56-15	1956	8.8	-------
	2-1/4" SOLID PARTITION		---	2-1/4"	TR 59 -98	1959	10.6	1" GYPSUM CORE - 5/8" BWG EACH SIDE (VAUGHN PARTITIONS)

SOUND TRANSMISSION CHARACTERISTICS INDIVIDUAL FREQUENCIES-CPS											STC	D. B. AVER.	SPEECH PRIV.	AVER.	LOAD	NON
125	175	250	350	500	700	1000	1400	2000	2800	4000					BEAR-	LOAD
128	192	256	384	512	768	1024	1414	2048	2828	4096	5	128 TO 4096	RANGE 6	PLUS 5	ING	BEARING
WALLBOARD MOVABLE PARTITION (CONTINUED)																
26	23	27	28	31	33	35	36	35	34	40	-	31.6	-	33	-	X
22	20	23	22	25	27	29	30	31	31	37	-	27.0	-	28	-	X
32	34	39	39	43	43	44	42	41	46	52	-	41.0	-	41	-	X
-	-	-	-	-	-	-	-	-	-	-	38	34	-	-	-	-
(5) WALLBOARD SEMI-SOLID																
21	17	27	34	36	40	39	43	36	36	39	35	32	37	-	-	X
28	36	43	46	50	54	58	59	58	57	59	51	48	56	-	-	X
23	23	31	36	36	38	39	39	36	36	41	37	34	37	-	-	X
27	24	20	29	34	33	37	40	35	37	39	-	32.4	-	-	-	X
21	17	27	34	36	40	39	43	36	36	39	-	33.5	-	-	-	X
29.5	31.0	34.5	37.0	38.0	36.5	35.0	-	42.0	-	51.5	-	37	-	42	-	X
32.0	34.0	37.5	39.5	39.5	38.0	38.5	-	46.5	-	54.0	-	40	-	45	-	-
(7) WALLBOARD SOLID LAMINATED																
-	-	-	-	-	-	-	-	-	-	-	-	37	-	-	-	X
-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	X
24	25	29	32	31	33	32	-	30	-	34	-	30	-	-	-	X
28	35	32	37	34	36	40	-	38	-	49	-	37	-	-	-	X
33.5	37.5	39	38	39.5	37.5	40	-	44	-	41	-	39	-	-	-	X
34.5	35	36	37.5	36	34	33.5	-	36	-	39	-	36	-	41	-	X

PARTITION CONSTRUCTION	FRAMING	STUD SPACE O.C.	PANEL THICK-NESS	TEST REF.	YEAR OF TEST	WT. LB. SQ.FT.	WALL SURFACE
(8) WALLBOARD DOUBLE SOLID							
4" DOUBLE SOLID		---	4"	TR-57 -42	---	13.4	5/8" F/S - 2 LAYERS EACH SIDE 1" GYPSUM RIB
5" DOUBLE SOLID		---	5"	TR-57-43	---	13.4	5/8" F/S - 2 LAYERS EACH SIDE - 1" RIB
6" DOUBLE SOLID		---	6"	OR-64-39	---	13	1/2" BWG OVER 1" CORE BOARD EACH SIDE OF 3" AIR SPACE
6" DOUBLE SOLID		---	6"	OR-64-58	---	17	1/2" BWG - 1 LAYER OVER 1" CORE BOARD EACH SIDE 3" AIR SPACE WITH 1" CORE BD. CENTERED IN AIR SPACE
6" DOUBLE SOLID		---	6"	OR-64-59	---	17.2	1/2" BWG - 1 LAYER OVER 1" CORE BOARD EACH SIDE OF 3" AIR SPACE WITH - 1" CORE BOARD CENTERED IN AIR SPACE AND FIBERGLASS INSULATION IN SPACE - 1 SIDE.
(9) WALLBOARD FLOOR & CEILING	FRAMING						
WOOD JOISTS	WOOD	16"	---	EST.	---	14.6	2 LAYERS 5/8" F/S - WITH RESILIENT CHANNEL BETWEEN LAYERS - @ 24" O.C.
WOOD JOISTS	"	16"	---	TL-64 -155	---	11.5	1/2" F/S - SCREWED TO RESILIENT CHANNEL @ 24"O.C.
(10) LATH & PLASTER PARTITIONS							
2" X 4"	"	16"	---	-----	---	15	TOTAL THICKNESS - 5-3/8" 3/8" B/W PINHOLATH 1/2" SANDED PLASTER THIN WHITE FINISH.
2" X 4"	"	16"	---	-----	---	14.7	TOTAL THICKNESS - 5-3/8" 3/8" PLAIN GYPSUM LATH 1/2" SANDED PLASTER THIN WHITE FINISH.
2" X 4"	"	16"	---	-----	---	18.1	TOTAL THICKNESS - 5-3/8" METAL LATH - 3/4" SANDED PLASTER - THIN WHITE FINISH.
PLASTER PARTITIONS							
2" X 4"	"	16"	5-3/8"	BS-420	1949	13.1	3/8" GYPSUM LATH WITH CLIP PLUS 1/2" SANDED PLASTER
2" X 4"	"	16"	5-1/8"	BS-148	1937	15.2	1/2" SANDED PLASTER OVER 3/8" GYPSUM LATH
2" X 4"	"	16"	5-1/8"	BS-239	1956	14.2	1/2" SANDED PLASTER OVER 3/8" GYPSUM LATH
2" X 4"	"	16"	5-1/8"	TR 56 -12	1956	13.2	1/2" SANDED PLASTER OVER 3/8" GYPSUM LATH
2" X 3" STAGGERED	"	8" 16"	5-1/8"	BS-245	1957	15.6	1/2" SANDED PLASTER OVER 3/8" GYPSUM LATH

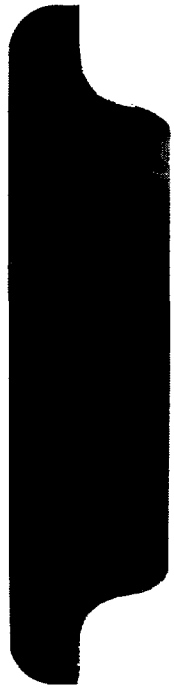
SGP 0028406

	SOUND TRANSMISSION CHARACTERISTICS INDIVIDUAL FREQUENCIES-CPS											STC	D. B. AVER.	SPEECH PRIV.	AVER.	LOAD	NON
	125	175	250	350	500	700	1000	1400	2000	2800	4000					BEAR-	LOAD
	128	192	256	384	512	768	1024	1414	2048	2828	4096	5	128 TO 4096	RANGE 6	FLUS 5	INS	BEARING
(8)	WALLBOARD DOUBLE SOLID																
	29.5	31	34.5	37	38	36.5	35	-	42	-	51.5	-	37	-	-	-	X
	32	34	37.5	39.5	39.5	38	38.5	-	46.5	-	54	-	40	-	-	-	"
	31	36	41	47	49	49	49	47	51	56	60	47	46	52	-	-	-
	29	34	40	45	47	50	54	55	59	60	60	51	46	54	-	-	-
	36	45	49	53	55	56	56	58	60	62	63	58	53	58	-	-	-
(9)	WALLBOARD FLOOR & CEILING																
	-	-	-	-	-	-	-	-	-	-	-	-	EST. 50	-	-	-	-
	34	35	37	44	48	45	49	49	51	50	54	47	44	49	-	-	-
(10)	LATH & PLASTER PARTITIONS																
	-	-	-	-	-	-	-	-	-	-	-	-	35 TO 45	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	35 TO 45	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-
	PLASTER PARTITIONS																
	46	44	46	56	54	57	57	-	50	-	62	-	52	-	-	-	-
	33	28	31	35	39	44	46	-	49	-	66	-	41	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	45	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	44	-	-	-	-
	48	48	46	47	48	47	48	-	48	-	59	-	49	-	54	-	-

SGP 0028407

PARTITION CONSTRUCTION FRAMING S(11)	STUD SPACE O.C.	PANEL THICK-NESS	TEST REF.	YEAR OF TEST	WT. LB. SQ.FT.	WALL SURFACE
NAILABLE PARTITION STUD PLASTER DS NAILABLE STUD	24"	4-3/8"	TL 64 -45	10/14 1963	10.4	DS - 40 - STUD @ 24" O.C. - 3/8" GYPSUM LATH - 1/2" PLASTER
2-1/2" DS NAILABLE STUD	16"	4-3/8"	TR-57 -38	1957	12.8	1/2" SANDED PLASTER OVER GYPSUM LATH & THIN WHITE COAT.
3-5/8" DS NAILABLE PART. STUD	16"	5-3/8"	TR-57 -40	1957	12.5	1/2" SANDED PLASTER OVER 3/8" GYPSUM LATH & FINISHED THIN WHITE COAT.
3-1/4"DS NAILABLE PART. STUD DONN	16"	5.0"	TR-57 -39	1957	12.4	1/2" SANDED PLASTER OVER 3/8" GYPSUM LATH - FINISHED THIN WHITE COAT.
2-1/2" DS NAILABLE PART. STUD DONN	16"	6"	TL-59 -90 DONN	1959	22.4	3/4" SANDED PLASTER OVER 3/8" - 3.4 LB. EXPAND.D-METAL LATH - FINISHED - THIN WHITE COAT.
GYPSUM LATH STAPLED TO M STUDS	16"	6"	TL-91 DONN	1959	13.0	1/2" SANDED PLASTER OVER 3/8" GYPSUM LATH - STAPLED TO STUDS - FINISHED THIN WHITE COAT.
GYPSUM LATH STAPLED TO M STUDS	---	5-1/4"	TL-60-2 DONN	1959	17.9	5/8" SANDED PLASTER OVER 3/8" GYPSUM LATH - STAPLED TO STUDS - FINISHED THIN WHITE COAT.
(12) LATH & PLASTER SOLID PARTITION						
2" SOLID PARTITION	SOLID	2"	----	---	16.5	1/2" L. L. GYPSUM LATH. 3/4" SANDED PLASTER - THIN WHITE FINISH
2" SOLID PARTITION	SOLID	2"	----	---	10.9	1/2" L. L. GYPSUM LATH 3/4" PERLITE PLASTER - THIN WHITE FINISH
2" SOLID PARTITION	SOLID	2"	----	---	18.1	METAL LATH - THIN WHITE FINISH
DENS-COTE SYSTEM						
3-5/8" METAL STUD	6-5/16"		----	----	12.8	2 LAYER 5/8" F/S DENS-COTE BASE - EACH SIDE - 3/32" DENS-COTE BASE

SOUND TRANSMISSION CHARACTERISTICS INDIVIDUAL FREQUENCIES-CPS											STC	D. B. AVER.	SPEECH PRIV.	AVER.	LOAD	NON
125	175	250	350	500	700	1000	1400	2000	2800	4000						
128	192	256	384	512	768	1024	1414	2048	2828	4096	5	128 TO 4096	RANGE 6	PLUS 5	BEAR-ING	LOAD BEARING
(11) NAILABLE PARTITION STUD																
-	-	-	-	-	-	-	-	-	-	-	38	41	-	-	-	-
20.5	26.5	34.5	37.0	37.5	39.5	40.0	-	39.5	-	49.0	-	36	-	-	-	-
21.5	29.0	36.0	38.5	38.0	40.5	42.5	-	39.5	-	49.5	-	37	-	-	-	-
19.0	26.0	33.5	35.5	36.5	38.5	40.5	-	39.5	-	52.5	-	36	-	-	-	-
39.5	39.5	43.5	49.0	48.5	48.0	43.0	43.5	49.0	54.5	56.0	-	46	-	-	-	-
36.0	39.0	43.0	48.5	49.0	49.5	50.0	48.0	45.5	52.0	55.0	-	46	-	-	-	-
37.5	39.0	43.0	47.5	49.0	48.5	44.0	45.0	49.0	54.0	57.5	-	46	-	-	-	-
(12) LATH & PLASTER SOLID PARTITION																
-	-	-	-	-	-	-	-	-	-	-	-	38	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	37	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	38	-	-	-	-
DENS-COTE SYSTEM																
-	-	-	-	-	-	-	-	-	-	-	-	45	-	-	-	-



J. C. Clark
Acquired

GEORGIA-PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION

February 8, 1967

TO: ALL REGIONAL SALES MANAGERS
ALL DISTRICT SALES MANAGERS
ALL SALESMEN

General Sales Bulletin #14-67

CC: R. I. Fredericks, Paoli
K. A. McCaskill, Paoli
M. M. Powers, Paoli

SUBJECT: S.B.C.C. REPORT NO. 6671

RE: 5/8"Firestop

BY: G. C. Moore:jw

FILE: Gypsum Products Manual #2
Section 10-Building Codes

Attached are two copies of an approval issued by the Model Building Code - "Southern Building Code Congress" (S.B.C.C.) Report No. 6671 dated November 17, 1966 that approves the use of all 5/8" thick Georgia-Pacific/Bestwall "FIRESTOP" gypsum wallboard in construction assemblies that include partitions, floor and ceilings and steel column fireproofing assemblies.

This report supercedes and takes precedence over S.B.C.C. Approval Report No.6344 dated October 10, 1963.

This approval is divided into seven sections that describe the construction assemblies using 5/8" thick "FIRESTOP", and they are: (1) Wood Stud Partitions (L.B.) (2) Wood Stud Partitions (N.L.B.) (Fire retardant treated wood studs) (3) Metal Stud Partitions (N.L.B.) (4) Metal Stud Partitions (L.B.) (5) Solid and Semi-Solid Gypsum Wallboard Partitions (N.L.B.) (6) Floor and Ceiling Assemblies and (7) Steel Column Fireproofing

Please note that 5/8" GP/Bestwall "FIRESTOP" Tile Backer Board is approved for use with the described partition assemblies in single layer and/or multiple layer application where a water resistant gypsum wallboard is required with fire resistive rating.

Thin Veneer plaster systems that include GP/Bestwall Dens-Cote System has been approved and written into the "Red Book", the "Southern Standard Building Code."

This approval is of particular interest to the sales representatives that sell in areas that follow building standards as set forth by the Southern Building Code Congress

If additional copies of this approval are required they are available from the General Sales office, Paoli, Pennsylvania.

G. C. M.
Jcm

Encl(2)

COMMITTEE
MYRON J. SASSER, Chm.
BURNNIE HOLLIDAY
J. D. LYONS

Southern Building Code Congress

BROWN-MARX BUILDING BIRMINGHAM, ALABAMA

REPORT: 6671
APPROVED: 11-17-66
EXPIRES:

COMMITTEE on COMPLIANCE APPROVAL REPORT

ON

5/8" THICK BESTWALL FIRESTOP PARTITIONS-FLOOR AND CEILING ASSEMBLIES-COLUMN FIREPROOFING

SUBMITTED BY

GEORGIA-PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION
PAOLI, PENNSYLVANIA

The Manufacturer made formal application on June 29, 1966, for re-evaluation of their Approval Report 6344 dated October 10, 1963, together with new fire endurance test reports on new assemblies, column fireproofing and certification that there has been no significant changes in the various assemblies previously approved.

THIS APPROVAL REPORT SUPERSEDES AND TAKES PRECEDENCE OVER REPORT 6344 DATED OCTOBER 10, 1963, THEREBY REMOVING AND MAKING INVALID APPROVAL REPORT 6344 AS DATED OCTOBER 10, 1963.

The Committee on Compliance has reviewed the data submitted on August 11, 1958, July 19, 1963, together with new test reports, etc. submitted on June 29, 1966, for compliance with the Southern Standard Building Code and submits its Report as follows:

DESCRIPTION:

Bestwall Firestop is a gypsum wallboard having a special core formulation under a patented process in which incombustible glass fibers and unexpanded vermiculite have been added to the gypsum core. Firestop is manufactured in ½" and ⅝" thicknesses, 4 foot width and 6 to 16 foot lengths. It is available in tapered, square or tongue and groove edges. The following is a brief description of the various partitions, floor and ceiling assemblies and column fireproofing, using ⅝" Bestwall Firestop and their fire retardant ratings.

1. WOOD STUD PARTITIONS — LOAD BEARING.

(a) **Bestwall Wood-Framed Partition (1 hour)** is a 4⅞" wide load bearing partition consisting of 2" x 4" wood studs 16" o.c., 2" x 4" fire stops between the studs at mid-height of the framing and ⅝" Bestwall Firestop gypsum wallboard attached to both sides of the studs with 6-d, 1⅞" long cement-coated, flat-head nails, spaced 7" o.c. U.L. Report R-2889 and Design No. 5.

(b) **Bestwall Wood-Framed Partition (1 hour)** is a 5⅜" wide load bearing partition, consisting of 2" x 4" wood studs 16" o.c., 2" x 4" fire stops mid-height of the framing, resilient furring channels 24" o.c. horizontal on one side of the studs, 1½" fiberglass insulation in stud space and ⅝" Bestwall Firestop gypsum wallboard attached to resilient furring channels with 1" long drywall screws and nailed to the studs on the other side, one layer of ⅝" Firestop nailed with 6d cement-coated flat-head nails. O.S.U. Report T-3127.

(c) **Bestwall Wood-Framed Partition (1 hour)** is a 5⅞" wide load bearing partition consisting of 2" x 4" wood studs 16" o.c., 2" x 4" firestops between studs at mid-height of the framing, ½" sound deadening fiberboard is attached to each side of the studs with 5d common cement-coated nails and ⅝" Bestwall Firestop gypsum wallboard laminated with three 4" strips of Bestwall Laminating Compound spaced off center line and ½" from each edge to the fiberboard and nailed to the studs 8d box nails. O.S.U. Report T-3006.

(d) **Bestwall Wood-Framed Partition (1 hour)** is a 4⅞" wide load bearing partition consisting of 2" x 4" wood studs 16" o.c., 2" x 4" fire stops between the studs at mid-height of the framing and ⅝" Bestwall Firestop Tile Backer Board is attached to both sides of the studs with 6d 1⅞" long cement coated flat head nails spaced 7" o.c. U.L. Design No. 5.

(e) **Bestwall Wood-Framed Partition (2 hours)** is a 6⅛" wide load bearing partition, consisting of 2" x 4" stud walls 16" o.c., 2" x 4" fire stops between the studs at mid-height of the framing and two layers of ⅝" Bestwall Firestop gypsum wall attached to both sides of the studs with 6d and 8d cement coated common nails. O.S.U. Report T-194.

2. WOOD STUD PARTITIONS NON-LOAD BEARING.

(a) **Bestwall Partition with Treated Wood Framed Partition (1 hour)** is a 4⅞" wide non-load bearing partition, consisting of 2" x 4" U.L. listed fire-retardant treated wood studs 24" o.c., 2" x 4" fire stops between studs at mid-height of the framing, and ⅝" Bestwall Firestop Type X gypsum wallboard attached to both sides of the studs with 6d cement coated nails. Forest Products Fire Test Furnace Fire Test was conducted for American Wood Preservers Institute on August 31, 1965.

3. METAL STUD PARTITIONS NON-LOAD BEARING.

(a) **Bestwall Metal Stud Partition (1 hour)** is a 4⅞" wide non-load bearing partition consisting of 3⅝" F & H light weight galvanized nailable steel studs 24" o.c. attached to the top and bottom channels runners with four No. 6 sheet metal screws, two at top and bottom on opposite sides at flanges of the studs, and ⅝" Bestwall Firestop gypsum wallboard is attached to each side of the metal studs with ⅛ x 1½" annular nails, ¾" diameter nailing disc with ⅛" holes are used with the nails at the joints. U. L. Report 3843 and 2717, Design No. 11.

(b) **Bestwall Metal Stud Partition (1 hour)** is a 2⅞" wide non-load bearing partition consisting of 1⅝" deep cold form steel channel studs, inserted in the ceiling and base tracks 24" o.c., and ⅝" Bestwall Firestop gypsum wallboard is attached to each side of the metal studs with 1" long self drilling sheet metal screws 8" o.c. at top and bottom edges and at the vertical butt joints where centered over studs, and 12" o.c. at all intermediate studs. O. S. U. Report No. T-2316.

(c) **Bestwall Metal Stud Partition (1 hour)** is a 3¾" wide non-bearing partition consisting of 2½" screwable steel channel studs 24" o.c., inserted and anchored to the top and bottom channel runners, and ⅝" Bestwall Firestop Eternawall Type "X" Vinyl coated gypsum wallboard attached to the metal studs with 1¼" long screws 12" o.c. at the ceiling and base

and at each stud at the center and 25" each way from the center. The base and ceiling trim was attached to the base and ceiling track and the battens were cut to length, positioned over each stud and fastened with 1½" screws 12" o.c., then the extruded plastic inserts are placed in the battens. O. S. U. Report T-2898.

(d) **Bestwall Metal Stud Partition (1½ hour)** is a 5½" wide non-bearing partition consisting of 3⅝" steel 25 gauge studs 24" o.c., inserted and anchored in the top and bottom channel runners, a layer of ⅝" Bestwall Firestop is fastened to one side of the studs with 1" long drywall screws 48" o.c., 3" of glass fiber insulation is attached to the back side of the gypsum wallboard with staples, a layer of ⅝" Bestwall Firestop is applied to the other side of the steel studs, with 1" long drywall screws 12" o.c., a second layer of ⅝" Bestwall Firestop is laminated to the first layer with staggered joints and fastened with 1¾" long drywall screws 16" o.c. at the intermediate studs and 12" o.c. at the vertical joints and periphery. O.S.U. Report T-3126.

(e) **Bestwall Metal Stud Partition (2 hours)** is a 5" wide non-bearing partition consisting of 2½" wide by 1⅝" deep channel section roll framed from 0.022 inch thick electra-galvanized steel studs 24" o.c., inserted and anchored in the top and bottom channel runners, a layer of ⅝" Bestwall Firestop gypsum wallboard is fastened to each side of the studs with 1" long self drilling sheet metal screws, and a second layer of ⅝" Bestwall Firestop is laminated to the first layer with the joints staggered and fastened with 1¾" long self drilling sheet metal screws. O. S. U. Report No. T-2557.

(f) **Bestwall Metal Stud Partition (2 hours)** is a 6⅛" wide non-bearing partition consisting of 3 ⅝" Zee studs of 20 gauge electra-galvanized steel 24" o.c., inserted and anchored in the top and bottom channel runners, a layer of ⅝" Bestwall Firestop tapered edge gypsum wallboard is fastened to studs with metal clips 12" o.c. at vertical joints and 1" long self-drilling screws 12" o.c. at the blind studs, 24" o.c. at top and bottom of panel and 30" o.c. along both vertical edges, and a layer of ⅝" tapered edge Bestwall Firestop Eternawall gypsum wallboard is laminated to the first layer and fastened with 1½" self drilling screws, 8" o.c. at top of partition, 24" o.c. at bottom and vertical studs. O. S. U. Report T-2406.

4. METAL STUD PARTITIONS — LOAD BEARING.

(a) **Bestwall Metal Stud Partition (1 hour)** is a 4⅞" wide load bearing partition consisting of 3 ⅝" wide 16 gauge steel studs 24" o.c., and matching channels for base and ceiling. The steel frame work is assembled on the floor, the studs, top and bottom channel runners are fastened together with sheet metal screws, set in place properly aligned then the top and bottom channels are welded to the studs. A layer of ⅝" Bestwall Firestop gypsum wallboard is attached to the studs with 6d cement coated nails 7" o.c. and all vertical joints are sealed with cement and fiber tape. O. S. U. Report T-209.

5. SOLID AND SEMI-SOLID GYPSUM WALLBOARD PARTITIONS.

(a) **Bestwall Semi-Solid Hummer "B" Partition (1 hour)** is a 2¼" deep laminated non-load bearing partition, consisting of 1 x 1⅝" wood runners, (combustible) or 1" x 1½" 24 gauge galvanized steel "L" or "U" shaped runners (incombustible) 3¼" and 6¼" wide gypsum wallboard ribs of double layers ½" ordinary gypsum wallboard laminated with a casein type glue and ⅝" Bestwall Firestop gypsum wallboard with staggered joints laminated, nailed or screwed to the ribs and wood and/or metal runners in accordance with manufacturer's specification. U. L. Report R-2717-19-21, Design No. 10.

(b) **Bestwall Semi-Solid Modified Partition (2 & 3 hours)** is a 4" and 5" laminated non-load bearing partition consisting of 1½ x 1⅝" wood (combustible) or or 1" x 1½" 24 gauge galvanized steel runners (incombustible) runners on the 4" partition and 1" x 1⅝" wood runners on the 5" partition, double row of 1" x 6" wide gypsum wallboard ribs of double layers ½ regular gypsum wallboard laminated with a casein type of glue, and two layers of ⅝" Bestwall Firestop gypsum wallboard each side, laminated, nailed and screwed to the ribs and wood or metal runners in accordance with manufactuer's specifications. U. L. Report No. R-2717-20-22, Design No. 5-5" deep (3 hours), Design No. 2-4" deep (2 hours).

(c) **Bestwall Semi-Solid Gypsum Stud Partition (1 hour)** is a 4¾" deep laminated non-loadbearing partition, consisting of 1" x 2½" steel channel tracks formed of 25 gauge steel, 2½" x 3" gypsum studs consisting of four layers of ⅝" gypsum wallboard laminated together with Bestwall Laminating Compound, ½" Bestwall Sound Deadening Board and ⅝" Bestwall Firestop gypsum wallboard is laminated with three 4" strips of Bestwall Laminating Compound spaced off center line and ½" from the edges to the studs and fastened with drywall screws in accordance with manufacturer's specifications. O. S. U. Report No. T-3128.

NOTE: Bestwall ⅝" Thick Firestop Tile Backer Board may be used as an alternate method in construction assemblies as the face layer in all partition assembies herein described. ⅝" thick Bestwall Firestop Tile Backer Board may be used in single or multiple layer applications that require a fire resistive rating, when used in shower or bath areas or where a fire rated gypsum wallboard is required as a backing for ceramic, metal or plastic tile is applied.

6. FLOOR AND CEILING ASSEMBLIES.

(a) **Bestwall Drywall Wood Frame Ceiling System (1 hour)** consists of nominal 1" wood sub-floor and finished floor over nominal 2" wood joist spaced 16" o.c. with ⅝" Bestwall Firestop Gypsum Wallboard nailed to the under side of the joist with 6d cement-coated common nails 1⅞" long and spaced 6" o.c. U. L. Report No. R-2717-7-8. U. L. Design No. 1.

(b) **Bestwall Drywall Wood Frame Ceiling System (2 hours)** consist of nominal 1" wood sub-floor and finished floor over nominal 2" wood joist spaced 16" o.c., with two layers of ⅝" Bestwall Firestop Gypsum Wallboard and resilient channels 24" o.c. between layers fastened to the bottom of the joist, in accordance with manufacturer's specifications. U. L. Report No. R-2717 - 35, Design No. 217.

(c) **Bestwall Drywall Steel Joist Ceiling System (1 hour)** consist of 2" reinforced concrete floor on ribbed lath supported on open web steel joist 24" o.c., steel furring channels 16" o.c., and ⅝" Bestwall Firestop gypsum wallboard fastened to bottom of channels with either 1¼" annular type nails 6" o.c., or No. 10 flathead sheet metal screws 8" o.c. U. L. Report No. R-2717-16, Design No. 2.

(d) **Bestwall Drywall Steel Joist Ceiling System (1½ hours)** consist of 2" reinforced concrete floor on ribbed lath supported on open web steel joist 24" o.c., galvanized steel furring channels 24" o.c., and ⅝" Bestwall Firestop gypsum wallboard fastened to bottom of channels with No. 6 - 1" long Phillips head tapping sheet metal screws 12" o.c. U. S. Report No. R-2717-26, Design No. 13.

(e) **Bestwall Drywall Steel Joist Ceiling System (2 hours)** consist of 2½" reinforced concrete floor on ribbed lath supported on open web steel joist 24" o.c., galvanized steel furring channels 24" o.c., and ⅝" Bestwall Firestop gypsum wallboard fastened to bottom of Channels with No. 6 - 1" long Phillips head self tapping sheet metal screws 12" o.c. U.L. Report No. R-2717-27, Design No. 69.

(f) **Bestwall Drywall Steel Joist Suspended Ceiling System (2 hours)** consist of 2½" reinforced concrete floor on rib lath supported on open web steel joist 24" o.c., exposed-grid suspension system with ⅝" thick x 24" x 24" Bestwall Firestop "120" lay-in gypsum ceiling tile and with recessed-type eight fixtures and air ducts. U. L. Report R-2717-32, Design No. 208.

(g) **Bestwall Drywall Steel Joist Suspended Ceiling System (2 hours)** consist of 2" reinforced concrete floor on rib lath supported on open web steel joist 24" o.c., exposed-grid suspension system with ⅝" thick x 24" x 24" Bestwall Firestop "120" lay-in gypsum ceiling tile O.S.U. Report No. T-2104.

7. STEEL COLUMN FIREPROOFING.

(a) **Bestwall Drywall Steel Column Protection (1 hour)** consist of a single layer of ⅝" Bestwall Firestop gypsum wallboard boxed around the column attached to lightweight galvanized channel studs which are installed vertically along the edges of each column flange with 1" L.G. Bestwall Drywall Screws 8" o.c. and 1¼ x 1¼" metal corner bead.

(b) **Bestwall Drywall Steel Column Protection (2 hours)** consist of two layers ⅝" Bestwall Firestop gypsum wallboard boxed around the column attached to lightweight galvanized channel studs which are installed vertically along the edges of each column flange with 1" and 1¾" L.G. No. 6 Drywall screws 24" and 12" o.c. and 1¼" x 1¼" metal corner bead. U.L. Report No. R-2717-34, Design No. 8.

(c) **Bestwall Drywall Steel Column Protection (3 hour)** consist of three layers ⅝" Bestwall Firestop gypsum wallboard boxed around column attached to lightweight galvanized channel studs, which are installed vertically along the edge of each column flange, with 1", 1¾" and 2½" L.G. No. 6 Drywall screws 12" and 24" o.c., and 1¼" x 1¼" metal corner bead. U.L. Report No. R-2717-31, Design No. 18.

(d) **Bestwall Drywall Steel Column Protection (4 hours)** consist of four layers ⅝" Bestwall Firestop gypsum wallboard boxed around column attached to lightweight galvanized channel studs, which are installed vertically along the edge of each column flange with 1", 1¾ and 2½" L.G. No. 6 Drywall screws 12" and 24" o.c., the last layer of gypsum wallboard is laminated and nailed 8d finishing nails, and 1½" x 1¼" metal corner bead. U.L. Design No. 26-4 hour.

NOTE: Based on Underwriter's Letter Report July 20, 1962, Tape and Cement not required for fire resistive ratings.

SUBSTANTIATING DATA:

1. Manufacturer's technical data.
2. Fire endurance test per ASTM E-119 conducted by Underwriter's Laboratories, Inc., or the Ohio State University.

(a) Underwriter's Laboratories, Inc.

R - 2889	1 hour
R - 2717-7-8	1 hour
R - 3843 - 2717	1 hour
R - 2717 - 16	1 hour
R - 2717 - 19 - 21	1 hour
R - 2717 - 20 - 22	2 and 3 hours
R - 2717 - 26	1½ hours
R - 2717 - 27	2 hours
R - 2717 - 35	2 hours
R - 2717 - 32	2 hours
R - 2717 - 34	2 hours
R - 2717 - 31	3 hours

(b) The Ohio State University

T - 209	1 hour
T - 194	2 hours
T - 2406	2 hours
T - 3006	1 hour
T - 3127	1 hour
T - 2316	1 hour
T - 2898	1 hour
T - 3126	1½ hours
T - 2557	2 hours
T - 3128	1 hour
T - 2104	2 hours

REFERENCES TO SOUTHERN STANDARD BUILDING CODE:

Section 103.6	Alternate Materials and Alternate Methods of Construction.
Section 201.2	Definition - Noncombustible Material.
Section 601.2	Fire Resistive Construction Requirements.
Chapter VII	Fire Protection Requirements.
Chapter X	Fire Resistance Standards for Materials and Construction.
Appendix B	Fire Resistance Ratings for Materials and Construction.

IDENTIFICATION:

Bestwall Firestop is shipped twin mounted (2 boards face to face) and an end bundling tape with the U.L. Manifest (label) on each end.

All Bestwall Firestop sheets shall carry a face marking in the center of the board, repeated every five feet "⅝" (or ½") Bestwall Firestop Type "X".

COMMITTEE FINDINGS:

The Committee on Compliance after reviewing the data submitted finds that, in their opinion, Bestwall Gypsum Division of Georgia-Pacific Corporation's ⅝" Thick Bestwall Firestop Partitions, Floor and Ceiling Assemblies and Column Fireproofing as enumerated in this Report meets the requirements of the Southern Standard Building Code.

COMMITTEE RECOMMENDATIONS:

The Committee recommends that Bestwall Gypsum Division of Georgia-Pacific Corporation's, ⅝" Thick Bestwall Firestop Partitions, Floor and Ceiling Assemblies and Column Fireproofing as enumerated in this Report, uses and limitations as set forth in this Report be approved by the Southern Building Code Congress.

LIMITATIONS:

1. Assemblies 1 (2) through (e) Bestwall Wood Framed Partitions (load bearing).
   (a) Maximum spacing of framing members for load bearing partitions for fire rated systems 16" o.c.
2. Assembly 2 (a) Bestwall Treated Wood Frame Partition (non-load bearing).
   (a) This assembly shall not be used as a load bearing partition.
3. Assemblies 3 (a) through (g) Bestwall Metal Stud Partition (non-load bearing).
   (a) These assemblies shall not be used as a load bearing partition.
   (b) That partition heights be limited to the following table:

STUD WIDTH	STUD SPACING 24" O.C.
1⅝"	9 foot height
2½"	12 foot height
3⅝"	16 foot height

4. Assembly 4 (a) Bestwall Metal Stud Partition (load bearing).
   (a) That floor and ceiling runners shall be metal.
   (b) That partition height shall be limited to 10 feet.
5. Assemblies 5 (a) through (c) Bestwall Solid and Semi-Solid Gypsum Wallboard Partitions.
   (a) These assemblies shall not be used as load bearing partitions.

(b) That partition height shall be limited to 12 feet.

6. Assemblies 6 (a) through (g) Bestwall floor and ceiling assemblies.

   (a) That wood joist shall not be spaced more than 16" o.c.

   (b) That steel joist shall not be spaced more than 24" o.c.

7. Assemblies 7 (a) through (d) Bestwall Steel Column Fireproofing.

   (a) That this system of column fireproofing be used only where it is not exposed to mechanical damage, excessive moisture or humidity.

8. Assemblies 1 through 7.

   (a) That the Manufacturer's specifications and installation on all the wall systems, floor and ceiling assemblies or column fireproofing enumerated in this Report be strictly adhered to.

   (b) That gypsum wallboard shall not be used when exposed to excessive moisture or humidity.

   (c) That gypsum wallboard shall be protected against excessive moisture during job handling, storage and application.

   (d) That only accessories, impaling clips, facing units recommended by the Manufacturer shall be used in the assemblies enumerated in this Report.

   (e) That the construction of partitions, wall, floor, ceiling systems and column fireproofing must be in accordance with the respective testing laboratories designs in order to obtain the fire-resistance ratings.

PERIOD OF APPROVAL:

This Approval or Certificate of Compliance will be in effect as long as the product "Bestwall Firestop" is listed by Underwriters' Laboratories and manufactured under Underwriters' Inspection Service. Should any revision or changes of method of construction occur, this Approval shall terminate. This, however, is not to be construed to preclude any new submittals.

M. J. Sasser, Chairman
Birmingham, Alabama

Burnnie Holliday
Spartanburg, South Carolina

J. D. Lyons
Kingsville, Texas

Segua - J. C. Clark

GEORGIA-PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION

November 25, 1966

TO: ALL REGIONAL SALES MANAGERS
ALL AREA SALES MANAGERS
ALL SALESMEN

CC: R. I. Fredericks, Paoli
K. A. McCaskill, Paoli
M. M. Powers, Paoli

General Sales Bulletin #74-66

SUBJECT: BOCA 52-3RA

RE: 1/2" Firestop

BY: G. C. Moore, :jw

FILE: Gypsum Wallboard Product Manual #2 - Section 10

Attached herewith is one new card from the Building Officials Conference of America, Inc. (BOCA) regarding three construction assemblies using 1/2" Firestop that have been added and approved under Approval No. 52-3RA. Two BOCA approval cards, Nos. 52-3R and 52-3RA show G-P/Bestwall Gypsum Division 1/2" Firestop Gypsum Wallboard Assemblies.

The original BOCA approval No. 52-3R dated July 12, 1965 covered Bestwall assemblies using 1/2" Firestop Gypsum Wallboard. This was sent with General Sales Bulletin #63-65 dated October 2, 1965. Please file this approval with the original No.52-3R.

BOCA approval numbers 52-3R and No. 52-3RA approve the following Bestwall Gypsum Division assemblies using 1/2" Firestop:

PARTITIONS	
Combustible	UL #1,45 Minutes
Combustible	BMS-92, 1 Hour
Incombustible	T-3218, 2 Hours
FLOOR AND CEILING CONSTRUCTION ASSEMBLIES	
Incombustible	UL #1, 45 Minutes
Combustible	UL #33, 1 Hour
Incombustible	UL #17, 1-1/2 Hours
Incombustible	UL #46, 1 Hour
Incombustible	UL #237, 2 Hours

These approval numbers covering the above described Partitions and Floor and Ceiling assemblies are important to the sales representatives that operate in states and municipalities that follow the BOCA Model Building Code. It is important to know the construction details of the various assemblies that have been fire tested at the various laboratories. It is also important to know the building officials in your areas and the Model Building Code under which they operate.

If General Sales can be of assistance with approvals of the various construction assemblies covered by BOCA cards please advise.

SGP 0028416

ATT: (1)

BUILDING OFFICIALS CONFERENCE OF AMERICA, INC.

MATERIAL APPROVALS COMMITTEE

PRODUCT CLASSIFICATION – ½" Firestop Gypsum Wallboard **APPROVAL NO.** 52-3RA

APPLICANT – Georgia-Pacific Corporation, Bestwall Gypsum Division **REPORT NO.** 13RA

PRODUCT TRADE NAME – Bestwall Firestop **APPROVED:** July 11, 1966

PERFORMANCE FOR WHICH APPROVAL WAS REQUESTED – 1. Fire Resistance

RECOMMENDED APPROVAL – Based on Structural Bureau Report No. 13RA, dated June 23, 1966, and subject to requirements due to peculiar local conditions, the following approvals are recommended provided that the sections set forth in the report and any other applicable sections of the BOCA Codes (1965) are observed, that the product is installed within the limitations of this report and in accordance with the manufacturer's specifications noted therein:

See BOCA 52-3R for Sections IV B 1 a through IV B 1 e.

f. In protected combustible floor and ceiling assemblies where the wood joists are spaced on not over 16 inch centers and the assembly is protected on the ceiling side by ½ inch Firestop nailed or drive-screw fastened directly to the joists such as Class F Designs, Design No. 46 - 1-Hr. Combustible, the fireresistance rating is recommended to be 1-Hr. In these assemblies, the joints and fastener heads need to be protected, the joints by taping, and both joints and fastener heads by a double layer of joint compound.

g. In protected noncombustible floor and ceiling systems having a 2½ inch concrete topping over steel joists located on not over 24 inch centers and protected on the ceiling side by ½ inch Firestop fastened to 25 gauge sheet steel runners spaced on not over 24 inch centers such as in the Class E 2-Hr. group, Design No. 237, the fireresistance is recommended to be 2-Hr. In these assemblies, there is no requirement that the joints need to be finished or the nails or wallboard screws protected.

(over)

h. In wall and partition construction, the wallboard may be used in a double layer, using staggered joints on successive layers, applied over steel studs set in steel channel runners where the studs are set on not over 24 inch centers provided the wallboard is not less than ½ inch Firestop. The outer layer is adhesive laminated and fastened through the inner layer to the studs using 1-3/4 inch drywall screws. The outer layer joints are taped and both the joints and screw heads are treated with a double layer of joint compound. A fireresistance of 2-Hr. is recommended.

In items IV B 1 f, g, and h, it is recommended that the wallboard sheets be butted at all joints in order to merit the noted fireresistance ratings.

IDENTIFICATION – All sheets of ½" Firestop Bestwall Gypsum Wallboard and all packages of this material manufactured under this Approval shall be clearly marked with the identifying symbol "BOCA 52-3RA", which shall be affixed at the place of manufacture.

Copies of the Structural Bureau Report may be obtained from the BOCA Executive Office, 1313 East 60th Street, Chicago, Illinois 60637 for $1.00 each.

SGP 0028418

RESEARCH RECOMMENDATION

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES • 684-1310 • PASADENA CALIFORNIA

Report No. 1997.2
June 3, 1966

BESTWALL TILE BACKER BOARD
GEORGIA-PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION
2 INDUSTRIAL BOULEVARD
PAOLI, PENNSYLVANIA

1. **Introduction:** At the request of the Georgia-Pacific Corporation, Bestwall Gypsum Division, Paoli, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a re-examination of the data submitted in connection with the use of the above gypsum products for use as a backing material behind approved finish materials in shower and tub enclosures.

II. **Description: General:** The Bestwall Gypsum Division's Tile Backer Board is manufactured with a ½-inch thickness with widths of 4 feet and in lengths of 8 feet, 11 feet and 12 feet with tapered factory bound edges. The board contains an asphaltic gypsum core with a blue water-resistant face paper and a charcoal gray breather type back paper.

Bestwall Firestop Tile Backer Board is manufactured with a ⅝-inch thickness and may be used where fire-resistive construction is required. Installation shall be in accordance with the Code or as described in Research Recommendations No. 1000, No. 1144 or No. 1155 issued to the Bestwall Gypsum Division of Georgia-Pacific Corporation.

Installation: Full size sheets of gypsum wallboard having a thickness of ½ inch are applied horizontally to supports spaced 16 inches on center and attached in the manner prescribed by the Code or applicable Research Recommendations.

For tub and shower enclosures, the tub or shower receptor or pan is positioned with respect to the studs so that projecting lips of the units are flush with the outside face of the wallboard. A ¼-inch clearance between the paperbound edge of the wallboard and the tub, receptor or pan must be maintained. All wallboard joints, cut edges and pipe openings are protected with a 2-inch wide vinyl tape which is supplied as an integral part of the backing system. An alternate method of treatment in lieu of using 2-inch wide vinyl tape is to treat all wallboard joints cut or raw edges with an approved waterproof sealer such as manufactured by Minnesota Mining and Manufacturing Company's CTA 11. When ceramic tile is more than ⅜ inch thick, solid blocking is required between studs. One row of the blocking is located approximately 1 inch above the tub or receptor and an additional row at the midpoint between the tub and the ceiling. Also, when the tile is more than ⅜ inch thick, the nails for applying the gypsum wallboard shall be spaced a maximum of 4 inches on center. A waterproofing membrane is applied to the exposed face of the wallboard by either of the following methods:

1. With the flat edge of a trowel, a full ⅛-inch skim coat of tile adhesive is evenly applied to the entire surface receiving the tile. The adhesive is applied also to the bottom edge of the wallboard and to fill the cutout spaces around the pipes, soap dishes, towel bars, etc. A setting time of 24 hours is required. Adhesives used as sealants under ceramic tile must conform to U. S. Department of Commerce Commercial Standard No. 181-52, "Water-Resistant Organic Adhesives for Installation of Clay Tile."

   After the skim coat has hardened so that it will not be grooved by the notches of the trowel, a bedding coat of the same adhesive is applied. The bedding coat extends down over the lip of the tub, receptor or pan to form a water dam behind the bottom edge of the tile.
2. A waterproofed sealer is used in lieu of the skim coat of the tile adhesive described above. Sealers shall be only those specifically made for the purpose, and compatible with the tile adhesive, such as certain rubber base sealants. The sealer is evenly applied in a heavy brush application. Permitted sealers are: Miracle Adhesive Corporation's Ceramic Tile Primer; Minnesota Mining and Manufacturing Company's CTA 50 Primer, or approved sealers of comparable quality. All edges of cutouts for pipes, soap dishes, towel bars, etc., must be sealed and then caulked with waterproof, nonhardening caulking compound. After the sealer coat has dried thoroughly, the bedding adhesive is trowelled on to receive the tile.

Identification: The products are identified by the color and by tape bearing the company and product name.

III. **Points of Variance with the Uniform Building Code:** Section 1711 (a) of the Uniform Building Code requires that materials forming shower and tub enclosures be of a type not adversely affected by moisture.

IV. **Evidence Submitted:** Installation instructions are submitted.

Recommendation

V. Recommendation: That the application of the Tile Backer Board described above in shower and bath areas as a backing material for approved nonabsorbent finishes is a satisfactory alternate method of construction to that specified in the Uniform Building Code provided the installation is in accordance with the description in Part II of this report.

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) T. H. Carter
Managing Director

SGP 0028419

J.C. Clark - Siguard Pl.

PAOLI, PENNSYLVANIA
August 22, 1966

To: All Regional Sales Managers
All Area Sales Managers
All Salesmen
Distribution Division Sales Personnel

CC: Mr. R. I. Fredericks, Paoli
Mr. K. A. McCaskill, Paoli

General Sales Bulletin #59-66

Subject: I.C.B.O. 1155.9
December 3, 1965

Re: Bestwall Firestop,
"Metal Framing"
1/2" and 5/8"

By: Gordon C. Moore - jp

File: BW - Product Manual #2 - Section 10

Attached is one copy of a new International Conference of Building Officials (ICBO) Report Number 1155.9, dated December 3, 1965.

This ICBO Report approves the use of 1/2" and 5/8" Bestwall Firestop on partitions and floor and ceiling construction assemblies using metal framing with one and two hour fire resistive rating.

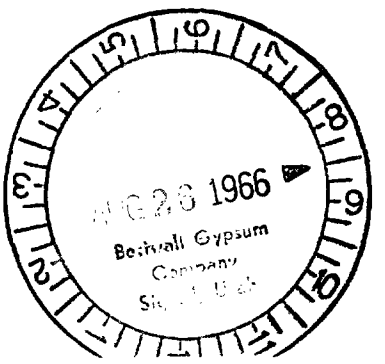
The construction assemblies covered by this Report Number are:

PARTITIONS	FLOOR AND CEILINGS
T-209 - 1 Hr.	UL #2 - 1 Hr.
T-2016 - 1 Hr.	UL #19 - 1 Hr.
T-2316 - 1 Hr.	UL #13 - 1 Hr.
T-2898 - 1 Hr.	UL #17 - 1 Hr.
T-3126 - 1 Hr.	UL #69 - 2 Hr.
T-2406 - 2 Hr.	UL #237 - 2 Hr.
T-3218 - 2 Hr.	UL #208 - 2 Hr.
	T-2104 - 2 Hr.

This ICBO Report Number is very important to the sales representatives that operate in areas where the municipalities and building officials approve the use of various construction assemblies covered under ICBO Report Numbers.

Additional copies of this report are available from General Sales, Bestwall Gypsum Division, Paoli, Pennsylvania.

NOTE: ICBO No. 1155.9, 12/3/65, supersedes ICBO No. 1155.8, 9/11/64. Please destroy all copies 1155.8.



RESEARCH RECOMMENDATION INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES • 684-1310 • PASADENA, CALIFORNIA

Report No. 1155.9
December 3, 1965

STEEL STUDS AND JOISTS
BESTWALL FIRESTOP GYPSUM WALLBOARD AND CEILING TILES
GEORGIA PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION
2 INDUSTRIAL BOULEVARD
BOX V
PAOLI, PENNSYLVANIA

I. **Introduction:** At the request of Georgia Pacific Corporation, Bestwall Gypsum Division, Paoli, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a re-examination of the test data submitted in connection with the above gypsum wallboards and has noted that the Uniform Building Code does not fully provide for the use of these materials.

II. **Description: General:** The gypsum wallboards are ⅝ inch thick and contain a core composed of gypsum, incombustible fibers and unexpanded vermiculite. The core is surfaced with paper which may be gray on both sides or have a finished paper on one side and a gray paper on the back side. They are made in 4-foot widths and in 6-foot to 16-foot lengths. The ⅝-inch wallboard is also supplied in 24-inch and 48-inch widths with tongue-and-groove edges. Joint treatment is not necessary for the fire-resistive ratings.

One-hour Fire-resistive Load-bearing Partition: Studs are 3⅝-inch deep Stran-Steel of No. 16 gauge material spaced 24 inches on center, attached to base and ceiling channels with sheet metal screws. After alignment, the studs are welded to the channels. The wallboard is attached to the studs with 6-penny cement-coated common nails spaced 7 inches on center.

One-hour Fire-resistive Nonbearing Partition: Consists of channel-shaped steel studs 1⅝ inches, 2½ inches or 3⅝ inches deep formed from light gauge steel .022 inch thick. The studs have flanges 1⅝ inches wide returned a distance of ¼ inch parallel to the stud depth and ⅛ inch parallel to the flange widths. The studs are inserted into channel-shaped floor and ceiling tracks formed from material .025 inch thick and fastened to the supporting structure at 24-inch intervals. The ⅝-inch thick wallboard is installed vertically without horizontal joints to each face of studs with vertical joints staggered with respect to the two faces. The wallboard is attached to the studs with Donn W-616 1-inch long self-drilling sheet metal screws spaced 8 inches on center at the top and bottom edges and vertical butt joints centered over studs and at 12 inches on center at intermediate studs.

Two-hour Fire-resistive Nonbearing Partition: Consists of 2½-inch deep metal studs spaced 24 inches on center with two layers of ⅝-inch Bestwall Firestop Gypsum Wallboard applied to each face. The studs are formed from .022-inch thick electrogalvanized steel and are channel-shaped with a flange width of 1⅝ inches. The ends of the flanges are returned ¼ inch. The studs are inserted into floor and ceiling tracks attached to the supporting structure with approved fasteners spaced not over 24 inches on center. The first layer of wallboard is fastened in place with 1-inch long W-616 self-drilling sheet metal screws. The screws are spaced 8 inches on center at top and bottom edges and at all butt joints and at 12 inches on center at intermediate supports. A second layer of wallboard then is applied by laminating it to the first layer by means of 3M brand contact drywall adhesive. Supplementary screws 1¾ inches long attach the second layer at 24-inch intervals around the perimeter of the wallboard and at 8 inches on center at the top to provide sufficient pressure to obtain adhesion. Vertical joints of the face layer are staggered with respect to those of the base layer.

One-hour Fire-resistive Nonbearing Partition with Glass Fiber Insulation: The construction consists of 3⅝-inch deep Donn DW-58 No. 25 gauge galvanized steel studs spaced 24 inches on center inserted into a metal track of corresponding width and identified as a Donn DS-580 track. The track is attached to the supporting framework with approved fasteners spaced not over 24 inches on center. The studs are cut ½ inch short of the required height and positioned to provide for ¼-inch expansion, top and bottom. Five-eighths-inch thick Firestop Bestwall Gypsum Wallboard is attached to one side vertically with 1-inch long No. 6 drywall screws spaced 48 inches on center. Three-inch thick glass fiber insulation batts weighing .66 pound per cubic foot then are attached to the back side of the wallboard with ½-inch long staples installed at the four corners and center of each 24-inch by 48-inch batt. A layer of ⅝-inch thick Firestop wallboard then is fastened vertically to the opposite side with 1-inch long No. 6 drywall screws spaced 16 inches on center at intermediate studs and 12 inches on center around the perimeter of the board. A second layer of ⅝-inch Firestop wallboard having 4-inch wide strips of laminating compound spaced 2 inches from the edges and 4 inches from the vertical center line then is applied over the first layer to which was attached the glass insulation backing. The second layer is positioned so that vertical joints are offset from the initial layer and is secured with 1¾-inch long No. 6 drywall screws spaced 16 inches on center at intermediate studs and 12 inches on center around the perimeter of the wallboard. Exposed joints are taped and joints and screw heads are treated with two coats of joint compound.

Two-hour Fire-resistive Nonbearing Partition: The partition construction consists of Donn DW-40 2½-inch deep by No. 25 gauge channel-shaped studs which are inserted into Donn DS-400 2½-inch by No. 25 gauge steel stud top and bottom tracks. Temporary shims, ½ inch thick, are placed beneath each stud to maintain ½-inch clearance at both ends of the studs. The shims are removed after a base layer is applied to one side. A base layer of ½-inch Firestop Bestwall Gypsum Wallboard is attached to each side of the studs with 1-inch long drywall screws spaced 12 inches on center at vertical joints and along the stud tracks and at third points along intermediate studs (not to exceed 40 inches). The screws are self-drilling and self-tapping, contain a .345-inch diameter flat Phillips head, and are fully threaded with an outside thread diameter of .147 inch. Vertical joints on one face are offset one stud space with respect to those on the opposite face. Laminating compound then is applied to the back surface of a second layer of ½-inch wallboard in 4-inch wide strips located 2 inches from the edge and approximately 4 inches off the vertical center line. The second layer then is applied to the base layer and attached with 1¾-inch long drywall screws of the same characteristics as described above spaced 12 inches on center at the vertical joints and tracks and 16 inches on center at intermediate studs. The face layer vertical joints are offset from base layer vertical joints one stud space. Joints are taped and finished with joint compound and screws are covered with a double coat of joint compound.

One-hour Fire-resistive Floor and Ceiling: The floor and ceiling construction consists of 2 inches of concrete on steel joists to which ¾-inch cold-rolled furring channels or approved nailing channels are attached with No. 18 gauge galvanized wire. Channels are doubled where butt joints occur. The ⅝-inch thick wallboard is attached to the furring channels with No. 6 flathead sheet metal screws 8 inches on center or to the nailing channels with 1¼-inch annular nails spaced 6 inches on center.

An alternate method of construction consists of steel joists spaced 24 inches on center with a sand-gravel reinforced concrete slab 2 inches thick poured over a metal lath form supported on the joists. The metal lath form is an expanded ribbed metal lath ⅜ inch high weighing 3.4 pounds per square yard and attached to the joists at every other rib and at salvage overlaps with No. 18 gauge galvanized steel wire. Adjacent sheets of lath are overlapped at the side by nesting the outside salvage and are overlapped 3 inches at the ends.

Inverted hat-shaped No. 25 gauge galvanized furring channels ⅞ inch deep and 2⅜ inches wide are saddle tied to the bottom chord of the joists at 24-inch intervals by means of double strands of No. 18 gauge galvanized steel wire. Adjoining lengths of channels are lapped 6 inches to 12 inches and tied together with a double strand of tie wire. Five-eighths-inch Type "X" Bestwall Gypsum Wallboard is attached to the furring channels by means of No. 6 Phillips flathead self-tapping sheet metal screws 1 inch long spaced ⅜ inch from wallboard edges and 12 inches on center. Support at end joints is provided by inserting an additional furring channel over the joint into which the butted ends of the wallboard are screwed. The additional channel is fastened as required for other channels and overlaps adjacent wallboards 6 inches to 12 inches. All screws are driven flush with the surface of the wallboard and the wallboard on each side of end joints is attached at the overlap of furring channels with one additional screw.

Two-hour Fire-resistive Floor-ceiling (Roof-ceiling) Construction: Identical to the alternate one-hour assembly described directly

SGP 0028421

above using Bestwall Gypsum Wallboard except the concrete slab has a thickness of 2½ inches and all butt joints of the wallboard are staggered and centered between doubled furring channels. The doubled channels are adjacent to each other and consist of a main continuous channel and an additional piece of channel parallel to it and extending approximately 6 inches to 12 inches over adjacent wallboard sheets. At such butt joints the wallboard is attached to each channel with screws spaced 12 inches on center providing a 1¼-inch end distance and a 1½-inch side distance.

Two-hour Fire-resistive Floor-ceiling (Roof-ceiling) Construction—Suspended Ceiling: The assembly is similar in floor construction to the two-hour system described above but has a suspended ceiling of ⅝-inch thick, 2-foot by 2-foot lay-in Bestwall Firestop "120" textured ceiling tile units. The suspension system consists of No. 12 gauge galvanized steel wire spaced 4 feet on center supporting main runners. The main runners consist of 1½-inch high by 1-inch wide inverted tee sections formed from No. 25 gauge galvanized steel. Cross tees of identical section also are provided and the flanges of both main runners and cross tees are faced with No. 32 gauge galvanized sheet steel stamped over the two edges and painted on the exposed surfaces. The main tee runners are in nominal 12-foot lengths and the cross tees are in nominal 2-foot or 4-foot lengths. Adjoining main runners are connected at the web with a 9⅜-inch by 1½-inch galvanized steel splicer punched from No. 21 gauge galvanized steel. The hanger wires are tied to the tees by drilling holes through the upstanding web of the tee to accommodate the 4-foot hanger wire spacing. The 4-foot long cross tees are supported at the main tees by a snap-lock which is located on both ends of the cross tee. The cross tee is pushed and hooked in place and leveled at the cross tee intersection holes that are located 12 inches on center on the main tees. The same type of connection is used for connecting the cross tees intersecting cross tees. The 2-foot long cross tees span between the 4-foot cross tees to form the 2-foot by 4-foot module. The gypsum wallboard lay-in tiles are supported on the flanges of the tees with the soffit of the tiles approximately 8 inches below the bottom chord of the joists. Steel air ducts aggregating not more than 70 inches in area for any 100 square feet of ceiling area may be installed in the ceiling system. The air ducts are supported by framing members spanned between the joists and are provided with fire dampers. Recessed light fixtures 2 feet by 4 feet in size and spaced to provide not more than 8 square feet in area for any 100 square feet of ceiling area also may be installed. The light fixtures are 24-inch Mobelex Type "G" as manufactured by Daybrite Lighting, Inc., and are protected by a light fixture protection shield. The shield consists of a 30-inch by 48-inch piece of wallboard scored on one side and broken to lay lengthwise over the light fixture forming sloping sides 7 inches wide with a top width of 16 inches. Ends of the shield are cut 6 inches by 26 inches in size and slotted to fit over the cross tees at each end. The end pieces are secured to the top and sides with 8-penny common nails. The light fixtures are placed on the main runners and cross tees.

Two-hour Fire-resistive Floor-ceiling (Roof-ceiling) with Bestwall Firestop "120" Ceiling Tile: The construction consists of a 2-inch thick reinforced concrete slab poured on a 3.4-pound ribbed metal lath form over 10-inch minimum depth open web steel joists spaced 24 inches on center. The ceiling construction consists of a suspended ceiling with the soffit location 4½ inches from the bottom chord of the joist. The ceiling suspension system is composed of main beams and cross tees formed from 1½-inch deep by No. 25 gauge steel bulb tee sections with a 1-inch flange and a ¼-inch by ½-inch deep bulb. The main beams are placed perpendicular to the joists at intervals of 48 inches on center and are supported by No. 12 gauge single strand wire hangers. The main runners are provided with an expansion relief splicer device for each tee. The expansion relief device consists of a "W" punched cutout extending from above the exposed flange through the bulb of the tee. The cutouts are located at splice plates. Elongated "T" slots attach the splicer to the main tee web, providing a slip joint between the tee and splicer. The splicers are held from slipping by the uncut exposed flange. Expansion also is provided for in cross tees at the stop which butts the main tee web, allowing the cross tee to overlap the main runner flange. Four-foot long cross tees then are placed between the main beams at 24 inches on center and connected thereto with a snap-lock connection as previously described. Bestwall Firestop "120" ceiling tile lay-in units ⅝ inch thick and 24 inches square then are placed in the exposed grid system.

Identification: All wallboards are identified with a light marking of the respective manufacturer consisting of the words "⅝" Bestwall Firestop-Type X" repeated down the center of each sheet and spaced approximately 5 feet on center. In addition, each bundle consisting of two sheets has an end bundling tape which bears the label service symbol of Underwriters' Laboratories, Inc. The ⅝-inch Type X gypsum wallboard is identified by the words "⅝-Inch Type X" printed on the tapered edge of each sheet.

III. **Points of Variance with the Uniform Building Code:** Chapter 43 assigns no fire-resistive rating to this type of construction.

IV. **Evidence Submitted:** The results of fire endurance tests conducted in accordance with U.B.C. Standard No. 43-1-64 are submitted.

Recommendation

V. **Recommendation: That the types of construction described in Part II of this report are satisfactory alternate fire-resistive assemblies to those specified in the Uniform Building Code for the uses noted.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) **T. H. Carter**
Managing Director

PAOLI, PENNSYLVANIA

July 18, 1966

General Sales Bulletin #51-66

TO: ALL REGIONAL SALES MANAGERS
ALL AREA SALES MANAGERS
ALL SALESMEN
DISTRIBUTION DIVISION SALES PERSONNEL

SUBJECT: SOUTHERN BUILDING CODE CONGRESS

CC: R. I. Fredericks, Paoli
K. A. McCaskill, Paoli
M. M. Powers, Paoli

RE: Report No. 6601 - 1/2" "Firestop"

BY: G. C. Moore:jw

FILE: Gypsum Wallboard Manual #2
Section 10-A

Attached is one copy of Report No. 6601 dated March 29, 1966 issued by the Committee on Compliance from the "Southern Building Code Congress", the Model Building Code of the South.

This report approves the use of all 1/2" thick Bestwall "Firestop" construction assemblies as fire tested and submitted to S.B.C.C.

The assemblies include partitions and floor and ceilings, with wood framing, steel, gypsum and metal faced partitions.

S.B.C.C. Report No. 6601 is important to sales representatives that sell gypsum products in cities and states that follow this Model Building Code.

Sales Representatives that have introduced themselves and Bestwall products to the Building Officials in their areas will certainly have a friendly ear in the Building Department when their contractor requests a change in the assembly that he wants to construct.

Additional copies of this report No. 6601 are available from General Sales, Paoli, Pennsylvania.

Encl.

SGP 0028423

COMMITTEE
MYRON J. SASSER, Chm.
BURNNIE HOLLIDAY
J. D. LYONS

Southern Building Code Congress
BROWN-MARX BUILDING BIRMINGHAM, ALABAMA

REPORT: 6601
APPROVED: 3-29-66
EXPIRES: ——

COMMITTEE on COMPLIANCE APPROVAL REPORT

ON

½" BESTWALL FIRESTOP PARTITION — FLOOR AND CEILING ASSEMBLIES

SUBMITTED BY

BESTWALL GYPSUM DIVISION
GEORGIA-PACIFIC CORPORATION
PAOLI, PENNSYLVANIA

The Manufacturer made formal application on August 2, 1965, together with Manufacturer's technical literature, test reports, etc.

The Committee on Compliance has reviewed the data submitted for compliance with the Southern Standard Building Code and submits its Report as follows:

DESCRIPTION:

Bestwall Firestop is a gypsum wallboard having a special core formulation under a patented process in which incombustible glass fibers and unexpanded vermiculite have been added to the gypsum core. Firestop is manufactured in ½" and ⅝" thicknesses, 4 foot width and 6 to 16 foot lengths. It is available in tapered, square or tongue and groove edges. The following is a brief description of the various partition, floor and ceiling assemblies using ½" Bestwall Firestop and their fire retardant rating:

1. **Bestwall Wood-Framed Partition. (1 hour)** is a load bearing 2" x 4" wood stud partition with ½" Bestwall Firestop gypsum wallboard on each side of studs and mineral-wool fill between stud space — BMS-92.

2. **Bestwall Wood-Framed partition (1 hour)** is a non-load-bearing 2" x 4" wood stud partition with ½" Bestwall regular gypsum wallboard on each side of studs and mineral wool fill between stud space — BMS-92.

3. **Bestwall Screw Type Steel Stud Partition (2 hours)** is a fire resistive non-load-bearing partition system composed of steel floor and ceiling runners, steel studs spaced 24" o.c., faced on each side with two layers of ½" Bestwall Firestop gypsum wallboard attached to the studs with special drywall screws. — O. S. U. Report T-3218.

4. **Metal Faced Partition (2 hours)** is a non-bearing wall with aluminum and steel units and five (5) layers of ½" Bestwall Firestop gypsum wallboard. U. L. Design Number 9. (The R. C. Mahon Company). U. L. Report No. 4008.6.

5. **Non-Load Bearing Steel Faced Wall (2 hours)** is a non-bearing wall with steel facing units and two (2) double layers of ½" Bestwall Firestop gypsum wallboard. U. L. Design Number 9. (The H.H. Robertson Company). U. L. Report No. R-4013-2.

6. **Non-Bearing Steel Faced Wall.**

   a. **(2 hours)** is a non-bearing wall with steel facing units and four (4) layers of ½" Bestwall Firestop gypsum wallboard. U. L. Design Number 12. (Elwin G. Emsworth Smith and Company). U. L. Report No. R4448.

   b. **(2 hours)** in a non-bearing wall with steel facing units and four (4) layers of ½" Bestwall Firestop gypsum wallboard. U. L. Design Number 10. (Walcon Corporation). U. L. Report No. 4193.1.

   c. **(2 hours)** is a non-bearing wall with steel facing units and four (4) layers of ½" Bestwall Firestop gypsum wallboard. U. L. Design 5. (The R. C. Mahon Company). U. L. Report No. 4008-2-3.

   d. **(3 hours)** is a non-bearing wall with steel facing units and two (2) layers of ½" Bestwall Firestop gypsum wallboard on each side. U. L. Design Number 8. (The R. C. Mahon Company). U. L. Report No. 4008-5-7.

   e. **(3 hours)** is a non-bearing wall with steel facing units and five (5) layers of ½" Bestwall Firestop gypsum wallboard. U. L. Design Number 7. (The R. C. Mahon Company). U. L. Report No. 4008-4.

7. **Bestwall 2" Solid Gypsum Wallboard Partition (2 hours)** is a fire resistive non-combustible, non-bearing partition system composed of a 1" thick gypsum wallboard core, homogenous or two ½" layer laminations, metal runners, with ½" type X gypsum wallboard and ½" regular gypsum wallboard each side of the core. U. L. Report No. R 3564.

8. **Bestwall Double Solid Gypsum Wallboard Partition (2 hours)** is a fire resistive non-combustible, non-bearing partition composed of 1⅝" x 3" wood runners, with gypsum coreboard each side of wood runners and ½" Bestwall regular gypsum wallboard facing laminated to the 1" coreboard. O. S. U. Report T-2575.

9. **Bestwall Wood Frame Ceiling System (1 hour)** consist of wood joist spaced 16" o.c., bridging, nominal 1" tongue and groove subflooring, finish flooring and one (1) layer of ½" Bestwall Firestop gypsum wallboard nailed to bottom of joist. U. L. Report No. R 2717-38. Design No. 46.

10. **Bestwall Wood Frame Ceiling System (1 hour)** consist of wood joist spaced 16" o.c., bridging, nominal 1" tongue and groove subflooring, finish flooring, 2½" wide by ½" deep furring channels attached to bottom of joist and ½" Bestwall Firestop gypsum wallboard attached to the furring channels by means of special gypsum wallboard screws. U. L. Report No. R 2717-29. Design No. 33.

11. **Bestwall Drywall Furring Channel Ceiling System (1½ hours)** consist of 2" sand-gravel concrete slab on ⅜" rib metal lath over steel joist, with 25 gauge 2-5/16" wide by ⅞" deep forming channels attached to bottom of joist spaced 24" o.c. and ½" Bestwall Firestop gypsum wallboard attached to the furring channels by means of special gypsum wallboard self tapping and self drilling metal screws. U. L. Report No. R 2717-30. Design No. 17.

12. **Bestwall Drywall Furring Channel Ceiling System (2 hours)** consist of 2½" sand-gravel concrete slab on ⅜" rib metal lath over steel joist, with 25 gauge 2-7/16" wide at top and 1-7/16" wide at bottom by ⅞" deep furring channels attached to bottom of joist spaced 24" o.c. and ½" Bestwall Firestop gypsum wallboard attached to the furring channels by means of special gypsum wallboard self tapping, self drilling metal screws. U. L. Report R 2717-37. Design No. 237.

Note: All Bestwall Firestop Gypsum Wallboard bears the U. L. Label.

SUBSTANTIATING DATA:

1. Manufacturer's technical data.
2. Fire endurance test per ASTM E 119 conducted by Underwriters' Laboratories, Inc., or the Ohio State University.
   a. Underwriters' Laboratories, Inc.

R 2717 - 29	1 hour
R 2717 - 30	1½ hour
R 2717 - 37	2 hour
R 2717 - 38	1 hour
R 3564	2 hour

   b. The Ohio State University.

T - 2575	2 hour
T - 3218	2 hour

3. Underwriters' Laboratories, Inc., Building Materials List Journal 1965.
4. Gypsum Association design data.
5. Building Materials and Structures Report BMS 92.

REFERENCES TO SOUTHERN STANDARD BUILDING CODE:

Section 103.6	Alternate Materials and Alternate Methods of Construction.
Section 201.2	Definition—Noncombustible Material.
Section 601.2	Fire Resistive Construction Requirements
Chapter VII	Fire Protection Requirements.
Chapter X	Fire Resistance Standards for Materials and Construction.
Appendix B	Fire Resistance Ratings for Materials and Construction.

LIMITATIONS:

1. Assemblies 1 and 2 — Bestwall Wood Framed Partitions.
   a. Maximum spacing of framing members is 24" o.c.; 16" o.c. for fire rated systems.
   b. Assembly 2 shall not be used as a load-bearing partition.
2. Assembly 3 — Bestwall Screw Type Steel Stud partition.
   a. This assembly shall not be used as a load-bearing partition.
   b. That partition heights to be limited to the following table:

Stud Width	Stud Spacing 24" o.c.	16" o.c.
1⅝"	10'-0"	12'
2½"	12'-0"	16'
3⅝"	16'-0"	20'-0"

3. Assembly 4 — Metal Faced Partition. (4008-6) — (U. L. #9 - 2-hr) R. C. Mahon Company.
   a. This assembly shall not be used as a load-bearing partition.
   b. That partition heights to be limited to the following table:

Width Between Restraints	Maximum Ceiling Height
10 ft.	Unlimited

4. Assembly 5 — Non-Load Bearing Steel Faced Wall. (R-4013-2) — (UL #8 - 2 hr) H. H. Robertson Company.
   a. This assembly may be used as a non-bearing partion.
   b. That partition heights to be limited to the following table:

Width Between Restraints	Maximum Ceiling Height
10 ft.	Unlimited

5. Assembly 6 — Non-Bearing Steel Faced Wall. No. (R-4448) — (U. L. #12-2 hr) Elwin G. Emsworth Smith & Company.
   a. These assemblies shall not be used as a load-bearing partition.
   b. That partition heights to be limited to the following table:

Width Between Restraints	Maximum Ceiling Height
10 ft.	Unlimited

6. Assembly 7 — Bestwall Solid or Laminated Gypsum Wallboard Partition.
   a. That this partition be non-load-bearing.
   b. That partition heights shall be limited to 12 feet.
7. Assembly 8 — Bestwall Double-Solid Gypsum Wallboard Partition.
   a. That this partition be non-load-bearing.
   b. That partition heights shall be limited to the following table.

Without Horizontal Bracing	With Horizontal Bracing	Length Between Restraints
10 ft.	None	Unlimited
12 ft.	None	Unlimited

8. Assembly 10—Bestwall Wood Frame Ceiling System.
   a. Channels shall not span more than 4 feet.
   b. Channels shall be spaced not more than 24" o.c.

9. Assemblies 11 and 12 Bestwall Drywall Furring Channel Ceiling System.
   a. Channels shall not span more than 4'0" for assembly 11 or more than 2'0" for assembly 12.
   b. Channels shall be spaced not more than 24" o.c.
10. Assemblies 1 through 12.
   a. That the Manufacturer's specifications and installation on all the wall systems and/or floor and ceiling assemblies enumerated in this Report be strictly adhered to.
   b. That gypsum wallboard shall not be used when exposed to excessive moisture or humidity.
   c. That gypsum wallboard shall be protected against excessive moisture during job handling, storage and application.
   d. That only accessories, impaling clips, facing units recommended by the Manufacturer shall be used in the assemblies enumerated in this Report.
   e. That the construction of partitions, walls and/or floor and ceiling systems must be in accordance with the respective testing Laboratories Designs in order to obtain the fire-resistance ratings.

IDENTIFICATION:

Bestwall Firestop is shipped twin mounted (2 boards face to face) and on end bundling tape with the U. L. Manifest (label) on each end.

All Bestwall Firestop Sheets shall carry a face marking in the center of the board, repeated every five feet ½" Bestwall Firestop.

COMMITTEE FINDINGS:

The Committee on Compliance after reviewing the data submitted, finds that, in their opinion, Bestwall Gypsum Division of Georgia-Pacific Corporation's partition and wall systems and/or floor and ceiling assemblies enumerated in this Report meets the provisions of the Southern Standard Building Code.

COMMITTEE RECOMMENDATIONS:

The Committee recommends, that Bestwall Gypsum Division of Georgia-Pacific Corporation's partition and wall systems and/or floor and ceiling assemblies, as enumerated in this Report, also uses and limitations as set forth in this Report, be approved by the Southern Building Code Congress.

PERIOD OF APPROVAL:

This Approval or Certificate of Compliance will be in effect as long as the product "Bestwall Firestop" is listed by Underwriters' Laboratories and manufactured under Underwriters' Inspection Service. Should any revision or changes of method of construction occur, this Approval shall terminate. This, however, is not to be construed to preclude any new submittals.

M. J. Sasser, Chairman
Birmingham, Alabama

Burnnie Holliday
Burnnie Holliday
Spartanburg, South Carolina

J.D. Lyons
J.D. Lyons
Kingsville, Texas

SGP 0028426

PAOLI, PENNSYLVANIA

June 3, 1966

TO: ALL REGIONAL SALES MANAGERS
ALL AREA SALES MANAGERS
ALL SALESMEN
DISTRIBUTION DIVISION SALES PERSONNEL

CC: R. I. Fredericks, Paoli
K. A. McCaskill, Paoli

General Sales Bulletin #39-66

SUBJECT: I.C.B.O. REPORT NO. 2035.1

RE: Steel Studs - Gypsum Lath and Plaster Partitions

BY: G. C. Moore:jw

Attached herewith is one copy of a reprint of an approval from the International Conference of Building Officials - I.C.B.O. This approval is dated June 4, 1965 and covers two non-loadbearing partition assemblies consisting of 2-1/2" steel studs with Bestwall Gypsum Lath (one assembly nailed and one assembly clipped) plus a 7/16" thick coat of sanded or perlite plaster and finished with a 1/16" thick lime putty finish.

The two partition assemblies have a 1-hour fire-resistive rating and are non-loadbearing.

This I.C.B.O. Report number is important to the sales representatives working in areas that operate under I.C.B.O. and in municipalities that accept I.C.B.O. approval numbers. This report number will assist you in obtaining acceptance of Bestwall Gypsum products and assemblies.

This copy is for your ready reference file and should be filed under Bestwall Gypsum Products Manual #2, Section 10.

Additional copies are available from General Sales, Paoli.

Enc.

RESEARCH RECOMMENDATION

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES • 684-1310 • PASADENA CALIFORNIA

Report No. 2035.1
June 4, 1965

BESTWALL PLAIN GYPSUM LATH AND PINHOLATH—STEEL STUD ASSEMBLIES
GEORGIA-PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION
2 INDUSTRIAL BOULEVARD
PAOLI, PENNSYLVANIA

I. **Introduction:** At the request of the Georgia-Pacific Corporation, Bestwall Gypsum Division, Paoli, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a study of the data submitted in connection with the use of the above gypsum laths for fire-resistive construction and has noted that the Uniform Building Code does not fully provide for such use.

II. **Description: One-hour Fire-resistive Steel Stud Nonbearing Partitions:** Consist of Donn DS-40 nailable steel studs 2½ inches deep spaced 16 inches on center with ⅜-inch thick Type "X" Plain Gypsum Lath or Type "X" Pinholath applied to each face followed by a coat of sanded gypsum plaster. The lath is attached to the studs by Donn D-11-⅜ clips and Donn A-616 annular ringed cadmium-plated nails, .025 inch in diameter and 1½ inches long. Three nails are used per stud per sheet of lath. Three lath clips are used at each vertical butt joint. The lath sheets are staggered so that butt joints do not occur at studs. Horizontal bridging consisting of ¾-inch furring channels is threaded through the studs at midpoint. The studs are inserted into Donn DS-400-2½ ceiling and base runners which are attached to the supporting framing using approved fasteners spaced at 24 inches on center. A ⅛-inch thick base coat of sanded or perlite plaster is applied to the lath in a scratch, double back operation using the proportion of 100 pounds of plaster to 200 pounds of plaster sand or to two cubic feet of perlite. A finish coat of plaster ⅛ inch thick consisting of three volumes of lime putty to one of slow set gauging plaster then is applied.

An alternate system of construction consists of 2½-inch deep Milcor No. 18 gauge steel studs spaced 16 inches on center and faced each side with ⅜-inch Type "X" gypsum lath covered with a ½-inch thickness of glass fibered plaster.

The construction employs Milcor Standard ⅞-inch by 2½-inch tracks formed from No. 18 gauge steel fastened to the floor and ceiling with approved fasteners spaced not over 24 inches on center. The 2½-inch deep channel-shaped steel studs containing ½-inch wide flanges are inserted into the track at 16 inches on center and fastened thereto with 7-inch stud shoes wire tied to the track with No. 18 gauge tie wires.

The lath is installed with Olsen Type BRC resilient starter-finisher clips at the partition perimeter with Olsen REZ clips at stud locations and Olsen Type C bridge clips at the lath ends. Vertical joints in each succeeding lath course are staggered. The plaster coat then is applied to each side in a double back operation using a 1:2 mix by weight, Bestwall Gypsum Plaster to sand. The base coat is applied to a thickness of ⅞ inch and a ⅛-inch thick lime-putty plaster white coat then is applied to bring the total thickness to ½ inch.

Materials: All materials conform to appropriate standards specified in Chapter 47 of the Code. In addition, Pinholath contains ⅛-inch diameter holes in the exposed face paper. The holes are spaced ⅜ inch on center diagonally.

Identification: Bestwall Plain Gypsum Lath and Pinholath are identified by a face imprint with the trade name "Bestwall" in letters 4 inches high with the words "Reinforced with Glass Fibers" in smaller letters above and the words "Fireproof Gypsum Lath" in smaller letters below. Bestwall Type "X" Plain Gypsum Lath and Type "X" Pinholath are further identified by the addition of the words "Type 'X'" to the markings described above.

III. **Points of Variance with the Uniform Building Code:** The Uniform Building Code does not fully provide for these types of construction.

IV. **Evidence Submitted:** The results of a fire endurance and hose stream test conducted on the load-bearing partitions in accordance with U.B.C. Standard No. 43-1-64 are submitted.

Recommendation

V. **Recommendation: That the fire-resistive constructions described in Part II of this report are satisfactory alternate types of construction to that specified in the Uniform Building Code.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) T. H. Carter
Managing Director

SGP 0028428

NONBEARING WOOD STUD PARTITION
AMERICAN WOOD PRESERVERS INSTITUTE
1707 L STREET, N. W.
WASHINGTON, D. C.

I. Introduction: At the request of the American Wood Preservers Institute, Washington, D. C., the Research Committee of the International Conference of Building Officials has made a study of the data submitted to support a one-hour fire-resistive rating for a nonbearing fire-retardant treated wood stud partition and has noted that the Uniform Building Code does not assign a fire-resistive rating to this type of construction.

II. Description: The partition consists of fire-retardant treated wood studs spaced 24 inches on center. Plates and fire blocking are also of fire-retardant treated wood.

Five-eighths-inch thick Type X gypsum board is applied horizontally and attached to each face of the studs and perimeter plates using 6-penny cement-coated cooler nails spaced 7 inches on center. Joints are taped and coated with joint compound.

III. Points of Variance with the Uniform Building Code: The Uniform Building Code does not assign a fire-resistive rating to this type of construction.

IV. Evidence Submitted: The results of a fire test conducted in accordance with Uniform Building Code Standard No. 43-1-64 are submitted.

Recommendation

V. Recommendation: That the partition construction described in Part II of this report is a satisfactory alternate method of construction to that specified in the Uniform Building Code for a one-hour fire-resistive nonbearing partition.

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials
(Signed) T. H. Carter
Managing Director

BAXCO-PYRESOTE FIRE-RETARDANT PRESSURE-TREATED LUMBER AND PLYWOOD
J. H. BAXTER AND COMPANY
120 MONTGOMERY STREET
SAN FRANCISCO, CALIFORNIA

BAXTER-WYCKOFF CO.
SEATTLE, WASHINGTON

McCORMICK AND BAXTER CREOSOTING CO.
PORTLAND, OREGON

I. Introduction: At the request of J. H. Baxter and Company, San Francisco, California, the Research Committee of the International Conference of Building Officials has made a re-examination of the data submitted in connection with the use of Baxco-Pyresote Fire-Retardant Pressure-Treated Lumber and Plywood and has noted that the Uniform Building Code requires such material to be qualified by tests.

II. Description: Baxco-Pyresoted wood is lumber or plywood that has been pressure-impregnated with inorganic fire-retardant chemicals. The surface burning characteristics of Baxco fire-retardant lumber and plywood are as set forth in Table No. I.[1]

The fire-retardant treated wood lumber products are identified by the words, "Baxco-Pyresote, ICBO Research 1814," stamped with indelible ink at 3-foot intervals. Both lumber and plywood are identified by a label from Underwriters' Laboratories, Inc., specifying the flame-spread, fuel contributed, and smoke density of the product when tested in accordance with U.B.C. Standard No. 42-1-64 for a period of 30 minutes.

[1]See page 2.

After fire-retardant treatment, all lumber and plywood are kiln-dried.

III. Points of Variance with the Uniform Building Code: Section 407 of the Code defines fire-retardant treated wood as lumber or plywood impregnated with chemicals which when tested in accordance with U.B.C. Standard No. 42-1-64 for a period of 30 minutes shall have a flame-spread of not over 25 and show no evidence of progressive combustion.

IV. Evidence Submitted: Descriptive literature and results of tests conducted in accordance with U.B.C. Standard No. 42-1-64 are submitted.

Recommendation

V. Recommendation: That Baxco-Pyresote Fire-Retardant Pressure-Treated Lumber and Plywood be classified as fire-retardant treated wood, under the provisions of Section 407 of the 1964 Edition of the Uniform Building Code for the following uses:

1. In temporary partitions under the provisions of Section 1705.
2. For framing within nonbearing one-hour fire-resistive permanent partitions in Types I, II and IV one-hour buildings.

Such materials shall not be installed in areas exposed to weathering.

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials
(Signed) T. H. Carter
Managing Director

TABLE NO. I—SURFACE BURNING CHARACTERISTICS[1]

	Douglas Fir Lumber	Redwood Lumber	Western Hemlock Lumber	White Fir Lumber	Douglas Fir Plywood
Flame-spread	15	20	20	20	15
Fuel Contributed	10	10	0	15	0
Smoke Developed	0	0	0	0	0

[1]As determined in accordance with U.B.C. Standard No. 42-1-64 in a

SGP 0028429

BAXCO-PYRESOTE - CODE ACCEPTANCE IN CALIFORNIA

BAXCO-Pyresote fire-retardant wood studs are now permitted for framing within 1-hr. non-bearing partitions in Types I, II and IV buildings by:

(a) Cities which have adopted the 1964 edition of the Uniform Building Code. ICBO Research card 1814.2 covers Pyresote treatment and Research card 2096.1 covers spacing on 24" centers.

(b) Cities like San Francisco or Oakland which publish their own building codes. In San Francisco, Ordinance No. 255-65 of October 13, 1965, covers the permissive use of Pyresote treated studs. Approval 192A25.1 of February 21, 1966, covers spacing on 24" centers. ICBO Research cards listed in (a) above are honored in Oakland.

(c) Cities which use earlier editions of the Uniform Building Code generally accept ICBO Research recommendations 1814.2 and 2096.1 described in (a) above.

(d) Title 19, California State Fire Marshal Administrative Code, which covers institutions, schools, buildings and all other occupancies over which the state has jurisdiction. Title 19 also permits roof decks and floors in Type IV buildings. Application has been made to the State Fire Marshal for approval and listing of the assembly with studs spaced on 24" centers. Until the general approval is granted, requests should be made for modification on each specific job.

(e) Federal Housing Administration "Minimum Property Standards for Multi-Family Housing" (FHA 2600) permits Pyresote treated wood studs for framing within 2-hr. non-bearing fire walls or party walls (Sect. M506-1.8a), studs within 2-hr. bearing fire walls or lot-line walls (Sect. M506-1.8b) and Pyresote studs in 1-1/2 hr. party walls in row or town house properties(Sect.M506-1.9).

Authorities having jurisdiction should be contacted to confirm the above and to determine the broader uses permitted by some cities.

Specification for BAXCO-Pyresote products can be found on back page of enclosed brochure.

5/1/66

J. Clark
Sigurd

PAOLI, PENNSYLVANIA
April 6, 1966

TO: All Regional Managers
All Sales Managers
All Salesmen
Distribution Division Sales Personnel

CC: R. I. Fredericks, Paoli
K. A. McCaskill, Paoli

General Sales Bulletin #22-66

Subject: BESTWALL FIRESTOP "120" CEILING TILE

Re: BOCA Approval No.62-25R
Supersedes 62-25

File: Gypsum Product Wallboard
Manual No. 11, Section 10

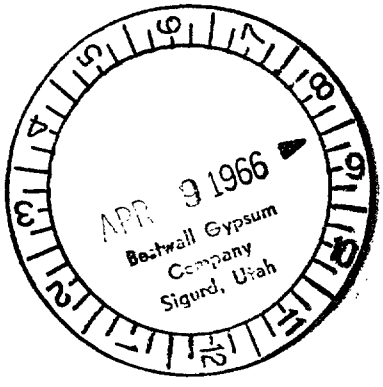
By: G. C. Moore jw

Attached herewith is a reprint of an Approval from the Building Officials Conference of America, Inc. Number 62-25R superseding Number 62-25. This Approval dated January 6, 1966 covers the use of 5/8" Bestwall Firestop "120" Ceiling Tile in floor and ceiling construction assemblies. This Approval also covers Bestwall 3/8" = 24" x 24" and 1/2" = 24" x 48" Noncombustible Ceiling Tile.

As with other Approvals, such as this, be sure that you are aware in your own areas where the BOCA Code is followed. It is in those communities that this report has value and will assist you in obtaining the acceptance of Bestwall gypsum wallboard products and assemblies.

This copy of Approval No. 62-25R is for your ready-reference file. In areas that operate under the BOCA Code, the Building Inspector will have a copy of this Approval, received directly from the BOCA organization, and you can refer to the Approval number when talking to the Building Official.

Attach:



SGP 0028431

BUILDING OFFICIALS CONFERENCE OF AMERICA, INC.
MATERIAL APPROVALS COMMITTEE

PRODUCT CLASSIFICATION – Noncombustible Acoustical Tile

APPROVAL NO. 62-25R
Supersedes 62-25

APPLICANT – Georgia-Pacific Corporation, Bestwall Gypsum Division

REPORT NO. 160R

PRODUCT TRADE NAME – Bestwall Firestop-120 Ceiling Tile
Bestwall Noncombustible Ceiling Tile
Bestwall Noncombustible Acoustical Tile

APPROVED: January 6, 1966

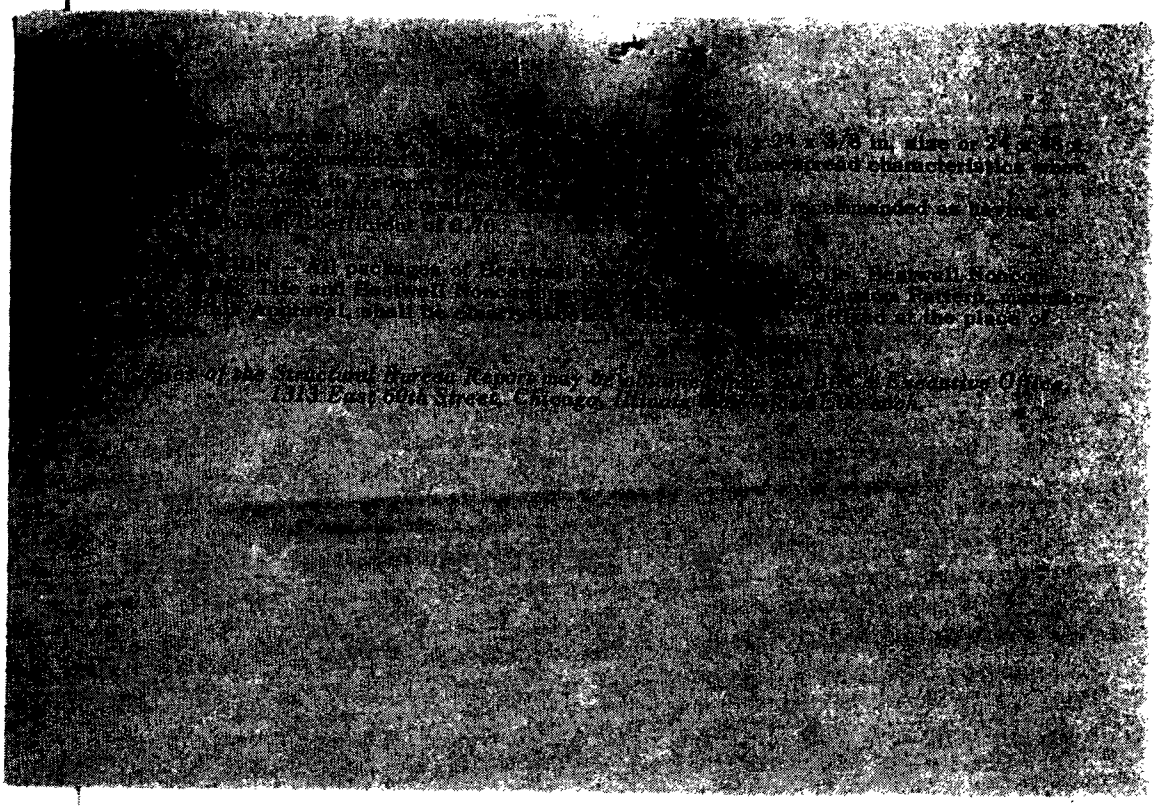
PERFORMANCE FOR WHICH APPROVAL WAS REQUESTED – 1. Fire Resistance: 2-Hour Fire Resistance
2. Flame Resistance: Class A

RECOMMENDED APPROVAL – Based on Structural Bureau Report No. 160R, dated December 7, 1965, and subject to requirements due to peculiar local conditions, the following approvals are recommended provided that the sections set forth in the report and any other applicable sections of the BOCA Codes (1960 as amended 1964) are observed, that the product is installed within the limitations of this report and in accordance with the manufacturer's specifications noted therein:

1. Bestwall Firestop-120 Ceiling Tile of the 24 x 24 x 5/8 inch size is recommended as a ceiling material which, when mounted, in an adequate metal grid such as the Donn Fire Grid Suspension System as a suspended ceiling under steel joists topped by two inches of reinforced concrete will provide a 2-hour fireresistance. The same system of construction and materials except that 2½ inches of concrete are poured over an expanded metal lath will provide the same fire-resistance. Where the 2½ inch reinforced concrete topping is used, up to 8 sq. ft. of recessed ceiling light fixtures and 76 sq. in. of air diffuser opening to air duct per 100 sq. ft. of ceiling area may be permitted, provided the light fixtures are protected by 5/8 in. gypsum board on all sides and the air diffuser has at least 1/32 in. of asbestos paper on the duct side and the diffuser has a 16 gauge minimum galvanized steel damper protected by a fusible link. No such ceiling openings are permitted where the 2 in. reinforced concrete topping is used.

(over)

SGP 0028432



SGP 0028433

PAOLI, PENNSYLVANIA
April 4, 1966

TO: All Regional Managers
All Sales Managers
All Salesmen
Distribution Division Sales Personnel

General Sales Bulletin #21-66
Subject: 5/8" BESTWALL FIRESTOP

Re: BOCA Approval Number 63-9A

CC: R. I. Fredericks, Paoli
K. A. McCaskill, Paoli

File: Gypsum Wallboard II
Section 10

By: G. C. Moore-jw

Attached herewith is a reprint of an Approval from the Building Officials Conference of America, Inc. Number 63-9A superseding Number 63-9. This approval dated January 6, 1966 covers the use of 5/8" Bestwall Firestop in partitions (load bearing and non-load bearing), Floor and Ceiling Assemblies, and for Steel Column Fireproofing. You will note that Approval No. 63-9A includes Partition assemblies with wood framing, gypsum studs and steel studs. The Floor and Ceiling assemblies include wood framing and cement floor over steel bar joists. Incombustible steel column fireproofing includes 2-hour and 3-hour assemblies.

This is especially important to the Sales Representatives working in areas that operate under the BOCA Code. It is in these communities where this Approval number has value and will assist you in obtaining acceptance of Bestwall gypsum wallboard products and assemblies in your areas.

This copy is for your ready-reference file. Each Building Official who operates under the BOCA Code will have a copy of this Number 63-9A he has received directly from the BOCA organization. He will understand when you refer to the various assemblies listed in the description of the assemblies, under Partitions, Floor and Ceiling Assemblies, or Steel Column Fireproofing.

Attach:

BUILDING OFFICIALS CONFERENCE OF AMERICA, INC.
MATERIAL APPROVALS COMMITTEE

PRODUCT CLASSIFICATION – Gypsum Drywall Board and Systems **APPROVAL NO.** 63-9A (Pts. k-q)

APPLICANT – Georgia-Pacific Corporation, Bestwall Gypsum Division **REPORT NO.** 176A (Pts. k-q)

PRODUCT TRADE NAME – Bestwall Firestop Systems **APPROVED:** January 6, 1966

PERFORMANCE FOR WHICH APPROVAL WAS REQUESTED – 1. Fireresistance
2. Flame resistance

RECOMMENDED APPROVAL – Based on Structural Bureau Report No. 176A, dated December 6, 1965, and subject to requirements due to peculiar local conditions, the following approvals are recommended provided that the sections set forth in the report and any other applicable sections of the BOCA Codes (1960 as amended 1964) are observed, that the product is installed within the limitations of this report and in accordance with the manufacturer's specifications noted therein: The recommendations offered for approval are to be found under Section IV B 1 in the individual parts of the report. They are summarized as follows:

Load-bearing Partitions

SBR 176a Wood studs on 16 in. centers surfaced on both sides with one layer 5/8 in. Bestwall Firestop 1-Hour fireresistance.

176b Wood studs on 16 in. centers surfaced on both sides with two layers each side 5/8 in. Bestwall Firestop 2-Hour fireresistance.

176c Steel studs on 24 in. centers load-bearing surfaced on both sides with one layer of 5/8 in. Bestwall Firestop 1-Hour fireresistance.

176l Wood studs on 16 in. centers, covered on both sides by 1/2 in. Bestwall Sound Deadening Board, and surfaced on both sides by one layer of 5/8 in. Bestwall Firestop 1-Hour fireresistance.

176m Load-bearing partition 2 x 4 wood studs on 16 in. centers with 5/8 in. Bestwall Firestop on Donn DG-8 channels on 24 in. centers on one side, 5/8 in. Bestwall Firestop directly on studs on the other side and 1½ in. glass fiber insulation in stud space 1-Hour fireresistance.

Nonload-bearing Partitions

SBR 176d 1 in. gypsum studs covered on each side by one layer of 5/8 in. Bestwall Firestop nonload-bearing 1-Hour fireresistance.

176e 1 in. gypsum studs covered on each side by two layers of 5/8 in. Bestwall Firestop nonload-bearing 2-Hour fireresistance.

176f 1 in. gypsum studs staggered, covered on each side by two layers of 5/8 in. Bestwall Firestop nonload-bearing 3-Hour fireresistance.

176g Steel Z studs having on each side two layers of 5/8 in. Bestwall Firestop nonload-bearing 2-Hour fireresistance.

176n One layer of 5/8 in. Bestwall Firestop on each side of Donn DW-26 steel studs on 24 in. centers 1-Hour fireresistance.

Floor and Ceiling Assemblies

SBR 176h Floor and ceiling assembly open web steel joists on 24 in. centers, 2 in. of concrete over joists, cross-furring on 16 in. centers and 5/8 in. Bestwall Firestop ceiling 1-Hour fireresistance.

176i Floor and ceiling assembly, open web steel joists on 24 in. centers with 2½ in. of concrete, cross-furring on 24 in. centers and one layer of 5/8 in. Bestwall Firestop ceiling 2-Hour fireresistance.

176j Floor and ceiling assembly, open web steel joists on 24 in. centers with 2 in. of concrete over the joists, cross-furring on 24 in. centers and one layer of 5/8 in. Bestwall Firestop ceiling, 1½-Hour fireresistance.

176k Floor and ceiling assembly, open web steel joists on 24 in. centers with 2 in. of concrete over the joists, cross-furring on 24 in. centers and one layer of 5/8 in. Bestwall Firestop ceiling, 1½-Hour fireresistance.

176o Floor and ceiling assembly 2 x 10 in. wood joists on 16 in. centers, conventional subfloor and floor of wood and two layers of 5/8 in. Bestwall Firestop as ceiling with resilient metal furring channels between Firestop layers 2-Hour fireresistance.

Protected Columns

SBR 176p Steel column protected by two layers of 5/8 in. Bestwall Firestop 2-Hour fireresistance.

176q Steel column protected by three layers of 5/8 in. Bestwall Firestop 3-Hour fireresistance.

(over)

IDENTIFICATION – All packages of material covered by this report shall bear the identifying symbol "BOCA 63-9A", which shall be affixed at the place of manufacture.

Copies of the Structural Bureau Report may be obtained from the BOCA Executive Office, 1313 East 60th Street, Chicago, Illinois 60637 for $1.00 each.

BESTWALL FIRESTOP OVER WOOD FRAMING
GEORGIA PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION
2 INDUSTRIAL BOULEVARD
PAOLI, PENNSYLVANIA

J-M FIRETARD GYPSUM WALLBOARD
JOHNS-MANVILLE SALES CORPORATION
22 EAST FORTIETH STREET
NEW YORK, NEW YORK

FIREBLOC GYPSUM WALLBOARD
AMERICAN GYPSUM COMPANY
POST OFFICE BOX 6345
ALBUQUERQUE, NEW MEXICO

FIREHALT GYPSUM WALLBOARD
BLUE DIAMOND COMPANY
DIVISION OF THE FLINTKOTE COMPANY
1650 SOUTH ALAMEDA
LOS ANGELES, CALIFORNIA

I. **Introduction:** At the request of Georgia Pacific Corporation, Bestwall Gypsum Division, Paoli, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a re-examination of the test data submitted in connection with the above gypsum wallboards and has noted that the Uniform Building Code does not fully provide for the use of this material.

II. **Description: General:** Bestwall Firestop Gypsum Wallboard is a Type X wallboard conforming to the requirements of U.B.C. Standard No. 47-8-64. It is supplied in thicknesses of ⅜ inch, ½ inch or ⅝ inch and in various lengths and widths. In wall construction, the wallboard may be applied vertically or horizontally. In double layer applications, the edge joints are staggered one stud space. Vertical joints in opposing faces are staggered one stud space. Joint tape and finish are not required for the ratings listed. All partitions are firestopped. The wallboard also is manufactured by Bestwall for Johns-Manville under the name "Firetard," by American Gypsum Company, under the name "Firebloc" and by Blue Diamond Company under the name "FireHalt." Bestwall Sound Deadening Board is a low density fiberboard product made from wood or cane fiber. It is ½ inch thick, has square edges and is supplied in 4-foot widths and 8-foot or 9-foot lengths. It has an oven dry density of 15 to 18 pounds per cubic foot.

One-hour Fire-resistive Load-bearing Partition—⅜-inch Gypsum Wallboard: Two layers of gypsum wallboard are applied to each face of 2-inch by 4-inch studs spaced 16 inches on center. Joints between the two layers are staggered with respect to the first layer and edges are spaced ¼ inch apart and filled with a gypsum filler. The second layer is nailed with No. 13 gauge cement coated nails 1⅞ inches long spaced 6 inches on center at edges and 8 inches on center at intermediate studs.

One-hour Fire-resistive Load-bearing Partition—⅝-inch Gypsum Wallboard: One layer of ⅝-inch gypsum wallboard is applied to 2-inch by 4-inch studs spaced 16 inches on center with edges of the wallboard butted together. Application of the wallboard is in accordance with the provisions of the Code using 6-penny cement coated nails 1⅞ inches long with ¼-inch diameter flat heads spaced 7 inches on center.

As an alternate method of construction the wallboard may be applied over an undercourse of ½-inch Bestwall Sound Deadening Fiberboard. In this construction the sound deadening board is applied vertically and attached with 5-penny cement coated nails spaced 24 inches on center vertically at edges and 16 inches on center horizontally at ends. There are no nails on intermediate framing members. The ⅝-inch wallboard has laminating compound applied to the back of the wallboard using a saw tooth applicator producing 6-inch wide strips of adhesive at the ends and edges and vertically down the center of the 4-foot wide sheets. The board is then nailed with 8-penny box nails spaced 12 inches on center around the perimeter of the sheet and at mid-height on intermediate studs.

Two-hour Fire-resistive Load-bearing Partitions: The partitions are constructed with 2-inch by 4-inch studs spaced 16 inches on center with 2-inch by 4-inch firestops installed at mid-height of the studs. The panels are covered on both sides with two layers of ⅝-inch gypsum wallboard applied vertically with the vertical joint between boards falling on the same stud for each layer. The first layer is attached to the studs with 6-penny cement coated common nails at 9 inches on center along the stud, sill and plate. The second layer is applied directly over the first and nailed with 8-penny nails spaced 7 inches on center. Vertical joints on the opposite side of the partition are placed on the next adjacent stud. Taping of joints is not required for the rating. One or both layers also may be applied horizontally provided the edge and end joints in both sides of the assembly are staggered so that they do not fall over one stud.

One-hour Fire-resistive Floor-ceiling Construction—⅝-inch Gypsum Wallboard: Consists of wood joists supporting a 1-inch nominal tongue and groove subfloor, a layer of building paper and a ¾-inch tongue and groove finish floor. Five-eighths-inch gypsum wallboard is applied to the soffit of the joist using 6-penny cement coated nails spaced 6 inches on center. Nails are 1⅞ inches long and have ¼-inch diameter flat heads. As an alternate method of construction ½-inch Bestwall Sound Deadening Fiberboard may be installed between the subfloor and the finish floor in lieu of the building paper.

One-hour Fire-resistive Floor-ceiling Construction—½-inch Gypsum Wallboard: Consists of the wood joist and double floor system described above with ½-inch gypsum wallboard applied to resilient furring channels which in turn are fastened to the joist soffit. The resilient furring channels are formed from No. 25 gauge galvanized steel into a modified channel-shaped cross section having an over-all width of 2⅞ inches and an over-all depth of ½ inch. One projecting flange of the furring channel having a flat width of ⅝ inch is attached to the joist soffit with a 6-penny common nail. The channels are spaced 24 inches on center perpendicular to the joists and are overlapped 4 inches at splices with splicing occurring at joists. The ½-inch thick gypsum wallboard is attached to the 1⅜-inch flat width of the furring channel with 1-inch long self-drilling and self-tapping Phillips head screws having .129-inch outside shank diameter and a .355-inch head diameter.

The wallboard is applied with the long dimension perpendicular to the furring channels with side joints occurring between joists. The screws are spaced 12 inches on center and are installed with ½-inch minimum edge distances from the edge of the wallboard.

An alternate method of construction consists of ½-inch thick Bestwall Firestop Gypsum Wallboard attached to the soffit of the joists with 5-penny cement coated nails (coolers) spaced 6 inches on center. Nail edge distances are ¾ inch and ½ inch from side and end joints, respectively. Joints are finished with joint tape and compound.

As an alternate method of construction ½-inch Bestwall Sound Deadening Fiberboard may be installed between the subfloor and the finish floor in lieu of the building paper.

Two-hour Fire-resistive Floor-ceiling Construction: Consists of the double wood floor and wood joist construction described above with two layers of ⅝-inch thick gypsum wallboard utilizing the resilient furring channels described above between the first and second layer of wallboard. The first layer is installed with the long dimension perpendicular to the joists and nailed with 8-penny box nails spaced 7 inches on center. The nails have a ½-inch edge distance from the wallboard edge and ends and end joints of the wallboard occur at the center line of the joists. The resilient furring channels described above then are applied over the wallboard at 24 inches on center and are fastened to each joist with 8-penny common nails. The second layer of wallboard is installed with the long dimension perpendicular to the furring channels and with edge joints of the second layer staggered with respect to end joints of the first layer. The second layer is attached to the channels with the screws described above spaced 12 inches on center. At side joints of the second layer, an additional screw is installed 3 inches each side of the joint. At end joints of the second layer, a furring channel is provided along each wallboard end. All screws are placed with a minimum edge and end distance of 1 inch.

As an alternate method of construction ½-inch Bestwall Sound Deadening Fiberboard may be installed between the subfloor and the finish floor in lieu of the building paper.

Identification: All wallboards are identified with a light marking of the specific manufacturer consisting of the words "⅝-Inch Bestwall Firestop—Type X," or "⅝-Inch Johns-Manville Firetard—

Type X," or "⅝-Inch Firebloc Gypsum Wallboard" repeated down the center of each sheet and spaced approximately 5 feet on center or by the words "⅝-Inch Blue Diamond FireHalt Type 'X'" on the tapered edge of each sheet. In addition, each bundle consisting of two sheets has an end bundling tape bearing the label of Underwriters' Laboratories, Inc. The Sound Deadening Fiberboard is identified by a sticker on each bundle reading "Bestwall Sound Deadening Fiberboard" or "Johns-Manville Sound Deadening Fiberboard."

III. **Points of Variance with the Uniform Building Code:** Table No. 43-B assigns no fire-resistive rating to these types of construction.

IV. **Evidence Submitted:** Results of various fire tests conducted in accordance with U.B.C. Standard No. 43-1-64 are submitted.

Recommendation

V. **Recommendation: That the types of construction described in Part II of this report are satisfactory alternates to those specified in the Uniform Building Code for the fire-resistive ratings noted. Further, that the gypsum wallboards have a Class I flame-spread rating.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) T. H. Carter
Managing Director

SGP 0028438

RESEARCH RECOMMENDATION

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES • 684-1310 • PASADENA, CALIFORNIA

Report No. 1766.3
October 1, 1965

FIRESTOP 120 GYPSUM CEILING TILE
GEORGIA-PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION
2 INDUSTRIAL BOULEVARD
PAOLI, PENNSYLVANIA

I. **Introduction:** At the request of Georgia-Pacific Corporation, Bestwall Gypsum Division, Paoli, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a re-examination of the data submitted in connection with the use of Bestwall Firestop 120 Gypsum Ceiling Tile and has noted that the Uniform Building Code does not assign a fire-resistive rating to this type of construction.

II. **Description: Two-hour Fire-resistive Incombustible Floor-ceiling or Roof-ceiling Construction:** Consists of a reinforced sand-gravel concrete slab 2 inches thick poured on a metal lath form spanning between steel joists and a ceiling consisting of Firestop 120 textured ceiling tile. Three-eighths-inch expanded ribbed metal lath weighing 3.4 pounds per square yard is attached to the top chord of the steel joists at alternate ribs with No. 18 gauge galvanized steel wire. Adjacent sheets of lath are overlapped 4½ inches at the sides and tied together with No. 18 gauge wires spaced 9 inches on center. End laps are approximately 3 inches. The concrete slab 2 inches thick is reinforced in accordance with the requirements of the Code and poured on the metal lath form.

A Donn fire grid suspension system provides support for the ceiling tile. Main beams consisting of No. 25 gauge steel 1½-inch deep bulb tee sections having a 1-inch flange width and a ¼-inch wide by ½-inch deep bulb are spaced 4 feet on center in a direction perpendicular to the joists and are saddle tied to the bottom chord of the joists with No. 12 gauge galvanized steel wire at 4-foot intervals. The bottom of the main beam is located 4½ inches below the bottom chord of the joists. Cross tees are placed perpendicular to the main beams at 24 inches on center and are fitted into the slots provided in the main beam at 6-inch intervals. Cross tees 2 feet long are placed perpendicular to the cross tees 4 feet long at 24-inch intervals to form a 2-foot by 2-foot grid for support of the ceiling tile. The cross tees are identical to the main beams. Special splices manufactured by Donn Products, Inc., are provided between the joints in the main beams to permit expansion.

The Firestop 120 textured ceiling tile is ⅝ inch thick and 24 inches by 24 inches in over-all size. The tile is supported on the projecting flanges of the bulb tee suspension system.

Alternate Construction: Two-hour Fire-restrictive Incombustible Floor-ceiling or Roof-ceiling: Consists of a 2½-inch thick concrete slab poured on a metal lath form spanning between steel bar joists spaced 24 inches on center. An exposed grid suspension system identical to that described above is suspended 16½ inches below the concrete slab and 6½ inches below the lower chord of the steel bar joists. The ceiling may contain 24-inch by 48-inch recessed type light fixtures protected with a box formed from ⅝-inch thick Firestop Bestwall. One 30-inch by 48-inch piece of Firestop Bestwall is scored on one side and is broken to form diagonal sides 7 inches wide and a top piece 16 inches wide. End sections 6 inches by 26 inches in size are slotted to fit over the T-sections and are nailed to the top and sides with 8-penny common nails. In addition, ducts protected with fusible link dampers covered with 1/16-inch thick asbestos paper may penetrate the ceiling provided the area does not exceed 76 square inches per 100 square feet of ceiling area. The area of light fixtures shall not exceed 8 square feet per 100 square feet of ceiling area and are identified with an Underwriters' Laboratories Label, Guide No. 21012.18.

Identification: The tile is packaged in cartons labeled "Firestop 120 Ceiling Tile."

III. **Points of Variance with the Uniform Building Code:** The Uniform Building Code does not assign a fire-resistive rating to this type of construction.

IV. **Evidence Submitted:** Results of fire-endurance tests and flame resistance tests conducted in accordance with U.B.C. Standards No. 43-1-64 and No. 42-1-64 are submitted.

Recommendation

V. Recommendation: That Firestop 120 Gypsum Ceiling Tile construction as described in Part II of this report are satisfactory alternates to that specified in the Uniform Building Code for a two-hour fire-resistive rating. Further the Firestop 120 ceiling tile has a flame-spread classification of 1.

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) T. H. Carter
Managing Director

SGP 0028439

RESEARCH RECOMMENDATION

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES • 684 1310 • PASADENA CALIFORNIA

Report No. 1997.1
June 4, 1965

BESTWALL TILE BACKER BOARD
GEORGIA-PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION
2 INDUSTRIAL BOULEVARD
PAOLI, PENNSYLVANIA

WATERTITE BACKER
JOHNS MANVILLE SALES CORPORATION
22 EAST 40TH STREET
NEW YORK, NEW YORK

I. **Introduction:** At the request of the Georgia-Pacific Corporation, Bestwall Gypsum Division, Paoli, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a study of the data submitted in connection with the use of the above gypsum products for use as a backing material behind approved finish materials in shower and tub enclosures.

II. **Description: General:** The Bestwall Gypsum Division's Tile Backer Board is manufactured with a ½-inch thickness with widths of 4 feet and in lengths of 8 feet, 11 feet and 12 feet with tapered factory bound edges. The board contains an asphaltic gypsum core with a blue water-resistant face paper and a charcoal gray breather type back paper.

The product also is manufactured by Georgia-Pacific Corporation, Bestwall Division for the Johns-Manville Sales Corporation, New York, New York, and is marketed under the product name "Watertite Backer."

Installation: Full size sheets of gypsum wallboard having a thickness of ½ inch are applied horizontally to supports spaced 16 inches on center and attached in the manner prescribed by the Code or applicable Research Recommendations.

For tub and shower enclosures, the tub or shower receptor or pan is positioned with respect to the studs so that projecting lips of the units are flush with the outside face of the wallboard. A ¼-inch clearance between the paperbound edge of the wallboard and the tub, receptor or pan must be maintained. All wallboard joints, nail heads, cut edges and pipe openings are protected with a 2-inch wide vinyl tape which is supplied as an integral part of the backing system. When ceramic tile is more than ⅝ inch thick, solid blocking is required between studs. One row of the blocking is located approximately 1 inch above the tub or receptor and an additional row at the mid-point between the tub and the ceiling. Also, when the tile is more than ⅝ inch thick, the nails for applying the gypsum wallboard shall be spaced a maximum of 4 inches on center. A waterproofing membrane is applied to the exposed face of the wallboard by either of the following methods:

1. With the flat edge of a trowel, a full ⅛-inch skim coat of tile adhesive is evenly applied to the entire surface receiving the tile. The adhesive is applied also to the bottom edge of the wallboard and to fill the cutout spaces around the pipes, soap dishes, towel bars, etc. A setting time of 24 hours is required. Adhesives used as sealants under ceramic tile must conform to U. S. Department of Commerce Commercial Standard No. 181-52, "Water-Resistant Organic Adhesives for Installation of Clay Tile."

   After the skim coat has hardened so that it will not be grooved by the notches of the trowel, a bedding coat of the same adhesive is applied. The bedding coat extends down over the lip of the tub, receptor or pan to form a water dam behind the bottom edge of the tile.
2. A waterproofed sealer is used in lieu of the skim coat of the tile adhesive described above. Sealers shall be only those specifically made for the purpose, and compatible with the tile adhesive, such as certain rubber base sealants. The sealer is evenly applied in a heavy brush application. Permitted sealers are: Miracle Adhesive Corporation's Ceramic Tile Primer; Minnesota Mining and Manufacturing Company's CTA 50 Primer, or approved sealers of comparable quality. All edges of cutouts for pipes, soap dishes, towel bars, etc., must be sealed and then caulked with waterproof, nonhardening caulking compound. After the sealer coat has dried thoroughly, the bedding adhesive is trowelled on to receive the tile.

Identification: The products are identified by the color and by tape bearing the company and product name.

III. **Points of Variance with the Uniform Building Code:** Section 1711 (a) of the Uniform Building Code requires that materials forming shower and tub enclosures be of a type not adversely affected by moisture.

IV. **Evidence Submitted:** Installation instructions are submitted.

Recommendation

V. **Recommendation: That the application of the Tile Backer Board described above in shower and bath areas as a backing material for approved nonabsorbent finishes is a satisfactory alternate method of construction to that specified in the Uniform Building Code provided the installation is in accordance with the description in Part II of this report.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) T. H. Carter
Managing Director

SGP 0028440

RESEARCH RECOMMENDATION

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES • 684 1310 • PASADENA CALIFORNIA

Report No. 1997.1
June 4, 1965

BESTWALL TILE BACKER BOARD
GEORGIA-PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION
2 INDUSTRIAL BOULEVARD
PAOLI, PENNSYLVANIA

WATERTITE BACKER
JOHNS MANVILLE SALES CORPORATION
22 EAST 40TH STREET
NEW YORK, NEW YORK

I. **Introduction:** At the request of the Georgia-Pacific Corporation, Bestwall Gypsum Division, Paoli, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a study of the data submitted in connection with the use of the above gypsum products for use as a backing material behind approved finish materials in shower and tub enclosures.

II. **Description: General:** The Bestwall Gypsum Division's Tile Backer Board is manufactured with a ½-inch thickness with widths of 4 feet and in lengths of 8 feet, 11 feet and 12 feet with tapered factory bound edges. The board contains an asphaltic gypsum core with a blue water-resistant face paper and a charcoal gray breather type back paper.

The product also is manufactured by Georgia-Pacific Corporation, Bestwall Division for the Johns-Manville Sales Corporation, New York, New York, and is marketed under the product name "Watertite Backer."

Installation: Full size sheets of gypsum wallboard having a thickness of ½ inch are applied horizontally to supports spaced 16 inches on center and attached in the manner prescribed by the Code or applicable Research Recommendations.

For tub and shower enclosures, the tub or shower receptor or pan is positioned with respect to the studs so that projecting lips of the units are flush with the outside face of the wallboard. A ¼-inch clearance between the paperbound edge of the wallboard and the tub, receptor or pan must be maintained. All wallboard joints, nail heads, cut edges and pipe openings are protected with a 2-inch wide vinyl tape which is supplied as an integral part of the backing system. When ceramic tile is more than ⅝ inch thick, solid blocking is required between studs. One row of the blocking is located approximately 1 inch above the tub or receptor and an additional row at the mid-point between the tub and the ceiling. Also, when the tile is more than ⅝ inch thick, the nails for applying the gypsum wallboard shall be spaced a maximum of 4 inches on center. A waterproofing membrane is applied to the exposed face of the wallboard by either of the following methods:

1. With the flat edge of a trowel, a full ⅛-inch skim coat of tile adhesive is evenly applied to the entire surface receiving the tile. The adhesive is applied also to the bottom edge of the wallboard and to fill the cutout spaces around the pipes, soap dishes, towel bars, etc. A setting time of 24 hours is required. Adhesives used as sealants under ceramic tile must conform to U. S. Department of Commerce Commercial Standard No. 181-52, "Water-Resistant Organic Adhesives for Installation of Clay Tile."

   After the skim coat has hardened so that it will not be grooved by the notches of the trowel, a bedding coat of the same adhesive is applied. The bedding coat extends down over the lip of the tub, receptor or pan to form a water dam behind the bottom edge of the tile.
2. A waterproofed sealer is used in lieu of the skim coat of the tile adhesive described above. Sealers shall be only those specifically made for the purpose, and compatible with the tile adhesive, such as certain rubber base sealants. The sealer is evenly applied in a heavy brush application. Permitted sealers are: Miracle Adhesive Corporation's Ceramic Tile Primer; Minnesota Mining and Manufacturing Company's CTA 50 Primer, or approved sealers of comparable quality. All edges of cutouts for pipes, soap dishes, towel bars, etc., must be sealed and then caulked with waterproof, nonhardening caulking compound. After the sealer coat has dried thoroughly, the bedding adhesive is trowelled on to receive the tile

Identification: The products are identified by the color and by tape bearing the company and product name.

III. **Points of Variance with the Uniform Building Code:** Section 1711 (a) of the Uniform Building Code requires that materials forming shower and tub enclosures be of a type not adversely affected by moisture.

IV. **Evidence Submitted:** Installation instructions are submitted.

Recommendation

V. **Recommendation: That the application of the Tile Backer Board described above in shower and bath areas as a backing material for approved nonabsorbent finishes is a satisfactory alternate method of construction to that specified in the Uniform Building Code provided the installation is in accordance with the description in Part II of this report.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) **T. H. Carter**
Managing Director

SGP 0028441

RESEARCH RECOMMENDATION

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES • 684-1310 • PASADENA, CALIFORNIA

Report No. 1993.1
May 7, 1965

⅝-INCH BESTWALL FIRESTOP STEEL COLUMN PROTECTION
GEORGIA-PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION
2 INDUSTRIAL BOULEVARD
PAOLI, PENNSYLVANIA

⅝-INCH FIRETARD STEEL COLUMN PROTECTION
JOHNS-MANVILLE SALES CORPORATION
22 EAST 40TH STREET
NEW YORK, NEW YORK

I. **Introduction:** At the request of the Georgia-Pacific Corporation, Bestwall Gypsum Division, Paoli, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a study of the data submitted in connection with the above Type "X" Gypsum wallboards for one-, two-, three- and four-hour fire-resistive column protection and has noted that the Uniform Building Code does not assign fire-resistive ratings to this type of construction.

II. **Description: One-hour Fire-resistive Column Protection:** The one-hour fire-resistive column protection consists of a single layer of ⅝-inch thick Bestwall Firestop or Johns-Manville Firetard Type "X" gypsum wallboard installed to completely encase the column. The wallboard is furred 1⅝ inches from the column flanges by means of four No. 25 gauge channel-shaped galvanized steel studs having a depth of 1⅜ inches, a width of 1⅝ inches with 1¼-inch wide folded flanges. The channels are installed at each column flange with the ¼-inch folded flanges in contact with the column flange. The ⅝-inch Bestwall Firestop or Johns-Manville Firetard Type "X" gypsum wallboard is cut to size with overlapping corners and is connected with 1-inch long No. 6 drywall screws spaced 8 inches on center to each flange of each channel. No. 25 gauge metal cornerbeads with ¼-inch wide perforated flanges are applied over each corner and are attached with 1-inch long No. 6 drywall screws spaced 24 inches on center. The screws have sufficient length so that they extend through the cornerbead, wallboard and into the flanges of the channel-shaped furring studs.

Two-hour Fire-resistive Column Protection: The two-hour fire-resistive column protection consists of two layers of ⅝-inch thick Bestwall Firestop or Johns-Manville Firetard Type "X" gypsum wallboard installed so as to completely encase the column. The channel-shaped furring studs are identical to that described above for the one-hour fire-resistive construction. The first layer of wallboard is attached to each face of the furring channels with 1-inch long No. 6 drywall screws spaced 24 inches on center. The second layer of wallboard is cut to size and connected to each face of the furring studs with 1¾-inch long No. 6 drywall screws spaced 12 inches on center. The screws have sufficient length so that both layers of wallboard and the furring studs are penetrated. When both layers of wallboard are in position, No. 25 gauge cornerbeads with 1¼-inch wide perforated flanges are applied to each corner of the column and are connected to the wallboard with 6-penny nails spaced 12 inches on center.

Three-hour Fire-resistive Column Protection: The three-hour fire-resistive column protection consists of three layers of ⅝-inch thick Bestwall Firestop or Johns-Manville Firetard Type "X" gypsum wallboard installed so as to completely encase the column. The first two layers of wallboard and furring studs are installed identically to that described above for the two-hour fire-resistive column protection. Prior to installation of the third layer of ⅝-inch thick Type "X" gypsum wallboard No. 18 gauge galvanized double tie wires are installed so that they completely surround the column and are spaced a maximum of 24 inches on center. When the tie wires are in place, a third layer of gypsum wallboard is cut to size and is secured to the previously applied layers with 2½-inch long No. 8 drywall screws spaced 12 inches on center. Metal cornerbeads are identical to those described above fastened with 6-penny nails spaced 12 inches on center through each flange.

Four-hour Fire-resistive Column Protection. The four-hour fire-resistive column protection consists of four layers of ⅝-inch thick Bestwall Firestop or Johns-Manville Firetard Type "X" gypsum wallboard installed so as to completely encase the column. The first two layers of gypsum wallboard and metal furring channels are installed identically to that described for the three-hour fire-resistive column. The third layer of ⅝-inch Type "X" gypsum wallboard is attached to each flange of the four furring channels with 2½-inch long No. 8 drywall screws spaced 12 inches on center. The screws have sufficient length to penetrate the three layers of ⅝-inch thick wallboard and the steel furring channels. Prior to installation of the fourth layer of ⅝-inch thick Type "X" gypsum wallboard No. 18 gauge galvanized double tie wires are installed identically to that described above for the three-hour column protection. The fourth layer of wallboard is cut to size and held in position with metal cornerbeads identical to those described above and fastened through each flange of the cornerbeads with 6-penny nails spaced 12 inches on center.

Identification: All wallboards are identified with a light marking of the respective manufacturers consisting of the words "⅝-Inch Bestwall Type 'X'" or "⅝-Inch Johns-Manville Firetard—Type 'X'."

III. **Points of Variance with the Uniform Building Code:** The Uniform Building Code does not assign a fire-resistive time period to these types of column protection.

IV. **Evidence Submitted:** Results of fire-endurance tests conducted by Underwriters' Laboratories, Inc., are submitted.

Recommendation

V. **Recommendation: That the fire-resistive column protection described in Part II of this report is a satisfactory alternate type of construction to that specified in the Uniform Building Code for the respective fire-resistive ratings.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) T. H. Carter
Managing Director

SGP 0028442

RESEARCH RECOMMENDATION

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES • 684-1310 • PASADENA, CALIFORNIA

Report No. 1993.1
May 7, 1965

⅝-INCH BESTWALL FIRESTOP STEEL COLUMN PROTECTION
GEORGIA-PACIFIC CORPORATION
BESTWALL GYPSUM DIVISION
2 INDUSTRIAL BOULEVARD
PAOLI, PENNSYLVANIA

¾-INCH FIRETARD STEEL COLUMN PROTECTION
JOHNS-MANVILLE SALES CORPORATION
22 EAST 40TH STREET
NEW YORK, NEW YORK

I. **Introduction:** At the request of the Georgia-Pacific Corporation, Bestwall Gypsum Division, Paoli, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a study of the data submitted in connection with the above Type "X" Gypsum wallboards for one-, two-, three- and four-hour fire-resistive column protection and has noted that the Uniform Building Code does not assign fire-resistive ratings to this type of construction.

II. **Description: One-hour Fire-resistive Column Protection:** The one-hour fire-resistive column protection consists of a single layer of ⅝-inch thick Bestwall Firestop or Johns-Manville Firetard Type "X" gypsum wallboard installed to completely encase the column. The wallboard is furred 1⅜ inches from the column flanges by means of four No. 25 gauge channel-shaped galvanized steel studs having a depth of 1⅜ inches, a width of 1⅝ inches with 1¼-inch wide folded flanges. The channels are installed at each column flange with the ¼-inch folded flanges in contact with the column flange. The ⅝-inch Bestwall Firestop or Johns-Manville Firetard Type "X" gypsum wallboard is cut to size with overlapping corners and is connected with 1-inch long No. 6 drywall screws spaced 8 inches on center to each flange of each channel. No. 25 gauge metal cornerbeads with ¼-inch wide perforated flanges are applied over each corner and are attached with 1-inch long No. 6 drywall screws spaced 24 inches on center. The screws have sufficient length so that they extend through the cornerbead, wallboard and into the flanges of the channel-shaped furring studs.

Two-hour Fire-resistive Column Protection: The two-hour fire-resistive column protection consists of two layers of ⅝-inch thick Bestwall Firestop or Johns-Manville Firetard Type "X" gypsum wallboard installed so as to completely encase the column. The channel-shaped furring studs are identical to that described above for the one-hour fire-resistive construction. The first layer of wallboard is attached to each face of the furring channels with 1-inch long No. 6 drywall screws spaced 24 inches on center. The second layer of wallboard is cut to size and connected to each face of the furring studs with 1⅝-inch long No. 6 drywall screws spaced 12 inches on center. The screws have sufficient length so that both layers of wallboard and the furring studs are penetrated. When both layers of wallboard are in position, No. 25 gauge cornerbeads with 1¼-inch wide perforated flanges are applied to each corner of the column and are connected to the wallboard with 6-penny nails spaced 12 inches on center.

Three-hour Fire-resistive Column Protection: The three-hour fire-resistive column protection consists of three layers of ⅝-inch thick Bestwall Firestop or Johns-Manville Firetard Type "X" gypsum wallboard installed so as to completely encase the column. The first two layers of wallboard and furring studs are installed identically to that described above for the two-hour fire-resistive column protection. Prior to installation of the third layer of ⅝-inch thick Type "X" gypsum wallboard No. 18 gauge galvanized double tie wires are installed so that they completely surround the column and are spaced a maximum of 24 inches on center. When the tie wires are in place, a third layer of gypsum wallboard is cut to size and is secured to the previously applied layers with 2½-inch long No. 8 drywall screws spaced 12 inches on center. Metal cornerbeads are identical to those described above fastened with 6-penny nails spaced 12 inches on center through each flange.

Four-hour Fire-resistive Column Protection. The four-hour fire-resistive column protection consists of four layers of ⅝-inch thick Bestwall Firestop or Johns-Manville Firetard Type "X" gypsum wallboard installed so as to completely encase the column. The first two layers of gypsum wallboard and metal furring channels are installed identically to that described for the three-hour fire-resistive column. The third layer of ⅝-inch Type "X" gypsum wallboard is attached to each flange of the four furring channels with 2½-inch long No. 8 drywall screws spaced 12 inches on center. The screws have sufficient length to penetrate the three layers of ⅝-inch thick wallboard and the steel furring channels. Prior to installation of the fourth layer of ⅝-inch thick Type "X" gypsum wallboard No. 18 gauge galvanized double tie wires are installed identically to that described above for the three-hour column protection. The fourth layer of wallboard is cut to size and held in position with metal cornerbeads identical to those described above and fastened through each flange of the cornerbeads with 6-penny nails spaced 12 inches on center.

Identification: All wallboards are identified with a light marking of the respective manufacturers consisting of the words "⅝-Inch Bestwall Type 'X'" or "⅝-Inch Johns-Manville Firetard—Type 'X'."

III. **Points of Variance with the Uniform Building Code:** The Uniform Building Code does not assign a fire-resistive time period to these types of column protection.

IV. **Evidence Submitted:** Results of fire-endurance tests conducted by Underwriters' Laboratories, Inc., are submitted.

Recommendation

V. **Recommendation: That the fire-resistive column protection described in Part II of this report is a satisfactory alternate type of construction to that specified in the Uniform Building Code for the respective fire-resistive ratings.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) T. H. Carter
Managing Director

SGP 0028443

B E S T W A L L G Y P S U M C O M P A N Y

GYPSUM WALLBOARD MANUAL — Section 10

1965 EDITION

Building Codes and Building Officials

(Refer to the Gypsum Lath and Plaster Manual Section 9 – Building Codes) 1965 Edition for an article on Building Codes and Building Officials. Many salesmen are overawed by the voluminous amount of building regulations and the many matters covered in building codes. 75% or more of these are of no concern to Bestwall. In a building code, it is necessary to know only three or four of the following:

1 – How building materials are approved under the Code.

2 – Is a separate approval required for specific assemblies, even with material approval?

3 – Fees and data required.

4 – Time required.

B E S T W A L L G Y P S U M C O M P A N Y

GYPSUM WALLBOARD MANUAL — Section 10

1965 EDITION

1964 UNIFORM BUILDING CODE

The 1964 Uniform Building Code, the official Model Building Code of the West Coast Building Officials organization, who call themselves the International Conference of Building Officials, is reprinted each three years, incorporating all changes the group have agreed on in the preceding period.

Many communities which follow the Uniform Building Code have arrangements to automatically adopt the latest edition of the Code. Other cities have arrangements to automatically accept the Approvals of the Research Committee insofar as approvals of materials and assemblies are concerned. Tables No. 43-A, 43-B, and 43-C giving standard assemblies with fire resistance of 1 to 4 hours. This is the bible for such communities and is used as a reference on fire resistance by all who refer to the UBC.

Attached hereto are excerpts from Table 43 pertaining to Gypsum Wallboard Assemblies, all of which cover Bestwall materials as well as those of other gypsum manufacturers. Remember, Bestwall's Type "X" Board is Firestop.

Please notice that insofar as these ratings are concerned, they all call for a paper tape and cement for joint treatment for the fire resistive ratings. The Bestwall Gypsum Company has conducted tests at Underwriters' to prove specifically that the paper tape and cement was not necessary for the fire resistive rating and have reports and letters from the Underwriters' covering this feature. All approvals of Bestwall are being so requested and Underwriters' Listing of Materials for 1964 have that notation.

Use the new Table 43 in the 1964 Edition for proof of your assemblies in those communities where the Uniform Building Code is used.

In taking advantage of the Gypsum Association's work, the Bestwall Gypsum Company has dropped Research Report #1145.6 as of April in '64 when it was due to be reviewed and reissued, making it current. Be sure that you understand and that any of your customers or Building officials who are concerned, understand that the 1145 was dropped only because the assembly is now covered in Table #43 and hence is a part of the Code itself.

1145 covered the 1-Hour approval for Bestwall's Firestop Gypsum Wallboard over wood studs and beneath wood floor and joists for 1-Hour fire resistance.

TABLE NO. 43-B RATED FIRE-RESISTIVE PERIODS FOR VARIOUS WALLS AND PARTITIONS

MATERIAL	CONSTRUCTION	Minimum Finished Thickness Face-To-Face (Including Plaster Where Mentioned) 2 Hr.	1 Hr.
Solid Gypsum Wallboard Partition	One layer ½" Type "X" wallboard laminated to each side of 1" V-Edged coreboards with approved laminating compound. Vertical joints of face layer & coreboard are staggered 3" or more. Joints are taped and finished	2"	
Interior Stud Partition W/Gypsum Wallboard on each side	Wood studs with 2 layers 3/8" gypsum wallboard each side. First layer nailed to studs in vertical position. Face layer laminated to base layer in horizontal position w/joints staggered using gypsum joint cement and nails.		5"
	Wood studs w/space between filled w/mineral wool bats nailed to studs, 1/2" gypsum wallbd.ea.side		4 1/2"
	Wood studs w/two layers of 1/2" gypsum wallboard each side, joints staggered		5 1/2"
Interior Stud Partition W/Gypsum Wallboard on each side	Wood studs w/one layer 5/8" Type "X" gypsum wallboard nailed 7" on center to each side w/end joints on nailing members. Joints taped and finished (Firestopped)		4 7/8"
	Wood studs w/two layers 5/8" Type "X" gypsum wallboard each side. Base layers applied vertically and nailed[5] 9" on center. Face layers applied vertically or horizontally & nailed[6] 7" on center. For nail-adhesive application base layers are nailed[5] 6" on center. Face layers applied with coating of wallboard adhesive and nailed[5] 12" on center. Face layer joints taped & finished (Firestopped)	6 1/8"	
Exterior Stud Wall	Drop siding over ½" gypsum sheathing on exterior surface w/interior surface treatment as required for interior stud partitions		5 5/8"
	Wood studs w/one layer 5/8" Type "X" gypsum wallboard nailed 7" on center on the inside w/end joints on nailing members. Covered on the exterior w/one of the materials specified above. Joints taped & finished (Firestopped)		5 1/8"

SGP 0028446

		Minimum Thickness of Ceiling 2 Hr.	1 Hr.
Wood joists w/subfloor of 1" nominal boarding, or 5/8" plywood, a layer of building paper & ½" T.& G. flooring	Attached ceiling of one layer 5/8" Type "X" gypsum wallboard nailed[5] 6" on center to joists w/end joints on nailing members. Joints taped and finished		5/8"
	Attached ceiling of 2 layers 1/2" gypsum wallboard w/ a separately attached 20-gauge 1" wire mesh between the two layers		1"

Note 5 or 6: Six-penny No. 13 gauge, 1-7/8" long, 1/4" diameter, flat head nail

Note 5 or 6: Eight-penny No. 11½ gauge, 2-3/8" long, flat head nail

REGIONAL CODE APPROVALS

AGENCIES

PRODUCT	FIRE RESISTIVE RATING	UBC	SBCC	ICBO	BOCA	NYB STD. & A	CITY OF L.A.	LOCAL	USE
5/8" FIRESTOP	2 HR.		6280	1000.6		709-51 SM			MULTIPLE LAYER APPLICATION WALLS AND PARTITIONS LOAD BEARING AND NON-LOAD BEARING (HUMMER B-MOD)
" "	1 HR.		6280			709-51SM WALL 710-51SM CEILING			SINGLE LAYER APPLICATION-WALLS & PARTITIONS - (WOOD OR STEEL) FLOOR & CEILING-LOAD BEARING & NON-LOAD BEARING
" "	1 HR.			1145.6		710-51 SM			SINGLE LAYER APPLICATION-LOAD BEARING (WOOD STUDS 16"o.c.)WALL & PARTITION FLOOR & CEILING (WOOD JOISTS 16" o.c.)
" "	1 HR.			1155.8		709-51 SM 710-51 SM	RR2230 RR2390		SINGLE LAYER-STEEL STUDS 24" o.c.-WALLS & PARTITIO FLOOR & CEILING-2½" CONCRETE ON STEEL JOISTS
" "	1 HR.			1144.7					MULTIPLE LAYER-GYPSUM RIBS LAMINATED TO PANELS NON-LOAD BEARING PARTITION ASSEMBLY
" "	1½ HR.		6280						MULTIPLE LAYER APPLICATION-FLOOR & CEILING
" "	2&3 HR.			1263.6		709-51 SM			4 & 5" THICK NON-LOAD BEARING LAMINATED WALLBOARD PARTITIONS (HUMMER B - MODIFIED)
" "	3 HR.		6280			709-51 SM			MULTIPLE LAYER APPLICATION-WALLS & PARTITIONS-NON-LOAD BEARING
" "	1 HR. 1 HR.					710-51 SM			MULTIPLE LAYER APPLICATION-FLOOR & CEILING 2" CONCRETE SLAB - STUB JOISTS
HUMMER "C"	1 HR.			1466.3		682-56 SM	3-9-59 LTR.		A 2-3/4" THICK 24" WIDE FACTORY FABRICATED NON-LOAD BEARING PARTITION
BESTWALL GYPSUM SHEATHING						683-56 SM			EXTERIOR SHEATHING ON WOOD FRAME CONSTRUCTION CLASS IV CONSTRUCTION-CORE TREATED & NON-CORE TREATED.
SPACIAL SILENCE ACOUSTICAL & CEILING TILE						682-56 SM			INCOMBUSTIBLE TILE FOR USE IN APPROVED SUSPENSION SYSTEM.
FIRESTOP-120 CEILING TILE	2 HR.		6283		62-25	710-51 SM			CEILING ASSEMBLIES IN AN APPROVED FIRERATED SUSPENSION SYSTEM
PLAIN GYPSUM LATH AND PINHOLATH TYPE "X"	1 HR.		6285	1526.4	62-23 62-23	686-56 SM			FLOOR & CEILING CONSTRUCTION-PLAIN OR PINHOLATH & GYP. SAND OR PERLITE PLASTER, NO METAL REINFORCEMENT-NON-LOAD BEARING METAL STUDS-WOOD FLOOR JOISTS.

CRD 000047

REGIONAL CODE APPROVALS

AGENCIES

PRODUCT	FIRE RESISTIVE RATING	UBC	SBCC	IOBO	BOCA	NYB STD. & A	CITY OF L.A.	LOCAL	USE
BASE COAT PLASTERS FINISH COAT MATERIALS						685-56 SM			BASE COAT PLASTER, NEAT, FIBERED, UNFIBERED, CON GAUGING, SLOW SET, FAST SET, SATIN SPAR GAUGING, KEENES CEMENT, WOOD FIBERED PLASTER, SUN FLOWER MOLDING, CONCRETE BOND PLASTER,
METRO-MIX	1-2 HR.					159-55 SM			GYPSUM CONCRETE FOR POURED ROOF DECKS - 2 TO 2½" THICK
PLASTER & LATH CEILING ASSEMBLIES	TYPE 1-1HR. TYPE 2&3-1½ HR. TYPE 4-2HR. TYPE 5-2½HR. TYPE 6,7,8-3 HR. TYPE 9,10, 11-4 HR.					1305-61 SM			COMPONENT PART OF FIRE RESISTIVE FLOOR & CEILING SYSTEM
PLASTER & LATH PARTITIONS	 1 HR. 1½ HR. 1 HR. 1½ HR. 2 HR.					1306-61 SM			GYPSUM LATH & PLASTER FOR SOLID & HOLLOW PARTITIONS NON-LOAD BEARING TYPE 1-PERLITE OR VERMICULITE PLASTER TYPE 2-SANDED GYPSUM PLASTER TYPE 3-2" PLAIN LATH - GYPSUM PLASTER TYPE 4-2" PLAIN LATH - PERLITE OR VERMICULITE TYPE 5-2" PLAIN LATH - PERLITE OR VERMICULITE
PLASTER & LATH COLUMNS	 1 HR. 1½ HR. 1 HR. 3½ HR. 1½ HR. 3 HR. 3 HR. 4 HR. 4 HR.					1307-61 SM	RR2911 (2 HR.)		FIREPROOFING OF STRUCTURAL STEEL COLUMN S, TYPE 1 - TYPE 2 - TYPE 3 - TYPE 4 - TYPE 5 - TYPE 6 - TYPE 7 - TYPE 8 - TYPE 9 -

SGP 002848

REGIONAL CODE APPROVALS

AGENCIES

PRODUCT	FIRE RESISTIVE RATING	UBC	SBCC	ICBO	BOCA	NYB STD. & A.	CITY OF L.A.	LOCAL	USE
GYPSUM WALLBOARD GYPSUM BACKERBOARD GYPSUM LATH & PLASTER				1874.1					TO FORM THE INTERIOR FINISH OF DUCTS OR PLENUM CHAMBERS BY PARTS OF THE BUILDING STRUCTURE.
GYPSUM WALLBOARD				1733.1					APPLICATION OF GYPSUM WALLBOARD IN SHOWER & BATH AREAS.
GYPSUM DRYWALL BOARD & SYSTEMS	1 HR.				63.9 (REPORT No. 176)				S.B.R.-176 A-WOOD STUDS - 5/8" B/W FIRESTOP
	2 HR.				"				S.B.R.-176 B-WOOD STUDS - 5/8" B/W FIRESTOP
	1 HR.				"				S.B.R.-176 C-STEEL STUDS-5/8" B/W FIRESTOP
	1 HR.				"				S.B.R.-176 D-1" GYPSUM STUDS 5/8" B/W FIRESTOP
	2 HR.				"				S.B.R.-176 E-1" GYPSUM STUDS 5/8" B/W FIRESTOP
	3 HR.				"				S.B.R.-176 F-1" GYPSUM STUDS 5/8" B/W FIRESTOP
	2 HR.				"				S.B.R.-176 G-STEEL Z STUDS 5/8" B/W FIRESTOP
	1 HR.				"				S.B.R.-176 H-FLOOR & CEILING ASSEMBLY 5/8" B/W FIRESTOP
	2 HR.				"				S.B.R.-176 I-FLOOR & CEILING ASSEMBLY 5/8" B/W FIRESTOP
	1½ HR.				"				S.B.R.-176 J-FLOOR & CEILING ASSEMBLY 5/8" B/W FIRESTOP
5/8" FIRESTOP	2 HR.			1000.8					NESLO Z STUD - 2 LAYERS = 5/8" B/W FIRESTOP
VINYL FACED GYPSUM WALLBOARD 5/8" B/W FIRESTOP TYPE "X"	1 HR.			1661.3					PENMETAL PANEL-BOARD PARTITION SYSTEM.
DW-SCREW CHANNEL STUD SYSTEM	1 HR.			1736.2					DONN DW-SCREW CHANNEL STUD SYSTEM
FIBERGLAS NOISE STOP BOARD PARTITION	1 HR.			1809.2					OWENS-CORNING-FIBERGLAS NOISE STOP BOARD - 5/8" B/W FIRESTOP PARTITION

SGP 0028449

BUILDING CODE DATA

S/R_____ SALES DISTRICT_____ DATE_____

1. CITY_____ POPULATION_____

2. PERSON IN CHARGE OF BUILDING DEPARTMENT

_____ _____
Name Title

_____
Address

BUILDING INSPECTOR_____

Address_____

PLAN ENGINEER_____ _____

Address_____

CHIEF FIELD INSPECTOR_____

Address_____ _____

3. BUILDING CODE

DATE OF CURRENT CODE_____

PATTERNED AFTER MODEL CODE? YES__ NO__. UBC__ BOCA__ SBCC__ NRC___
Check one)

NEW CODE BEING CONSIDERED? YES__ NO__

4. HOW ARE MATERIALS AND ASSEMBLIES APPROVED

(a) BY ONE PERSON? YES___ NO___. WHO?_____

(b) BY A GROUP? YES___ NO___

WHAT IS GROUP?_____

MEMBERS_____ _____
Name Title

_____ _____

_____ _____

_____ _____

(c) ANY FEE REQUIRED? YES___ NO___. AMOUNT_____

(d) WHAT DATA IS NEEDED?

ANY LAB_____ MEETING WHAT STANDARD_____

or ONLY ONE LAB? YES___ NO___. WHAT LAB?_____

SGP 0028450

5. IS BESTWALL MATERIAL APPROVED?

			(Hrs.) Walls				(Hrs.) Ceilings					
	Yes	No	L	2	3	4	1	2	3	4	Column	Beam
NEAT GYPSUM PLASTER												
LITE MIX												
GYPSUM LATH												
PINHOLATH												
GYPSUM WALLBOARD												
5/8" FIRESTOP												
1/2" FIRESTOP												
2'x8' GYPSUM SHEATHING												
4'x8' GYPSUM SHEATHING												

ANY PROBLEMS _____

_____

_____

_____

_____

SIGNED _____ S/R

_____
Address

BUILDING OFFICIALS CONFERENCE OF AMERICA, INC.

MATERIAL APPROVALS COMMITTEE

PRODUCT CLASSIFICATION – Gypsum Drywall Board and Systems **APPROVAL NO.** 63-9

APPLICANT – Bestwall Gypsum Company **REPORT NO.** 176

PRODUCT TRADE NAME – Bestwall Firestop Systems **APPROVED:** Dec. 2, 1963

PERFORMANCE FOR WHICH APPROVAL WAS REQUESTED – 1. Fire resistance: 2. Flame resistance.

RECOMMENDED APPROVAL – Based on Structural Bureau Report No. 176, dated October 1, 1963, and subject to requirements due to peculiar local conditions, the following approvals are recommended provided that the sections set forth in the report and any other applicable sections of the BOCA Codes (1960 as amended 1962) are observed, that the product is installed within the limitations of this report and in accordance with the manufacturer's specifications noted therein:

The recommendations offered for approval are to be found under Section IV B 1 in the individual parts of this report. They are summarized as follows:

Interior load-bearing partitions

SBR 176a Wood studs on 16 inch centers surfaced on both sides with one layer 5/8" Bestwall Firestop 1-Hour fire resistance.

176b Wood studs on 16 inch centers surfaced on both sides with two layers each side 5/8" Bestwall Firestop 2-Hour fire resistance.

176c Steel studs on 24 inch centers load-bearing surfaced on both sides with one layer of 5/8" Bestwall Firestop 1-Hour fire resistance.

176d 1 inch gypsum studs covered on each side by one layer of 5/8" Bestwall Firestop non-load-bearing 1-Hour fire resistance.

176e 1 inch gypsum studs covered on each side by two layers of 5/8" Bestwall Firestop non-load-bearing 2-Hour fire resistance.

176f 1 inch gypsum studs staggered covered on each side by two layers of 5/8" Bestwall Firestop non-load-bearing 3-Hour fire resistance.

176g Steel Z studs having on each side two layers of 5/8" Bestwall Firestop non-load-bearing 2-Hour fire resistance.

176h Floor and ceiling assembly open web steel joists on 24 inch centers, 2 inches of concrete over joists, cross-furring on 16 inch centers and 5/8" Bestwall Firestop ceiling 1-Hour fire resistance.

176i Floor and ceiling assembly, open web steel joists on 24 inch centers with 2½ inches of concrete, cross-furring on 24 inch centers and one layer of 5/8" Bestwall Firestop ceiling 2-Hour fire resistance.

176j Floor and ceiling assembly, open web steel joists on 24 inch centers with 2 inches of concrete over the joists, cross-furring on 24 inch centers and one layer of 5/8" Bestwall Firestop ceiling, 1½-Hours fire resistance.

IDENTIFICATION – All packages of material covered by this report shall bear the identifying symbol "BOCA 63-9".

Copies of the Structural Bureau Report may be obtained from the BOCA Executive Office, 1313 East 60th Street, Chicago 37, Illinois, for $3.00 each.

SGP 0028452

COMMITTEE

MYRON J. SASSER, Chm.
L. P. HAMILTON
CHARLES LESLIE

Southern Building Code Congress

BROWN-MARX BUILDING BIRMINGHAM 3, ALABAMA

REPORT: 6280

APPROVED: 12-28-62

EXPIRES: NO DATE

COMMITTEE on COMPLIANCE APPROVAL REPORT

ON

5/8" THICK FIRESTOP BESTWALL

MANUFACTURED BY

BESTWALL GYPSUM COMPANY

SOLD THROUGH

BESTWALL CERTAIN-TEED SALES CORPORATION

ARDMORE, PENNSYLVANIA

The Manufacturer made formal application for Approval on August 11, 1958, supported by fire test data.

THIS APPROVAL REPORT SUPERSEDES AND TAKES PRECEDENCE OVER REPORT DATED FEBRUARY 6, 1959. THIS REPORT IS ISSUED TO CLARIFY INDEXING AND CLASSIFICATION WITH NO TECHNICAL CHANGES OF ORIGINAL REPORT OF FEBRUARY 6, 1959.

The Committee has reviewed all material submitted for Compliance with the Southern Standard Building Code and submits its report as follows:

DESCRIPTION:

Firestop Bestwall is a gypsum wallboard having a special core formulation under a patented process in which incombustible glass fibers and unexpanded vermiculite have been added to the gypsum core. It is manufactured in ½" and in ⅝" thicknesses. Firestop is made generally in 4 ft. wide sheets with tapered edges and a finished wall or ceiling includes the conventional tape and cement joint system. It is available with a square edge and also in 2 ft. and 4 foot widths with tongue and grooved edges for use as a backup for further treatment as acoustical tile, etc.

USES:

Wall, floor and ceiling assemblies, for load bearing and non-load bearing with fire retardant properties. Framing consists of metal or wood studs, bar joist or wood joist and no frames on no-load bearing partitions.

SUBSTANTIATING DATA:

(1) Manufacturers literature
   (a) Sweet's insert 1958—Firestop Bestwall—form 5657.
   (b) Fire Resistive Ratings — Firestop Bestwall — form BW 58106.

(2) Copies of Official Fire Test Reports made under ASTM E 119.

Underwriter Retardant	2889	8/5/47	Loadbearing Partition	1 hr.
Underwriter Retardant	2717-7-8	7/12/51	Floor and Ceiling	1 hr.
Underwriter Retardant	3843 2717	12/27/55	Non-Load Bearing Partition	1 hr.
Underwriter Retardant	2717-16	12/1/52	Floor and Ceiling	1 hr.
Underwriter Retardant	2717-19-21	6/3/57	Non-Load Bearing Wall	1 hr.
Underwriter Retardant	2717-20-22	8/26/57	Non-Load Bearing Wall	2 hr. 3 hr.
Underwriter Retardant	2717-23	Tested 7/22/58	Floor and Ceiling	1½ hr.
Ohio State Experimental Station Report T-209			Load Bearing Wall	1 hr.
Ohio State Experimental Station Report T-194.			Load Bearing Wall	1 hr.

REFERENCES: Southern Standard Building Code.
Chapter X — Fire Resistance Rating For Materials and Construction.

IDENTIFICATIONS:

All firestop Bestwall sheets shall carry the U L label and a face marking in the center of the board, repeated every five feet "5/8" Firestop Bestwall."

COMMITTEE CONCLUSION:

That 5/8" thick Firestop Bestwall Construction meets the provisions of the Southern Standard Building Code as follows:

(A) 5/8" Firestop Bestwall in single layer application in the construction detailed in the fire test reports meets the provisions in the Southern Building Code where 1 hour fire resistance, load bearing or non-load bearing, combustible or incombustible wall and partition or floor and ceiling construction is required.

(B) 5/8" Firestop Bestwall in multiple layer application in the constructions detailed in the fire test reports meets the provisions in the Southern Building Code where 2 hour fire resistive walls and partitions, load-bearing or non-load bearing, combustible or incombustible is required.

(C) 5/8" Firestop Bestwall in multiple layer application in the construction detailed in the fire test reports meets the provisions in the Southern Building Code where 3 hours non-load bearing fire resistive walls and partitions are required.

(D) 5/8" Firestop Bestwall in multiple layer application in the construction detailed in the fire test reports meets the provisions in the Southern Building Code where 1-1/2 hours fire resistive floor and ceiling incombustible construction is required.

(E) In view of the Fire Hazard Classification showing a 10 to 15 Flame Spread Rating, 5/8" Firestop Bestwall shall not be limited under the Southern Building Code other than as above in A, B, C and D.

(F) Height of non-load bearing flameless partition shall be limited to 12 ft. Maximum height of frame partitions shall be governed by rules on frame material (including section) used

LIMITATIONS:

That Firestop Bestwall shall be made only under Underwriters Inspection Service and carries the U L Label.

PERIOD OF APPROVAL:

This Approval or Certificate of Compliance will be in effect as long as the product "Firestop Bestwall" carries the U L Label. Should any revision or changes of method of construction occur, this Approval shall terminate. This however, is not to be construed to preclude any new submittals.

Myron J. Sasser, Chairman
Birmingham, Alabama

Charles Leslie
Charles Leslie Shreveport, Louisiana

L. P. Hamilton
L. P. Hamilton Columbia, South Carolina

SGP 0028453

COMMITTEE

MYRON J. SASSER, Chm.
L. P. HAMILTON
THOMAS M. MOSES

Southern Building Code Congress

BROWN-MARX BUILDING BIRMINGHAM, ALABAMA

REPORT: 6482

APPROVED: 12-7-64

EXPIRES:

COMMITTEE on COMPLIANCE APPROVAL REPORT

ON

BESTWALL "FIRESTOP-120" GYPSUM CEILING TILE

SUBMITTED BY

BESTWALL GYPSUM COMPANY

PAOLI, PENNSYLVANIA

The Manufacturer made formal application on September 24, 1964 for re-evaluation of their Approval Report 6283 dated December 31, 1962, together with new test report R-2717-32 on Firestop-120 Ceiling Tile system with recessed light fixtures and air vent openings.

THIS APPROVAL REPORT SUPERSEDES AND TAKES PRECEDENCE OVER REPORT 6283 DATED DECEMBER 31, 1962, THEREBY REMOVING AND MAKING INVALID APPROVAL REPORT 6283 AS DATED DECEMBER 31, 1962.

The Committee has reviewed the data submitted on August 30, 1962, and new data submitted on September 24, 1964, for Compliance with the Southern Standard Building Code and submits its Report as follows:

DESCRIPTION:

Bestwall "Firestop-120" is a fibered gypsum ceiling tile 5/8" x 24" x 24", designed for use in exposed grid suspended ceilings, hereinafter described, and is afforded a time design rating.

SUBSTANTIATING DATA:

1. Fire endurance Test Report No. T-2104 by Engineering Experiment Station of the Ohio State University.
2. Fire Test Report No. 533064 by Pittsburgh Testing Laboratory.
3. Sound Absorption Test No. A-60-33 by Armour Research Foundation.
4. Fire endurance Test Report R-2717-32, August 8, 1964, by Underwriters Laboratories, Inc.

REFERENCES TO SOUTHERN STANDARD BUILDING CODE:

Section 103.6	Alternate Materials and Alternate Methods of Construction.
Chapter X	Fire Resistance Ratings for Materials and Construction.

COMMITTEE FINDINGS:

The Committee on Compliance, in review of the data submitted, finds that, in their opinion, Bestwall "Firestop-120" Gypsum Ceiling Tile, used in floor and ceiling assemblies according to Ohio State University, Engineering Experiment Station, Fire Endurance Test Report T-2104, meets the requirements of the Southern Standard Building Code.

COMMITTEE RECOMMENDATIONS:

The Committee recomends that Bestwall "Firestop-120", uses and limitations as set forth in this Report, be approved by the Southern Building Code Congress for Fire endurance rating of floor and ceiling assembly in accordance with the following summary of Ohio State University Test, T-2104 and Underwriters Laboratories Report R-2717-32.

T-2104—10" deep open web steel joist, 2" thick concrete deck on metal lath and a Donn fire Grid Suspension System supporting 24" x 24" x 5/8" thick Bestwall "Firestop-120" Ceiling Tiles—2 hour rating.

R-2717-32—10" deep open web steel joist, 2-1/2" thick concrete deck on metal lath. 24" x 24" x 5/8" gypsum lay-in tile in an exposed-grid suspension system, with recess type light fixtures and air duct system—Design 208—2 Hr.

LIMITATIONS:

1. That all limitations of use prescribed by the manufacturer be strictly adhered to.
2. That "Firestop-120" should not be exposed to relative high humidity above or below the tile.
3. That Bestwall "Firestop-120" Gypsum Ceiling Tile shall be made under Underwriters Inspection Service, listed by Underwriters Laboratories and carry the UL manifest on all cartons.

IDENTIFICATION:

Every box of "Firestop-120" Ceiling Tile shall bear the name of the Manufacturer and type of tile, Underwriters Label, also the Southern Building Code Congress Seal of Approval may be applied for field identification as to this Approval.

PERIOD OF APPROVAL:

This Approval or Certificate of Compliance will be in effect as long as the product Bestwall "Firestop-120" is listed by Underwriters Laboratories and manufactured under Underwriters Inspection Service. Should any revision or changes of method of construction occur, this Approval shall terminate. This, however, is not to be construed to preclude any new submittals.

Myron J. Sasser, Chairman
Birmingham, Alabama

L. P. Hamilton, Columbia, South Carolina

Thomas M. Moses, Winter Park, Florida

SGP 0028454

COMMITTEE
MYRON J. SASSER, Chm.
L. P. HAMILTON
THOMAS M. MOSES

Southern Building Code Congress
BROWN-MARX BUILDING BIRMINGHAM, ALABAMA

REPORT: 6483
APPROVED: 12-7-64
EXPIRES: 12-7-67

COMMITTEE on COMPLIANCE APPROVAL REPORT

ON

BESTWALL GYPSUM LATH, PLAIN, PINHOLATH & PERFORATED

SUBMITTED BY

BESTWALL GYPSUM COMPANY
PAOLI, PENNSYLVANIA

SGP 0028455

The Manufacturer made formal application on September 25, 1964, for re-evaluation of their Approval Report 6285 dated December 31, 1962, together with certification that there has been no significant change in Bestwall Gypsum Lath previously approved.

THIS APPROVAL REPORT SUPERSEDES AND TAKES PRECEDENCE OVER REPORT 6285 DATED DECEMBER 31, 1962, THEREBY REMOVING AND MAKING INVALID APPROVAL REPORT 6285 AS DATED DECEMBER 31, 1962.

The Committee has reviewed the data submitted on September 28, 1962, for compliance with the Southern Standard Building Code and submits its Report as follows:

DESCRIPTION:

Bestwall Plain Gypsum Lath, consists of a core of gypsum rock, reinforced with glass fibers, sandwiched between two layers of special multi-layer covering and meets the requirements of a "Type X" lath. Pinholath has the same core as plain lath and surface perforations through the face paper. Perforated lath has the same core as plain lath and perforations approximately 3/4" in diameter, approximately 4" on center throughout the lath.

These laths when installed in accordance with the manufacturer's specifications as hereinafter described, will have a fire resistance rating of one hour.

USES:

As a plaster base for wall and ceiling assemblies. Pinholath is specially designed for machine applied plaster.

SUBSTANTIATING DATA:

1. Standard ASTM Fire Endurance and Fire and Hose Stream Test of Bestwall Plain Gypsum Lath, reinforced with Glass-Fibers. The test was conducted on July 11, and 12, 1960, at the Engineering Experimental Station of Ohio State University under Project T-1490.
2. Standard ASTM Fire Endurance and Fire and Hose Stream Test of Bestwall Pinhole Gypsum Lath. The test was conducted on October 18 and 20, 1960, at the Engineering Experimental Station of Ohio State University under Project T-1571.
3. Standard ASTM Fire Endurance Test of Bestwall Pinholath "Type X" and Gypsum Lath "Type X". The test was conducted on June 5, 1962 at the Engineering Experimental Station of Ohio State University under Project T-2134.
4. Test No. SFT-22 conducted at the Fire Prevention Research Institute at Gardena, California for the Bestwall Gypsum Company, entitled "Fire Test of Gypsum Lath and Plaster Applied to Wood Floor System", dated April 21, 1962.
5. "Bestwall Pinholath Reinforced with Glass Fibers."
6. "Bestwall Gypsum Lath and Plaster", A. I. A. File #21-B-2.

REFERENCES TO SOUTHERN STANDARD BUILDING CODE:

Section 103.6	Alternate Materials and Alternate Methods of Construction.
Chapter X	Fire Resistance Ratings for Materials and Construction.
Chapter XVII	Wood Construction Practice, Design and Quality.

SPECIFICATIONS AND TECHNICAL DATA:

The lath may be attached to wood or steel framing, with nails, staples or clips.

Construction		Type Base	Plaster		Fire Hour Rating
			Mix 1 part of Gypsum Plaster (100 lbs.)* to cu. ft. aggregate	Thickness Face of Lath to Face of Finished Surface	
Partitions					
Description	**Thickness**				
2" x 4" Wood Studs 16" o.c.	5-3/8"	3/8" Plain Lath	Sand or Perlite 1:2	1/2"	1 hr.
		3/8" Pinholath	Sand or Perlite 1:2	1/2"	1 hr.
		3/8" Plain Lath	Neat Wood Fiber	1/2"	1 hr.
		3/8" Perforated Lath	Sand or Perlite 1:2, 1:2	1/2"	1 hr.
Solid Partition	2"	1/2" Long Length Lath	Sand or Perlite 1:1, 1:2	1/2"	1 hr.
Steel Frame	4-1/4" to 5-3/8"	3/8" Pinholath	Sand or Perlite 1:2	1/2"	1 hr.
		3/8" Plain Lath	Perlite 1:2	1/2"	1 hr.
		3/8" Perforated Lath	Sand 1:2, 1:2	1/2"	1 hr.
Ceilings					
Wood Joists and Floor		3/8" Pinholath Reinforced with Metal Strips Along Joist	Sand 1:2 or Perlite 1:2	1/2"	1 hr.
		3/8" Pinholath No Reinforcing	Perlite 1:2	5/8"	1 hr.
		3/8" Plain Lath Reinforced with Metal Strips along Joist	Sand 1:2 or Perlite 1:2	1/2"	1 hr.
		3/8" Perforated Lath with Metal Lath Strip	Sand 1:2 or Perlite 1:2	1/2"	1 hr.

*Base Coat may be applied in one coat as a "Scratch Double Up" or in two separate coats as a scratch and brown.

COMMITTEE FINDINGS:

The Committee on Compliance in review of the data submitted finds that, in their opinion, Bestwall Gypsum, Plain, Pinholath and Perforated used in walls and ceiling asemblies, meets the requirements of the Southern Standard Building Code.

COMMITTEE RECOMMENDATIONS:

The Committee recommends that Bestwall Gypsum Lath, Plain, Pinholath, and Perforated, uses and limitations as set forth in this Report, be approved by the Southern Building Code Congress.

LIMITATIONS:

1. That the manufacturer's specifications for attaching the lath and thickness of plaster be strictly adhered to.
2. That all limitations of use prescribed by the manufacturer be adhered to.

IDENTIFICATION:

The Manufacturer shall furnish the customer a certification that Bestwall Gypsum Lath, Plain, Pinholath and Perforated meets the requirements of the Southern Standard Building Code and the certification shall be kept on file at the job site during the construction for field identification of this Approval by the Building Inspector.

PERIOD OF APPROVAL:

This Approval or Certificate of Compliance is granted for a period of three years from date. An extension may be granted only after a re-evaluation of Company data to insure that no change in design and/or manufacture has occurred during the interim period. Should any revision or change occur, this Approval shall terminate. This, however, is not to be construed to preclude any new submittals.

Myron J. Sasser, Chairman
Birmingham, Alabama

L. P. Hamilton, Columbia, South Carolina

Thomas M. Moses, Winter Park, Florida

SGP 0028456

BESTWALL FIRESTOP TWO-HOUR RATING
BESTWALL GYPSUM COMPANY
2 INDUSTRIAL BOULEVARD, BOX V
PAOLI, PENNSYLVANIA
FIRETARD, TWO-HOUR RATING
JOHNS-MANVILLE SALES CORPORATION
22 EAST 40TH STREET
NEW YORK, NEW YORK

FIREBLOC GYPSUM WALLBOARD
AMERICAN GYPSUM COMPANY
P. O. BOX 6345
ALBUQUERQUE, NEW MEXICO

I. **Introduction:** At the request of Bestwall Gypsum Company, Paoli, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a re-examination of the test data submitted in connection with the above gypsum wallboards and has noted that the Uniform Building Code does not fully provide for the use of this material.

II. **Description: General:** The gypsum wallboards have a core of gypsum, incombustible fibers, and unexpanded vermiculite. The core is surfaced with paper. Boards are made forty-eight inches (48") wide and in six-foot (6') to sixteen-foot (16') lengths.

Two-hour Fire-resistive Load-bearing Partitions: The partitions are constructed with two-inch by four-inch (2" x 4") studs spaced sixteen inches (16") on center with two-inch by four-inch (2" x 4") firestops installed at mid-height of the studs. The panels are covered on both sides with two layers of five-eighths-inch (⅝") gypsum wallboard applied vertically with the vertical joint between boards falling on the same stud for each layer. The first layer is attached to the studs with 6-penny cement coated common nails at nine inches (9") on center along the stud, sill and plate. The second layer is applied directly over the first and nailed with 8-penny nails spaced seven inches (7") on center. Vertical joints on the opposite side of the partition are placed on the next adjacent stud. Taping of joints is not required.

Two-hour Fire-resistive Incombustible Nonload-bearing Partitions: The partition construction consists of Zee studs of No. 20 gauge electrogalvanized steel three and five-eighths inches (3⅝") deep designated as Type Z-3 manufactured by Neslo Manufacturing Corporation. The studs are spaced twenty-four inches (24") on center and are mounted in channel-shaped No. 18 gauge electrogalvanized floor and ceiling track sections three and five-eighths inches (3⅝") deep designated as the Neslo T-3 stud track. The tracks are attached to the floor or ceiling framing with approved fasteners spaced twenty-four inches (24") on center. Bestwall Firestop gypsum wallboard five-eighths inch (⅝") thick is attached to each side of the studs with Neslo clips spaced twelve inches (12") on center at the vertical joints. No. 6 Philips head self-tapping screws one inch (1") long attach the board to intermediate studs and at the perimeter track sections with screws spaced twelve inches (12") on center at the intermediate studs and twenty-four inches (24") on center at the top and bottom of the panel. In addition, the screws are installed at thirty inches (30") on center along the vertical edges. A face layer of Bestwall Firestop Eternawall (vinyl-faced) gypsum wallboard five-eighths inch (⅝") thick is then applied to the base layer with vertical joints offset eleven inches (11") from those of the base layer. The face layer is laminated to the base layer by an air-drying liquid contact adhesive. No. 8 Philips head self-tapping screws one and one-half inches (1½") long secure the face layer at eight inches (8") on center at the top and at twenty-four inches (24") on center at the bottom of the partition on each face. The screws penetrate both layers of wallboard and fasten to the track sections. The studs are not attached directly to the floor and ceiling tracks but are positioned in place by means of the wallboard attachment to the studs and tracks.

Identification: All wallboards are identified with a light marking of the respective manufacturer consisting of the words "⅝" Bestwall-Type X" or "⅝" Johns-Manville Firetard-Type X" or "⅝" Firebloc" repeated down the center of each sheet and spaced approximately five feet (5') on center.

III. **Points of Variance with the Uniform Building Code:** Table No. 43-B assigns no fire-resistance rating to this construction.

IV. **Evidence Submitted:** Report of a fire test made at the Ohio State University Engineering Experimental Station is submitted.

Recommendation

V. **Recommendation:** That the tpes of construction described in Part II of this report are a satisfactory alternate types of construction to that specified in the Uniform Building Code for a two-hour fire-resistive rating. Further, that the gypsum wallboards have a Class I flame-spread rating.

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials
(Signed) T. H. Carter
Managing Director

SGP 0028457

RESEARCH RECOMMENDATION INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
80 SOUTH LOS ROBLES • 681-4966 • PASADENA, CALIFORNIA
Report No. 1144.8
December 4, 1964

BESTWALL FIRESTOP NONBEARING PARTITION ASSEMBLY
BESTWALL GYPSUM COMPANY
120 EAST LANCASTER AVENUE
ARDMORE, PENNSYLVANIA
FIRETARD, NONBEARING PARTITION ASSEMBLY
JOHNS-MANVILLE SALES CORPORATION
22 EAST 40TH STREET
NEW YORK, NEW YORK

I. *Introduction:* At the request of the Bestwall Gypsum Company, Ardmore, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a re-examination of the test data submitted in connection with the Nonbearing Partition of Bestwall Firestop manufactured by the Bestwall Gypsum Company and sold through the Bestwall Certain-teed Sales Corporation, and of Firetard, manufactured by the Bestwall Gypsum Company and sold through the Johns-Manville Sales Corporation, and has noted that the Uniform Building Code does not take into consideration this type of construction.

II. **Description: General:** The job-fabricated partition consists of two layers of five-eighths-inch (⅝") thick Bestwall Firestop separated by a one-inch (1") air space. The four-foot (4') wide layers of wallboard are continuous from the bottom plate to the top plate. Vertical joints of opposing layers of wallboards are offset a distance of twenty-four inches (24"). The two layers of wallboard are interconnected at all vertical joints by means of six-inch (6") wide gypsum wallboard ribs one-inch (1"), one and one-fourth-inch (1¼"), one and five-eighths-inch (1⅝") or one and three-fourths-inch (1¾") thicknesses extending the full height of the partition where incombustible runners are used and between runners where wood runners are used. The ribs are laminated to the two layers of Bestwall Firestop with a casein type glue known as Bestwall Laminating Compound. In addition, No. 16 Phillips head screws, one and one-half inches (1½") long, are screwed at twenty inches (20") on center into the vertical joint and 6-penny finishing nails are driven at a 45-degree angle on one side of the vertical joint. The nails are spaced at eight inches (8") on center.

In addition to the ribs located at vertical joints an intermediate vertical rib is provided approximately midway between other ribs, but not more than twenty-four inches (24") on center. The two layers of Bestwall Firestop are attached to this rib by means of a casein type glue known as Bestwall Laminating Compound and 6-penny finishing nails are driven at a 45-degree angle and spaced eight inches (8") on center. Joints may be left unfinished or finished with the Best-wall tape joint system.

The gypsum board has a flame-spread classification of I when tested in accordance with U.B.C. Standard No. 42-1-64.

Nonbearing Walls in Residential Buildings Having Clear Span Roof Truss Construction: The basic construction is similar to that specified for one-hour fire-resistive construction. The partition shall be installed as follows:

1. Not less than one-inch by one and five-eighths-inch (1" x 1⅝") net wood top and bottom plates shall be used with the partitions. The plates shall be nailed to the floor framing with not less than 16-penny nails spaced sixteen inches (16") on center and driven through predrilled holes.
2. Where spaced roof sheathing is used, the top plate shall be nailed to the exterior wall plate with not less than two 16-penny nails or approved equal (no toenails).
3. A separation of not less than one-half inch (½") shall be provided between partitions and the lower chord of the trusses where the partitions run perpendicular to the span of the trusses. In lieu of the separation, truss web members may be placed from the lower chord (at point of contact with the partition) to an upper chord panel point.
4. Floor joists running parallel to and immediately below partitions located perpendicular to the truss span shall be doubled where the separation required in item No. 3 above is not provided.
5. Framing at openings shall consist of not less than one-inch by three and five-eighths-inch (1" x 3⅝") net wood members. The framing members shall be installed in a flat position and extend from the bottom to the top plate.

Identification: Each Bestwall gypsum wallboard panel is identified with a light ink marking consisting of the words "⅝" Bestwall Firestop" which is repeated down the center of each sheet and spaced approximately five feet (5') on center. In addition each bundle consisting of two sheets has an end bundling tape which bears the label of Underwriters' Laboratories, Inc. The Johns-Manville gypsum wallboard is identified by the words "⅝" Type X" imprinted thereon.

III. **Points of Variance with the Uniform Building Code:** The Uniform Building Code does not recognize this type of construction as having a fire-resistive rating.

IV. **Evidence Submitted:** A fire test made by Underwriters' Laboratories, Inc., and conforming to Chapter 43 of the Uniform Building Code, is submitted. Results of the test indicate this type of construction qualifies for a one-hour fire-resistive rating.

Recommendation

V. **Recommendation:** That the type of construction described in Part II of this report (material distributed by Bestwall Certain-teed Sales Corporation) is a satisfactory alternate type of construction to that specified in the Uniform Building Code for one-hour fire-resistive nonbearing partitions and for use as nonbearing walls in residential buildings having clear span truss construction provided:

1. The unsupported height does not exceed twelve feet (12').
2. The walls are classified as combustible fire-resistive construction except that a rating of incombustible fire-resistive construction may be assigned where the top and bottom plates are of incombustible material.

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) T. H. Carter
Managing Director

SGP 0028458

RESEARCH RECOMMENDATION INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
80 SOUTH LOS ROBLES • 681-4986 • PASADENA CALIFORNIA
Report No. 1155.8
September 11, 1964

STEEL STUDS AND JOISTS
BESTWALL FIRESTOP GYPSUM WALLBOARD
BESTWALL GYPSUM COMPANY
2 INDUSTRIAL BOULEVARD
BOX V
PAOLI, PENNSYLVANIA

FIRETARD GYPSUM WALLBOARD
JOHNS-MANVILLE SALES CORPORATION
22 EAST 40TH STREET
NEW YORK, NEW YORK

FIREBLOC GYPSUM WALLBOARD
AMERICAN GYPSUM COMPANY
P. O. BOX 6345
ALBUQUERQUE, NEW MEXICO

I. **Introduction:** At the request of Bestwall Gypsum Company, Paoli, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a re-examination of the test data submitted in connection with the above gypsum wallboards and has noted that the Uniform Building Code does not fully provide for the use of this material.

II. **Description: General:** The gypsum wallboards are ⅝ inch thick and contain a core composed of gypsum, incombustible fibers and unexpanded vermiculite. The core is surfaced with paper which may be gray on both sides or have a finished paper on one side and a gray paper on the back side. They are made in 4-foot widths and in 6-foot to 16-foot lengths. The ⅝-inch wallboard is also supplied in 24-inch and 48-inch widths with tongue-and-groove edges. Joint treatment is not necessary for the fire-resistive ratings.

One-hour Fire-resistive Load-bearing Partition: Studs are 3⅝-inch deep Stran-Steel of No. 16 gauge material spaced 24 inches on center, attached to base and ceiling channels with sheet metal screws. After alignment, the studs are welded to the channels. The wallboard is attached to the studs with 6-penny cement-coated common nails spaced 7 inches on center.

One-hour Fire-resistive Nonbearing Partition: Consists of channel-shaped steel studs 1⅝ inches, 2⅝ inches or 3⅝ inches deep formed from light gauge steel .022 inch thick. The studs have flanges 1⅜ inches wide returned a distance of ¼ inch parallel to the stud depth and ⅛ inch parallel to the flange widths. The studs are inserted into channel-shaped floor and ceiling tracks formed from material .025 inch thick and fastened to the supporting structure at 24-inch intervals. The ⅝-inch thick wallboard is installed vertically without horizontal joints to each face of studs with vertical joints staggered with respect to the two faces. The wallboard is attached to the studs with Donn W-616 1-inch long self-drilling sheet metal screws spaced 8 inches on center at the top and bottom edges and vertical butt joints centered over studs and at 12 inches on center at intermediate studs.

One-hour Fire-resistive Floor and Ceiling: The floor and ceiling construction consists of 2 inches of concrete on steel joists to which ¾-inch cold-rolled furring channels or approved nailing channels are attached with No. 18 gauge galvanized wire. Channels are doubled where butt joints occur. The ⅝-inch thick wallboard is attached to the furring channels with No. 6 flathead sheet metal screws 8 inches on center or to the nailing channels with 1¼-inch annular nails spaced 6 inches on center.

An alternate method of construction applicable only to the use of gypsum wallboard consists of steel joists spaced 24 inches on center with a sand-gravel reinforced concrete slab 2 inches thick poured over a metal lath form supported on the joists. The metal lath form is an expanded ribbed metal lath ⅜ inch high weighing 3.4 pounds per square yard and attached to the joists at every other rib and at salvage overlaps with No. 18 gauge galvanized steel wire. Adjacent sheets of lath are overlapped at the side by nesting the outside salvage and are overlapped 3 inches at the ends.

Inverted hat-shaped No. 25 gauge galvanized furring channels ⅞ inch deep and 2¾ inches wide are saddle tied to the bottom chord of the joists at 24-inch intervals by means of double strands of No. 18 gauge galvanized steel wire. Adjoining lengths of channels are lapped 30 inches and tied together with a double strand of tie wire. Five-eighths-inch Type "X" Bestwall Gypsum Wallboard is attached to the furring channels by means of No. 6 Philips flathead self-tapping sheet metal screws 1 inch long spaced ½ inch from wallboard edges and 12 inches on center. The screws are driven flush with the surface of the wallboard and the wallboard on each side of end joints is attached at the overlap of furring channels with one additional screw.

Two-hour Fire-resistive Floor-ceiling (Roof-ceiling) Construction: Identical to the alternate one-hour assembly described directly above using Bestwall Gypsum Wallboard except the concrete slab has a thickness of 2½ inches.

Identification: All wallboards are identified with a light marking of the respective manufacturer consisting of the words "⅝" Bestwall Firestop-Type X" or "⅝" Johns-Manville Firetard-Type X" or "⅝" Firebloc" repeated down the center of each sheet and spaced approximately 5 feet on center. In addition, each bundle consisting of two sheets has an end bundling tape which bears the manifest of Underwriters' Laboratories, Inc.

III. **Points of Variance with the Uniform Building Code:** Chapter 43 assigns no fire-resistive rating to this type of construction

IV. **Evidence Submitted:** The results of fire endurance tests conducted in accordance with U.B.C. Standard No. 43-1-64 are submitted.

Recommendation

V. **Recommendation: That the types of construction described in Part II of this report are satisfactory alternate fire-resistive assemblies to those specified in the Uniform Building Code for the uses noted.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

International Conference of Building Officials
Research Committee

(Signed) T. H. Carter
Managing Director

SGP 0028459

RESEARCH RECOMMENDATION

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES • 681-4986 • PASADENA CALIFORNIA

Report No. 1263.7
December 4, 1964

**FIRESTOP AND FIRETARD
4-INCH AND 5-INCH THICK NONLOAD-BEARING
LAMINATED WALLBOARD PARTITIONS
BESTWALL CERTAIN-TEED SALES CORPORATION
2 INDUSTRIAL BOULEVARD, BOX V
PAOLI, PENNSYLVANIA**
JOHNS-MANVILLE SALES CORPORATION
22 EAST 40TH STREET
NEW YORK, NEW YORK

I. **Introduction:** At the request of Bestwall Certain-teed Sales Corporation, Paoli, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a re-examination of the test data submitted in connection with the approval of 4-Inch and 5-Inch Thick Laminated Partitions constructed of Bestwall Firestop manufactured by the Bestwall Gypsum Company and sold through the Bestwall Certain-teed Sales Corporation and Firetard made by the Bestwall Gypsum Company and sold through the Johns-Manville Sales Corporation, and it is noted that the Uniform Building Code does not take into consideration this type of construction.

II. **Description: General:** The 4-Inch and 5-Inch Thick Nonload-bearing Partitions are formed of four layers of Bestwall Firestop or Firetard Gypsum Board, five-eighths inch (⅝") thick, fastened to double layers of gypsum board ribs, one-half inch (½") thick. The ribs and the inner and outer layers of gypsum board, five-eighths inch (⅝") thick, extend the full height of the partition.

4-Inch Thick Two-hour Fire-Resistive Nonbearing Partition: The vertical six-inch (6") wide gypsum board ribs are laminated with Bestwall or Johns-Manville Laminating Compound to the interior surfaces of two inner layers of vertical five-eighths-inch (⅝") gypsum wallboard The ribs are spaced twenty-four inches (24") on center and are centered over the longitudinal edges of the inner layer of wallboard. The two inner layers of five-eighths-inch (⅝") board are nailed to sill and header members with 5-penny nails, one and five-eighths inches (1⅝") long, spaced eight inches (8") on center. As each successive wallboard rib unit is butted against its neighbor the joint between them is made by the adhesive bond at the overlap provided by the ribs and 6-penny finishing nails spaced eight inches (8") on center, driven at a 45-degree angle into the ribs. Phillips head wood screws, one and one-half inches (1½") long, are driven at twenty inches (20") on center into the joints.

The outer layers of five-eighths-inch (⅝") gypsum board are coated with an adhesive spread at the rate of four pounds of mixed material per one hundred square feet (100 sq. ft.) and then bonded to the inner layer. Vertical joints of the outer layer are staggered six inches (6") from the vertical joints of the inner layers. The outer layer is attached to a one and one-half-inch by one and five-eighths-inch (1½" x 1⅝") sill and header with 8-penny nails, two and one-half inches (2½") long, spaced eight inches (8") on center. Phillips' head wood screws, spaced twenty-four inches (24") on center at the joint, are inserted through the inner layer into the ribs and 8-penny finishing nails, two and one-half inches (2½") long, spaced eight inches (8") on center, are then driven at 45 degrees through the inner layer of wallboard into the ribs.

The wallboard joints may be left unfinished or may be finished along with nail and screw heads using the Bestwall or Johns-Manville Tape Joint System which consists of a paper tape finished with cement.

5-Inch Thick Three-Hour Fire-Resistive Nonbearing Partition: The construction of the 5-Inch Thick Partition is identical to the 4-Inch Thick Partition with the exception that a wider air space is provided between the double layers of gypsum board, five-eighths inch (⅝") thick and sills and headers are one inch by one and five-eighths inch (1" x 1⅝").

Identification: Each Bestwall gypsum wallboard panel is identified with a light ink marking consisting of the words "⅝" Bestwall Firestop" which is repeated down the center of each sheet and spaced approximately five feet (5') on center. In addition, each bundle consisting of two sheets has an end bundling tape which bears the label of Underwriters' Laboratories, Inc. The Johns-Manville gypsum wallboard is identified by the words "⅝" Type X" imprinted thereon.

III. **Points of Variance with the Uniform Building Code:** Chapter 43 of the Uniform Building Code does not assign a fire-resistive rating to the proposed type of construction.

IV. **Evidence Submitted:** A fire test report made by Underwriters' Laboratories, Inc., is submitted.

Recommendation

V. Recommendation: That the 4-Inch and 5-Inch Thick Nonload-bearing Laminated Wallboard Partitions are satisfactory alternate types of construction to that specified in the Uniform Building Code for use as incombustible fire-resistive nonbearing partitions provided:

1. **Fire-resistive ratings not exceeding two hours and three hours are assigned to the four-inch (4") and five-inch (5") thicknesses, respectively. The unsupported height of partitions does not exceed ten feet (10').**
2. **Details of construction conform to Part II.**
3. **The walls are classified as combustible fire-resistive construction except that a rating of incombustible fire-resistive construction may be assigned where the top and bottom plates are of incombustible material.**
4. **The partitions are not installed in buildings of Type V construction used for residential purposes.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

**Research Committee
International Conference of Building Officials**

**(Signed) T. H. Carter
Managing Director**

SGP 0028460

RESEARCH RECOMMENDATION

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES • 681-4986 • PASADENA CALIFORNIA

Report No. 1263.7
December 4, 1964

FIRESTOP AND FIRETARD
4-INCH AND 5-INCH THICK NONLOAD-BEARING
LAMINATED WALLBOARD PARTITIONS
BESTWALL CERTAIN-TEED SALES CORPORATION
2 INDUSTRIAL BOULEVARD, BOX V
PAOLI, PENNSYLVANIA
JOHNS-MANVILLE SALES CORPORATION
22 EAST 40TH STREET
NEW YORK, NEW YORK

I. **Introduction:** At the request of Bestwall Certain-teed Sales Corporation, Paoli, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a re-examination of the test data submitted in connection with the approval of 4-Inch and 5-Inch Thick Laminated Partitions constructed of Bestwall Firestop manufactured by the Bestwall Gypsum Company and sold through the Bestwall Certain-teed Sales Corporation and Firetard made by the Bestwall Gypsum Company and sold through the Johns-Manville Sales Corporation, and it is noted that the Uniform Building Code does not take into consideration this type of construction.

II. **Description: General:** The 4-Inch and 5-Inch Thick Nonload-bearing Partitions are formed of four layers of Bestwall Firestop or Firetard Gypsum Board, five-eighths inch (⅝") thick, fastened to double layers of gypsum board ribs, one-half inch (½") thick. The ribs and the inner and outer layers of gypsum board, five-eighths inch (⅝") thick, extend the full height of the partition.

4-Inch Thick Two-hour Fire-Resistive Nonbearing Partition: The vertical six-inch (6") wide gypsum board ribs are laminated with Bestwall or Johns-Manville Laminating Compound to the interior surfaces of two inner layers of vertical five-eighths-inch (⅝") gypsum wallboard. The ribs are spaced twenty-four inches (24") on center and are centered over the longitudinal edges of the inner layer of wallboard. The two inner layers of five-eighths-inch (⅝") board are nailed to sill and header members with 5-penny nails, one and five-eighths inches (1⅝") long, spaced eight inches (8") on center. As each successive wallboard rib unit is butted against its neighbor the joint between them is made by the adhesive bond at the overlap provided by the ribs and 6-penny finishing nails spaced eight inches (8") on center, driven at a 45-degree angle into the ribs. Phillips head wood screws, one and one-half inches (1½") long, are driven at twenty inches (20") on center into the joints.

The outer layers of five-eighths-inch (⅝") gypsum board are coated with an adhesive spread at the rate of four pounds of mixed material per one hundred square feet (100 sq. ft.) and then bonded to the inner layer. Vertical joints of the outer layer are staggered six inches (6") from the vertical joints of the inner layers. The outer layer is attached to a one and one-half-inch by one and five-eighths-inch (1½" x 1⅝") sill and header with 8-penny nails, two and one-half inches (2½") long, spaced eight inches (8") on center. Phillips' head wood screws, spaced twenty-four inches (24") on center at the joint, are inserted through the inner layer into the ribs and 8-penny finishing nails, two and one-half inches (2½") long, spaced eight inches (8") on center, are then driven at 45 degrees through the inner layer of wallboard into the ribs.

The wallboard joints may be left unfinished or may be finished along with nail and screw heads using the Bestwall or Johns-Manville Tape Joint System which consists of a paper tape finished with cement.

5-Inch Thick Three-Hour Fire-Resistive Nonbearing Partition: The construction of the 5-Inch Thick Partition is identical to the 4-Inch Thick Partition with the exception that a wider air space is provided between the double layers of gypsum board, five-eighths inch (⅝") thick and sills and headers are one inch by one and five-eighths inch (1" x 1⅝").

Identification: Each Bestwall gypsum wallboard panel is identified with a light ink marking consisting of the words "⅝" Bestwall Firestop" which is repeated down the center of each sheet and spaced approximately five feet (5') on center. In addition, each bundle consisting of two sheets has an end bundling tape which bears the label of Underwriters' Laboratories, Inc. The Johns-Manville gypsum wallboard is identified by the words "⅝" Type X" imprinted thereon.

III. **Points of Variance with the Uniform Building Code:** Chapter 43 of the Uniform Building Code does not assign a fire-resistive rating to the proposed type of construction.

IV. **Evidence Submitted:** A fire test report made by Underwriters' Laboratories, Inc., is submitted.

Recommendation

V. Recommendation: That the 4-Inch and 5-Inch Thick Nonload-bearing Laminated Wallboard Partitions are satisfactory alternate types of construction to that specified in the Uniform Building Code for use as incombustible fire-resistive nonbearing partitions provided:

1. **Fire-resistive ratings not exceeding two hours and three hours are assigned to the four-inch (4") and five-inch (5") thicknesses, respectively. The unsupported height of partitions does not exceed ten feet (10').**
2. **Details of construction conform to Part II.**
3. **The walls are classified as combustible fire-resistive construction except that a rating of incombustible fire-resistive construction may be assigned where the top and bottom plates are of incombustible material.**
4. **The partitions are not installed in buildings of Type V construction used for residential purposes.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) T. H. Carter
Managing Director

SGP 0028461

RESEARCH RECOMMENDATION INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES · 681 4866 · PASADENA CALIFORNIA

Report No. 1263.6
December 6, 1963

FIRESTOP AND FIRETARD
4-INCH AND 5-INCH THICK NONLOAD-BEARING
LAMINATED WALLBOARD PARTITIONS
BESTWALL CERTAIN-TEED SALES CORPORATION
120 EAST LANCASTER AVENUE
ARDMORE, PENNSYLVANIA
JOHNS-MANVILLE SALES CORPORATION
22 EAST 40TH STREET
NEW YORK, NEW YORK

I. **Introduction:** At the request of Bestwall Certain-teed Sales Corporation, Ardmore, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a re-examination of the test data submitted in connection with the approval of 4-Inch and 5-Inch Thick Laminated Partitions constructed of Bestwall Firestop manufactured by the Bestwall Gypsum Company and sold through the Bestwall Certain-teed Sales Corporation and Firetard made by the Bestwall Gypsum Company and sold through the Johns-Manville Sales Corporation, and it is noted that the Uniform Building Code does not take into consideration this type of construction.

II. **Description: General:** The 4-Inch and 5-Inch Thick Nonload-bearing Partitions are formed of four layers of Bestwall Firestop or Firetard Gypsum Board, five-eighths inch (⅝") thick, fastened to double layers of gypsum board ribs, one-half inch (½") thick. The ribs and the inner and outer layers of gypsum board, five-eighths inch (⅝") thick, extend the full height of the partition.

4-Inch Thick Two-hour Fire-Resistive Nonbearing Partition: The vertical six-inch (6") wide gypsum board ribs are laminated with Bestwall or Johns-Manville Laminating Compound to the interior surfaces of two inner layers of vertical five-eighths-inch (⅝") gypsum wallboard. The ribs are spaced twenty-four inches (24") on center and are centered over the longitudinal edges of the inner layer of wallboard. The two inner layers of five-eighths-inch (⅝") board are nailed to sill and header members with 5-penny nails, one and five-eighths inches (1⅝") long, spaced eight inches (8") on center. As each successive wallboard rib unit is butted against its neighbor the joint between them is made by the adhesive bond at the overlap provided by the ribs and 6-penny finishing nails spaced eight inches (8") on center, driven at a 45-degree angle into the ribs. Phillips head wood screws, one and one-half inches (1½") long, are driven at twenty inches (20") on center into the joints.

The outer layers of five-eighths-inch (⅝") gypsum board are coated with an adhesive spread at the rate of four pounds of mixed material per one hundred square feet (100 sq. ft.) and then bonded to the inner layer. Vertical joints of the outer layer are staggered six inches (6") from the vertical joints of the inner layers. The outer layer is attached to a one and one-half-inch by one and five-eighths-inch (1½" x 1⅝") sill and header with 8-penny nails, two and one-half inches (2½") long, spaced eight inches (8") on center. Phillips' head wood screws, spaced twenty-four inches (24") on center at the joint, are inserted through the inner layer into the ribs and 8-penny finishing nails, two and one-half inches (2½") long, spaced eight inches (8") on center, are then driven at 45 degrees through the inner layer of wallboard into the ribs.

The wallboard joints may be left unfinished or may be finished along with nail and screw-heads using the Bestwall or Johns-Manville Tape Joint System which consists of a paper tape finished with cement

5-Inch Thick Three-Hour Fire-Resistive Nonbearing Partition: The construction of the 5-Inch Thick Partition is identical to the 4-Inch Thick Partition with the exception that a wider air space is provided between the double layers of gypsum board, five-eighths inch (⅝") thick and sills and headers are one inch by one and five-eighths inch (1" x 1⅝").

III. **Points of Variance with the Uniform Building Code:** Chapter 43 of the Uniform Building Code does not assign a fire-resistive rating to the proposed type of construction.

IV. **Evidence Submitted:** A fire test report made by Underwriters' Laboratories, Inc., is submitted.

Recommendation

V. Recommendation: That the 4-Inch and 5-Inch Thick Nonload-bearing Laminated Wallboard Partitions are satisfactory alternate types of construction to that specified in the Uniform Building Code for use as incombustible fire-resistive nonbearing partitions provided:

1. **Fire-resistive ratings not exceeding two hours and three hours are assigned to the four-inch (4") and five-inch (5") thicknesses, respectively. The unsupported height of partitions does not exceed ten feet (10').**
2. **Details of construction conform to Part II.**
3. **The walls are classified as combustible fire-resistive construction except that a rating of incombustible fire-resistive construction may be assigned where the top and bottom plates are of incombustible material.**
4. **The partitions are not installed in buildings of Type V construction used for residential purposes.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) T. H. Carter
Managing Director

SGP 0028462

RESEARCH RECOMMENDATION INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES · 681 4966 · PASADENA CALIFORNIA

Report No. 1661.3
August 7, 1964

PENMETAL PANEL-BOARD PARTITION SYSTEM
PENN METAL COMPANY, INC.
4309 DISTRICT BOULEVARD
LOS ANGELES, CALIFORNIA

I. **Introduction:** At the request of Penn Metal Company, Inc., Los Angeles, California, the Research Committee of the International Conference of Building Officials has made a re-examination of data submitted in connection with the Penmetal Panel-Board Partition System and has noted that the Uniform Building Code does not assign a fire-resistive rating to this type of construction.

II. **Description:** The Penmetal panel-board partition system is constructed of Permalock studs two and one-half inches (2½") deep, spaced twenty-four inches (24") on center and faced on each side with Bestwall Firestop FR Type X gypsum wallboard five-eighths inch (⅝") thick, having glass fibers on each face.

For construction, vertical starters consisting of a No. 24 gauge channel two and one-half inches (2½") wide centered on a Penn Metal Company No. 4-16 20-gauge channel four inches (4") wide are fastened to the supporting framework in thirty-six-inch (36") maximum intervals using approved fasteners. Ceiling and floor tracks are two and one-half inches (2½") wide No. 24 gauge Permalock track No. 1-11. The floor and ceiling tracks are anchored to the framework at twenty-four-inch (24") intervals with approved fasteners. Permalock studs No. 1-10, two and one-half inches (2½") deep, are placed in the floor and ceiling track at twenty-four inches (24") on center and secured with one sheet metal screw through each leg at the top and bottom on both sides of the studs. Penmetal Bridging Special No. 1-13 consisting of a channel-shaped section No. 24 gauge two and one-half inches (2½") wide is installed between the studs at mid-height. A strip of wallboard five-eighths inch (⅝") thick is installed on each side of every other stud where metal battens are used to attach the wallboard. The strips are cut to fit snugly within the flanges of the studs and are secured to the studs with sheet metal screws spaced thirty inches (30") on center and engaging the web of the studs. The gypsum wallboard face layers five-eighths inch (⅝") thick are placed vertically with vertical joints staggered on one side with respect to those on the opposite side. There are no horizontal joints. The wallboard is inserted into the vertical starters and anchored at intermediate studs with No. 12 flat head wood screws one and one-half inches (1½") long spaced thirty inches (30") on center. The wallboard is held in place at the vertical edges by No. 3-53 quick-grip No. 24 gauge T-section batten strips. The flanges of the batten strips grip the outer side of the wallboard and the batten strips are impressed into the 1-10 studs. At the vertical starter the wallboard is held in place between the outstanding flanges of the vertical starter and the Permalock track No. 1-11. The base joint is completed by inserting one-inch by one and one-fourth-inch (1" x 1¼") No. 20 gauge angle sections at the base track with the one-inch (1") outstanding leg on the outside of the wallboard. Exposed screw heads are covered with joint compound.

III. **Points of Variance with the Uniform Building Code:** The Uniform Building Code does not assign a fire-resistive rating to this type of construction.

IV. **Evidence Submitted:** The results of a fire endurance test conducted at Ohio State University are submitted.

Recommendation

V. Recommendation: That the Penmetal Panel-Board Partition System described in Part II of this report is a satisfactory alternate method of construction to that specified in the Uniform Building Code for a one-hour fire-resistive nonload-bearing partition of incombustible construction, provided the partition does not exceed a height of twelve feet (12").

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) T. H. Carter
Managing Director

SGP 0028463

RESEARCH RECOMMENDATION INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
80 SOUTH LOS ROBLES · 681-4988 · PASADENA CALIFORNIA

Report No. 1733.1
January 3, 1964

APPLICATION OF GYPSUM WALLBOARD IN SHOWER AND BATH AREAS
GYPSUM ASSOCIATION
1350 NORTH HIGHLAND
HOLLYWOOD, CALIFORNIA

I. **Introduction:** At the request of the Gypsum Association, Hollywood, California, the Research Committee of the International Conference of Building Officials has made a study of the data submitted in connection with the use of Gypsum Wallboard as a backing material behind approved finish materials applied with water-resistant organic adhesives to shower and tub enclosure walls.

II. **Description:** Full size sheets of gypsum wallboard having a minimum thickness of ½ inch are applied horizontally to supports and attached in the manner prescribed by the Code. Insulating foil surface wallboard shall not be used.

For shower and tub enclosures, the tub or shower receptor or pan is positioned with respect to the studs so that projecting lips of the units are flush with the outside face of the wallboard. A ¼-inch clearance between the paperbound edge of the wallboard and the tub, receptor or pan must be maintained. All wallboard joints are taped and nail heads and joints are treated with two coats of joint compound. When ceramic tile is more than $\frac{5}{16}$ inch thick, solid blocking is required between studs. One row of the blocking is located approximately 1 inch above the tub or receptor and an additional row at the mid-point between the tub and the sealer. Also, when the tile is more than $\frac{5}{16}$ inch thick, the nails for applying the gypsum wallboard shall be spaced a maximum of 4 inches on center. A waterproofing membrane is applied to the exposed face of the wallboard by either of the following methods:

1. With the flat edge of a trowel, a full $\frac{1}{16}$-inch skim coat of tile adhesive is evenly applied to the entire surface receiving the tile. The adhesive is applied also to the bottom edge of the wallboard and to fill the cutout spaces around pipes, soap dishes, towel bars, etc. A setting time of 24 hours is required. Adhesives used as sealants under ceramic tile must conform to U. S. Department of Commerce Commercial Standard No. 181-52, "Water-Resistant Organic Adhesives for Installation of Clay Tile."

   After the skim coat has hardened so that it will not be grooved by the notches of the trowel, a bedding coat of the same adhesive is applied. The bedding coat extends down over the lip of the tub, receptor or pan to form a water dam behind the bottom edge of the tile.
2. A waterproofed sealer is used in lieu of the skim coat of the tile adhesive described above. Sealers shall be only those specifically made for the purpose, and compatible with the tile adhesive, such as certain rubber base sealants. The sealer is evenly applied in a heavy brush application. Permitted sealers are: Miracle Adhesive Corporation's Ceramic Tile Primer; Minnesota Mining and Manufacturing Company's CTA 50 Primer, or approved sealers of comparable quality. All edges of cutouts for pipes, soap dishes, towel bars, etc., must be sealed and then caulked with waterproof, nonhardening caulking compound. After the sealer coat has dried thoroughly, the bedding adhesive is trowelled on to receive the tile.

III. **Points of Variance with the Uniform Building Code:** Section 1711 (a) of the Code requires that materials in shower and tub enclosure walls be of a type not adversely affected by moisture.

IV. **Evidence Submitted:** A report is submitted by the Armour Research Foundation of the Illinois Institute of Technology reflecting the investigation of performance of backing materials for ceramic tile.

Recommendation

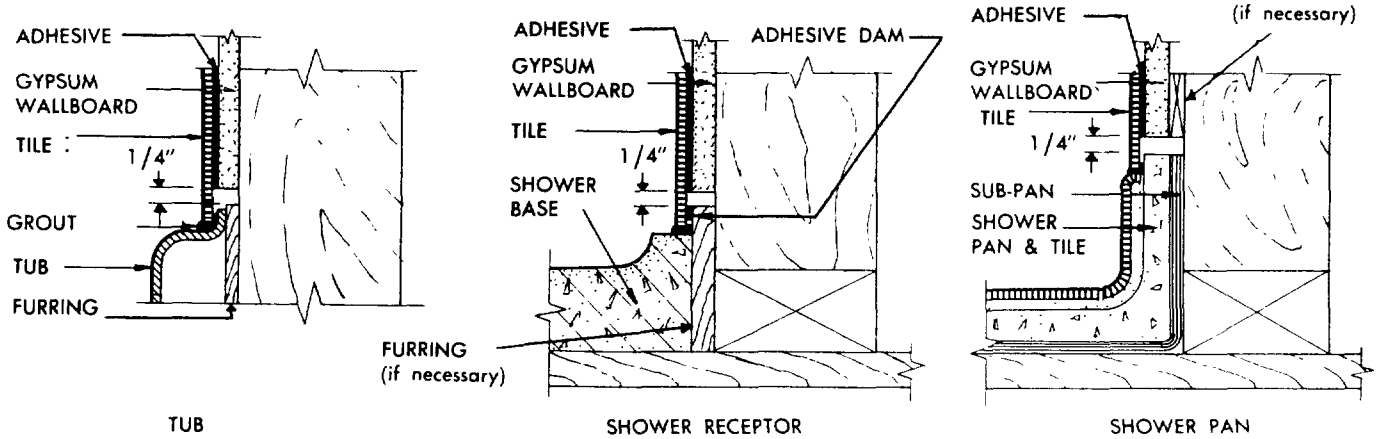
V. **Recommendation: That the application of gypsum wallboard in shower and bath areas as a backing material for approved nonabsorbent finishes is a satisfactory alternate method of construction to that specified in the Uniform Building Code provided the installation is in accordance with the description in Part II of this report.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

International Conference of Building Officials
Research Committee

(Signed) T. H. Carter
Managing Director

INSTALLATION DETAILS



SGP 0028464

RESEARCH RECOMMENDATION INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES 681 4888 · PASADENA CALIFORNIA

Report No. 1736.2
August 7, 1964

DW-SCREW CHANNEL STUD SYSTEM
DONN PRODUCTS, INC.
909 SOUTH SANTA FE
LOS ANGELES, CALIFORNIA

I. **Introduction:** At the request of Donn Products, Inc., Los Angeles, California, the Research Committee of the International Conference of Building Officials has made a re-examination of the data submitted in connection with the DW-Screw Channel Stud System and has noted that the Uniform Building Codes does not assign a fire-resistive rating to this type of construction.

II. **Description:** Donn DW-Screw channel studs of various depths as shown in Table No. I are set into Donn DW floor and ceiling tracks at twenty-four inches (24") on center. The tracks are fastened to the wall and ceiling framing with approved fasteners spaced not more than twenty-four inches (24") on center. A layer of Type X gypsum wallboard five-eighths inch (⅝") thick is applied to each face of the studs with W-616 self-drilling sheet metal screws spaced eight inches (8") on center at the top and bottom edges and at the vertical butt joints which are centered over studs and at twelve inches (12") on center at all intermediate studs. The vertical butt joints on one side of the wall are offset one stud spacing from those on the opposite side of the wall. All joints and screw heads are finished with tape and finishing compound as recommended by the manufacturers of the wallboard.

The wall and ceiling tracks are formed from light gauge steel .025-inch thick and are C-shaped with legs one inch (1") high. The track width is equal to the nominal depth of the studs inserted into the track. The studs are C-shaped with top and bottom flanges one and three-eighths inches (1⅜") wide containing flanges one-fourth inch (¼") deep returned one-eighth inch (⅛"). The web of the studs is offset a distance of one thirty-second inch (1/32") at a point three-eighths inch (⅜") in from each flange.

III. **Points of Variance with the Uniform Building Code:** The Uniform Building Code does not assign a fire-resistive rating to this type of construction.

IV. **Evidence Submitted:** The results of a fire-endurance test conducted in accordance with U.B.C. Standard No. 43-1-64 are submitted.

Recommendation

V. **Recommendation: That the Donn Products DW-Screw Channel Stud System described in Part II of this report is a satisfactory alternate type of construction to that specified in the Uniform Building Code for one-hour fire-resistive incombustible non-load-bearing partitions provided the partition heights do not exceed the height set forth in Table No. I[1].**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) T. H. Carter
Managing Director

TABLE NO. I—STUD HEIGHTS

STUD DESIGNATION	STUD DEPTH (In Inches)	STUD HEIGHT (In Feet)
DW-26	1⅝	9
DW-40	2½	12
DW-48	3	14
DW-54	3⅜	15
DW-58	3⅝	16

SGP 0028465

RESEARCH RECOMMENDATION

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES • 681-4986 • PASADENA, CALIFORNIA

Report No. 1766.2
October 9, 1964

FIRESTOP 120 GYPSUM CEILING TILE
BESTWALL GYPSUM COMPANY
120 EAST LANCASTER AVENUE
ARDMORE, PENNSYLVANIA

I. **Introduction:** At the request of Bestwall Gypsum Company, Ardmore, Pennsylvania, the Research Committee of the International Conference of Building Officials has made a re-examination of the data submitted in connection with the use of Bestwall Gypsum Company Firestop 120 Gypsum Ceiling Tile and has noted that the Uniform Building Code does not assign a fire-resistive rating to this type of construction.

II. **Description: Two-hour Fire-resistive Incombustible Floor-ceiling or Roof-ceiling Construction:** Consists of a reinforced sand-gravel concrete slab 2 inches thick poured on a metal lath form spanning between steel joists and a ceiling consisting of Firestop 120 plain gypsum ceiling tile. Three-eighths-inch expanded ribbed metal lath weighing 3.4 pounds per square yard is attached to the top chord of the steel joists at alternate ribs with No. 18 gauge galvanized steel wire. Adjacent sheets of lath are overlapped 4½ inches at the sides and tied together with No. 18 gauge wires spaced 9 inches on center. End laps are approximately 3 inches. The concrete slab 2 inches thick is reinforced in accordance with the requirements of the Code and poured on the metal lath form.

A Donn fire grid suspension system provides support for the ceiling tile. Main beams consisting of No. 25 gauge steel 1½-inch deep bulb tee sections having a 1-inch flange width and a ¼-inch wide by ½-inch deep bulb are spaced 4 feet on center in a direction perpendicular to the joists and are saddle tied to the bottom chord of the joists with No. 12 gauge galvanized steel wire at 4-foot intervals. The bottom of the main beam is located 4½ inches below the bottom chord of the joists. Cross tees are placed perpendicular to the main beams at 24 inches on center and are fitted into the slots provided in the main beam at 6-inch intervals. Cross tees 2 feet long are placed perpendicular to the cross tees 4 feet long at 24-inch intervals to form a 2-foot by 2-foot grid for support of the ceiling tile. The cross tees are identical to the main beams. Special splices manufactured by Donn Products, Inc., are provided between the joints in the main beams to permit expansion.

The Firestop 120 gypsum plain ceiling tile is ⅝ inch thick and 24 inches by 24 inches in over-all size. The tile is supported on the projecting flanges of the bulb tee suspension system.

Alternate Construction: Two-hour Fire-restrictive Incombustible Floor-ceiling or Roof-ceiling: Consists of a 2½-inch thick concrete slab poured on a metal lath form spanning between steel bar joists spaced 24 inches on center. An exposed grid suspension system identical to that described above is suspended 16½ inches below the concrete slab and 6½ inches below the lower chord of the steel bar joists. The ceiling may contain 24-inch by 48-inch recessed type light fixtures protected with a box formed from ⅝-inch thick Firestop Bestwall. One 30-inch by 48-inch piece of Firestop Bestwall is scored on one side and is broken to form diagonal sides 7 inches wide and a top piece 16 inches wide. End sections 6 inches by 26 inches in size are slotted to fit over the T-sections and are nailed to the top and sides with 8-penny common nails. In addition, ducts protected with fusible link dampers covered with 1/16-inch thick asbestos paper may penetrate the ceiling provided the area does not exceed 76 square inches per 100 square feet of ceiling area. The area of light fixtures shall not exceed 8 square feet per 100 square feet of ceiling area and are identified with an Underwriters' Laboratory Label, Guide No. 21012.18.

Identification: The tile is packaged in cartons labeled "Firestop 120 Ceiling Tile."

III. **Points of Variance with the Uniform Building Code:** The Uniform Building Code does not assign a fire-resistive rating to this type of construction.

IV. **Evidence Submitted:** Results of fire-endurance tests and flame resistance tests conducted in accordance with U.B.C. Standards Nos. 43-1-64 and 42-2-64 are submitted.

Recommendation

V. **Recommendation: That Bestwall Gypsum Firestop 120 Gypsum Ceiling Tile construction as described in Part II of this report are satisfactory alternates to that specified in the Uniform Building Code for a two-hour fire-resistive rating. Further the Firestop 120 ceiling tile has a flame-spread classification of I.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

Research Committee
International Conference of Building Officials

(Signed) T. H. Carter
Managing Director

SGP 0028466

RESEARCH RECOMMENDATION INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES · SU 4-4866 · PASADENA CALIFORNIA

Report No. 1809.2
July 10, 1964

FIBERGLAS NOISE STOP BOARD PARTITION
(METAL STUDS)
OWENS-CORNING FIBERGLAS CORPORATION
PACIFIC COAST DIVISION
P. O. BOX 89
SANTA CLARA, CALIFORNIA

I. **Introduction:** At the request of Owens-Corning Fiberglas Corporation, Santa Clara, California, the Research Committee of the International Conference of Building Officials has made a re-examination of the use of Fiberglas Noise Stop Board in a steel stud fire-resistive partition assembly and has noted that the Uniform Building Code does not fully provide for this product.

II. **Description: General:** Fiberglas Noise Stop Board has a thickness of ½ inch and consists of a fiberglas core faced with a 70-pound kraft paper on the wall surface side. The kraft paper is laminated to the fiberglas core by an asphaltic adhesive weighing one and one-half ounces per square foot. The board is supplied in 4-foot by 4-foot or 4-foot by 8-foot panels.

One-hour Fire-resistive Nonbearing Metal Stud Partition: Consists of metal studs 16 inches on center covered on each side with an undercourse layer of Fiberglas Noise Stop Board and an outer layer of ⅝-inch-thick Type X gypsum wallboard.

The studs are formed from .021-inch to .022-inch thick light gauge galvanized steel into a channel section having a depth of 2½ inches and flange widths of 1¼ inches. The ends of the flanges are returned at right angles a distance of ¼ inch and hemmed. The studs are inserted into runners formed from the same material and have similar dimensions except that the flanges are hemmed back in a direction parallel to the flange. The runners are attached at the top and bottom by means of approved fasteners spaced not over 24 inches on center. The studs are inserted into runners and twisted into position. The 4-foot by 4-foot or 4-foot by 8-foot sheets of fiberglas Noise Stop Board are fastened to the studs by means of 1-inch-long No. 6 self-drilling drywall screws with countersunk heads.

The vertical and horizontal joints of the Fiberglas Noise Stop Board are staggered 16 inches and 12 inches respectively on each side. Five-eighths-inch Type X gypsum wallboard in ceiling height lengths and widths of 4 feet are then attached to the studs by 1⅝-inch long No. 6 self-drilling drywall screws. The screws are spaced 9 inches on center around the perimeter of the sheet and at 12 inches on center at intermediate studs. The vertical joints on one side are staggered 16 inches with respect to those on the other. All joints are taped and all joints and screw heads are given two coats of joint compound.

The one-hour fire-resistive nonbearing metal stud partition consists of metal studs spaced 24 inches on center covered on each side with an undercourse layer of Fiberglas Noise Stop Board and an outer layer of ½-inch thick Type X gypsum wallboard. The studs are formed from .0237-inch thick light gauge galvanized steel into channel-shaped sections having a depth of 1⅝ inches and flange widths of 1¼ inches. The ends of the flanges are returned at right angles a distance of ¼ inch and hemmed. The studs are inserted into runners formed from the same material and have similar dimensions except that the flanges are hemmed back in a direction parallel to the flange. The runners are attached at the top and bottom by means of approved fasteners spaced not over 24 inches on center. The studs are inserted into runners and twisted into position. The 4-foot by 4-foot or 4-foot by 8-foot sheets of Fiberglas Noise Stop Board are fastened by means of 1¼-inch long No. 6 self-drilling drywall screws spaced 12 inches on center along the top and bottom edges and along all studs.

The vertical and horizontal joints of the Fiberglas Noise Stop Board are staggered 24 inches and 12 inches respectively on each face of the partition. One-half-inch Type X gypsum wallboard, applied horizontally, is attached to the studs by 1¾-inch long No. 6 self-drilling drywall screws spaced 9 inches on center where joints between wallboard occur, and 12 inches on center at intermediate studs. The vertical joints on one side are staggered 24 inches with respect to those on the other and the horizontal joints are staggered a minimum of 12 inches. All joints are taped and all joints and screw heads are given two coats of joint compound.

III. **Points of Variance with the Uniform Building Code:** The Uniform Building Code does not assign a fire-resistive rating to this type of construction.

IV. **Evidence Submitted:** The results of a fire-endurance test conducted in accordance with U.B.C. Standard No. 43-..-61 are submitted.

Recommendation

V. **Recommendation: That the use of Owens-Corning Fiberglas Noise Stop Board as described in Part II of this report is a satisfactory alternate type of construction to that specified in the Uniform Building Code for a one-hour fire-resistive incombustible nonload-bearing partition, provided the partition height does not exceed 12 feet.**

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

International Conference of Building Officials
Research Committee

(Signed) T. H. Carter
Managing Director

SGP 0028467

RESEARCH RECOMMENDATION INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
50 SOUTH LOS ROBLES · 681 4986 · PASADENA CALIFORNIA

Report No. 1874.1
June 5, 1964

GYPSUM BOARD PRODUCTS
GYPSUM ASSOCIATION
1350 NORTH HIGHLAND AVENUE
HOLLYWOOD, CALIFORNIA

I. **Introduction:** At the request of the Gypsum Association, Hollywood, California, the Research Committee of the International Conference of Building Officials has made a study of the data submitted in connection with the use of Gypsum Board Products in ducts and plenum chambers and has noted that the Uniform Building Code does not fully provide for the use of this material.

II. **Description:** Gypsum Wallboard, Gypsum Backerboard, and Gypsum Lath and Plaster are applied to supports and attached in the manner prescribed by the Code to form the interior finish of ducts or plenum chambers formed by parts of the building structure.

III. **Points of Variance with the Uniform Building Code:** Section 5105 (i) 3 requires that ducts be constructed of incombustible material or may be formed by parts of the building structure if constructed of ¾-inch cement or gypsum plaster on metal lath applied to both sides of supports.

IV. **Evidence Submitted:** The results of flame-spread tests conducted by Underwriters' Laboratories, Inc., are submitted.

Recommendation

V. **Recommendation:** That the use of Gypsum Board Products described in Part II of this report be accepted as a satisfactory alternate method of construction for the lining of duct and plenum chambers of air distribution systems provided:

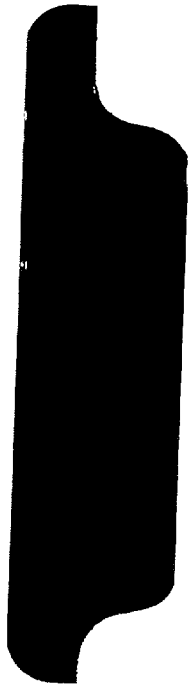
1. The temperature in the duct or plenum does not exceed 125°F.
2. The Gypsum Board Products are installed on framing members in accordance with applicable requirements of the Code or Research Recommendations.
3. Where a ceiling is suspended to form a plenum chamber the suspended ceiling members shall be of incombustible materials.
4. Such systems are connected only to automatically operated electric gas or oil furnaces and low pressure steam or hot water heat exchangers except that installation of terminal reheats is permitted.
5. The materials are not used within 6 feet of the furnace plenum or heat exchanger casing.

This recommendation is granted for a period of one year from date, at which time a request shall be made for re-examination in accordance with the Policy and Rules of Procedure of the Research Committee.

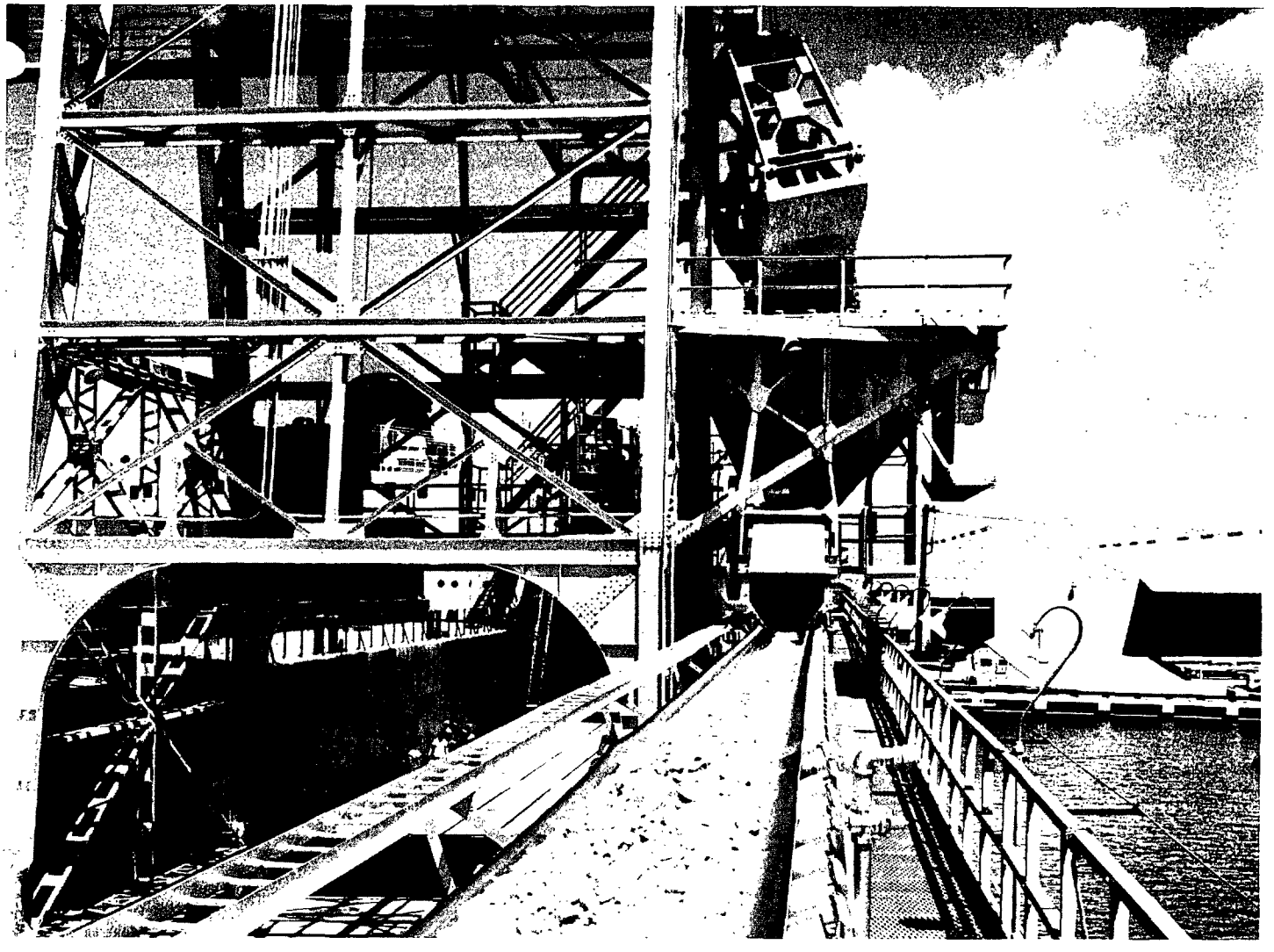
International Conference of Building Officials
Research Committee

(Signed) T. H. Carter
Managing Director

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BESTWALL GYPSUM FOR PORTLAND CEMENT

Bestwall Gypsum Cement Rock, produced at our River Denys, Nova Scotia, Plant, is available in shipload quantities from our loading facilities at Point Tupper on the Strait of Canso.

PHYSICAL AND CHEMICAL PROPERTIES

Rock Size — Approximately 6″ to fines
Sulphur Trioxide (SO_3) content — guaranteed minimum 41.0%
Gypsum ($Ca\ SO_4 . 2H_2O$) purity — minimum 88.2%

Typical Analysis

Gypsum ($Ca\ SO_4 . 2H_2O$) purity	92.00%
Anhydrite (natural)	1.00%
Sand, Shale and Clay	3.60%
Limestone	3.40%
Free Moisture	Nominal

SGP 0028470

GEORGIA-PACIFIC / BESTWALL GYPSUM DIVISION