NEW CONSTRUCTION WALL DETAILS

SIMPLE SAVER SYSTEM®
INSTALL INSTRUCTIONS

Call Toll-free: 1-800-255-0776 Fax: 1-402-454-2708
E-mail us at: custserv@thermaldesign.com

thermal design
energy saving products for buildings™

SIMPLE SAVER SYSTEM INSTALL INSTRUCTIONS
BY THERMAL DESIGN

INTRODUCTION

Thermal Design is the nation's leader in the ongoing development of thermal insulation technologies for pre-engineered and other non-residential buildings.

Born out of a successful contracting business, Thermal Design brought together practical methodology and cost efficient materials to solve the problems of insulating pre-engineered buildings.With over 30,000 installations to date, the Simple Saver System is still being improved with superior quality control of materials and installation procedures. A new United States Patent was issued covering the use of the Simple Saver System as a means of providing fall protection for insulation and roofing workmen. Because of the life saving importance, Thermal Design has included this recently patented feature in the standard Simple Saver System without any extra charge. Due to the critical, life-dependent importance of the materials and installation, only legitimate, quality controlled Simple Saver System materials, installation drawings and instructions should be used. By rights granted under U.S. patent law, only authorized licensed distributors will be allowed to sell the products used in the patented systems and marketed under the Simple Saver System service mark.

The content of this manual contains proprietary information, drawings and instructions which are copyrighted and made available for use under the shrink wrap license agreement on the cover wrapper of this manual. This manual and associated video tapes, CD's, software and other documents covered under the license agreements remain property of Thermal Design, Inc. and are solely intended for the exclusive use with the legitimate materials and systems of Thermal Design.

We request that all designers and users only allow the purchase of legitimate materials from authorized sources and follow installation drawings and instructions to assure satisfactory performance of the products. A life could depend on it!

Technical information, support and quotations may be obtained by calling Thermal Design at (800) 255-0776 or an authorized distributor.

Thermal Design is dedicated to improving the quality and performance of these multipurpose systems for insulating pre-engineered buildings and providing an economically desirable means of building energy efficient buildings.

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ACTUAL R-VALUES

Designed for optimal performance, the Simple Saver System uses the space required for the full specified insulation thickness, isolates the conductive steel purlins/girts, and seals the insulation from interior air and moisture infiltration. Insulative thermal breaks are used to minimize conduction. Every system is designed to perform at the specified R-value. The user is responsible for providing suitable structure. Flexible insulation is considered within specifications with +/- 10% of thickness.

PRE-INSTALLED R-VALUE (THICKNESS)	INSTALLED R-VALUES/U-VALUES FOR TYPICAL PURLIN AND GIRT SPACINGS
R-38 (12 inches)	R=38 U= 0.026
R-34 (11 inches)	R=34 U= 0.029
R-30 (10 inches)	R=30 U= 0.033
R-25 (8 inches)	R=25 U= 0.040
R-22 (7 inches)	R=22 U= 0.045
R-19 (6 inches)	R=19 U= 0.053
R-13 (4 inches)	R=13 U= 0.077
R-10 (3 inches)	R=10 U= 0.100

In-place insulation values are obtained by installing insulation in an actual structure, determining the average thickness and multiplying by the tested R-value per inch. The conductive losses through purlins and girts are negligible when thermally broken and isolated from interior air by the Simple Saver liner fabric.

The calculations of ASHRAE accurately predict insulation values of the Simple Saver method. Insulation R-values and thicknesses shown are for 0.6 lb./ft. density fiberglass. High density yields higher R-values with less overall thickness.

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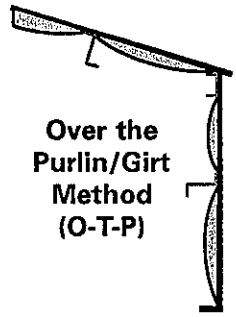
ACTUAL R-VALUES OF OUTDATED INSULATION METHODS

Outdated insulation methods are often represented as the pre-installed R-values when they actually perform at far less. This table reveals the truth about the traditional over the purlin/girt method.

Based on NAIMA Formula: U=.012 + [0.255 / (.31Rf +t)] (1-N / L) + (.198 + .065n) / L

Variables:
Rf = The sum of inside and outside air films R-value of .78 used for all calculations.
t = Pre-installed insulation thickness = see below.
N = Number of purlins or girts in the L dimension = (L/spacing) +2.
L = Dimension of the building section in linear feet = 100 foot width used.
n = Fastener population per linear foot of purlin = one per linear foot used.
U = Heat loss in BTU per square foot- hour- degree Fahrenheit.



Over the Purlin/Girt Method (O-T-P)

PRE-INSTALLED R-VALUE (THICKNESS)	INSTALLED R-VALUES AND U-VALUES *Add 1 to 2 R-values for standing seam roof with 1" standoff			
	Purlin/Girt Spacings and Percentage of Compression Loss			
	Five Ft./Pct. Loss	Four Ft./Pct. Loss	Three Ft./Pct. Loss	Two Ft./Pct. Loss
R-19 (6 inches)	R=10.05/47.2% U=0.10	R=9.04/52.5% U=0.11	R=7.74/59.3% U=0.13	R=6.02/68.4% U=0.17
R-16 (5 inches)	R=9.46/40.9% U=0.11	R=8.60/46.2% U=0.12	R=7.45/53.4% U=0.13	R=5.89/63.2% U=0.17
R-13 (4 inches)	R=8.72/32.9% U=0.11	R=8.01/38.4 U=0.12	R=7.05/45.8% U=0.14	R=5.70/56.2% U=0.18
R-10 (3 inches)	R=7.73/22.7% U=0.13	R=7.22/27.8% U=0.14	R=6.50/35.0% U=0.15	R=5.41/45.9% U=0.18
R-6 (2 inches)	R=6.37/106% U=0.16	R=6.08/101% U=0.16	R=5.65/94.1% U=0.18	R=4.95/82.5% U=0.20

Notes: In-place insulation values shown above are for white vinyl laminated installed in traditional over-the-purlin method based on published NAIMA Formula. The NAIMA Formula has been verified to be accurate in a study conducted by the BROOKHAVEN NATIONAL LABORATORY for the DEPARTMENT of ENERGY and NAIMA claims accuracy within 3%. In-place insulation values actually contained in a new building must be disclosed at the point of sale for the customer's information and energy code compliance. Representation of insulation values greater than those indicated may be misrepresentation and in most states constitutes fraud.

Formula was derived from test data of non-reinforced vinyl faced insulation. Reinforced facings commonly in use are more resilient and are generally installed more tightly, resulting in greater compression of the insulation and less actual insulation performance than the above formula would indicate. Actual independent tests of the effects of reinforced facings on actual performance have not been made available to the general public. No valid representation of the in-place insulation performance with the reinforced facings can be made.

TIMA was an abbreviation for the Thermal Insulation Manufacturers Association, 1420 King St.# 410, Alexandria, VA.22314, (703) 684-0474. The formula for determining in-place R-value was published in the July issue of the Metal Construction News, in the letter to the editor. (Since this analysis was published, NAIMA has changed it's name to North American Insulation Manufacturers Association, or NAIMA.)

The Brookhaven National Laboratory, Upton, Long Island, NY 11973, issued a final report of the study entitled: Metal Building Study: Performance of Materials and Field Validation dated December 1987 by W. Loss. The study was supported by the United States Department of Energy. BNL 52134

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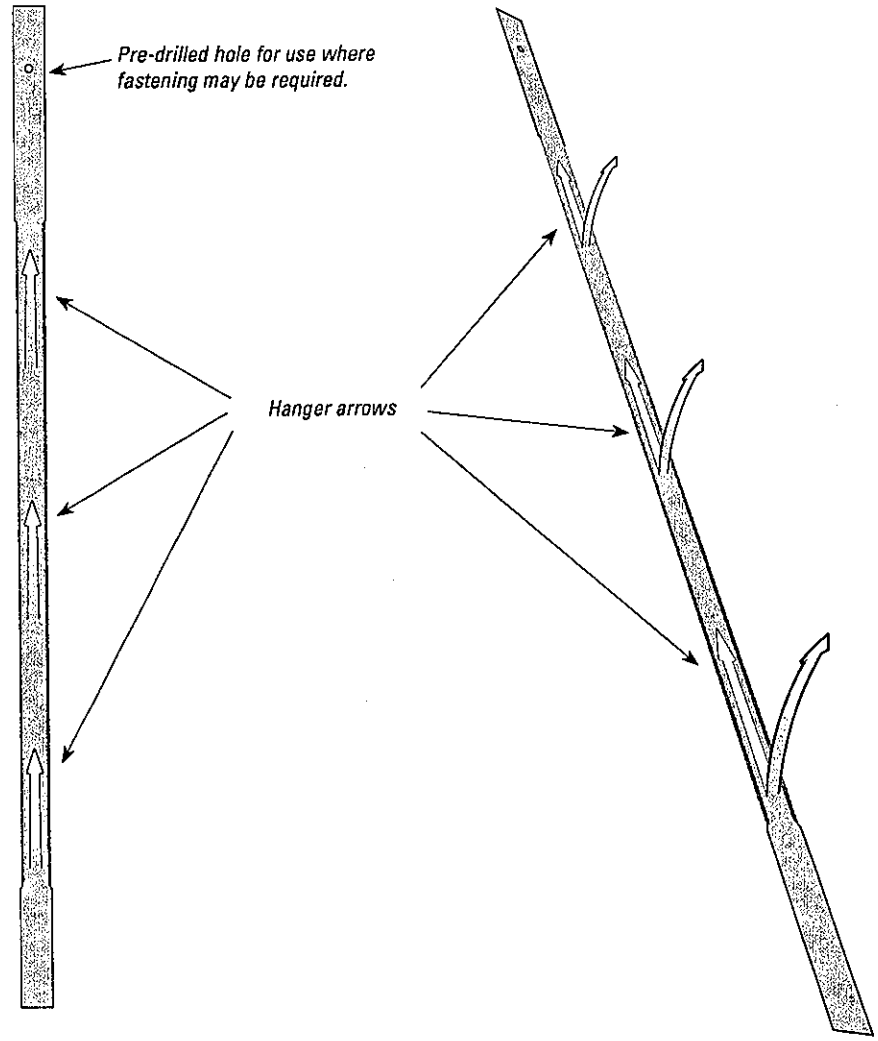
FAST-R™ HANGER INSTRUCTIONS

Fast-R hangers have been developed to quickly hang Simple Saver blanket fiberglass wall insulation. They are pre-cut metal strips with barbed arrows punched into them every 8" on center. These special hangers are shipped in boxes of 80 pieces, which will cover approximately 1000 sq. ft. with girts spaced 48"-96" apart.

(Narrow girt spaces, such as 24", may not require hangers if insulation will support itself in cavity.)



(Patent Pending)

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SIMPLE SAVER SYSTEM INSTALL INSTRUCTIONS
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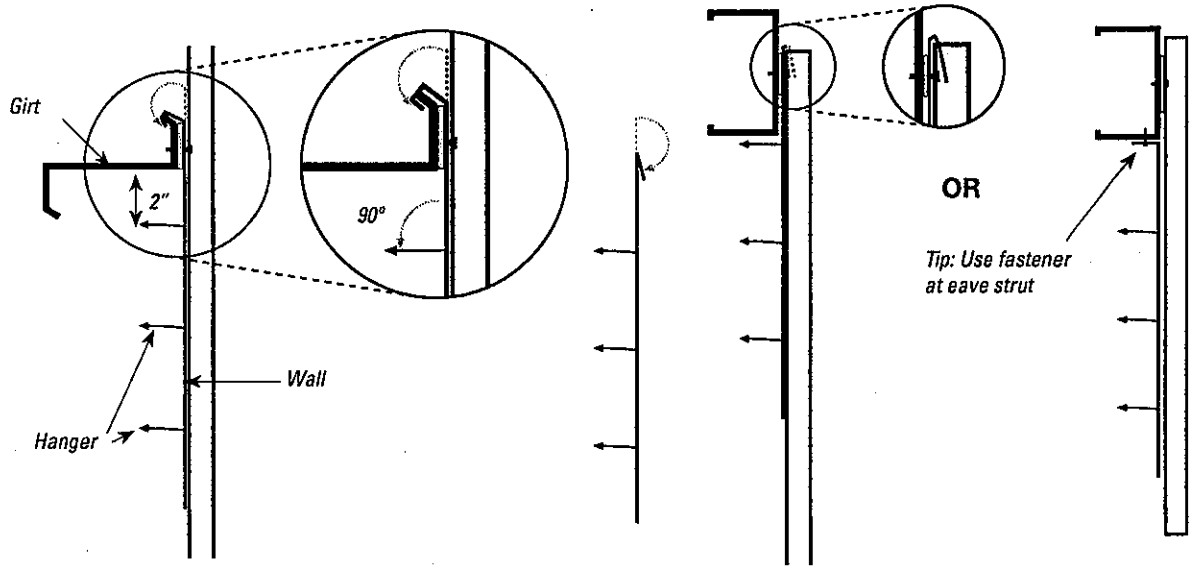
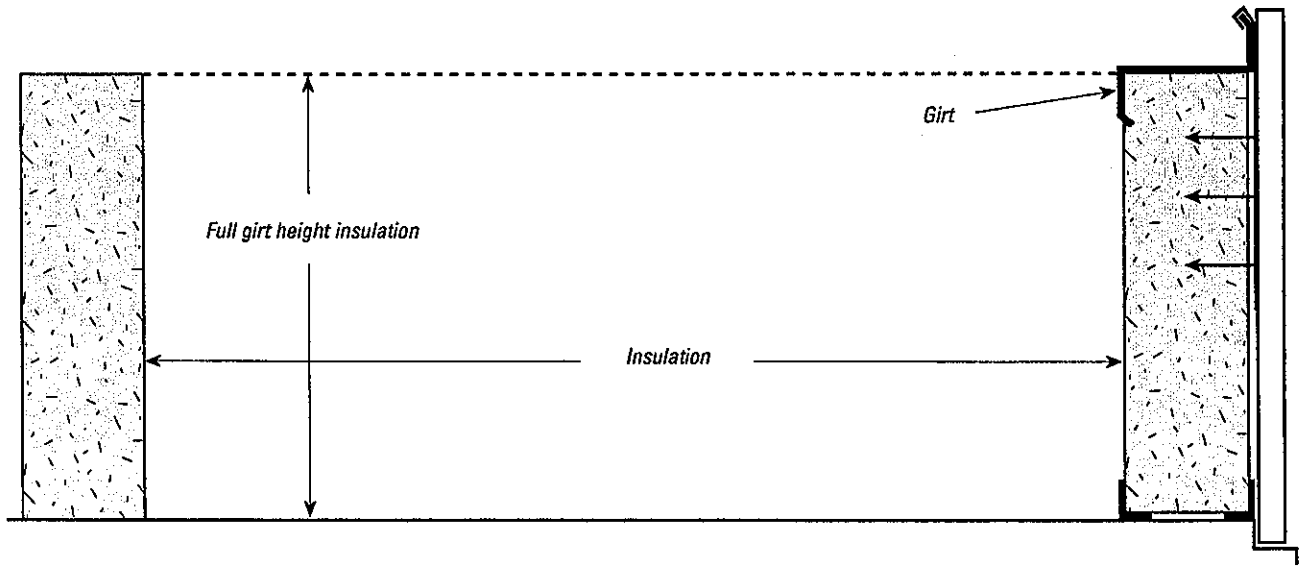
FAST-R™ HANGER INSTRUCTIONS

Step 1: Start at one end of the wall area to be insulated. Remove a hanger from the box and pull the three barbed arrows perpendicular (90°) to the main body of the hanger. From the interior of the building, slide the top end of the hanger upward between the girt and the wall panel until the end protrudes above the girt lip approximately 1.5". Bend this protruding end sharply inward around the girt lip to secure the hanger. Typically two hangers are placed per 60" or 72" insulation blanket width or 30" to 36" apart. Hangers positioned 15" or 18" from each side of the blanket, respectively, is ideal. If any part of the building structure does not allow the above process, simply fasten the hanger to the appropriate structure with a suitable fastener.



Girt Condition **Eave Conditions**

Step 2: Cut the insulation to fit exact length between girts. Shake insulation to aid in thickness recovery. Carefully lift up the insulation blanket into position and impale it on the barbed arrows. Bend the arrow heads up to lock insulation in position starting at the top arrow and gently fluff insulation out to full uniform thickness around the arrows.



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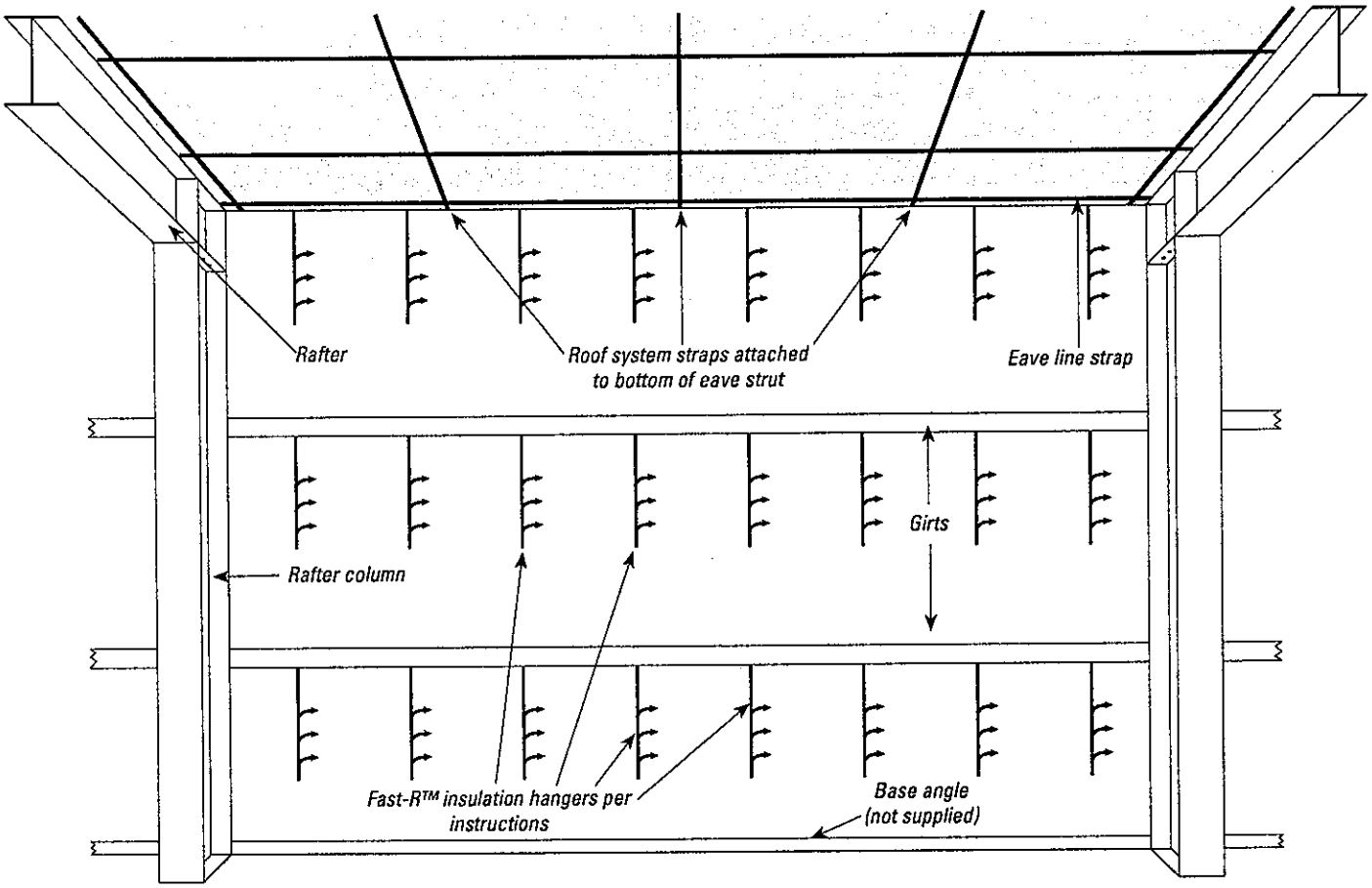
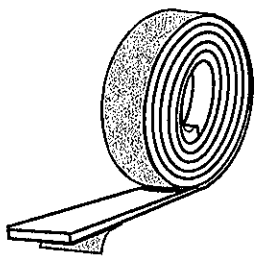
EAVE LINE STRAP INSTALLATION

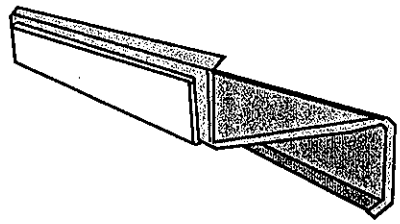
Step 3: If the eaveline strap was not installed with the roof straps, it should be now be fastened below the traverse straps. Cut the eave line strap the width of the bay and install plumb with the inside plane of the girts.

Figure 1



Thermal Design recommends applying Type 1 thermal break to the outside of girts before applying wall sheets.





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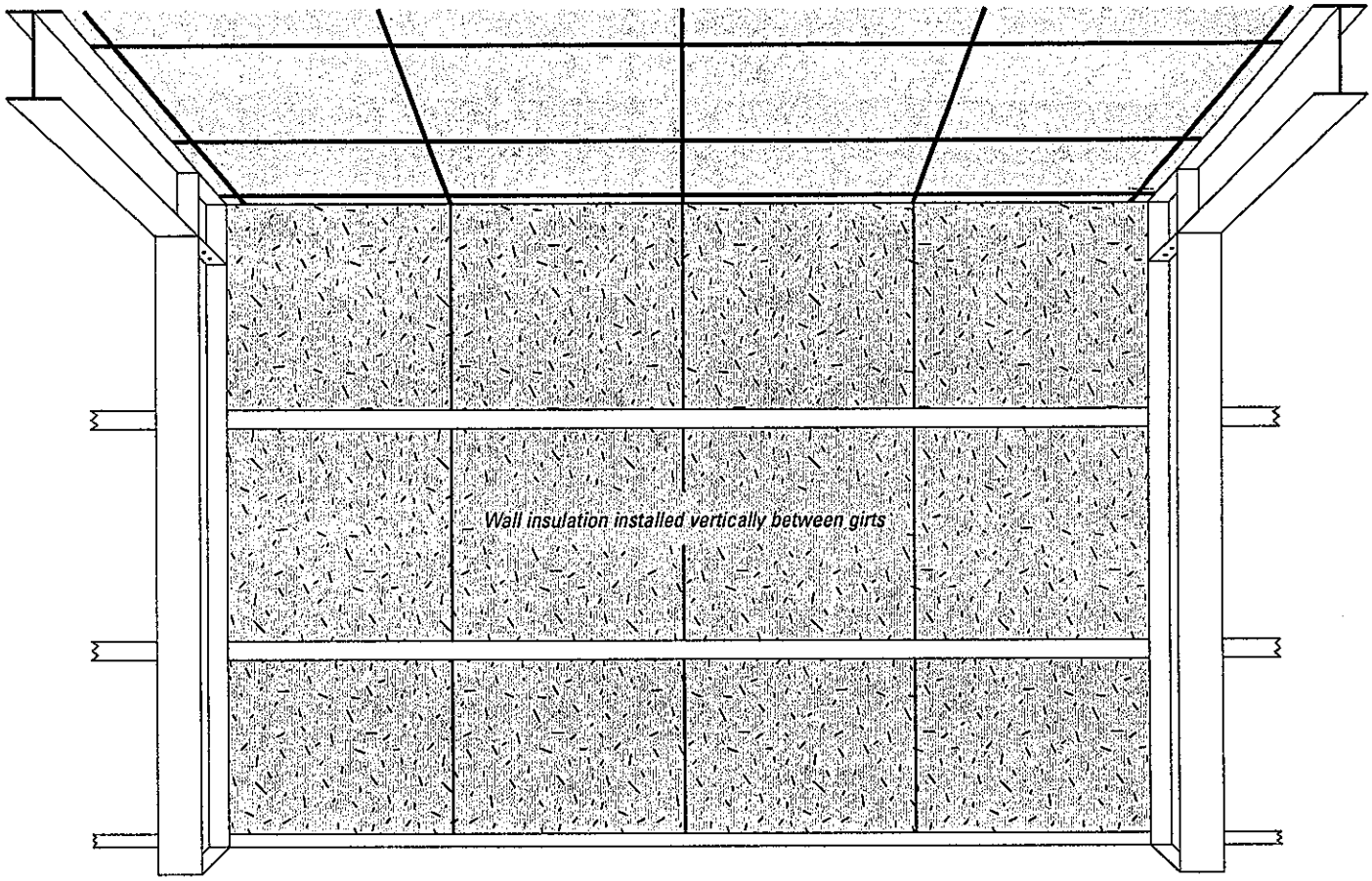
NEW WALL SYSTEM INSULATION
IN STEEL FRAME BUILDINGS

Figure 2



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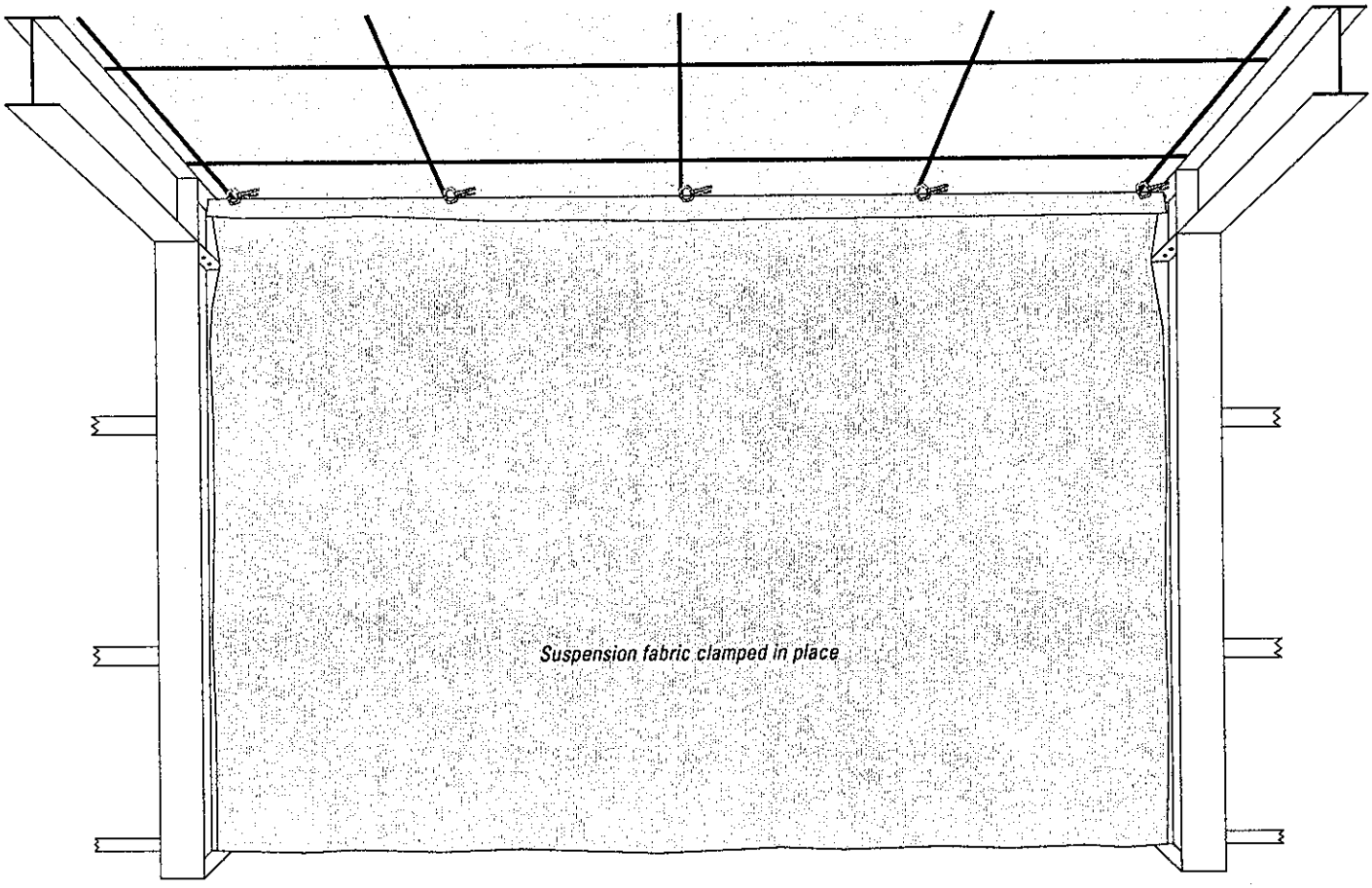
NEW WALL SYSTEM INSTALLATION
IN STEEL FRAME BUILDINGS

Step 4: Position appropriate sized fabric on wall (see sketch provided with system for sizes). Factory seams should run vertically on wall fabric. Start positioning in either corner at rafter and roof intersection. Position fabric 3" over eave line strap and clamp. Proceed to opposite corner clamping the fabric in several points across the bay.

Figure 3



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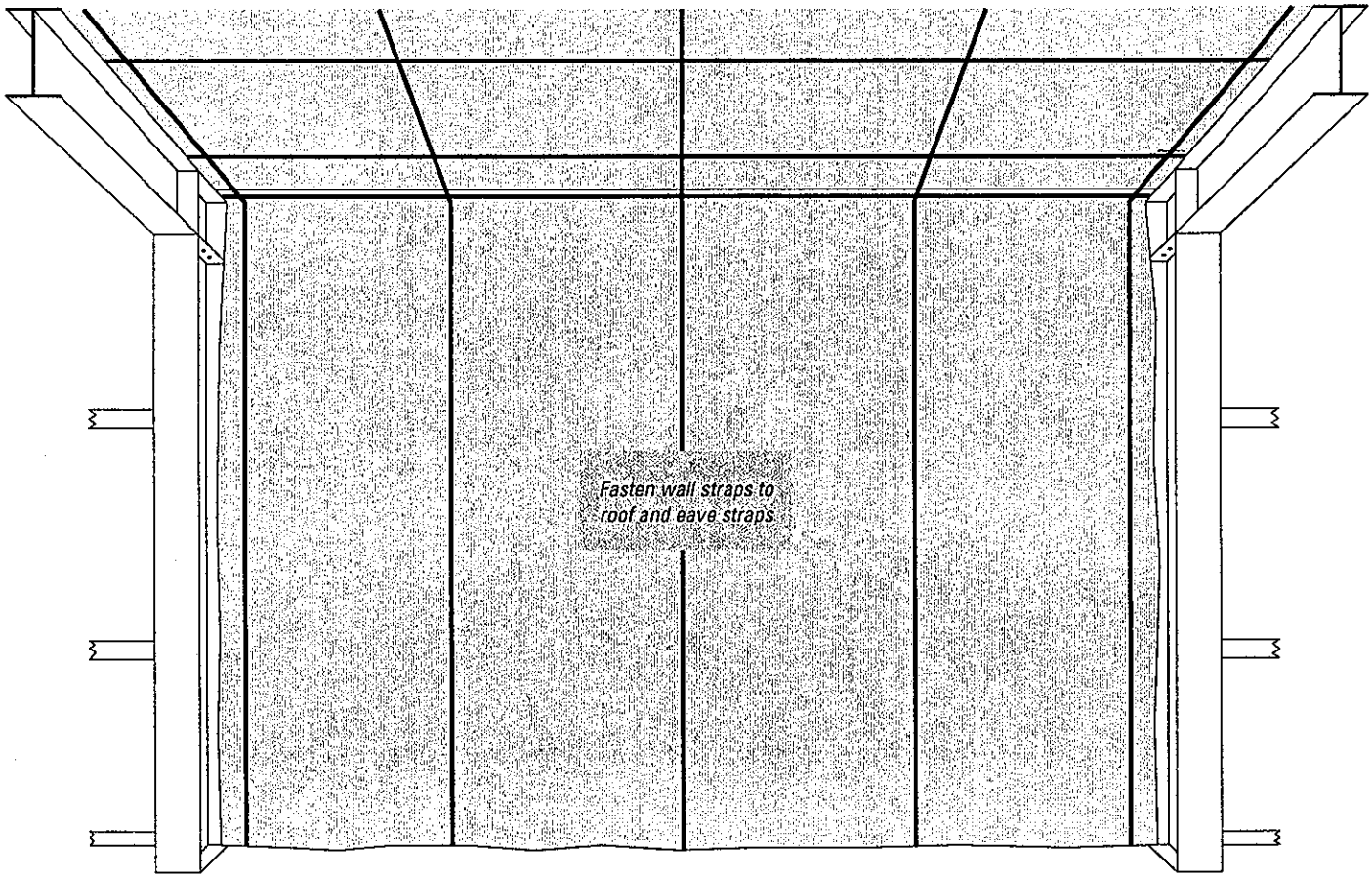
**NEW WALL SYSTEM INSTALLATION
IN STEEL FRAME BUILDINGS**

Step 5: Cut the number of wall straps required. Straps shall reach from roof to floor. Install wall straps by drilling self tapping screws through wall strap, eave line strap and fabric into the roof strap fastening them together. Also install a strap 6" away from the column.

Step 6: Adhere fabric to roof fabric along the eave line strap with Syseal® Tape.

Figure 4



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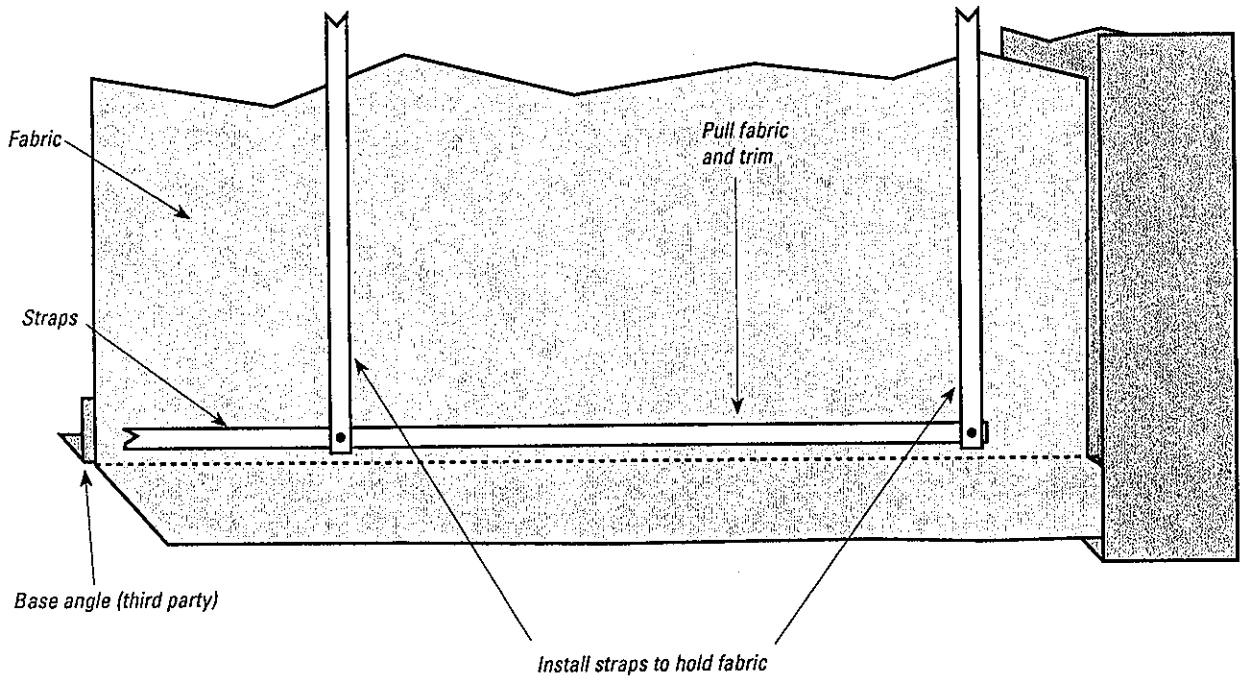
**NEW WALL SYSTEM INSTALLATION
IN STEEL FRAME BUILDINGS**

Step 7: Pull fabric downward to remove wrinkles. Start in the center and adhere to base angle or 2x4 at floor with tape (tape will not work on wood). Trim off excess fabric (see figure below). Fasten wall straps at base then girts with self-drilling fasteners. Adhere fabric to column with Syseal® Tape and trim off excess fabric. Fasten straps next to column at girts. Refer to installation sketches with these instructions.

Figure 5



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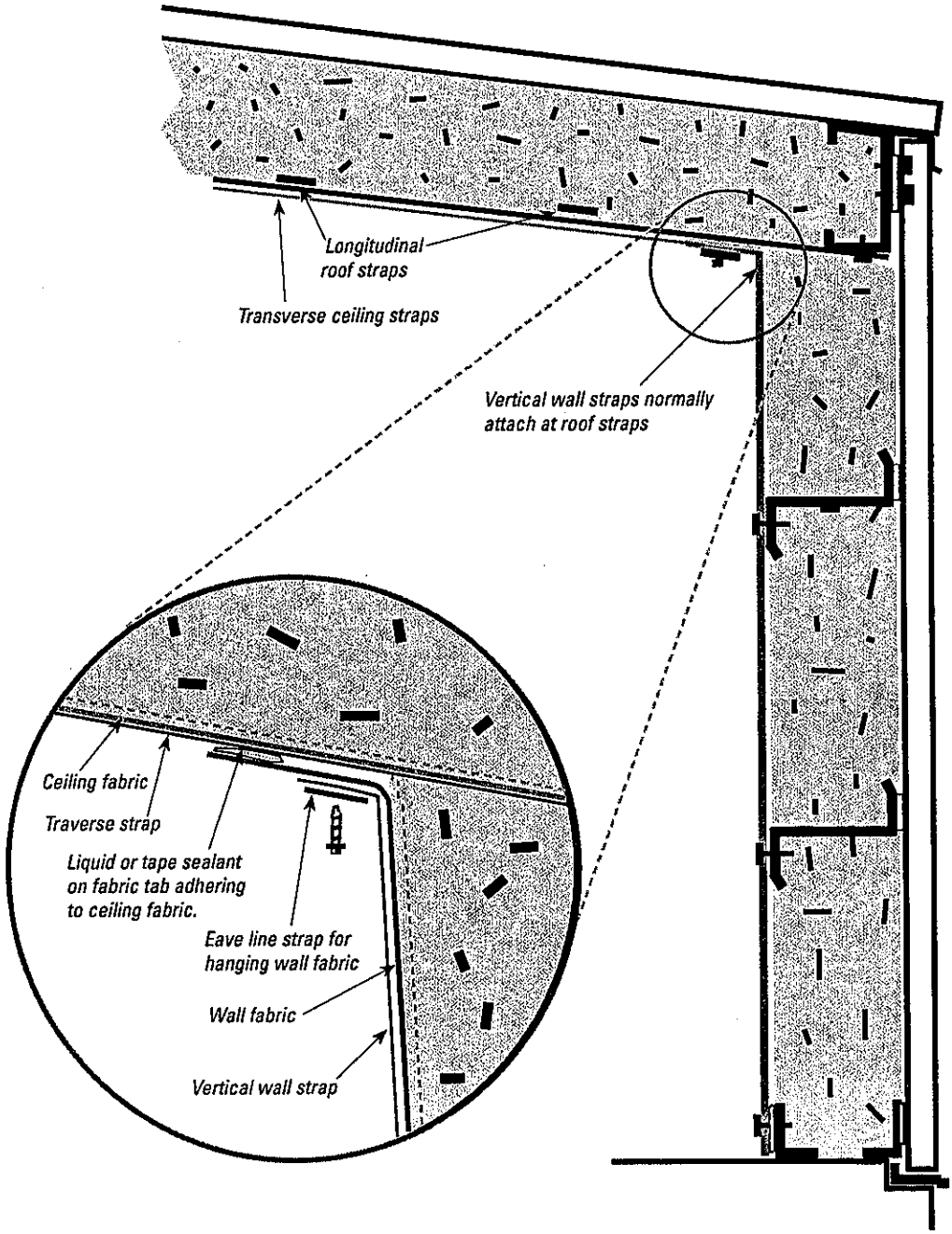
PROPER INSTALLATION OF WALL STRAPS

Figure 6



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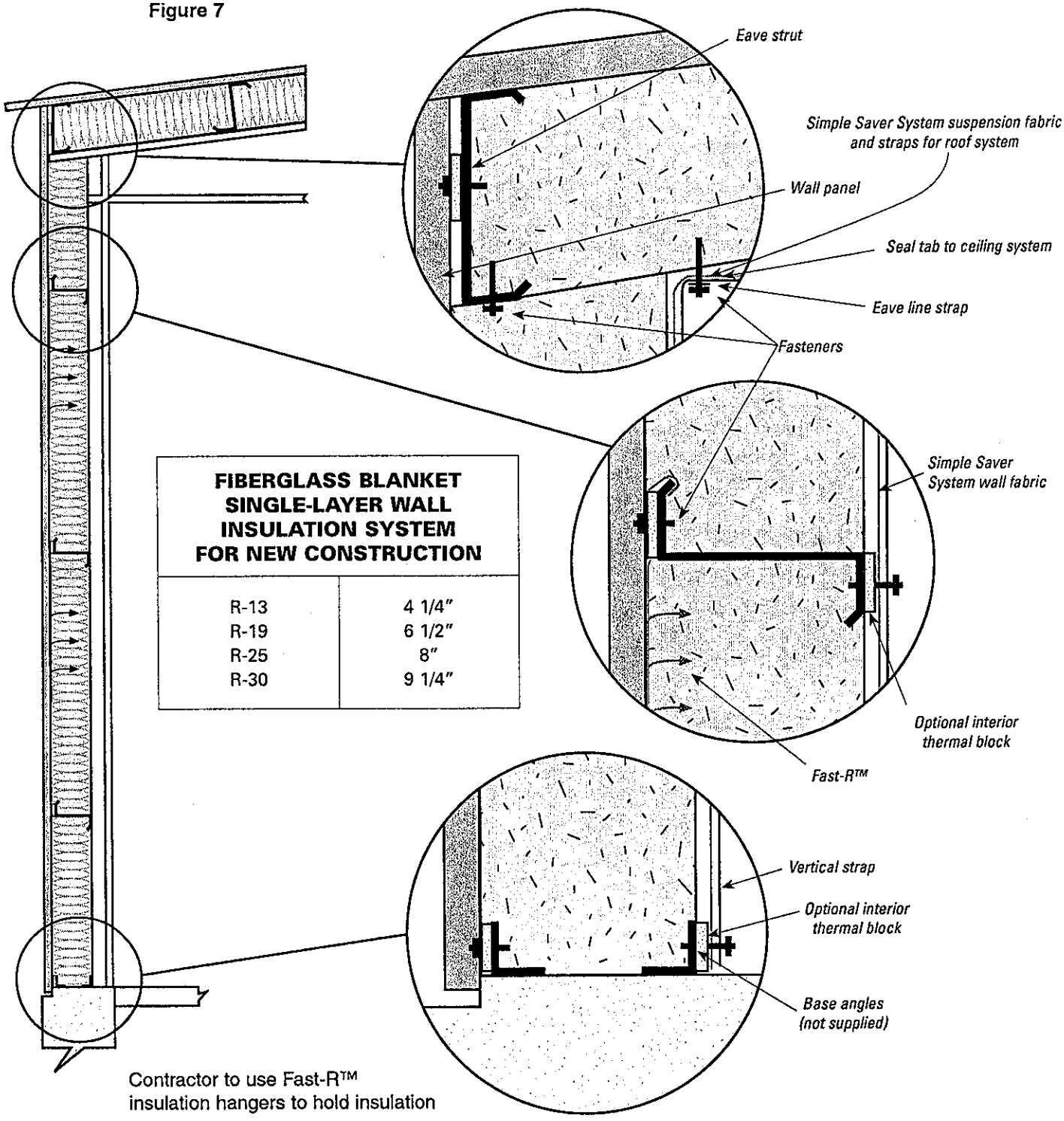
SINGLE-LAYER WALL SYSTEM INSULATION IN STEEL FRAME BUILDINGS

Figure 7



FIBERGLASS BLANKET SINGLE-LAYER WALL INSULATION SYSTEM FOR NEW CONSTRUCTION	
R-13	4 1/4″
R-19	6 1/2″
R-25	8″
R-30	9 1/4″

Contractor to use Fast-R™ insulation hangers to hold insulation

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SIMPLE SAVER SYSTEM INSTALL INSTRUCTIONS
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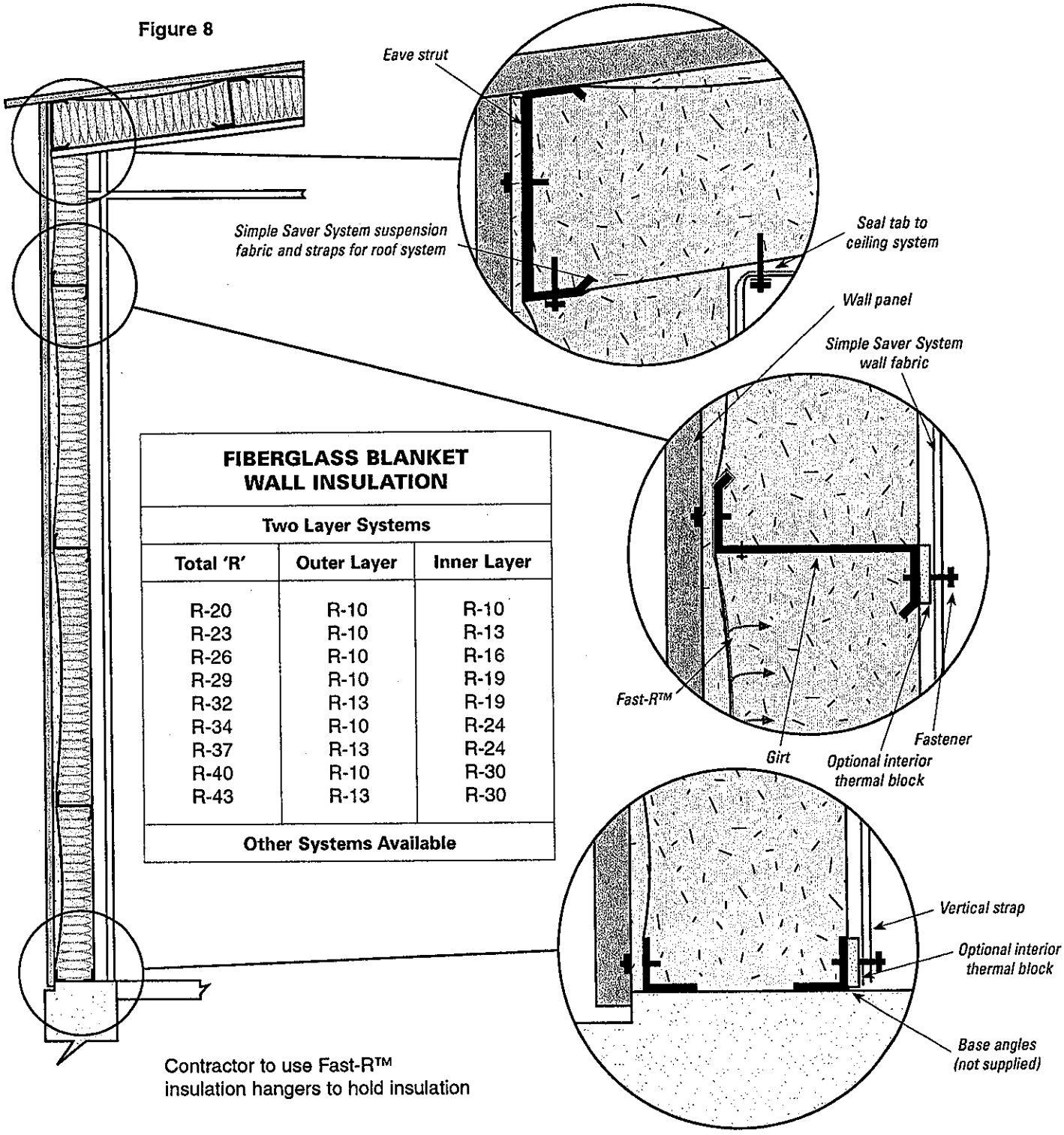
DOUBLE-LAYER WALL INSULATION SYSTEM FOR STEEL FRAMED BUILDINGS

Figure 8



FIBERGLASS BLANKET WALL INSULATION		
Two Layer Systems		
Total 'R'	Outer Layer	Inner Layer
R-20	R-10	R-10
R-23	R-10	R-13
R-26	R-10	R-16
R-29	R-10	R-19
R-32	R-13	R-19
R-34	R-10	R-24
R-37	R-13	R-24
R-40	R-10	R-30
R-43	R-13	R-30
Other Systems Available		

Contractor to use Fast-R™ insulation hangers to hold insulation

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SIMPLE SAVER SYSTEM INSTALL INSTRUCTIONS
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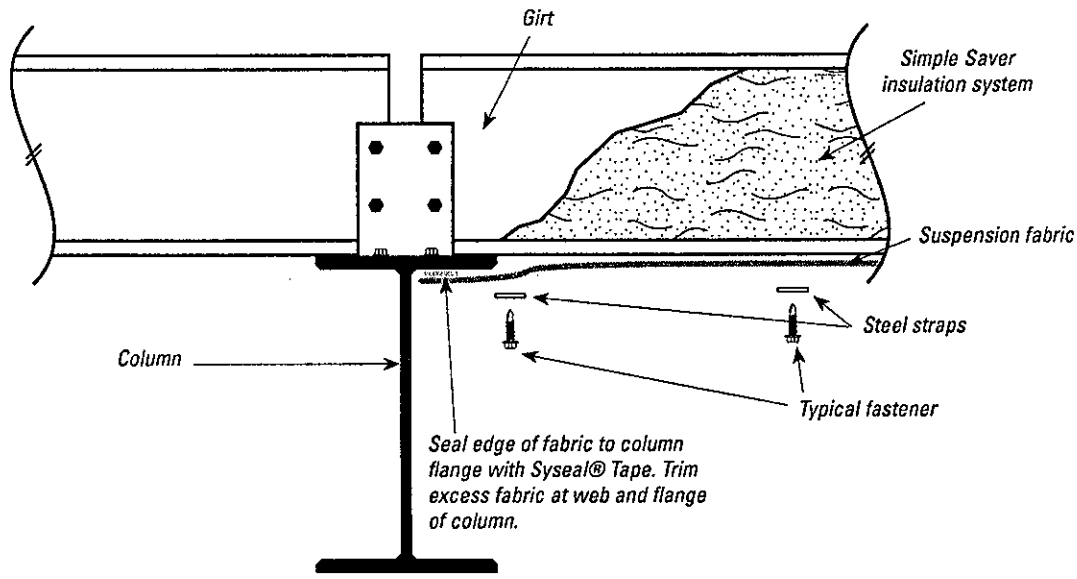
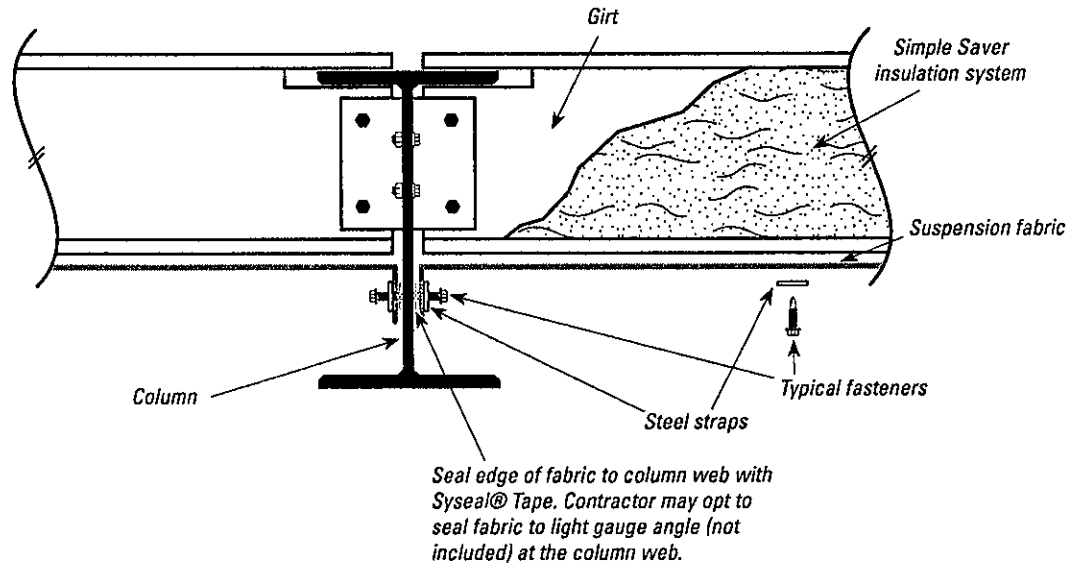
SECTIONAL DETAIL AT GIRT-TO-COLUMN CONNECTION

Outset Girt Condition



Inset Girt Condition



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SIMPLE SAVER SYSTEM INSTALL INSTRUCTIONS
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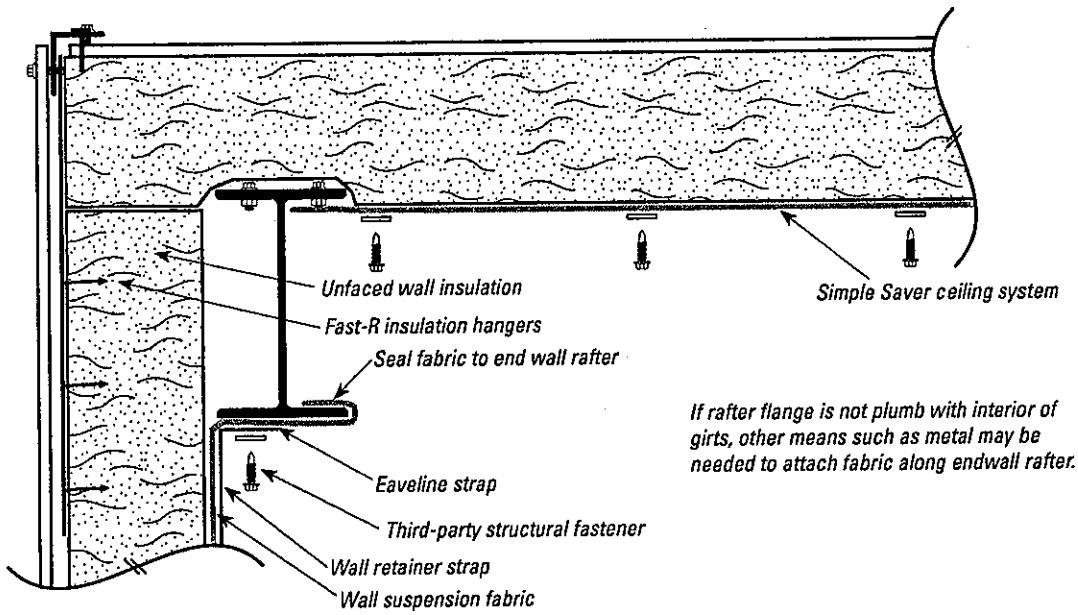
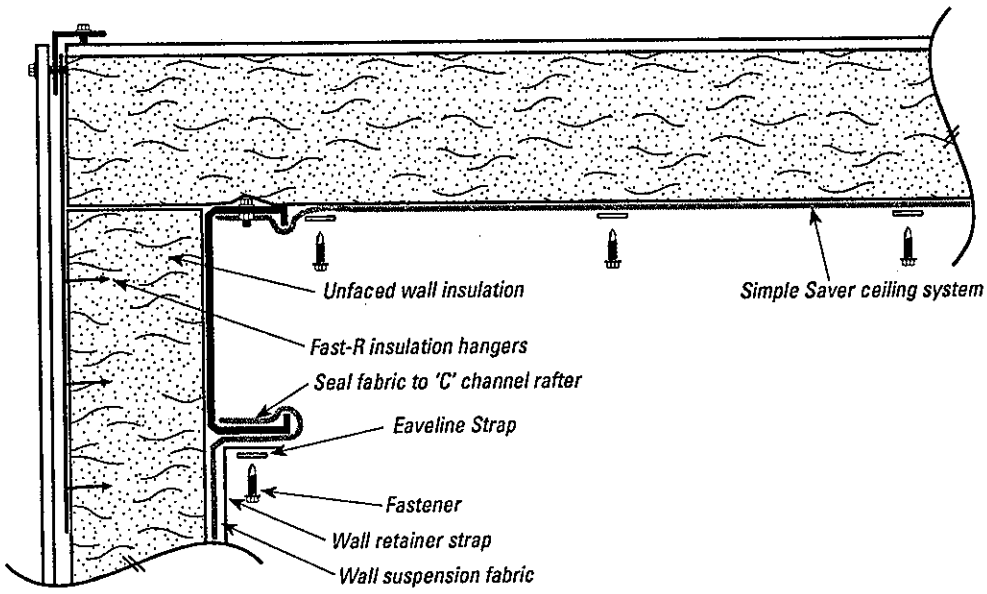
SECTIONAL DETAIL AT END RAFTER TO END WALL CONNECTION



If rafter flange is not plumb with interior of girts, other means such as metal may be needed to attach fabric along endwall rafter.



Note: Various building lines have different structural details and may be different than these shown. Call (800) 255-0776 or your distributor for recommendations.

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SIMPLE SAVER SYSTEM INSTALL INSTRUCTIONS
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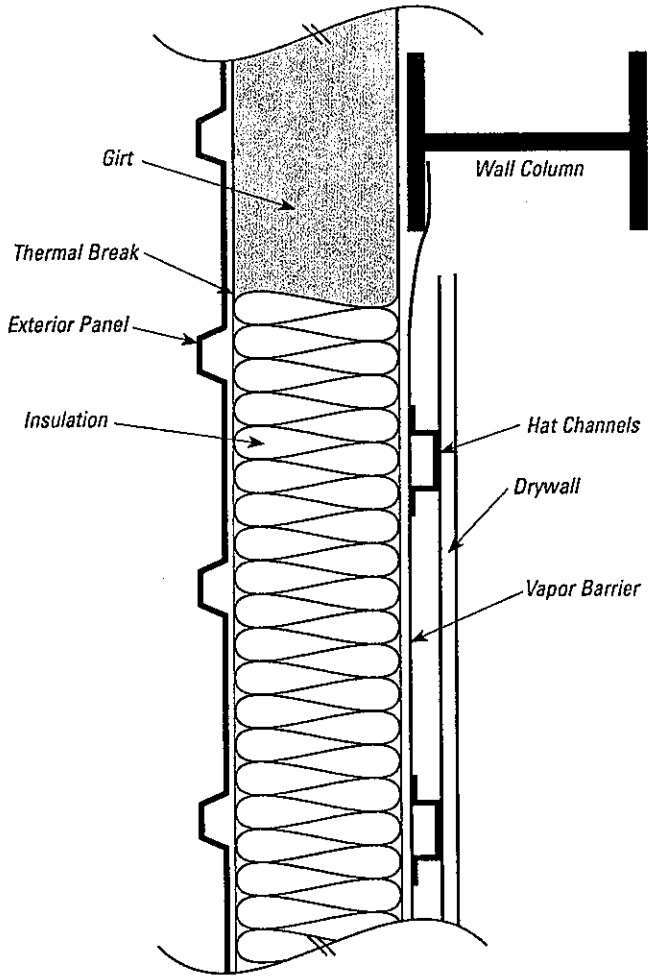
The detail to the right shows how a conventional pre-engineered wall with normal sized girts can be well insulated using the Simple Saver System. Either hat channels or steel studs can be installed vertically on 16" or 24" centers and the drywall applied to them.

When using hat channels it might be necessary to specify an intermediate girt in the lower seven foot (or more) girt span when ordering the building to provide adequate support for the lighter channels.

All the electric, phone and computer wires can be placed in the open hat channel/steel stud cavity created along with the receptacle boxes. This allows the integrity of the vapor barrier to be maintained, unlike a standard stud wall that is full of sub-contracters installations. *(Note: Wires can run horizontally between the vapor barrier and studs by simply pushing in on the vapor barrier.)*

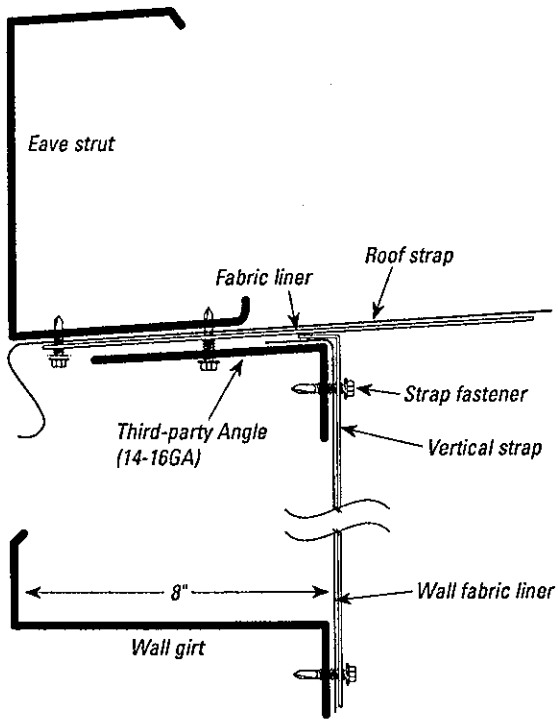
Limited holes can be drilled in the column webs (and in limited numbers) for the horizontal running wires. Contact your building manufacturer for limitations.

Wall Detail: Full Girt Cavity Insulation



Top View

Special Eave Detail



For use if a more finished look is desired where the roof and wall systems adjoin each other. Recommended when roof and wall systems are different colors.

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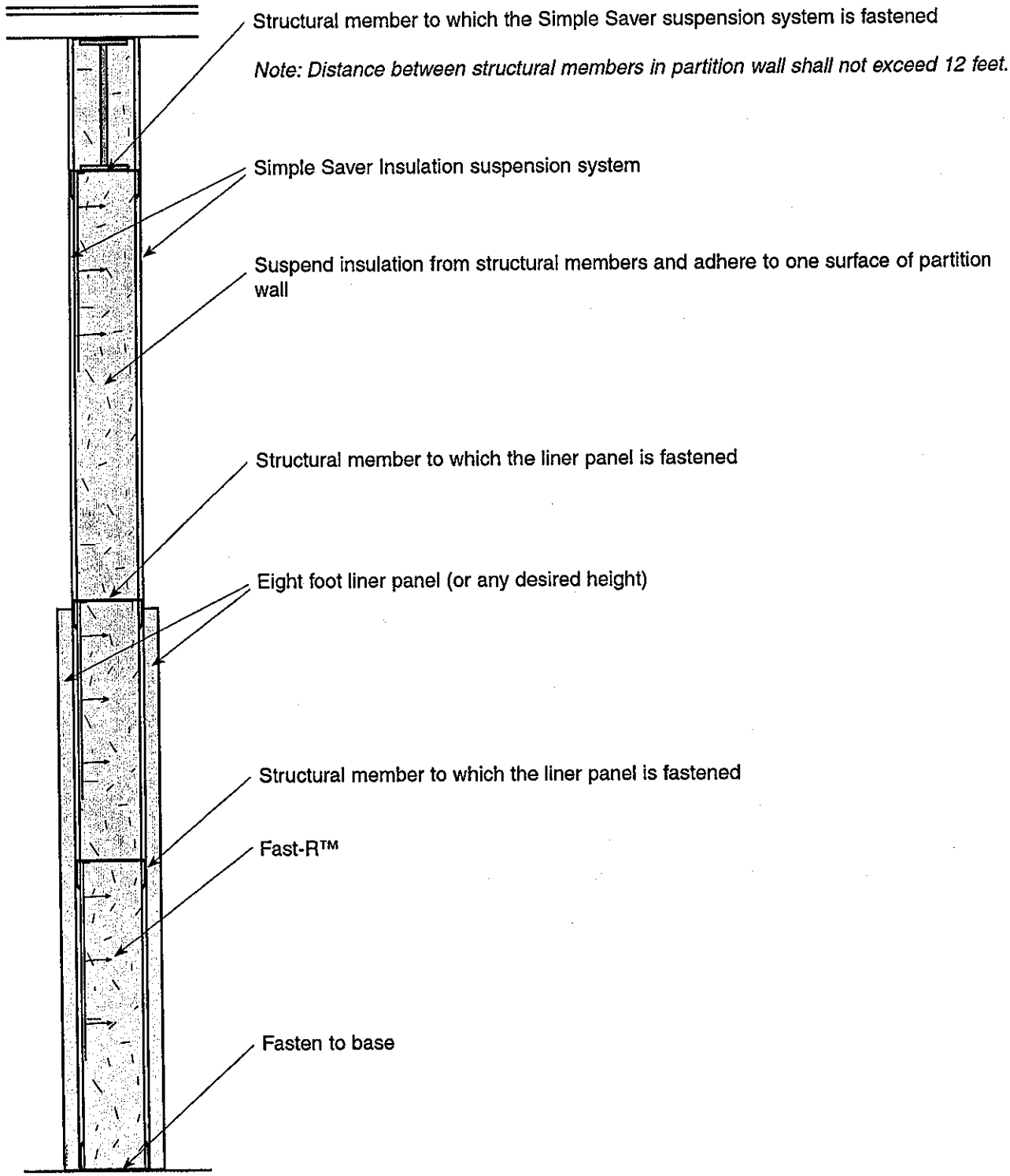
INSULATED PARTITION WALL SYSTEM

Figure 9



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Thermal Performance Guarantee: Thermal Design, Inc. will guarantee to the building owner/user that the thermal performance of a Simple Saver System will perform at the average purchased insulation level, plus or minus 10%, when properly installed at the prescribed thickness and sealed against air and water vapor infiltration. Thermal Design shall, at its option, correct any deficiencies of thermal performance or credit to the owner/user the percentage of the insulation material cost equal to the percentage of any deficiency if a valid claim is filed within one year after installation.

Five-Year Limited Warranty: The Simple Saver System materials are warranted against manufacturing defects in materials that are provided by Thermal Design for the Simple Saver System that may become evident within five years after delivery. This warranty specifically is limited to providing materials for replacement and does not include: any expense to remove or install materials, site workmanship or damages that may be caused by defective materials, installation or design. Labor is typically covered by contractor's warranty for at least one year after installation completion. Thermal Design shall make the sole and final decision as to the validity of any defect claim. Valid claims will be limited to replacement materials or the cost value thereof. Any claims should be submitted in writing by US Mail to Thermal Design, Inc., P.O. Box 468, Madison, NE, 68748. There are no other expressed or implied warranties that extend beyond these limitations and these are a condition of the sale of these goods. The company shall not be held responsible for consequential, liquidated or other damages under any theory of law.

Notices: All customers will be charged Nebraska sales tax on all products unless sales and use tax certificates are provided. Point of sale and venue for all claims shall be Madison County, Nebraska. Any material not specifically included on a quotation is excluded although additional materials may be provided solely at the discretion of Thermal Design.

Unauthorized making, using or selling of this patented technology or trademarks or service marks shall be each subject to a minimum royalty of ten dollars per square foot of surface insulated from such unauthorized acts. Sellers of any component with the knowledge or intent that such component is to be used to evade the purchase of legitimate materials from authorized sources shall be held liable as contributory infringes and otherwise as lawful. All costs of collection, including legal fees and costs, shall be sought as damages for unauthorized infringement.

The EnergyCraft units are factory run tested. Minor adjustment may have to be made on site. Installation of these appliances and framing kits normally do not require a license. Installation of gas piping and electric power to the appliance receptacles should be done by a qualified licensed installer. See Goodman manufacturing warranty documents for limitations and exclusions pertaining to the HVAC products. All sales are subject to the limitations and conditions set forth in those documents as well as the contract of sale.

Simple Saver System is not designed or intended to be walked or stood upon. Any such use will void the fall protection certification. The fall protection feature is strictly for accidental falls while insulating and roofing.

To obtain a project fall protection certificate, all system materials must be purchased from an authorized distributor of Thermal Design, Inc. The erectors/installers will be required to thoroughly read the installation instructions and sign the form provided that they have read, understood and agree to install the Simple Saver System in accordance with the instructions. A copy of the signed form must be received by Thermal Design, Inc. along with a current erector/installer insurance certificate listing Thermal Design a certificate holder and show required coverages of liability, property damage and worker's compensation coverage for the project. The primary limits of the insurance coverage shall be those already provided by the erector/installer to cover their workers and liability. The secondary limits shall be that liability coverage carried by Thermal Design.

Safety lines along the rafters and a safety harness with shock absorbing lanyards must be used while installing the Simple Saver liner system for topside workers. A safety harness with lanyard in combination with a suitable lift must be used by bottom-side workers when installing the Simple Saver liner system. Once the Simple Saver System liner is properly installed in the affected building roof area, the through fall protection certificate will become effective for topside workers for subsequent insulation and roof sheeting work.

The Simple Saver liner system must be completely installed in each affected building area prior to reliance on the system as an alternative means of fall protection for that area. Only one installation of the Simple Saver Systems materials will be allowed per certificate. A copy of the installation instructions and the "Certificate of Alternative Fall Protection" signed by the erector/installer must be prominently posted at the job site as notice to all contractors, workers and inspectors. Perimeter protection must be provided by guard-rail or other effective system per OSHA regulations.

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