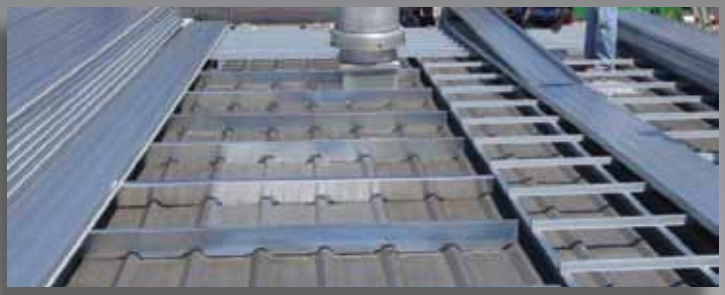
Your Guide To Retrofit Sub-Framing Solutions



ROOF HUGGER®

THE LEADERS IN METAL-OVER-METAL
RE-ROOFING SYSTEMS

www.RoofHugger.com

TABLE OF CONTENTS

2012 Roof Hugger Products

IN STOCK SUB-PURLINS

- 1.83" Tall for 1¼"-1½" X 12" O.C. "R" and "PBR" Panels
- 4.50" Tall for 3" X 24" O.C. Trapezoidal Standing Seam

STANDARD PRODUCTION SUB-PURLINS

Over Existing Thru-Fastened Roofs

- 6"- 10" O.C. Ribbed Panels
- 7.2" O.C. Industrial Rib Panels

Over Existing Standing Seam Roofs

- Any Profile Trapezoidal Rib SSR
- Any Profile Vertical Rib SSR

SPECIAL FLANGES AND WEB HEIGHTS

- Any Specified Dimension

SECONDARY FRAMING MEMBERS

- Integral Sub-rafters for Corner and Edge Zone Reinforcement
- Structural Hat Channels

SPECIALTY FRAMING SYSTEMS

- Roof Floater© "Expand-Contract" Sub-framing Systems
- Corru-Fit© Corrugated Roofing Sub-Framing Systems

SERVICES, TESTING, APPROVALS AND MORE

DESIGN AND DETAILING SERVICES

- Standard Framing Details
- Preliminary Framing Design
- Project Engineering (O/S Source-Fee Based)
- Installation Drawings (O/S Source-Fee Based)

MATERIAL SPECIFICATIONS

- 16-Gauge, 0.060" Minimum Thickness
- 50 KSI Structural Grade Steel
- G-90 Galvanized

PRODUCT AND ASSEMBLY TESTING

- E-1592 Wind Uplift – Numerous Panel Manufacturer Systems
- AISI Base Testing for Existing Purlin Reinforcement

PRODUCT APPROVALS

- FM Global – One Manufacturer Panel System
- Florida Product Approval - 4 Panel Assemblies
- ECO-FIT© ENERGY EFFICIENT RE-ROOFING TECHNOLOGIES
- Above Sheathing Ventilation
- Insulated Re-Roofing Assemblies

Dale Nelson, left, Roof Hugger President with the late inventor of the Roof Hugger system, "Red" McConnohie

ROOF HUGGER – THE BEGINNING

Roof Hugger, Inc. was founded in 1991 by D.V. "Red" McConnohie and Dale Nelson. The concept of the Roof Hugger was created out of the need to re-roof one of Red's investment buildings. Dissatisfied with the options available at the time, the Roof Hugger sub-purlin was born.

Red understood that a retrofit framing system needed to have a low profile and it needed to attach directly to the existing purlins or joist. Additionally having a Zee shape would allow new screw down or standing seam roof panels to function properly. Nothing like this existed, so Red designed and created the "NOTCHED ZEE", fulfilling all these needs. Soon after, Red and I created Roof Hugger, Inc. knowing other contractors also needed a product like the Hugger.

Having been long time partners in design-build contracting, Red and I also understood the importance of product test data. Thus Roof Hugger, by design, has strived to be the leader in actual in-place retrofit assembly testing. The simple, easy to install, Roof Hugger offers test confirmed code compliance, strengthening of existing purlins, easy upgrades from screw-down to standing seam roofs and many energy saving retrofit assemblies. All of this while eliminating the disruption and risk to building owners of having their old roofs removed in order to have a new roof installed.

Beginning our 21st year of operations, Roof Hugger has grown and evolved into a recognized authority in Metal-over Metal retrofit technologies, with Headquarters in Tampa, Florida plus additional production facilities in Indiana, Texas and Washington.

Roof Hugger is proud to be accepted by most metal panel manufacturers as their standard for retrofitting existing metal roofs. Our assemblies are American Made and have earned, Florida Product and Factory Mutual approved assembly certifications. Our ongoing testing and quality control programs keep us in the lead of the metal over metal retrofit market.

It is a tribute to Red's memory that to date we have been trusted to "Hug" over 60 million square feet of existing metal roofs throughout the United States, Guam and the Caribbean. Our customers include all branches of the Military, Coast Guard, NASA, State/Private Schools, Departments of Transportation, Utility Companies, Car Dealers, Mini Storage Facilities, Airports and hundreds of privately owned buildings.

Hugs to our many existing and soon to be new customers,
Dale Nelson
President, Roof Hugger, Inc.

ROOF HUGGER Sub-purlins are Proudly Made 100% in the USA.

What Building Owners are saying about Roof Hugger Solutions!

"We were so pleased that our contractor knew about Roof Huggers! We got an entirely new roof with no interruptions to our business... we hardly knew they were there!"

What contractors are saying about Roof Hugger Solutions!

"Recovering existing metal roofs in high wind zones is one of our core competencies and a very important part of our business. Roof Hugger provides the very best sub frame to attach our -125 PSF rated 238T roof system to. What really differentiates Roof Hugger from all other recover framing systems is that a Roof Hugger adds strength to the existing structure. No other system can claim that"

Charles Smith,
National Roofover Manager,
McElroy Metal, Inc.
Houston, Texas

"The simple and non-invasive Roof Hugger System enables us to offer an excellent, cost effective roofing solution in our difficult weather environment"

Ron Haffner, Vice-President
Design North, Inc.
Juneau, Alaska

DESIGNORTH

"Their initial service, timely delivery and quality of product contributes to the success of our installation and maintaining our schedules"

David Dodge, President
Paramount Metal Systems
Little Rock, Arkansas

Paramount Metal Systems
Design/Build Steel Structures & Roof Systems

What Is Metal-over-Metal Re-roofing?

Simply put, it is the installation of a new long life metal roof over an existing metal roof in a way that is structurally correct, non-disruptive and cost effective. It is a system that adds strength, is environmentally friendly, cooler in summer, warmer in winter and conserves energy.

ROOF HUGGER provides the industry's most effective way of doing this with ROOF HUGGER SUB-PURLIN SYSTEMS. The Roof Hugger Systems can fit *ANY* existing metal panel, support *ANY* new roof panel and be configured to add insulation and solar energy equipment between the old and new roofs.

Roof Huggers "Nest" Into and Over Existing Rib Profiles!

Roof Hugger patented sub-framing systems for Metal-over-Metal re-roofing applications provide the Building Owner, Design Professional and Roofing Contractor with a multitude of benefits and advantages:

Building Owner Benefits

- Old Roof Stays - No Business Disruption
- Insulation is Easily Added for Energy Savings
- 40+ year New Roof Service Life
- New Roof can have 20-Plus Year Weathertight Warranty
- Easy Upgrade from Screw-down to Standing Seam
- Meets New Stringent Building Code Requirements
- Available Solar Energy Systems

Design Professional Benefits

- Expert Online AutoCAD Details
- Factory Mutual & Florida Product Approved Assemblies
- Extensively Tested for ASTM-1592 Wind Uplift
- Meets Building Code Requirements
- Free Preliminary Design Load Estimates
- Can Compensate for Added Retrofit Weight
- American Made with 16ga. 50KSI, G-90 Steel
- Custom Depths for Increased Insulation
- USGBC LEED Point Applicable
- Ideal Platform for Renewable Solar Systems

Roofing Contractor Advantages

- Labor Saving - Minimal Prep Time
- Precision Pre-Punched for Anchoring
- Low Profile - Structurally Correct
- Zee Shape - Best for Screw-down Roofs
- Free Preliminary Design & Estimates
- 2-Day Shipping on In-Stock Components
- Fast Project Completion
- Growing Market Sector

99,000 Square Foot Retrofit over existing Trapezoidal Standing Seam completed in 40 days

Visit our website at: www.RoofHugger.com

ROOF HUGGER - *The Only "Right Way" to Retrofit Your Old Metal Roof*

Roof Huggers make fast work of this 24,000 sq. ft. retro-fit project.

Retrofitting An Old Roof With Roof Huggers Is The Best way to Re-roof.

Why would you Re-roof your Old Metal Roof?

- Plagued with roof leaks
- Old roof has passed its service life
- That sprayed on roof coating "FIX" didn't last
- Add Heat Recovery and Photovoltaic Systems
- Want to increase R-Value to reduce energy expenses
- Old roof has no thermal movement qualities
- Deterioration from surrounding environment
- To comply with current building codes
  - Increase wind speed and uplift
  - Increase snow loading
- Lower your insurance rates
- Want to upgrade to a standing seam metal roof

How ***Not*** To Retrofit an Old Metal Roof

- Steel Hat-Sections Installed on Old Panel Ribs
  - Unstable connection to roof's structural and subject to Wind Uplift failures
- Wood framing over Major Panel Ribs
  - No Thermal Movement capability and typically cannot meet building code requirements
  - Pressure Treated Wood Attacks Steel Panels
- High SSR Clip over existing
  - Typically limited to existing purlin spacing
  - Most clips cannot accommodate taller panel ribs
  - Problems with modularity of new to old roofs
- Coatings are Quick Fixes that Never Permanently Fix the Roof
- **COATING WILL NEVER STRENGTHEN THE ROOF TO MEET STRINGENT NEW CODE REQUIREMENTS**

Hat Channel failure showing substandard re-roofing system.

Wood framed supports add no strength nor support for a new roof.

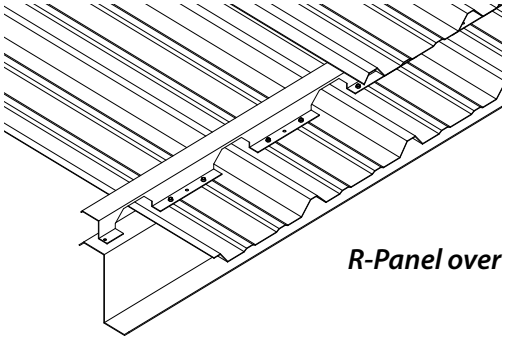
High SSR clips allowed wind to tear this roof apart.

Coatings fail to stop problems permanently.

Roof Hugger Retrofit Solutions

"R" Panel Over "R" Panel

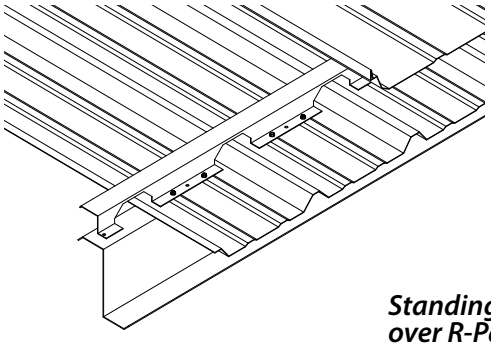
The 12" o.c. ribbed "R" Panel is the most common existing panel on older metal buildings. Roof Hugger mass-produces a part that will fit most but not all existing "R" panel roofs. This part is normally an inventory item ready for immediate shipment.
Thermal efficiency can be increased by ventilating the new cavity. Insulation can also be added. Taller Huggers are custom-produced for increased new insulation depth.



R-Panel over R-Panel

Standing Seam Over "R" Panel

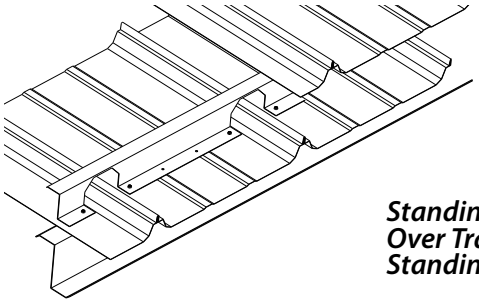
Another typical installation is a new standing seam panel roof installed over an old screw-down roof system. This upgrade eliminates the problems inherent with thru-fastened panels. Leaving the existing roof in place also eliminates the need for major bracing modifications to the existing purlin system to make it suitable for installing a new standing seam roof.



Standing Seam over R-Panel

Standing Seam over Standing Seam

There are two major existing standing seam panel types: vertical rib and trapezoidal rib. Their rib spacing's vary from 12" to 30". Roof Hugger can produce a part to fit any existing standing seam profile to make retrofitting these roofs fast and easy.



Standing Seam Over Trapezoidal Standing Seam

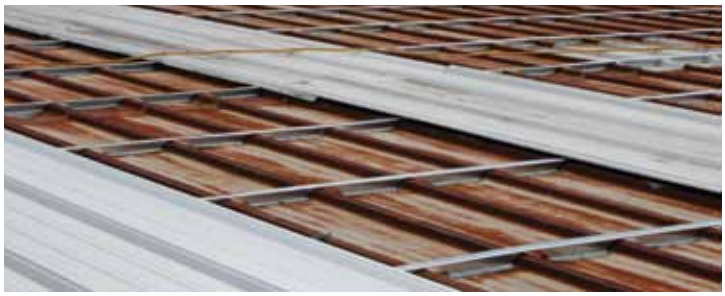
UPGRADING TO A STANDING SEAM ROOF?

Did you know that you cannot remove an existing screwdown roof and install a new standing seam system without installing major purlin bracing?

BUT THERE IS NO PROBLEM... IF YOU HUG IT!

Leave the old screw down roof in place!

Install **ROOF HUGGERS** and get that new standing seam roof you want AND with all of the necessary purlin bracing for NO ADDED COSTS!



Trapezoidal Standing Seam installed over "R" Panel

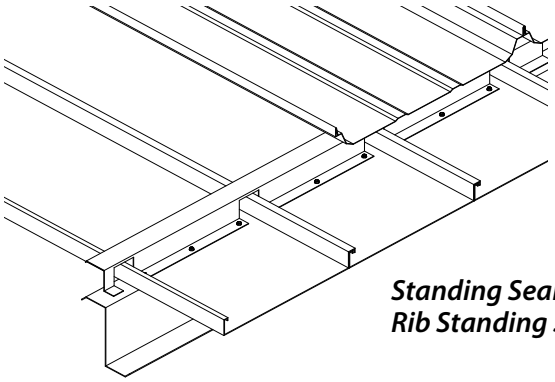
Vertical Rib Standing Seam over "R" Panel vented at the ridge

A trapezoidal standing seam roof being installed over an old trapezoidal standing seam roof with optional insulation.

Vertical rib standing seam roof being installed over an old vertical rib standing seam roof.

Standing Seam Roofs With or Without Thermal Blocks

Roofs with standoff clips and/or thermal blocking require special Huggers and fasteners. Tell Roof Hugger if you have that condition to assure correct design and pricing (see Special Situations on page 8).



Standing Seam Over Vertical Rib Standing Seam

Special Size Roof Huggers Are NEVER A Problem!

Roof Huggers are made from 16 ga., high strength, galvanized steel and produced by automatic computer controlled punching equipment. This allows us to easily control the flange size, opening sizes and spacing.

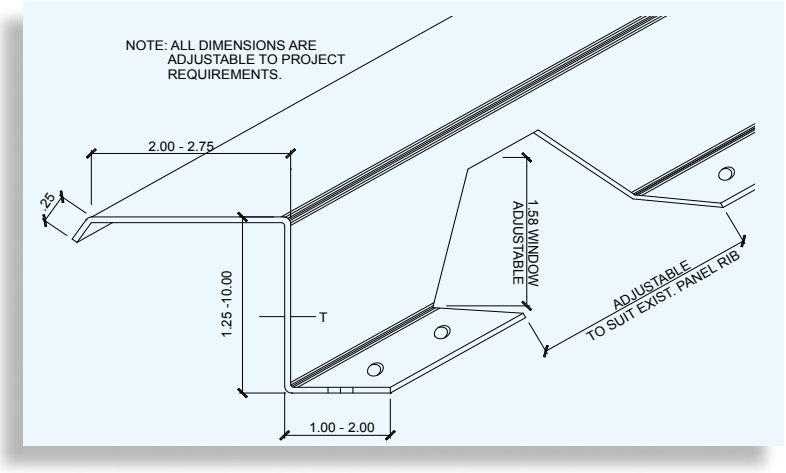
ALL DIMENSIONS CAN BE SPECIFIED INDIVIDUALLY TO SUIT PROJECT NEEDS.

If you have a special condition such as adding a specific depth of rigid or fiberglass insulation; or a larger top flange for a special clip… just let us know, we can produce exactly what you need!

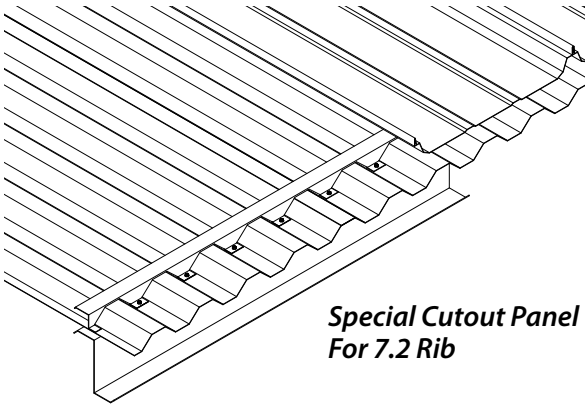
Special Height Roof Hugger

We never had a roof we couldn't fit!

Our Patented Design is Simple, Strong and Effective!



Huggers are typically shipped in 10' to 12' lengths, based on existing panel rib spacing.



Special Cutout Panel For 7.2 Rib

Q. How close are the HUGGERS cut around the existing panel ribs?

A. Typically, the HUGGERS are overcut 3/4" - 1" wider and about 3/8" - 1" taller than the existing ribs to allow for some "run-out" of the existing panel. Many panels however may have less clearance. ROOF HUGGER recommends that you measure the existing panels over a 10' to 20' distance to confirm the actual "In-Place" module of the existng roof panel ribs.

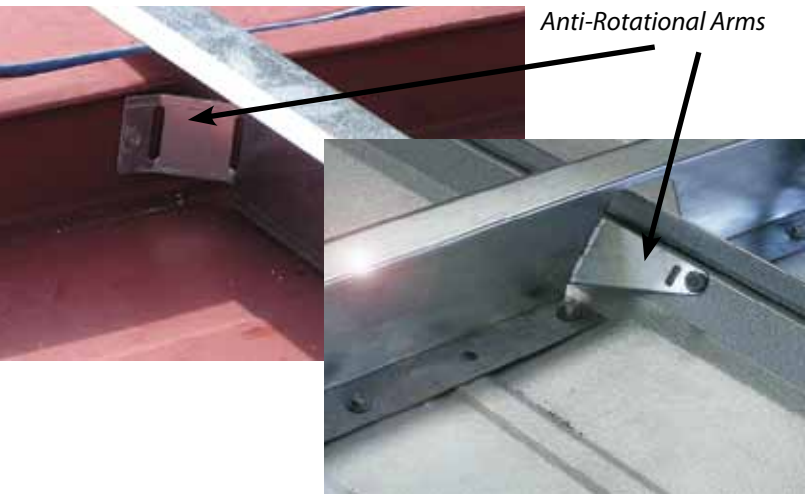
Roof Hugger Solutions For Special Situations

Roof Hugger Now Has A Special Patented System To Retrofit Stand-off Clip Standing Seam Roofs.

These uniquely designed Roof Huggers represent the first and only re-roof sub-framing system specifically engineered to retrofit standing seam roofs originally installed with stand-off attachment clips.

The Huggers employ unique fasteners that hold the part firmly on the pan of the existing panel but above the purlin while providing the needed structural attachment. The special patented "Anti-Rotational Arm" prevents the Huggers from pivoting on these fasteners and rolling up or down slope. The perfect solution to a difficult re-roofing project.

Roof Hugger's Patented Special Anti-Rotational Sub-Framing System

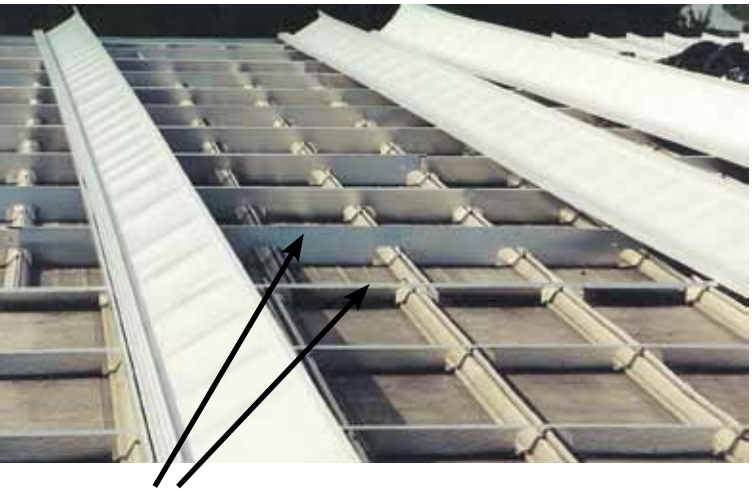


Stand-Off Clip & Thermal Blocking

Typical standoff assembly for trapezoidal standing seam panel.

Removing "Lean-To" Steps Made Easy!

You can use TWO DIFFERENT SIZE Roof Huggers to remove troublesome roof steps created when a "lean-to" was added to an existing building. No more awkward flashings and closures. No more leaks and a beautiful roof, ALL ON ONE PLANE!!



Use 2 sizes of ROOF HUGGERS to remove a step in an old roof.

Fasteners and Attachments

Roof Huggers are typically attached with 2 fasteners per L.F. The fasteners normally used are #12 – 14 threads/inch, drill tip 3, 1-1/2" long. *(Denoted #12-14 x 1-½" Tek-3.)* Existing fasteners are usually not removed even though they may cause some minor distortion of the Roof Hugger base flange.

Exisiting fasteners usually do not have to be removed.

ROOF HUGGER SOLVES THE CORRECT STRUCTURAL CONNECTION AND PANEL MODULARITY PROBLEMS OF CORRUGATED ROOFS WITH CORRU-FIT!

There are countless old roofs out there with 2.5", 2.67", 2.75", 4.25" and even more rib spacing. We know this because Roof Hugger has been manufacturing factory-notched sub-purlins for these problematic roofs for decades.

The problem with these old roofs is that they are notorious for their inconsistent corrugation rib spacing, making it very difficult to install a structurally correct sub-purlin. That is, a sub-purlin that attaches in the low corrugation directly into the existing roof purlins.

Roof Hugger's newest patent-pending **Corru-Fit™ Huggers** are especially suited for existing corrugated roofs. It is the ONLY factory manufactured system available in the market today having passed ASTM E-1592 wind uplift testing.

*The **CORRU-FIT™ HUGGER** is placed into the lowest part of a corrugated panel with spacing as per design specifications.*

A single fastener then attaches a new ZEE purlin and the Corru-Fit Hugger through to the old corrugated roof and into the existing purlin.

After the CORRU-FIT System has been installed, a new roof panel is attached to the new ZEE purlin.

This CORRU-FIT System eliminates all of the problems inherent with installing retro-fit roofs on old corrugated panels.

Features

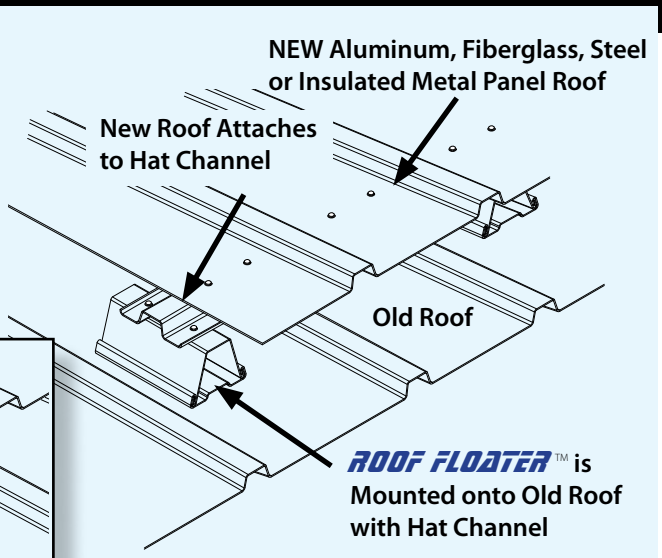
- **Corru-Fit™** spacers are installed at variable spacing to eliminate inconsistent corrugations
- Specifically designed to deal with inconsistent corrugated rib spacing
- Factory templates for confirmation of ribs spacing
- Factory slotted for easy corrugation alignment and fastening
- Fits all corrugations up to 1.25" tall
- Corner and edge reinforcement available
- Suitable for screw-down or standing seam
- Saves removal and disposal of old roofing
- Maintains building diaphragm for easy ugrade to standing seam roofing
- Special self-drilling fastener included with all **Corru-Fit™** orders

Thru-fastened Panel Solution For Long Panel Runs

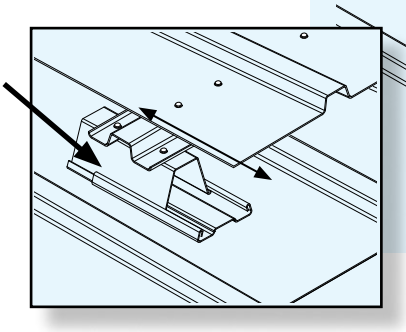
ROOF FLOATER©

Patent# 5,557,903

"EXPAND & CONTRACT" SUB-FRAMING SYSTEMS



ROOF FLOATERS Allow The Hat Channel and New Roof To Slide For Expansion and Contraction



Get Standing Seam Performance From A Through-fastened Roof!

The patented ROOF FLOATER™ Systems were developed to address re-roofing applications when the new roof system has limited or no thermal movement capability OR for those new roofs that have excessive thermal expansion and contraction issues. This specialty retrofit sub-framing system does not replace the use of our standard Roof Huggers but works in very problematic re-roofing applications such as:

- Used for new thru-fastened ribbed panel system roofs, when a standing seam roof is not necessary and/or affordable and the roof panel runs (eave to ridge) are excessive
- For thru-fastened metal roofs being installed over wood or pole framed buildings
- For new Fiberglass Reinforced Panel (FRP) roofs used in new construction in harsh environments or greenhouses
- For new aluminum thru-fastened roof systems needing thermal movement
- For new insulated metal panel system roofs (IMP) being installed over roofs with excessive panel runs

ROOF FLOATER™ System over thru-fastened roof.

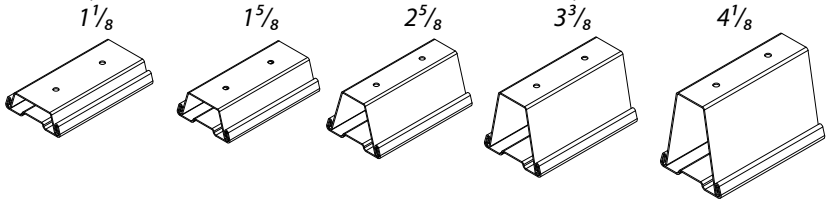
ROOF FLOATER™ System on membrane roof.

Other Advantages

ROOF FLOATER™ Systems can also help satisfy many conditions found in existing roofs. All components are manufactured with the same rigid material specifications as our Roof Hugger sub-purlins; 16- GA x 0.060" minimum 50 KSI structural grade in G-90 galvanized steel. Roof Floaters come in standard heights of 1-1/8", 1-5/8", 2-5/8", 3-3/8", 4-1/8" which allows flexible designs to solve some conditions as follows:

- Correcting a minimal roof step transition between main roof and lean-to's or extension by varying the height of the new sub-purlin
- Installing a new metal roof over an existing sloped roof with conventional roofing (single-ply, modified bitumen, etc.)
- New thru-fastened metal roof installed on Roof Floaters and sub-purlins over existing ribbed metal roof
- Allows thru-fastened panels to be used on structural steel and bar joist framing

Typical shapes to the ROOF FLOATER™ System Components



Visit our website at: www.RoofHugger.com

Insulation

When you install ROOF HUGGERS, the air space between the existing old roof and the bottom side of the new roof is well suited to install insulation for increasing the building's thermal resistance. This is a very effective and inexpensive measure to save those energy dollars. Case studies have shown between 21% to 25% reduction in heating and cooling cost per year. Each case is different and depends on the building's occupancy, inhabitants and locale.

Typically, fiberglass blanket insulation of varying thicknesses is installed but many building owners and design professionals will opt for rigid insulation.

Fiberglass insulation installed between Huggers

Roof Huggers being installed with rigid insulation.

Some Answers to Common Questions

Q. Do you have to remove the existing fasteners?

A. It depends on the panel and existing fastener location, but typically NO. Even if the ROOF HUGGER rests on the screws it will pull down evenly on the old panel. Some bending of the base flange is normal. Any fasteners that cause the Hugger to porpoise up and down or roll out of plane with the old roof should be removed.

Q. What fasteners are typically used?

A. An inexpensive #12 - 14 threads/inch Tek-3 fastener is used. 1-1/4" - 1-1/2" length is common. Two fasteners per linear foot are typical for attachment.

Q. Is condensation an issue?

A. Depending on your building use and climate, condensation can be an issue. Standard trade practice is to ventilate and/or insulate any cavity. Roof Hugger can refer you to moisture control experts if your building has any potential condensation problems.

Q. How tall are the ROOF HUGGERS?

A.Typically 1/4" to 1" above the existing ribs, but you can specify any special height.

Florida Product Approved Systems

Roof Hugger has acquired several Metal-over-Metal assemblies that are ***Florida Product Approved*** for new Screw-down and Standing Seam metal roofs over existing R-Panel. These assemblies are specific to the manufacturer's roof systems that have been tested to achieve the required results for approval. Manufacturers include Architectural Building Components, Inc. (ABC) and Metal Building Components, Inc. (MBCI).

Approvals FL 10141 R-1 and FL 9561 R-1

Product approvals for new 26 Ga. and 24 Ga. R-Panel roofing over existing R-Panel roofs. New roof systems used for testing are the generic "PBR" as manufactured by several manufacturers.

Approvals FL 9352.1 R-2 and FL 9352.2 R-1

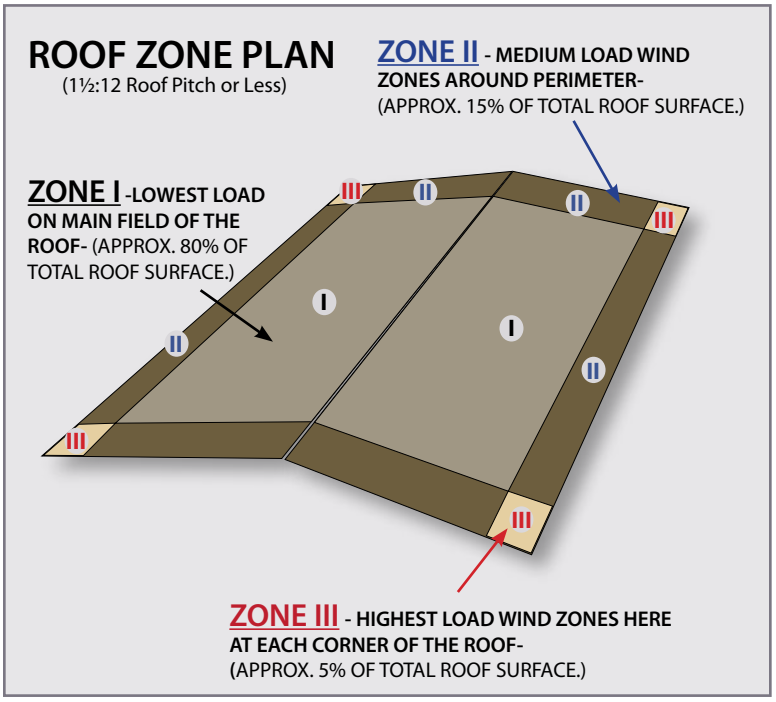
Product approvals for new 24 Ga. 16" and 18" wide vertical rib standing seam roofing over existing R-Panel roofs. New roof systems used for testing are Architectural Building Components' JSM 200 DL and MBCI's SuperLok.

Roof Design Basics / Corner-Edge Strengthening

Regardless of building geometry, all roofs must satisfy two basic design load principals. They are "Wind Loads" and "Gravity Loads". Wind loads are the loads that result from wind or gusts passing over the roof's surface creating a negative pressure (suction) that tries to pull the roof off the structure. Gravity loads are commonly referred to as "Snow" or "Equipment" loads that impose downward pressure on the panels, purlins and frames.

Other re-roofing and roof replacement methods cannot address newly adopted building code requirements without extensive and very expensive remedial work being performed on the existing roof's structural support system.

The Roof Zone Plan illustration (right) explains the various zones in a common gabled roof with each zone requiring a varying degree of uplift pressures to be satisfied. Please note that the zone locations and their dimensions are determined by roof size, shape, slope, height and code required design wind speed.



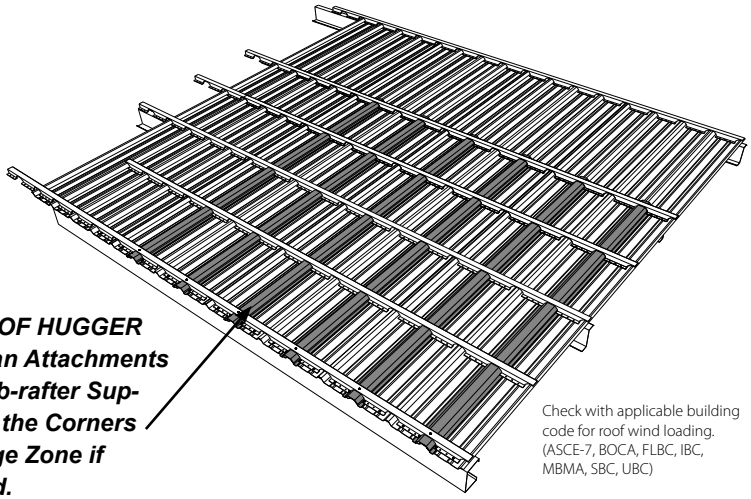
Roof Huggers Help Satisfy Wind Uplift

Older building codes looked at roofs as being uniformly loaded in all areas with no consideration for corners and edges. Since the loads were applied on a uniform basis, the purlin spacing was typically the same throughout the building. Thus for several decades most existing metal buildings were designed using a 5'-0" o.c. purlin spacing.

Today's current building code requirements divide the roof into zones as shown above and apply specific design loads to each zone. The edge and corner load pressure requirements are now higher, meaning the new roof panels must be stronger or the purlin spacing must be reduced to meet these design loads.

Roof Hugger can provide a Preliminary Design Pressure Analysis, if requested. The preliminary analysis can then be cross-checked against any new roof panel's capacity to determine if additional reinforcement is needed. (There is no charge for the preliminary analysis, however it is subject to a fee based final 3rd party engineering review if certification is required.) When reinforcement is needed, Roof Hugger has two basic systems to address this condition. We refer to them as "Integral Hugger Framing" and "Hat Grid Framing"

The need for reinforcement is determined by the loads in each zone as compared to the new metal roof panel's tested strength. If the loads exceed the tested strength of the panel, then the purlin spacing must be reduced to provide more frequent panel or clip attachment. Roof Hugger can help guide you in the correct selection of reinforcement for your specific project and specific new roof panel.



Use ROOF HUGGER Mid-Span Attachments with Sub-rafter Support for the Corners and Edge Zone if required.

Check with applicable building code for roof wind loading. (ASCE-7, BOCA, FLBC, IBC, MBMA, SBC, UBC)

Integral Hugger Framing

This framing system is unique where it includes a structural sub-rafter that fits tightly under the Roof Hugger. Its purpose is to span from purlin to purlin and to provide support of the Roof Huggers that are located between existing purlins. This exclusive framing method is typically used only on projects that the new metal roof system has been laboratory tested over the integral Hugger framing system.

Contact us to obtain a list of the applicable metal roof systems that have been tested with Roof Hugger systems. The real benefit of this framing method is standard height Roof Huggers are used, maintaining an economical, "low-profile" sub-framing system throughout the roof.

Hat Grid Framing

This framing method is used on projects where the new metal roof system has not been tested over a Roof Hugger sub-framing system. The system includes hat-shaped purlins spaced as required by the new metal roof to meet the uplift pressures in the corners and/or edge zones. The hat purlins are then supported by a special sub-rafter member that is manufactured to fit over or between the existing roof's major ribs. Special height Roof Huggers are then provided for the balance of the roof.

Q: What if the particular assembly I wish to use does not have a Florida Product Approval, can I still use Huggers and my panels in Florida or other high wind areas?

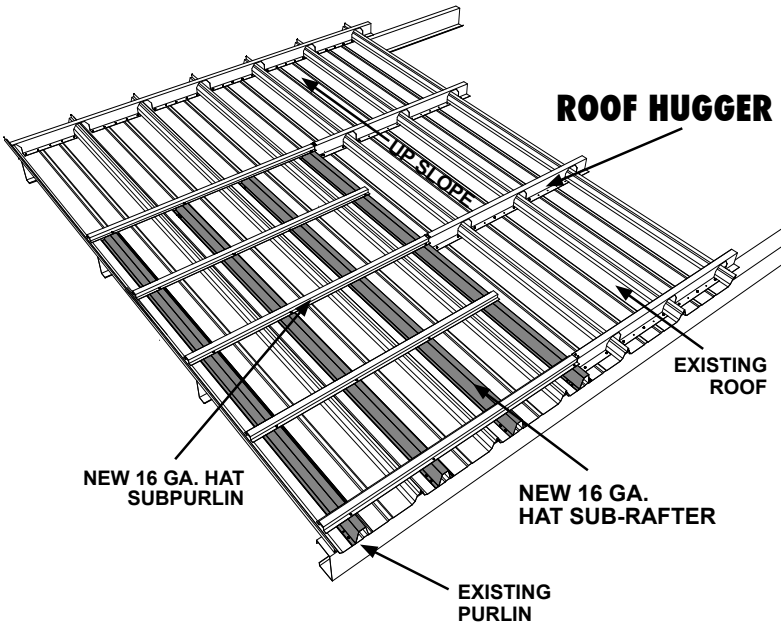
A: Yes, Roof Huggers can be designed and engineered to meet the wind loads in your area. The system may resemble our product approved systems or it may be a combination of grids and Huggers as needed. (Refer to page 11 for Florida Product Approved Systems.)

Roof Huggers Help Satisfy Gravity Loads

Every retrofit adds additional weight to the existing metal building. The typical retrofit only adds about 2 pounds per square foot of roof area. Normally this is of no concern, however there can be situations where, the snow load codes have changed, additional internal or external equipment have been added to the building that were not part of the original design, making any increase worthy of review.

Roof Huggers unique design cannot only assist with this problem but actually improves the existing buildings' purlin strength beyond the additional loads imposed. When attached per the adjacent detail, in their lowest profile with only ¼" of material above the Hugger's panel rib cutout, the Roof Hugger sub-purlins can add 85% to existing purlin uplift capacity and 42% to their gravity capacity. A 42% increase on a 20 psf building is an additional 8 psf of capacity!* This is all accomplished with the simple addition of 4 pancake head fasteners at each Hugger lap or about every 10'-0".

**Assumes 16 ga. 8" deep existing purlins, 25' bay spacing, main frame capacity is not part of analysis.*

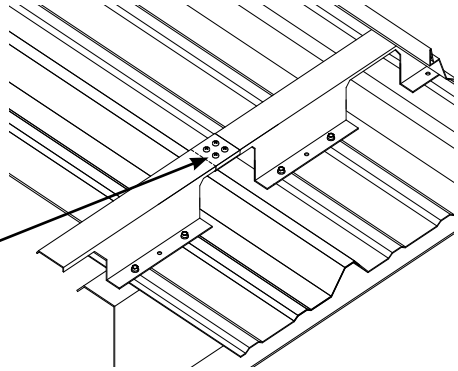


STRENGTH INCREASE WITH ROOF HUGGERS			
PURLIN SIZE	MAX SPAN	UPLIFT	GRAVITY
8" x16 Ga.	25 FT	**85%**	**42%**
8" x14 Ga.	25 FT	**50%**	**37%**
8" x12 Ga.	25 FT	**0.2%**	**25%**

This chart indicates the results of our Certified AISI Gravity and Uplift Load Test from September, 2008. These results show the increased strength in load values when the Roof Hugger Retro-fit System was used.

The 16-gauge Roof Huggers on 16-gauge purlins resulted in a significant increase in strength!

NOTES:
1) ALL ROOF ASSEMBLIES WERE TESTED WITH LGSI STANDARD PURLINS WITH 26-GAUGE "PBR" ROOF PANELS ATTACHED TO TOP FLANGE OF ROOF HUGGER
2) ALL ROOF ASSEMBLIES WERE TESTED WITH THE BOTTOM FLANGES OF THE PURLINS COMPLETELY UNBRACED AND SPANNING 25'-0"
3) ALL ROOF HUGGERS TESTED WERE STANDARD MODEL "C" 1.83" TALL X 16-GAUGE NOTCHED ZEE NESTED OVER "PBR" PANEL
4) ALL TESTS WERE CONDUCTED IN COMPLIANCE WITH AISI TS-8-02 BASE TEST METHOD FOR PURLINS SUPPORTING A STANDING SEAM ROOF SYSTEM



This drawing shows how the Roof Hugger assembly is secured with our unique fastener system which strengthens the existing purlins.

Let Roof Hugger Turn Your Re-Roofing Expense Into An Investment

ROOF HUGGER nested sub-purlins create an air-space between the old and new metal roofs.

This space can be used to employ some very simple and inexpensive technology that will improve your building's energy efficiency and produce operating cost savings. Add insulation (as explained on page 11) or convective ventilation to help your roof reduce heat gain in the summer months as well as heat loss in winter. These effective systems are ideal for all climates regardless where your building is located.

In addition, if you wish to reap the benefits of current IRS tax incentives, you can install renewable solar thermal and power systems that begin paying you back immediately after the re-roofing project is completed.

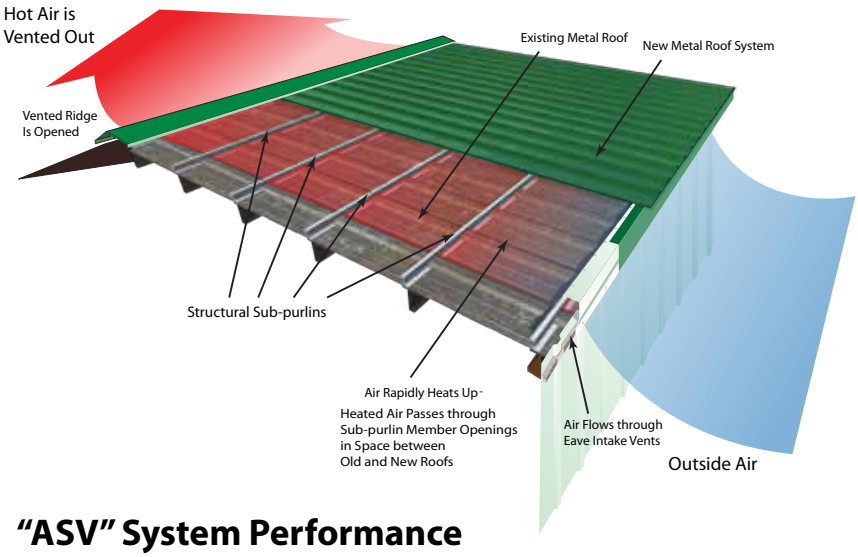
ROOF HUGGER®

ECO-Fit™

Above Sheathing Ventilation (ASV)

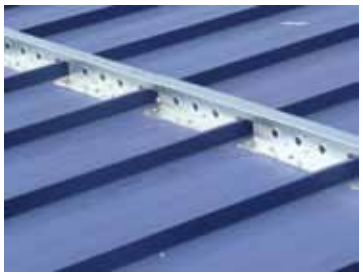
How Do "ASV" System Dynamics Work?

Fresh air is introduced to the cavity between the old and new roofs through ventilation at the low-eave of the building. When the sun heats the new metal roof, the cavity air becomes less dense. Because of this, the air becomes more buoyant and therefore begins to move upslope at the immediate underside of the new metal roof. The air is then exhausted at the high point of the roof (ridge, etc.) through convection. The end result is the system creates an insulating barrier of air between the two roofs. Many ventilation products are available that accommodate these applications and the system has the natural ability to dissipate any moisture caused by condensation as well as aiding in the elimination of mold growth.



"ASV" System Performance

The "ASV" system has been tested under real-world conditions at Oak Ridge National Laboratories, just outside Knoxville, Tennessee. Results indicate that the system reduces the heat radiation through the roof assembly a minimum of 30% and as much as 45% when a new roof is painted with a "Cool" rated coating. In addition, this cavity air represents an R-Value of 0.85 per 1" of depth, thus increasing the overall roof assembly's thermal resistance. Depending on the profile of the existing roof, most cavities are no more than two-inches deep. To increase the energy efficiency even more, rigid or fiberglass insulation can be added to the cavity, but it is important to note that a minimum of 1" must be provided above the insulation to allow for adequate airflow. In some cases, a simple radiant barrier can be installed atop the existing roof to increase the assembly's energy efficiency.



Tax Benefits For "ASV" And Insulated Applications

Under Section 179D of the U.S. Tax Code, commercial buildings that improve their energy efficiency are eligible for tax deductions. For "ASV" and Insulated systems, the benefits are extended through the end of 2013 as a result of the Economic Stabilization Act of 2008. For buildings that reduce energy consumption a minimum of 16 $^{2}/_{3}$% and not more than 50%, a tax deduction of 60 cents per square foot of building floor area with a maximum of $1500 is available. Ask your Tax Professional for more details.

ROOF HUGGER®

JOB INFORMATION FORM

REQUIRED FOR QUOTES AND ORDERING

More Questions?
Call TOLL FREE 800-771-1711
or fax TOLL FREE 877-202-2254
www.RoofHugger.com

Buyer: _____

Contact: _____

Address: _____

City/State/Zip: _____

Ship To: _____

C/O: _____

Address: _____

City/State/Zip: _____

Project Name: _____

Bldg. Owner: _____

Address: _____

City/State/Zip: _____

Telephone: _____

Delivery Contact: _____

Telephone: _____

Required Delivery Date: _____

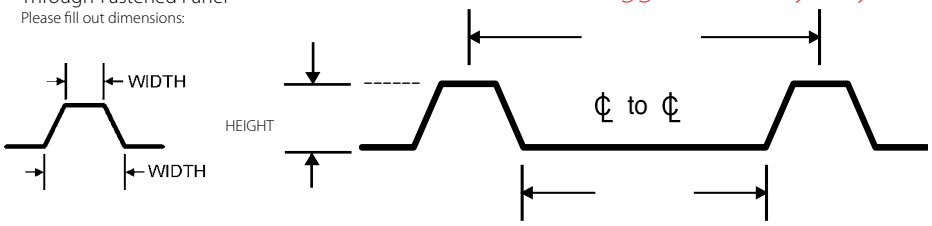
Quant.(L/F): _____ Gauge: _____

Area Wind Load Code: _____ mph

FILL IN CRITICAL DIMENSIONS BELOW: Sketch Your Existing Panel.

ESSENTIAL Dimensions we must have to quote and/or fabricate Roof Huggers correctly for you!

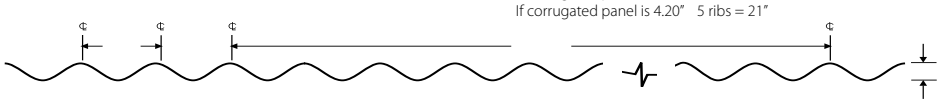
Through-Fastened Panel
Please fill out dimensions:



Please fill out dimensions of your particular roof shape:

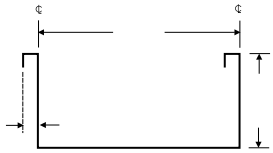
Corrugated Panels

If corrugated panel is 2.67" 9 ribs = 24"
If corrugated panel is 2.50" 8 ribs = 20"
If corrugated panel is 2.75" 8 ribs = 22"
If corrugated panel is 4.20" 5 ribs = 21"

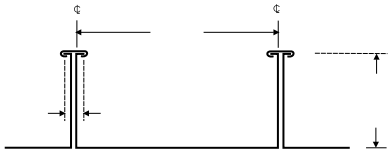


Trapizodial Standing Seam *
Please fill out dimensions:

Vertical Standing Seam *



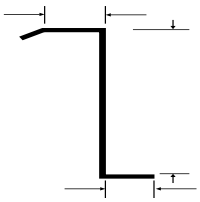
"T" Rib *



* Does existing roof have thermal blocks? YES ☐ NO ☐

ROOF HUGGERS ARE NORMALLY 3/8" - 1/2" TALLER THAN THE EXISTING RIBS.

SPECIAL SIZES ARE AVAILABLE.



NEED SPECIAL ROOF HUGGER HEIGHT?

NEED SPECIAL FLANGE SIZES?

Sketch any special panel configurations:
If profile is different than above, please sketch below...

Contractor should verify the existing panel module is maintained over several 20' areas of existing roof. Panel run-out may require adjustments to Hugger punching. This should be known in advance for both of us doing a perfect job!

I hereby certify that the above dimensions are correct.

Your Name (Please Print): _____ Date: _____

Signature: _____ Title: _____

Benefits of Using Roof Hugger

* OLD ROOF STAYS IN PLACE
* NO DISRUPTION TO BUILDING OPERATIONS
* WORKS WITH ANY NEW METAL ROOF
* FITS NEARLY ALL EXISTING METAL ROOFS
* FULLY-ENGINEERED SYSTEM TO MEET CODE
* STRENGTHENS EXISTING PURLINS
* COMPENSATES FOR ADDED WEIGHT
* DECREASES ENERGY COSTS
* LEED POINT QUALIFIED
* ONLINE ACAD DETAILS & SPECS
* LOAD & BUDGET ESTIMATES

Call and let us show you the re-roofing solution for your building.

800-771-1711 Or fax us at: 877-202-2254 www.roofhugger.com

ROOF HUGGER®

Proudly Made in the U.S.A.

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Fax: 877-202-2254

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