

# Welcome



# Firestone Building Products

- Founded in 1982
- Leader in low-sloped commercial products
  - EPDM, Asphalt & TPO membranes
  - Polyisocyanurate & other insulations
  - Fasteners
  - Accessories
  - 2 billion Square feet roofing annual sales
  - 50 billion Sq. Ft. under warranty currently
- 1 in 4 Low-sloped roofs has Firestone products on it.
- Acquired Copper Sales, UNA-CLAD, spring 2005

# Metal Roof Basics

- Roof types
- Base metal types
- Panel Coatings

# Metal Roof Systems

- Through Fastened
- Architectural Panel Systems
  - Flat-Lock clip systems
  - Standing Seam - water shedding
- Structural Panel Systems
  - Double-lock, Trapezoid, Insulated structural



Through Fastened Roof System













May need to practice before  
attempting one of these!!!

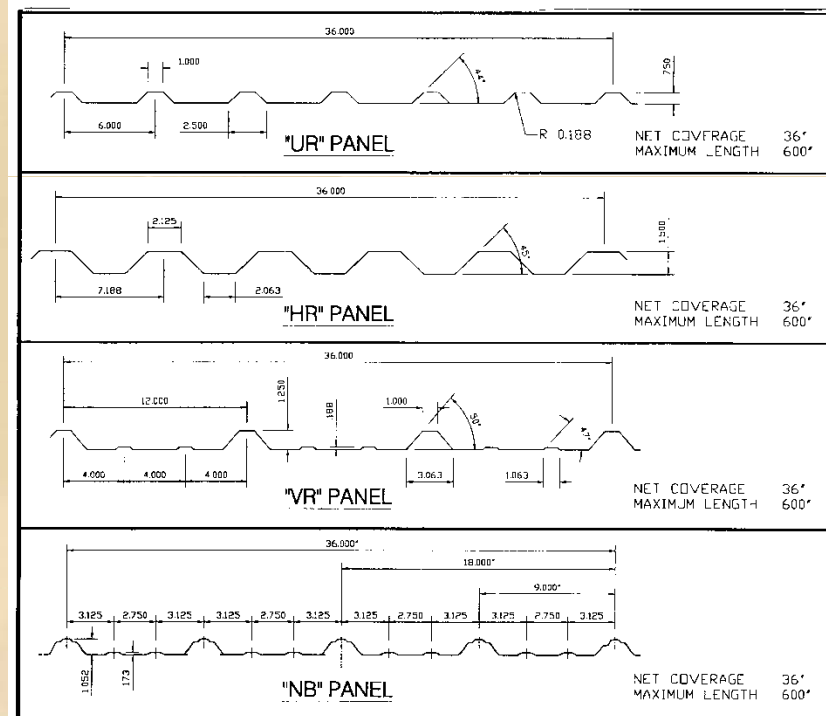


Never underestimate the  
usefulness of Metal Roofing!!!



# Through Fastened Roof System

- Simple Installations
- Corrugated Panel
- Fast installation
- Exposed Fasteners
- Omega series offered by Firestone



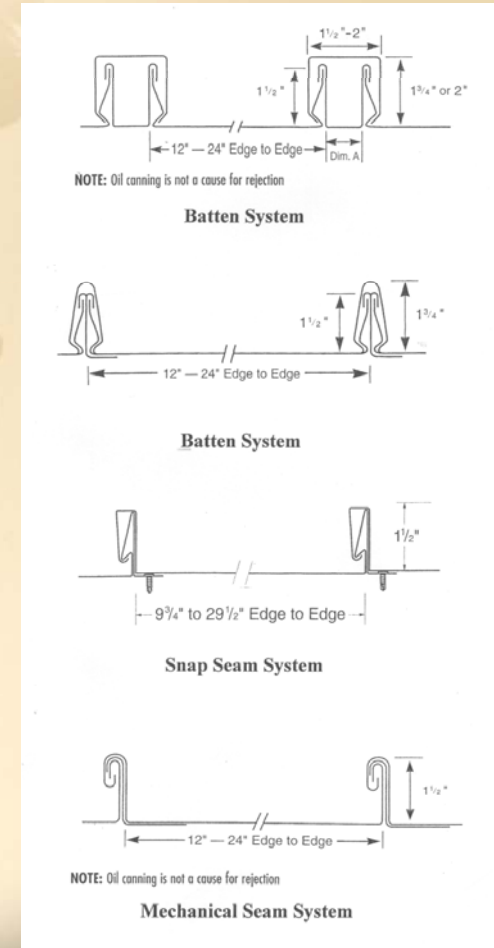


# Architectural Roof Systems

- Hydrokinetic (water shedding)
- Steep Roof Slope (minimum 3"/12")
- Requires Substrate (non-load bearing)
- Concealed Panel Clips Provide Attachment
- Minimum Exposed Fasteners
- Additional Waterproofing Required

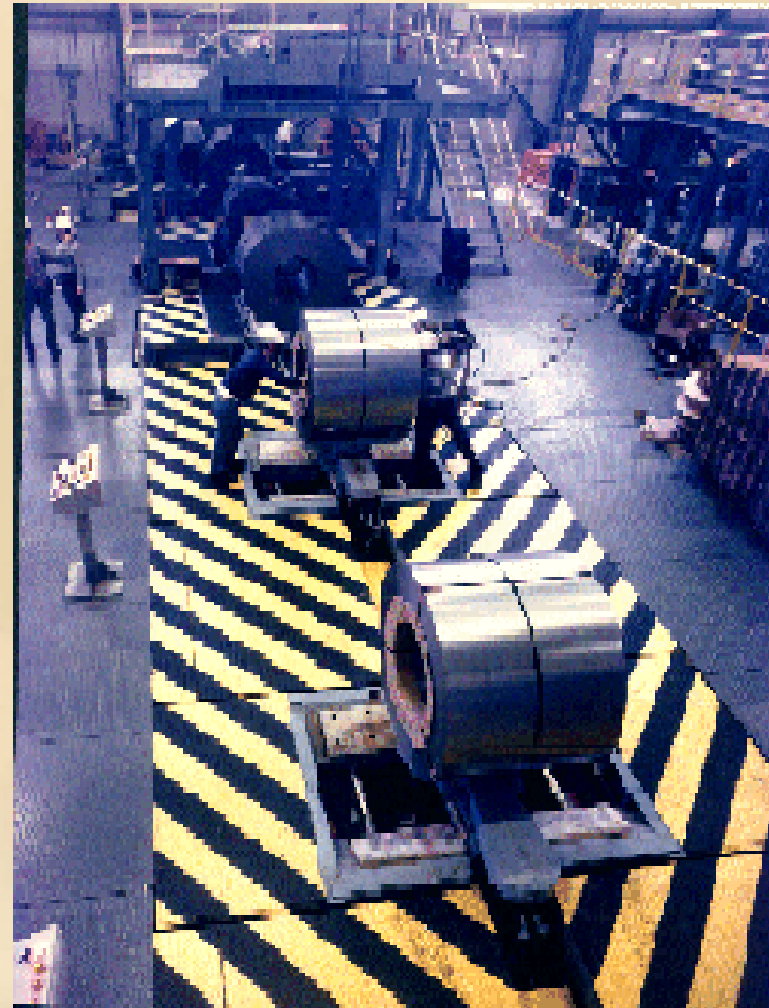
# Architectural Panel Systems

- Flat-Lock Systems:
  - Independent Panel Clips
- Standing Seam Systems:
  - Independent Panel Caps
  - Can Be Radiused
- Integral Seam Systems:
  - Simple Installation
  - No Seamer Required
- Mechanical Seam:
  - Single & Double Fold Seams
  - Requires Mechanical Seamer
  - Can Be Radiused



# Base Metal for Roof Panels

- Copper
- RHEINZINK
- Aluminum
- Stainless Steel
- Steel
- Acrylume





# Base Metal for Roof Panels

## ● Copper

- Old world charm and durability
- Low maintenance
- Water shedding/non-structural applications
- Ideal for coastal environment

## ● Aluminum

- Water shedding/non-structural applications
- Anodic or Kynar coatings required for aesthetics & durability
- Superior for coastal environment

# Base Metal for Roof Panels

- Stainless Steel

- Very durable
- Optional coating for aesthetics (Terne, Lead coat)
- Limited roofing manufacturers, cost prohibitive for use as a roofing material.

- Steel

- Most common material used for architectural and structural systems
- Offered in variety of coatings
- Panel durability is dependent on substrate used

# Copper – The “Original” Metal





# Copper

- The oldest metal of the metals that is still used today.
- Very easy to work with (with proper tools).
- The best life cycle value.
- Easily recycled.
- A commodity that is traded on the exchange everyday.
- Can be 3-4 times as expensive as coated steel/alum.

# Aluminum

- Light weight and non-ferrous are the strengths.
- Great life cycle costs
- Flatness is the best of all the coatable substrates.
- Global presence & availability
- Great for Salt regions



# Stainless Steel

- Not used a lot in roofing.
- Used in column covers, wall panels, custom projects, decorative, food service areas.
- The two most common are Type 304 and Type 316. The latter has a higher nickel content and thus is the most resistant to rusting.
- There are four predominant (mechanical) finishes.
  - #8 Mirror finish
  - #6 In line brushed finish
  - #4 Standard brush finish
  - 2B standard mill finish





# Stainless Steel

This is a good example of designing a truly finished appearance.

The stainless column covers are #8 mirror finish.

# Steel

- The most popular material used for roofing.
  - It is cost efficient.
  - Easy to work with.
  - A strong performer.
- Galvanized steel and Galvalume are the leaders.



# Substrate Coatings

## ● Metallic Coatings

- Galvanized

Zinc protective coating over base steel  
( G-40, G-60, G-90 )

- Galvalume

Aluminum/zinc protective coating over base steel ( AZ-50, AZ-55 )

- Acrylume

Clear acrylic coating for unpainted substrate

Note: Both are trademark names...



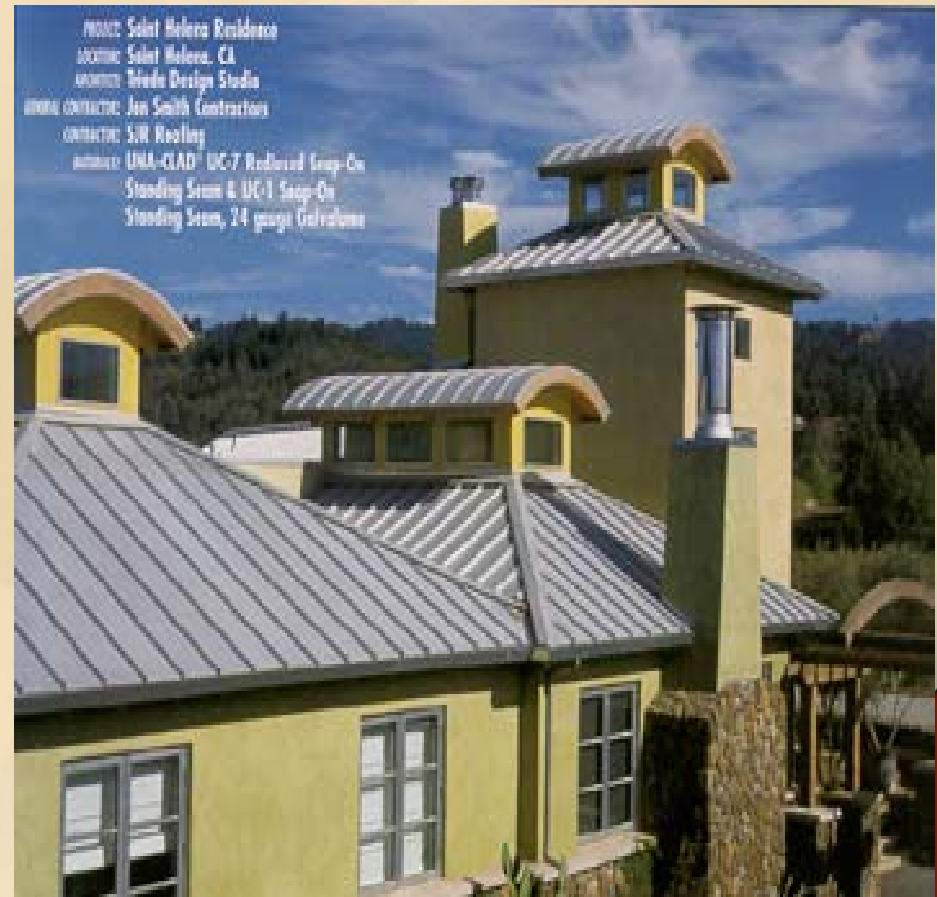
# Galvanized Steel

- Steel strip is hot-dipped in a continuous line.
  - The thickness of the zinc coating ...
    - **G90 - .90 ounces per square foot**
      - 48" x 120" sheet = 2.25 lbs of coating wt.
    - **G60 - .60 ounces per square foot**
      - 48" x 120" sheet = 1.5 lbs. of coating wt.
    - **G40 - .40 ounces per square foot**
      - 48" x 120" sheet = 1 lbs. of coating wt.



# Galvalume

- Galvalume sheet steel is an 55% aluminum-43.4% zinc alloy coated sheet steel product that is ideally suited for most types of roofing applications.
- Pictured is an application of Acrylume which is acrylic coated Galvalume.



# Galvalume

Steel strip that is hot-dipped in a continuous line.

- The thickness of the zinc coating ...
  - AZ55 - .55 ounces per square foot
    - 48" x 120" sheet = 1.375 lbs. of coating wt.
  - AZ50 - .50 ounces per square foot
    - 48" x 120" sheet = 1.25 lbs. of coating wt.

# Who's Best?

## ● Galvalume versus Galvanized

- Application many times drives the decision
  - E.g. You can not use Galvalume around animal confinement.
  - Both are the wrong selection for true performance in a salt water environment. The correct substrate for a salt water environment is aluminum.
- In reality both galvanized and galvalume are long lasting products and a good selection for an exterior of a project in most conditions. (Salt water being the exclusion for both.)

# Acrylume

- For unpainted applications, bare Acrylume is recommended.
- It has a clear “Acrylic” resin coating applied to both sides of the steel sheet.
- Can be roll-formed without lubricants.
- The clear coating prevents blackening from finger prints and oil spots.
- The clear coating will dissipate and allow the Acrylume to age to a soft gray uniform appearance.



# RheinZink

- We have developed a relationship with RheinZink, the market and industry leader.
  - A German mill that is known for producing the best zinc product world wide.
  - A European leader that selected UNA-CLAD to bring their product to market in the United States and some parts of Canada.
  - Firestone is RheinZink's largest distributor.
  - U.S. Warehouse opened about a year ago in the Boston area.

# Rheinzink





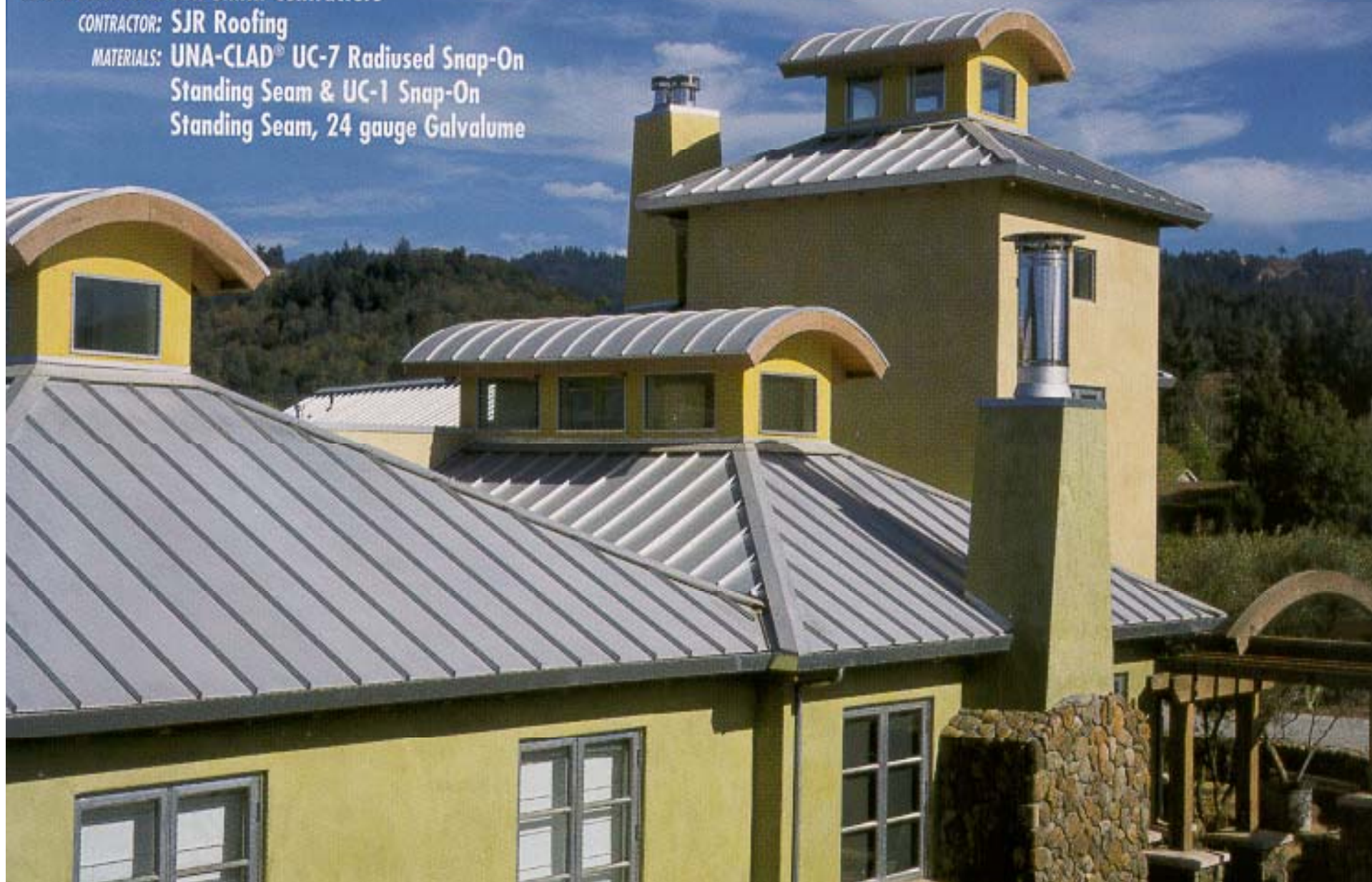








**PROJECT:** Saint Helena Residence  
**LOCATION:** Saint Helena, CA  
**ARCHITECT:** Triade Design Studio  
**GENERAL CONTRACTOR:** Jon Smith Contractors  
**CONTRACTOR:** SJR Roofing  
**MATERIALS:** UNA-CLAD® UC-7 Radiused Snap-On  
Standing Seam & UC-1 Snap-On  
Standing Seam, 24 gauge Galvalume









# Two Primary Alloys

- 3000 Series – Used for painted coatings

Are alloyed with *manganese*, and can be work-hardened

- 5000 Series – Used for anodized finishes.

Are alloyed with *magnesium*, derive most of their strength from work hardening. However is susceptible to corrosion above 60°C, 140°F.

# Why Do We Paint?

- Provide protection
- Add aesthetic appeal
- Promote corporate brand and increase recognition
- Decrease energy costs





# ***From Coil to Building***



# ***End Uses***

- Wall panels
- Roofing panels
- Component parts
- Pre-engineered buildings
- Agricultural buildings



# Fluoropolymers (Teflon)

- A **fluoropolymer** is a fluorocarbon based polymer with multiple strong carbon–fluorine bonds. It is characterized by a high resistance to solvents, acids, and bases.
- Excellent resistance to chalk and fade
- Excellent chemical resistance
- Excellent post-formability
- Excellent gloss retention
- Excellent humidity resistance
- Wide range of colors available

# Conclusion

- Paint is comprised of pigments, resins, solvents, and additives.
- The quality of the paint ingredients and chemical technology are key to product performance.
- The best choice of paint coating depends upon a variety of factors including end use, color and gloss desired, budget, product life-cycle, and environment.



# The Valspar Corporation

- Founded in 1806
- Celebrating 200 years
- Headquartered in Minneapolis, MN
- World's largest non-automotive coatings company
  - 6th in world
  - 3rd in USA



Corporate Headquarters





# UNDERLAYMENTS

- Self-adhered membrane
- ASTM D 1970 for nail sealability.
- May be left exposed for 60 days or more.
- Minimum high temperature resistance of 230° F.
- Contact FSBP Roof Solutions for Approved Alternates (manufacturers)



# Underlayments

- Felt/Rosin Paper (non-warranted systems)
- Non-Asphaltic Membranes (MA-mechanically attached)
- Self Adhering Membranes (SA-Peel & Stick)
- Ventilation Mats (Required for Rheinzink)



# **CLAD-GARD** underlayments

- Firestone is proud to present two new underlayments:
  - **CLAD-GARD SA** – a modified SBS self adhering underlayment with a non-skid woven top film
  - **CLAD-GARD MA** – an inorganic coated woven underlayment that is mechanically-attached with cap nails

# CLAD-GARD SA underlayment

## ● Features:

- Woven non-slip top surface
- Non-reinforced modified SBS
- High-temp resistant
- UV resistant
- Silicon-coated split-release film
- Light-colored reflective surface



# CLAD-GARD MA

## underlayment

### ● Features:

- Woven top surface is textured and has a rubberized coating
- High-temp resistance to 230° F
- UV resistant
- Light-colored reflective surface
- Light weight
- 48" wide x 250' roll size (10 sq. gross coverage)
- Warranted for slopes 5/12 (+)



# **CLAD-GARD R**

## **Underlayment**

### ● Features:

- Styrene-Butadiene-Styrene (SBS) rubber modified
- Self-adhesive membrane.
- Reinforced with a non-woven fiberglass mat.
- Textured, slip-resistant traction film on the top surface and a silicone-treated.
- Split-back opaque release film on the bottom surface.





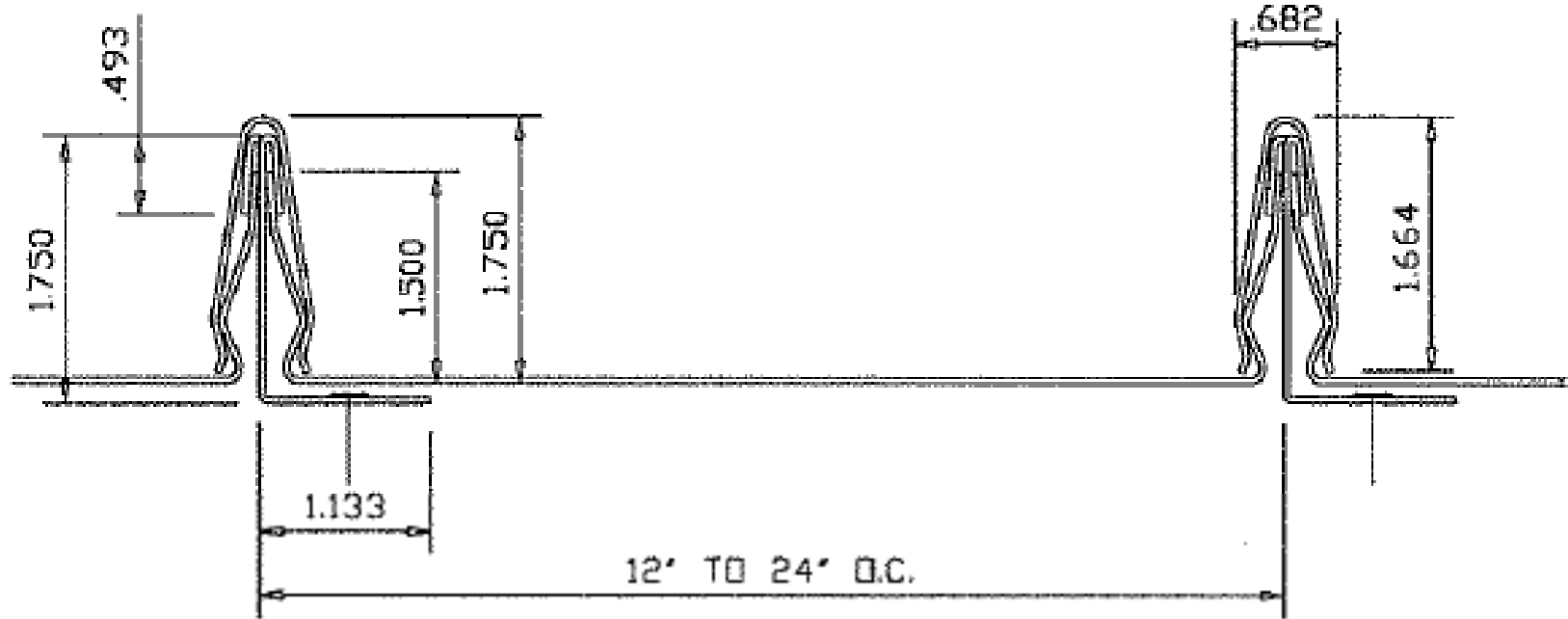
# **UNA-CLAD Metal Panels**

# RED SHIELD WARRANTED SYSTEMS

- UC-3 Double Lock
- UC-4 Nail Strip, 40 ft max, Unidirectional
- UC-6 Tall UC-3
- UC-14 Snap Lock w/clip

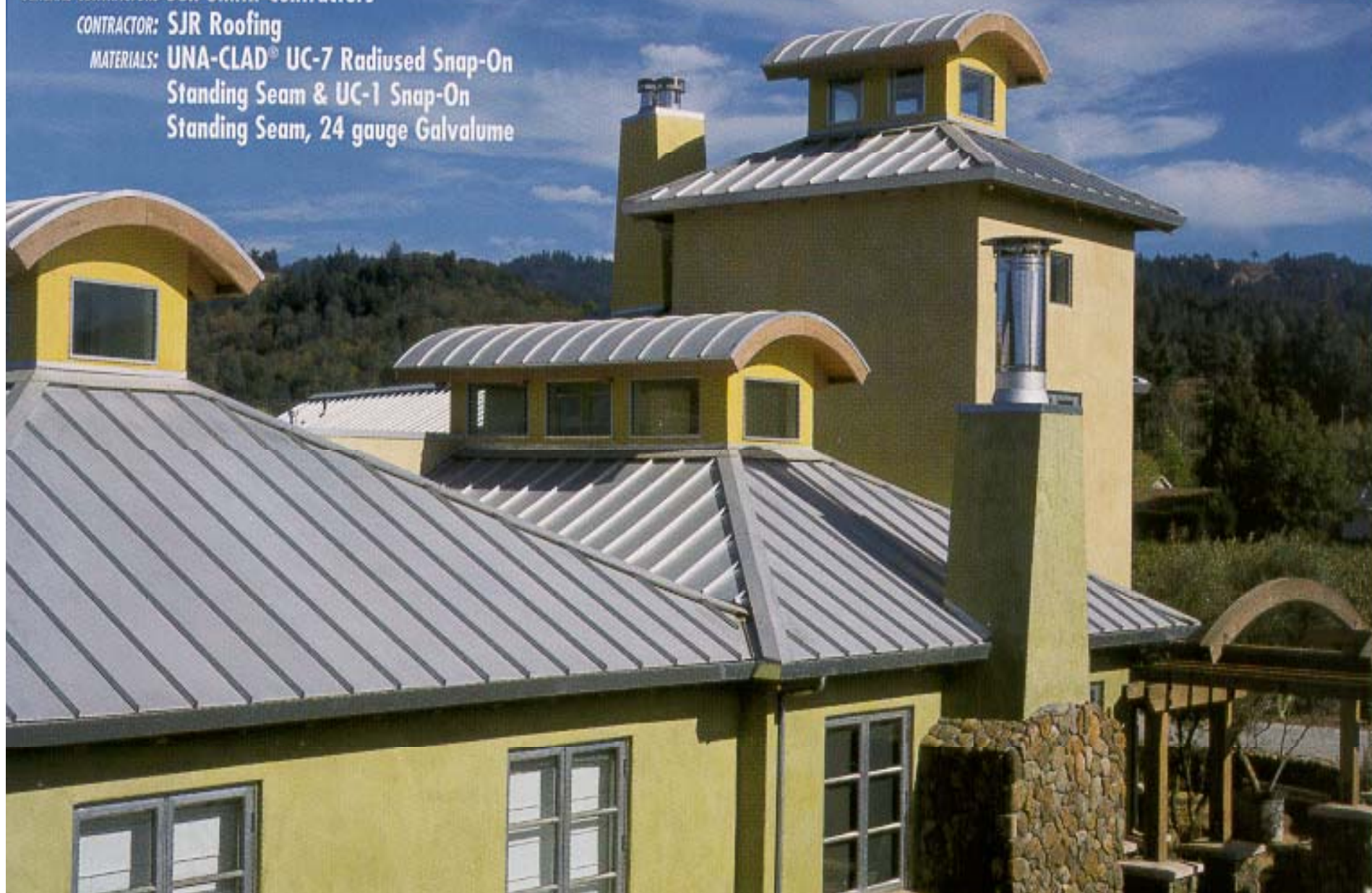
# UC-1

## Snap-On Standing Seam



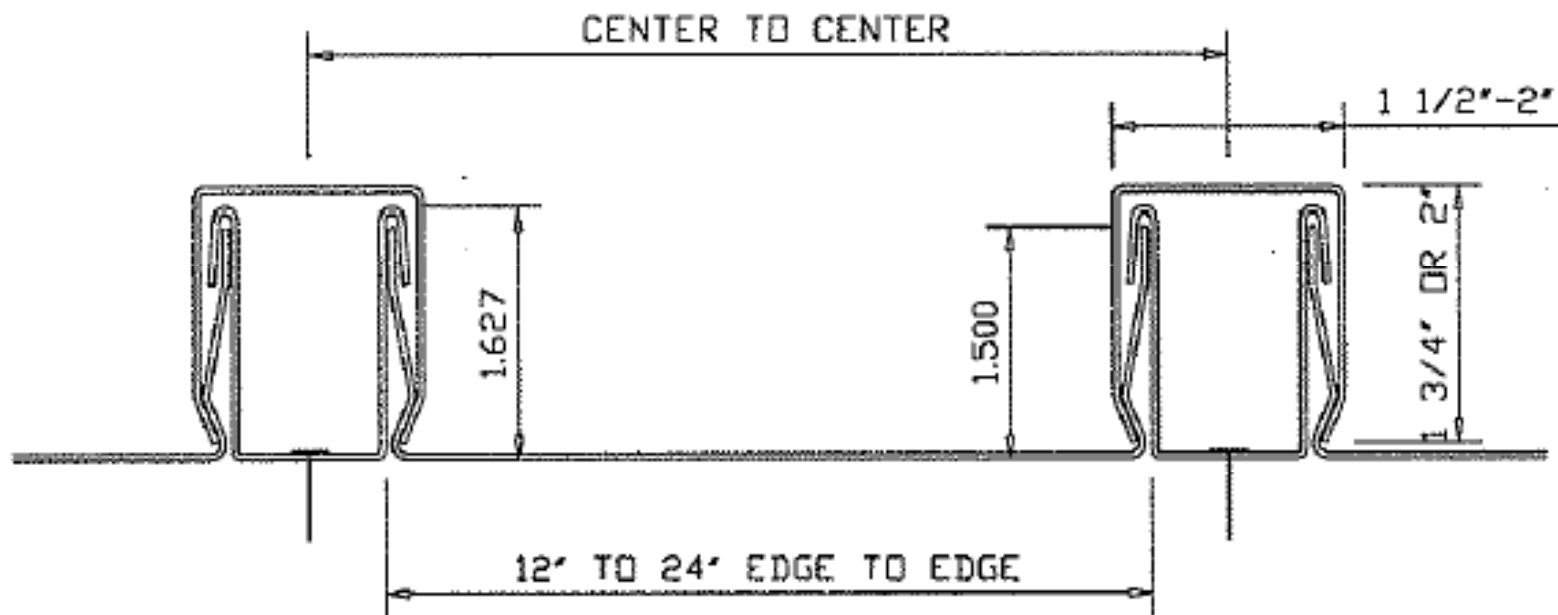


PROJECT: Saint Helena Residence  
LOCATION: Saint Helena, CA  
ARCHITECT: Triade Design Studio  
GENERAL CONTRACTOR: Jon Smith Contractors  
CONTRACTOR: SJR Roofing  
MATERIALS: UNA-CLAD® UC-7 Radiused Snap-On  
Standing Seam & UC-1 Snap-On  
Standing Seam, 24 gauge Galvalume



# UC-2

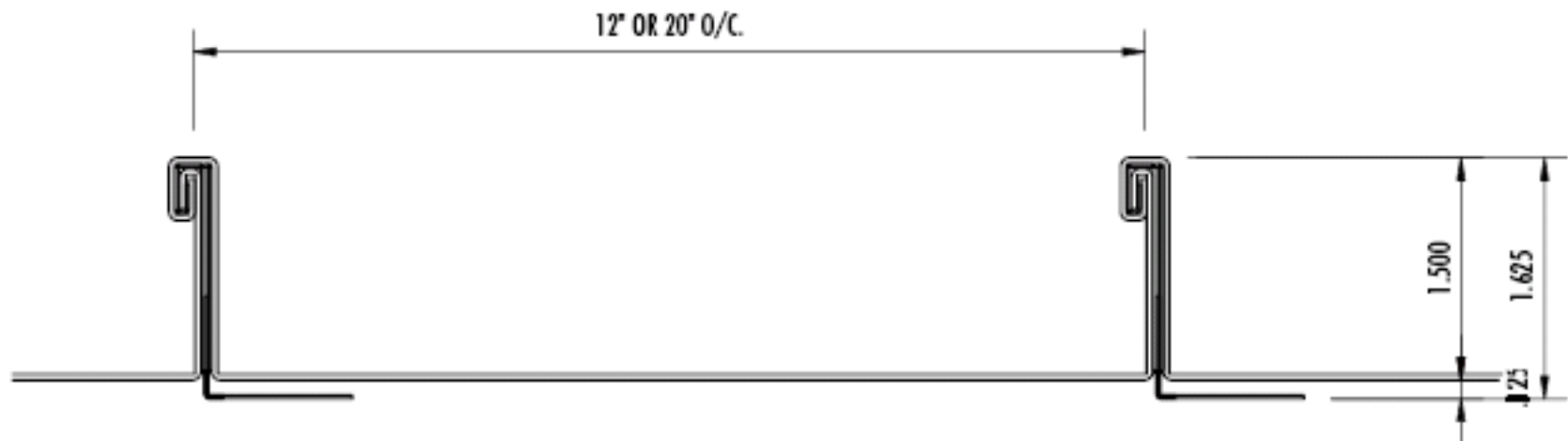
## Snap-on Batten Seam



UL-580 Class 90

# UC-3

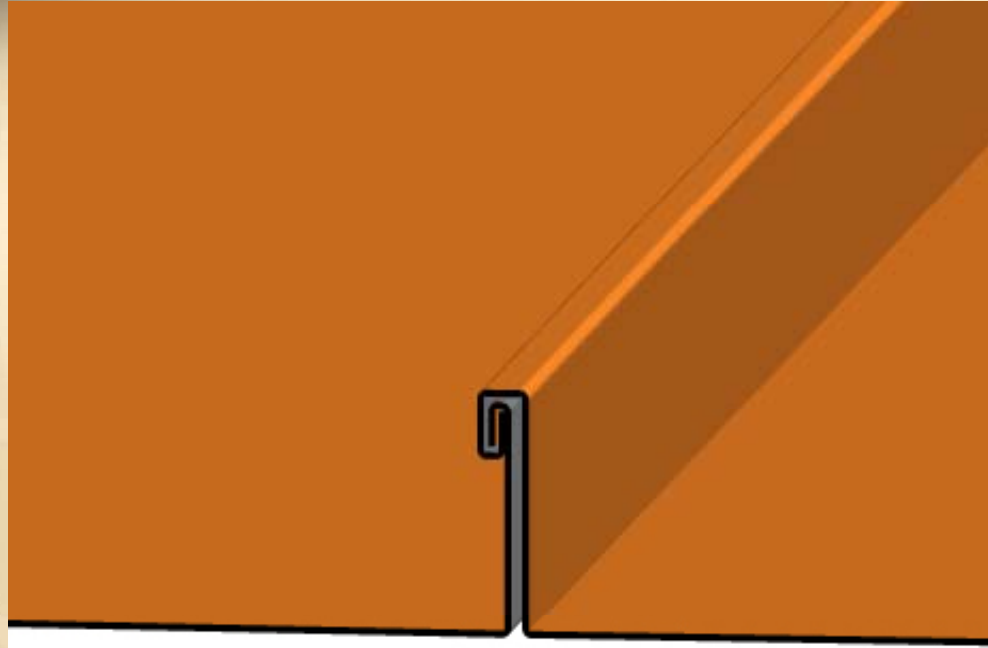
## Double Lock Standing Seam



UL-580 Class 90

Metro Dade County Approved



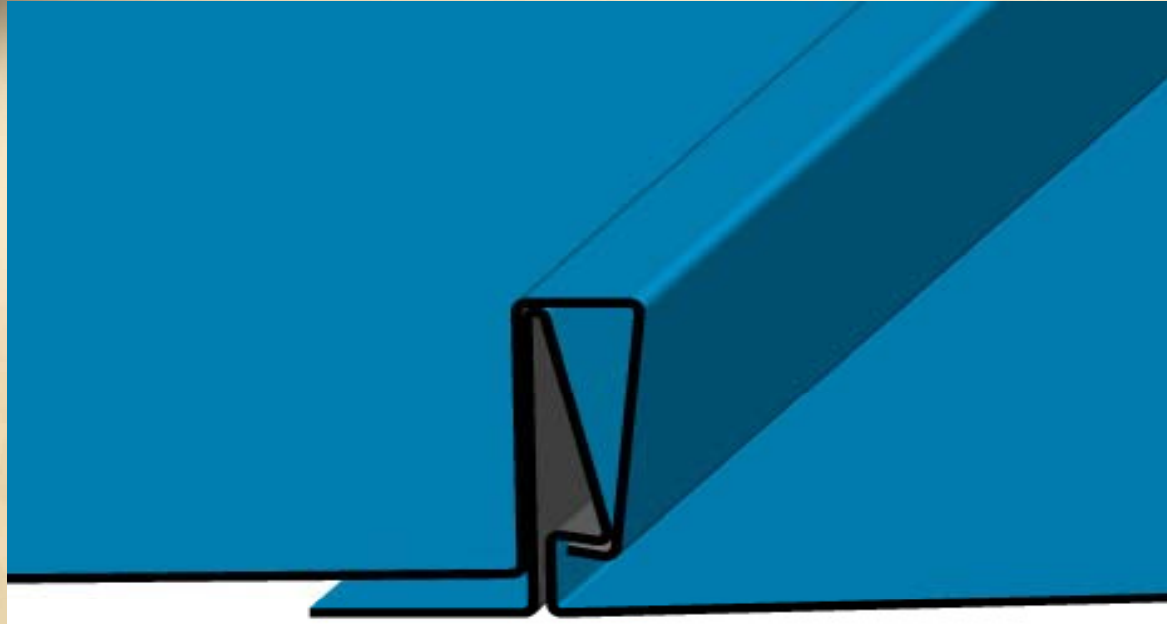


Double-Lock Architectural Series **UC-3**



Red Shield Warranty

5, 10, 15, 20



No-Clip Architectural Series

**UC-4**



Red Shield & 25 Year Red Shield Medallion

5, 10, 15, 20, **25**

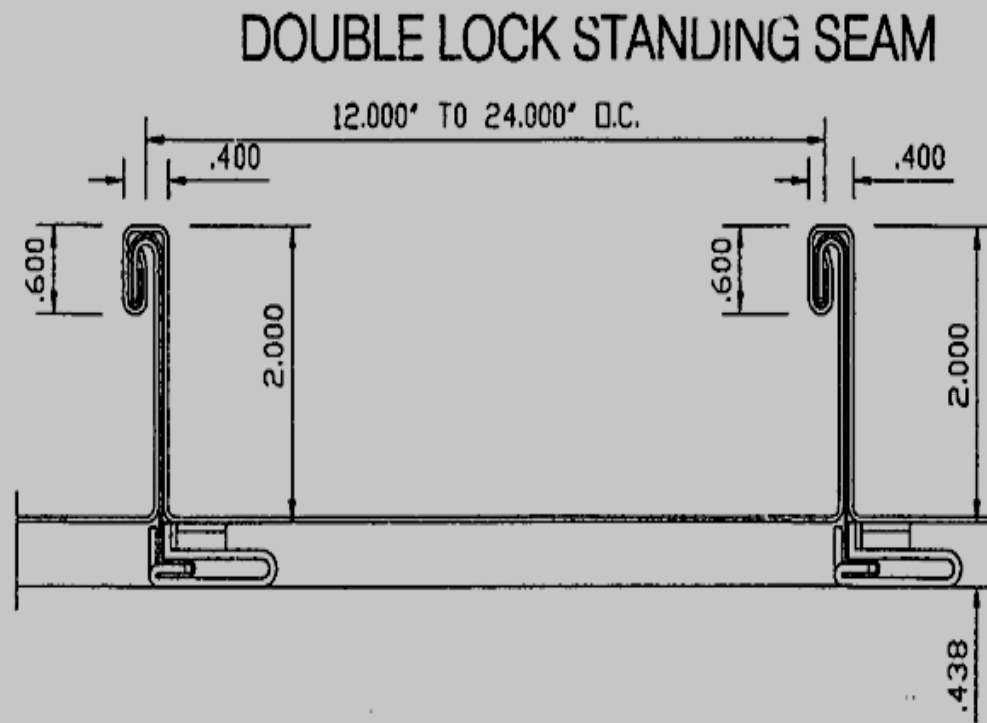








# UC-6 Structural Double Lock Standing Seam

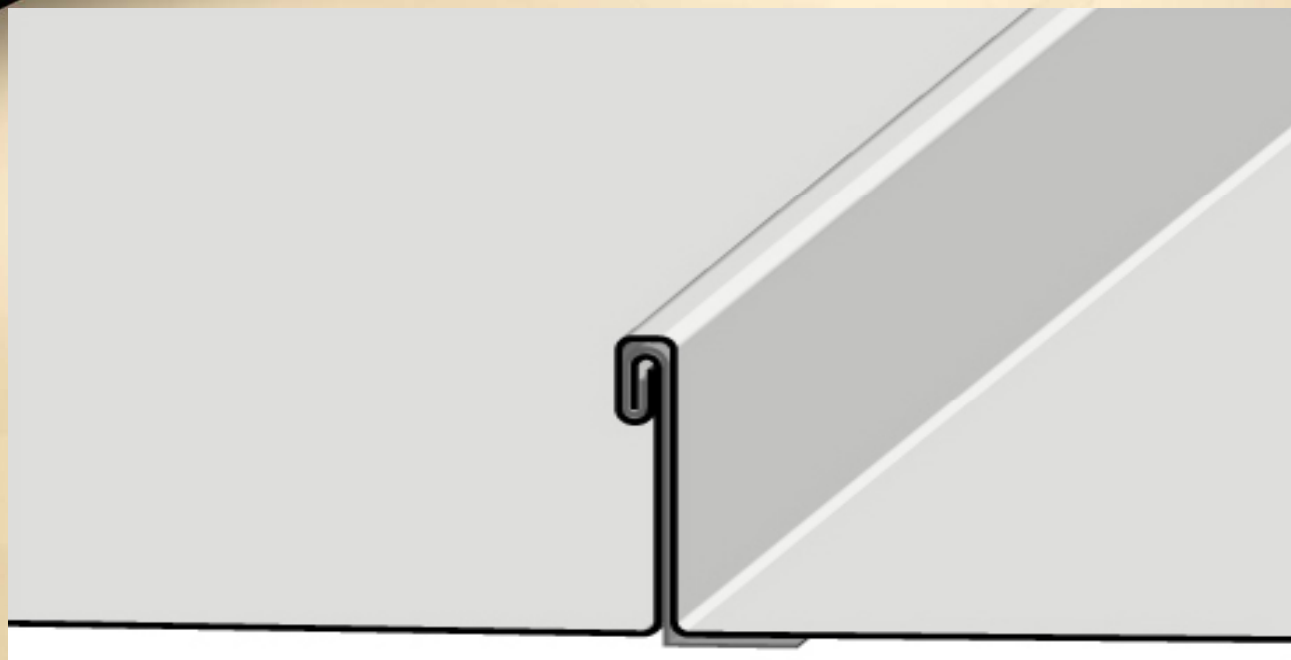


UL-580 Class 90

ASTM 1592

Metro Dade County Approved





Double-Lock Structural Series **UC-6**



Red Shield Warranty

5,10,15,20



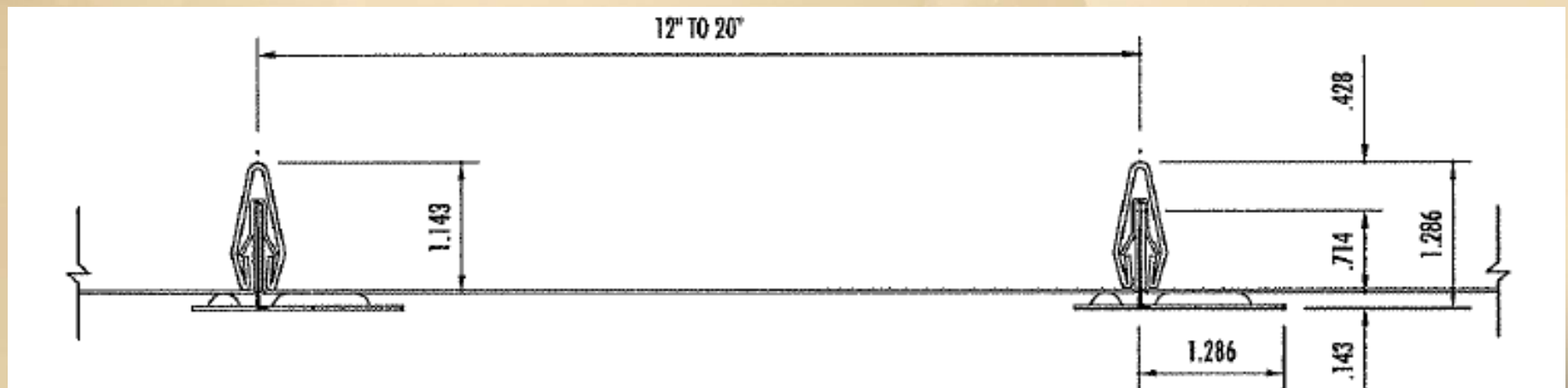






# UC-7

## Snap-On Standing Seam









# Radius Standing Seam Roof





# UC-14

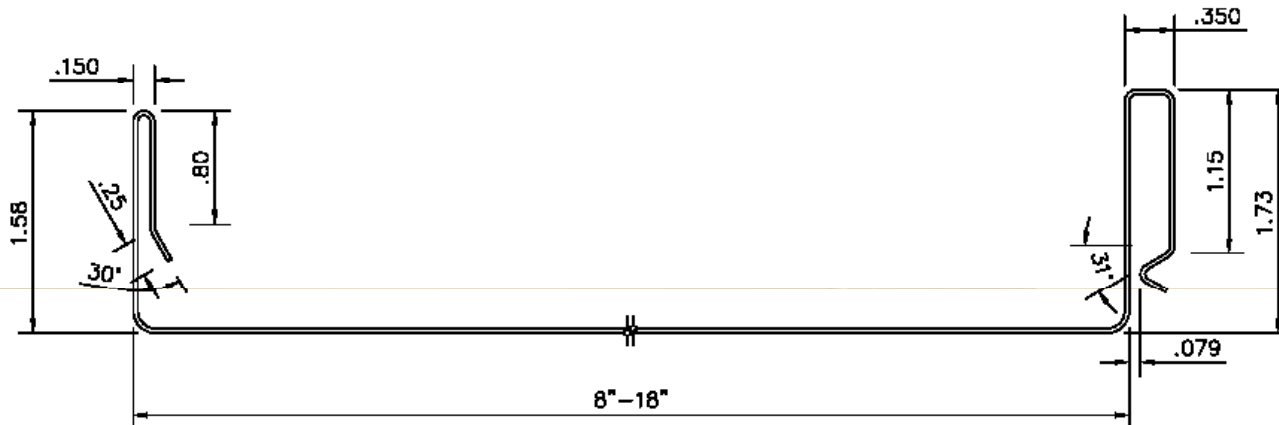


- Factory-formed panel with an interlocking seam that snaps together over concealed clips



- Accommodates very long runs and virtually unlimited thermal expansion

# UC-14



## NOTES:

1. ALL DIMENSIONS ARE SHOWN IN INCHES
2. ALL DIMENSIONS ARE OUTSIDE TO OUTSIDE
3. ALL ANGLES ARE 90°+/-2° UNLESS NOTED OTHERWISE
4. DIMENSIONS SHOWN FOR 24GA. +/- FOR DIFFERENT MATERIAL THICKNESS

## TOLERANCES - EXCEPT AS NOTED

ANGULAR ± 2 DEGREES

5. FRACTIONS +/- 1/32"

6. DECIMALS

.X +/- 0.075

.XX +/- 0.050

.XXX +/- 0.025

7. PART TOLERANCES:

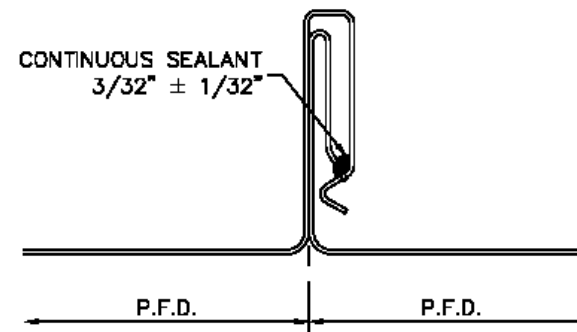
BOW: .01 PER FOOT IN LENGTH.

CAMBER: .01 PER FOOT IN LENGTH.

FLARE: .10 WITHIN 6" OF EACH END.

CONTINUOUS SEALANT

3/32" ± 1/32"



SEALANT DETAIL  
FULL SCALE

**Firestone**  
METAL PRODUCTS  
**USA-GLAD**

1001 LUND BLVD. ANOKA, MINNESOTA 55303  
NATIONWIDE 1-800-428-7737 LOCAL (763) 578-8282  
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DESCRIPTION	PLANT	ALL PLANTS - CSI/QUADRO	DRAWN BY: LMS
SERIES UC14	FAB NUMBER: -	RELEASE: -	SCALE: FULL
REVISION DATE	MATERIAL: STEEL	THICKNESS: 24 GA.	DATE: 05/08/09
	DRAWING NO. UC14-SYSTEM		PAGE NO. P1
	FINISH: -		PRE: <input type="checkbox"/> POST: <input type="checkbox"/>

# Weather Tightness Warranties

- Not all warranties are structured the same
  - Read the fine print, exclusions and interpret the meaning
- Examples
  - Guaranteed not to leak “unless roof system is installed improperly”
  - Warranty “Excludes Flashings and Trims”
  - Warranty covers panels only
  - Many “Weather Tight warranties are pro-rated over time...
  - Some Warranties only cover the cost of material replacement, with no labor...



# Firestone Metal Warranties

## Warranty Offerings

- Metal Finish Warranties
- Metal System Warranties (Red Shield)
  - Panels/Underlayment
  - Clips/Screws
  - Firestone Brand - It is covered!!

# Contractor-Fabricated Snap-On Roof Edge (Firestone Detail RE-10 or Similar)

*Note: Not suitable for extended wind warranties, projects requiring FM approval, or projects requiring ANSI ES-1 compliance.*

## Material Requirements

### UNA-CLAD MATERIALS:

Snap-On Cover &  
Splice Plates

Min. 24 Ga. G-90 Galv. Steel w/ Kynar Finish  
or Min. .040 Aluminum (Painted or Anodized)

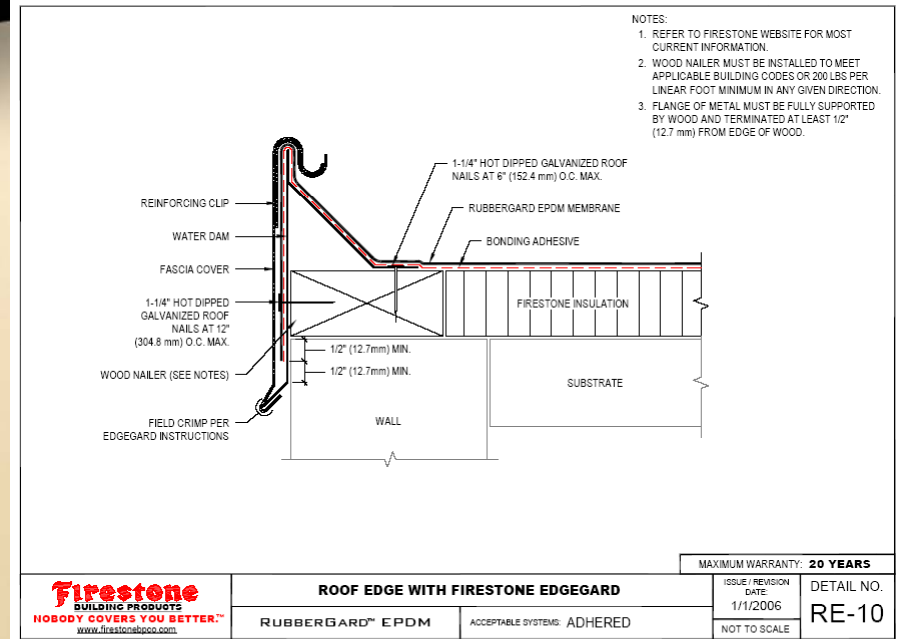
### OTHER MATERIALS:

Water Dam  
Fasteners  
Sealants

Min. 24 Ga. G-90 Galv. Steel  
1 1/4" Hot Dipped Galv. Roofing Nails  
Firestone AP Sealant

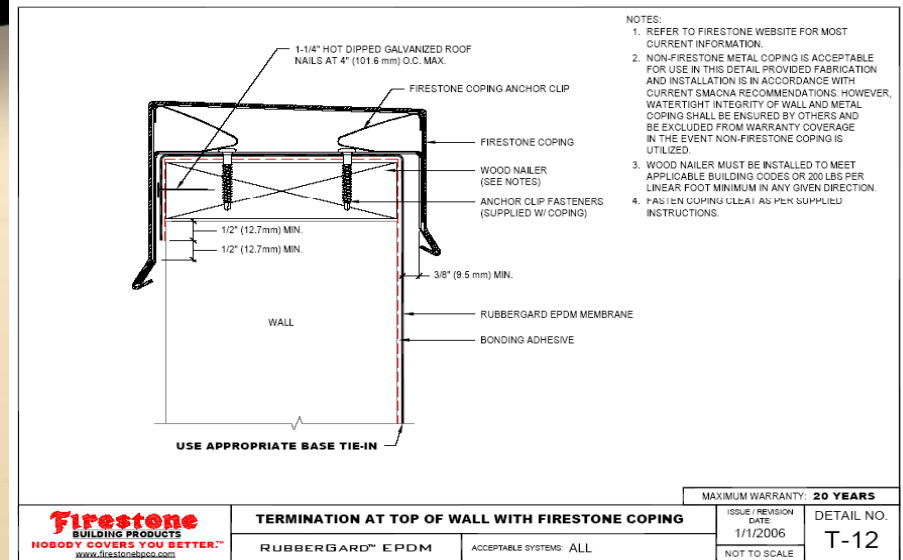
## Installation Requirements

1. Back-edge of Snap-on cover shall be formed upward to avoid cutting membrane (as illustrated in Firestone drawing)
2. Water dam shall be continuous and fastened 4" O.C. max. with roofing nails.
3. Min. 8" wide splice plates shall be installed at all connections and intersections.
4. A continuous bead of Firestone AP Sealant shall be installed at all connections and intersections.  
(Note: Sealants at metal connections are an owner maintenance item in accordance with Firestone Red Shield Maintenance Guidelines.)
5. Follow all Firestone drawing notes and an application specifications.



# Contractor-Fabricated Coping (Firestone Detail T-12 or Similar)

*Note: Not suitable for extended wind warranties, projects requiring FM approval, or projects requiring ANSI ES-1 compliance.*



## Material Requirements

### UNA-CLAD MATERIALS:

Coping Cap &  
Splice Plates

Min. 24 Ga. G-90 Galv. Steel w/ Kynar Finish  
Min. .040 Aluminum (Painted or Anodized)

### OTHER MATERIALS:

Cleats  
Fasteners  
Sealants

Min. 22 Ga. G-90 Galv. Steel  
1 1/4" Hot Dipped Galv. Roofing Nails  
Firestone AP Sealant

## Installation Requirements

1. In lieu of the factory-fabricated spring clip supplied with Firestone Coping, minimum 22 ga. shop-fabricated cleats may be used. Cleats shall be continuous on both sides of the parapet and fastened 4" O.C. max. with roofing nails.
2. Min. 8" wide splice plates shall be installed at all connections and intersections.
3. A continuous bead of Firestone AP Sealant shall be installed at all connections and intersections. (Note: Sealants at metal connections are an owner maintenance item in accordance with Firestone Red Shield Maintenance Guidelines.)
4. Follow all Firestone drawing notes and an application specifications.



**Metal Accessory Warranties**  
**Other Options**

***Facades & Equipment Screens can also be included ...***



***...when designed and quoted by Firestone Metal  
Products @ FSBP***

## Metal System Warranties

# Type & Availability

### ● Warranty Type: Red Shield

- 5, 10, 15, or 20 year standard term
- May be combined with other systems (EPDM / TPO / Asphalt),
- Plus...new 25 year Red Shield Medallion term for UC-4 only

### ● Warranty Availability: Licensed Contractors


- Must be authorized for metal by local sales rep and approved by Regional Sales Manager
- May need to provide a job history of past projects

## Metal System Warranties

# Technical Requirements

- Factory-Fabricated System and Components
  - UC-3, UC-4, UC-6 or UC-14 panel systems only
  - Fasteners, clips & sealants supplied by factory
  - Factory or Contractor fabricated trim with some field options
- Installed over Firestone's or Approved Underlayment\*
- Follow standard Firestone Red Shield details or details with prior approval from Firestone
- Quoted by FSBP – Estimating Services
  - Lump-sum quote similar to Tapered Iso
  - Requires approved shop drawings & verified field measurements





## **Metal System Warranties**

# **Contractor Procedures**

1. Receive quote from Firestone Building Products Sales Reps.
2. Submit purchase order to Firestone Building Products
3. Submit Pre-Installation Notice (P.I.N.)
4. Submit shop drawings to Firestone Building Products for review
5. Complete Installation
6. Submit RFI

# Other Items

- Oil Canning
- Underlayments
- Decks/Substrates
- Green Design (Tree Hugger's delight)
- Shipping/Jobsite staging
- Hands On!!!

# Oil Canning

“Oil canning is an aesthetic issue, not a structural problem or a defect. It is unrealistic to expect any architectural roof or similar wide-metal element to be totally free of some degree of oil canning. While oil canning cannot be totally eliminated, adherence to industry accepted and recognized methods of design, metal specification, handling, fabrication, and installation can minimize its occurrence.”

- 6th edition, SMACNA Technical Manual



# Oil Canning

- Causes of oil canning

- Coil manufacturing

- Excess material in the middle of the coil strip
    - Excess material in the edges of the coil strip
    - Camber - coil side edge is not straight

- Fabrication

- Slitting of coil for proper panel width
  - Less control with on-site roll forming



# Oil Canning

- Causes of oil canning installation

- Substrates and underlayments
- Out of plane sub – structure
- Stretched seam engagement
- Over - driven fasteners
- Handling

# Methods of Control Oil Canning

- Stringent specifications for maintaining proper plane of sub-structure
- Tension leveling material before forming (not possible with on-site roll forming)
- Design panel with stiffening ribs or Striations
- Choosing narrow panel widths
- Heavier gauge material
- Install Foam Backer Rod @ center of Pan

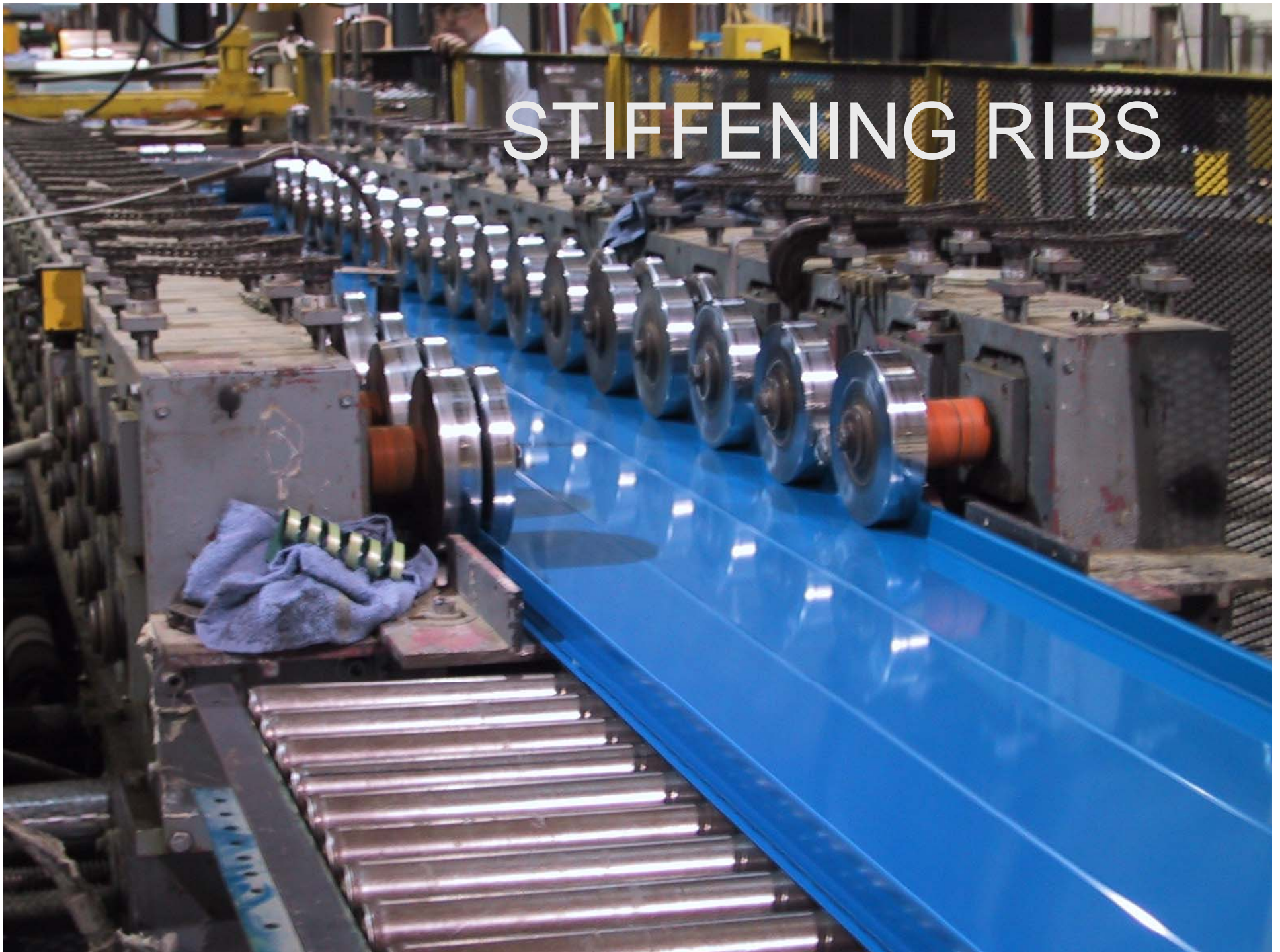


# Tension Leveling (factory)





# STIFFENING RIBS



# Foam Backer Rod

## ● Backer Rod

**BACKER ROD** SEALANT JOINT

THE ORIGINAL  
ONE-STOP SOURCE FOR  
ALL YOUR BACKER ROD  
REQUIREMENTS

- CLOSED CELL
- HOT ROD XL
- OPEN CELL
- SOFT-TYPE BACKER ROD

Without a doubt, the  
most common and  
effective way of sealing  
concrete joints is  
backer rod.

Adding the outstanding  
and proven performance  
of ITP's Backer Rods  
will ensure the life of your  
structure and its contents.

**ITP** Industrial Thermo Polymers Limited  
A Division of Industrial Thermo Polymers Limited, 10000 Highway 101, Unit 101, Richmond, BC V6V 2G9, Canada  
Tel: (604) 273-1111 Fax: (604) 273-1112  
www.itp.com



# Backer-Rod Works!!!!



# How to apply, What Diameter?

- After removal from the crate, simply tape a continuous pc. full length of the panel.
- If difficult staging (roof height, distance, weather) Backer can be applied prior to panel placement.
- Start with 1/2" dia. Adjust if needed to larger diameter.
- This is not a Firestone product, it will not be included in your order...







# Green Design

## ● Recyclability

- Copper, zinc, aluminum & steel are all 100% recyclable
- Recycled percentages vary on type of metal and market conditions

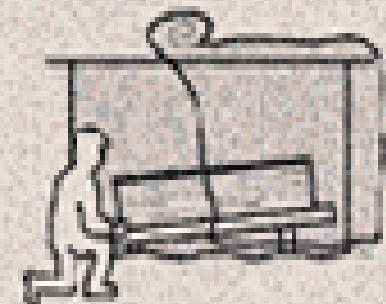
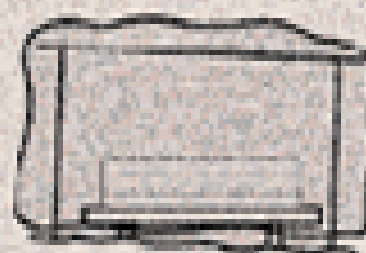
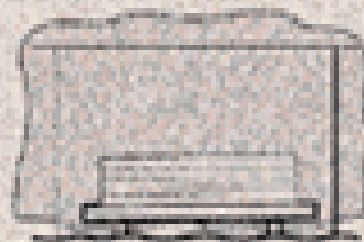
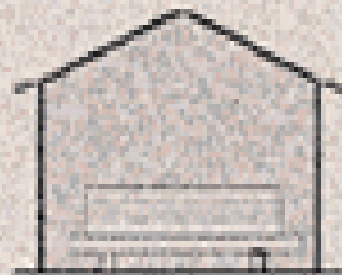
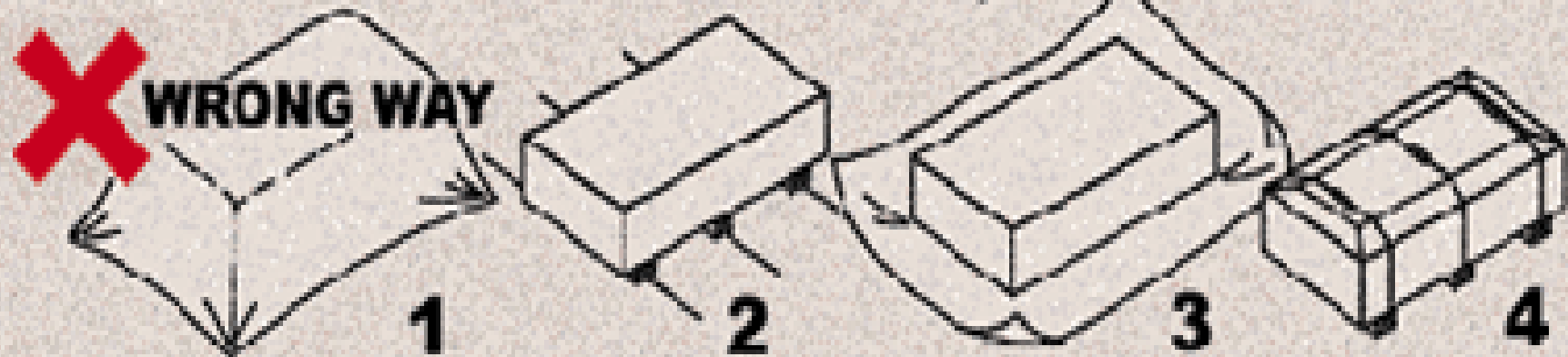
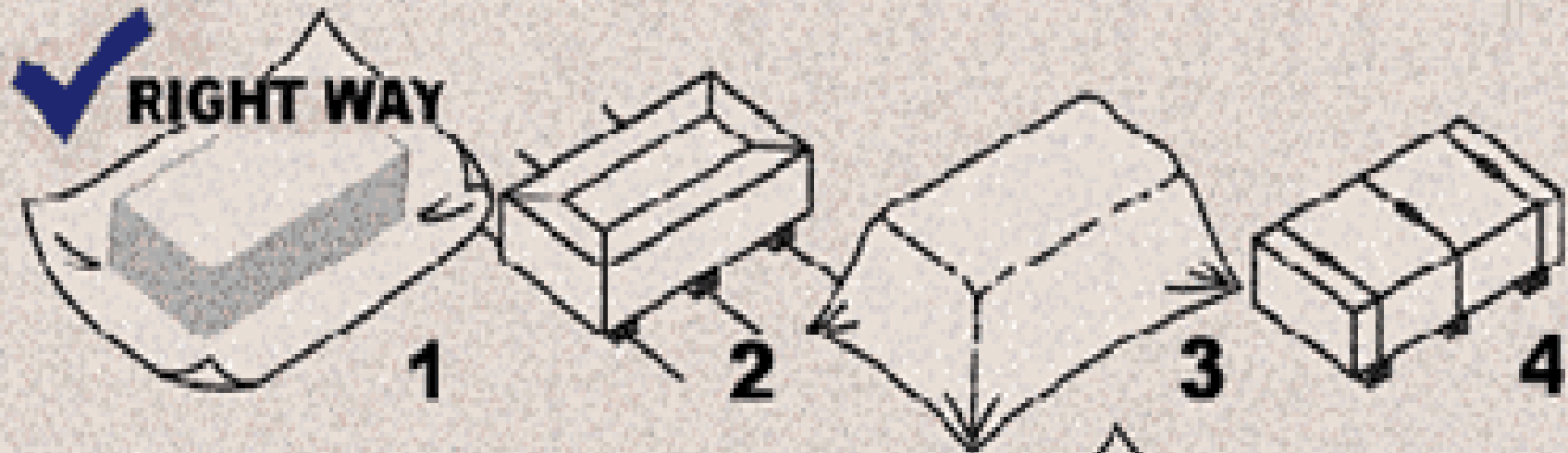
## ● Solar Reflectivity

- Deflection of solar energy from the material's surface
- The greater the amount of solar energy reflected, the less energy the building will need to cool down

# Staging the Job

- Bundles should be lifted with equipment that supports most of the panel length. (spreaders)
- Bundles should be rigidly packaged with crosswise and lengthwise blocking, on level surface.
- Protected from contact with other items such as structural components.
- PANEL/CRATES NEED TO BE TARPED OR COVERED AFTER EACH DAY!!!!

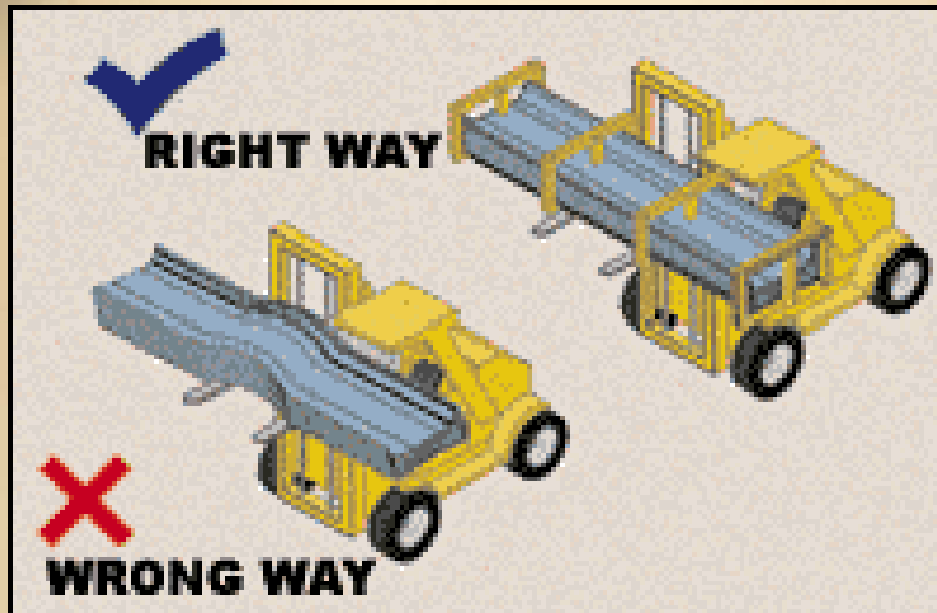
# Paper Wrapping Procedure



**Proper Storage**

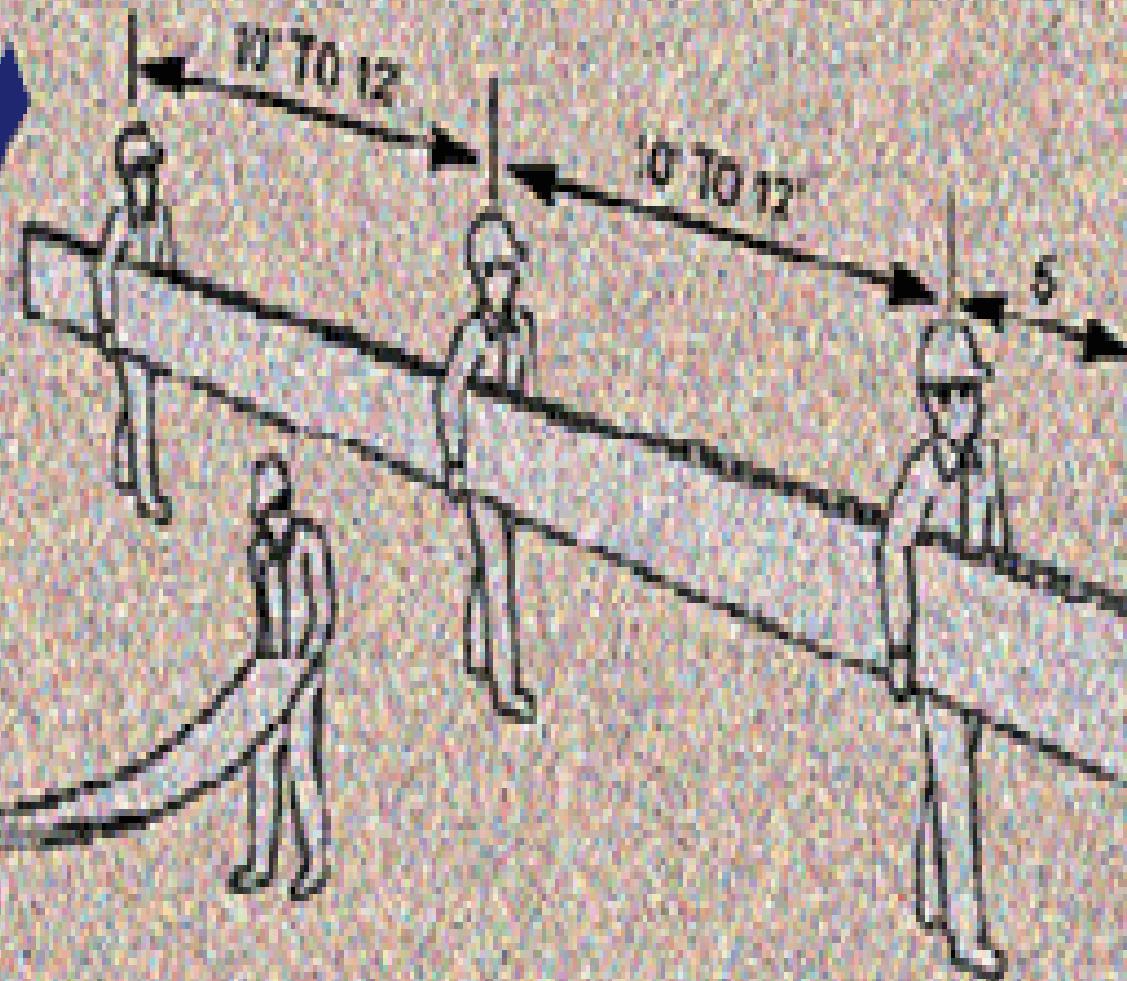
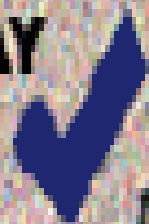


# When using a forklift, careful handling and unloading practices should also be used to

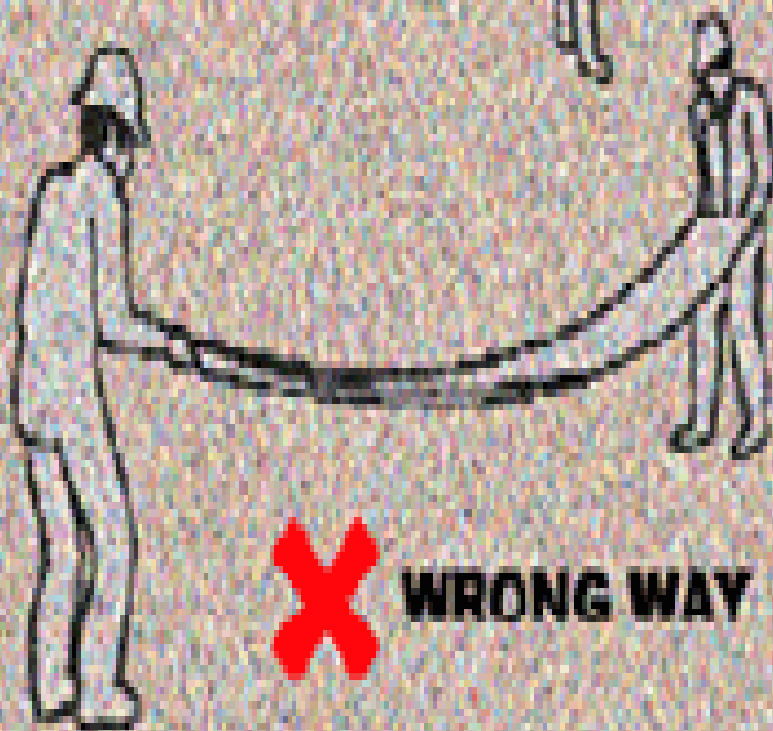


- Avoid excessive bundle flexing or abrasion of the panels
- Forklift forks must be a minimum of five feet apart.
- Do not transport open bundles.
- Drive slowly when crossing rough terrain to prevent panel buckling.

**RIGHT WAY**



**WRONG WAY**



# Field Cutting

- Minimized by using factory-supplied cut-to-length Panels.
- If required use
  - Straight blade shears, profile shears, nibblers or hand snips.
- Clean-cut edge without damaging the paint or metal coating.
- The shear blades should be kept sharp to minimize burrs
- DO NOT cut with an abrasive wheel, hacksaw, or other cutting tools!!!!





































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