SPECIFICATION 07542.1

Custom Seal (PVC)
Fully Adhered System Specifications

1.01 DESCRIPTION

A. This system is a fully adhered design utilizing .048 mil (1.2mm) or .060 mil (1.5mm) nominal thickness Custom Seal (PVC) roofing membrane in a single weld configuration bonded to an approved insulation secured to the structural deck or applied directly to an approved substrate.

B. Roof Application and related work shall be installed by a single firm authorized by the roofing manufacturer. A single firm is required so that there is undivided responsibility for performance of all Custom Seal supplied roof components.

C. Furnish and install the Custom Seal thermoplastic membrane roofing system in strict accordance with drawings and specifications approved by Custom Seal Roofing Systems.

D. Related Work

The work includes, but is not necessarily limited to the installation of:

1. Vapor Retarders (where required)
2. Custom Seal Insulation
3. Custom Seal Anchor Bars
4. Custom Seal slip sheet
5. Custom Seal Fasteners
6. Custom Seal Roof Membrane
7. Custom Seal Flashing
8. Custom Seal Metal Flashing
9. Wood Nailer
10. Custom Seal Walkways
11. Custom Seal Approved Sealants
12. Custom Seal Adhesives
13. Metal Coping (as required)

1.02 QUALITY ASSURANCE

A. This roofing system must be installed by an authorized Custom Seal Roofing Systems (PVC) applicator.

B. There shall be no deviation made from this specification or the detail drawings without written approval from Custom Seal Roofing Systems 14 days prior to the start of the roofing project.

C. Upon completion of the installation, an inspection shall be conducted by a Technical Representative of Custom Seal Roofing Systems to ascertain that the roofing system has been installed according to Custom Seal Roofing Systems most current published specifications and details. This inspection is not intended to be a final inspection for the benefit of the owner but for the benefit of Custom Seal Roofing Systems to determine whether a warranty shall be issued.

D. It is the roofing applicator's responsibility to adhere to all applicable building codes (local and national) for roofing system installation requirements and limitations in their local areas applicable at the time of the bid.

E. For specific code and testing agency approvals achieved by Custom Seal Roofing Systems, refer to the published listings or call Custom Seal Roofing Systems Technical Department at 1-800-370-7325.

1.03 SUBMITTALS

A. Submit a "Pre-Job Survey" to Custom Seal Roofing Systems Technical Department for approval PRIOR to the job start to enable the Technical Department to approve and assign a job number to the project.

1. The "Pre-Job Survey" must be filled out completely and accurately to include any prior deviations approved from this specification.

2. A roof drawing or shop drawing may be provided to the Technical Department with each "Pre-Job Survey". Drawings must show dimensions and all penetrations.

B. When Material & Workmanship or Full Systems warranties are desired, it is recommended Custom Seal Roofing Systems be contacted PRIOR to project bid and installation regarding system requirements. Information may be required for the wind design of the system.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original, unopened containers.

B. Containers shall be labeled with manufacturer's name, brand name, installation instructions and identification of various items.

C. All materials, except membrane, must be stored between 16°C (60°F) and 27°C (80°F). If exposed to lower temperatures, restore to 16°C (60°F) minimum temperature before using.

D. Store all materials, including membrane, in a dry protected area. Damaged materials must not be used. Installed materials found to be damaged shall be replaced at contractor's expense.

E. Store the membrane in a manner to protect it from abrasion or puncture.

F. It is recommended that insulation is stored on skids (or insulation bunking) and completely covered with a breathable material such as a tarp or canvas if the insulation is not installed the same day as being loaded on the roof.

1.05 JOB CONDITIONS (CAUTIONS AND WARNINGS)

Prior to the use of any Custom Seal Roofing Systems product, consult Material Safety Data Sheets for applicable cautions and warnings.

A. Do not use oil base or bituminous base roof cement with Custom Seal (PVC) materials.

B. Do not install Custom Seal (PVC) membrane directly over asphalt or smooth surfaced modified bitumen without consulting the Custom Seal Technical Services department.

C. Do not expose membrane or accessories to a constant temperature of 82°C (180°F) or above.

D. Do not allow waste products (petroleum grease, oil or solvents, etc.,) or direct steam venting to come in contact with the Custom Seal (PVC) roofing system. Any exposures not typical for normal roofing installation must be presented to Custom Seal Roofing Systems for assessment of any impact on the performance of the roofing system.

E. Do not install Custom Seal (PVC) membrane directly over coal tar roof surfaces.

F. Cements and solvents and their fumes contain petroleum distillates and are extremely flammable. Do not breathe vapors or use near fire. Care must also be exercised to ensure that open containers are not placed near fresh air intake ventilators on the roof. Consult container labels and Material Safety Data Sheets for specific information.

G. All seaming and bonding surfaces must be dry and clean.

H. Contact Custom Seal Roofing Systems Technical Department for procedures when installing Custom Seal (PVC) roofing systems during temperatures less than 4°C (40°F).

I. Roofing surface must be free of ponded water, ice or snow prior to and during the roofing project.

J. Rubber gloves are recommended when using any solvents or adhesives.

K. Safety glasses, goggles or a face shield are recommended for eye protection.

L. When using automatic heat welding equipment consult manufacturer's warnings.

1.06 WARRANTY- Refer to section 1.06 of the design section.

1.07 PRODUCTS- Refer to section 2.01 of the design section.

2.01 SUBSTRATE CRITERIA

A. The building owner or owner's representative is responsible for providing and determining that the substrate is suitable to receive the Custom Seal (PVC) roofing system and the Custom Seal authorized contractor should not proceed until all defects have been corrected. If possible, install roofing system at the high point of the roof and work to the lowest point.

B. Custom Seal Roofing Systems has compiled a list of the most common deck types found in the construction field. Custom Seal Roofing Systems strongly recommends that you review our requirements and restrictions prior to each roofing project. Refer to section 3.01 of the design section.

4. Wood nailers must be installed by an industry accepted method to resist 200 pounds (889N) of force in any direction with fasteners spaced a maximum of 24" apart.

C. Insulation Attachment

1. When mechanically attaching insulation to approved decks, Custom Seal Roofing Systems requires a minimum of one (1) fastener every 2 sq. ft. ($0.2m^2$) (reduced fastening patterns available for select insulations / thicknesses) using only Custom Seal Roofing Systems brand fasteners. Refer to 3.05 of the design section for fastener information and to the table on page 12 of the design section for insulation attachment rates and patterns (including reduced rates and patterns).
2. Alternative methods of attaching insulation to the deck may be acceptable. Contact Custom Seal Roofing Systems Technical Department for alternative methods.

D. Membrane

NOTE: The (PVC) membrane must be installed lines and dots up. The lines on the membrane are used to determine proper overlap. It is recommended that the widest panel width practical for the project be used to reduce number of field seams.

1. Position the Custom Seal (PVC) membrane over approved substrate without stretching.
2. Allow the membrane to relax a minimum of one-half (1/2) hour prior to any seaming or fastening.
3. Position all adjoining sheets in the same manner. Using the solid line, lap the edges a minimum of 6.3cm (2 1/2").

E. Adhering Membrane

1. The fully adhered (PVC) system may be installed on roofs up to 15.2m (50') in height. For heights exceeding 15.2m (50') contact Custom Seal Roofing Systems Technical Department. This design can be used for roofs requiring the Zone 1 and Zone 2 wind uplift criteria as contained in Loss Prevention Data 1-28 as published by the Factory Mutual Research Corporation.*

   *This does not mean these systems are approved by the Factory Mutual Research Corporation. Contact Custom Seal Roofing Systems or consult Factory Mutual Approval Guide for approved assemblies.
2. Fold sheet back so one-half (1/2) of the underside of the sheet is exposed. Ensure the sheet fold is smooth with no wrinkles or buckles.
3. Stir Custom Seal Bonding Adhesive. DO NOT THIN.
4. Apply Bonding Adhesive to the substrate and the membrane with a 9" (22.9cm) medium nap roller, approved spray equipment (back rolling of adhesive is required) or power roller equipment. 100% adhesive coverage on both the membrane and substrate is required. Do not apply bonding adhesive to the splice area. Avoid globs or puddles of adhesive. One gallon (3.8 liter) of solvent based Bonding Adhesive correctly applied will cover approximately 60 square feet ($5.6m^2$ -$6.5m^{2)}$) of finished surface. Allow adhesive to dry to the point that it feels tacky to the touch but does not transfer to a clean dry finger when you conduct a push / tack test. Do not allow to over dry. If the surface dries to the point that if no longer feels tacky reapply bonding adhesive to both surfaces at the prescribed application rate and allow to flash off again to the proper drying condition.

   NOTE: Do not allow adhesive to come into contact with areas that will be hot air welded. If contamination occurs remove any contaminates prior to hot air welding seams.
5. Roll the adhesive coated membrane onto the adhesive coated substrate avoiding wrinkles.
6. Using a push broom and positive pressure brush down the bonded half of the sheet to achieve maximum contact.
7. Fold back the unbonded half of the sheet and repeat bonding procedure.
8. Apply adjoining sheets in same manner, lapping edges a minimum of 6.3cm (2 1/2").
9. Any wrinkles found in the splice area or that impedes the flow of water drainage, must be cut out, laid flat and repaired using (PVC) membrane and standard repair procedures.

F. Seaming

Important: Ensure both mating surfaces are free of debris and no moisture is present on the splicing surfaces.

1. Unroll the membrane and allow to relax as long as possible. (Minimum 1/2 - 1 hour)
2. Position the top membrane to overlap the bottom membrane by 2 1/2" (6.3cm) inches.
3. Using a clean rag saturated with Custom Seal Solvent, thoroughly clean an area on both sheets at least 4 inches (10.2cm) wide if seam area has become contaminated with dirt, debris, etc. Change rags frequently to avoid depositing previously removed materials.
4. Using an approved automatic heat welding machine or hand held heat gun and teflon roller, continuously weld a minimum 3.8cm (1 1/2") wide seam. Custom Seal recommends that only approved Automatic Walker Welders be used to weld all field seams.

5. All welded seams must be manually checked for voids or seal deficiencies by probing the entire seam area with a dull cotter key extractor after the seam has cooled. In addition, there must be destructive testing performed daily at the beginning and every time there is an interruption in the welding process (i.e. Power failure, welder shut down, job site conditions change and after lunch). All deficiencies must be repaired.

G. Perimeter Membrane Attachment

1. The Custom Seal (PVC) membrane must be securely attached to the approved roof substrate.
2. Custom Seal Roofing Systems offers several different attachment methods. Consult Custom Seal (PVC) standard details.
3. Perimeter membrane attachment is required at each roof level, curb, skylight, expansion joint and roof penetration and at any deck or substrate angle change greater than 2 / 12.
4. Nailers must be pressure treated wood with salt preservatives. Creosote and asphaltic preservatives are not acceptable.
   a. Wood nailers are required along roof edges wherever metal gravel stops , drip edges or gutter systems are specified. Wood nailers are also required when roof curbs are to be mounted at finished roof level and not directly to the structural deck.
   b. Wood nailers must be equal in height to the roof insulation and be wider than the flange of the roof edge metal or curb being installed but not less than 3½" wide.
   c. Wood nailers must be installed by an industry accepted method to resist 200 pounds (889N) of force in any direction with fasteners spaced a maximum of 24" apart.

H. Night Seal

At the completion of each day's work, temporarily seal any loose edge in such a way as to prevent water from flowing beneath any completed sections of roof. Consult Custom Seal Technical Services for methods of sealing the membrane to the deck if necessary to protect the completed system. If sealants or seam tapes are used in the assembly of the night seal the area of membrane affected must be removed the next work day before continuation of the roofing application.

I. Night Seal

At the completion of each day's work, temporarily seal any loose edge of membrane with Custom Seal Night Seal. Care must be used to guarantee that no water flows beneath any completed sections of roof. Consult Custom Seal Roofing Systems standard detail for method of attachment. Night Seal must be cut out and discarded prior to resumption of work.

J. Walkways

1. If regular maintenance (once a month or more) is required to service rooftop units, Custom Seal walkway pads are recommended.
2. Walkways <u>are recommended</u> at all traffic concentration points, such as roof hatches, access doors, rooftop ladders, etc., regardless of traffic frequency.
3. Consult Custom Seal (PVC) standard details for attachment method.
4. Walkways are considered a maintenance item and are not warranted by Custom Seal Roofing Systems.
5. See 3.13 of the design section for approved list of walkways.

K. Expansion Joints and Building Control Joints

1. Consult Custom Seal Roofing Systems standard details for various application methods.

L. Pitch Pans

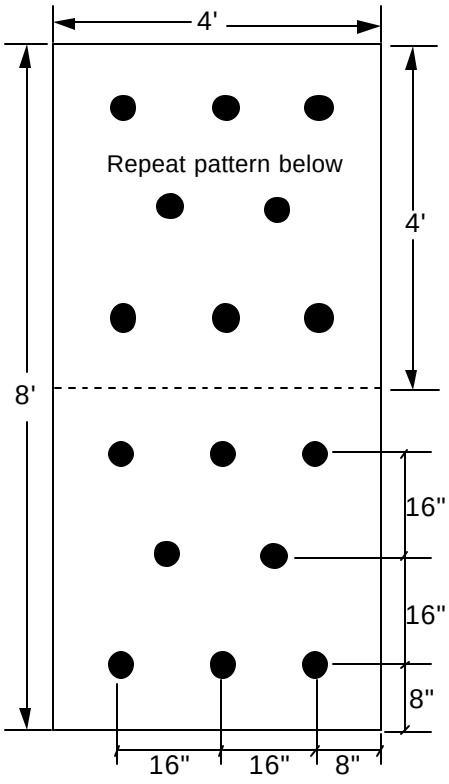
1. Fill pitch pans in accordance with Custom Seal Roofing Systems standard details.

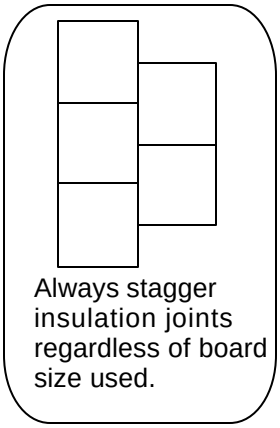
M. Roof Drains

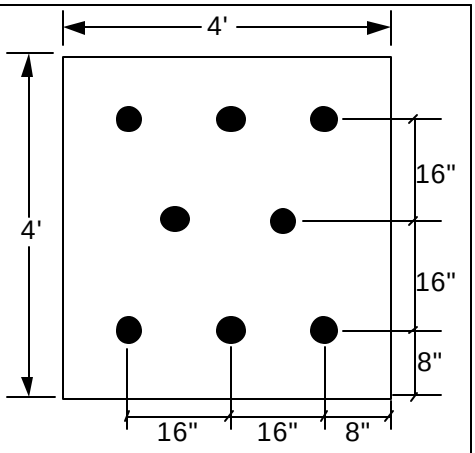
1. Prepare substrate around each roof drain to prevent any distortion or membrane bridging and to provide a smooth transition from the roof surface to the drain clamping ring.
2. The surfaces between the clamping ring and the drain must be clean and smooth. Remove all existing flashing, cement or lead on retrofit drains.
3. One (1) complete tube of Custom Seal Waterstop is required per drain.
4. **<u>All bolts and/or clamps must be in place to provide constant even compression.</u>**
5. Do not run seam through roof drain or sumps.

N. Metal Work

1. Supply and install metal work meeting project design requirements and SMACNA recommendations, refer to the general details section of this manual for Custom Seal installation requirements.
2. Nailers must be pressure treated wood with salt preservatives. Creosote and asphaltic preservatives are not acceptable.
    a. Wood nailers are required along roof edges wherever metal gravel stops , drip edges or gutter systems are specified. Wood nailers are also required when roof curbs are to be mounted at finished roof level and not directly to the structural deck.
    b. Wood nailers must be equal in height to the roof insulation and be wider than the flange of the roof edge metal or curb being installed but not less than 3½" wide.
    c. Wood nailers must be installed by an industry accepted method to resist 200 pounds (889N) of force in any direction with fasteners spaced a maximum of 24" apart.



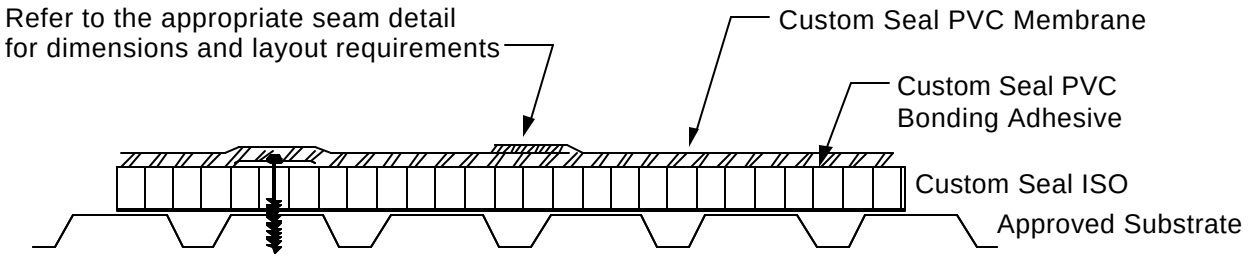




For use on buildings up to 15.2m (50') high. If building height exceeds 15.2m (50') contact Custom Seal Roofing Systems for attachment pattern.

Minimum Thickness Restrictions Apply. Refer to Insulation Attachment for Adhered Systems Table on next page.

Insulation Securement for PVC Adhered Systems	**Detail #:CS PVC 41.05r**	**PVC Systems**	06/02



Position insulation to enable securment into the top flutes on steel decks to ensure positive attachment and to reduce fastener movement. Insulation should be installed with board ends resting on the top flutes.

Insulation Placement and Cross Section For PVC Adhered Systems	**Detail #:CS PVC 41.02r**	**PVC Systems**	06/02

REDUCED INSULATION ATTACHMENT OPTIONS FOR FULLY ADHERED SYSTEMS

(minimum thickness requirements as noted apply)

Insulation	Rating	Min. Thickness	Frequency # per 4'x8' bd.	Fastener & Plate	Pattern Refer to pages 13 & 14
Custom Seal Iso	I-90	1.4"	16	#14 or #15 w/ square or round steel plate	6
	I-90	2.0"	8		1
Custom Seal Iso	I-60	1.25"	16	#14 or #15 w/ square or round steel plate	6
	I-60	1.5"	12		5
	I-90	2.0"	12		5
Custom Seal Iso	I-90	1.3"	16	#14 or #15 w/ square or round steel plate	6
	I-90	1.5"	11		4
	I-90	2.0"	8		2
Custom Seal Iso	I-75	1.4"	10	#14 or #15 w/ square or round steel plate	3
	I-90	1.4"	16		6
	I-90	1.5"	11		4
	I-90	2.0"	8**		1
Wood Fiber Board	I-90	1.0" *	16	#14 or #15 w/ square or round steel plate	6
GP Dens-Deck	I-60	1/4"	12	#14 or #15 w/ square or round steel plate	5
	I-90	1/4"	16		6
	I-60	1/2"	10		3
	I-90	1/2"	12		5
	I-60	5/8"	8		2
	I-90	5/8"	8		2
GP Dens-Deck Prime	I-60	1/4"	12	#14 or #15 w/ square or round steel plate	5
	I-90	1/4"	12		5
	I-60	1/2"	10		3
	I-90	1/2"	12		5
	I-60	5/8"	8		2
	I-90	5/8"	8		2

* 1/2" HIGH DENSITY WOOD FIBER BOARD (ROOF RITE & WEATHER GUARD) MANUFACTURED BY INTERNATIONAL BILDRITE APPROVED FOR FM I-90.

** REINFORCED MEMBRANE ONLY.

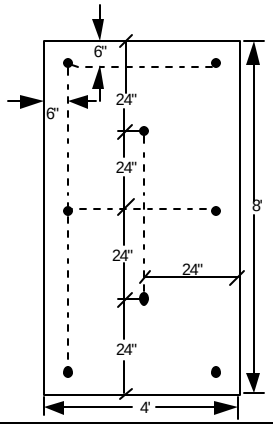
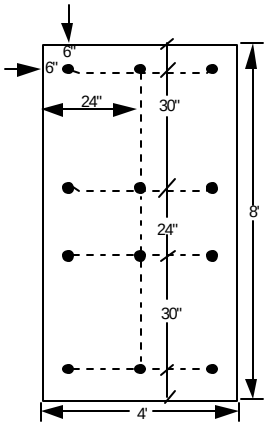
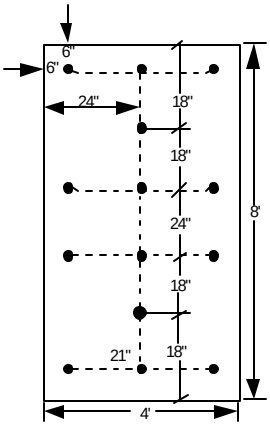
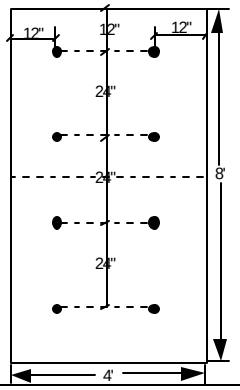
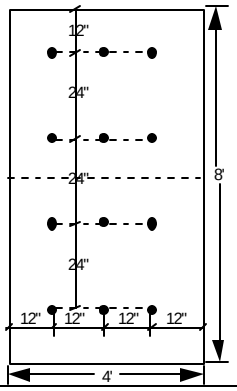
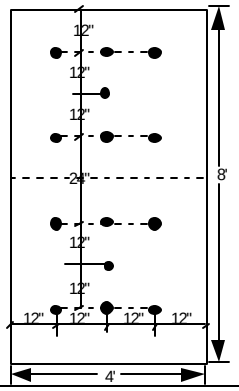
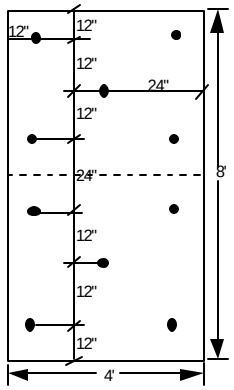
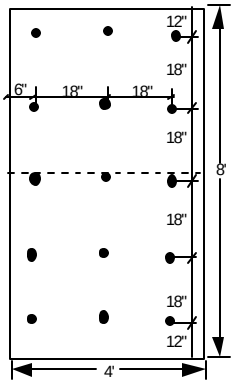
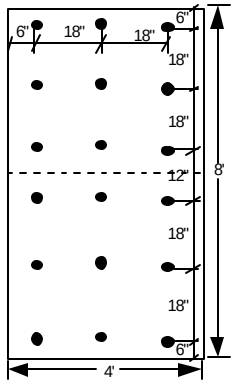
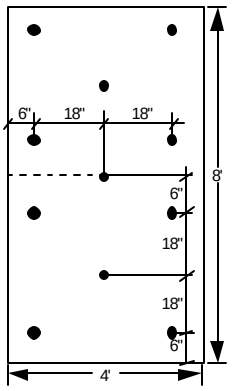
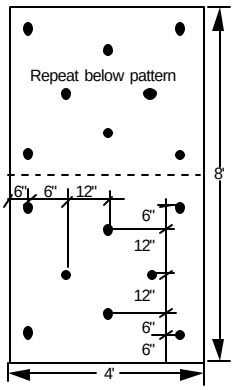
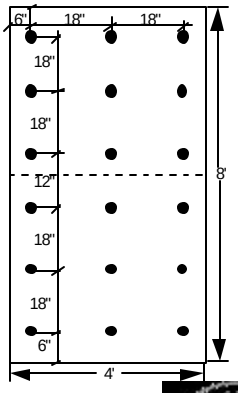
NOTE: FOR ALL MECHANICALLY FASTENED INSULATIONS OR THERMAL BARRIERS, THE NUMBER OF FASTENERS PER BOARD SHOULD BE INCREASED OVER THE FMRC-APPROVED FIELD OF ROOF SPACING BY:

- 50% IN THE ROOF PERIMETER
- 75% IN THE ROOF CORNERS
- ROUND UP TO THE NEXT WHOLE NUMBER OF FASTENERS

THE WIDTH OF THE ROOF CORNERS AND PERIMETER IS DEFINED AS THE SMALLER OF:

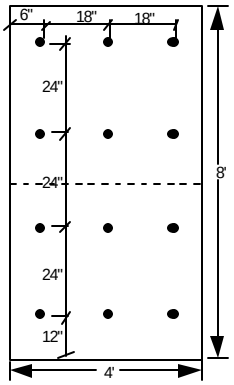
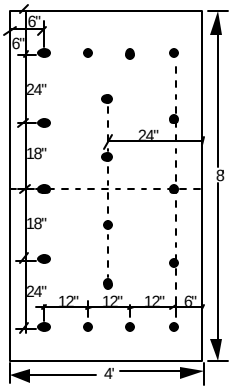
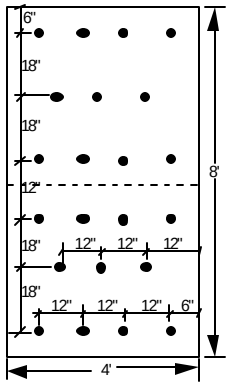
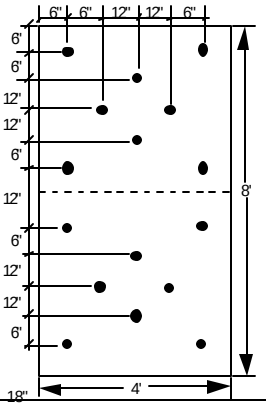
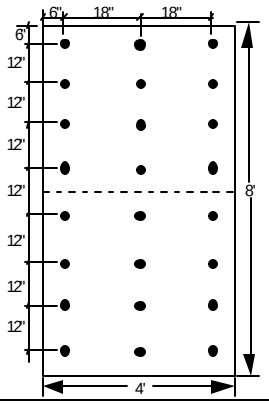
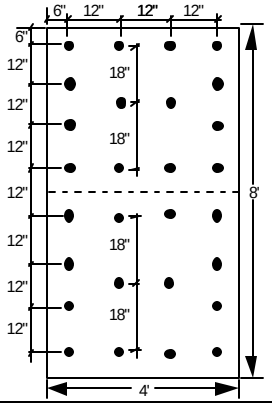
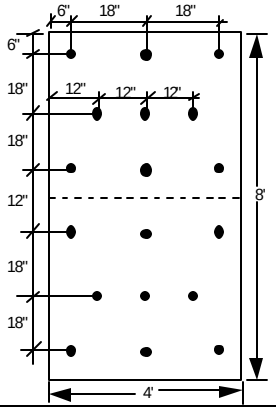
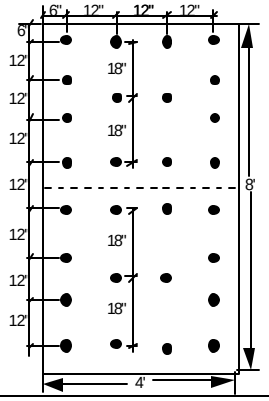
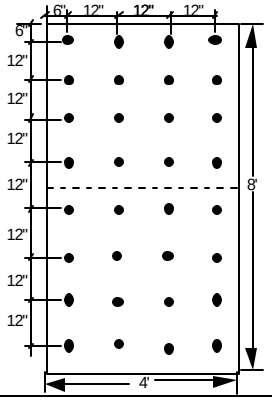
- 0.1 TIMES THE BUILDING LESSER PLAN DIMENSION
- 0.4 TIMES THE EAVE HEIGHT
- SUBJECT TO A MINIMUM WIDTH OF 4 FT.

ON RECOVER SYSTEMS FACTORY MUTUAL LIMITS THE INSULATION THICKNESS TO A MAXIMUM OF ONE INCH. CONTACT CUSTOM SEAL ROOFING SYSTEMS FOR APPROVALS OVER DECK TYPES OTHER THAN METAL AND CONCRETE (I.E. CEMENTITOUS WOOD FIBER, GYPSUM, ETC.)

	Base Pattern	Perimeter + 50%	Corner + 75%
Pattern #1 For use with 2" min. ISO.			
Pattern #2 For use with 2" min. ISO. and 5/8" Dens-Deck & Dens-Deck Prime			
Pattern #3 For use with min. 1.4" ISO. and 1/2" Dens-Deck & Dens-Deck Prime			
Pattern #4 For use with 1.5" min. ISO. and 2" min. ISO.			

Use this visual reference in conjuction with the Insulation For Fully Adhered Systems table located in the design portion of this manual and in the back of the Fully Adhered Application Specification.

Insulation Securment Patterns	**Detail #: N/A**	**ADHERED SYSTEMS** 06/02

	Base Pattern	Perimeter + 50%	Corner + 75%
Pattern #5 For use with 1/4" & 1/2" Dens-Deck and Dens-Deck Plus			
Pattern #6 For use with 1.3" min. Custom Seal ISO. 1.4" Custom Seal ISO. 1.25" Custom Seal ISO. 2, 1" Wood Fiberboard and .25 " DensDeck			
Pattern #7 For use with 1/4" Dens-Deck			

Use this visual reference in conjuction with the Insulation For Fully Adhered Systems table located in the design portion of this manual and in the back of the Fully Adhered Application Specification.

Insulation Securment Patterns	**Detail #: N/A**	**ADHERED SYSTEMS** 06/02