



UNITED STRUCTURES OF AMERICA  
I N C O R P O R A T E D

---

## TECHNICAL BULLETIN

---

Date: March 28, 2012

TB2012.03.28

### LONG PBR RUNS ON ROOF SYSTEMS

United Structures of America has supplied million of square feet of PBR roof systems over the past 31 years. I would expect that most are still in place today with little to no issues. However, over the years as the size and complexity of projects grew it seems the issue of thermal expansion remained in the background. We need to educate ourselves on this issue.

The development of the standing seam roof system was designed to combat thermal expansion and provide a more weathertight roof system with minimal penetrations. Projects which have long runs of PBR panels (100' and greater) can be designed and detailed to eliminate potential problems created by thermal expansion. However, as you would expect, *any* penetration in a roof system is means for a leak in the future.

On a project with 100 degree temperature differential (quite common) a 100' run of PBR roof can expand nearly 1" in a single direction. How do we design and detail features to combat this? Some guidelines are below:

#### **DO NOT fix the panel at the eave to a tilt wall or masonry wall system.**

- The roof panel must float at the eave or ridge (or both) to accommodate expansion and contraction

#### **DO NOT fix the rake trim to the sidewall. The rake trim condition should be handled in similar to that of the floating standing seam roof rake trim.**

- Two piece trim should be supplied in many circumstances.

**Be cautious of the location of anti-roll clips.**

- Locating anti-roll clips at the peak and the eave will create problems by not allowing the purlin to roll forward or back with the expansion of the roof panel. This creates slotted screw holes at the location of the anti-roll clip.
- Fixing the panel at the midspan and using the antiroll clip at this location allowing the panel to travel upslope and downslope will allow for expansion and contraction.

**Eliminate the use of peak panels on buildings with a PBR runs 100' or greater from peak to eave.**

- Supply a ridge cap typically used on a standing seam roof systems (similar to GP01) to allow for the ridge to act as an expansion joint.

**Supply expansion joints along the width and the length per U.S.A. standard recommendations – see attachment “A”.**

Be advised, these guidelines are for runs 100' and greater. Any runs less than 100' should be designed and detailed based on current U.S.A. standards. Drafting personnel who detail these projects should discuss this matter with their squad leader. Reviewing these items in the early stages of the project will eliminate the potential for problems.

U.S.A. highly recommends the use of standing seam roof systems on large projects which have long runs of roof panel(s) and long term weathertightness concerns. Educating the customer of the potential problems with exposed fastener roof systems on large project may help. Nonetheless, U.S.A. will not always be able to bid standing seam roof systems on large buildings. Make note, no one will ever offer a weathertightness warranty on a PBR roof. Offering the customer the insurance of a weathertightness warranty with a standing seam roof may help drive home the integrity of standing seam roof systems. Rest assured U.S.A. will continue to provide the highest quality product possible no matter the roof type.

**KNOW YOUR PRODUCT**

## ATTACHMENT "A"

DRAFTING PROCEDURES MANUAL	SECTION #:11 PAGE: 43	REV: 0
SECTION: TRIM	EFFECTIVE DATE: 7-11-06	
SUBJECT: METAL BUILDING EXPANSION JOINT PROCEDURES	ISSUED BY: GIG	
	APPROVED BY: J. CORTEZ	

### METAL BUILDING EXPANSION JOINTS

Expansion joints are used to prevent damage caused by expansion/contraction.

Please refer to the following guidelines for the use of expansion joints.

- 1) The maximum building length between expansion joints is  $\pm 300$ -350ft.  
The design must indicate the expansion joint location, taking into consideration bracing design, as purlin and girt design  
(REF. SECT. 11 PGS: 50 & 51)
  - 2) The maximum length of eave and rake trim, including gutters, shall be 200ft. between expansion joints.  
(REF. SECT. 11 PGS: 44 & 45)
  - 3) The maximum building width between expansion joints (eave to peak) is  $\pm 150$ ft. for SSR panels or TFR panels attached to zee purlins.  
(REF. SECT. 11 PGS: 46, 47 & 48)
- The dimensions which are given the approximate ( $\pm$ ) notation, may be adjusted approximately  $\pm 10\%$  depending on factors such as location and cladding color (darker colors are more dependant on the use of expansion joints).
  - Buildings located in the mid-plains area of the country are more susceptible to expansion and contraction due to the large temperature ranges in those areas.