
Technical Bulletin US 20120124

Comparison of “Rim to Joist” Post Connectors and “Surface Mounted” Post Anchors

This technical bulletin will attempt to make as direct a comparison as is possible between the common “Rim to Joist” post connectors and “Surface Mounted” post anchors currently available on the market.

There are many ways to secure wood posts to wood frame structures to meet or exceed building code safety factors. This can be achieved either by traditional means using metal connectors with bolts and screws that reinforce the entire connection between all joists and post or by alternative surface mounted anchors.

The challenge with this comparison is to find the right balance between brevity and complexity. Since the range of possible configurations between post and joist and materials is quite extensive, only the most common post and joist configurations will be shown and compared so as to provide useful information to the reader.

It is accepted that there remain numerous other configurations of varying complexity not discussed in this bulletin. However the information provided will be more than sufficient to inform the reader of the basic components and hardware required so that they can conduct their own reliable comparison.

“Rim to Joist” Post Connectors

Rim to Joist post connectors are designed to facilitate carriage bolts and metal connectors that securely reinforce the rim joist to main joist unions. This in turn provides greater resistance against leverage from a post bolted to the joists.

They provide a very secure connection and are offered by three manufacturers in one format or another. These manufacturers are DeckLock, USP and Simpson. Their use is confined to post connections within wood frame structures. Each of these manufacturers has provided testing showing code compliance for residential guard rails.

“Surface Mounted” Post Anchors

The Surface Mounted post anchor for this comparison is the Titan “*Primus*” Post Anchor manufactured by Titan Building Products. It is presently made for both 4x4 and 6x6 posts. The 4x4 post anchor will be compared against the Rim to Joist connectors.

Both the 4x4 and 6x6 post anchors were tested in September 2011 against ASTM D-7032 in accordance with AC 273 test procedures by Intertek. For copies of the Intertek reports please contact us at 1-866-577-8868.

The Titan post anchor works by impaling a light weight but rigid hollow tube into the solid core of the wood post. The base of the tube is welded into a circular cradle formed in the base of the anchor. Lag screws are driven vertically into the post parallel to the tube and the protruding edges of the base are then secured to the decking. The decking screws secure into deck boards and then a flat 2x8 blocking piece secured between opposing joists.

Differences in Installation Techniques

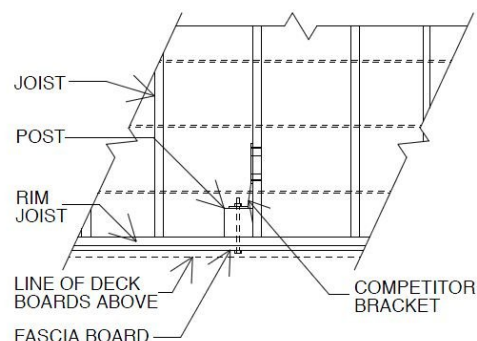
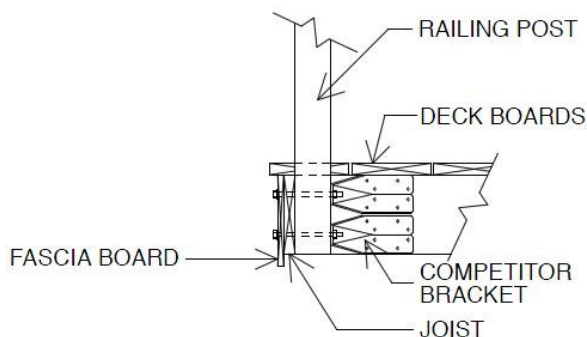
Rim to Joist connectors require different sizes of bolts, quantities of connectors and fasteners as well as blocking depending on whether posts are secured on the inside or outside of rim joists, alongside joists, perpendicular to joists, between opposing joists, and at 45° or 90° corners. There are close to two dozen possible configurations each with their own material list.

The Titan post anchor and its recommended fastener offering plus a single 2x8 blocking piece secured horizontally between opposing joists are the only materials required in every installation scenario. This simplifies installation.

And because the Titan post anchor is surface mounted, it is easy to also achieve code compliant guard rail installations on any hard surface, extending its range of use.

Common Post Attachment Positions

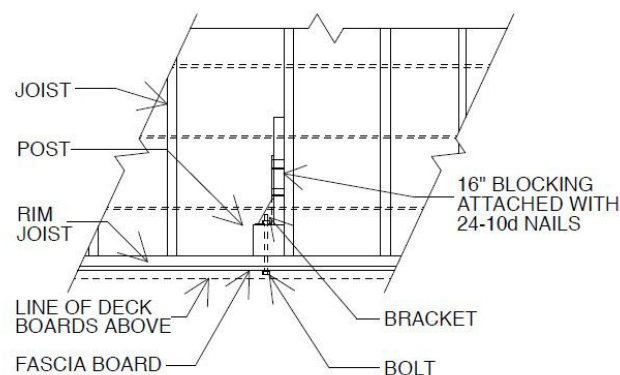
Style A: Post Alongside Joist – Inside or Outside Rim Joist



(2) Connectors	7.75 ea	15.50
(16) #10x1.5 Screws	0.41 ea	6.56
(2) 1/2x6" Carriage bolt	2.79 ea	5.58
(4) 1/2" Flat washer	0.49	1.96
(2) 1/2" Nut	0.30	0.60
	Total	30.02¹

If a single connector is used blocking is required to provide equal resistance from inward and outward force...

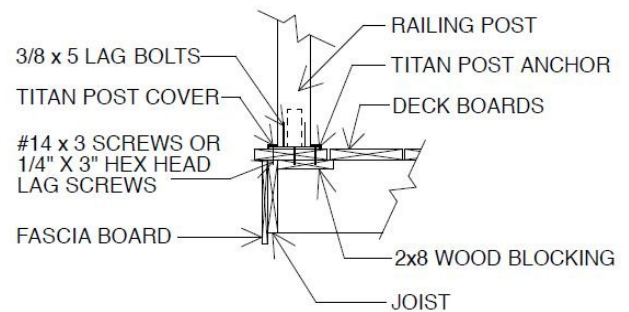
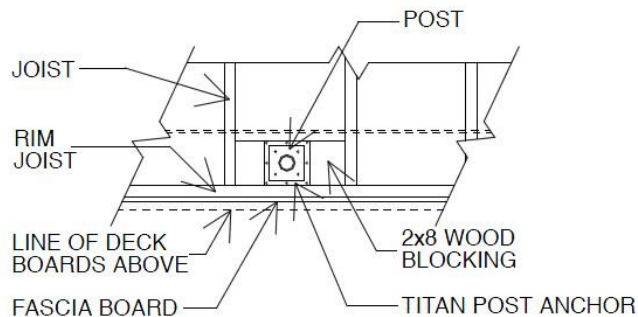
(1) Connectors	7.75 ea	7.75
(8) #10x1.5 Screws	0.41 ea	3.28
(2) 1/2x6" Carriage bolt	2.79 ea	5.58
(4) 1/2" Flat washer	0.49	1.96
(2) 1/2" Nut	0.30	0.60
(24) 10d Nails for blocking	0.05	1.20
	Total	20.37



Note: if a single connector is used a 2x blocking cleat must be fitted against the bottom of the post along the joist or blocking to ensure post can withstand identical minimal code stipulated load from both directions.

¹ All prices are based on purchases made from Home Depot in January 2012.

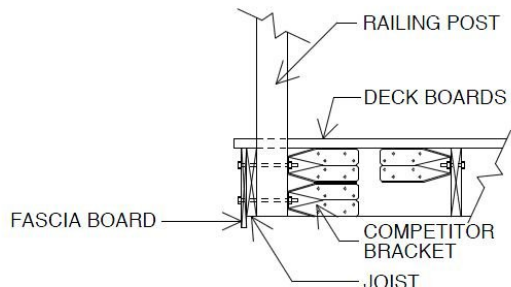
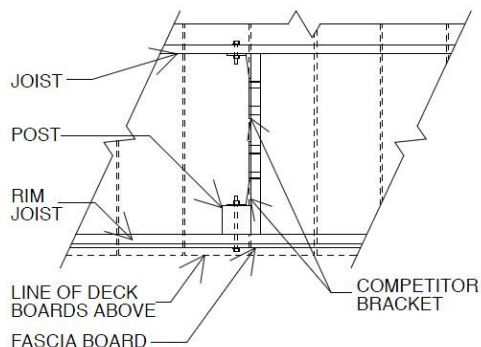
Style A: Same Post Position Using Titan Post Anchor



(1) Titan Post Anchor 4x4	19.97 ea	19.97
(4) Galv. Lag screws	Included	nc
(8) Black deck screws ACQ	Included	nc
Total		19.97

Note: the 4x4 and 6x6 post anchors have been tested as components within a residential guard rail system with post spacing set at a maximum of 6' and 8' apart respectively.

Style B: Post Between Joists – Inside or Outside Rim Joist



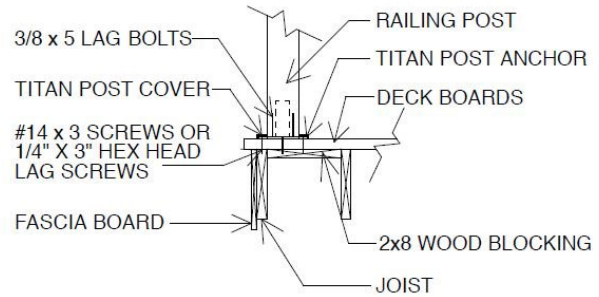
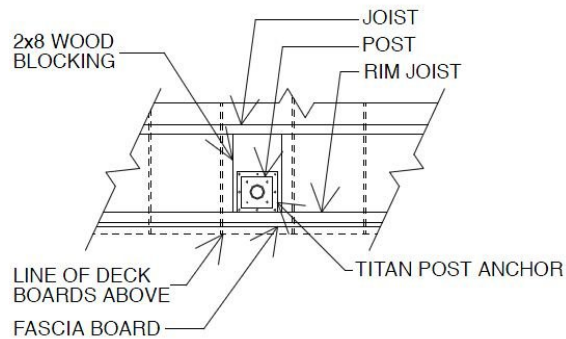
(3) Connectors	7.75 ea	23.25
(24) #10x1.5 Screws	0.41 ea	9.84
(2) 1/2x6" Carriage bolt	2.79 ea	5.58
(1) 1/2x2.5" Carriage bolt	1.19	1.19
(6) 1/2" Flat washer	0.49	1.96
(3) 1/2" Nut	0.30	0.90
	Total	42.72

If only two connectors are used...

(2) Connectors	7.75 ea	15.50
(16) #10x1.5 Screws	0.41 ea	6.56
(2) 1/2x6" Carriage bolt	2.79 ea	5.58
(1) 1/2x2.5" Carriage bolt	1.19	1.19
(6) 1/2" Flat washer	0.49	2.94
(3) 1/2" Nut	0.30	0.90
	Total	32.67

Note: if a single connector is used at the post, a 2x blocking cleat must be fitted against the bottom of the post along the joist or blocking to ensure post can withstand identical minimal code stipulated load from both directions.

Style B: Same Post Position Using Titan Post Anchor



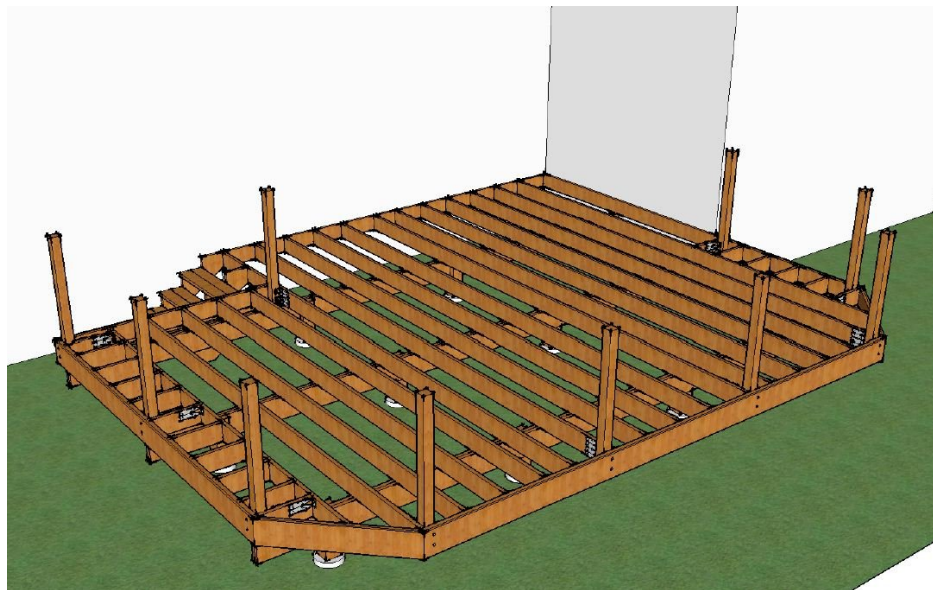
(1) Titan Post Anchor 4x4	19.97 ea	19.97
(4) Galv. Lag screws	Included	nc
(8) Black deck screws ACQ	Included	nc
	Total	19.97

Note: the 4x4 and 6x6 post anchors have been tested as components within a residential guard rail system with post spacing set at a maximum of 6' and 8' apart respectively.

Any configuration within the mandated post spacing and fastener combination has been tested according to AC 273 procedures and shown to meet or exceed standards set out in ASTM D 7032-08.

Deck Post Layout – “Rim to Joist” Connectors versus Post Anchors on 18x25’ Sample Deck

Code Compliant Post Layout Using “Rim to Joist” Connectors



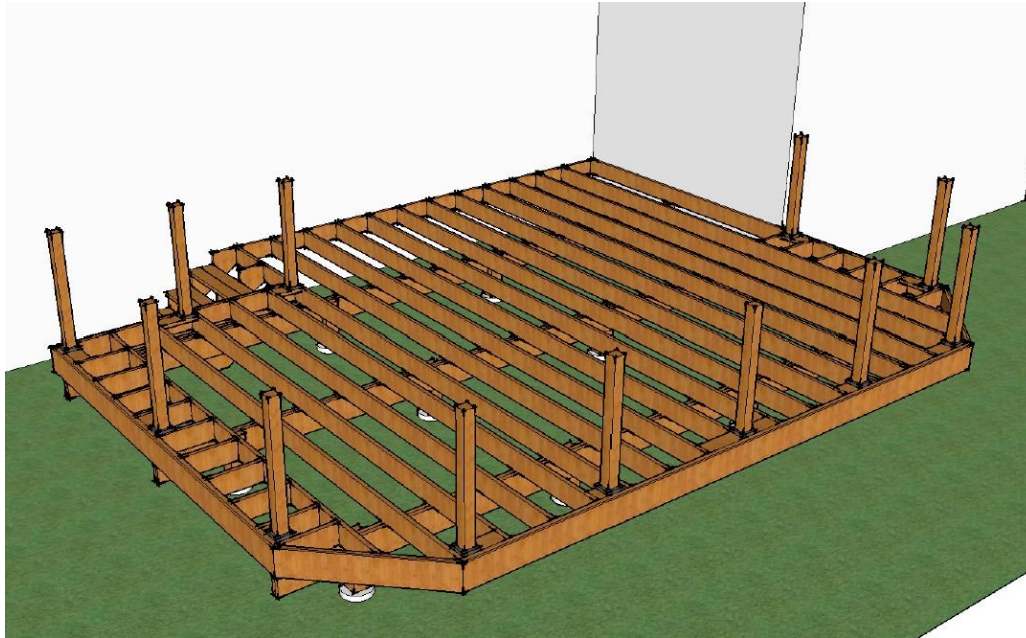
Material List	Two	Ext	One	Ext
(10) 4x4x48" posts				
(5) Style A Rim to Joist Connectors	@30.02 ²	150.10	@20.37	101.85
(5) Style B Rim to Joist Connectors	@42.72 ³	213.60	@32.67	163.35
		363.70		265.20

Note: Rim to Joist post connections can result in post spacing greater than 6'. On this deck **ten posts** are required.

² See diagrams and cost analysis Style A

³ See diagrams and cost analysis Style B

Code Compliant Post Layout Using Post Anchors



Material List		Ext
(12) 4x4x36" posts		
(7) Style A Post Anchor Connection	@19.97 ⁴	139.79
(5) Style B Post Anchor Connection	@19.97 ⁵	99.85
		239.64

Note: Surface mounted posts using the Titan Post Anchor remain code compliant when spaced at a maximum of 6' apart. On this deck **twelve posts** are required. Cost savings are between 11% and 52%, not including savings in time, labor notching deck boards around posts and drier longer lasting posts.

⁴ See diagrams and cost analysis Style A

⁵ See diagrams and cost analysis Style B

Quoted prices are current as of January 24, 2012

Summary

"Rim to Joist" Post Connectors

Rim to Joist connected posts are the traditional means of securing wood posts to wood structures and are a proven way to securely construct decks and other similar structures. They also have the benefit that post spacing can be set at greater distances than 6' if desired because a joist mounted post will sustain a higher maximum load than a surface mounted post. Consult each manufacturer to ascertain maximum allowable post spacing.

However both Rim to Joist connectors and the Titan Post Anchor have been tested and shown to meet or exceed the safety factors set out for residential guard rails.

Skill Required to Install

However this analysis shows only two configurations of how posts may be secured by this technique. There are almost two dozen different configurations for a myriad of joist layouts and corner framing styles.

The blocking techniques can be more complicated and the hardware required is extensive further increasing cost and time to install. In some cases the skill required to properly install is beyond all those except professionals skilled in the trade.

Notching of Deck Boards

Deck boards must be accurately notched around posts that protrude upwards from framing.

Vulnerability to Moisture

Any post to joist connection is more susceptible to the ravages of moisture over time.

Applicable for Wood Framed Structures Only

Connectors of this genre have no utility where users wish to secure wood posts to hard surfaces such as concrete, paver or flag stone or other framed structures where access to the joists from below is not possible.

“Surface Mounted” Post Anchors

Surface mounted post anchors which are code compliant can overcome these issues. The Titan Post Anchor has been rigorously tested for compliance when used in residential guard rail applications but also is very useful for gazebos, pergolas and other post to surface connections. They have very high compression and uplift load resistance also allowing them to be used to function as support post bases.

While traditional construction techniques will continue to be popular, and in some cases the only option available, the arrival of the Titan Post Anchor allows homeowners and professionals alike to confidently install wood posts, quickly, easily and cost effectively for a long life and in more situations than ever before.