

Tiedown Engineering, Inc. – Vector Dynamics

The following are the requirements for using the Vector Dynamics System from Tiedown Engineering, Inc.:

- Approved for HUD coded homes ONLY
- Homes must **not** be located within 1500 feet of the coast
- Approved for Wind Zone 1, 2 and 3
- Minimum main I-beam spacing 86 inches
- Maximum main I-beam depth 12 inches
- Maximum pier height 56 inches
- Maximum sidewall height 96 inches
- Vertical tiedowns must be used at all connection points furnished/required by the manufacturer along the sidewall and marriagewall
- Max roof pitch 4.36/12
- Maximum width 16 feet including eaves (maximum eave width 12 inches on each side) – singlewide
- Maximum width 36 feet including eaves (maximum eave width 12 inches on each side) – doublewide
- Maximum width 48 feet including eaves (maximum eave width 12 inches on each side) - triplewide

Vector Dynamics

"Engineered Tie Down System"

by TIE DOWN ENGINEERING, Inc.

Installation Instructions for the State of California, Wind Zone 1, 15 PSF Wind, Seismic Zone 4

Introduction

These instructions describe the proper use of the lateral and longitudinal engineered tie down system.

General

The Vector Dynamics Engineered Tie Down System resists lateral & longitudinal wind loads by anchoring the two longitudinal main rails. The system is approved to be used on single or multi section homes:

- These plans and specifications meet the requirements of Title 25 section 1336.3 Sub Section A and CBC requirements.

The Vector Dynamics Engineered Tie Down System has not been designed for use on exposure "D" homes within 1500 feet of the coastline.

GENERAL INSTALLATION INSTRUCTIONS

Specification for Vector Pads

Vector Pads are used in place of conventional support pads. One Vector pad provides 2 sq. ft. on single block and 3 sq ft. double block pads of bearing support. Vector Systems should be spaced as symmetrically as possible within 10' of end of home. For pier locations in between the Vector Systems, use the normal support pads.

Unequal Pier Heights

Mutli-section homes with unequal pier heights are limited to 50" maximum pier height. The difference between the taller pier and the shorter pier cannot exceed 26".

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Engineer Approval

State Approval

ENGINEERED TIEDOWN SYSTEM
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SUBJECT TO CORRECTIONS NOTED

Approval does not authorize or approve any omission or deviation from requirements of applicable State laws and regulations.

State of California
Department of Housing and Community Development
DIVISION OF CODES AND STANDARDS

By Alidwell Date 1/24/07
(Signature)

SPA NO ETS 114

This Plan Approval Expires 2/22/09

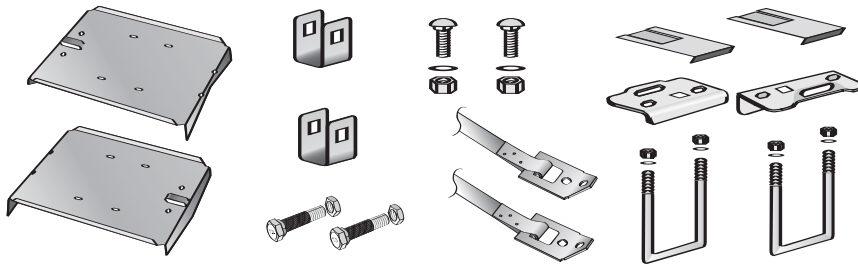
TIE DOWN ENGINEERING • 5901 Wheaton Drive • Atlanta GA, 30336
www.tiedown.com • (404) 344-0000 • Fax (404) 349-0401



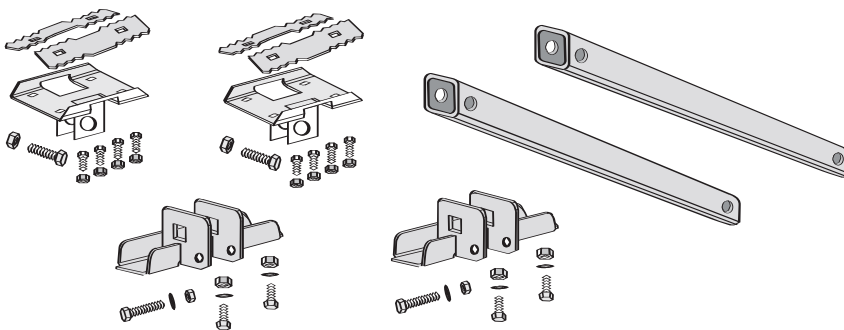
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Vector Dynamics “Engineered Tie Down System” Component Parts List

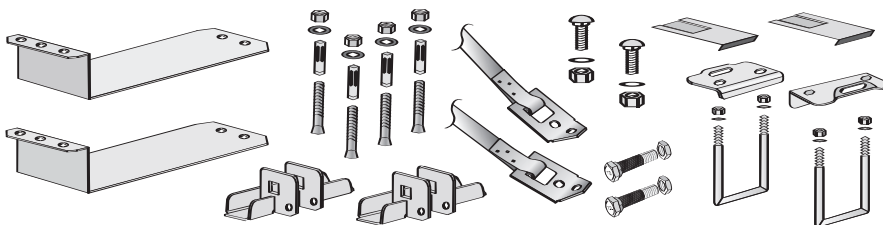
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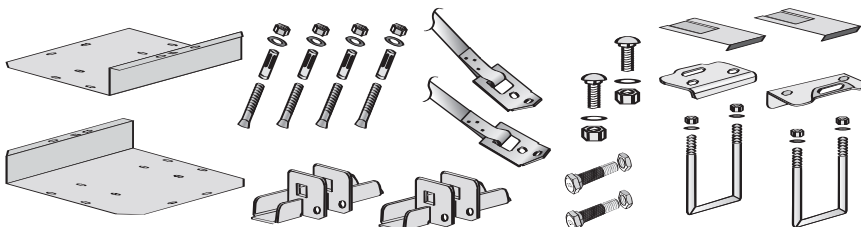
Vector System
Part # 59018
Single piece pads
with straps
and slotted bolts



Vector/LSD Kit
Part # 59013K
for single block pads



Concrete Vector System
Part # 59036
(for single stack blocks)

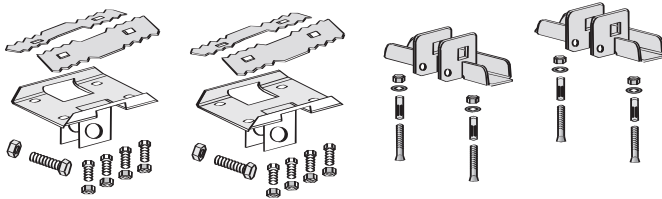


Concrete Vector System
Part # 59049
(for double stack blocks)

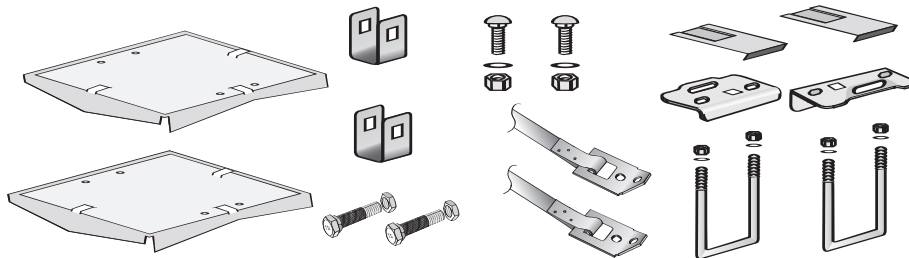
Vector Dynamics "Engineered Tie Down System" Component Parts List

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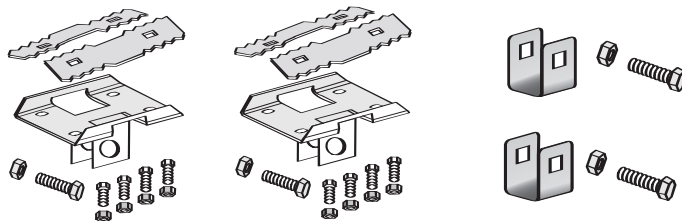
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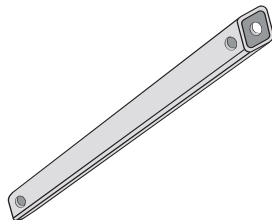
**Longitudinal
Stabilization
Hardware Kit
for Concrete
Part # 59023**



**Vector 2000 3 Sq. Ft. Pad
Part # 59276 for double
block sets with strap and
hardware.**

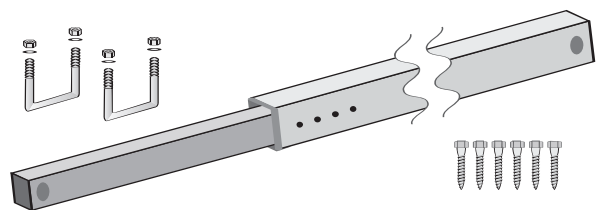


**Longitudinal
Hardware Kit
Part # 59026
(for use with 59271)**



Struts for Longitudinal Systems

Part	Strut	Pier
59013	44"	up to 4 Blocks
59015	65"	5 to 6 Blocks

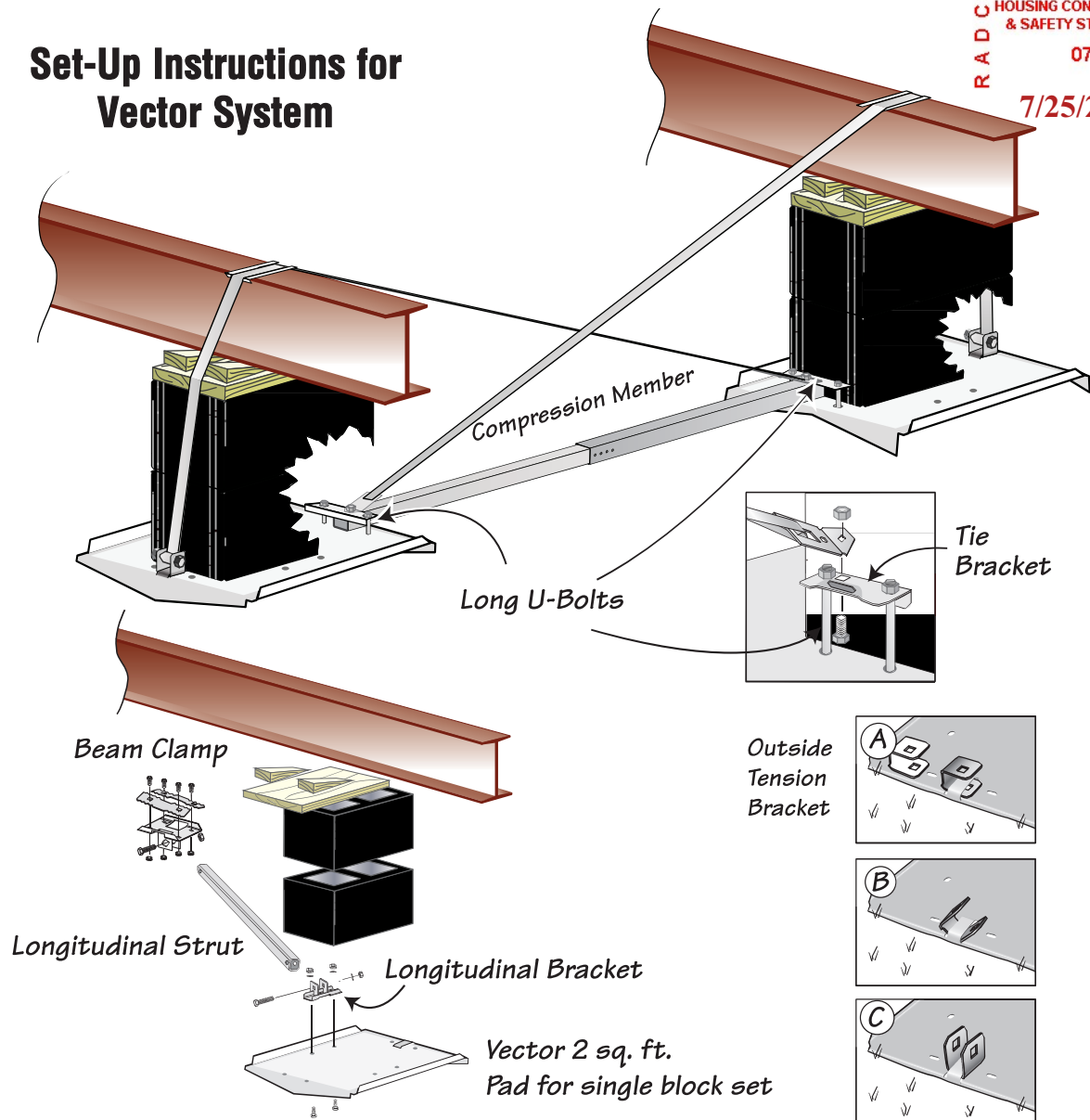


**Center Compression Strut
48612 - 62" - 108" Strut
48613 - 34" - 60" Strut**



Set-Up Instructions for Vector System

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1. Set Vector Pads

Clear all vegetation where pads will rest. Place a long U-bolt in pad as shown. Attach longitudinal bracket to pan. Press or hammer pad into the ground.

2. Set Block or piers on pads.

Center support blocks or piers on pads. Place metal strut between blocks, resting on pads, centers between U-bolts as shown.

3. Outside Tension Bracket

Attach outside tension bracket as shown to outside of pads.

4. Inside brackets & straps

Attach the inside tie brackets to the U-bolts over the compression member. Attach a strap w/hook or swivel strap w/nut & bolt. Place other end of the strap over opposite I-beam & down to outside tension bracket. Cut strap 12 - 15 inches past bracket. Attach strap & slotted bolt in bracket. Tighten strap until tight with 4-5 wraps around bolt. Repeat with opposite strap.

5. Longitudinal

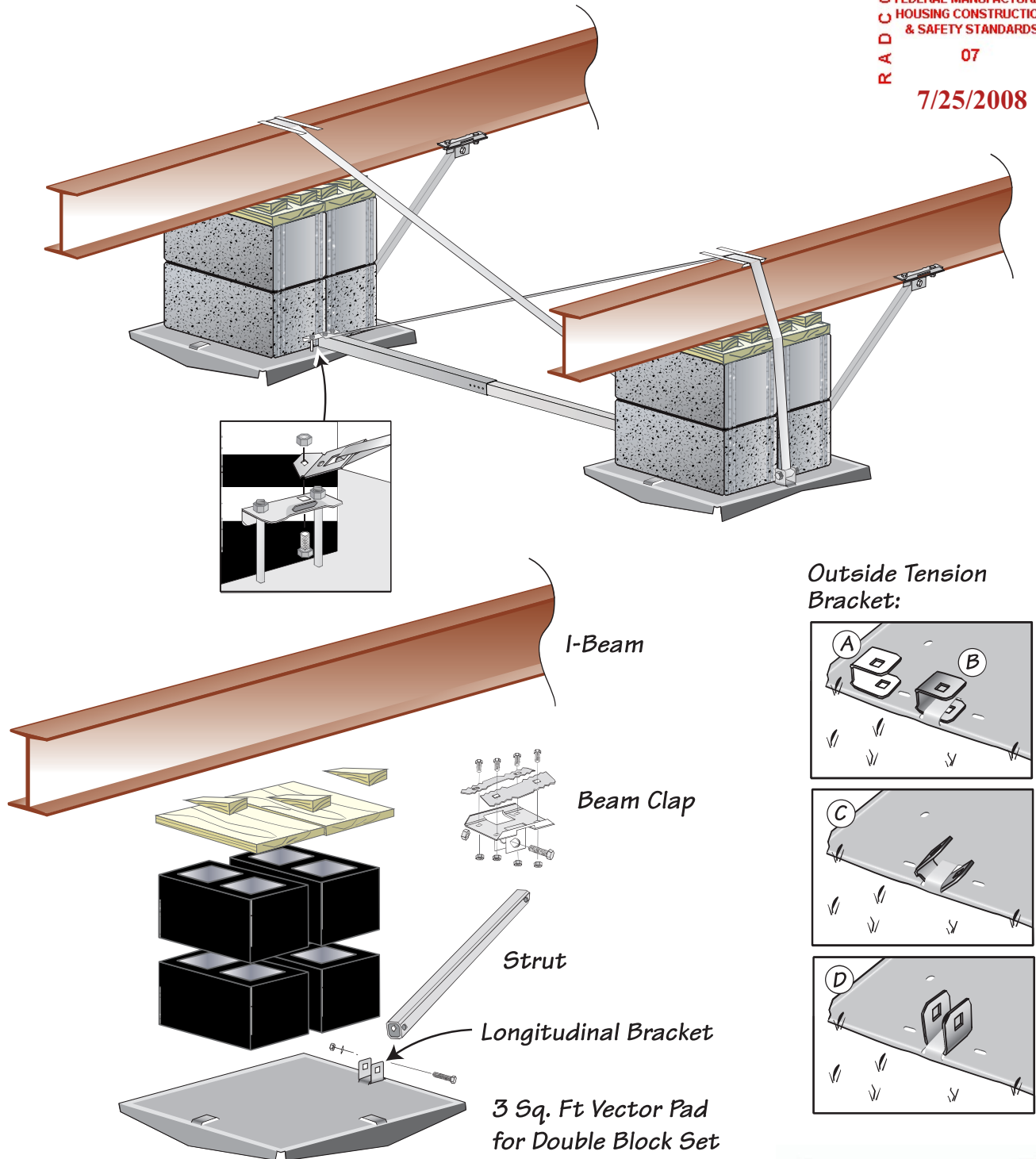
Install beam clamp to I-beam and attach longitudinal strut to pan using nuts and bolts provided. Pull beam clamp outward to remove any slack and tighten all nuts and bolts.

Set-Up Instructions for Double Stack Vector Systems Part #59276

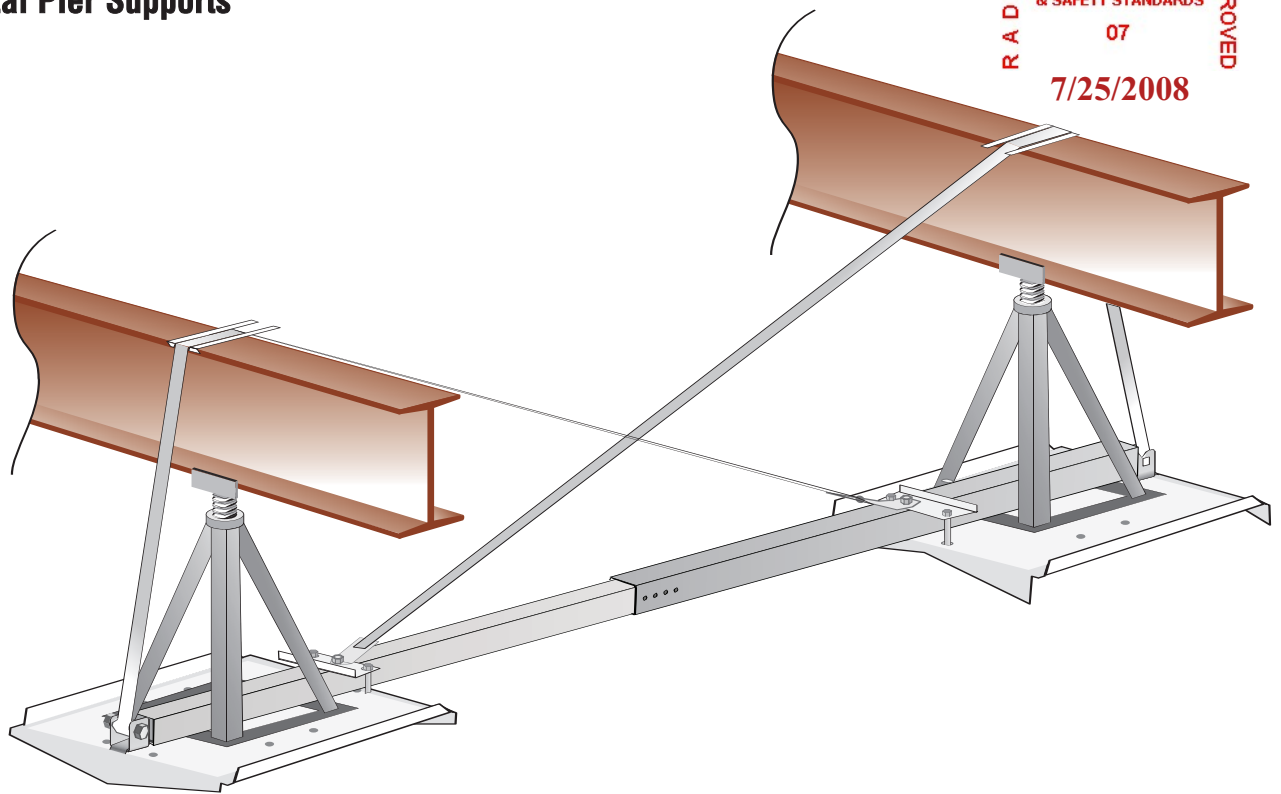


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Metal Pier Supports



For metal piers, place the piers in the center of the Vector pad. Set the strut through the piers so that it butts up against the tension bracket. Inside tie bracket mounts upside down as shown in drawing. Metal piers on Vector can only be used on level ground sets.

Conventional pier adjusters must be placed under beam with head fastened to beam.

Pier spacing must be consistent with home manufacturers' installation instructions and/or state requirements.

WIND ZONE I for Single Section Homes

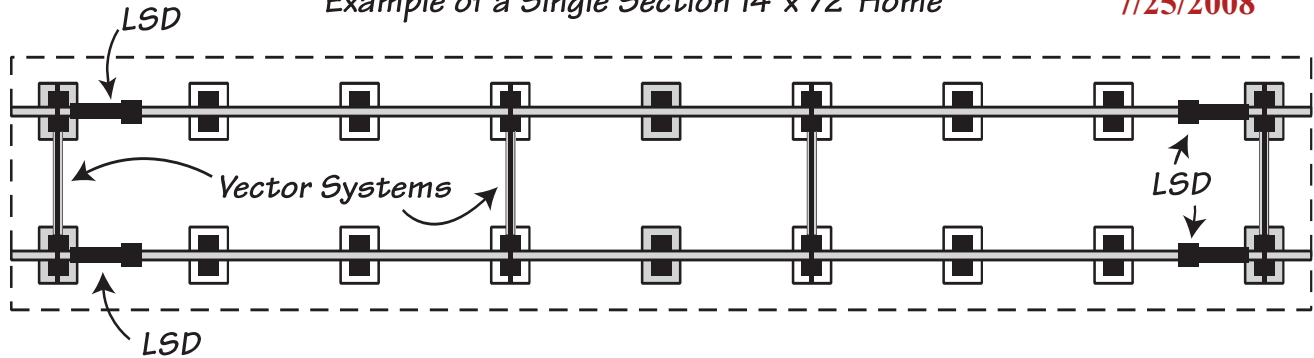
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Example of a Single Section 14' x 72' Home



Soil Bearing Capacity: 1,000 PSF Minimum

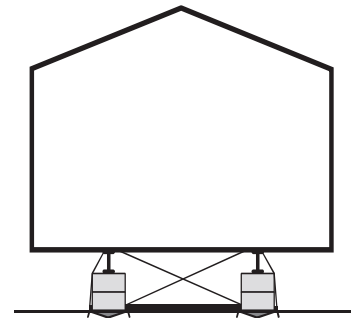
Home Length	Vector Systems Required	Longitudinal Stabilization (LSD)
0 to 80'	4	2

NOTES:

For use on 14' & 16' wide homes.
Main rail spacing on single wide must be 95" or more.
Pier heights cannot exceed 36".
Roof slope no greater than 20° (4.37 in. 12" pitch).

Vector Systems should be spaced as symmetrically as possible along the length of the home. Pier spacing must be consistent with home manufacturers instruction and/or state requirements.

Two Struts = 1 LSD System. Can be used on one pad or on opposite ends of home

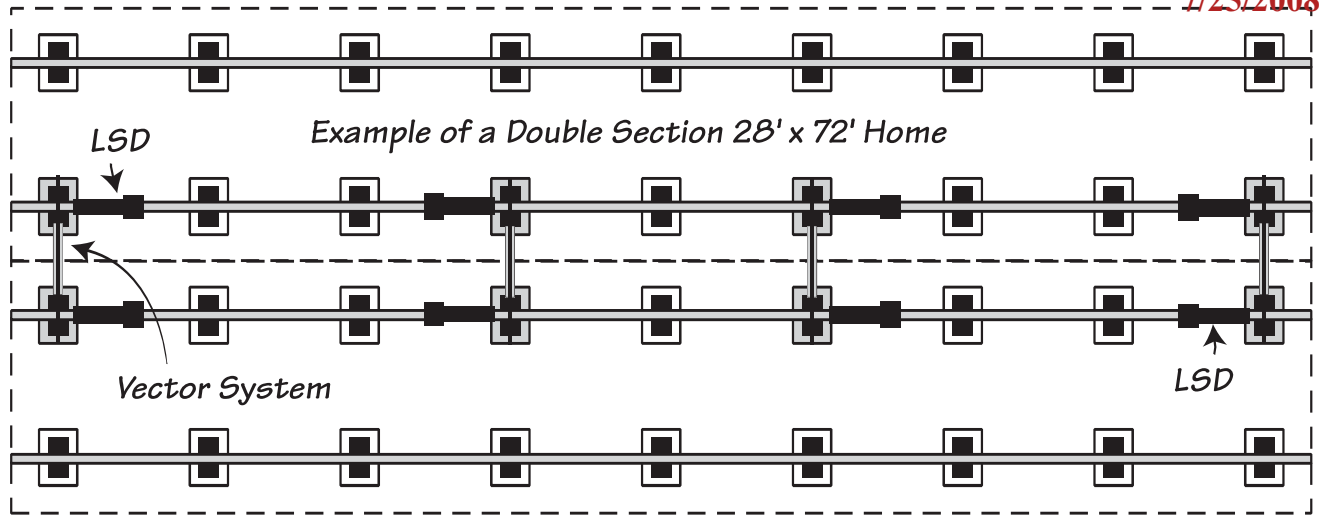


WIND ZONE I for Double Section Homes

Using Vector Dynamics Engineered Tie Down System

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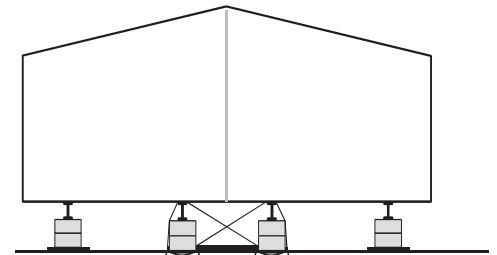
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Soil Bearing Capacity: 1,000 PSF Minimum

Home Length*	Vector Systems Required	Longitudinal Stabilization (LSD)
0 to 62'	3	2
63' to 80'	4	4

* Up to 7:12 Slope

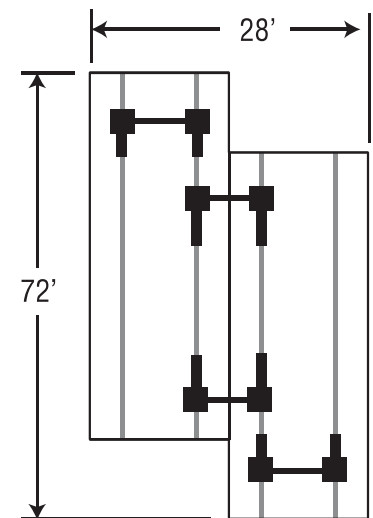


NOTES:

Vector Systems should be spaced as symmetrically as possible along the length of the home. Pier spacing must be consistent with home manufacturers instruction and/or state requirements.

Two Struts = 1 LSD System which can be used on one pad or on opposite ends of the home.

Diagram represents example of a double section offset. Total size is determined by the length of unit plus offset.

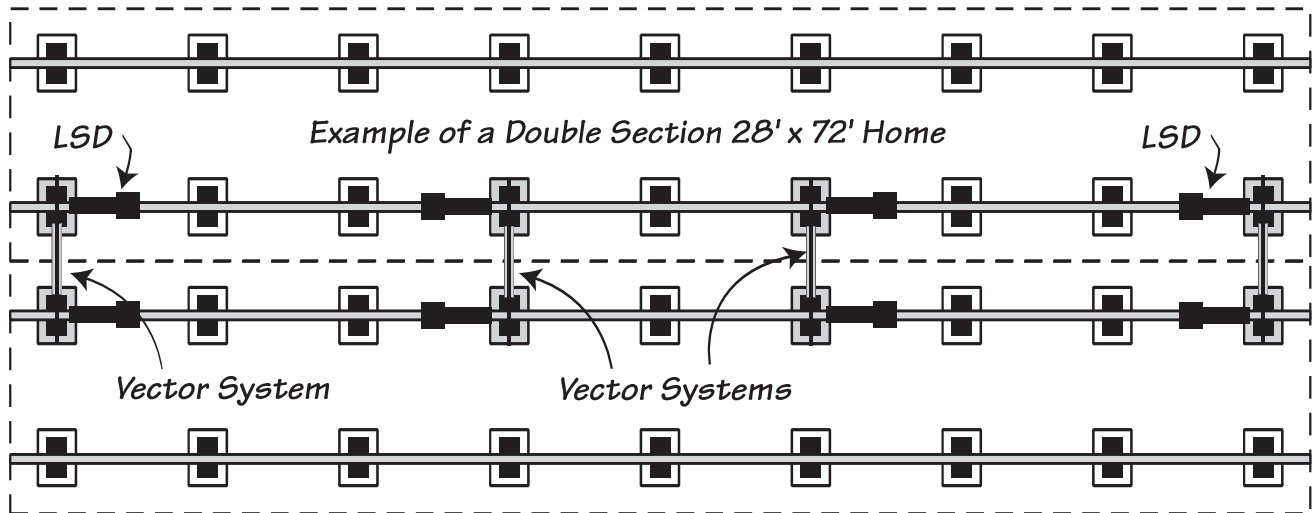


Example: 28' x 72'



WIND ZONE I for Double Section Homes (High Pier Sets)

Using Vector Dynamics Engineered Tie Down System



Soil Bearing Capacity: 1,000 PSF Minimum

Home Length	Vector Systems Required over 24"	Longitudinal Stabilization (LSD)
0 to 80'	4	4

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NOTES:

Pier height is measured from top of the Vector Pad to the bottom of the I-beam.

Vector Systems should be spaced as symmetrically as possible along the length of the home. Pier spacing must be consistent with home manufacturers instruction and/or state requirements.

Two Struts = 1 LSD System which can be used on one pad or on opposite ends of the home.

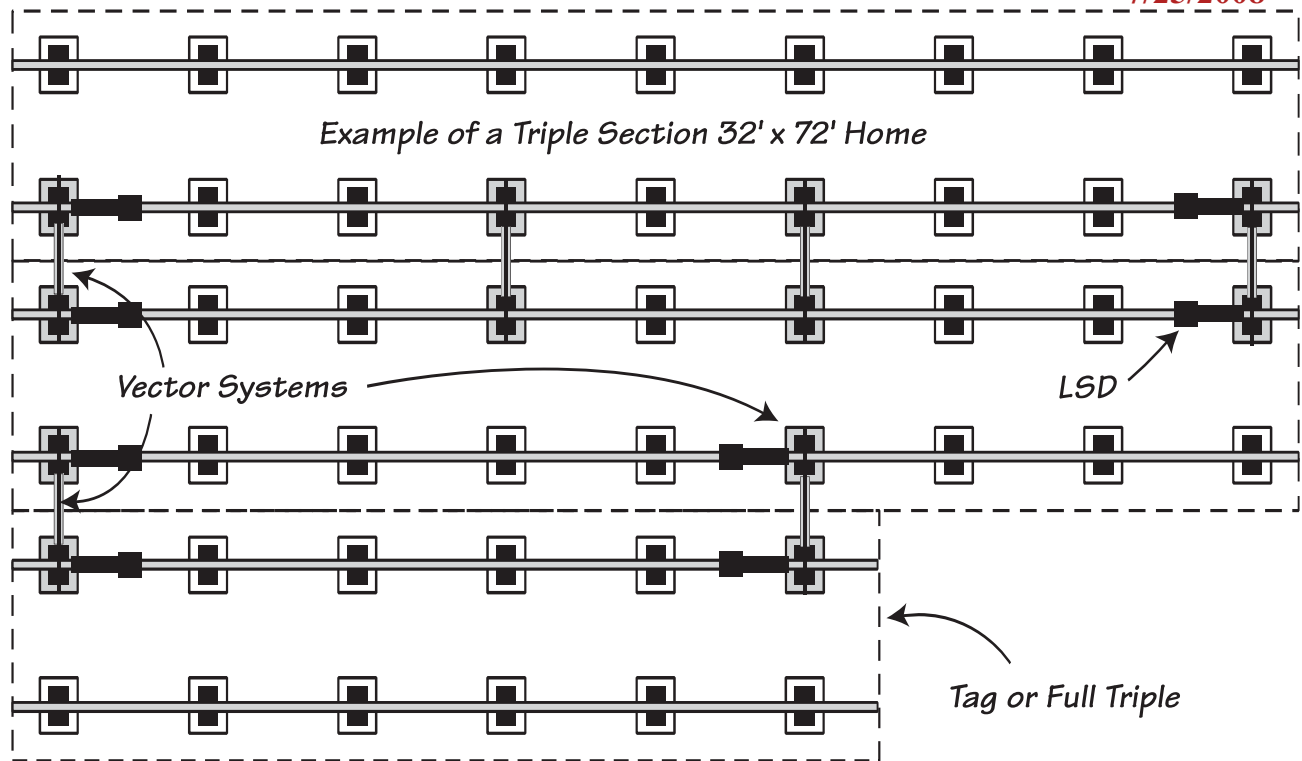


WIND ZONE I for Triple Section Homes

Using Vector Dynamics Tie Down System

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Soil Bearing Capacity: 1,000 PSF Minimum

Home Length	Vector Systems Required	Longitudinal Stabilization (LSD)	Tag Or 3rd Section
0' to 80'	4 + 2 on Tag	2	2

NOTES:

Vector Systems should be spaced as symmetrically as possible along the length of the home. Pier spacing must be consistent with home manufacturers instruction and/or state requirements.

Two Struts = 1 LSD System which can be used on one pad or on opposite ends of the home.

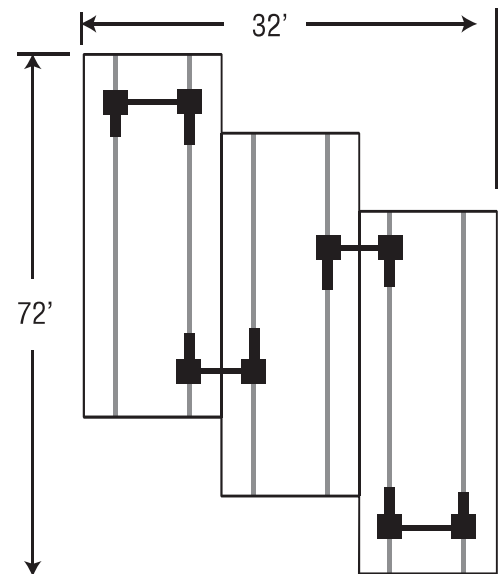


Diagram represents example of a triple section offset. Total size is determined by the length of unit plus offset.

Vector Dynamics System for Concrete Applications

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Instructions

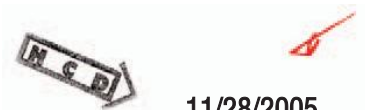
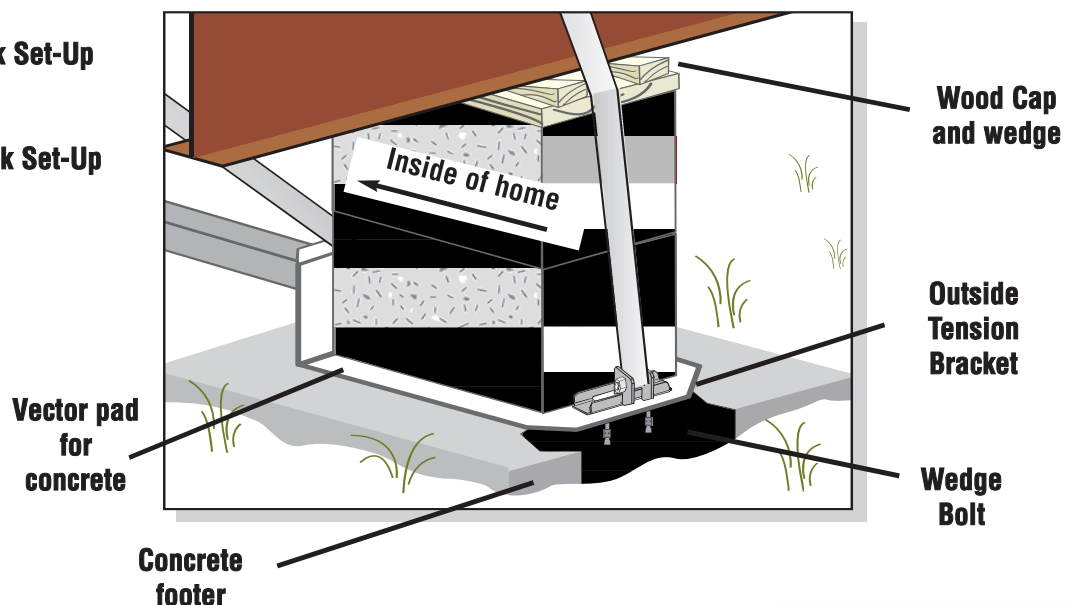
Read and follow all applicable instructions and guidelines in the Vector instructions and home installation manual. The Vector system for concrete pads applies to concrete footers, runners and slabs. Minimum size of concrete per Vector pier is 24"x24" x 4" or 18" round (min) x 10" deep. The bottom of footers must be below the frost line or a minimum of 4" below finished grade whichever is greater. Concrete must be sufficiently cured and set to accommodate an anchor bolt to its' full load resistance.

1. Determine location of pier sets where the Vector systems will be located.
2. Place one Vector concrete pad (galv. metal) on the concrete where the pier will be located, centered under the I-beam of the home. Place the upturned edge towards the center of the home and directed to the opposite Vector pier. Do the same for the opposite Vector pier.
3. Place a long u-bolt through the holes of the Vector pad as shown.
4. Place the concrete pier blocks on the Vector pad. Center the blocks under the frame. The upturned edge end of the Vector pads should be up against the inside of the pier blocks.
5. Build vector piers but do not wedge at this time.
6. Using a concrete drill bit, drill two holes on each side into the concrete using the holes in the Vector pad as a guide. Drill the 3/8" diameter holes 3 inches deep.
7. Place an outside tension bracket on the Vector pad as shown in Illustration one. Line up the holes in the bracket, Vector pad and concrete pad.

Illustration One:

Single Block Set-Up
Part #59036

Double Block Set-Up
Part #59049



Vector Dynamics System for Concrete Applications

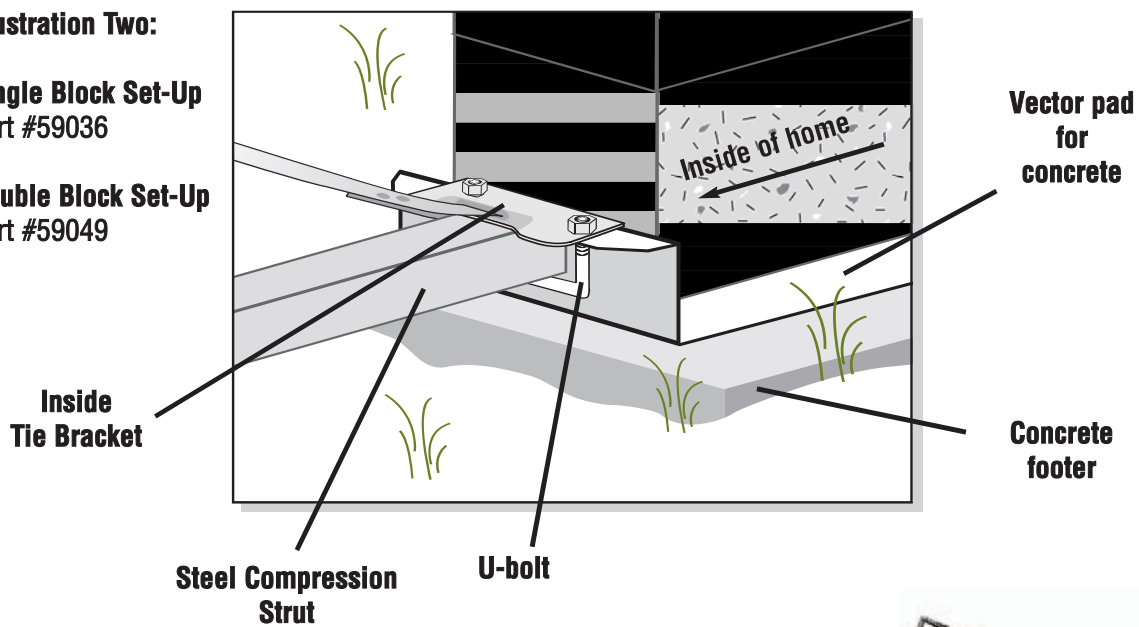


8. Put a washer and nut on one of the 3/8" x 3-3/4" wedge anchors. The nut should be screwed on enough to have 1 or 2 threads showing on the top of the bolt. Place the wedge end of the bolt into one of the holes, going through the outside tension bracket, metal Vector pad and into the concrete.
9. Using a hammer, tap the wedge bolt into the hole. Maximum height for expansion bolt above concrete is 2".
10. Repeat for the other hole in the outside tension bracket and the two holes on the other Vector system pier set.
11. Place an inside tie bracket over the u-bolt so that the lip of the bracket is between the Vector plate and concrete blocks. Place washers and nuts on each U-bolt. Do not tighten yet.
12. Attach a strap w/hook or swivel strap w/nut & bolt. Place other end of the strap over opposite I-beam & down to outside tension bracket. Cut strap 12 - 15 inches past bracket. Attach strap & slotted bolt in bracket. Tighten strap until tight with 4-5 wraps around bolt. Repeat with opposite strap.
13. Tighten inside u-bolts at this time.
14. Use the outside tension brackets to remove any space between the outside tension brackets, concrete blocks and the inside edge of the Vector pad, by tapping the brackets with a hammer. Wedge the pier set at this time.
15. Using a 9/16" socket wrench, tighten all of the wedge/anchor bolts, securing the outside tension bracket and Vector pad to the concrete.
16. Using a slotted bolt in the outside tension brackets, insert strap through slotted bolt with end of strap aligned with outside edge of bolt. Turn slotted bolt until straps are tight using at least five turns on the slotted bolts.

Illustration Two:

Single Block Set-Up
Part #59036

Double Block Set-Up
Part #59049





Parts Breakdown

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#59018-1 Hardware Kit for #59018 & #59276 Lateral System

- 2 10019 Flat Washer 1/2" zinc
- 4 10502 Flat Washer 3/8-16 zinc
- 4 10624 Hex Nut 3/8-16 Grade 5 zinc
- 2 10646Y Hex Nut 1/2-13 Grade 5 zinc
- 2 10925 Carriage Bolt 1/2 x 1 Grade 5 zinc
- 2 59135 Slotted Bolt w/Nut
- 2 59232 Protecto Strap
- 2 59279 Diagonal Connector
- 2 59288 Vector Tension Head
- 2 83044Z U Bolt 3/8-16 x 4.06 x 4.88 zinc

#10732 Hardware Kit Longitudinal

- 4 10804 Carriage Bolt 3/8-16 x 1 Grade 5 zinc
- 4 10502 Flat Washer 3/8-16 zinc
- 4 10624 Hex Nut 3/8-16 Grade 5 zinc

#10732-1 Hardware Kit Longitudinal

- 8 10926 Carriage Bolt 1/2-13 x 1-1/4 full Thread
- 12 10646Y Hex Nut 1/2-13 Grade 5 zinc
- 4 10801 Carriage Bolt 1/2-13 x 2-1/2 Grade 5 zinc

#10733 Longitudinal Hardware for #59013 Kit

- 1 10732 Hardware Kit
- 1 10732-1 Hardware Kit
- 2 59282 Tension Link
- 2 59272-1 Beam Clamp Base
- 4 59272-2 Beam Clamp Top Flange

#59036-2 Vector Sub Kit for Concrete

- 4 10502 Flat Washer 3/8-16 zinc
- 4 10530 Hardware Anchor wedge 3/8 x 3.50
- 4 10624 Hex Nut 3/8-16 Grade 5 zinc
- 3 83004Z U Bolt 3/8-16 x 4.56 x 5.50 1-3/4 Thread zinc
- 2 59135 Slotted Bolt w/Nut
- 2 10926 Carriage Bolt 1/2-13 x 1-1/4 Full Thread
- 2 10646Y Hex Nut 1/2-13 Grade 5 zinc
- 2 10019 Flat Washer 1/2 zinc

#59036-1 Hardware for #59036 and #59049 Lateral Concrete System

- 1 59036-2 Sub Kit
- 2 59279 Diagonal Connector
- 2 59282 Tension Link
- 2 59232 Protecto Strap

#59023 Longitudinal Hardware

- 4 10530 Hardware Anchor Wedge 3/8 x 3.50
- 1 10732-1 Hardware Kit
- 2 59272-1 Beam Clamp Base
- 4 59272-2 Beam Clamp Top Flange
- 2 59282 Tension Link

#59026 Longitudinal Hardware

- 2 59272-1 Beam Clamp Base
- 4 59272-2 Beam Clamp Top Flange
- 2 59288 Vector Tension Head
- 1 10732-1 Hardware Kit

#48612-1 Compression Strut Hardware

- 2 10999 U Bolt 3/8-16 x 4.06 x 2.75 1-3/4 Thread zinc
- 4 10502 Flat Washer 3/8-16 zinc
- 4 10624 Hex Nut 3/8-16 Grade 5 zinc
- 6 10556 Tek Screw #12 x 1

