

GROUND ANCHOR INSTALLATION INSTRUCTIONS

- NOTE: 1) The split bolt can be inserted in the head from either side.
2) In areas of severe cold weather, where possible damage could occur from frost heave, the home owner should be prepared to adjust tension on the straps to take up slack.

Ground anchors come in a variety of lengths and designs. Always test the soil with a “soil test probe” prior to any anchor installation. This will determine the proper anchor for the soil condition. **WARNING!** Prior to any anchor installation, determine that the anchor location around the home will not be close to any underground electrical cables, water lines or sewer pipes. Failure to determine the location of electrical cable may result in serious injury or death.

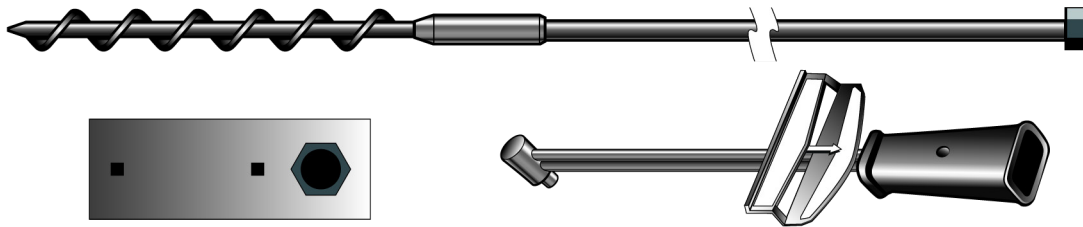


Table 1: Anchor Soil Classification Table

Product	Application	Soil Class	Test Value	Rod Length (in.)	Rod Diameter (in.)	Helix Diameter (in.) & Qty			Finish	Stabilizer
						4"	6"	7"		
OT30CDP	Rock	1	N/A (Solid Rock)	30	3/4				Painted	OT MSP 2P
OT3044AP	Ground	3	350-550 in-lbs.	30	5/8	2			Painted	OT MSP 2P
OT3044BP	Ground	3	350-550 in-lbs.	30	3/4	2			Painted	OT MSP 2P
OT3044BPC	Ground	3	350-550 in-lbs.	30	3/4	2			Painted	Integrated Cap
OT3646BP	Ground	4a	276-350 in-lbs.	36	3/4	1	1		Painted	OT MSP 2P
OT3646BG	Ground	4a	276-350 in-lbs.	36	3/4	1	1		Galvanized	OT MSP 2P
OT3646BPC	Ground	4a	276-350 in-lbs.	36	3/4	1	1		Painted	Integrated Cap
OT4244BP	Ground	4a	276-350 in-lbs.	42	3/4	2			Painted	OT MSP 2P
OT486A	Ground	4a	276-350 in-lbs.	48	5/8		1		Galvanized	OT MSP1 or 1055-19
OT486B	Ground	4a	276-350 in-lbs.	48	3/4		1		Galvanized	OT MSP1 or 1055-19
OT607B	Ground	4b	175-275 in-lbs.	60	3/4			1	Galvanized	OT MSP1 or 1055-19
OT CAD	Concrete	N/A	2,500 psi concrete	3	5/8				Painted	N/A
OT CADG	Concrete	N/A	2,500 psi concrete	3	5/8				Galvanized	N/A
OT CAWP	Concrete	N/A	2,500 psi concrete	8	5/8				Painted	N/A
OT CAW-S	Concrete	N/A	2,500 psi concrete	9	5/8				Painted	N/A

REMEMBER: Each State, County, or Municipality may require a specific anchor from the groups shown for each soil classification. Check State & local regulations first.

NOTE: Many anchors are designed for particular soil condition(s) and are unacceptable for use in other soil types. We have listed the soils for which each anchor is designed and approved. Soil classifications are taken from the “standard for the installation on mobile homes.” Each anchor listed meets ANSI A225.1 and ASTM D3953.91 codes.

DISCLAIMER: All Oliver Technologies products must be installed in accordance with Oliver Technologies installation instructions, the home manufacturer’s installation requirements, and all applicable local, state, and federal codes and regulations. Products shall not be modified or used outside their intended application. Failure to follow installation requirements may result in property damage, product failure, serious injury, or death.

INSTALLATION INSTRUCTIONS OTI AUGER ANCHOR

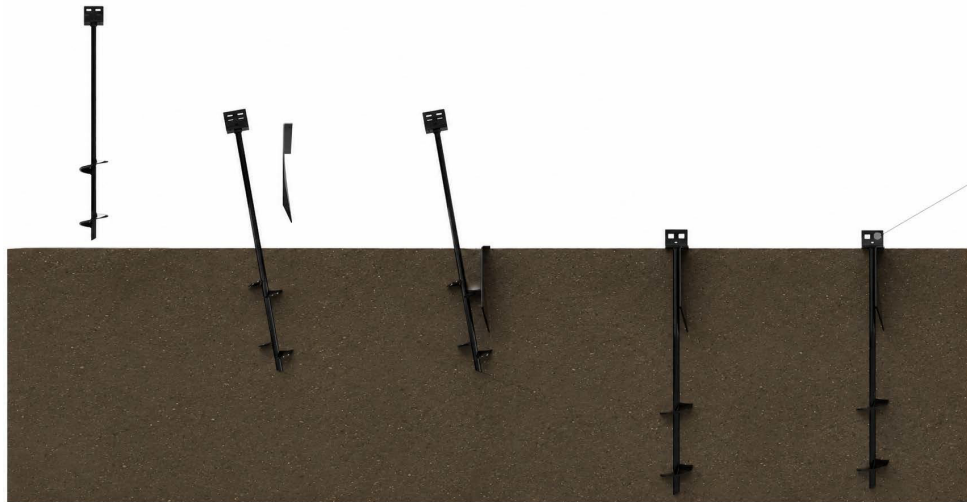


FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

1. Attach anchor to machine (two person operation). Place anchor in proper position in line with the strap.
2. Install the anchor into the ground leaving 14" - 16" of the rod exposed. (FIG. 1)
3. Place the stabilizing plate in front of the shaft in the direction of pull. Always remove vegetation under the stabilizing plate. (FIG. 2)
4. Drive the stabilizing plate into the ground (FIG. 3)
5. The anchor is then turned into the ground to a point where the bottom of the tension head is at or slightly below ground level. Engineered to allow ground anchor to be installed at a slight back angle of 10 degrees. (FIG. 4)
6. Use Galvanized Strapping page for installation instructions for proper tensioning on anchor and stabilizer plate (FIG. 5)

IMPORTANT NOTES

- Anchors must be approved by the authority having jurisdiction.
- Anchors must be installed in the correct soil types (classes 2, 3, 4a or 4b).
- The maximum allowable working load of the anchors are 3150lbs and shall withstand a 50% overload (4725lbs)

QUICK ANCHOR INSTALLATION INSTRUCTIONS

OTI Anchor Model #'s OT3044BPC (welded cap) and OT3646BPC (welded cap)

1. Attach anchor to drive machine (two person operation). Place anchor in proper position.
2. The anchor is then turned into the ground to a point where the bottom of the tension head is at or slightly below ground level. (Fig. 3)
3. Use installation instructions on galvanized strapping page for proper tensioning of anchor and stabilizing device.

Note: In certain soil conditions, it may be difficult to install anchors using standard methods. In these cases anchors may be manually installed by following the procedure below:

Step 1: Excavation and Anchor Placement

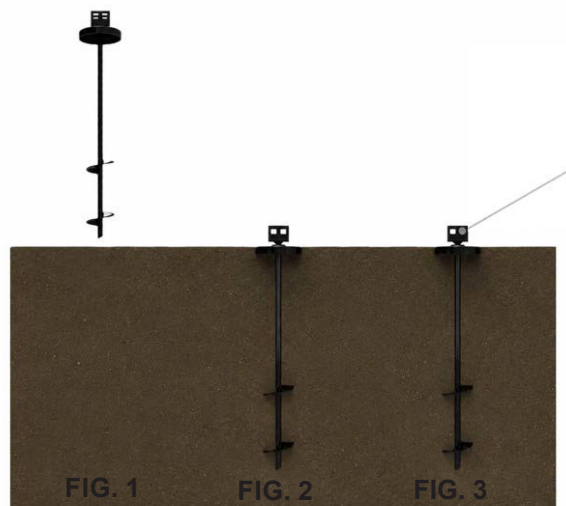
- Dig a hole to a depth equal to two-thirds of the anchor length. This can be achieved manually or with the use of equipment.
- Install the anchor.

Note: For Anchors with integrated stabilizer caps, leave stabilizer approx. 1" above surface. Rotate anchor/ stabilizer cap into ground once compaction is complete, until top of stabilizer cap is at ground level.

Step 2: Backfill and Compaction

- Any fill material placed beneath or around the anchor should consist of clean, non organic material.
- Backfill shall be compacted in lifts not exceeding six inches to a minimum of 90% maximum density, per ASTM D-698 Standard Proctor.
- Ensure uniform, stable support and full soil contact around the anchor assembly.

Note: In loose soil conditions, additional testing may be required to verify that the anchor can achieve the proper holding power.



IMPORTANT NOTES

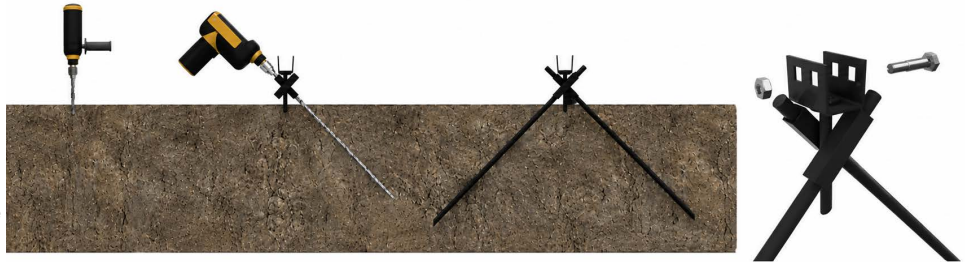
PATENT # 6,298, 611B1

- Anchors must be approved by the authority having jurisdiction.
- Anchors must be installed in the correct soil types (Classes 2, 3, 4a or 4b).
- OT3646BP: In class 4a, the soil torque value must be 276 in. lbs. or greater at the stabilizer device depth and the soil torque value must be 276 in. lbs. or greater at the bottom helix depth. In class 3 soil: OT3646BP or OT3044BP, the soil torque value must be 350 in. lbs. or greater at the stabilizer device depth and the soil torque value must be 350 in. lbs. or greater at the helix depth.
- The maximum allowable working load of the anchors are 3150lbs and shall withstand a 50% overload (4725lbs).

GROUND ANCHOR INSTALLATION INSTRUCTIONS

CROSS DRIVE ROCK ANCHOR (Model# OT36CDP)

1. Drill a 5/8" diameter hole 5 1/2" deep, on a 90 degree angle on center of anchor location. Place OT 36 CDP Rock Anchor Head into hole. The distance from the square tubing to the rock surface shall not exceed 1".
2. Drill two - 3/4" diameter holes in rock at 45 degree angles, using anchor head as a location guide.
3. Place rod through the top of (1) square tube and into hole.
4. Rod must be driven into rock at least 24" in order to achieve minimum allowable pullout resistance.
5. Place the second rod through the top of the remaining tube.

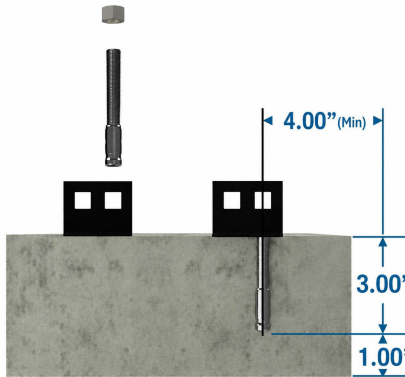


APPROVED FOR SOLID ROCK ONLY

NOTE: Where solid rock is encountered below finished grade, the OT 36 CDP anchor may be installed below grade. In such cases, the installed anchor location shall remain open and accessible for verification. The installation must be inspected and approved by the local authority having jurisdiction (AHJ) prior to backfilling, to confirm that the anchor has been properly installed in solid rock and that the required minimum embedment has been achieved. The maximum allowable working load of the anchor is 3150lbs and shall withstand a 50% overload (4725).

CONCRETE DRY SET INSTALLATION Model# OTCAD (Offset)

1. Drill a 5/8" diameter hole 4" minimum from the edge of the slab or footing.
2. Place tension head on slab and install supplied 5/8" diameter expansion bolt into predrilled hole.
3. Tighten until maximum expansion of steel sleeve has been achieved, or per manufacturer's instructions.



- Minimum slab area per anchor

4" slab - 95 sf
6" slab - 65 sf
8" slab - 48 sf

The OTCAD Patio Anchor shall be installed using the supplied anchor bolt or a concrete fastener equivalent, provided the substituted fastener has a minimum diameter of 5/8" and meets or exceeds a minimum pullout strength of 4,725 lbs.

The maximum allowable working load of the anchor is 3150lbs and shall withstand a 50% overload (4725lbs).

CONCRETE WET SET INSTALLATION (Model# OTCAWP, OTCAW or OTCAW10)

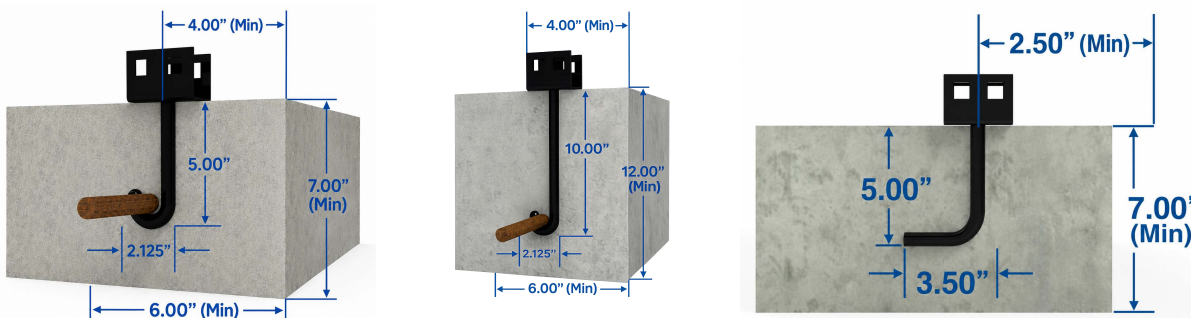
1. Insert anchor into wet concrete so that the bottom of the anchor head is flush with the concrete. Provide a minimum spacing of 4" center-to-center between 5/8" anchor rod installations and maintain a minimum distance of 4" from any concrete edge to the centerline of the anchor rod.

Note: Concrete must be a minimum thickness to allow at least 2" of concrete below bottom of rod at anchor location.

- The maximum allowable working load of the anchor is 3150lbs and shall withstand a 50% overload (4725lbs.) Concrete slab or footer must allow 4725lbs of vertical tension without lifting.

- Minimum anchor embedment - 5.00"
- Minimum slab area per anchor

4" slab - 95 SF
6" slab - 65 SF
8" slab - 48 SF

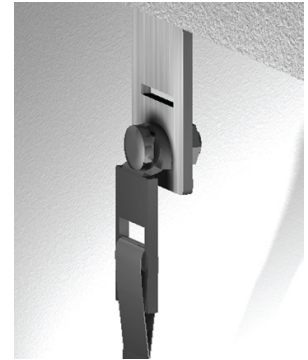


SIDEWALL AND LONGITUDINAL FRAME CONNECTORS MODEL# OTQC or OT SQ

STEP 1: Locate the sidewall or longitudinal bracket installed by home manufacturer, insert bolt through hole in Quick Connector then through hole in bracket.

STEP 2 : Place nut on bolt and tighten.

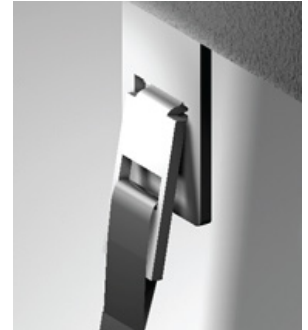
STEP 3 : Refer to strapping page for proper installation of strap.



STEP 1: Locate the sidewall or longitudinal bracket installed by home manufacturer, insert Quick Connector into bracket slot at 45 degree angle.

STEP 2 : Rotate Quick Connector until locked into position per illustration.

STEP 3: Refer to strapping page for proper installation of strap.



Model # OTSWB



Floor Joist Install:
Up to 10" from the edge

1. Locate the Desired location under home, on underside of the rim or floor joist.
 2. Position Sidewall Bracket with two holes centered on joist and the strap. Orientation of sidewall bracket does not affect performance.
 3. Mark the center of both holes and pre-drill two pilot holes using a 15/64" drill bit.
 - 4: Install (2) two lag bolts into pre-drilled holes to secure sidewall bracket.
- Minimum size:** 3/8"-7 x 3 1/2" with a minimum of 3 1/4" threads.
- 5: Refer to anchor and strapping installation instructions for proper installation of anchor and strap. NOTE: The OT SWB sidewall bracket can be used in place of any sidewall or marriage line bracket that is rated at or below 3150 lbs. working load.

I-BEAM FRAME CONNECTORS

FRAME TIE (OTFT-1)

STEP 1 : Attach frame clamp (hook) inside top flange of home frame.

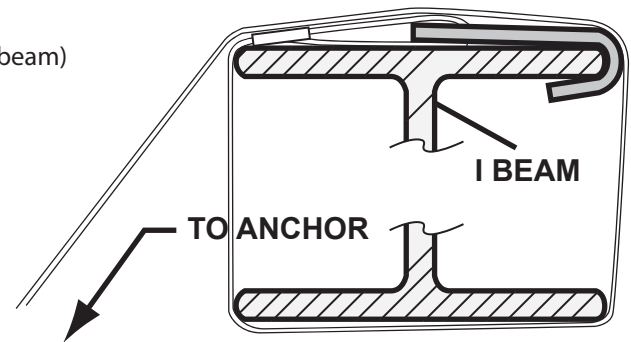
STEP 2 : Place strap between the frame and home as shown. (wrapping I-beam)

STEP 3 : Pull strap tight and attach to the anchor tension head. (Refer to strapping page for proper installation of strap.)

NOTE: The frame tie has an allowable working load of 3150 lbs., with no more than 12% elongation and shall withstand a 50% overload (4725 lbs. total)

OTFT-1 with factory installed strap

Enlarged End View of I-Beam Floor



DOUBLE SLOTTED BUCKLE (OTST-1)

INSTALLATION INSTRUCTIONS

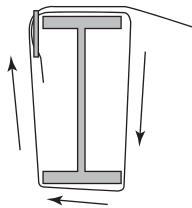


STEP 1 : Thread frame tie strap through buckle as shown.

STEP 2 : Thread long end of strap between the frame and floor of home.

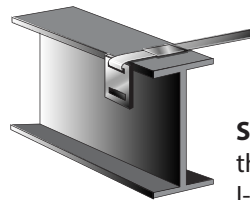
STEP 3 : Ensure proper strap tension. (Refer to strapping page for proper installation of strap.)

NOTE: The maximum allowable working load capacity of the strap woven through the slots in the buckle is 3150 lbs., with no more than 12% elongation and shall withstand a 50% overload (4725 lbs. total)

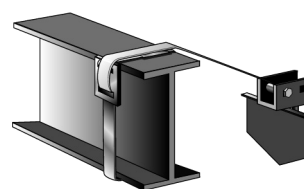
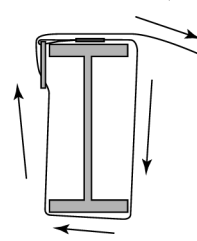


FACTORY CRIMPED DOUBLE SLOTTED BUCKLE (OTST-1)

INSTALLATION INSTRUCTIONS

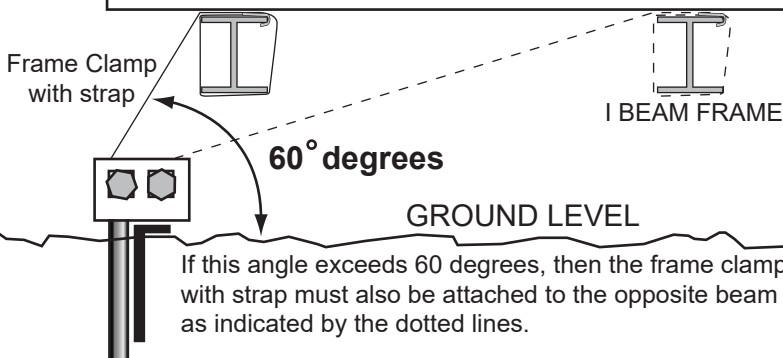


STEP 1 : Install strap by pushing the end of the strap between the inside of the frame I-beam and the floor. **STEP 2 :** Position the buckle at the upper end of the I-beam frame. Wrap the end of the strap through the slot in the buckle as shown. Push the end of the strap in between the I-beam and floor.



NOTE: The maximum allowable working load capacity of the strap woven through the slots in the buckle is 3150 lbs., with no more than 12% elongation and shall withstand a 50% overload (4725 lbs. total)

MANUFACTURED HOME

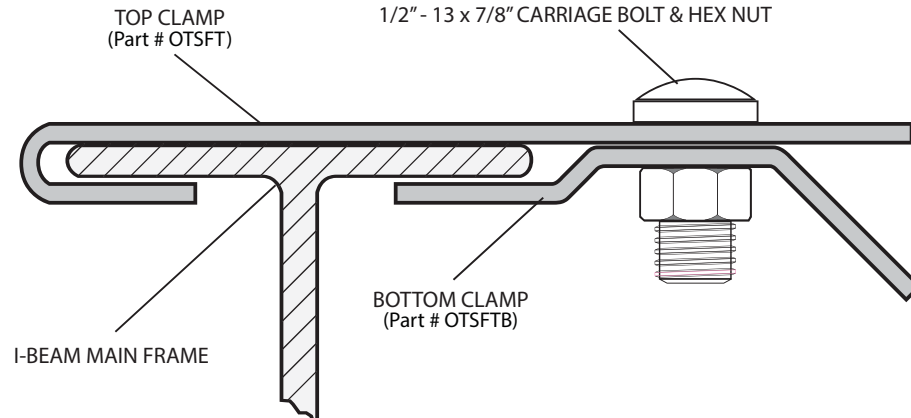


- 1) The tensioning bolt can be inserted in the head from either side.
- 2) In areas of severe cold weather where possible damage could occur from frost heave, the homeowner should be prepared to adjust tension on the straps to take up slack.

SWIVEL FRAME TIE

Model # OTSFT

PATENT # 6,928,783,B2



STEP 1: Place top clamp over the top of the I-Beam.

STEP 2: Place the carriage bolt in the first exposed hole closest to the I-Beam. (Top clamp works on I-Beam sizes 2 3/4" through 4") (Part # EXTOTSFT extended top clamp works on I-Beam sizes 7" - 9")

STEP 3: Attach the bottom clamp (with pre fabricated strap) by tightening the carriage bolt and hex nut.

STEP 4: The Swivel Frame Tie and attached strap should be installed perpendicular to the I-Beam when possible, however there is an allowance of 7.5 degrees in either direction from perpendicular.

NOTE: DO NOT WRAP STRAP AROUND FRAME. The maximum allowable working load capacity of the OTSFT is 3150 lbs., with no more than 12% elongation and shall withstand 50% overload (4725 lbs.).

OTI anchors and components will perform at this design load regardless of the wind pressures and distance from the coastline, provided that the number, location and spacing of the components is such that the design load of 3150 is not exceeded.

Fastener required to assemble both parts 1/2" - 13 x 7/8" carriage bolt and hex nut (abstract of SAE J429 1985) coating ASTM standard B633-85 (re-approved 1994).

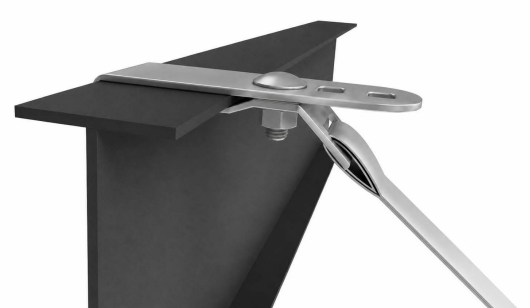
Step 1
Position Top Clamp



Step 2
Install Hardware



Step 3
Complete Installation



INSTALLATION INSTRUCTIONS

MODEL # OTLT LONGITUDINAL BEAM CONNECTOR

Use with OTQC (Quick Connector Strap)

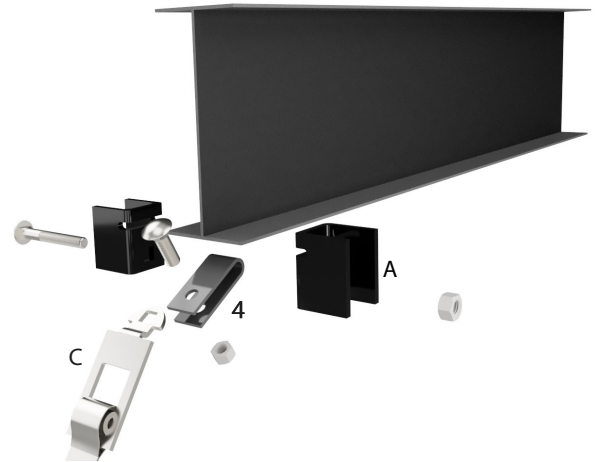
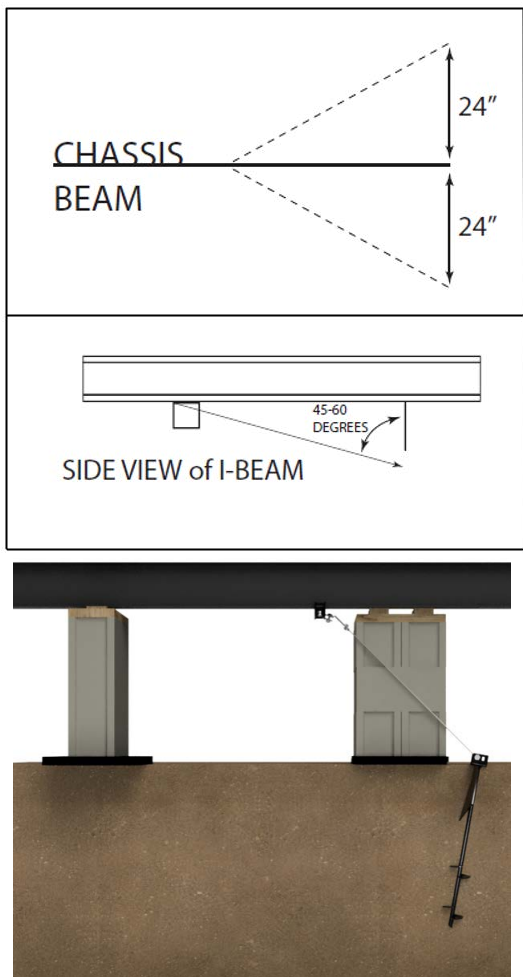
STEP 1: Attach the longitudinal beam connectors (A) on the bottom flange of the I-beam, tighten beam connectors with carriage bolt & nut 2 1/2 turns past hand tight.

STEP 2: Slide clip (B) over bolt and attach swivel clamp (C) with 1 1/2" carriage bolt & nut and tighten with standard hand tools.

STEP 3: Refer to anchor and strapping installation instructions for proper installation to anchor and strap.

NOTE: 1) End tie-downs shall be located within 24" of either side of chassis beam axis as refer to "*" below.

2) Brackets need to be connected to I-Beam at proper distance from anchor so that correct strap angle can be achieved.



*When following the home installation instructions, the installer must use the numbers and angles of the longitudinal ties specified by the home installation instructions. The longitudinal tie angles shall not exceed the limits of these OTLT instructions.

Patent # 6,725,613B2

TABLE 1

The maximum allowable working load capacity of the OTQC is 3150 lbs., with no more than 12% elongation and shall withstand 50% overload (4725 lbs.)

Fastener required to assemble both parts (1) 4" and (1) 1 1/2" - 13 x 7/8" carriage bolt & hex nut. (abstract of SAE J429 1985) coating ASTM standard B633-85 (re-approved 1994)

INSTALLATION INSTRUCTIONS GALVANIZED STRAPPING and SPLIT BOLTS

STRAP SPLICE

To lengthen strap in the field. Overlap strap and use two crimp seals evenly spaced, with 2 crimps per seal.



2 Seals - 2 Crimps per seal

STRAP CONNECTOR

One crimp seal is used when strap is attached to a sidewall bracket or a strap connector. If the bracket does not have a radius edge, a radius clip (short "U" shaped piece of strap) must be placed between the strap and contact point to protect the strap from sharp edges.

Seals specifications: Type 1, Finish B, Grade 1, Semi-open crimp seals



1 Seal- 2 Crimps
Strap Connector

Certified Galvanized Strapping

HUD requires that certified strapping must meet ASTM specification. OTI strapping is marked every 12 inches.

Oliver Technologies, Inc.
Certified TO
ANSI A225.1 ASTM D3953-97



Material: Type 1, Finish B, Grade 1
Dimension of strapping: 1 1/4" width, .035 thickness + or - .003



SPLIT BOLT

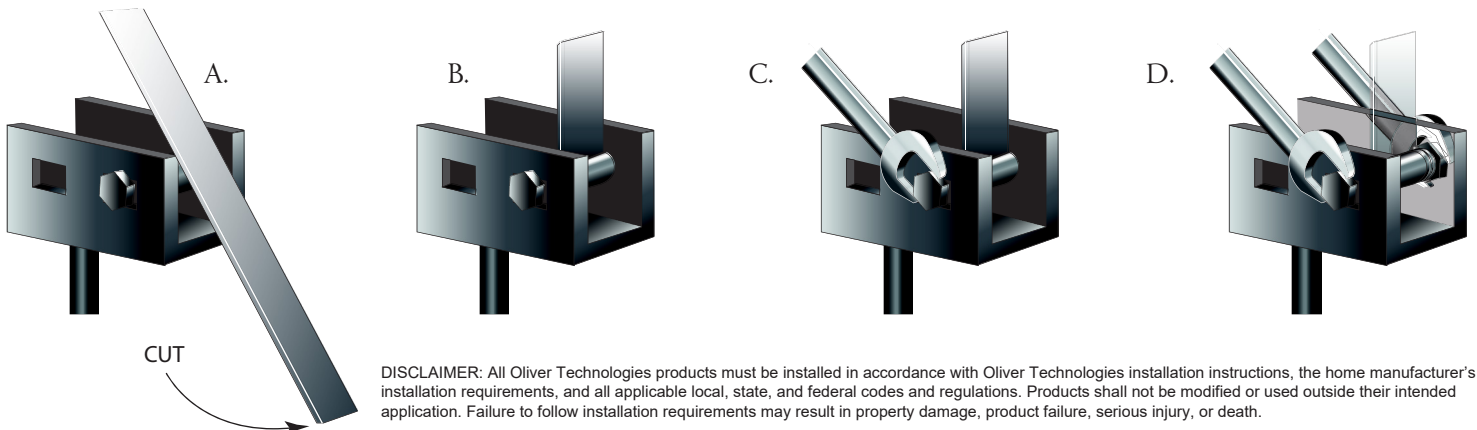
Galvanized split bolt:
5/8"x3"x5/8" sq. shoulder with hexagon head, Standard national thread, shaft saw cut.

1. ENSURE PROPER STRAP TENSION:

- A) Insert split bolt into anchor head, attach loosely. Pull strap past bolt and cut strap leaving approximately 12" of strap to wrap onto bolt.
- B) Insert the strap end into the slot in bolt until flush with opposite side of bolt.
- C) Using 15/16" wrench or socket; turn the bolt, winding the strap so that a minimum of four to five complete turns are made and the strap is adequately tensioned so that the anchor is firmly against the stabilizing device in direction of pull. All slack must be removed.
- D) Align square shoulder with square hole in tension head. Hold the bolt under tension while tightening the nut, drawing the square shoulder of the bolt into the recess, continue to tighten the nut until securely fastened.

NOTE: The split bolt can be inserted in the head from either side.

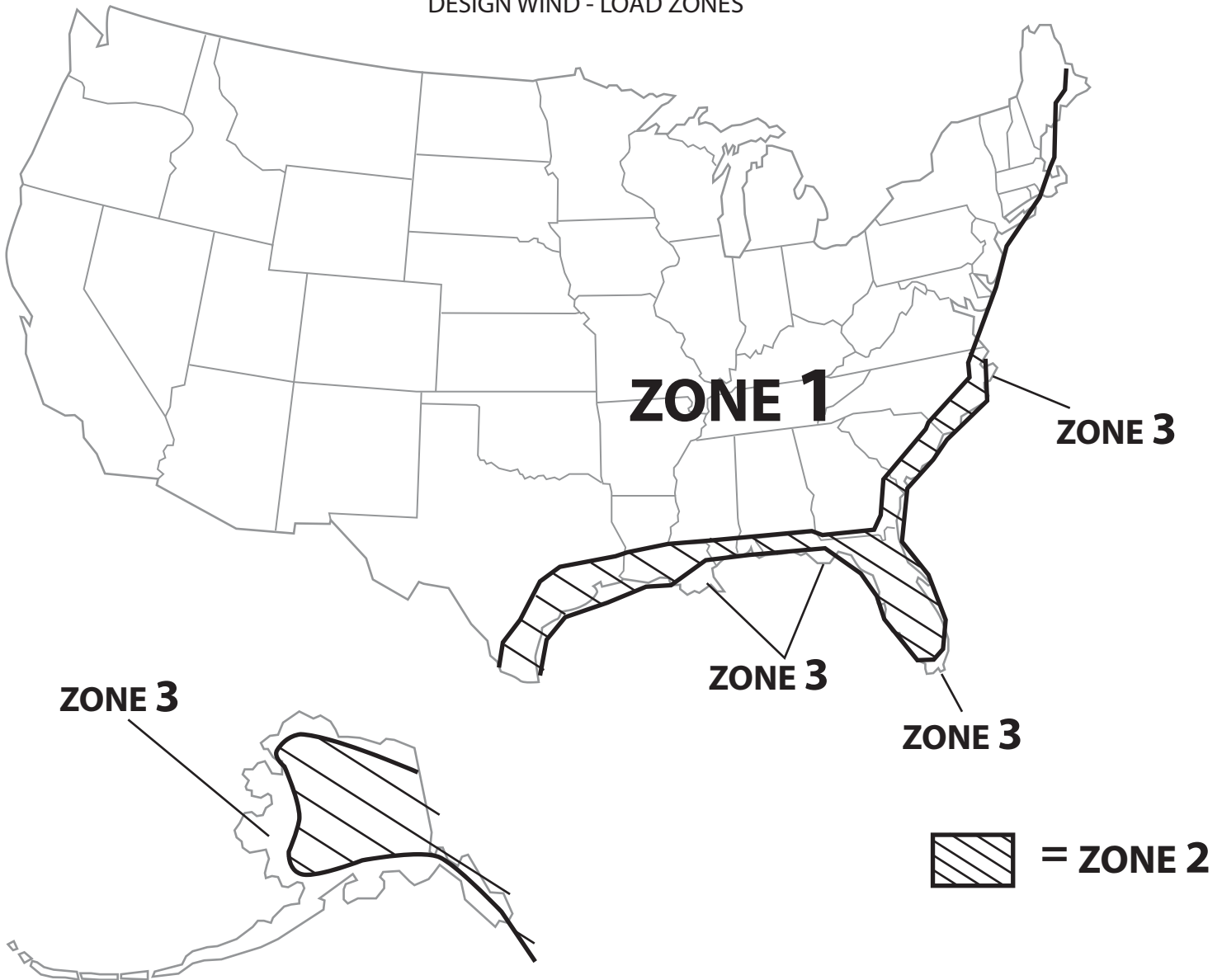
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WIND ZONE MAP

DESIGN WIND - LOAD ZONES



NOTE: psf = pounds per square foot

DESIGN WIND LOADS			
STANDARD WIND	ZONE 1	15 psf HORIZONTAL	9 psf UPLIFT
HURRICANE	ZONE 2	+ 39 psf HORIZONTAL	27 psf UPLIFT
HURRICANE	ZONE 3	+ 47 psf HORIZONTAL	32 psf UPLIFT

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