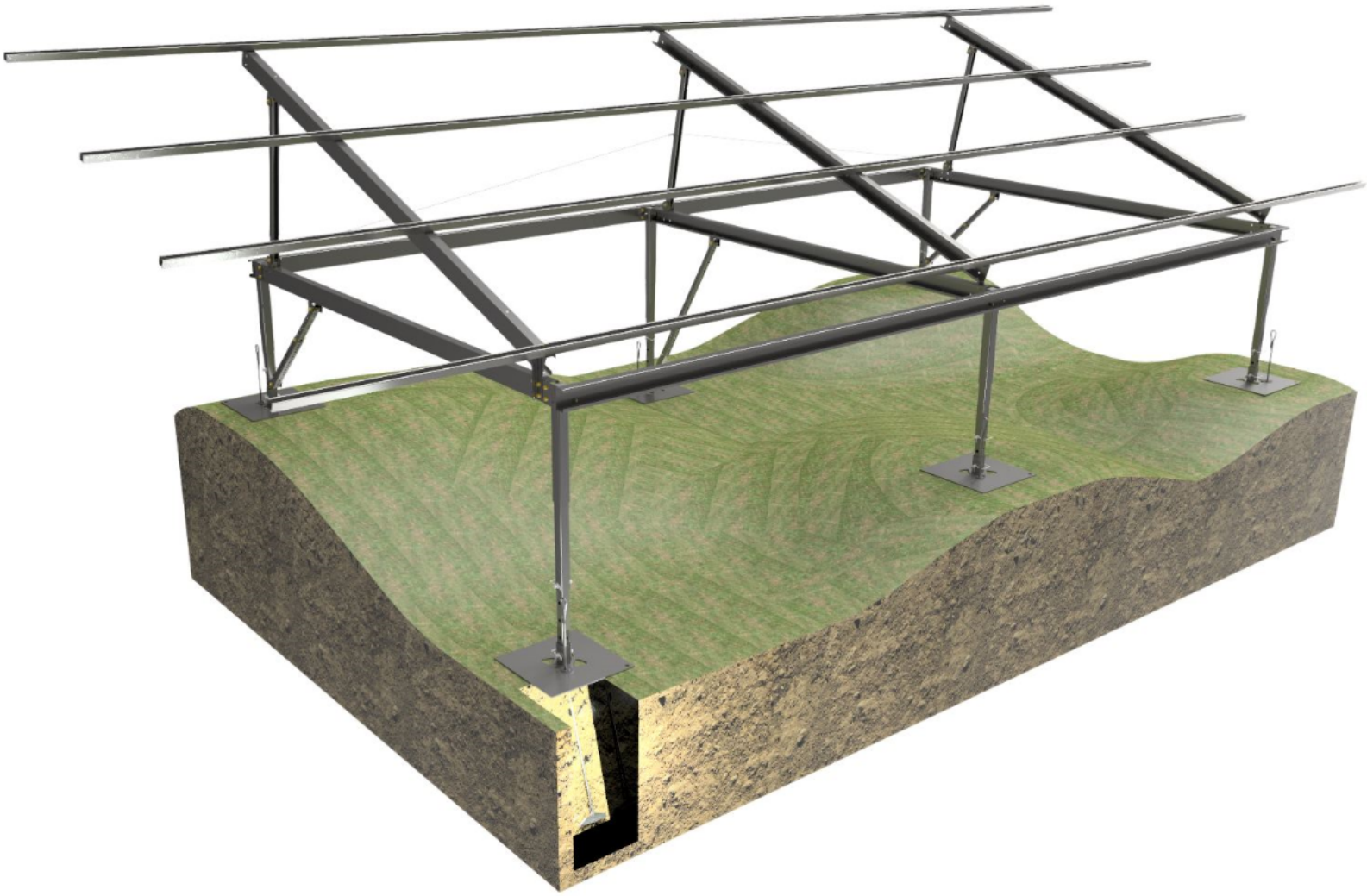


Osprey PowerPlatform®
Installation Manual Rev. 7.0

Table of Contents

Introduction

This manual is an installation guide and not meant to be a comprehensive technical engineering manual. It is for the assembly and installation of Osprey PowerPlatform®. The Osprey PowerPlatform® is different than other solar racking systems. Nuance Energy requires each Osprey PowerPlatform® unit to be built to Nuance Energy's specifications. However, EPC firms may find alternative means and methods of building the racking that work better for their situation, logistics, facilities and personnel, etc.

Product Summary and Intellectual Property

The Osprey PowerPlatform® is a proprietary and utility patented ground mount solar racking structure. The modular Osprey PowerPlatform® unit assembles rapidly on site and can be built with a non-skilled labor force if desired. No concrete or pile driving equipment is required and only common hand-held tools are necessary.

- Design and engineered to 2015 IBC and 2016 California Building Code.
- CPP Wind Tunnel Tested
- Certified to UL2703 and cETL Standards
- Each Osprey PowerPlatform is technology neutral and can host any size solar panel.
- Osprey PowerPlatform® (units) have power adjustable legs that work independent of each other so Osprey PowerPlatforms® can be installed on uneven terrain with little if any site preparation.
- Osprey PowerPlatforms® are engineered up to 170 MPH (ASCE 7-16) wind loads and snow loads up to 87 PSF.
- Refer to calculation packet for details. Each Osprey PowerPlatform® utilizes earth penetrating Earth Anchors. Earth Anchors have been proven and tested in a variety of applications, including electric utility poles, civil engineering, retention walls, marine tethering, and municipal drainage systems.

Using this earth anchor technology allows the install team to secure Osprey PowerPlatforms® to the ground and test for resistance to wind uploads in real time soil conditions eliminating the need for geotechnical soils report or impact studies.

Osprey PowerPlatforms® are also a portable solar ground mount system meaning the capital asset can be moved, as needed, and when combined with other Ospreys, they scale to thousands. The Osprey PowerPlatform® is a systematic approach to ground mount design and construction that is revolutionizing how ground mount solar systems are installed. Osprey PowerPlatforms® are currently being used in the design and development of solar energy systems for small utility scale solar projects, commercial and industrial, community solar farms, landfills, off-grid, agriculture and even rural residential solar projects throughout North America and Canada. The product name and product design have been protected in the United States Patent and Trademark office, and a utility patent has been granted.

Safety

Safety of people and property should always be considered the top priority. All personnel should be required to wear personal protective eye wear, clothing, footwear, and any other protective gear that complies with Contractor's Injury and Illness Protective Plan (IIPP). Many of the components that are fabricated and assembled to complete an Osprey PowerPlatform® are made of steel, therefore are heavy, may have sharp edges and can cause injury if not handled properly and with care. Additionally, as components get assembled, there are pinch points in the assembly that can compromise fingers and limbs, and therefore should be avoided.

Tools and Equipment

There are no specialized or unusual tools or pieces of equipment required for the assembly and installation of the Osprey PowerPlatform®. The following list shows the standard tools that are generally used for the assembly and production of the Osprey PowerPlatforms®. Installers may find alternatives or additions that are better suited for their situation.

Hand Tools

- Combination Rotary Hammer Drill for driving anchors with drive rods and drilling through frozen ground and Hard soils.
  - Bosch RH1255VC SDS-Max Rotary Hammer
  - Milwaukee 5342-21 2" SDS-Max Rotary Hammer
  - Also Recommended for use with the drill bit listed below for installs taking place during severe frost conditions.

- Gas Powered Post Pounder can be used when pilot hole drilling is not needed. In other words when not drilling into bedrock or frozen ground.
- Used in conjunction with the Jackjaw Load test device as the drive rod stays with the anchor and needs to be pulled out using the Jackjaw in order to then test the anchor.

Gas Powered Driver

Jackjaw Load Test Device with Scale

- 5' Anchor Drive Rod (available for sale by Nuance Energy Group)
- 66" x 1 3/8" fluted SDS MAX Drill bit for pilot holes
- Impact Drivers with 3/8" drive Socket Adapter for each worker-3/4" Impact Sockets for 'Power Adjustable Leg' leveling
- 9/16" Thin Wall Impact Sockets for Osprey PowerPlatform bolt and nut connections
- 9/16" Thin wall, Deep Well Impact Sockets for Strut Rail bolt and nut connections
- 5/16" Impact Sockets for Mid Clamps-6mm Hex Bit Socket for End Clamps
- Tape Measures-String Line and Stakes
- 4 Foot Level-Shovel
- Tool Pouch for nuts and bolts

Equipment

- 3k Portable Generator (if 120VAC power unavailable) for use with the Electric Drills.
- Earth Anchor Load Testing Kit

- Jackjaw / and Scale Combo

Solar Modules

The following solar modules have been evaluated and tested to Standard UL2703 and cETL using Self-Bonding Module Strut Mid Clamp Assembly M8-1.25x75mm Hex Bolt - 13mm Hex [Torque to 200 in-lbs or 23 Nm]. Our rails are designed around a 39.5" wide panel. Any wider and this will lead to fewer panels that will fit on each array.

-	Manufacturer	Model Numbers
1	Canadian Solar	CS6X-310|315|320P, CS6X-P-FG, CS6K-P-FG, CS6K-M, CS6K-M AB, CS6P-P, CS6P-P-SD, CS6V-M,CS3U-XXX-MS,CS3W-XXX-PB-AG
2	Certainteed Corp.	CTxxxM00-03, CTxxxM10-03, CTxxxM11-03
3	CSUN	CSUNxxx-72MH (xxx can be 355 - 375 with 5 watt interval) QSAR 255-60M, QSAR 260-60M, QSAR 265-60M, QSAR 270-60M, CSUN310-60MH-BB
4	GCL	P6/72-330, M6/72H 365-400
5	Hansol	HSxxx-UD-AN1, HSxxx-UB-AN1
6	Hanwha Q Cells	Q.PRO BFR G4|G4.1|G4.3, Q.PLUS BFR G4.1, Q.PRO G4, Q.PLUS G4, Q.PRO L G4.1,Q.PLUS L G4.1|G4.2, Q.PEAK-G4.1|G4.1/MAX, Q.PEAK BLK G4.1, Q.PEAK L G4.2, HSL72P6-PC-3-xxxT (xxx = power class), Q.Peak Duo L-G5.2 380-395
7	JA Solar	JAM6(K)-72-xxx/PR
8	Jinko	JKM xxx P-60, JKM xxx PP-60, JKM xxx M-60, JKM xxx M-60B, JKMS xxx PP-60, JKMS xxx P-60, JKMSxxx-72, JKMxxxP-72, JKMSxxxP-72, JKMxxxM-72, JK07A (JKMSxxxPP-60 & JKMSxxxPP-72), JK07B (JKMSxxxPP-60), JKMxxx PP-60(Plus), JKM xxx PP-60B, JKM xxx M-60B, JKMSxxxM-60, JKMSxxxM-60-EP, JKM xxx P- 72B, JKMxxxPP-72, JKMxxxPP-72B, JKMxxxPP-72(Plus), JKMSxxxPP-72, JKMxxxM-72-V, JKMxxxPP-72-V, JKMxxx-72L-V, JKMxxx-72HL-V, JKMxxxM-60L, JKMxxxM-60BL, JKMxxxM-60HL
9	LG	LGxxxN1C-G4, LGxxxN1W-G4, LGxxxS1C-G4, LGxxxS1W-G4, LGxxxN1K-G4, LGxxxN2C-B3, LGxxxN2W-B3, LGxxxN1C-A5, LGxxxS1C-A5, LGxxxN2W-A5, LGxxxS2W-A5, NeON 2 Bifacial LGxxxN2T-A5
10	Mission	MSExxxSQ5T
11	Seraphim	SEG-6MA-xxx WW
12	Sunpower	SPR-X21-xxx, SPR-E20-xxx, SPR-P17
13	Talesun	TP572, TP596, TP654, TP660 (35mm/40mm), TP672, Hipor M350+ (40mm), Talesun Smart (35mm) M = Mono P = Poly B = Black T = Transparent (H) = 1500V without (H) is 1000V, TP6H72M / TP6H72(H)
14	Trina	TSM-PD14, TSM-PD05, TSM-PD05.08, TSM-PD05.05, TSM-PEG5, TSM-PEG5.07, TSM-PEG14, TSM-PEG40.07, TSM-DD14A(II), TSM-330-DD14A(II), TSM-335- DD14A(II), TSM-340-DD14A(II), TSM-345-DD14A(II), TSM-350-DD14A(II), TSM- 355-DD14A(II), TSM-DD06M.05, TSM-DE15H(II)
15	URE Solar	D6MxxxH4A
16	Yingli	YL xxxP-29b, YL xxxP-35b
17	Phono Solar	PS-xxxMH-24/TH, PS-xxx-60, PS-xxx-72 6
18	HT Solar	HT72-156M-V, HT60-156(M) (NDV) (-F), HT72-156(M/P)
19	Renesola	JCxxxM-24/Abw, Virus II 250-260W with 5 watt Interval, 156 Series 270-275W 20 Longi
20	Longi	LR6-72BP 355-375M 72 CELL, LR6-60 (40mm), LR6-72 (40mm), LR6-60 HV (40mm), LR6-72 HV (40mm), LR6-60 PH (40mm), LR6-72 PH (40mm), LR6-60 PE (40mm), LR6-72 PE (45mm), LR6-60 BK (40mm Black frame), LR6-72 BK (40mm Black frame), LR6-60 PB (40mm Black frame), LR6-72 PB (45mm Black frame) Number in paranthesis signifies frame profile height, LR6-72-xxxM, LR6-72HV-xxxM, LR6-72BK- xxxM, LR6-72PE-xxxM, LR6-72PHxxxM, LR6-72PB-xxxM, LR6-60-xxxM, LR6-60BK- xxxM, LR6-60PE-xxxM, LR4-60HPB/HIBxxxM, LR4-60HPH/HIH-xxxM, LR4-72HPH/HIH-xxxM, LR6-72BP-xxxM, LR672HBD/HIBD-xxxM, LR6-60BP-xxxM, LR6-60HBD/HIBD-xxxM
21	REC	REC-320TP2M, PEAK Energy Series, PEAK Energy BLK2 Series, PEAK Energy 72 Series, TWINPEAK 2 SERIES, TWINPEAK 2 BLK2 SERIES, TWINPEAK SERIES
22	Risen	RSM72-6-xxxM/5BB, RSM72-6 (MDG) (M), RSM60-6
23	Heliene	72M, 36M, 60M, 60P, 72P
24	Axitec	AC-xxxMH/120S (AXIblackpremium HCSeries), AXIblackpremium 60 (35mm), AXIpower 60 (35mm), AXIpower 72 (40mm), AXIpremium 60 (35mm), AXIpremium 72 (40mm)
25	ZNShine	ZXM6-72-395/M

Solar Modules

The following solar modules have been evaluated and tested to Standard UL2703 and cETL using Everest Cross Rail EC Silver Mid Clamp, SS UL2703 35-50mm [120 in-lbs (16 Nm)]. Our rails are designed around a 39.5" wide panel. Any wider and this will lead to fewer panels that will fit on each array.

-	Manufacturer	Model Numbers
1	Canadian Solar	CS6X-310|315|320P, CS6X-P-FG, CS6K-P-FG, CS6K-M, CS6K-M AB, CS6P-P, CS6P-P-SD, CS6V-M
2	Certainteed Corp.	CTxxxM00-03, CTxxxM10-03, and CTxxxM11-03
3	CSUN	CSUNxxx-72MH (xxx can be 355 - 375 with 5watt interval), QSAR 255-60M, QSAR 260-60M, QSAR 265-60M, QSAR 270-60M
4	GCL	P6/72-330, M6/72H 365-400.
5	Jinko	JKM xxx P-60, JKM xxx PP-60, JKM xxx M-60, JKM xxx M-60B, JKMS xxx PP-60, JKMS xxx P-60, JKMSxxx-72, JKMxxxP-72, JKMSxxxP-72, JKMxxxM-72, JK07A (JKMSxxxPP-60 & JKMSxxxPP-72), JK07B (JKMSxxxPP-60), JKM xxx PP-60(Plus), JKM xxx PP-60B, JKM xxx M-60B, JKMSxxxM-60, JKMSxxxM-60-EP, JKM xxx P-72B, JKMxxxPP-72, JKMxxxPP-72B, JKMxxxPP-72(Plus), JKMSxxxPP-72, JKMxxxM-72-V, JKMxxxPP-72-V, JKMxxx-72L-V, JKMxxx-72HL-V, JKMxxxM-60L, JKMxxxM-60BL, JKMxxxM-60HL
6	Seraphim	SEG-6MA-xxx WW
7	Sunpower	SPR-X21-XXX, SPR-E20-xxx, SPR-P17.
8	Talesun	TP572, TP596, TP654, TP660 (35mm/40mm), TP672, Hipor M350+ (40mm), Talesun Smart (35mm) (M = Mono, P = Poly, B = Black, T = Transparent, (H) = 1500V without (H) is 1000V).
9	Trina	TSM-PD14, TSM-PD05, TSM-PD05.08, TSM-PD05.05, TSMPEG5, TSM-PEG5.07, TSM-PEG14, TSM-PEG40.07, TSM-DD14A(II), TSM-330-DD14A(II), TSM-335-DD14A(II), TSM-340-DD14A(II), TSM-345-DD14A(II), TSM-350-DD14A(II), TSM-355-DD14A(II), TSM-DD06M.05, TSM-DE15H(II)
10	URE Solar	D6MxxxH4A
11	Yingli	YL xxxP-29b, YL xxxP-35b

On Site Assembly

The Osprey Powerplatform can be assembled at just about any outdoor location. The Osprey Powerplatform® is designed to be built first and then oriented on site then spliced together at the rails which will work out your spacing between platforms. Once the system is leveled, aligned, and oriented you then commence with driving the anchors through the base plates. The Osprey Powerplatform® available in Standard Duty [STD], Heavy Duty [HD], Extra Heavy Duty [XHD] and Heavy Snow Load [HSL] models.

Components and Hardware

All components and hardware required for the final assembly and installation of the Osprey PowerPlatform® are shipped with an order. A comprehensive Bill of Materials [BOM] is provided with every delivery. Contractors should thoroughly check the Bill of Material (BOM) and visually inspect inventory on every shipment. Any discrepancies need to be reported to Nuance within 5 days of

receipt of product and BOM. Per the terms of the Warranty, damaged goods should be reported directly to the freight carrier.

Components

- Front & Rear Chassis, 2 per Osprey
- Chassis Stud, 3 per unit (2 per for 2x5)
- Strong Back, 3 per unit (2 per for 2x5)
- Strut Rails, 8 per unit (4 per for 2x5)
- Power Adjustable Leg, 6 per for 2x8, 2x7 and 2x6 (4 per for 2x5)
- Adjustable Leg Brace, 3 per STD for 2x8, 2x7 and 2x6 (2 per for 2x5) w/ hardware
- Adjustable Leg Brace, 6 per HD/XHD/HSL for 2x8, 2x7 and 2x6 (4 per for 2x5) w/ hardware
- Rack Mounting Bracket
- STD, 3 per (2 per unit for 2x5) [4 Hole]-Rack Mounting Bracket
- HD/XHD/HSL, 3 per (2 per for 2x5) [8 Hole]
- Back Brace, 3 per unit (2 per for 2x5)
- Back Brace Bracket, 6 per unit (4 per for 2x5)
- Splice Plates, 4 per (not required for 2x5), 4 per to connect Ospreys sold separately
- Cable Brace, 2 per Ospreys
- Adjustable End Clamps, 8 per stand-alone Osprey
- Self-Bonding Mid Clamps, 28 per 2x8, 24 per 2x7, 20 per 2x6, 16 per2x5, 4 per connecting Ospreys together sold separately
- Earth Anchors (Refer to Engineering report for quantity and required test load)

Hardware

- Bolt: Chassis, Strong Back and Strut Rail Assembly3/8"-16 x 1" Serrated Flange Bolt - 9/16" Hex
  [Torque to 33 ft-lbs]
- Nut: Osprey PowerPlatform Assembly3/8"-16 Serrated Flange Nut - 9/16" Hex
- Bolt: Back Brace Bracket Assembly and Adjustable Leg Brace3/8"-16 x 2.5" Serrated Flange Bolt -9/16" Hex [Torque to 33 ft-lbs]
- Bolt: Self-Bonding Module Strut Mid Clamp AssemblyM8-1.25x75mm Hex Bolt - 13mm Hex [Torque to 200 in-lbs or 23 Nm]
- Cap Screw: -Everest Cross Rail EC Silver Mid Clamp, SS UL2703 30-- 50mm[120 in-lbs (16 Nm)]
- Cap Screw: Adjustable Module Strut End Clamp AssemblyM8-1.25x25mm Socket Head Cap Screw -69 mm Allen [Torque to 200 in-lbs or 23 Nm]

Assembly Osprey Chassis

Two Assemblers ~ Duration: 10 minutes

The Osprey PowerPlatform® Chassis is easily assembled on site. The idea is to complete each
chassis build completely as a stand along unit first then if splicing multiple units together splicing each system together at the rail. Then using a simple string line and impact drill aligning each system even using the Power Adjustable Leg.

This assembly example is for a six leg Osprey Powerplatform® which is very similar to a four leg
Osprey PowerPlatform® assembly for the 2x5 (10 Panel Osprey Model). Measuring corner to corner will help square up the chassis and should be done before proceeding to the next step. Refer to Figure 1 on next page of the STD version and Figure 2 for HD/XHD/HSL version.

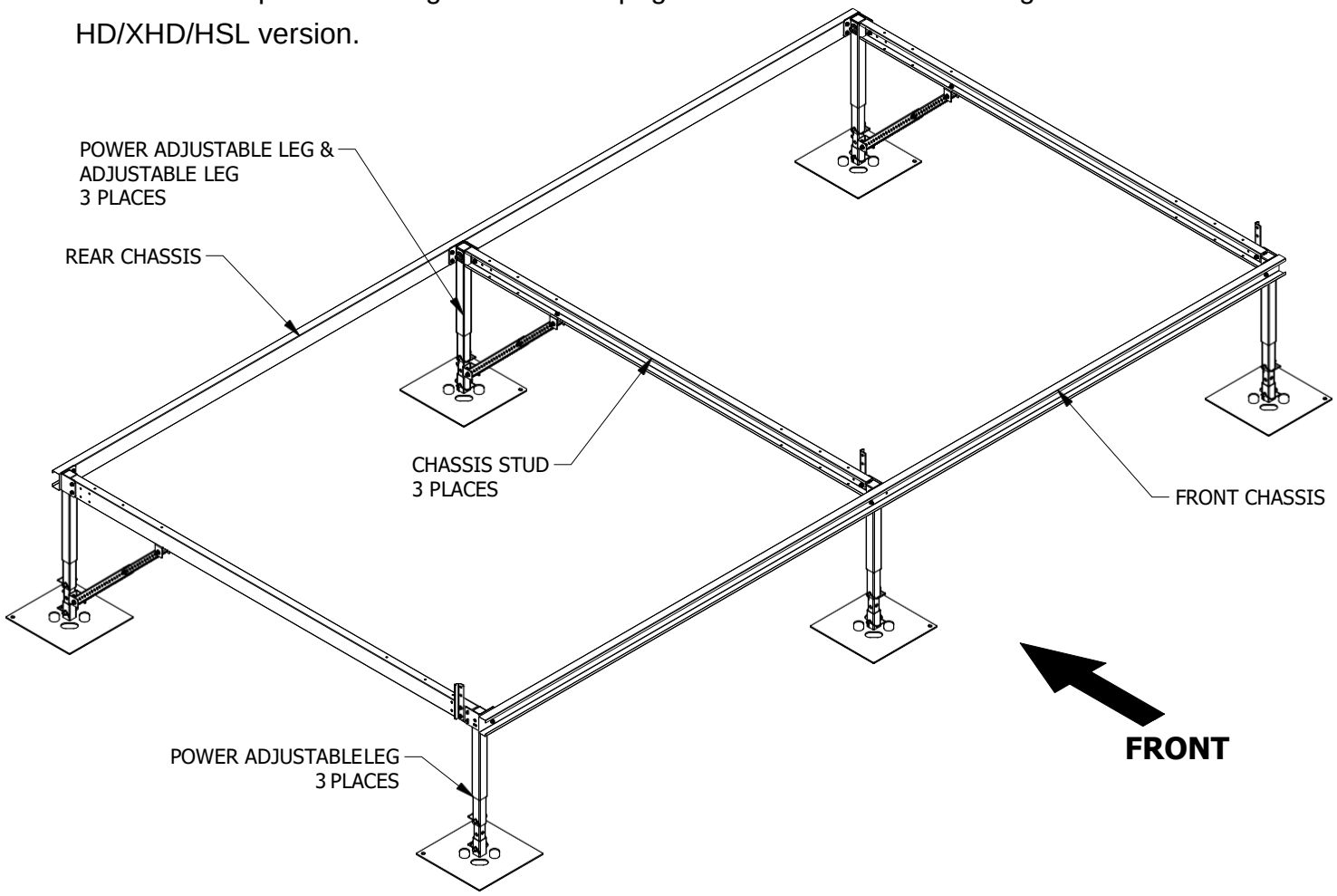


FIGURE 1: Osprey Chassis - STD

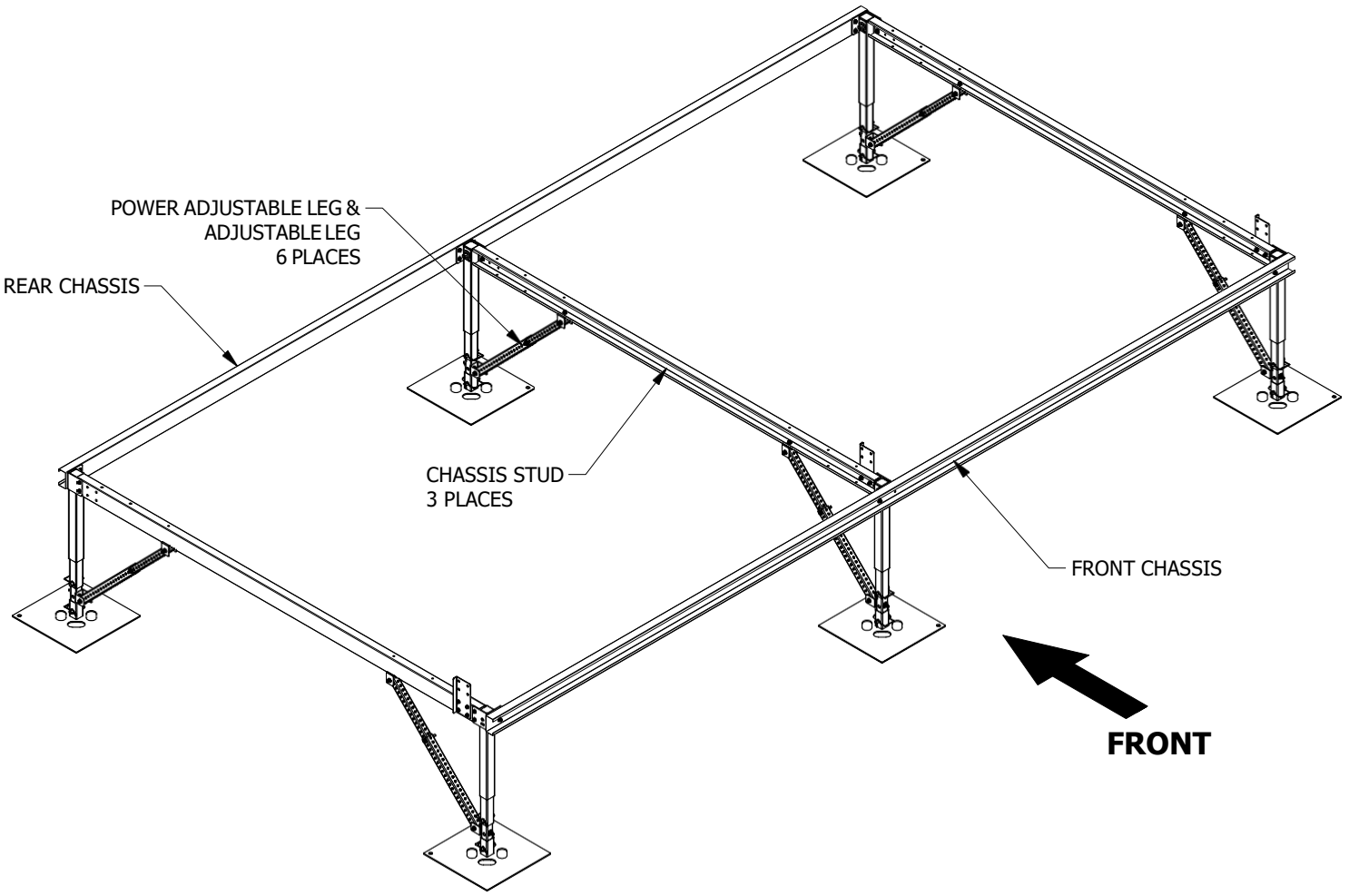


FIGURE 2: Osprey Chassis - HD/XHD/HSL

1. Begin Chassis assembly by having the Assemblers unpack six Power Adjustable Legs. Insert the

bottom tube of the leg into the base plate and secure with pin assembly.See Figure 3 below and make sure to expose the four lower holes on the bottom tube.

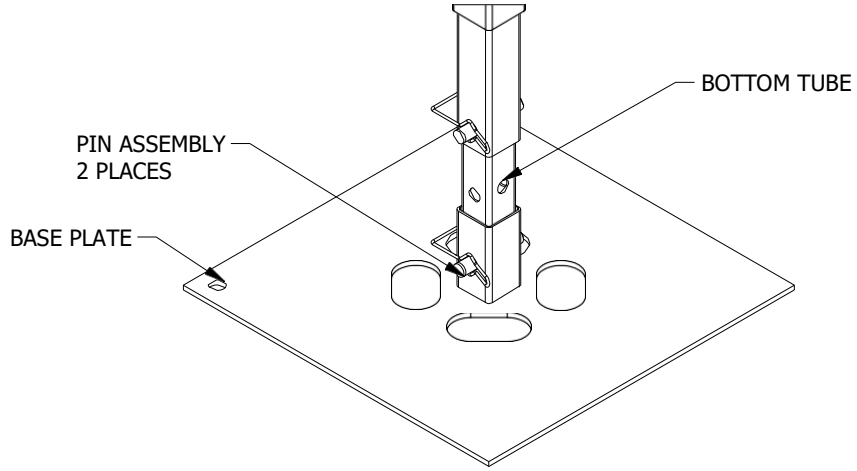


FIGURE 3: Power Adjustable Leg Pin Connections

2. Next place the Front & Rear Chassis lengthwise at the location of the first Osprey PowerPlatforms®. Attach to the Angle Bracket of the Power Adjustable Leg with (2)3/8"-16 x 1" serrated flange bolts and nuts making sure to align the Leg as seen below for the outside corners. See Figure 4 below:

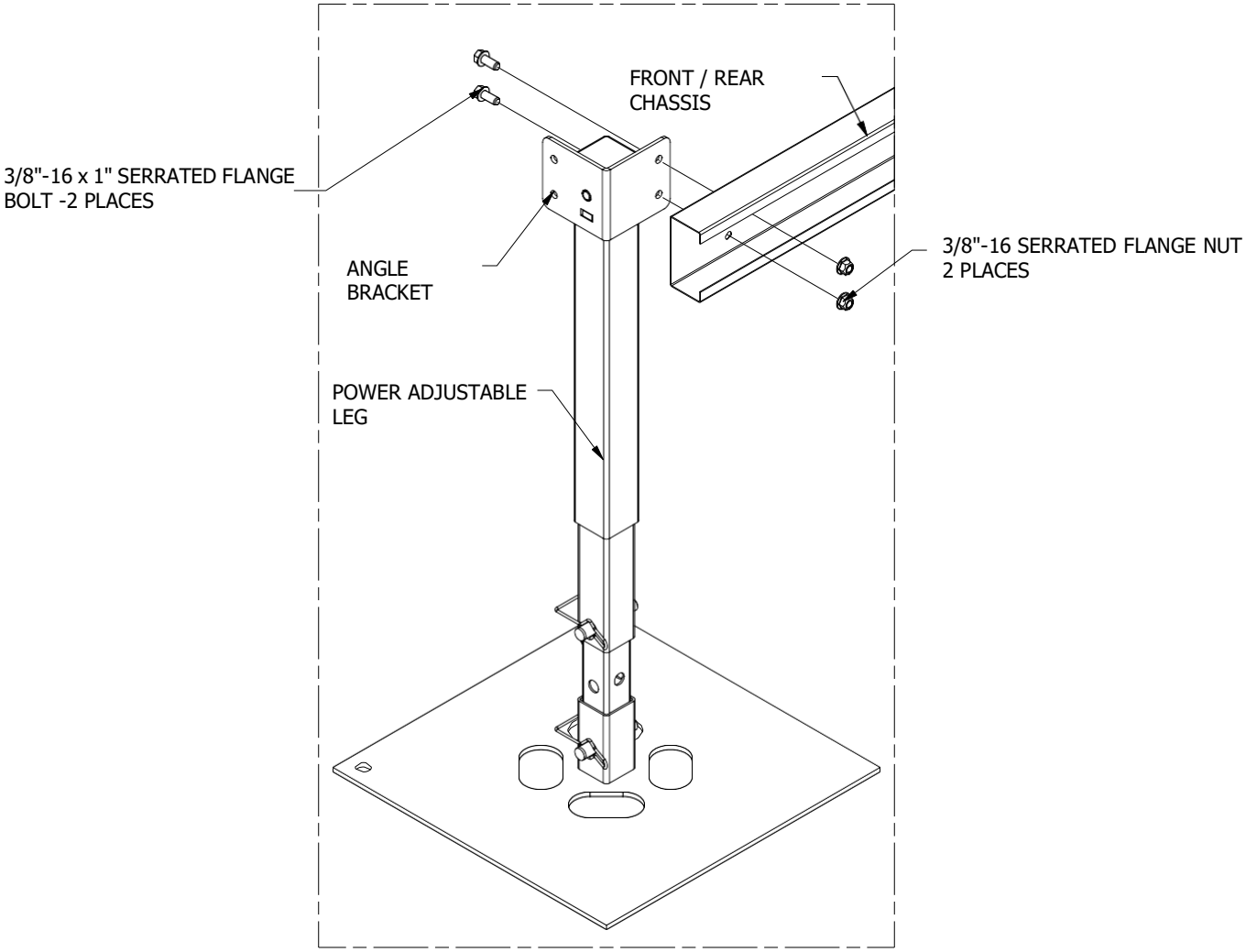


Figure 4: Front/Rear Chassis to Angle Bracket on Power Adjustable Leg

3. Place three Power Adjustable Legs just inside the Front Chassis and the other three Power Adjustable Legs just inside the Rear Chassis. The legs will create the corners of the PowerPlatform. Note that there are four pre-punched holes in the center of the chassis. The two holes on the left should be used. Refer to Figure 5 on next page. Figure 6 shows similar detail for the HD/XHD/HSL version Powerplatform.

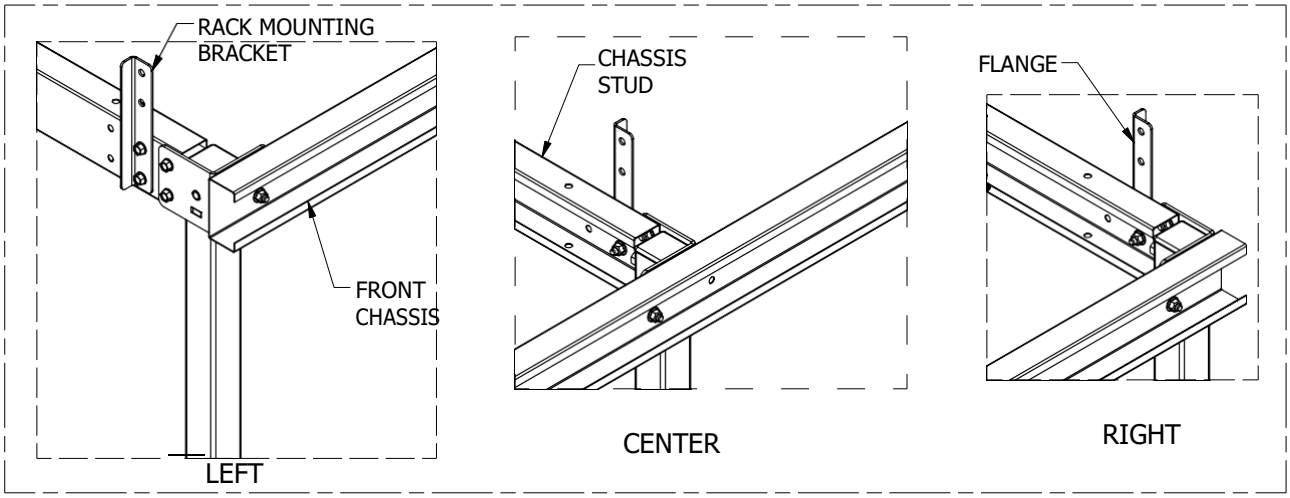


Figure 5: Chassis Assembly - STD

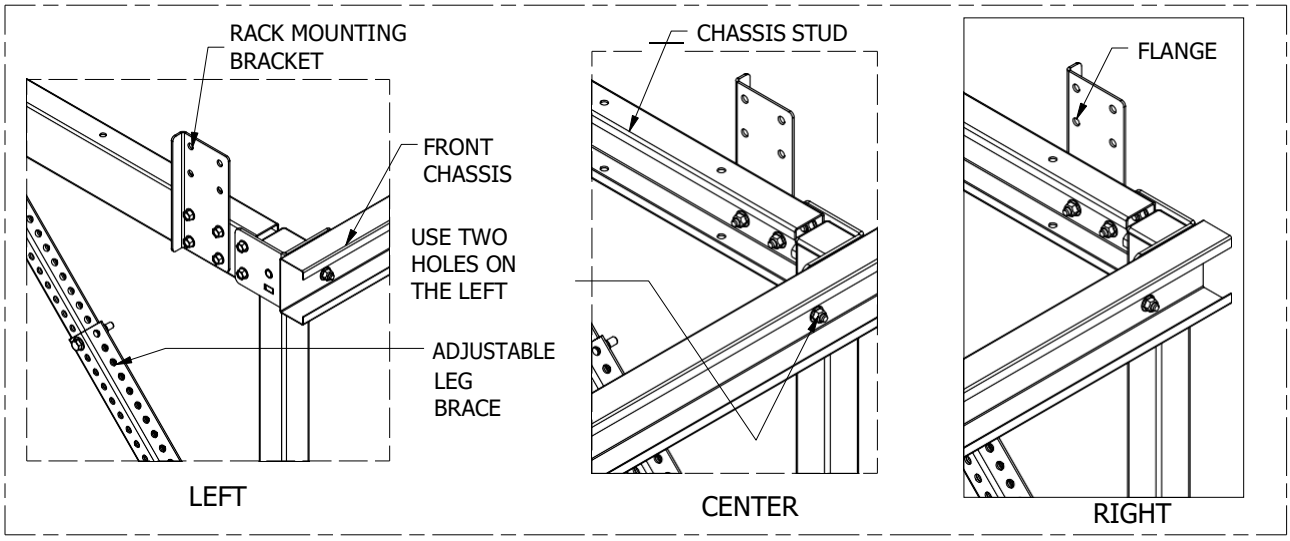


Figure 6: Chassis Assembly - HD / XHD / HSL

4. Place three Chassis Studs perpendicular to the Front & Rear Chassis aligned with the Power Adjustable Legs near the corresponding pre-punched bolt holes. Note how Chassis Studs are oriented in Figure 5 & 6 above and Figure 7 on next page.

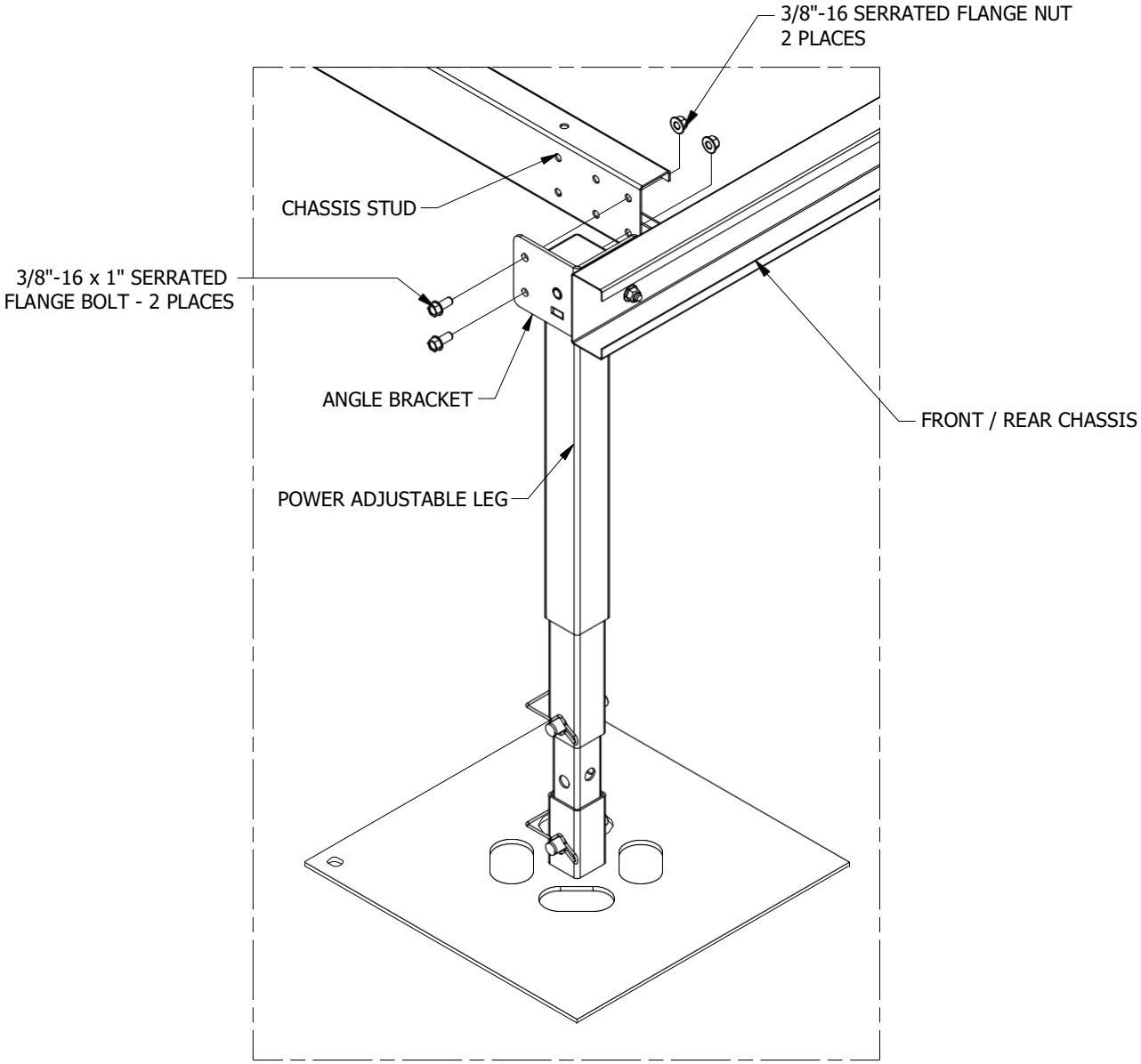


Figure 7: Chassis Stud to Angle Bracket on Power Adjustable Leg

5. Install the Rack Mounting Brackets with the Flange facing away from the Front Chassis. Attach with 3/8"-16 x 1" serrated bolts and nuts. Using a tape measure, verify the Chassis is square by measuring from corner to corner and adjusting as necessary.

6. Verify that nut and bolts are properly installed and torqued using an impact driver.

7. Assemble the Adjustable Leg Brace with telescopic tubes, brackets fender washer and hardware. See Figure 8 on next page.

8. Be sure to tighten and torque the Back Brace Bracket hardware securing it to the Chassis Stud and Power Adjustable Leg before installing the upper and lower telescopic tube.

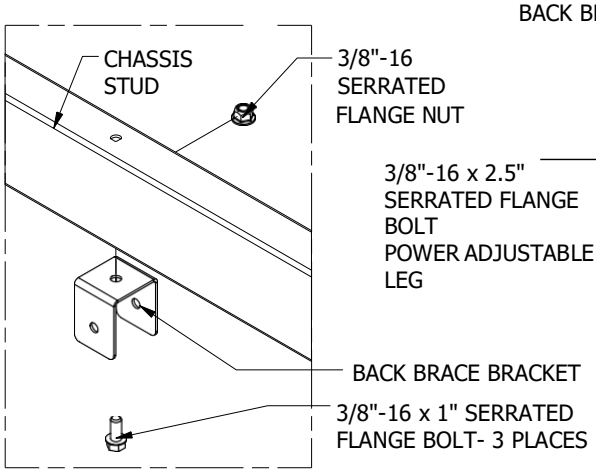


Figure 8: Adjustable Leg Brace Assembly (a)

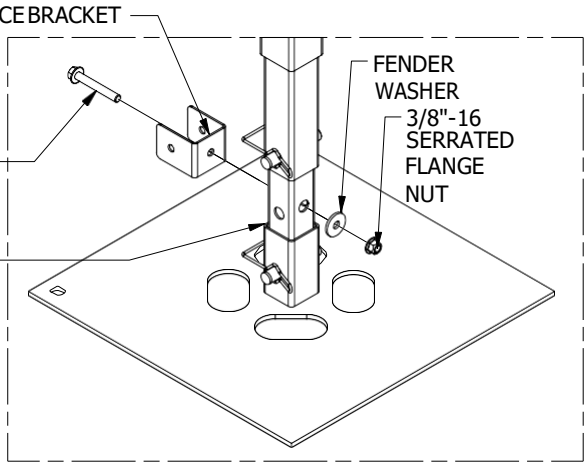


Figure 8: Adjustable Leg Brace Assembly (b)

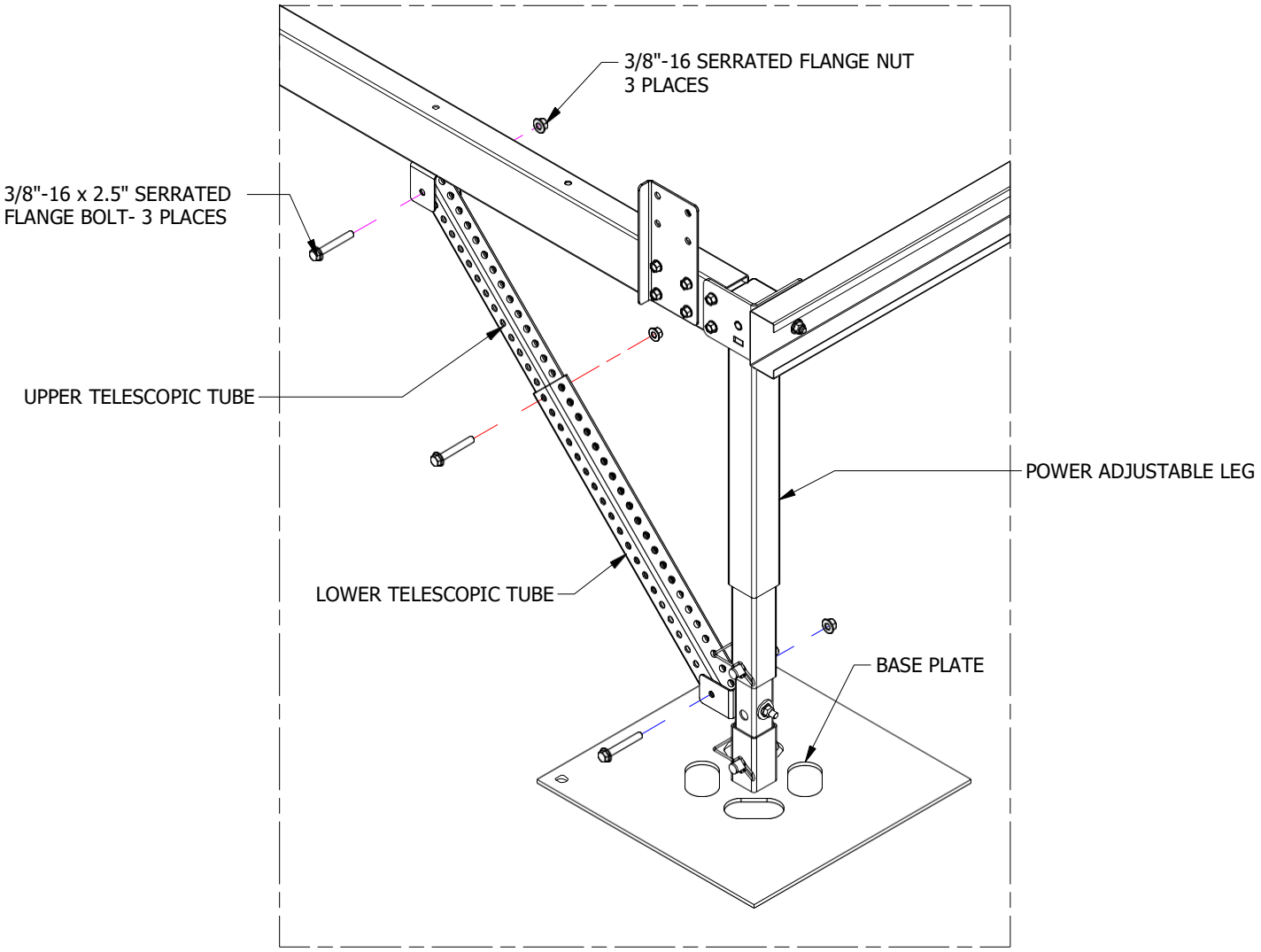


Figure 8: Adjustable Leg Brace Assembly (c)

Osprey Strong Backs and Back braces

Two Assemblers ~ Duration: 10 minutes

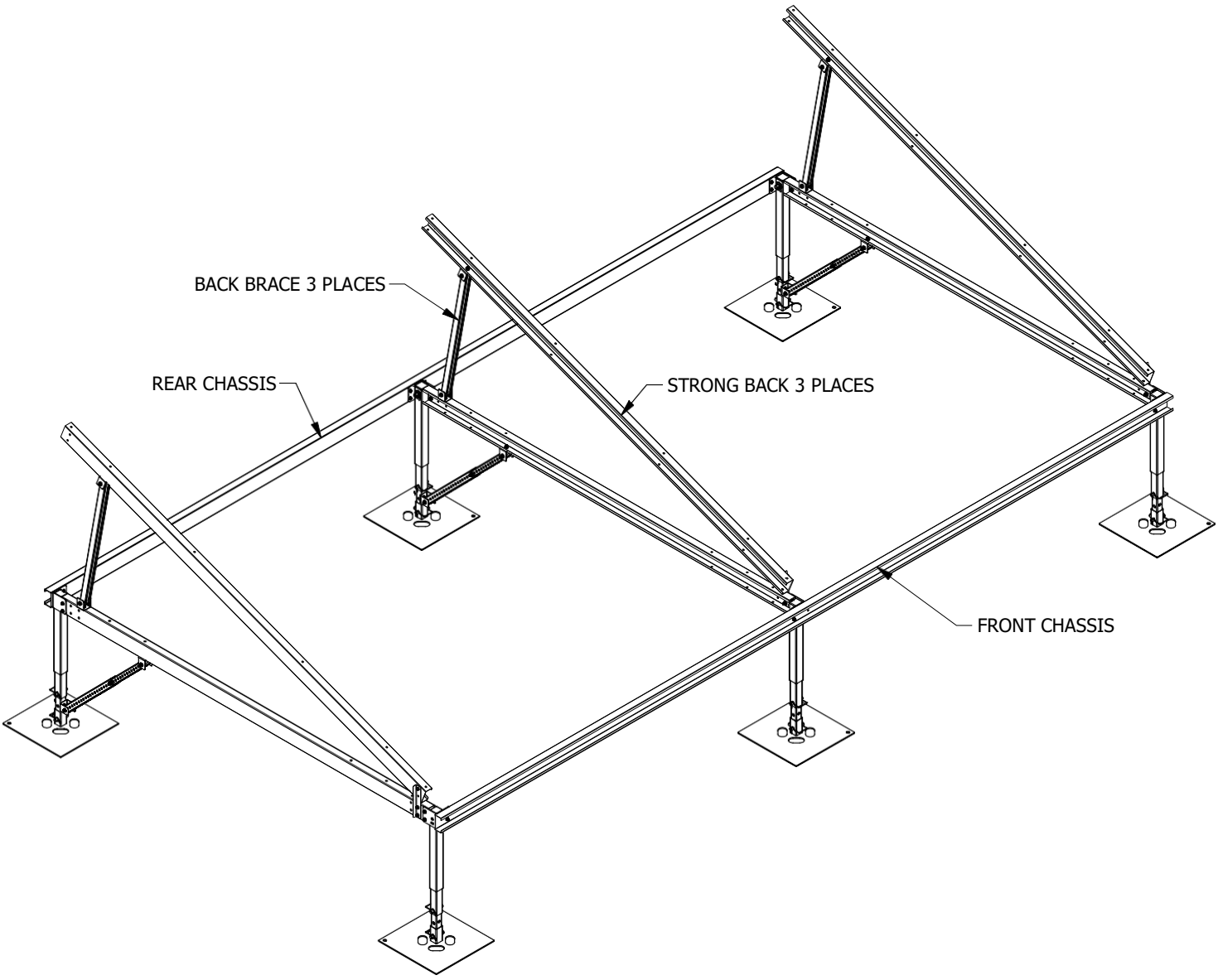


Figure 9: Strong Backs and Back Braces [STD Version shown above]

1. Attach a Back Brace Bracket without the Back Brace on the top rear hole of each of the Chassis Studs with 3/8"-16 x 1" serrated bolts and nuts. (Tighten before inserting back brace.)

2. Also, attach a Back Brace Bracket without the Back Brace to the second hole on the underside of the Strong Back with 3/8"-16 x 1" serrated bolts and nuts. (Tighten before inserting back brace.)

3. Place the Strong Back in line with the Chassis Stud and bolt the Strong Back to the upper hole of the Rack Mounting Bracket. Refer to Figure 10 and Figure 11 below.

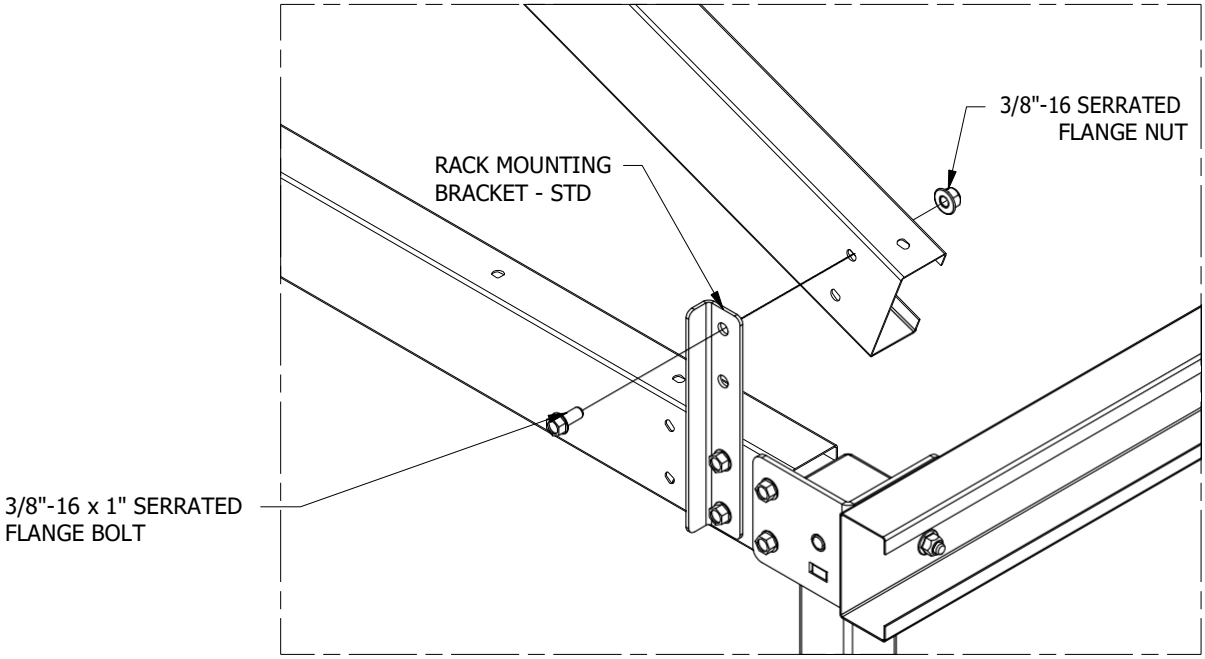


Figure 10: Strong Back to Rack Mounting Bracket - STD

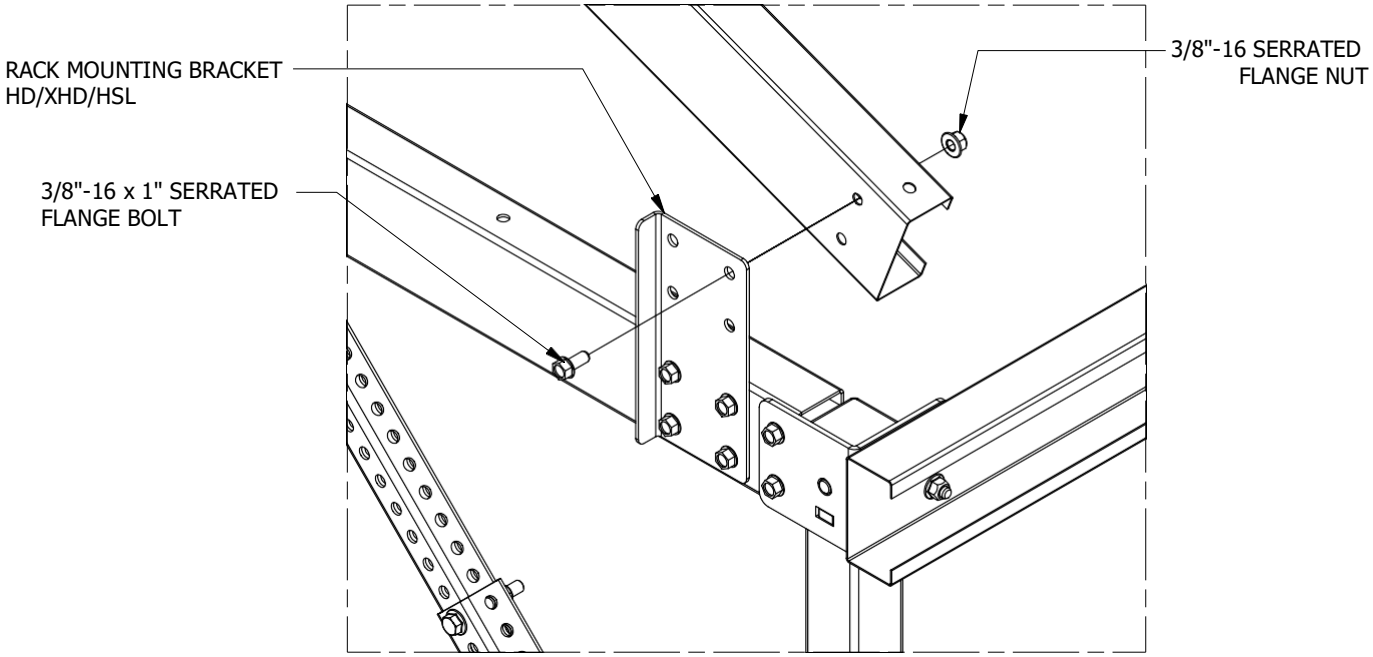


Figure 11: Strong Back to Rack Mounting Bracket - HD/XHD/HSL

4. Insert the Back Brace into the Back Brace Bracket on top of the Chassis Stud and insert 3/8"-16 x 2.5" serrated bolts through both pieces. Leave the nut and bolt hand tight. Refer to Figure 12 below.

5. Tighten the Back Brace Bracket to the Strong Back and Chassis Stud before inserting back brace.

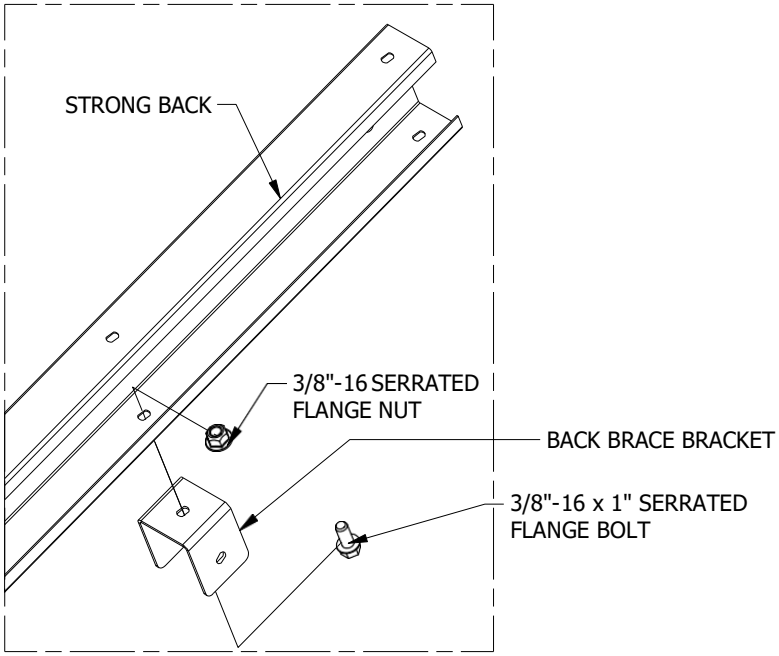


Figure 12: Back Brace Assembly (a)

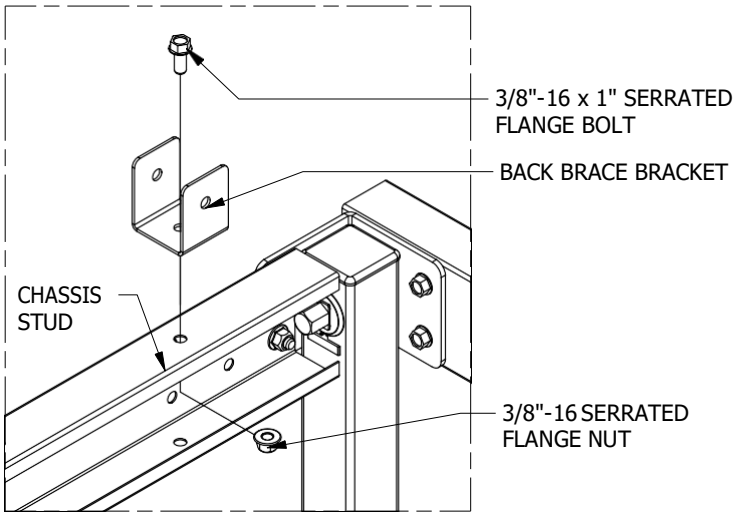


Figure 12: Back Brace Assembly (b)

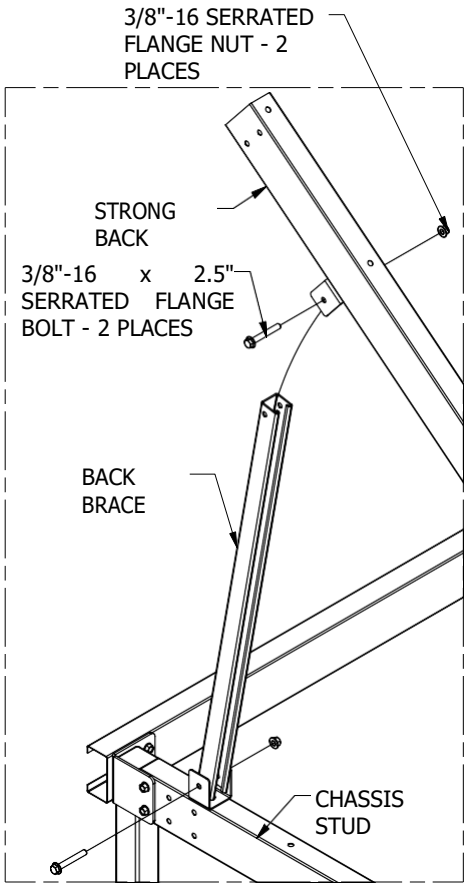


Figure 12: Back Brace Assembly (c)

6. Lift the rear end of the Strong Back and rotate the Back Brace upwards to meet with the Back Brace Bracket on the underside of the Strong Back. Ensure the Back Brace is oriented with the lower hole near the Chassis Stud for proper cable brace assembly. Refer to Figure 13 on next page.

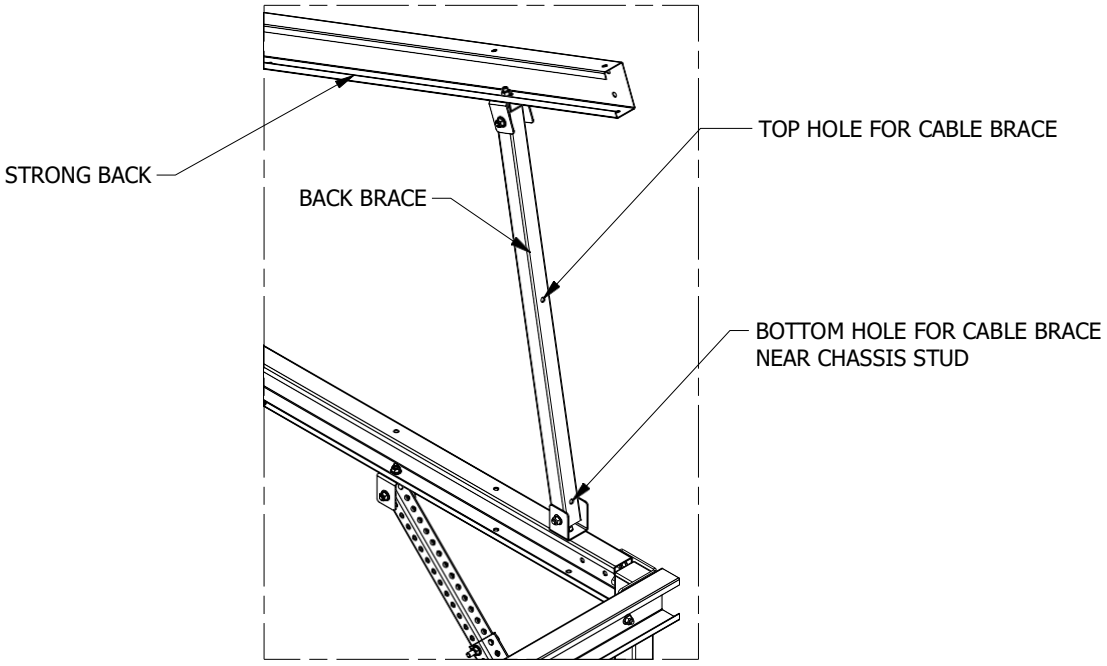


Figure 13: Back Brace Orientation for Cable Brace Attachment.
Note All Back Braces Should Be installed With the Same Orientation.

7. Insert 3/8"-16 x 2.5" serrated bolts and nuts through both pieces and tighten all connections with an impact driver.

8. Continue with the remaining two Back Brace Assemblies and tighten all connections between Strong Back and Rack Mounting Bracket.

9. The installer can install the back brace flat on the chassis pointing outward toward the rear of the platform prior to installing the rails which will allow for the rails to be installed flat on the chassis for easier fastening. See Figure 14 on next page.

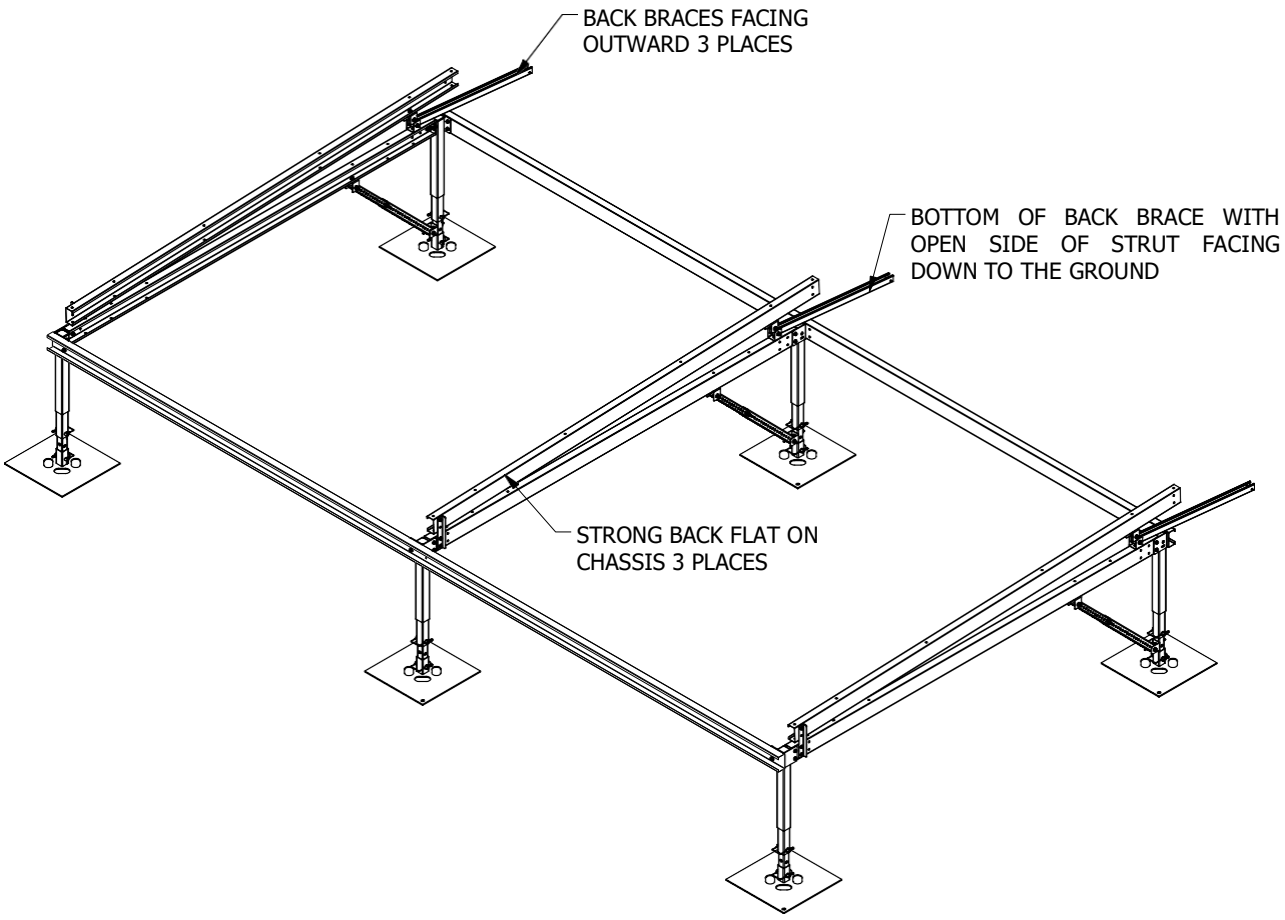


Figure 14: Alternate Back Brace Installation prior to installing Strut Rails.

Osprey Strut Rails

Two Assemblers ~ Duration: 10 minutes

The Osprey PowerPlatform® Strut Rails have symmetrical pre-punched holes so they can be installed in either direction. The rails connect with a splice place at the center of the Osprey PowerPlatforms® for the 2x8, 2x7 and 2x6 Ospreys, while a continuous rail is used for the 2x5 version so splice plates are not
required. 2-3 assemblers are required to lift assembly into place (the 2x5 Osprey can be done with 2 people) and insert the bottom bolts in the back brace which is already secured to the Chassis Stud.

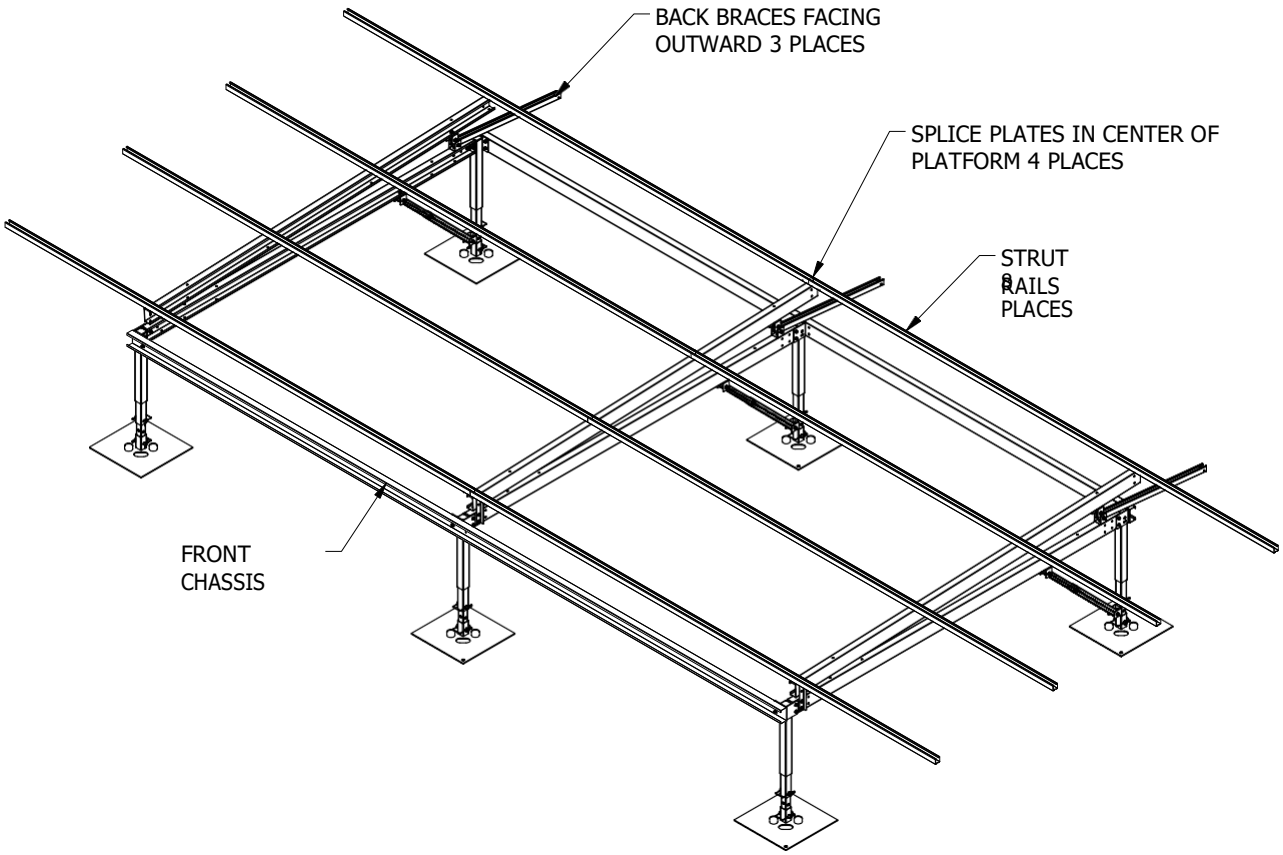


Figure 15: Strut Rails

1. Insert a Splice Plate halfway into one end of the Strut Rail, center the Chassis hole and bolt it with a single 3/8"-16 x 1" serrated bolt and Figure 16 below.

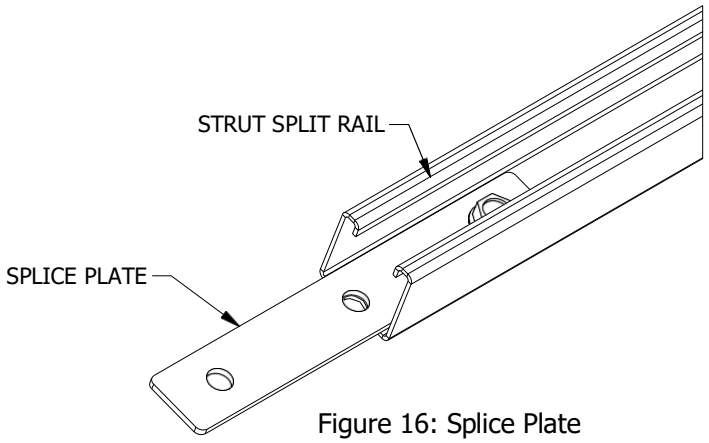


Figure 16: Splice Plate

2. Place the Strut Rail on the lower end of the Strong Backs with the Splice Plate centered on the center Strong Back.

3. Take another Strut Rail and insert one end into the loosely connected Splice Plate at the center Strong Back. Push the two rails together so they are flush. See Figure17 below.

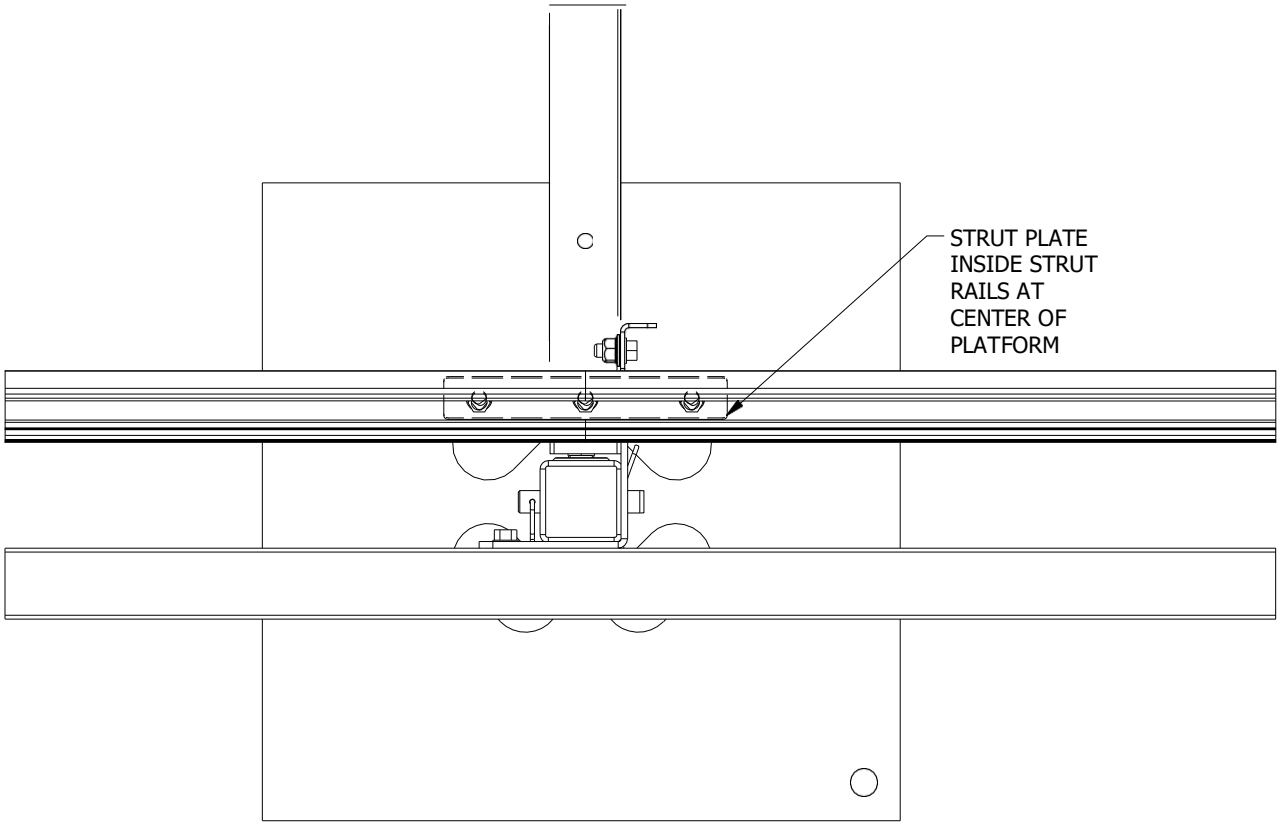


Figure 17: Strut Rail Assembly at Center of Platform

4. Complete the assembly by connecting the other two bolts and nuts. Confirm the Strut Rails are flush together and then tighten all connections with an impact driver.

5. Then bolt the other end of the Strut Rail to the end Strong Back with bolts and nuts. Refer to Figure 18 below.

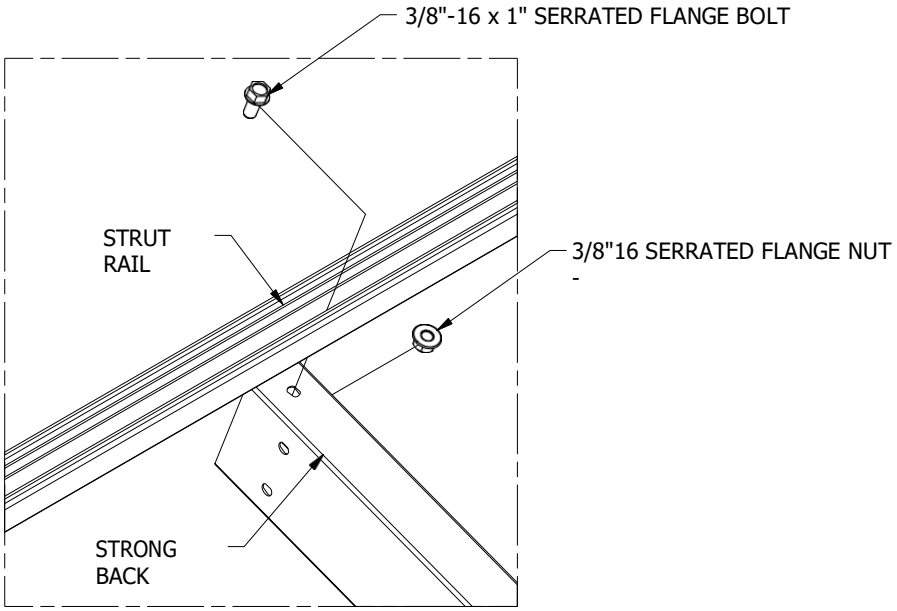


Figure 18: Strut Rail to Outer Strong Back

6. Repeat for the remaining three sets of Strut Rails.

7. Make certain that the bottom Back Brace Bracket has been securely tightened before raising completed rail assembly into position.

8. Then lift the completed assembly and connect to the back braces to bottom back brace brackets and insert the 3/8"-16 x 2.5" long bolts and nuts. The assembly is ready for cable braces to be attached. In order for the cable braces to be installed the bottom chassis must be squared up.

Osprey Cable Braces

Two Assemblers ~ Duration: 5 minutes

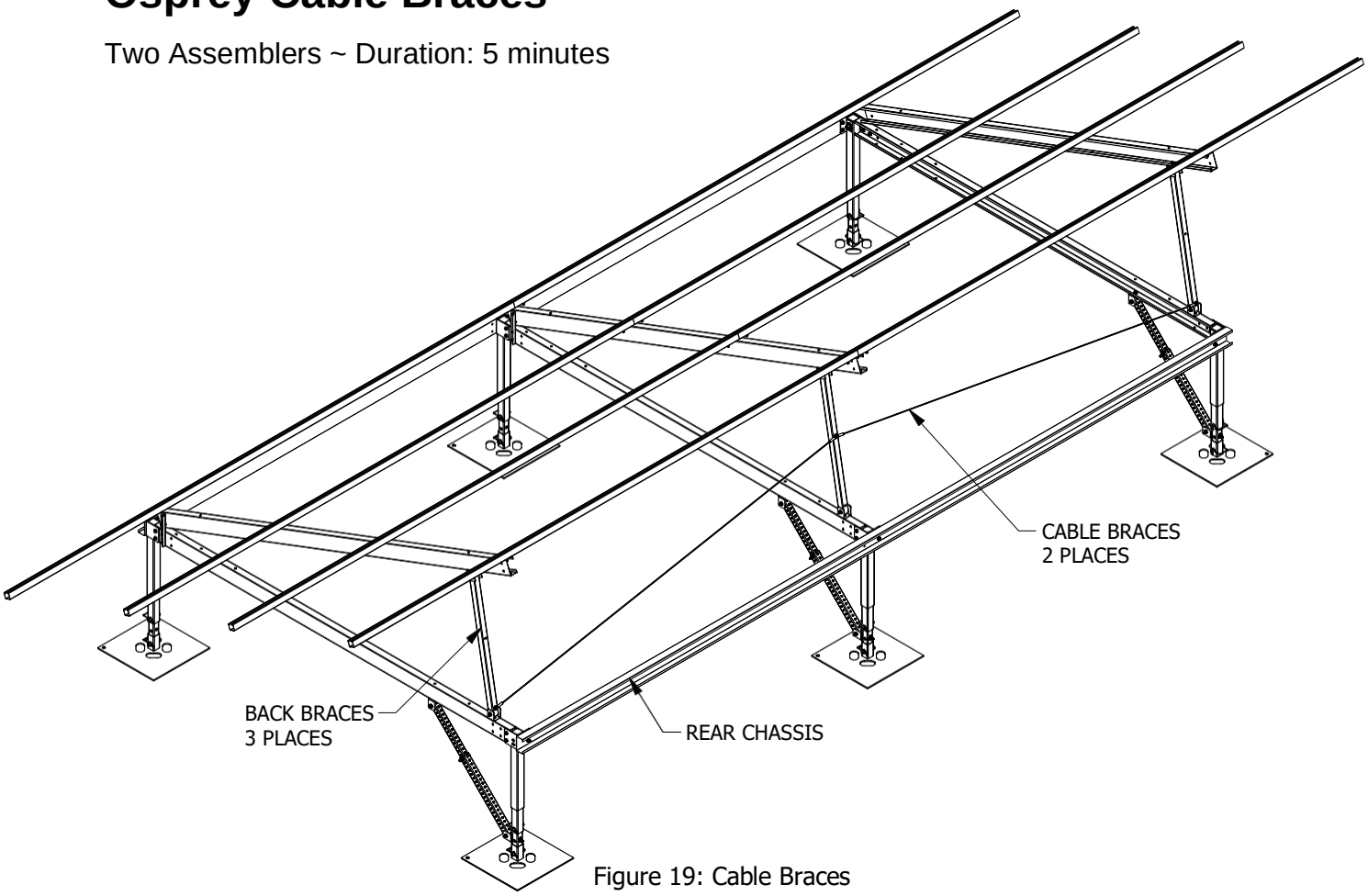


Figure 19: Cable Braces

1. Attach Cable Brace to the Back Braces with 3/8"-16 x 1" serrated bolts and nuts. Refer to Figure 20.

Note: Depending on the Osprey PowerPlatform® type and tilt there will be a "High and Low" Cable Brace assembly with a specific length. Be sure to specify

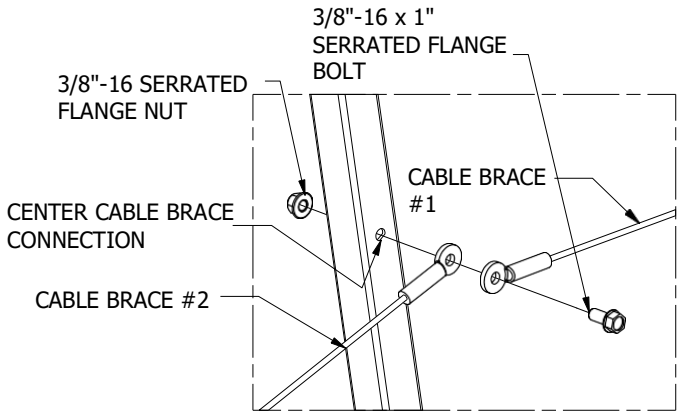


Figure 20: Cable Brace Assembly (a)

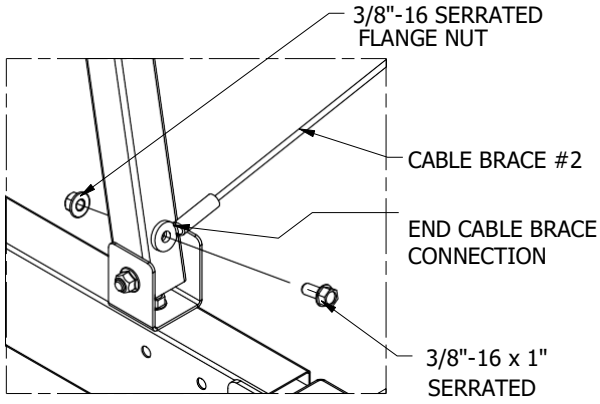


Figure 20: Cable Brace Assembly (b)

Installation and Testing of Earth Anchors

Two Assemblers ~ Duration: 15 minutes

Once the Osprey PowerPlatform® unit is fully assembled, aligned, squared, leveled, and spliced to the next Osprey unit, the earth anchors can be installed. Once all the anchors have been driven and tested you then proceed to mounting the panels. The use of a string line for aligning panels is preferred as the rails may not always be 100% straight like they are on an extruded aluminum rail.

A minimum of one Earth Anchor will be installed in each Base Plate, and every earth anchor must be tested. In severe frost or extremely hard soil the use of our Drill bit listed on page 6 may be needed to create pilot holes for our anchors. These pilot holes are not big enough to allow the anchor to go through solid rock. For that we use an epoxy spin in Chemical capsule method and HDG All Thread with a 3/4" Drill bit purchased outside of Nuance Energy. For more detail see the Supplementary Earth Anchor Instructions below. Watch the Earth Anchor Installation Videos for additional guidance.

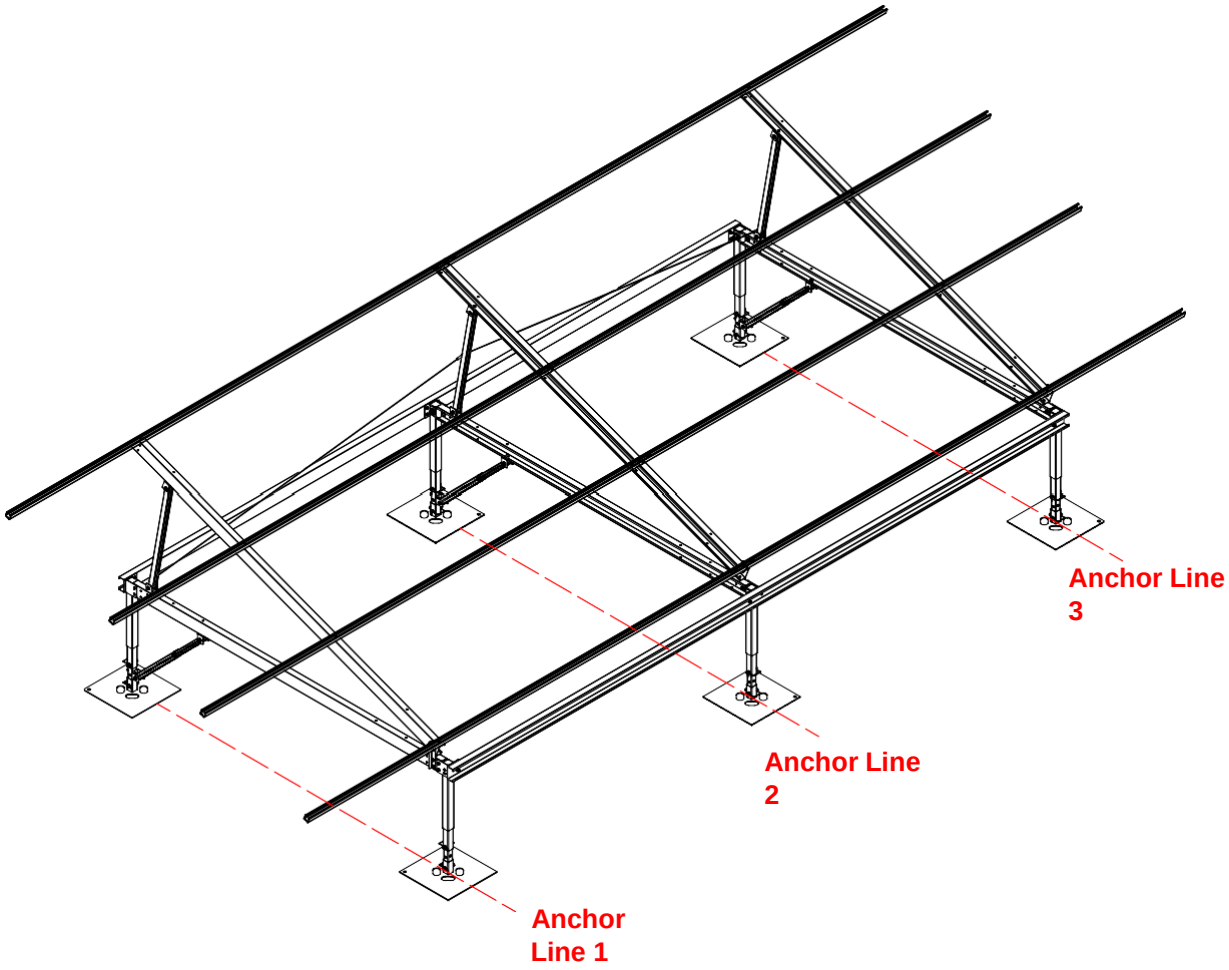
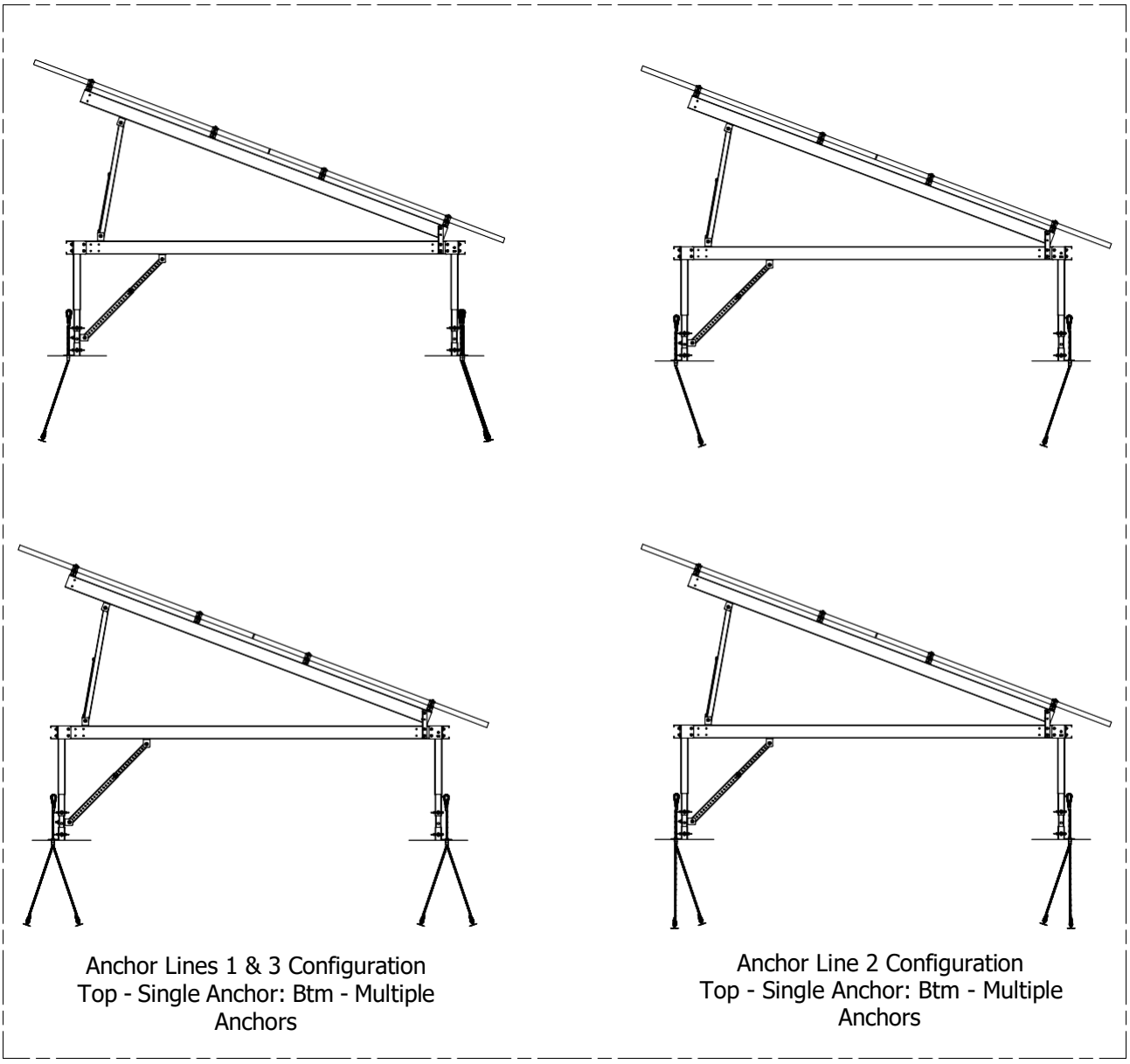


Figure 21: Earth Anchor Lines (a)



Anchor Lines 1 & 3 Configuration
Top - Single Anchor: Btm - Multiple Anchors

Anchor Line 2 Configuration
Top - Single Anchor: Btm - Multiple Anchors

Figure 21: Earth Anchor Lines (b)

3. Figure 22 below shows the Earth Anchor used in our installations.

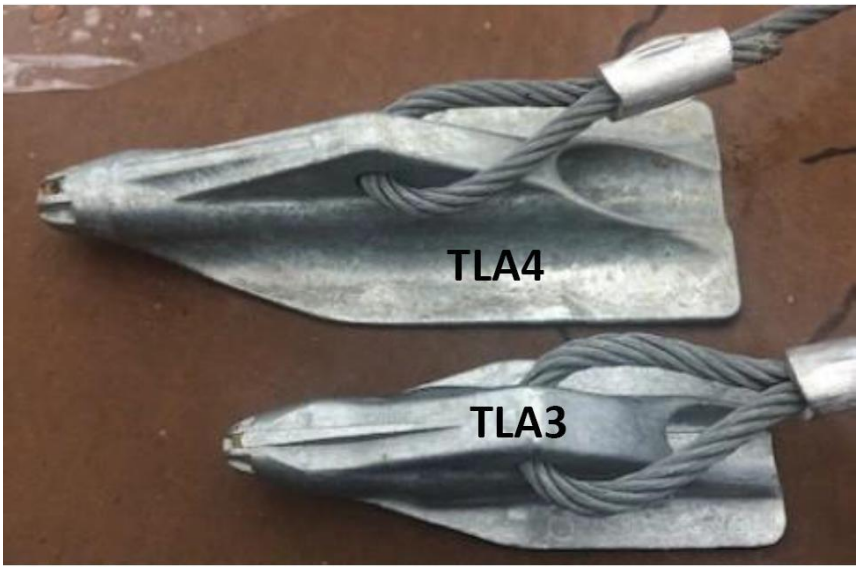


Figure 22: Earth Anchor

4. Drive the anchor to the full depth of the cable. Post pounding attachments are available for bob cats for larger projects but may require a thicker drive rods sold separately by Nuance. Refer to Figure 23 below.

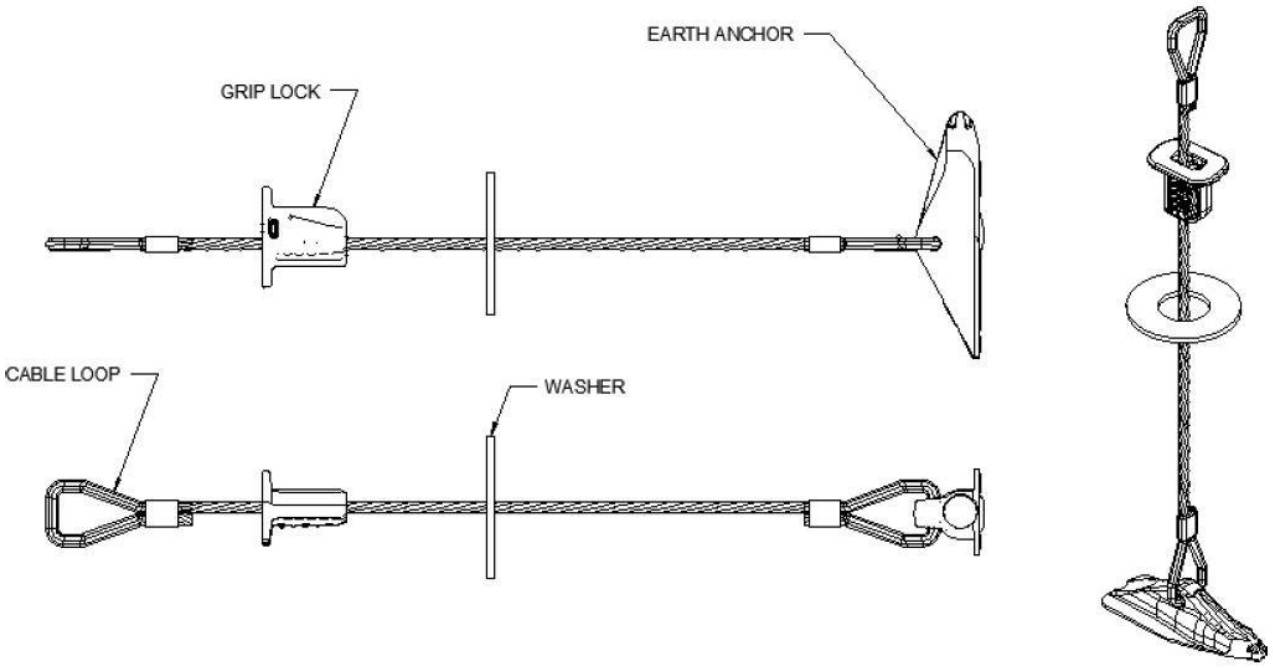


Figure 23: Earth Anchor Assembly

5. **Start by choosing a shoe plate hole and driving the anchor into the corner of that hole at the desired 10-15 degree angle.** Once the anchor is at full depth, retract the steel drive rod from the hole. The minimum depth of the earth anchor is 30" and, in all cases, must remain below the frost line even after the test on the anchor is performed.
6. Pull back on the anchor cable to engage the lip of the anchor and begin to toggle the anchor into a perpendicular or anchor-locked position.
7. Once the anchor is locked underground, continue to draw up the cable using the load test device until desired test amount flashes on the screen. In cases where the frost depth is 48" you may only get 8-10" of pull to get your required test results.
8. When using the Jackjaw you will need to multiply the load you are seeing on the scale by 2 as the scale only measures one half of the total amount being applied due to the nature of the device. If using the older version (tripod load testing device) you will see the total amount on the screen.
9. Load test each anchor according to the specifications in the structural engineering report. When two or more earth anchors are required, multiply the value listed in the report to get the load value per the following guideline:

- **(1) anchor = 100% of listed load**
- **(2) anchors = Test each anchor to 67% of listed load**
- **(3) anchors = Test each anchor to 45% of listed load**
- **(4) anchors = Test each anchor to 34% of listed load**

10. Record the load achieved while testing. Do not try to get the load to stabilize at the required specification.
11. Once you have confirmed the load, the anchor has been tested and reached required capacity. (Note the TLA3 earth anchor is rated for 3,333lbs.) **The tension needs to be relaxed on the cable, then slide the Grip Lock down the cable keeping it taught and push it flat against the Base Plate into the same corner of the base plate hole that the anchor was driven into.** It is normal for the Washer and Grip Lock to move minimally, but all slack should be removed from the cable assembly.

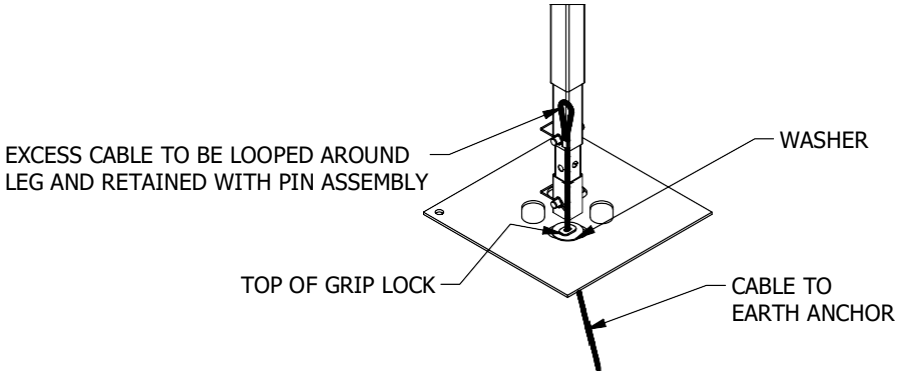


Figure 24: Grip Lock Secured to Base Plate

12. Remove testing device from cable and wrap the excess cable around the leg and secure the loop to one of the retention pins near the bottom of the leg.

13. If a second anchor is required per the engineering report, drive the second anchor at no more than 15 degrees from vertical and pointed away from the other anchor. Record the value achieved.

14. If an earth anchor is not reaching the desired capacity within 10" of pulling distance, stop the tensioning procedure and record the peak value.

15. When multiple anchors are installed in one location, record the sum of the tested loads by using the guideline as described in step 8) above. A total of four earth anchors can be installed on a single base plate.

16. **All test loads must be recorded, documented in spreadsheet form and submitted to Nuance Energy for review within 60 days of the installation date via www.nuanceenergy.com/warranty. Refer to Figure 25 below.**

17. **It is recommended that you return to the site for a visual inspection of the anchor wedge grip after the first year to adjust the wedge grip back to the shoe plate should there be any settling over that period with the soil itself.**

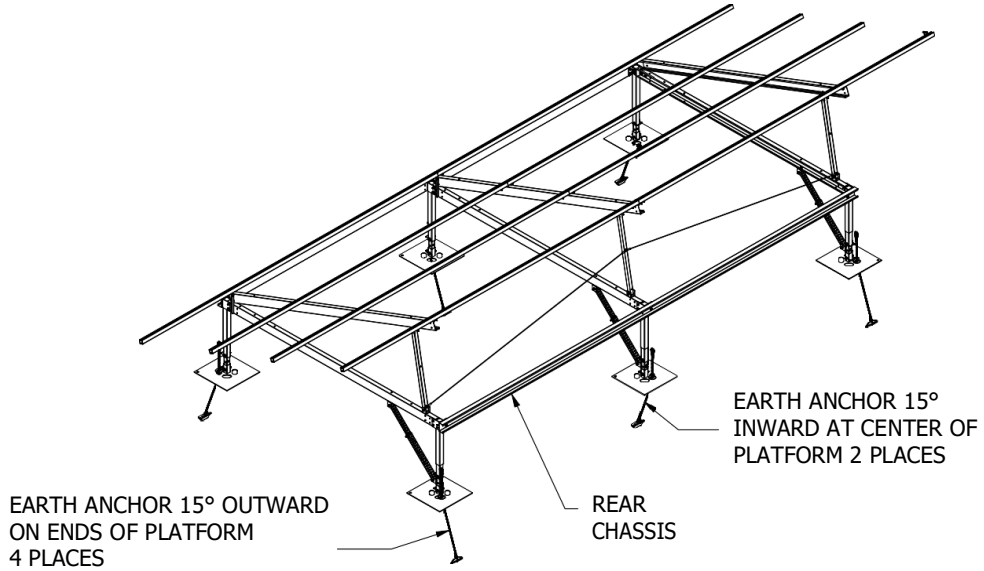


Figure 25: Earth Anchors Installed and Load Tested

Solar Module Mounting

Four Assemblers ~ Duration: 20 minutes

Most solar modules commonly used for residential and commercial applications are easily mounted on the Osprey PowerPlatform® .
The Osprey PowerPlatform® may only be used to ground a solar module complying with UL1703. Specific modules must be tested with the self-bonding Chassis Clamp in order to qualify for UL2703. Refer to the solar manufacturing list on page 7 of all modules approved for UL2703 integrated grounding.

Self-bonding Strut Mid Clamp and Adjustable Strut End Clamp Assemblies are included with each order as an additional line item. **Note the Adjustable Strut End Clamps are not a bonding clamp nor do they required to be.** See Figure 26 below. (Note: The Everest CrossRail Mid Clamp is an approved clamp for UL 2703 listing see approved panel list on page7-8.)

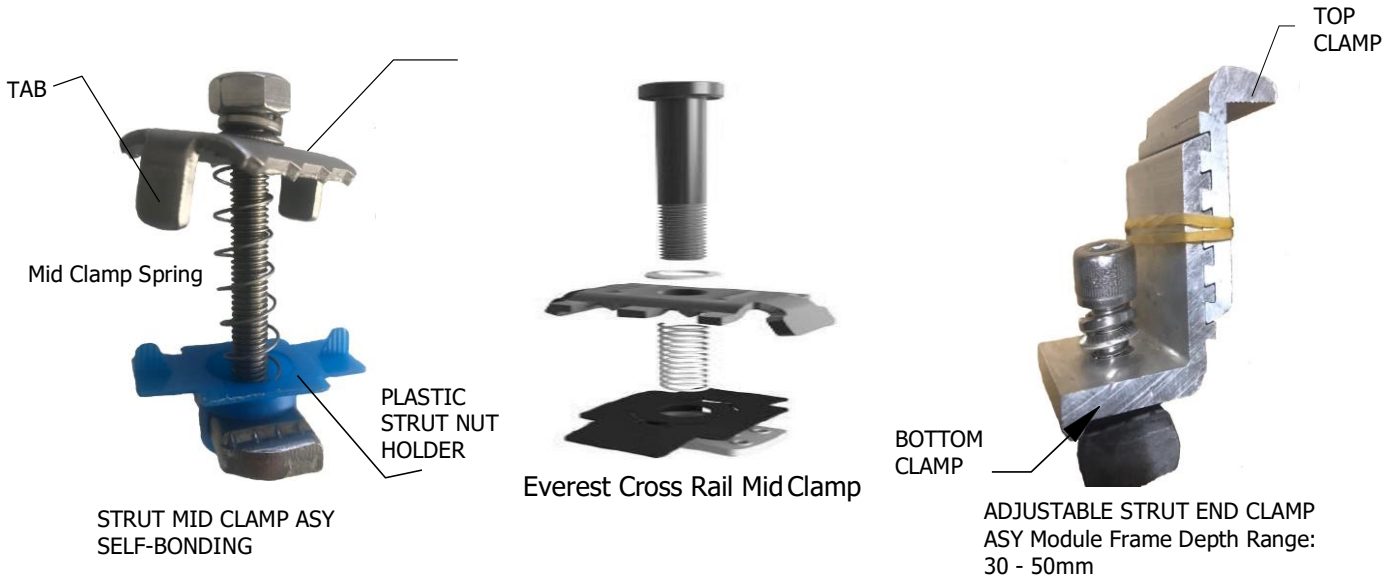


Figure 26: Module Clamp Assemblies

The Solar Modules on the Osprey PowerPlatform® are mounted in a portrait orientation.

1. Place a solar module on the lower set of rails a minimum of 2 inches from the end of the Strut Rail.
2. Square the solar module frame to the Strut Rails and center the top edge of the module between the two middle Strut Rails. A gap of 1 inch should be left between the top and bottom portrait solar modules.
3. Install two Strut End Clamp assemblies to hold the module in place. Slide the Top Clamp into the correct slots of the Bottom clamp to obtain the frame depth of the solar module being installed. A 6mm hex bit socket should be used to tighten the socket head cap screw.

4. Install two Strut Mid Clamps to the Strut Rails. The channel nut gets inserted into the strut and then rotated 90 degrees by hand. The Plastic Strut Nut Holder will hold channel nut into the channel to receive the bolt of the Strut Mid Clamp which has a 13mm hex.

5. Slide the two Strut Clamps tight up to the solar module frame. The integrated spring will hold the Strut Mid Clamp above the solar module.

6. Place a second solar module next to the first and slide it tight up to the two Strut Mid Clamps. Aligned and square the second solar module to the first module. The solar module frame of the second module will need to be lifted slightly to rest above the Plastic Strut Nut Holder.

7. The Tab of Strut Mid Clamp must be flush and tight to the module frames for the teeth of the Strut Mid Clamp to fully engage and penetrate the anodized module frame for proper grounding per UL2703.

8. Once the two modules are aligned and squared, tighten the Strut Mid Clamps to the lower rail until it is snug, but not overtightened.

9. Repeat procedure on the upper pair of Strut Rails and install two more solar modules.

10. Ensure the alignment of the first four modules is parallel with the rails and adjust if necessary, to ensure the following modules are installed evenly. It is recommended to run a string line with stakes along the bottom edge of the lower module to ensure proper alignment and the modules are installed evenly.

11. Once the 1-inch gap is centered and confirmed between the first four portrait modules then torque the Mid Clamp bolts and end clamp screws all to 200in-lbs. Snug with drill and use a torque wrench to finish off each clamp.

12. Continue placing modules on the rails and repeating steps above for the remaining modules on the lower and upper set of rails.

13. Alternatively, all the lower portrait solar modules can be installed first and then the upper solar modules can be installed last.

14. Refer to Figure 27 on next page of the completed Osprey PowerPlatform.

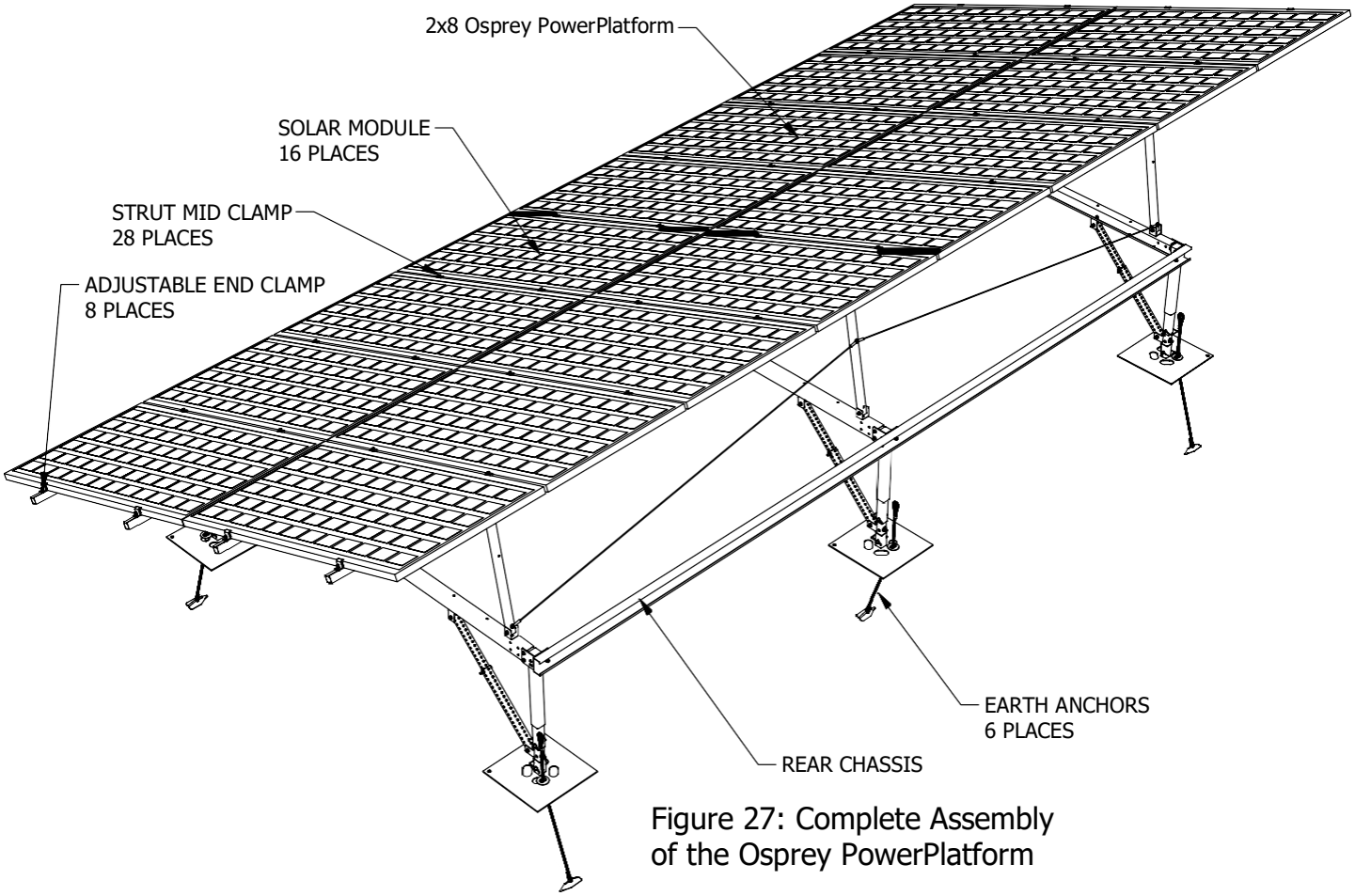


Figure 27: Complete Assembly of the Osprey PowerPlatform

Splicing Osprey (UNITS) Together

Four Assemblers ~ Duration: 20 minutes

If the Osprey PowerPlatform is being installed in a long continuous row and not a stand-alone platform, then splicing the Ospreys together is an option. The longest row that can be spliced is 150 feet until a thermal expansion gap of 6 inches must be introduced.

Installation of splices on either end of the Ospreys is performed just like the splices installed at the center of the platform.

Four Splices will be required to connect the neighboring Strut Rails with 3/8"-16 x 1" serrated bolts and nuts. A Splice Plate Kit is sold separately with four splice plates including hardware.

Grounding

Grounding the Osprey PowerPlatform must be performed per the National Electric Code and any other applicable local codes in accordance with the manufacturer's specification of a UL and cETL listed
grounding lug. A grounding lug is not supplied.

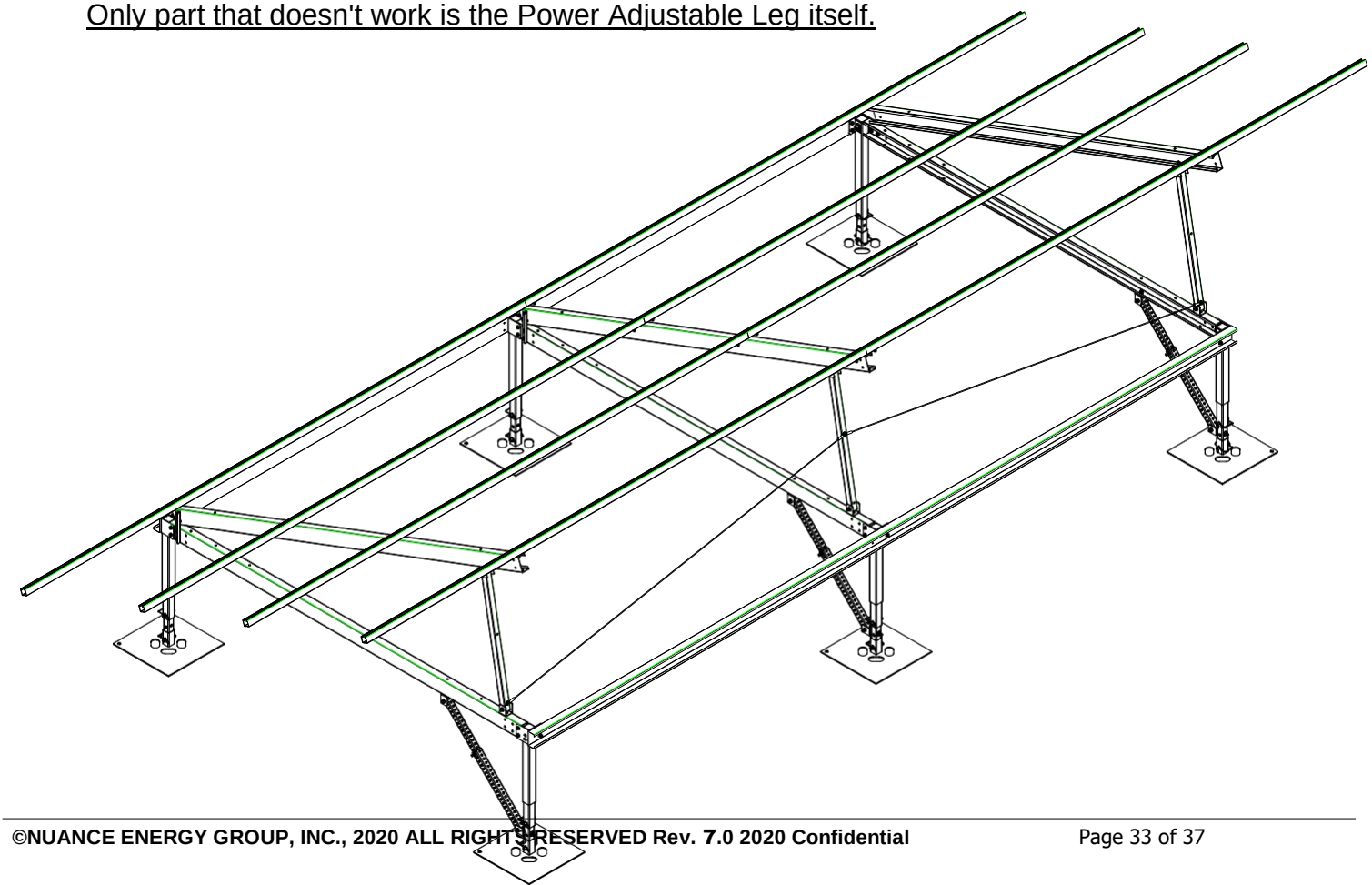
1. Select a location on the lower Strut Rail for a grounding lug to be installed.

2. Drill a hole in the Strut Rail and install an ILSCO GBL-4DBT or other UL and cETL listed lay-in grounding lug. Refer to Figure 21 below.

The grounding path is from the Self- Bonding Mid Clamp, to solar module frame, to Strut Rail, to Strong Back, to Back Brace, to Chassis Stud and finally to the NEC Ground. This also includes the splice plates which connect one unit to the next to form one Array with two Osprey PowerPlatforms using the included hardware.

See Bonding Path Diagram below.

The NEC Ground can be attached to any part of the path laid in GREEN.
Only part that doesn't work is the Power Adjustable Leg itself.



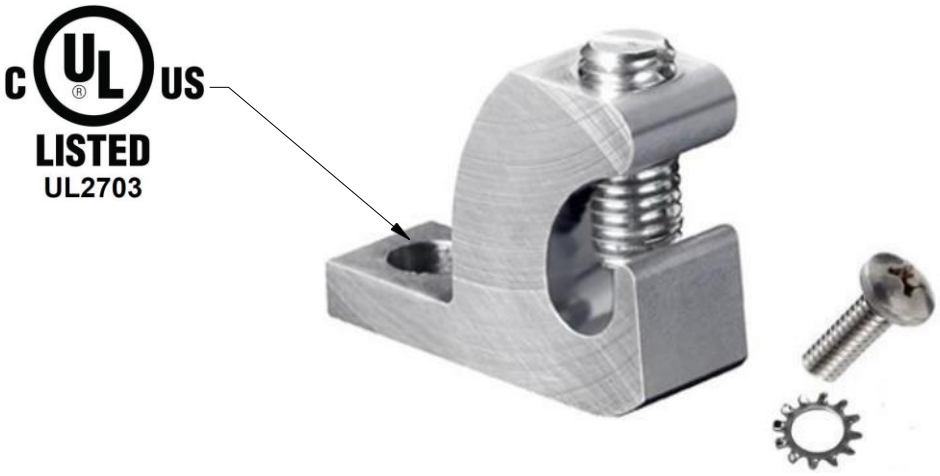


Figure 21: ILSCO GBL-4DBT GROUNDING LUG

3. Place the lug over the hole with the star washer between the bottom of the grounding lug and the
   Rear Chassis, insert bolt and torque the grounding assembly.

4. Insert a #4 to #10 AWG copper wire into the lug and tighten the lug set screw onto the copper wire. For #4-6 AWG wire torque to 35 in-lbs and for #8-10 AWG torque to 30 in- lbs. Minimum grounding conductor to be used is #10 AWG Copper.

5. Connect the grounding electrode conductor to a ground rod or equivalent ground per the National
   Electric Code.

6. For multiple rows of Osprey PowerPlatforms®, connect each row strut rail with an appropriately size grounding conductor and run it in conduit with string wires to next row according to the maximum fuse rating of the module string. For example, a bare #6 copper wire is rated for 200A. If this string is rated for 15ADC, then 13 strings can be connected to a single ground rod. If the string has a 20 ADC rating, then 10 strings of Osprey PowerPlatforms® can connect to the single ground rod.

7. For large solar arrays, multiple ground rods will be required.

QA / QC

Confirming that all the procedures listed above have been followed and all components listed above have been properly installed, personnel should thoroughly review every component and connection and verify the assembly. Immediately correct any issues that are identified.

It is suggested a re-inspection of the installation be performed annually. Over time, the base plates will settle into the ground due to the weight of the structure resting on top of the soil which is normal. Once the system had found settle point after the first year or so there should not be any significant movement after that initial settle period. The Wedge grip may need to be pushed down and reseated flat against the base plate. The power adjustable legs may need adjusting if certain legs settle more than others.

Installer Warning and Notice

Notice

Please carefully read and understand the provided installation manual before installing, wiring or operating our product in your PV system. Failure to follow all instructions and procedures could possibly damage the product, and above all, lead to serious injury or death. All PV systems and Osprey PowerPlatform® installations must comply with the National Electric Code. Installers are solely responsible for code and safety compliance and consequences.

WARNING!

DANGER
Electric shock risk

PV modules generate electricity when exposed to light and are electrically live when mounted. This DC electricity can pose danger to the installer, user, and/or property. Any contact with electrically active module terminals can result in arcing; leading to shocks, fires, burns, and/or death. Use caution around utility power lines that may be near the work area. Never work in wet or windy conditions. Lighting is a hazard to any work with metal, never work when lighting is present. Insure good earth-bonding as part of a lighting protection system.

DANGER!

Electrical shock potential of PV modules increases with higher parallel currents and series voltage connections. The PV installer must assume all inherent risk of property damage and/or personal injury related to the mishandling of PV modules during installation and maintenance. Skilled, Licensed Electricians must conduct all electrical installation procedures. All work must comply with all national, state and local installation procedures, product and safety standards. These standards include but are not limited to applicable National Electrical Code (NEC®) sections, UL Standards, OSHA Regulations, State or Local Fire Marshall Codes, NFPA 70E. Installation must comply with NEC 250 (Grounding and Bonding), NEC 690 (Solar Photovoltaic Systems), CSA 22.1 (Safety Standard for Electrical Installations), Canadian Electrical Code Part 1, and all other applicable state, provincial, and local electrical code requirements. Dual Rack Solar Racking Systems must be used with UL1703 listed equipment including but not limited to; PV modules, combiners and disconnects.

DANGER!

Avoid electrical injuries by preventing the accidental or unintentional release of hazardous energy. Proper Lockout/Tag out procedures will limit this danger. All Personnel must. Use caution when working in and around PV arrays. Proper PPE worn at all times will also limit this danger. Modules produce electricity when exposed to light. To avoid electric shock and injury, completely cover the front of the module with an opaque material before making any electrical connections. Lock out / tag out and disconnect the PV system from all electrical energy before any maintenance or cleaning. NEVER disconnect or connect modules under load. Never disconnect the earth bond to the array.

~ END OF INSTALLATION MANUAL ~