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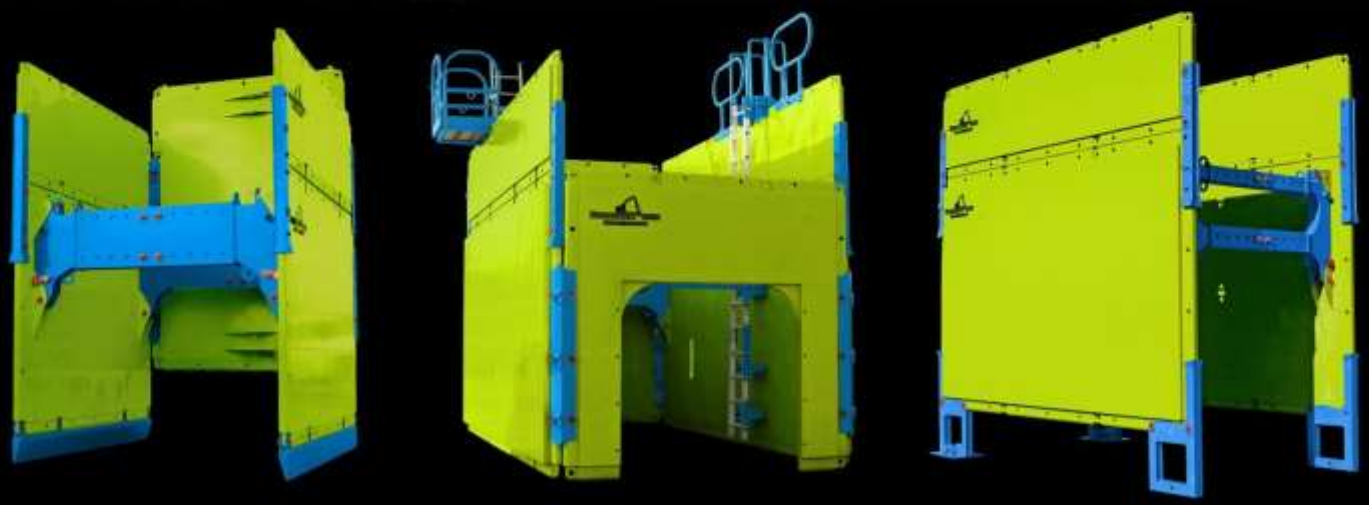
GROUNDWORKS
SAFETY SYSTEMS

MULTILATERAL TRENCH BOX MANUAL



GWSS.CA NEXT LEVEL
IN TRENCH SAFETY

PREFACE

Thank you for purchasing a GroundWorks Trench Box System. Contained within this product manual are detailed documents pertaining to safe use procedures, proper inspection procedures, specifications and parts breakdowns of the GroundWorks Trench Box System. Every Trench Box System GroundWorks produces is specifically engineered for certain applications and it is the responsibility of the user to apply them, considering the job requirements and safety.

Please read and understand this manual in its entirety to ensure the performance and safety of your GroundWorks Trench Box System. Read and follow all precautionary notes included to ensure the health and safety of surrounding workers. Failure to do so could result in serious injury or death.

Any questions related to this product that cannot be answered by this text should be directed to your Rental Company or GroundWorks Customer Service at 1-403-227-1001.

CONTENTS

GENERAL SAFETY

READ MANUAL PRIOR TO INSTALLATION

Improper use of this system may result in serious injury or death. **All personnel working in and around the Trench Box should read this manual thoroughly before use. Failure to perform these tasks as outlined in this manual may result in serious injury or death.**

READ AND UNDERSTAND ALL SAFETY STATEMENTS

Read all safety decals and safety statements in all manuals prior to use of this system. Know and obey all relevant regional safety regulations, laws, and any other professional guidelines pertaining to system use.

KNOW YOUR SYSTEM

Know your system's capabilities, specifications, and assembly procedures before use. Visually inspect the entire system before every use. Check that all hardware and connecting devices are properly installed and secure. Remove and replace any damaged, fatigued, or excessively worn parts as soon as they become apparent. All personnel working with and around the Trench Box System should be properly trained, experienced and supervised.

DO NOT MODIFY SYSTEM

Modifications may impair the function, safety, life, and performance of the system. Do not alter or remove any safety equipment from the system. When making repairs, use only the manufacturer's genuine parts and consult GroundWorks to obtain authorized instructions. Failure to do so may void warranty and may result in serious injury or death.

LADDERS, CATWALKS & ACCESS PLATFORMS

All ladders, catwalks and access platforms supplied by GroundWorks have a working load limit of 300 lbs (136 kg) unless otherwise stated. Do not exceed the stated load limit. Refer to accessory certification sheet for further details.

SAFE LIFTING AND TRANSPORTATION PRACTICES

- Do not exceed the lifting capacity of your lifting machine when moving or assembling the Trench Box.
- Ensure all lifting equipment (e.g. chains, slings, wire rope, hooks and clevises) are rated for loads applied during transporting, assembly and disassembly of the Trench Box System. Refer to page 19 for lift point locations.
- Never stand under the system, any of its components, or lifting equipment if it is moving or suspended in air. All personnel should be clear of system during movement. GroundWorks recommends using tag lines to assist in the guiding of suspended equipment.

MAINTAINING THE TRENCH BOX SYSTEM

- Before performing any maintenance, ensure the system is placed in a stable position.
- Ensure all personnel performing any maintenance or inspections on the system are qualified and authorized to do so.
- After performing any maintenance or repair, check that the system is in proper working condition. If problems affecting performance and/or safety are discovered, the defective component must be immediately removed from service.
- A proper maintenance and inspection schedule must be developed, performed, and documented on a regular basis. Refer to page 77 for recommended inspection procedures.

USERS OF INDUSTRIAL SHIELDING SYSTEMS ARE RESPONSIBLE FOR CONSTRUCTING AND ENFORCING SAFETY PROGRAMS THAT ARE SPECIFIC TO THEIR APPLICATION. COMPLIANCE TO LOCAL SAFETY CODES MUST BE MAINTAINED WITHIN SUCH PROGRAMS. GROUNDWORKS CANNOT PREDICT EVERY SITUATION THAT MAY INVOLVE HAZARDS, THEREFORE THE WARNINGS AND GUIDELINES PRESENTED IN THIS MANUAL DO NOT CONSTITUTE A COMPREHENSIVE SAFETY PROGRAM.

SYSTEM OVERVIEW

The GroundWorks Trench Box System is composed of two main components; the panels which provide protection against the wall of the trench, and the struts which provide the support between the panels. There are also many ancillary items that can be added and configured around the main trench box to allow for complete customization of the system to suit job requirements as needed.

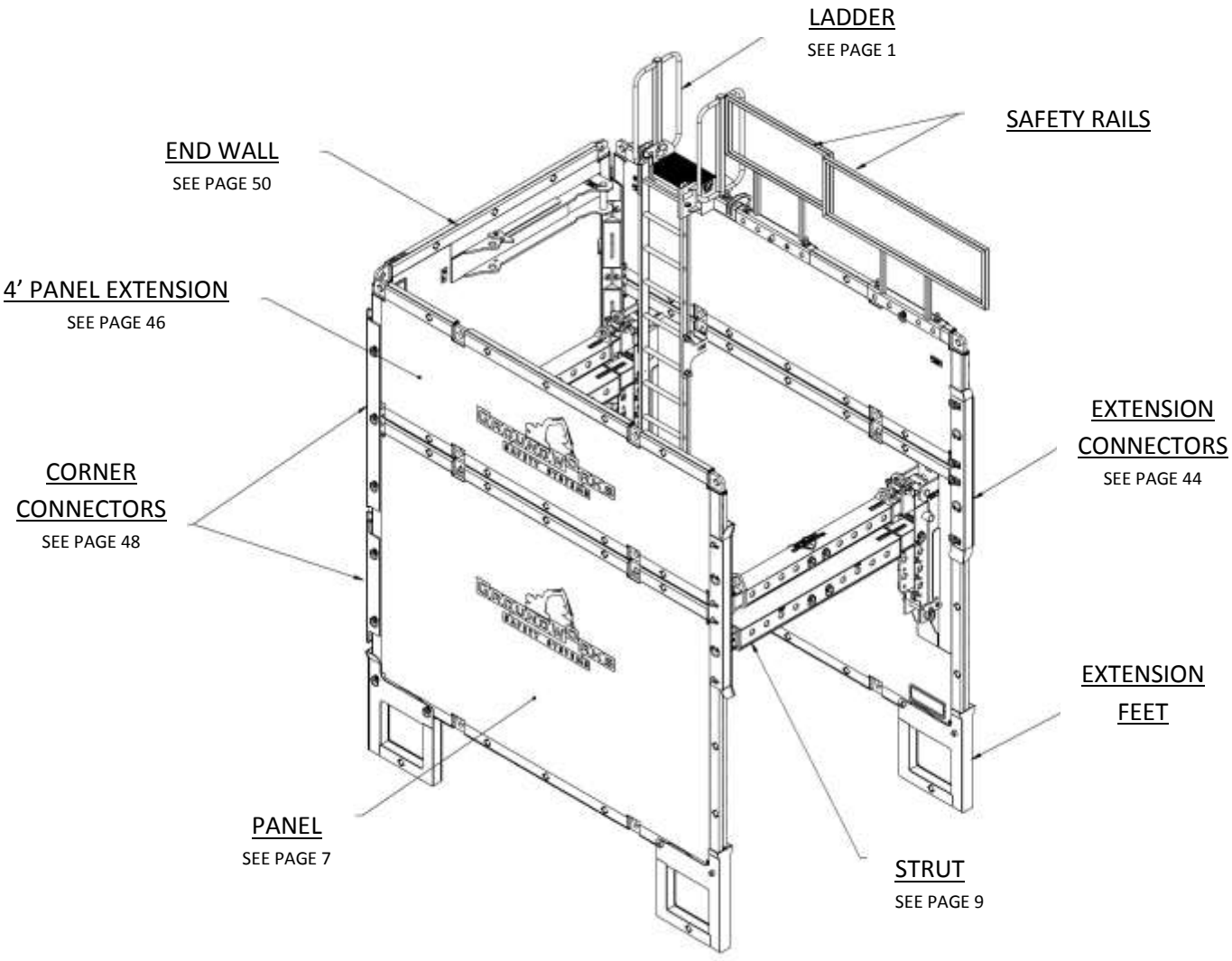


Figure 1: Example of a GroundWorks Trench Box

Components of the GroundWorks Trench Box System are classified into the following different series in order of lightest to heaviest: SM (Super Light Multilateral), MM (Medium Multilateral), HM (Heavy Multilateral) and XM (Extreme Multilateral). Series components are interchangeable to optimize utilization so attention needs to be given as to what each component series is. This information is obtained through the first two characters of the components serial number. Ancillary items that have no relevance to a systems depth rating are assigned a serial number beginning with "A" and may be used on any system without affecting the capacity. ***Depth rating of a system is limited by the depth rating of the lightest series of component***

GROUNDWORKS PANELS

GroundWorks Safety Systems offers panels in four different series: Super Light Multilateral panels compare to traditional 3" walls, Medium Multilateral panels compare to traditional 4" walls, Heavy Multilateral panels compare to traditional 6"-8" walls, and Extreme Multilateral panels compete with traditional 8"+ walls. The series of panel is indicated on the serial number tag as well as being identifiable by the first letter in the unit number (S/M/H/X).

Due to the high tensile steel construction, there is a dramatic weight savings with GroundWorks panels yet they are able to meet or exceed traditional depth ratings. In order to maximize the strength/weight ratio, not all panels in a series will have the same cross sectional dimension. However, due to the fact that all GroundWorks Multilateral panels are built with the identical perimeter connection system, all panels can be connected to one another and all panels will work with the same accessories, regardless of size or series.

The panel's serial number tag will be located on the inside of the panel below one of the lugs. The panel's serial number, unit number, model description and weight are etched into the serial number plate and are arranged as illustrated in Figure 3.

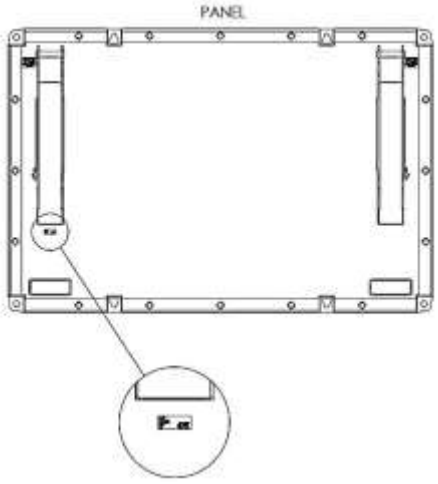
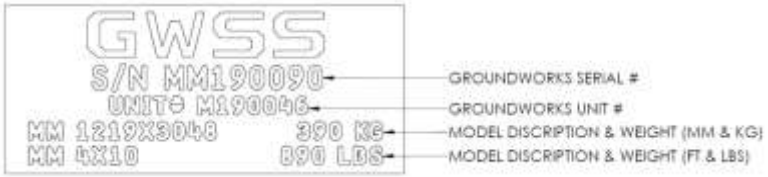


Figure 2: Serial Number Plate Location



WEIGHT IS PER ITEM

Figure 3: Serial Number Plate Layout

The panel's unit number tag will be located between the edge of the panel and the outside of both connection lugs, as well as on each side wear strip. (See Figure 4). This unit number will correspond with any certified documents relating to use and capacity for the set of panels. This information can be found at www.gwss.ca under "Tab Data" or by contacting GroundWorks Safety Systems. The panel's unit number and outside-to-outside strut width (required for assembly - See Figure 5) will be displayed as illustrated below.

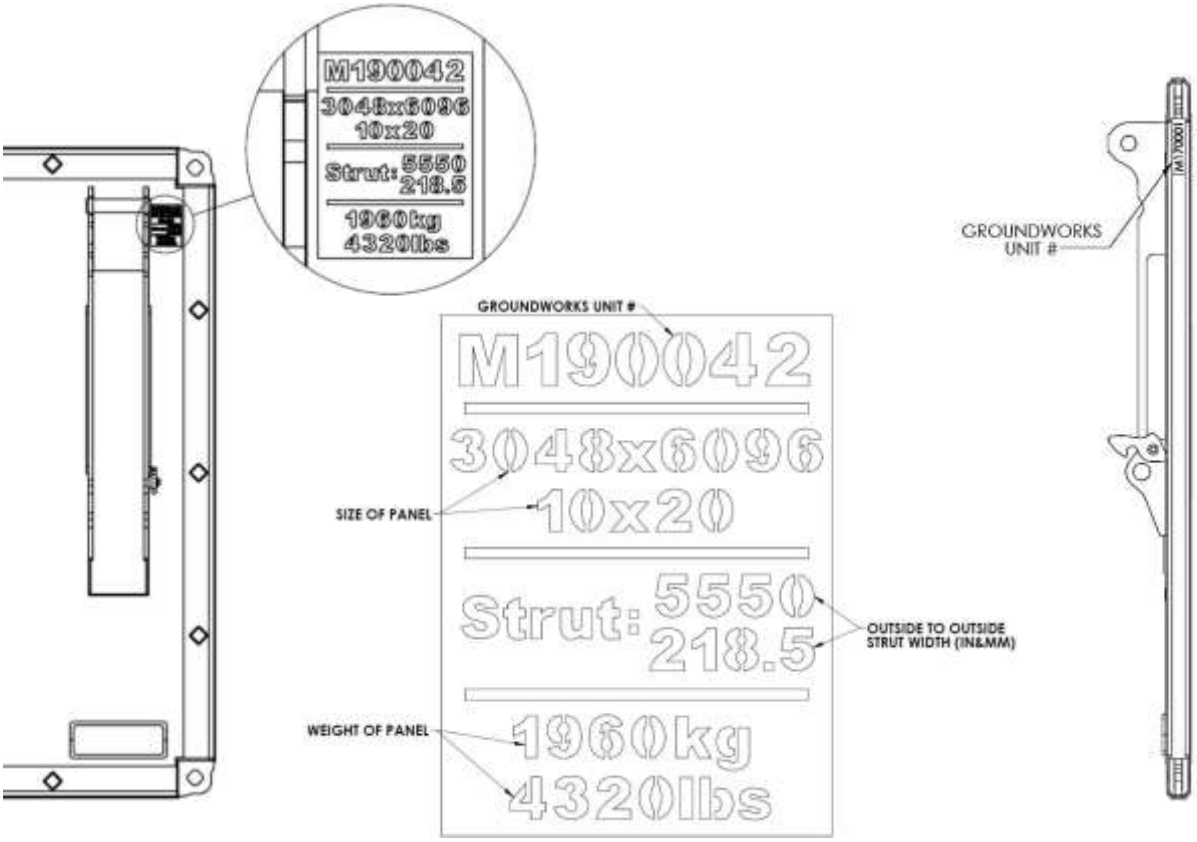


Figure 4: Unit Number Tags

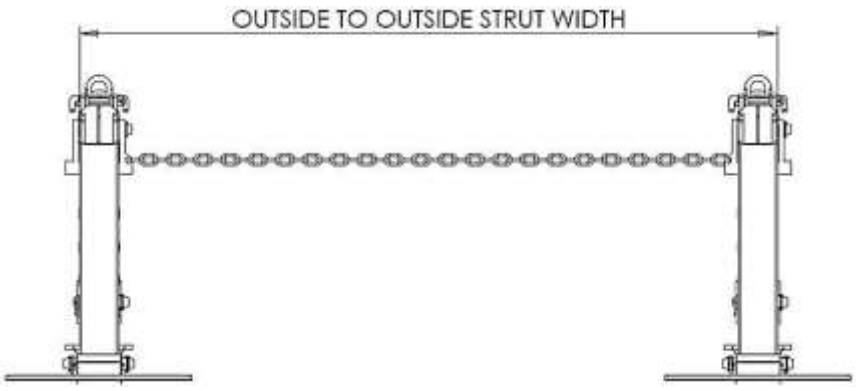


Figure 5: Outside to Outside Strut Width

GROUNDWORKS MULTILATERAL STRUTS

GroundWorks Multilateral Struts are manufactured with interchangeable sections in order to increase versatility and utilization. The two main components of the Multilateral struts are the strut couplers, located on each end of the strut assembly, and the strut tubes, which are located in the center portion of the strut and dictate the distance between the panels when a box system is fully assembled.

As with the GroundWorks panels, GroundWorks Multilateral strut tubes are available in four main series: Super Light, Medium, Heavy, and Extreme. The strut couplers are available in three series: Super Light, Heavy and Extreme. Each series of strut tube is compatible with all other series of strut couplers so attention needs to be paid to the lowest series in an assembly. For example, if Heavy strut couplers are assembled with Medium strut tubes, then the strut will limit the system to Medium depth ratings, even if Heavy panels are used. If Heavy depth ratings are required, then the Medium tubes must be changed out for Heavy tubes.

The series of each component is indicated on the strut ID plate. The strut ID plate will be located on both sides of the bottom strut tube (See figure 6). The ID plate will display the strut tube series, adjustable tube lengths, and the weight of the single fully assembled strut (See figure 7). The strut coupler serial tag is located on the inside face of the coupler just below where the top tube connects (See figure 8).

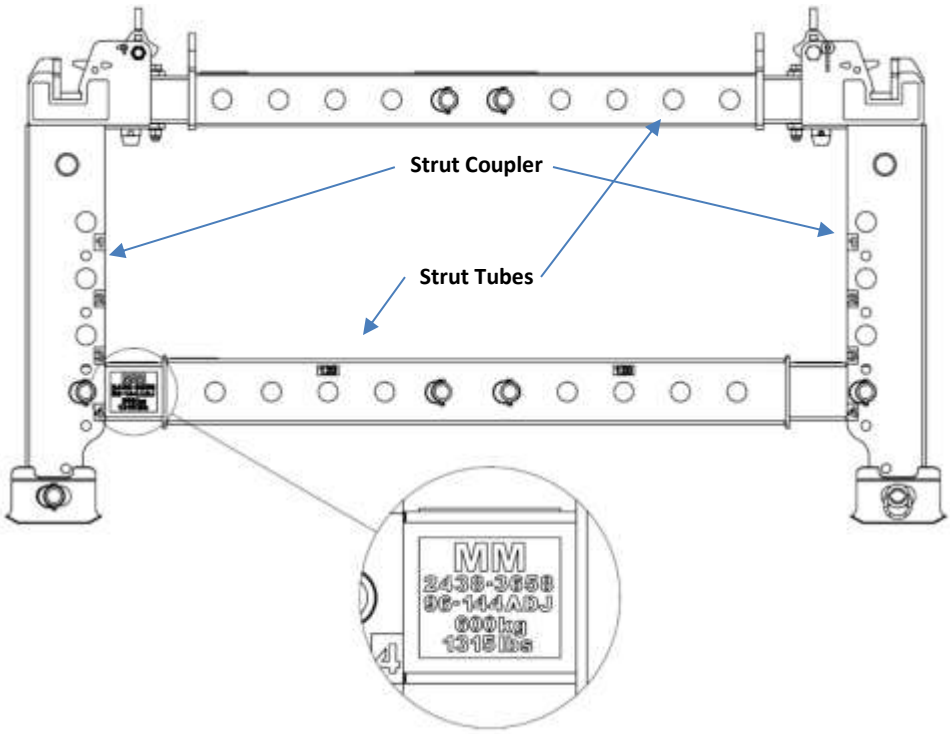


Figure 6: Strut ID Plate

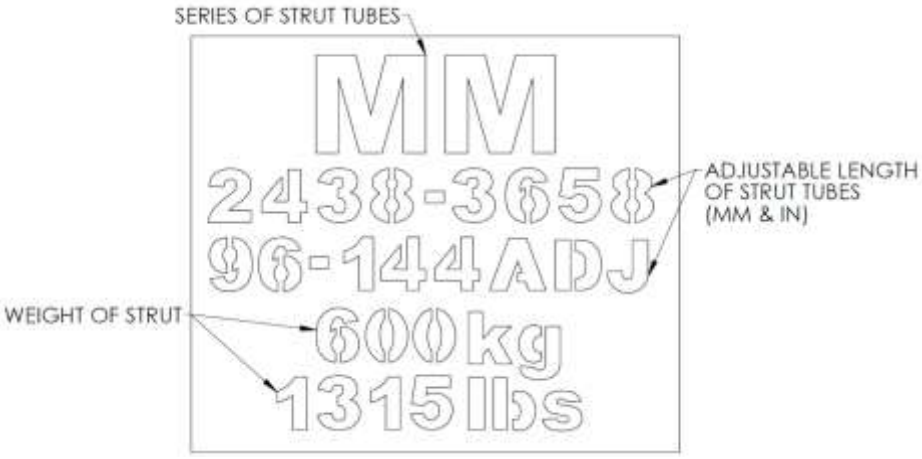


Figure7: Strut ID Plate Layout

GroundWorks Multilateral struts are available in both fixed width and adjustable width configurations. **All GroundWorks struts are manufactured to be used at full width to full depth rating of any panel in the corresponding series.** Attention needs to be paid to the clearance setting (positions 1-4) when referencing tab data sheet to ensure proper system requirements are met for desired depth rating. Refer to page 14 for further information.

Adjustable struts will have a serial number plate on each component that links the 2 strut center sections and 4 strut slide tubes along with a separate serial number that ties the couplers to one another. See Figure 8 for the 8 locations of the serial number identification tags found on adjustable struts.

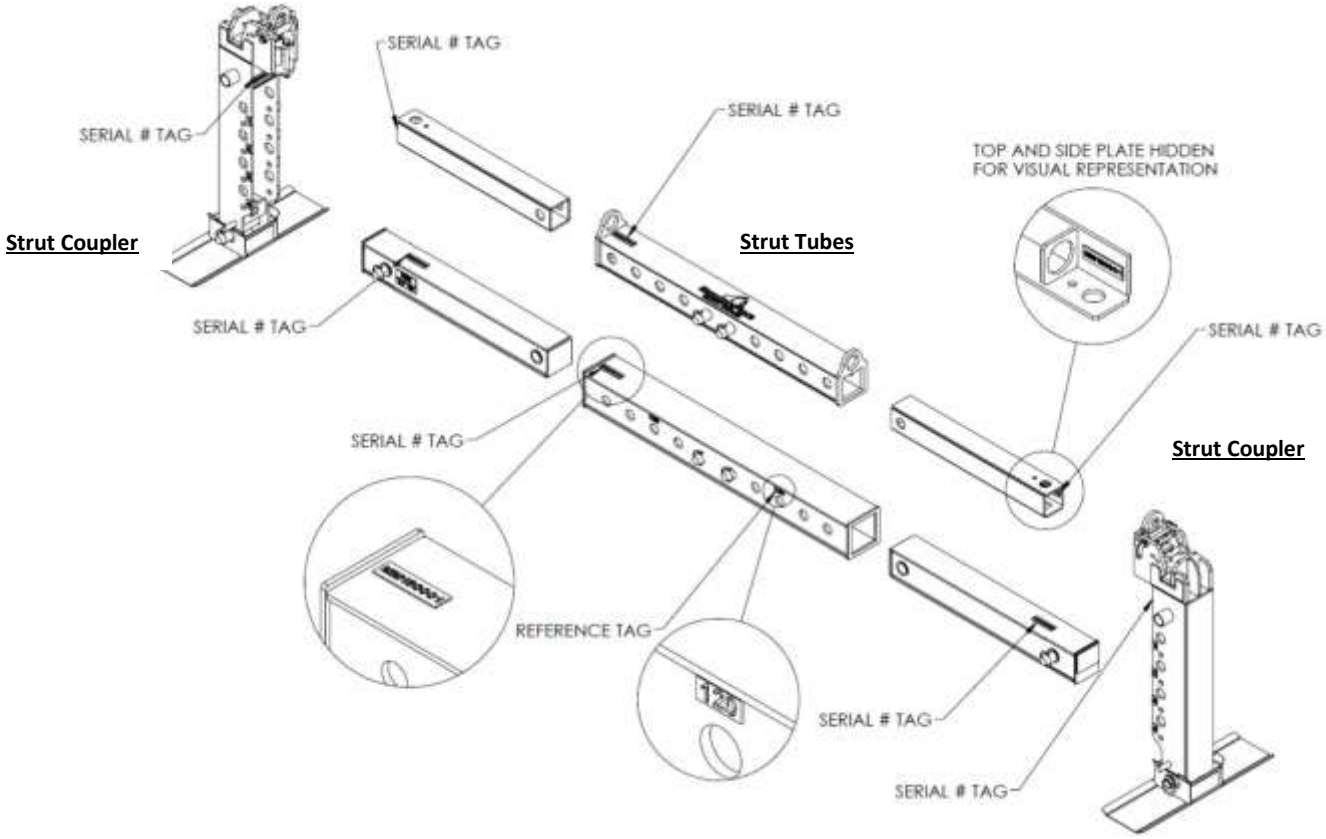


Figure 8: Serial Number Plate Identifying Tag Location

GWSS strut pins have a color-coded system, with each color corresponding to a particular UL (Usable Length). For example:

- Yellow pins have a UL of 6.375
- Green pins have a UL of 7.5
- Red pins have a UL of 9.25
- Orange pins have a UL of 9.75

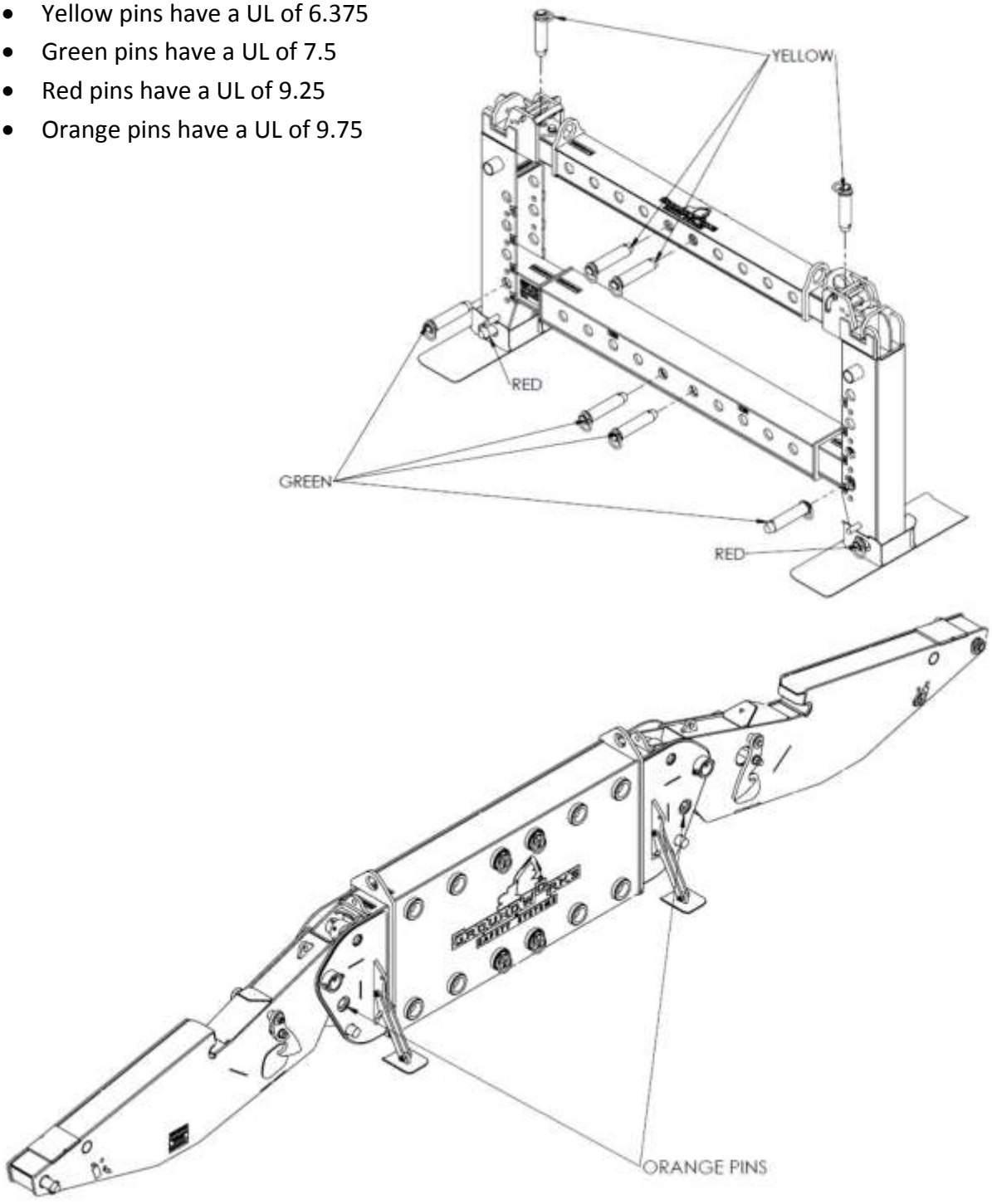


Figure 9: Strut Pin Color Reference

STRUT ASSEMBLY PROCEDURE

1. Identify the coupler along with the top and bottom slide tubes. Insert slide tubes into the coupler and secure using the provided hardware. Repeat step 1 for the second coupler.

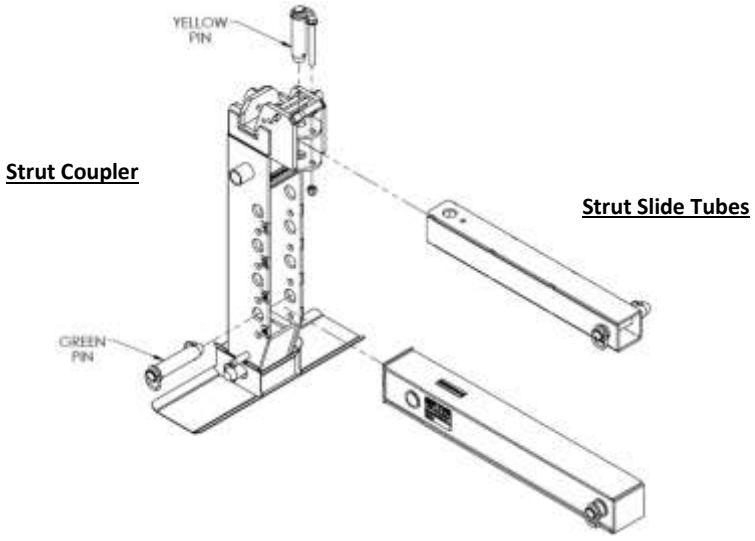


Figure 10: Strut Assembly - Step 1

2. Insert first connecting tube over slide tube. Select desired width before pinning.

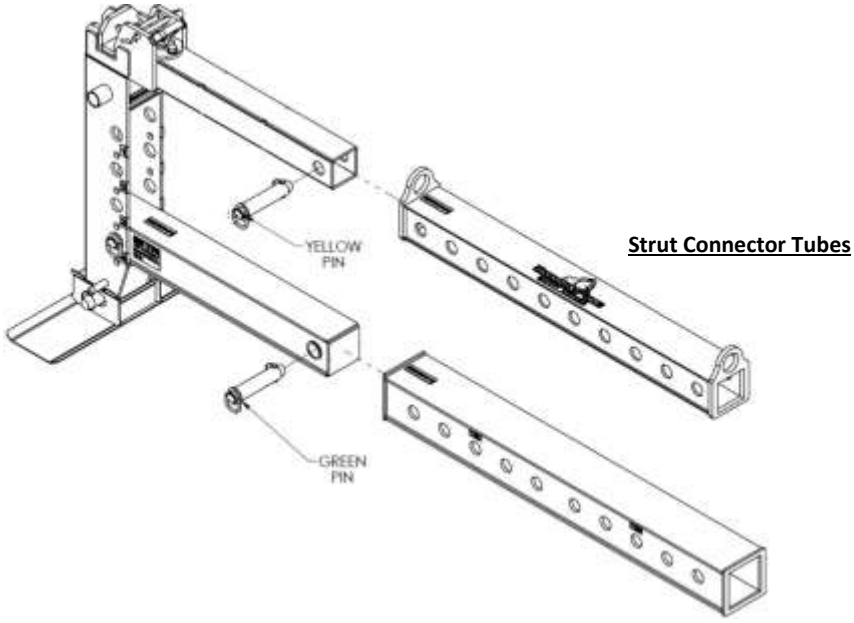


Figure 11: Strut Assembly - Step 2

3. Add the second coupler to the end of the current configuration and slide in until desired width is achieved. ***It is important that the connector tube be either centered in the assembly or to the nearest six inch increment***

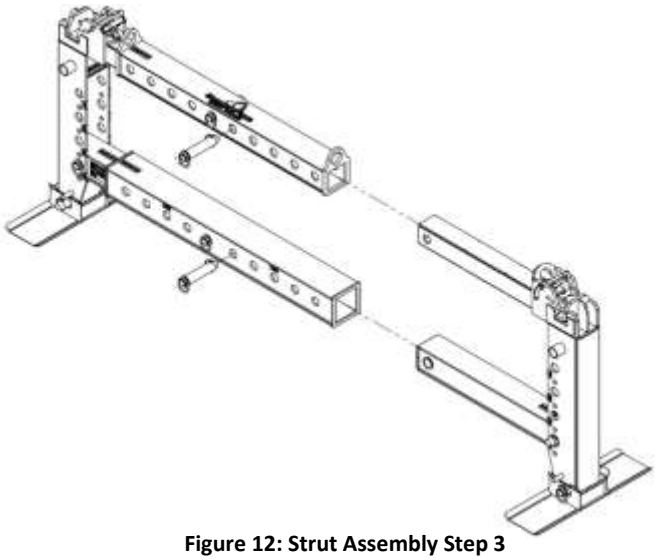


Figure 12: Strut Assembly Step 3

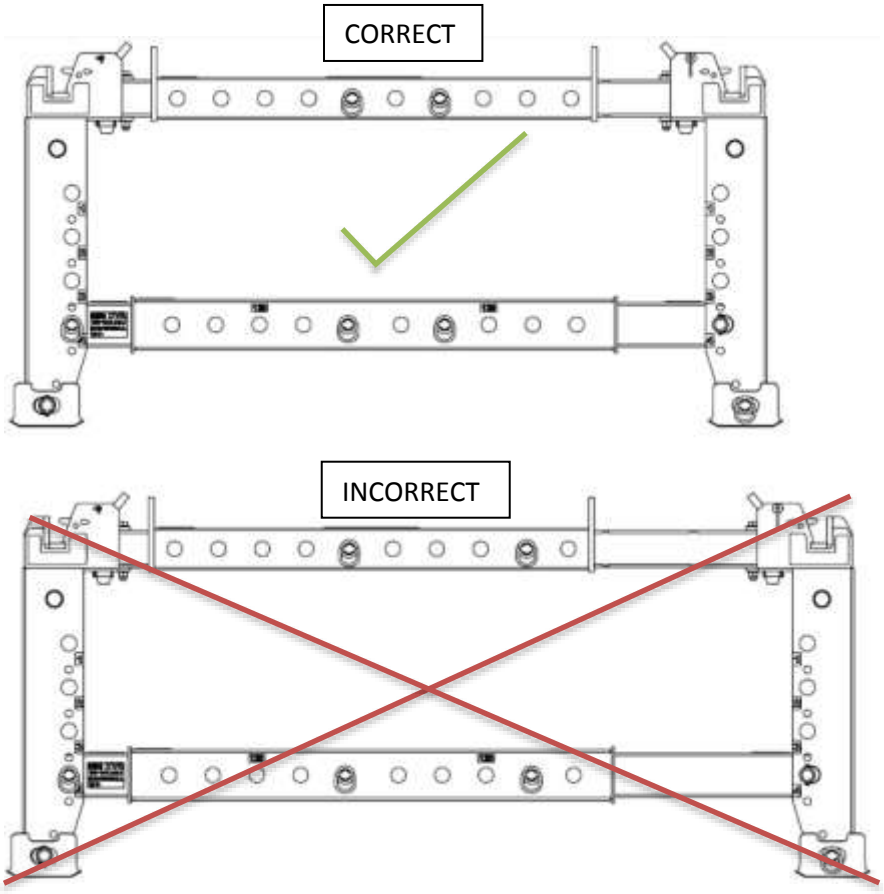


Figure 13: Proper Adjustable Strut Setup

SETTING ADJUSTABLE STRUTS

NOTE: If using adjustable struts in your system, always set to desired width and clearance before connecting to the Trench Box panels.

WARNING:

NEVER REMOVE ADJUSTABLE STRUT PINS WHILE PANELS ARE CONNECTED, THIS CAN CAUSE PANELS TO FALL, POTENTIALLY CAUSING INJURY OR DEATH.

Horizontal adjustment

1. **Remove 2 Pins on one side from the center tubes.**
2. **Adjust the strut on disconnected side to the desired width.**
3. **Reinstall the 2 pins in the center tubes.**
4. **Repeat steps 1-3 for other side.**

It is important that the connector tube be centered in the assembly. Ensure that the width pins are the same number of spaces from each end of the connector tube to the nearest 6 inch increment

Vertical adjustment

1. **Remove both pins restricting vertical movement of the bottom tube**
2. **Adjust bottom tube according to clearance and depth rating required. Each vertical position is labeled with a position tag from 1 thru 4. Consult GWSS tab data sheet for further information**
3. **Reinstall the 2 pins in the bottom tube**

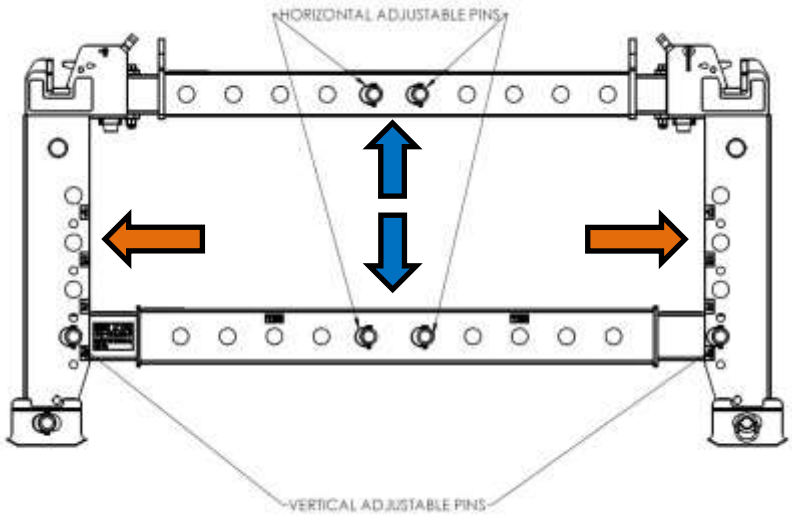


Figure 14: Strut Adjustments

****NOTE: Tab data sheet must be referenced when setting strut clearance to ensure required depths ratings are obtainable****

TABULATED DATA SHEET

The Tabulated Data Sheet template on the following pages is to be used as a general guideline to assist in the application of the GroundWorks Trench Box System. Contained within the document will be effective fluid pressure and corresponding depth ratings for different soil class's dependant on selected strut position or orientation of edge connection. Careful consideration must be taken when setting up the system to ensure that components are properly orientated in order to achieve the desired depth rating.

- Before beginning assembly, the application of each system component shall be verified by a competent individual, or a Professional Engineer.

WARNING:

FAILURE TO COMPLY WITH MANUFACTURERS TABULATED DATA WHEN USING THIS EQUIPMENT MAY LEAD TO INJURY OR DEATH.

- The following data is not to be used to determine the appropriate safety system alone, but used in addition to the competent individual's training to determine the best solution.
- Every GroundWorks Trench Box unit will be sent with a tabulated data sheet giving a general outline of the product's technical specifications. These are also available online at WWW.GWSS.CA
- In order to optimize a system for a job, four key aspects need to be determined before selecting the appropriate setup:
    - Soil type / equivalent fluid pressure
    - Strut connected or corner connected panels
    - Required pipe clearance (if using struts)
    - Required depth

  Using this information, the competent individual can reference the tab data associated with the product they have available to ensure that they are operating within the specified parameters.
- All configurations outlined on a GroundWorks tab data sheet are achievable with any strut width selected.

MODEL #: MM 10X16

UNIT #:

FABRICATION DATE:

UNIT WEIGHT:

SEE BELOW FOR TAB DATA INSTRUCTIONS

PANEL DESIGN SPECIFICATION #:

E2018038-S06

WARNING!

FAILURE TO COMPLY WITH MANUFACTURERS TABULATED DATA WHEN USING THIS EQUIPMENT MAY LEAD TO INJURY OR DEATH

Notes Pertaining to Tabulated Data

- This Panel Tabulated Data has been prepared by a Registered Professional Engineer in compliance with OSHA Standard 29 CFR, Part 1926, Subpart P - Excavations.
- Soil classification Types A, B and C as defined in OSHA Standard 29 CFR, Part 1926, Subpart P (Appendix A). It is the responsibility of the customer to determine the applicable soil type.
- Application of each panel shall be verified by a competent person, or Registered Professional Engineer retained by the customer. Soil conditions should be tested and monitored throughout the excavation and the competent person must take immediate corrective action if soil conditions deteriorate.
- A competent person shall satisfy the definition and intent of OSHA Standard 29 CFR, Part 1926 and ensure the excavation is performed safely. The competent person must also understand the working parameters of the shield system and ensure all equipment is in good working condition and is being used correctly.
- Only engineered spreaders and accessory components authorized by GWSS may be utilized with GWSS equipment. Use of unauthorized components with GWSS Panels will void tab data certification.
- The depths given in this Tabulated Data are based on the panel shield capacity and the soil pressure designated by the OSHA soil type ie. C80 = 80 psf/ft. Choosing a safe working depth is the responsibility of the designated competent person.
- Maximum depth in the tabulated data is measured from the surface to the bottom of the panel.
- Surcharge loads are not considered in the depth chart and can be created by nearby equipment, soil piles, and any ground load within a distance equal to the depth of the trench. Surcharge loads increase panel pressure and may reduce the maximum working depth.
- It is recommended that actual soil pressures be verified by a Registered Professional Engineer to ensure the shield capacity is not exceeded.

Liability Considerations

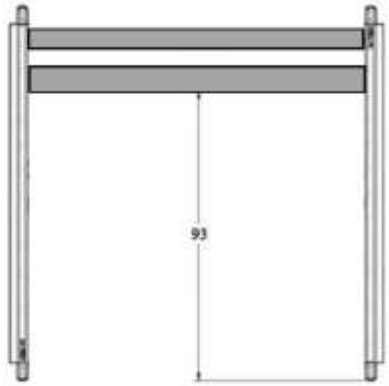
- GroundWorks Safety Systems (GWSS) shall not be liable for damage or injury caused by incorrect use or exceeding capacity of the shield system. No repairs or modifications to GWSS components may be performed without prior written consent.
- Each panel and associated attachments shall be inspected prior to, and during each use, following the GWSS inspection guidelines. Damaged components shall be immediately tagged and removed from service.
- Handling and operational sequences different than outlined in the GWSS operational instructions may damage components and void warranty.

Tab Data Instructions: Ratings provided in this Tab Data are driven by the support conditions depicted in each position/configuration. Clearances shown in each position assume a 7" tall bottom spreader centered at the supporting position on the panel. Some GWSS equipment such as high arches and long span spreaders may provide more or less clearance than shown here. Edge supported ratings require that the full edge length of the panel is supported. Support conditions other than those provided in this specification are rated separately. Refer to the GWSS operations manual or contact GWSS to obtain further information regarding applicable depth rating for selected equipment.

TABULATED DATA SHEET

MODEL #:	MM 10X16
UNIT #:	
DESIGN SPEC #:	E2018038-S06

POSITION - 1 [93" Clearance]



SOIL TYPE	EFP*	POSITION-1 MAX DEPTH (ft)
A	25	21
B	45	14
C	60	11
C	80	10
SHIELD CAPACITY (psf):		400

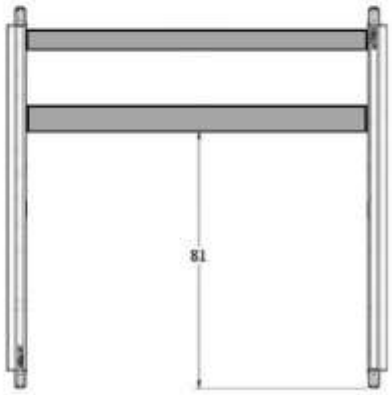
* Equivalent Fluid Pressure (psf per ft depth)

POSITION - 2 [87" Clearance]

SOIL TYPE	EFP*	POSITION-2 MAX DEPTH (ft)
A	25	37
B	45	23
C	60	18
C	80	15
SHIELD CAPACITY (psf):		800

* Equivalent Fluid Pressure (psf per ft depth)

POSITION - 3 [81" Clearance]



SOIL TYPE	EFP*	POSITION-3 MAX DEPTH (ft)
A	25	50
B	45	30
C	60	23
C	80	19
SHIELD CAPACITY (psf):		1120

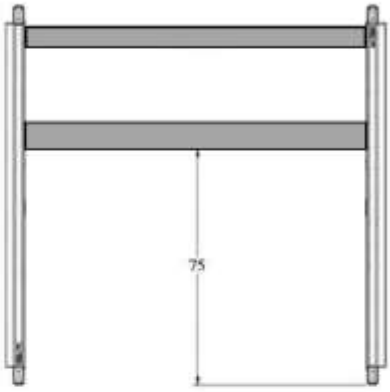
* Equivalent Fluid Pressure (psf per ft depth)

MODEL #: MM 10X16

UNIT #:

DESIGN SPEC #: E2018038-S06

POSITION - 4 [75" Clearance]



SOIL TYPE	EFP*	POSITION-4 MAX DEPTH (ft)
A	25	62
B	45	37
C	60	29
C	80	23
SHIELD CAPACITY (psf):		1440

* Equivalent Fluid Pressure (psf per ft depth)

EDGE SUPPORTED - HORIZONTAL ORIENTATION - PANEL HEIGHT: 10 FT

Selected equipment must provide continuous edge support to the panel. Refer to GWSS operations manual for specific configurations.

This rating includes box configurations where the panel lugging faces outwards.

SOIL TYPE	EFP*	EDGE SUPPORT MAX DEPTH (ft)
A	25	59
B	45	35
C	60	27
C	80	22
SHIELD CAPACITY (psf):		1360

* Equivalent Fluid Pressure (psf per ft depth)

EDGE SUPPORTED - VERTICAL ORIENTATION - PANEL HEIGHT: 16 FT

Selected equipment must provide continuous edge support to the panel. Refer to GWSS operations manual for specific configurations.

This rating includes box configurations where the panel lugging faces outwards.

SOIL TYPE	EFP*	EDGE SUPPORT MAX DEPTH (ft)
A	25	81
B	45	49
C	60	38
C	80	31
SHIELD CAPACITY (psf):		1840

* Equivalent Fluid Pressure (psf per ft depth)

LIFTING POINTS

- GroundWorks classifies lifting points in to 3 different categories: handling points, assembly points, and extraction points. Handling points are only used for moving the item they are attached to (e.g. d-ring on a corner connector). Assembly points are used in the assembly of the box and can also be used to handle the item (e.g. strut eye holes). Extraction points are used in the extraction of the box from the ground as well as for handling the item. Extraction points are only located on panels.
- All personnel working with and around the Trench Box System should be properly trained, experienced, and supervised.
- Before beginning assembly, the application of each system component shall be verified by a competent individual, or a Professional Engineer.

WARNING:

FAILURE TO COMPLY WITH MANUFACTURERS TABULATED DATA AND OTHER SAFETY GUIDELINES WHEN USING THIS EQUIPMENT MAY LEAD TO INJURY OR DEATH.

- Ensure a proper inspection (See page 77) is done to all system components prior to assembly.

WARNING:

DURING MOVEMENT ENSURE GROUND PERSONNEL ARE FREE AND CLEAR OF SYSTEM. GROUNDWORKS RECOMMENDS USING TAG LINES WHEN GUIDING ELEVATED EQUIPMENT INTO POSITION.

- When removing the Trench Box from excavation site, use the panel extraction points. **DO NOT USE THE STRUT HANDLING POINTS FOR REMOVING THE TRENCH BOX FROM EXCAVATION. SEE FIGURE 15 FOR LIFT POINTS ON PANELS AND STRUTS.**

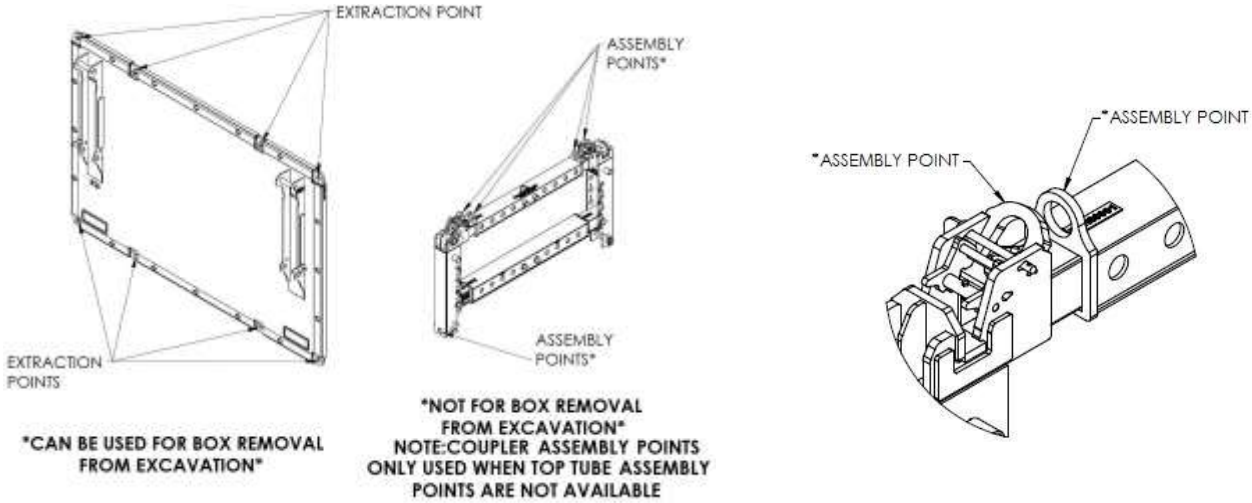
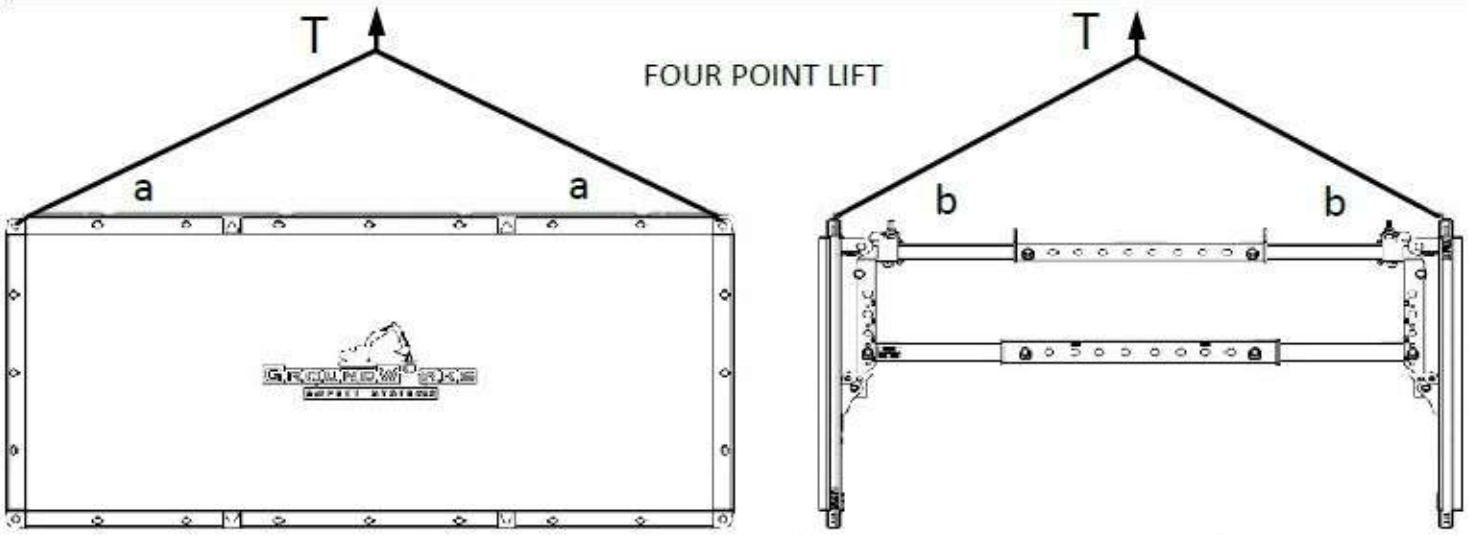


Figure 15: Lift Point Locations

Hoisting Pad Eyes for Models SM, LM, MM and HM Panels



Assembly Weight (lbs)	Hoisting Line Angle from Horizontal	
	a_{min} (degrees)	b_{min} (degrees)
more than 60,000 but not more than 100,000	90	90
more than 25,000 but not more than 60,000	60	60
no more than 25,000	30	30

*Ratings are based on a safety factor of 3 on minimum ultimate material strength.

WARNING!

FAILURE TO COMPLY WITH MANUFACTURERS INSTRUCTIONS WHEN USING THIS EQUIPMENT MAY LEAD TO INJURY OR DEATH

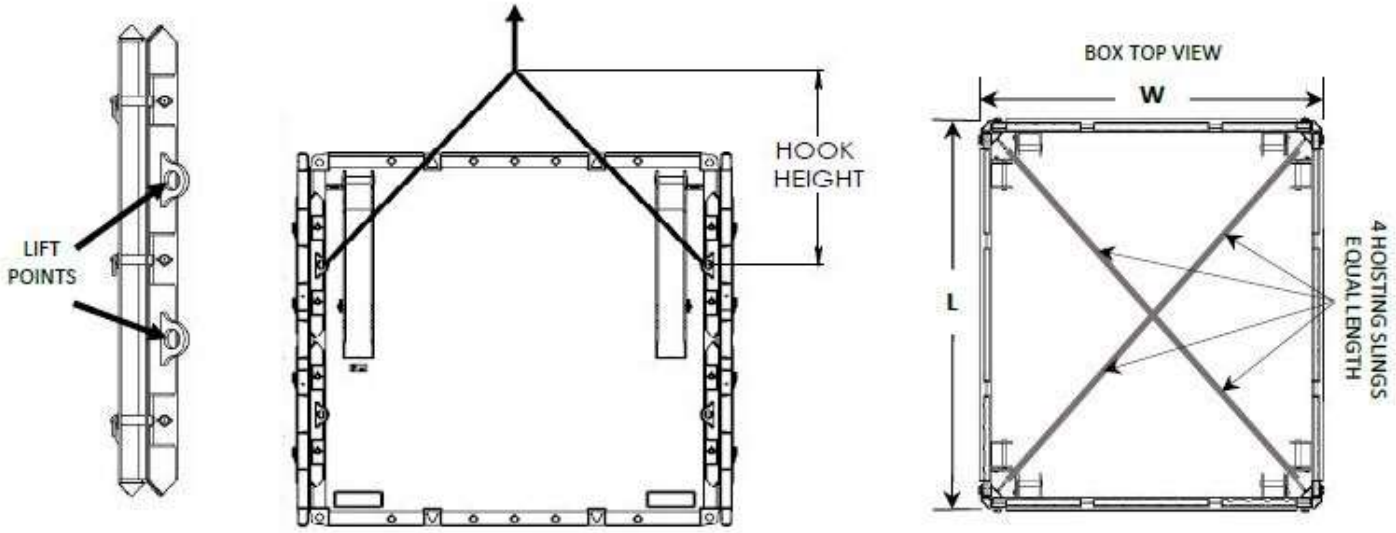
GroundWorks Safety Systems (GWSS) panel hoisting pad eyes are rated for a maximum assembly weight not exceeding 60,000 lbs. For a hoisting arrangement in a given weight range both lifting angles a_{min} and b_{min} must not be exceeded. Ratings are based on a safety factor of 3 on minimum ultimate material strength. Additional requirements are as follows:

- All four pad eyes must be used during hoisting.
- Slings attaching to each pad eye must be of equal length to ensure even load sharing.
- Rigging used to hoist the shield system must have appropriate load capacity for the hoisting arrangement.
- Prior to assembly all pad eyes, associated welds and adjoining structure must be inspected as per the GWSS product manual.
- Damaged components must be removed from service until repaired in a manner acceptable to GWSS.
- Ground personnel must be free and clear of the shield system during hoisting.
- Tag lines are recommended for ground personnel providing guidance to the elevated shield system.
- Refer to the GroundWorks Safety Systems Trench Box Manual for additional hoisting instructions.

Liability Considerations

- GroundWorks Safety Systems (GWSS) shall not be liable for damage or injury caused by incorrect use or exceeding capacity of the shield system. No repairs or modifications to GWSS components may be performed without prior written consent.
- Only engineered spreaders and accessory componenets authorized by GWSS may be utilized with GWSS equipment.
- Each panel and associated attachments shall be inspected prior to, and during each use, following the GWSS inspection guidelines. Damaged components shall be immediately tagged and removed from service.
- Handling and operational sequences different than outlined in the GWSS operational instructions may damage components and void warranty.

Corner Connector Lift Lug



TOTAL BOX LOAD (LBS)	MIN HOOK HEIGHT (FT) L/W OF 1 TO 1.5	MIN HOOK HEIGHT (FT) L/W GREATER THAN 1.5
0-10,000	2	3
10,000-15,000	4	7
15,000-20,000	7	10
20,000-30,000	20	22

*Ratings are based on a safety factor of 3 on ultimate material strength.

ASPECT RATIO L/W:
FOR A BOX L=16FT, W=10FT
L/W = 16/10 = 1.6

WARNING!

FAILURE TO COMPLY WITH MANUFACTURERS INSTRUCTIONS WHEN USING THIS EQUIPMENT MAY LEAD TO INJURY OR DEATH

For a hoisting arrangement with a given weight and aspect ratio (L/W) hook height must not be less than the miniumum given in the table above. Ratings are based on a safety factor of 3 on minimum ultimate material strength. Additional requirements are as follows:

- Hook heights given in the load chart require all four corner connectors to be used during hoisting.
- Slings attaching to each pad eye must be of equal length to ensure even load sharing.
- Rigging used to hoist the shield system must have appropriate load capacity for the hoisting arrangement.
- For box assemblies weighing more than 30,000 lbs consult GWSS for requirements.
- Prior to assembly all corner connectors, associated welds and adjoining structure must be inspected as per the GWSS product manual.
- Damaged components must be removed from service until repaired in a manner acceptable to GWSS.
- Ground personnel must be free and clear of the shield system during hoisting.
- Tag lines are recommended for ground personnel providing guidance to the elevated shield system.
- Refer to the GroundWorks Safety Systems Trench Box Manual for additional hoisting instructions.

Where spreader bars are used to maintain a vertical sling arrangement above each lift point minimum hook heights do not apply. In this case each lift point used provides 24,500 lbs of hoisting capacity. Only one lift point per corner connector may be used at a time.

Liability Considerations

- GroundWorks Safety Systems (GWSS) shall not be liable for damage or injury caused by incorrect use or exceeding capacity of the shield system. No repairs or modifications to GWSS components may be performed without prior written consent.
- Only engineered spreaders and accessory componenets authorized by GWSS may be utilized with GWSS equipment.
- Each panel and associated attachments shall be inspected prior to, and during each use, following the GWSS inspection guidelines. Damaged components shall be immediately tagged and removed from service.
- Handling and operational sequences different than outlined in the GWSS operational instructions may damage components and void warranty.

SPACING CHAINS

The following will detail the proper procedure to follow when using optional spacing chains to place struts for box assembly.

1. To set the correct length of the spacing chains, match the number on the spacing chain tags to the number on the panel unit tag. Move the hook to the desired position using the snap hooks provided.

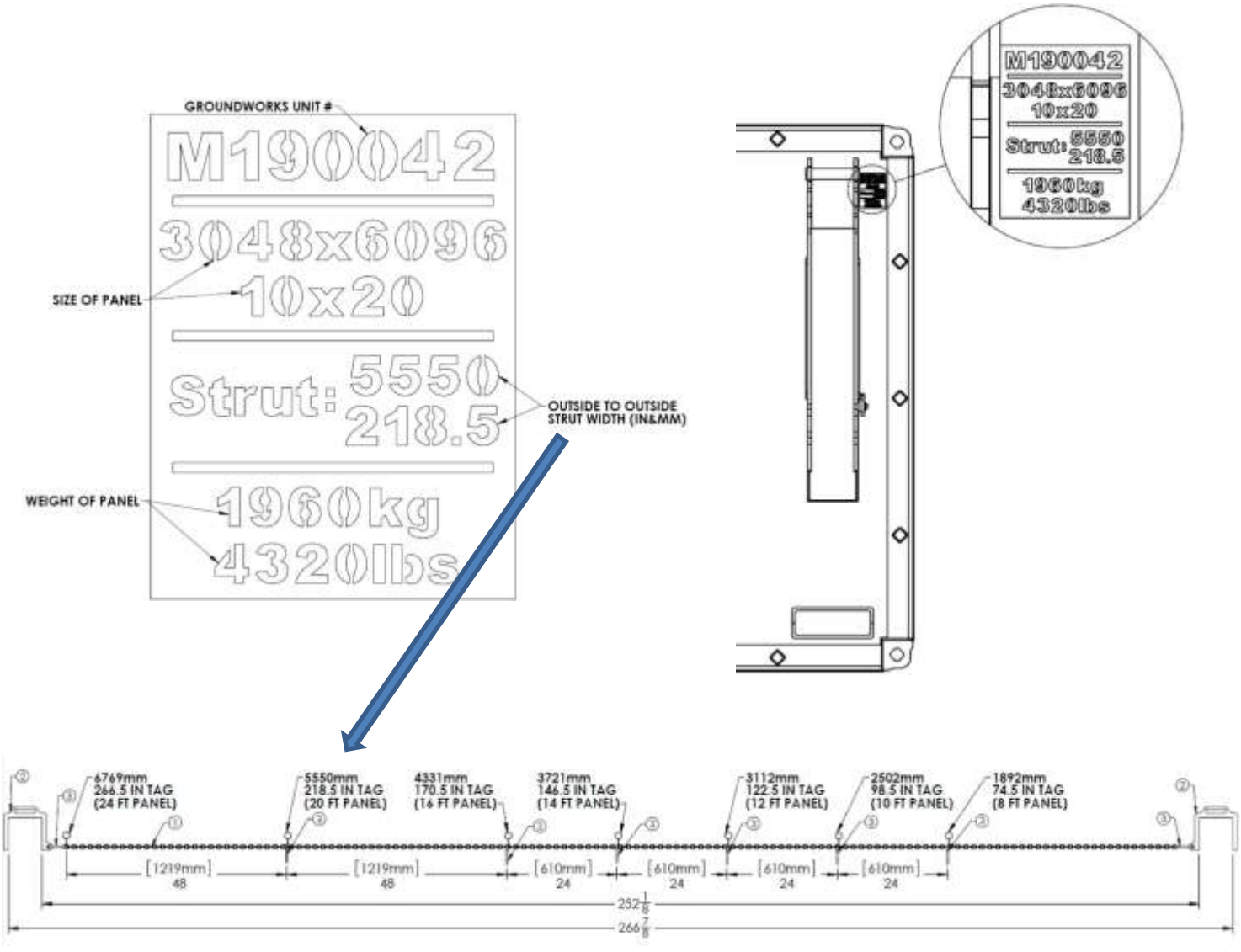


Figure 16: Spacing Chain Details

2. Once the correct length has been set, place both spacing chain hooks onto the top of both strut couplers of the first strut.

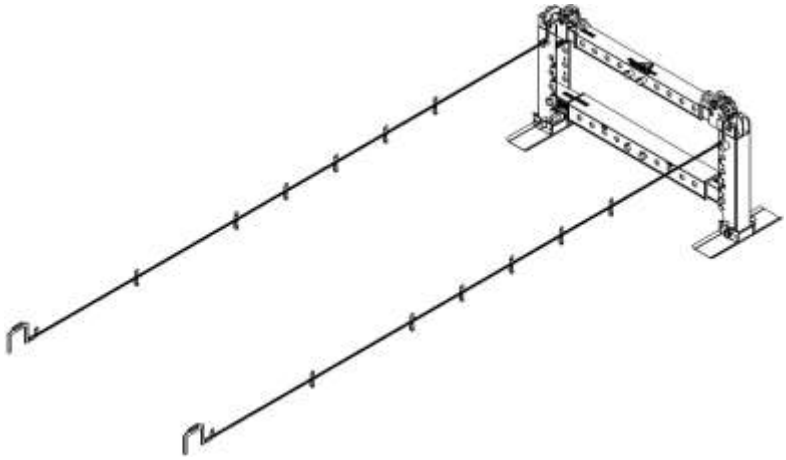


Figure 17: Spacing Chains on First Strut

3. Attach the remaining hooks to the top of the couplers on the second strut and position strut using the provided lift points, moving the struts away from each other until the chains are tight.

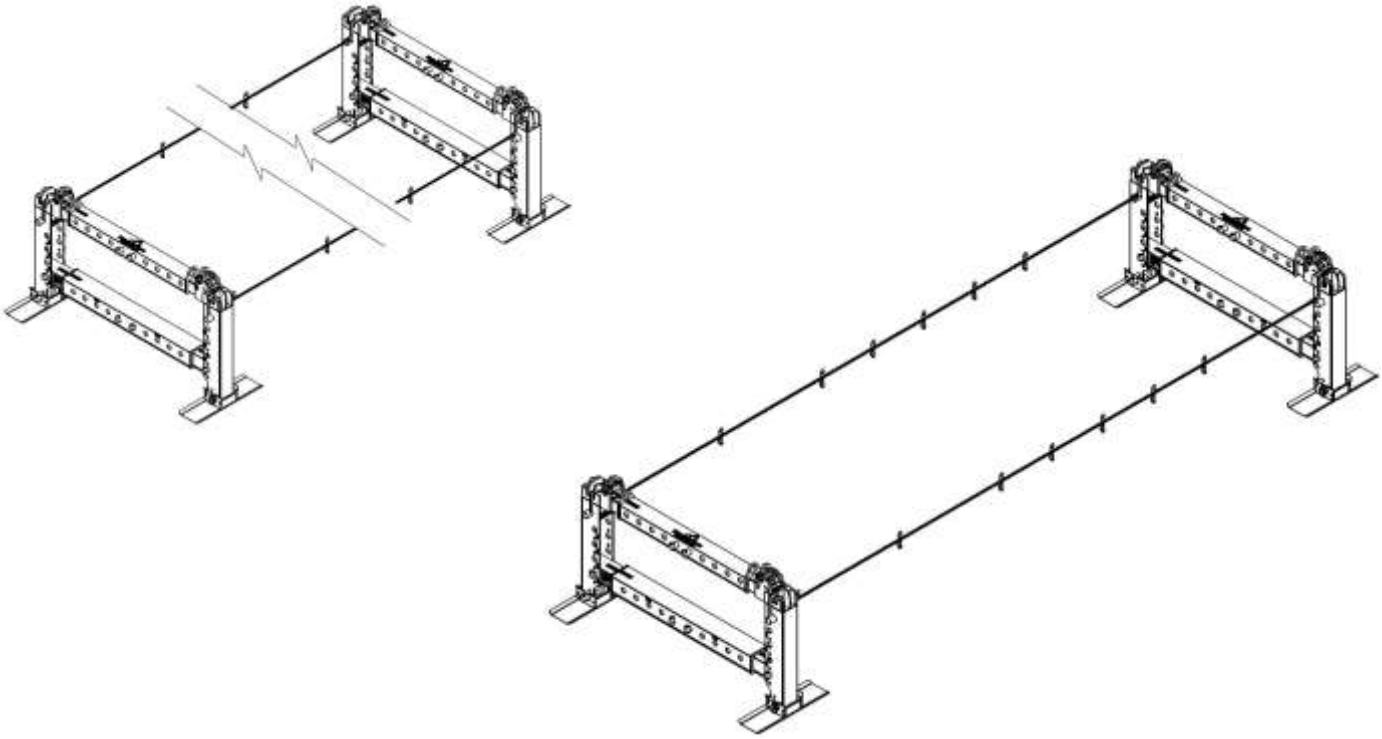


Figure 18: Spacing Chains on Second Strut

4. Remove spacing chains and proceed to add panels.

ASSEMBLY

1. Lift the strut assembly and place into the coupler stand. Secure the stands to struts with red pins.

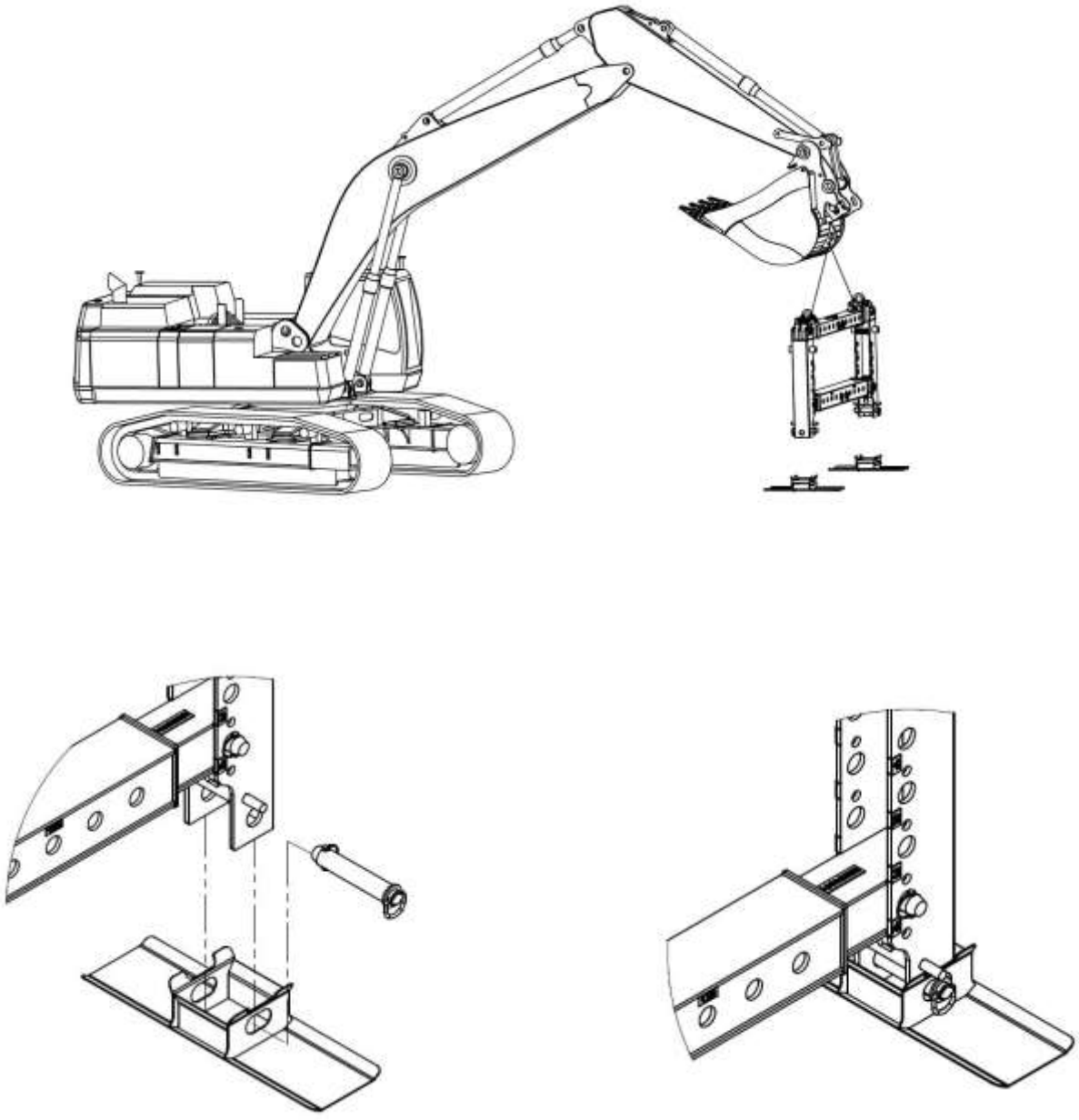


Figure 19: Assembly Step One – Securing Strut in Stands

2. Use the optional spacing chain and hook system or a measuring device to position struts at correct distance for the panel being used (Refer to page 22 for steps on how to use spacing chains). **IF USING ADJUSTABLE STRUTS, SET DESIRED WIDTH AND POSITION BEFORE CONNECTING PANELS (See page 14).**

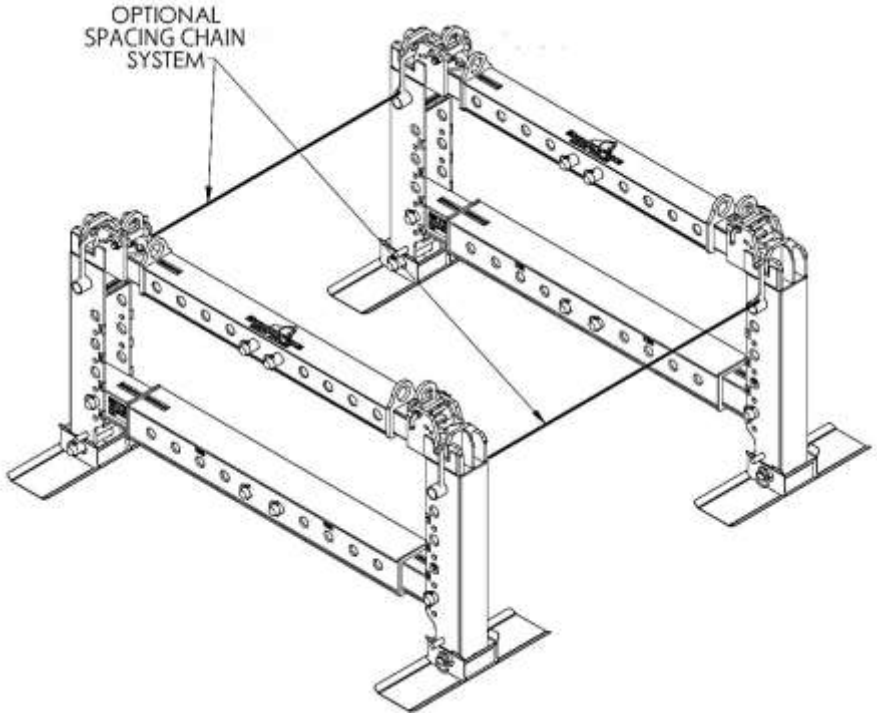


Figure 20: Assembly Step Two – Spacing Struts

3. Ensure the strut flip latches are in the open position and the latch pin is installed in the unsecure position.

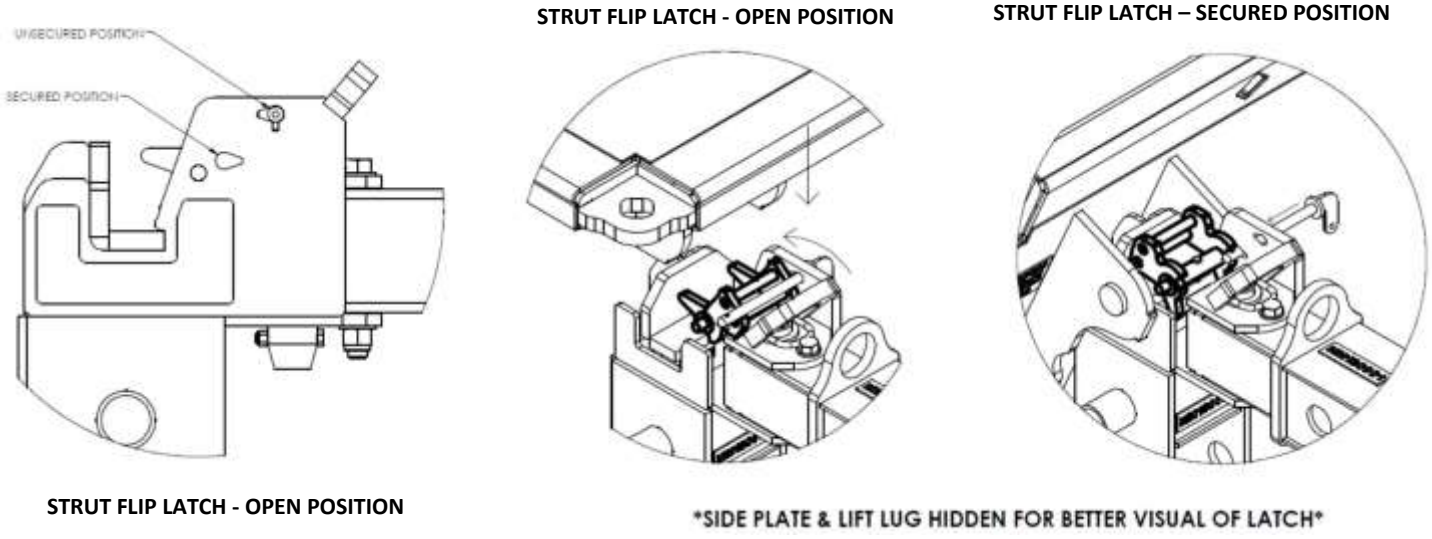


Figure 21: Assembly Step Three – Strut Flip Latch Operation

4. Lower top of panel all the way in to the top catch. Lower the bottom edge of the panel to the ground. Once gravity flip latch engages reinstall pin into the secured position.

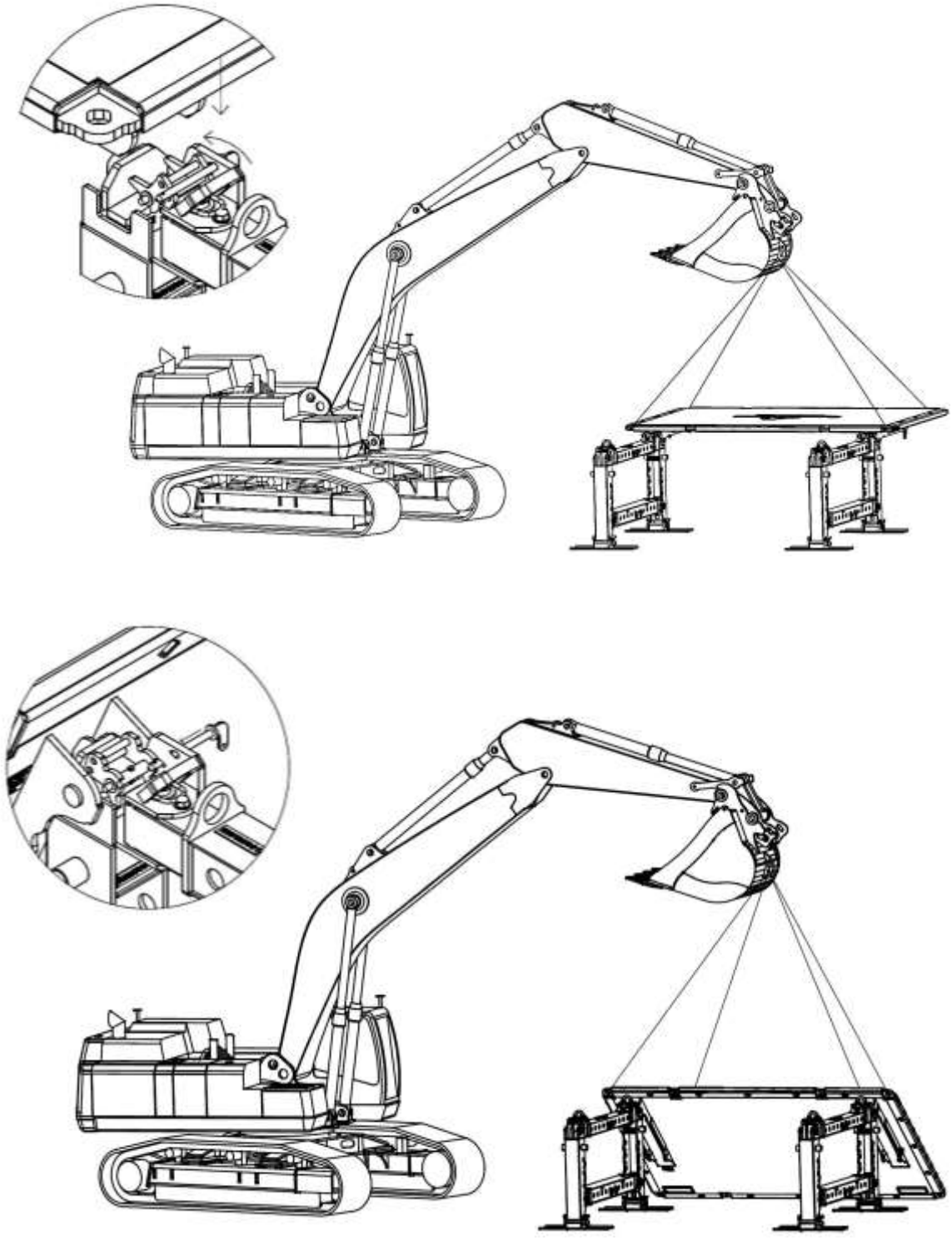


Figure 22: Assembly Step Four – Placing First Panel

5. Repeat steps 3-4 with second panel.

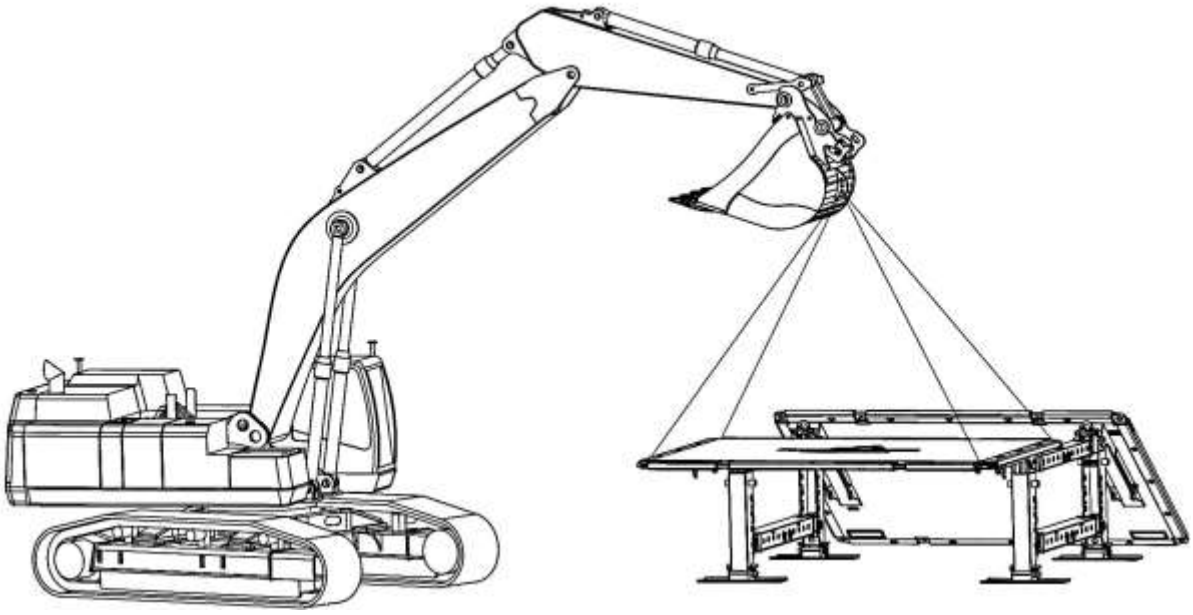


Figure 23: Assembly Step Five – Placing Second Panel

6. Attach lifting devices to the strut's 4 assembly points as shown below. Remove the red pins from the coupler stands, to allow the system to be raised separately.

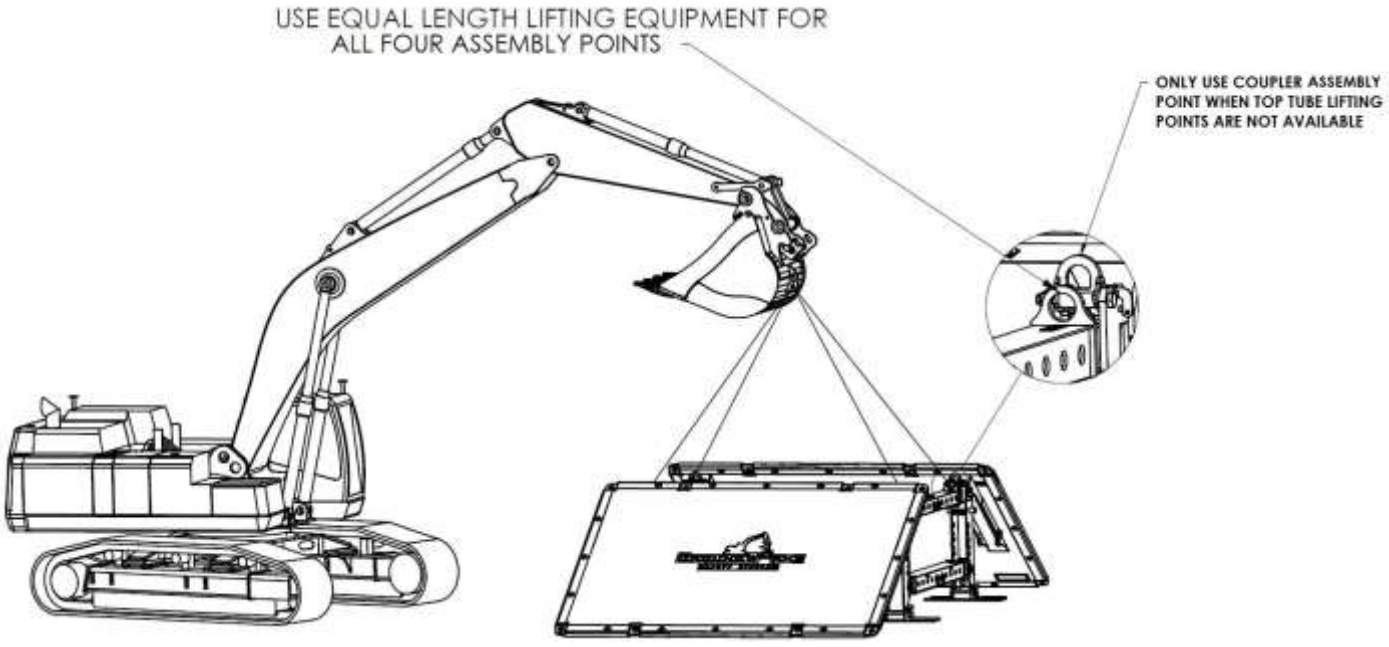


Figure 24: Assembly Step Six – Assembly Lifting Points

7. Lift the entire assembly to allow the Gravity Lock to engage. **NOTE**: **WALLS WILL PIVOT INWARD WHILE SYSTEM IS BEING RAISED. ENSURE ALL GROUND PERSONNEL ARE CLEAR OF THE SYSTEM BEFORE RAISING THE ASSEMBLY. STANDS SHOULD REMAIN ON GROUND WHEN LIFTING.**

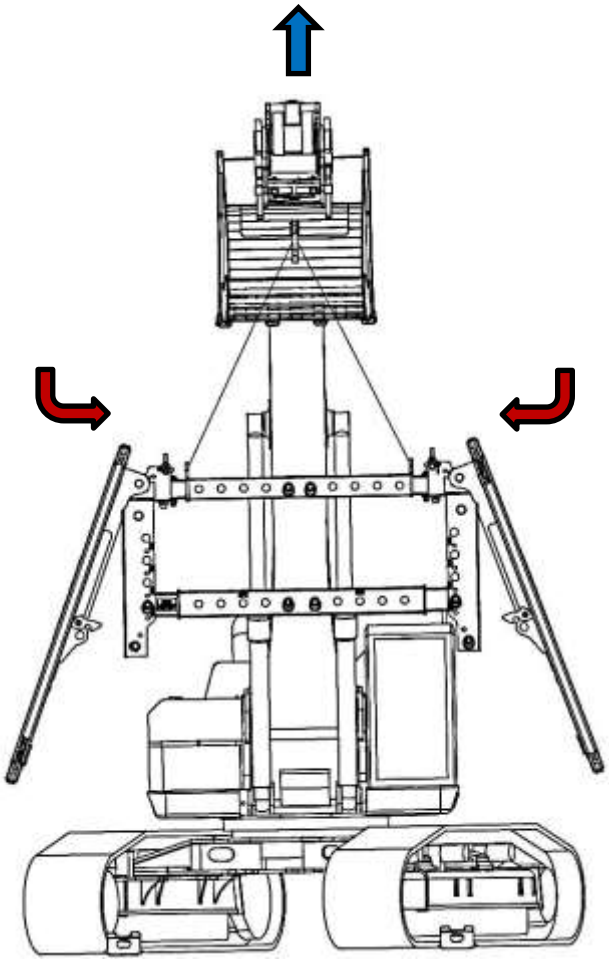


Figure 25: Assembly Step Seven – Erecting the Box

8. Continue lifting until the Gravity Lock has engaged, then lower the Trench Box to the ground. **KEEP PERSONNEL CLEAR FROM SYSTEM UNTIL BOX HAS BEEN LOWERED. CONFIRM THE GRAVITY LOCK IS ENGAGED BEFORE CONTINUING**. Keeping tension on the lifting hardware, install the bottom coupler pins and retainers to secure both panels and struts together.

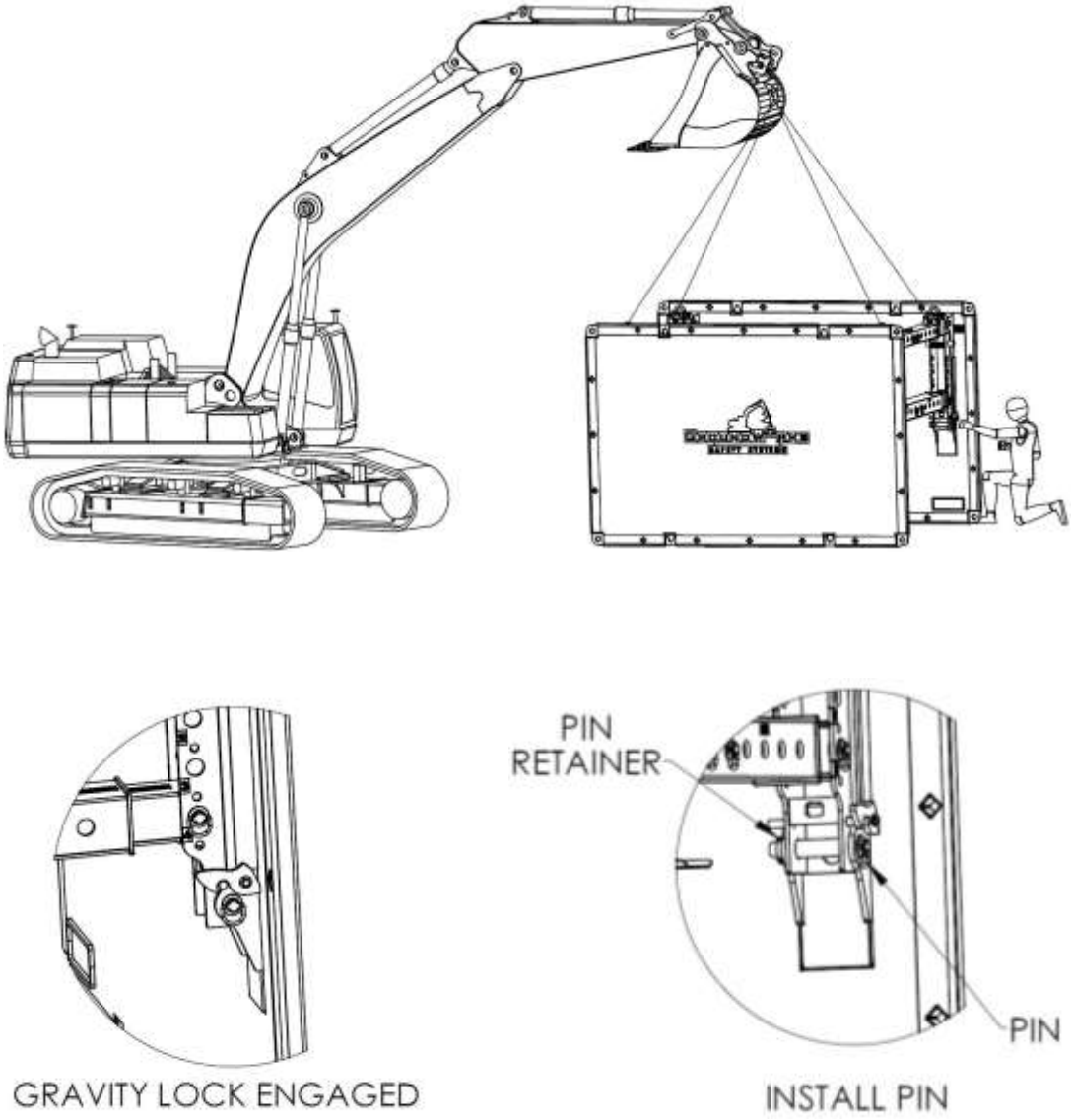


Figure 26: Assembly Step Eight – Final Securement of the Panels

9. Perform a visual inspection to ensure there are no damaged parts and that all connections are secured by required pins and latches.
10. Lift entire system off ground to ensure there are no loose components.

DISASSEMBLY

1. Ensure work area is clear of all personal unless otherwise noted.
2. Tip the Trench Box System on to its side.
3. Remove the bottom coupler pins from the panel on the ground, and ensure gravity latches are disengaged.

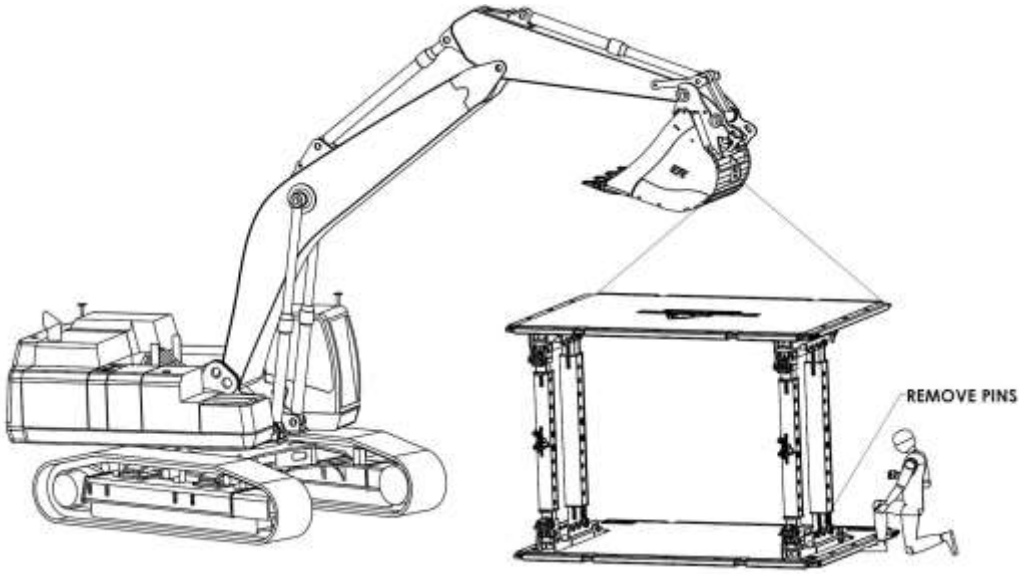


Figure 27: Disassembly Step Three – Remove Bottom Coupler Pins

4. Rotate the second panel and connected struts around the top coupler pin until it is standing perpendicular to the ground. **ENSURE ALL GROUND PERSONNEL ARE CLEAR OF TRENCH BOX.**

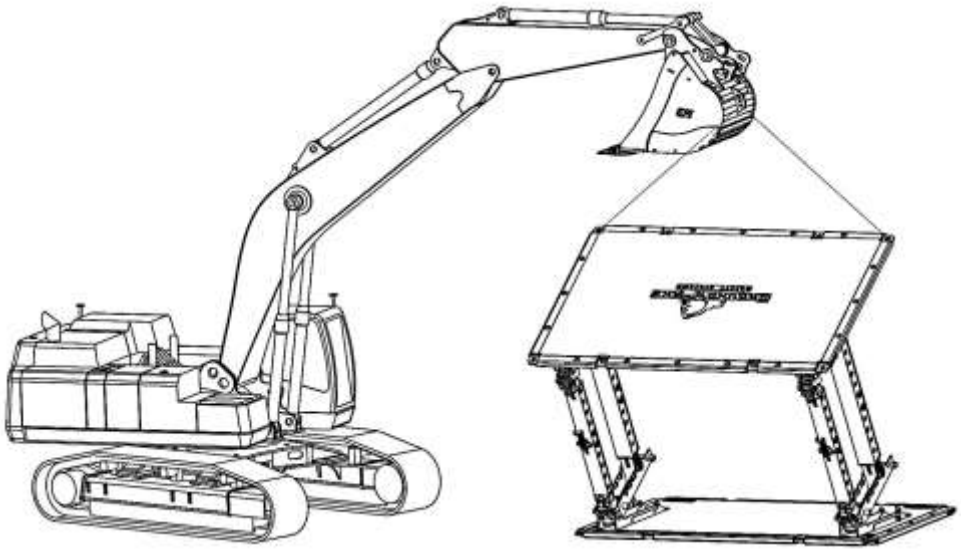


Figure 28: Disassembly Step Four – Unfolding the Box

5. Remove the bottom coupler pins from the second panel and carefully lay the panel flat on the ground, rotating around the top lug pin.

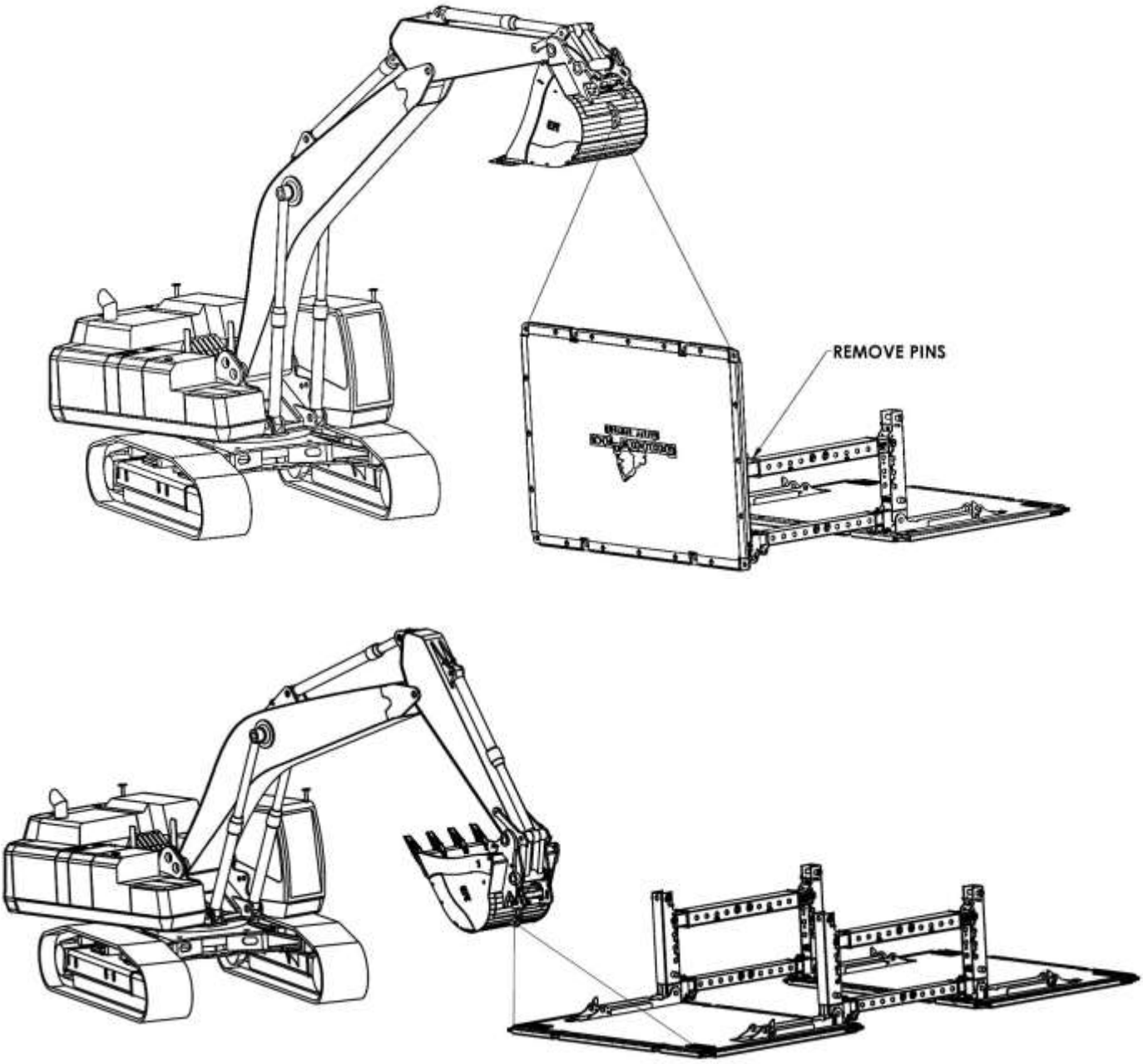


Figure 28: Disassembly Step Five – Lowering Second Panel

6. Once chains are attached to strut lift points and strut is secure, move gravity flip latch pin from secured position to unsecured position on all four corners of the strut.

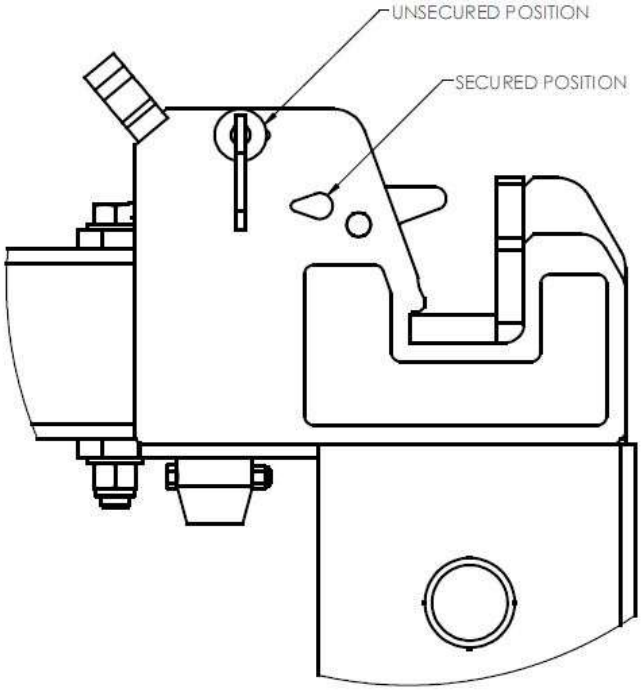


Figure 29: Disassembly Step Six – Disengaging Coupler Latch

7. Lift the struts free from the panels.

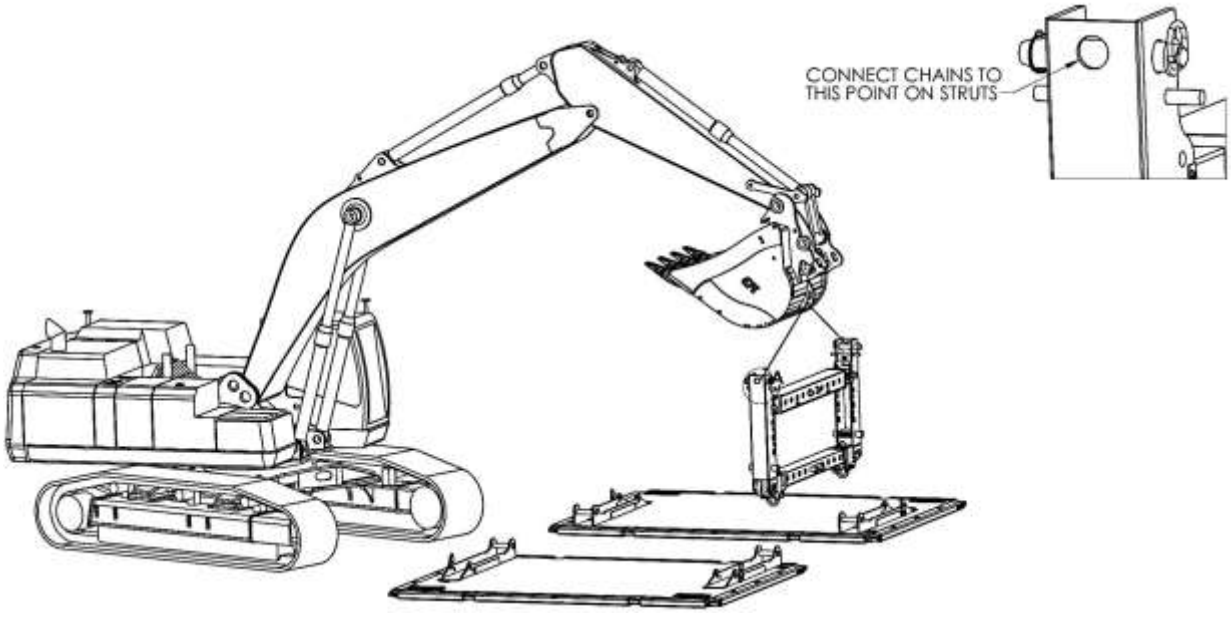


Figure 30: Disassembly Step Seven – Removing the Struts

HIGH ARCH

When a job requires more internal pipe clearance than what the Multilateral struts are able to offer, the next step is to use the GroundWorks High Arch System. These high arches are available in the same four series as the panels and Multilateral struts and are available in adjustment ranges starting at 8'.

The GroundWorks High Arch utilizes self-contained hydraulic snubbers that control the speed of descent, so the trench box is able to stay in the upright position during both assembly and disassembly. Because of this, GroundWorks is able to offer High Arch center sections capable of reaching in excess of 40' wide.

HIGH ARCH ASSEMBLY PROCEDURE

1. Ensure the coupler feet are down and pinned securely into place to stabilize the strut. **SET DESIRED WIDTH OF STRUTS BEFORE CONNECTING PANELS (REFER TO PAGE 14)**

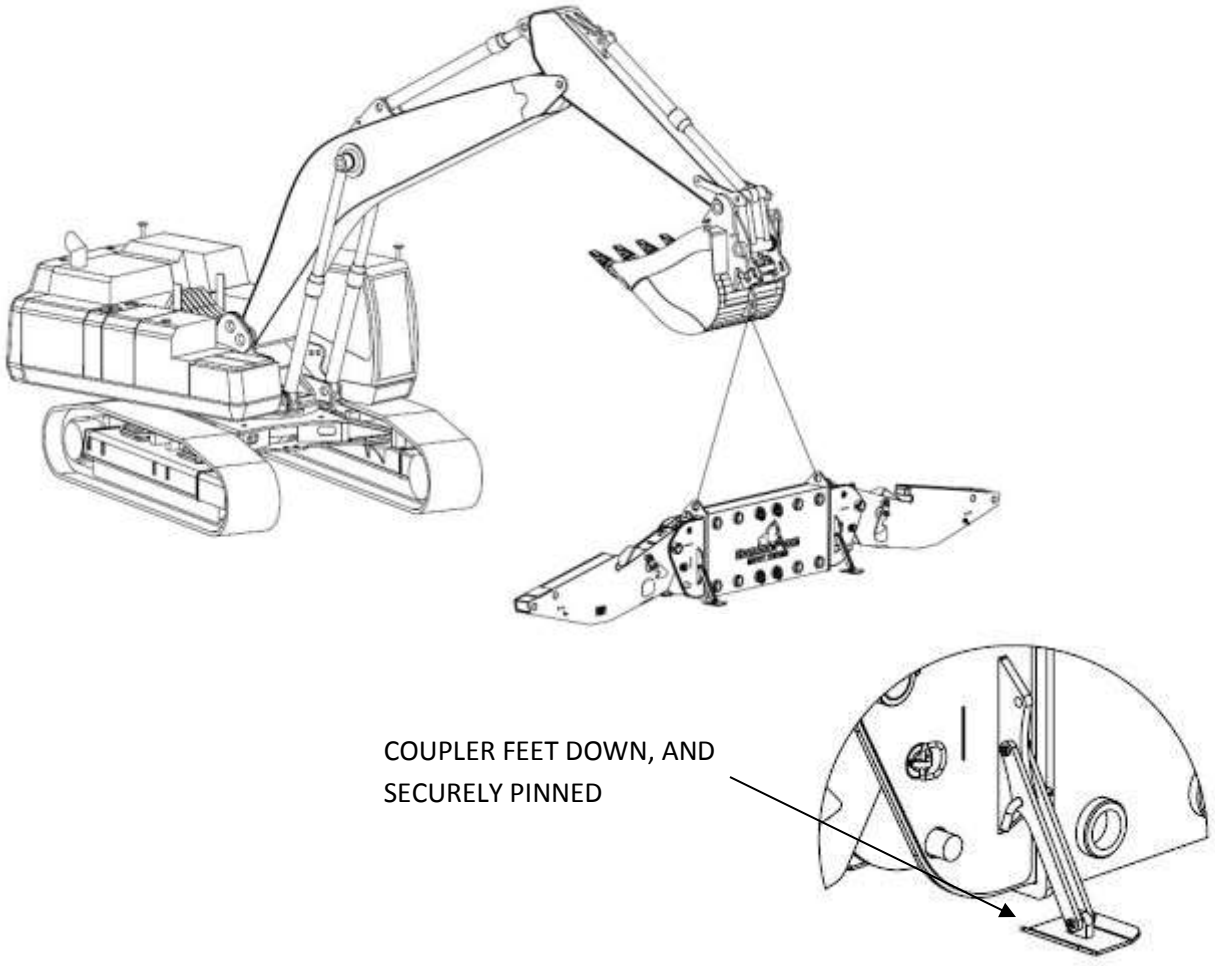


Figure 31: High Arch Assembly - Step One

2. Use the optional spacing chains system or a measuring device to position struts at correct distance for the panel being used (Refer to unit tag on the panel for correct outside to outside dimension).

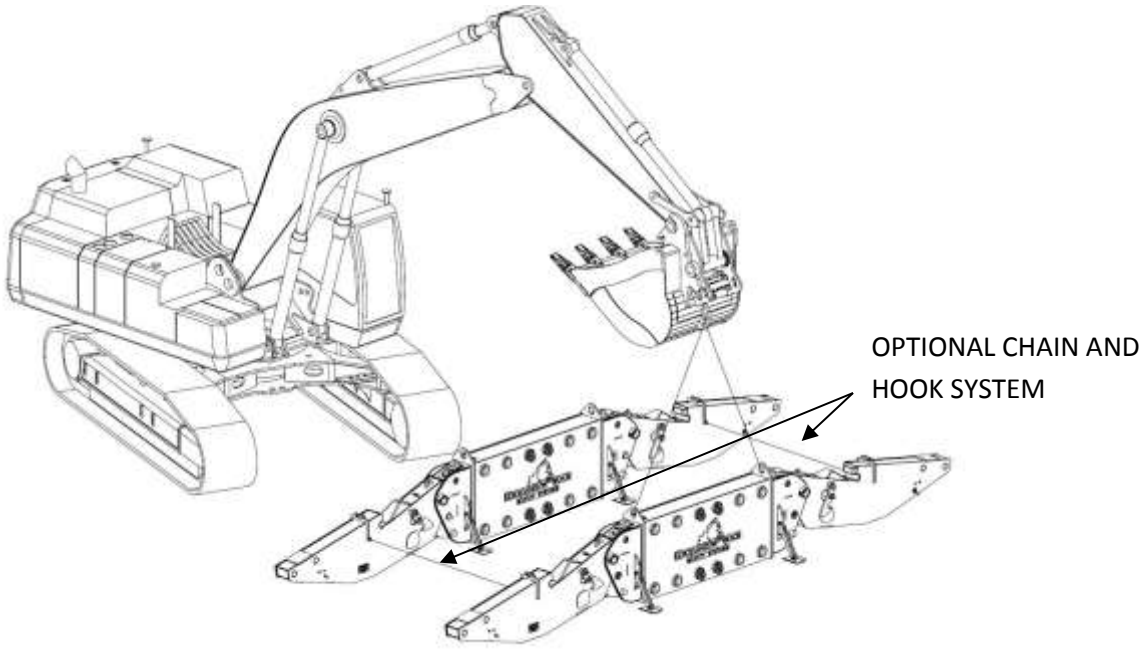
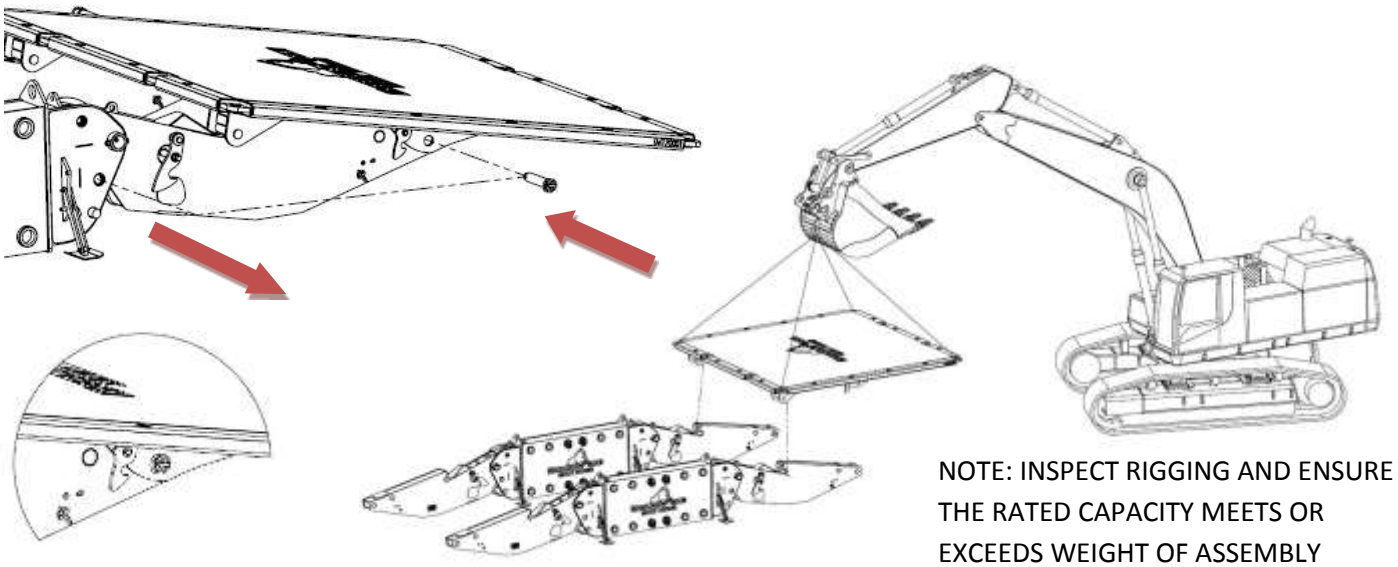


Figure 32: High Arch Assembly - Step Two

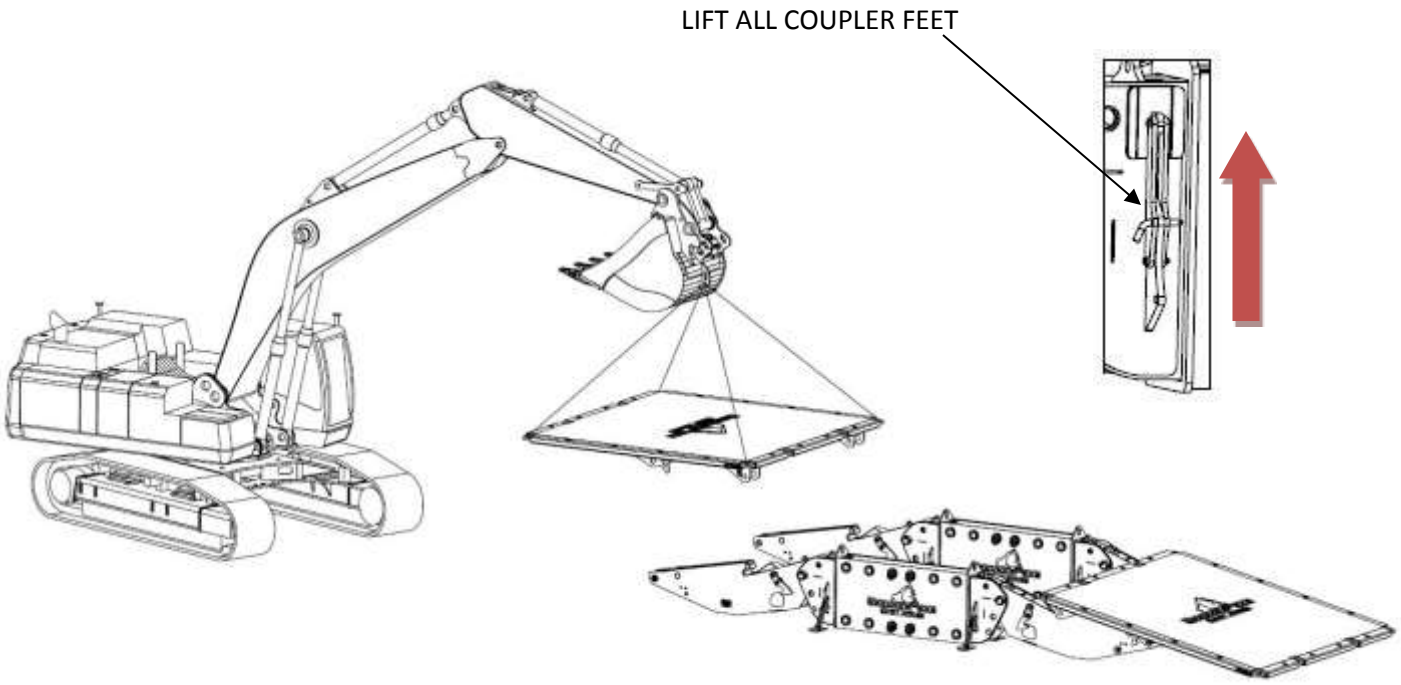
3. Using equal length lifting devices place the panel on the struts and slide into place. Remove the pins from the assembly position and insert and lock them into the standing position holes securing the panel to the strut.

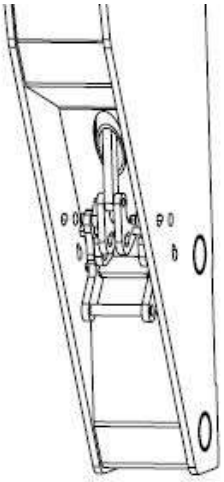


NOTE: INSPECT RIGGING AND ENSURE THE RATED CAPACITY MEETS OR EXCEEDS WEIGHT OF ASSEMBLY BEFORE USE

Figure 33: High Arch Assembly - Step Three

4. Repeat step 3 for the other panel. When both panels are in place, lift up all of the coupler feet and pin them securely in place. **REMOVE THE LATCH HANDLE PINS TO ALLOW THE LATCH TO FLOAT INTO THE PROPER POSITION BEFORE LIFTING THE TRENCH BOX ASSEMBLY.**





****REMOVE LATCH PIN BEFORE LIFTING TRENCH BOX ASSEMBLY**

Figure 34: High Arch Assembly - Step Four

5. Attach equal length lifting devices to the strut's 4 lift points as shown below. After ensuring the panels are secured in place with the pins, lift the box assembly until the strut arms and panels swing into place and the gravity locks engage. **NOTE: WALLS WILL PIVOT INWARD WHILE SYSTEM IS BEING RAISED. ENSURE ALL GROUND PERSONEL ARE CLEAR OF THE SYSTEM BEFORE RAISING THE ASSEMBLY.**

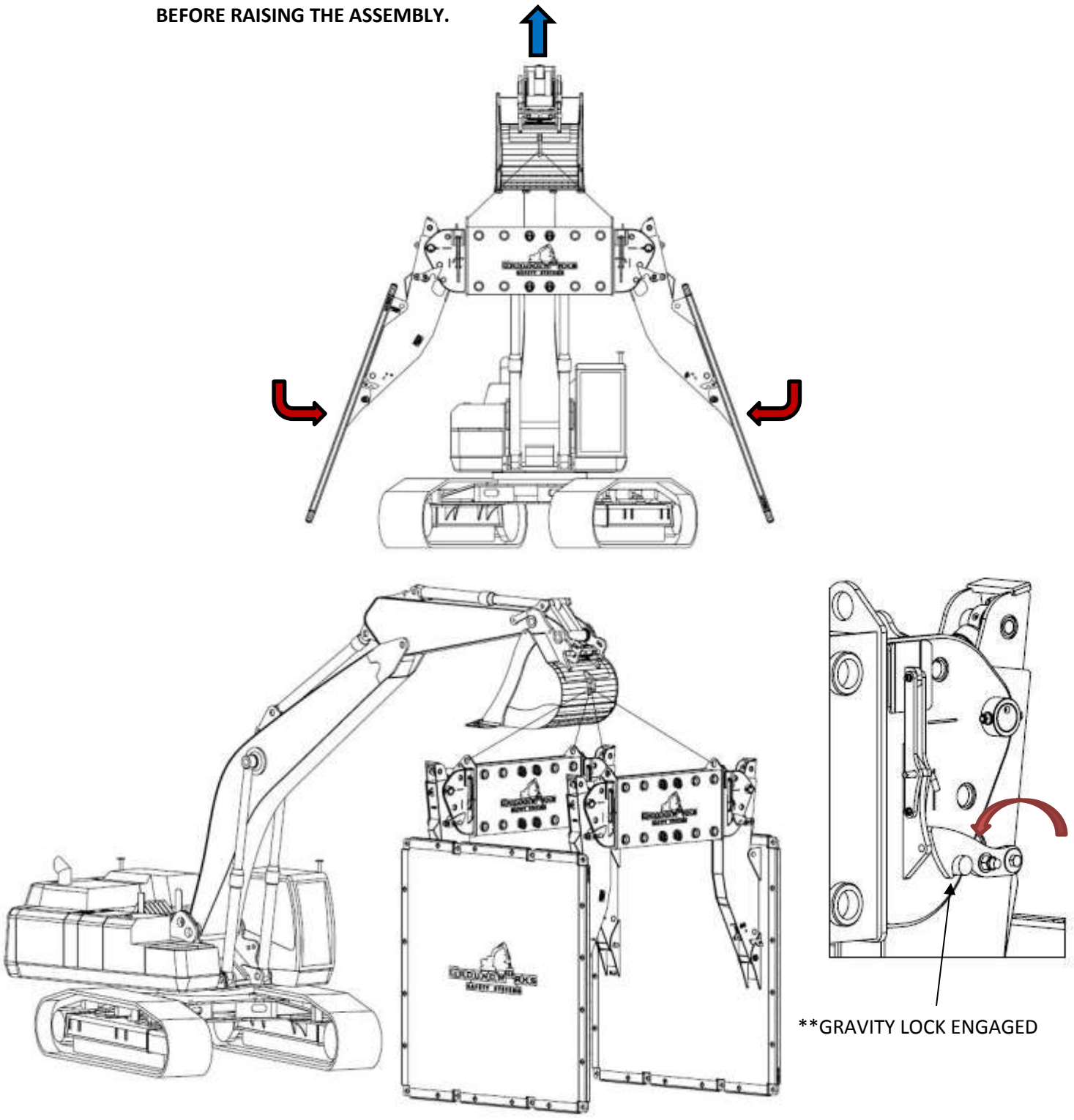


Figure 35: High Arch Assembly - Step Five

6. With the box secured in place, move the latch handle into the downward position ensuring that the gravity lock has secured the coupler arms into place. Re-insert the latch pin securing the latch handle into place and lock it. Repeat for all 4 corners. **KEEP PERSONEL CLEAR FROM SYSTEM UNTIL BOX HAS BEEN SECURED. CONFIRM ALL PINS, RETAINERS AND THE LOCKING SYSTEM IS SECURE AND ENGAGED BEFORE CONTINUING.**

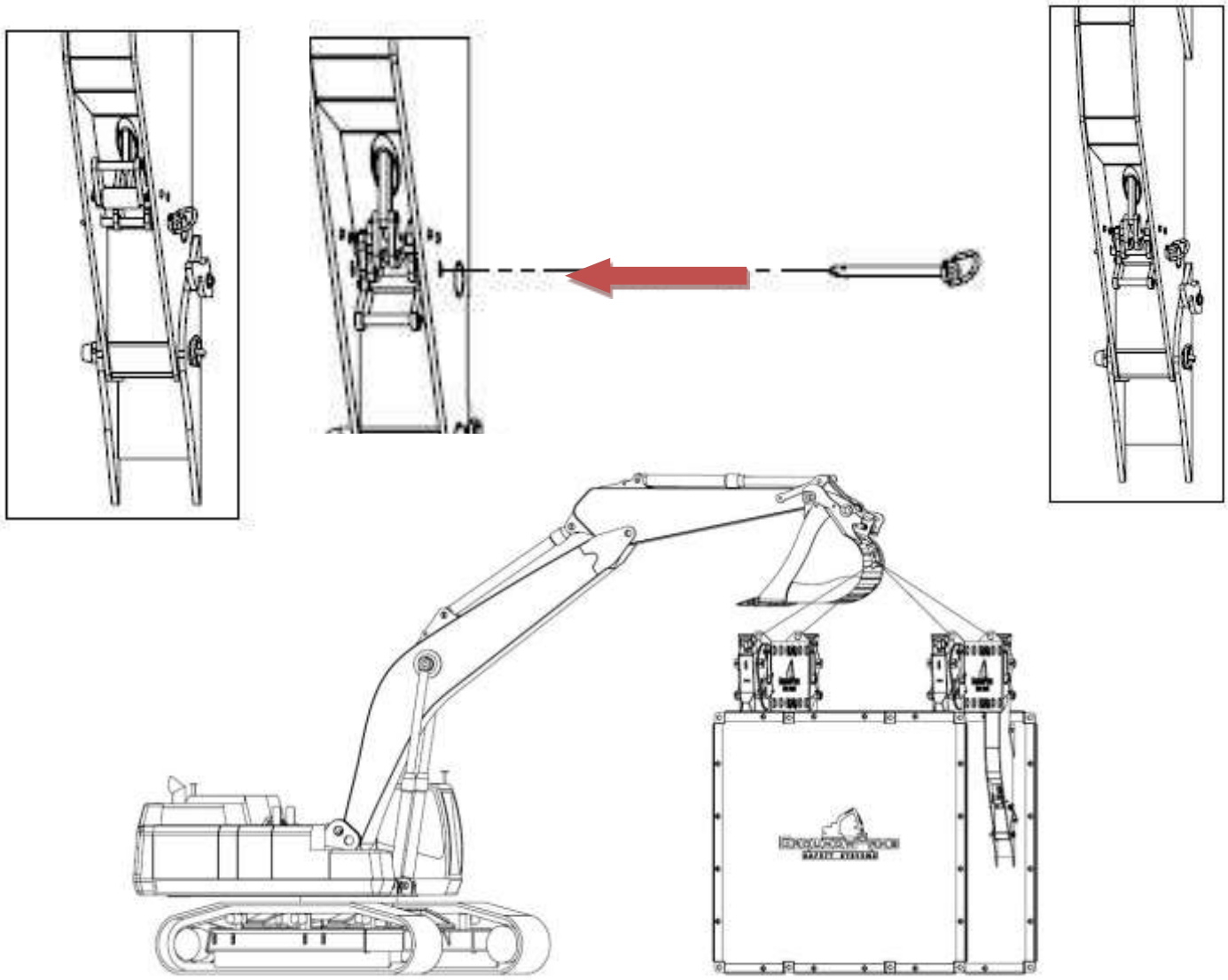


Figure 36: High Arch Assembly - Step Six

7. Perform a visual inspection to ensure there are no damaged parts and that all connections are secured by required pin and latches.
8. Lift the entire system off the ground to ensure there are no loose components.
9. The Trench Box is now ready for use.

HIGH ARCH DISASSEMBLY PROCEDURE

1. Remove latch pin and move the latch handle into the upward position releasing the latch on the coupler arm. Re-insert the latch pin locking the latch handle in the upward position. Repeat for all four latches.

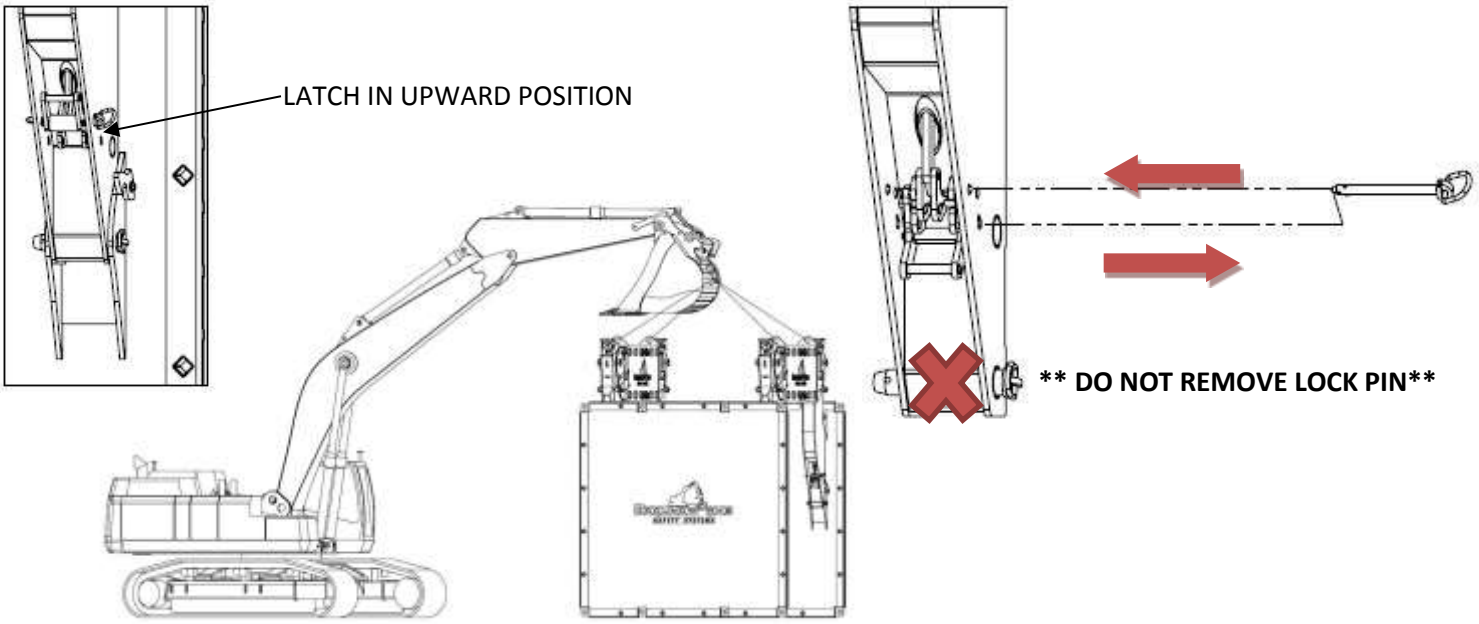


Figure 37: High Arch Disassembly - Step One

2. Lift one side of the box at the bottom of the panel and gently pull. Allow the box to descend on its own while guiding it down. <u>This will take approximately 1 minute</u>. **ENSURE ALL GROUND PERSONEL ARE CLEAR OF TRENCH BOX WHILE IT DESCENDS. DO NOT FORCE TO SPEED DESCENT AS DAMAGE MAY OCCUR**

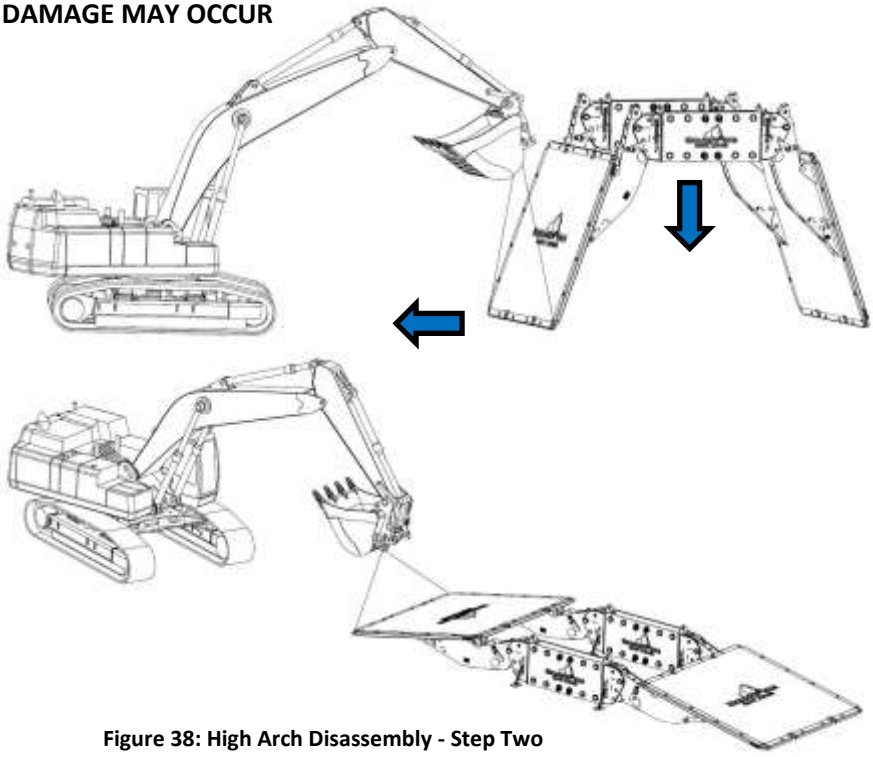
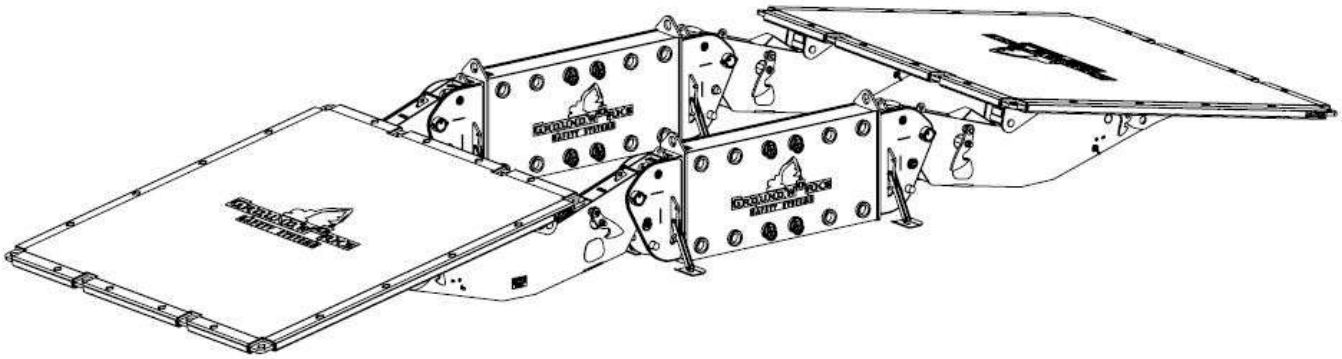


Figure 38: High Arch Disassembly - Step Two

3. When the assembly is settled on the ground and safe to approach, put the coupler feet down and pin into place to stabilize the struts.



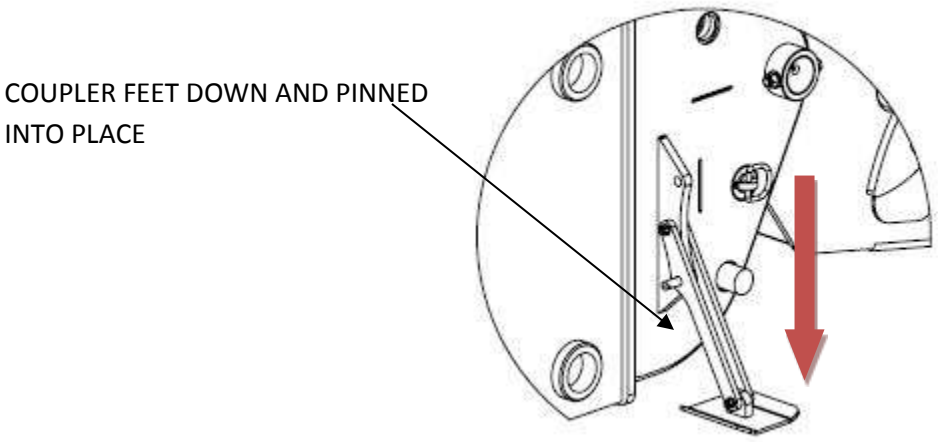


Figure 39: High Arch Disassembly - Step Three

4. Remove the pins that secure the panels to the strut's and place back into the assembly position.

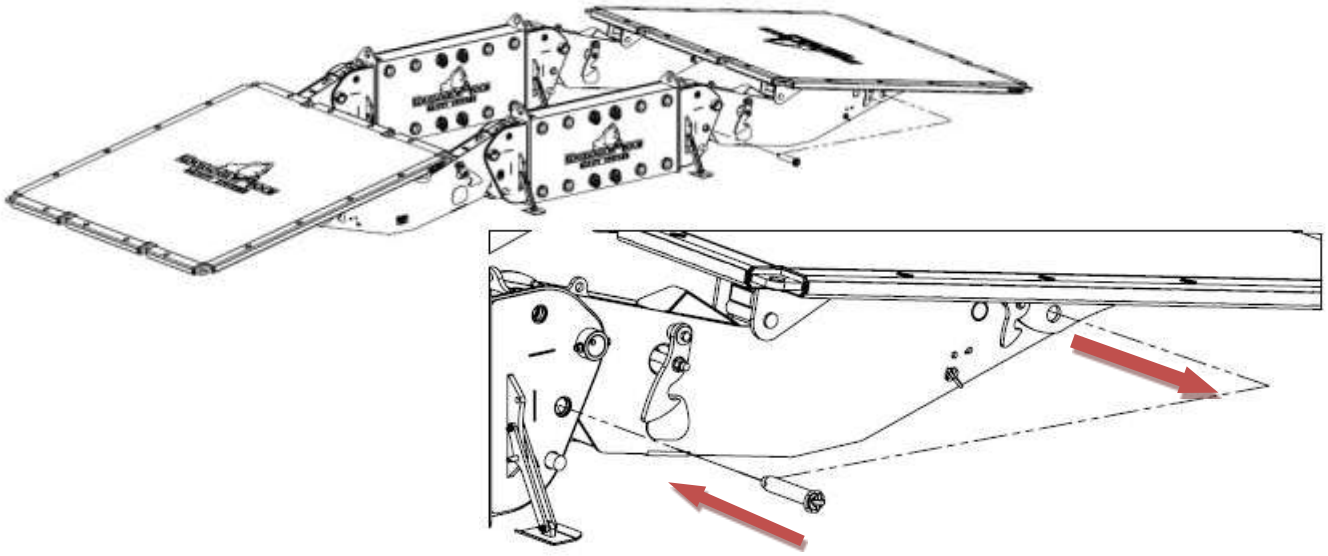


Figure 40: High Arch Disassembly - Step Four

5. Using equal length lifting equipment, remove the panels on both sides.

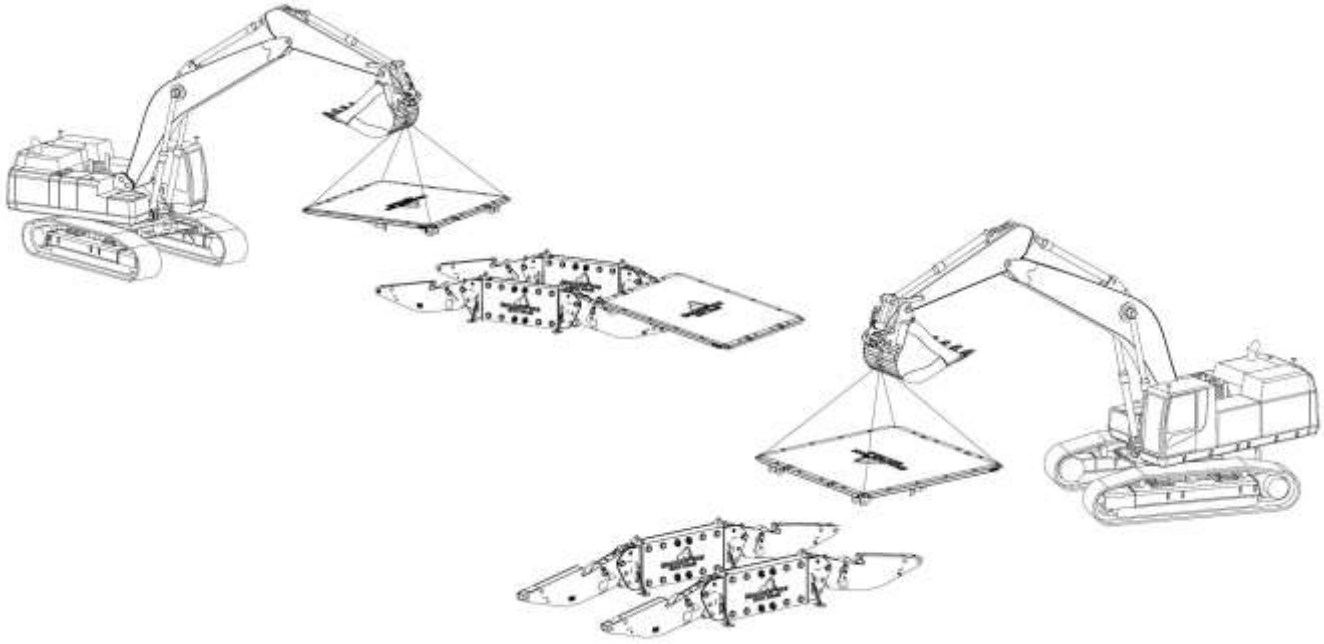


Figure 41: High Arch Disassembly - Step Five

6. Struts and panels are now ready for transport/storage.

PERIMETER PINS

The perimeter pin is used to secure the connection for the Universal 4-Sided Connection System that is featured on all GroundWorks trench box panels. The two variations of the GroundWorks perimeter pins are the standard keeper perimeter pin and the optional lynch perimeter pin. The difference between the two perimeter pins is the method in which the pin is secured in place between the panel and selected accessory. All accessories available for the GroundWorks Trench Box System that use perimeter pins have the ability to accept the different variations of the perimeter pins based on the working personnel's preference. Below, the two variations of the perimeter pin are shown.

Standard Keeper Perimeter Pin

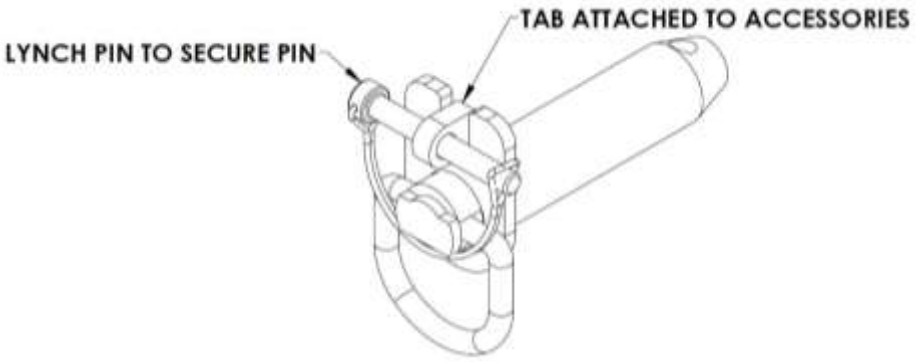


Figure 42: Standard Perimeter Pin

Optional Lynch Perimeter Pin

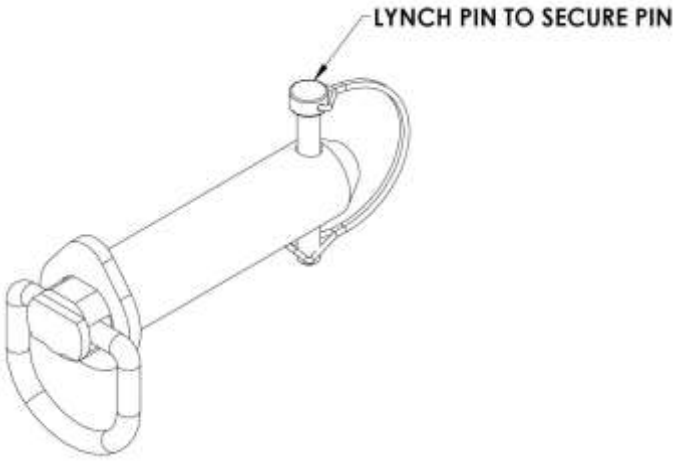
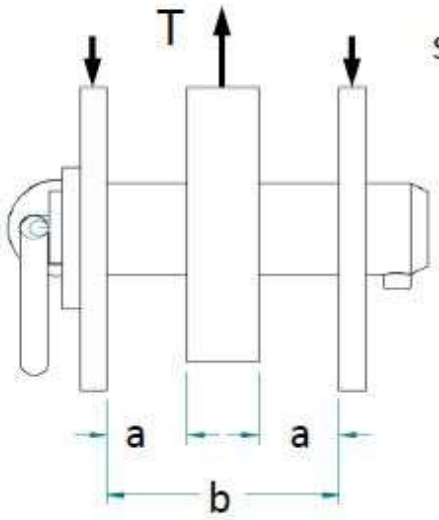


Figure 43: Optional Perimeter Pin

Perimeter Pins



STRAIGHT PULL

Maximum Pin Load (lbs)	Pin / Lug Arrangement	
	a_{max} (inches)	b_{max} (inches)
23,000	0.563	3.25

*Rating is based on a safety factor of 3 on ultimate material strength.

WARNING!

FAILURE TO COMPLY WITH MANUFACTURERS INSTRUCTIONS WHEN USING THIS EQUIPMENT MAY LEAD TO INJURY OR DEATH

- This rating applies to pins designated as *perimeter pins* in GroundWorks Safety Systems (GWSS) product manuals only.
- GWSS perimeter pins are to be used for connecting between GWSS manufactured equipment only.
- Pin and lug arrangements must be as shown above. Pins must be loaded in double plane shear without exceeding gap widths a_{max} and b_{max}. The applied load is limited to a straight pull on the pin with no twisting.
- This rating is based on a safety factor of 3 on minimum ultimate material strength.
- This rating applies to the pin only and does not extend to lugging used with the pin.
- Pins must be inspected prior to assembly as per the GWSS product manual.
- Damaged components must be removed from service until repaired in a manner acceptable to GWSS.

Liability Considerations

- GroundWorks Safety Systems (GWSS) shall not be liable for damage or injury caused by incorrect use or exceeding capacity of the shield system. No repairs or modifications to GWSS components may be performed without prior written consent.
- Only engineered spreaders and accessory componenets authorized by GWSS may be utilized with GWSS equipment.
- Each panel and associated attachments shall be inspected prior to, and during each use, following the GWSS inspection guidelines. Damaged components shall be immediately tagged and removed from service.
- Handling and operational sequences different than outlined in the GWSS operational instructions may damage components and void warranty.

PERIMETER PIN INSTALLATION

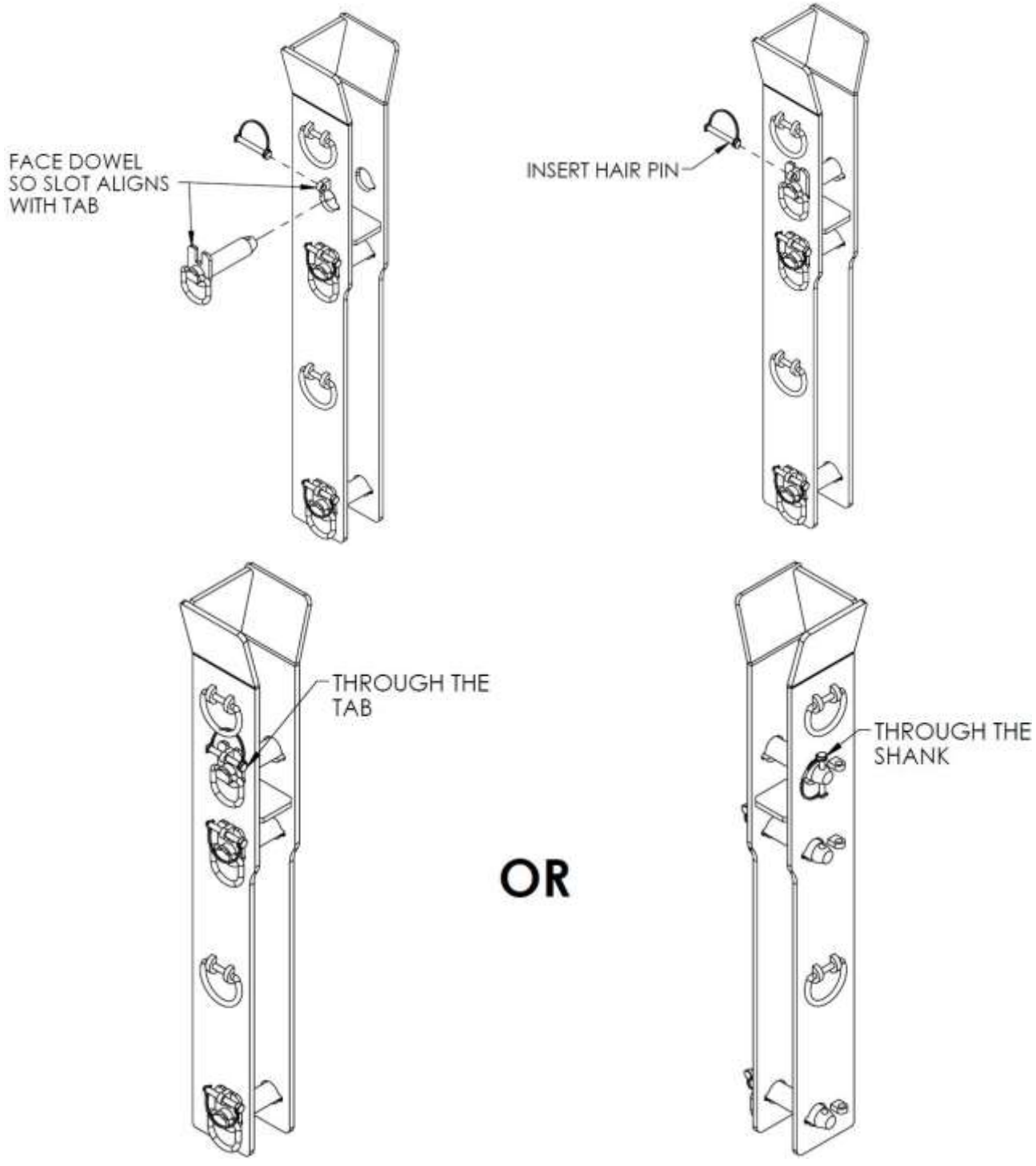


Figure 44: Perimeter Pin Securement

STACKING TRENCH BOXES

1. Install the 4 pin panel extension connector on each corner of the first Trench Box System using the bottom pins (NOTE: STACKER FLAIR IS TO INSIDE OF THE PANEL). **Refer to page 43 for pin installation.**

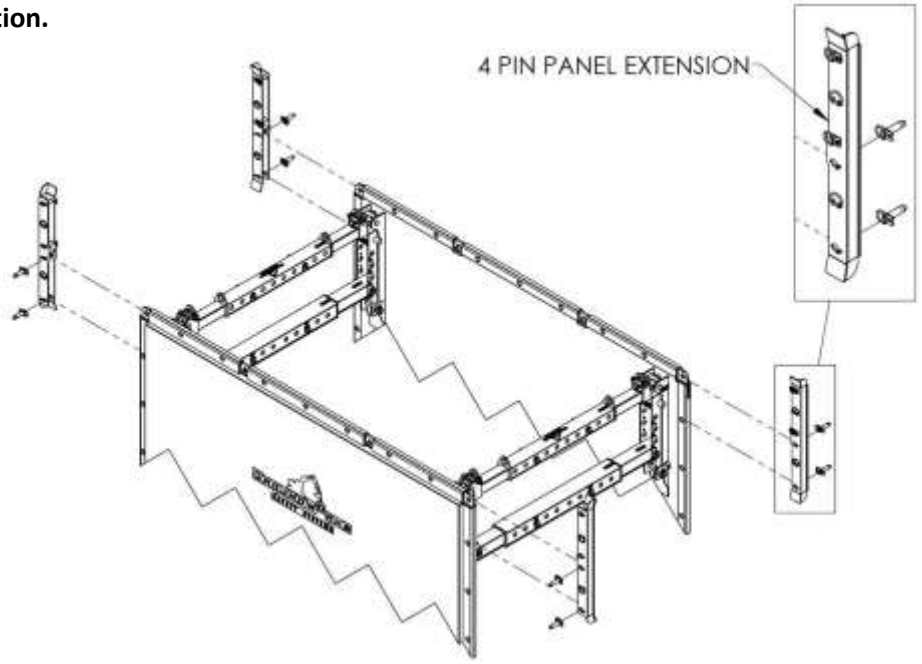


Figure 45: Stacking – Step One

2. Preferably with the bottom Trench Box System in the trench, lower the top Trench Box System into the 4 pin panel extension connector and fix with top pins.

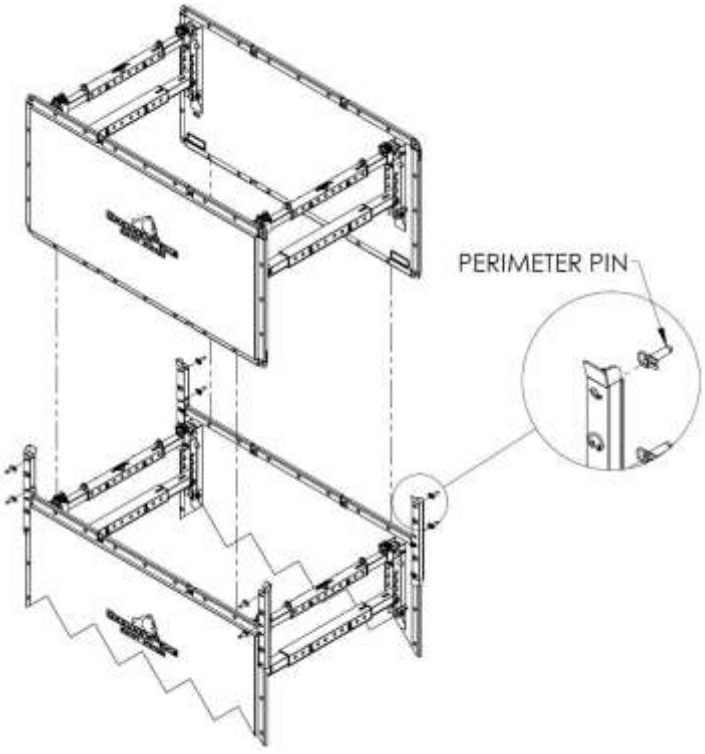


Figure 46: Stacking – Step Two

3. Ensure at least 3 of the 4 pins are engaged and panels are aligned before moving Trench Box System.

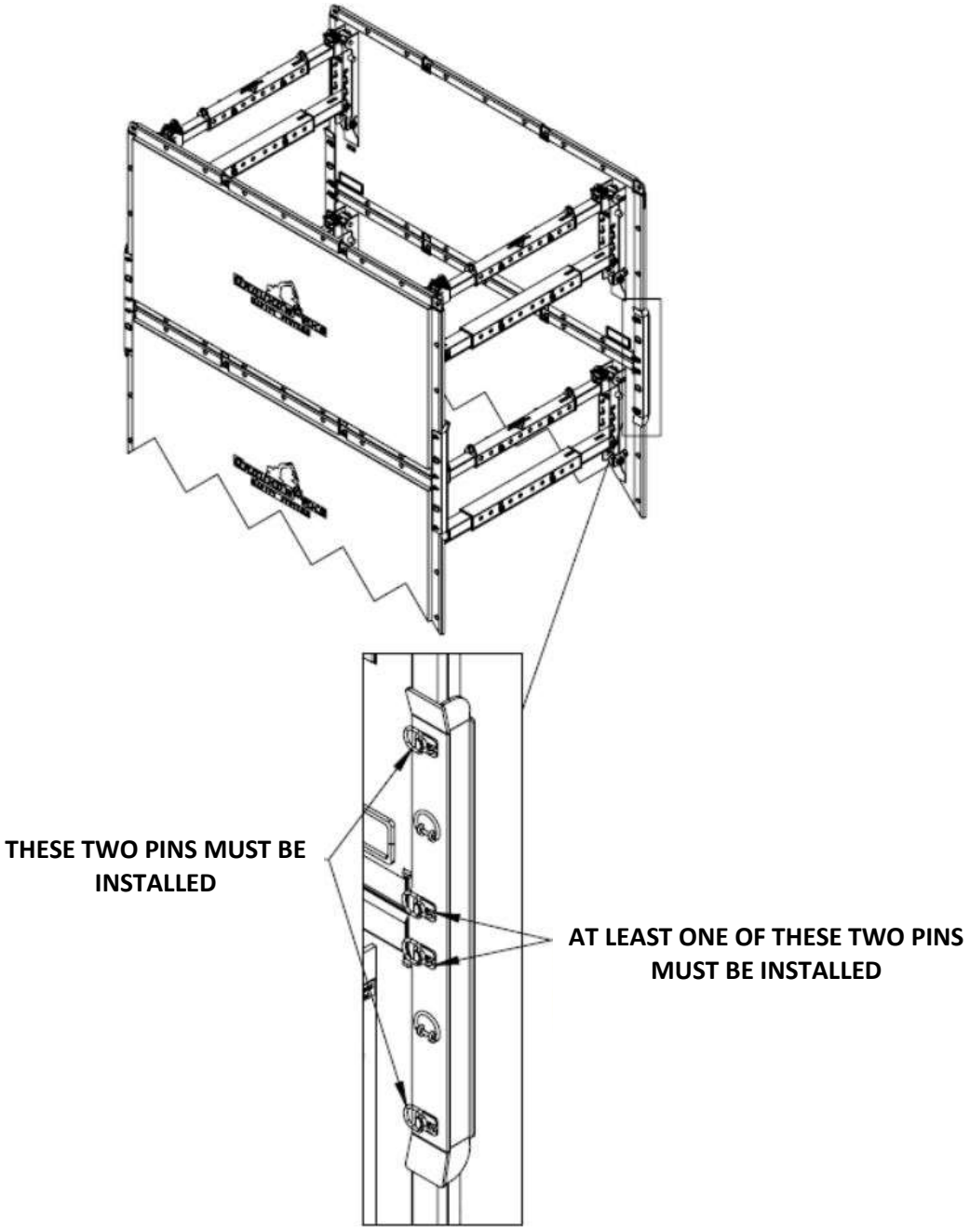


Figure 47: Stacking – Step Three

PANEL EXTENSIONS

GroundWorks Safety Systems 4' Panel Extensions do not require the use of additional struts and can be installed on top of any series of box using the 4-pin panel extension connectors following these steps.

1. Attach the 4-pin panel extension connectors to the bottom Trench Box System using the bottom pins. **Refer to page 43 for pin installation. Note: When attaching 4-foot panels, the 4-pin panel extension connectors MUST be used.**

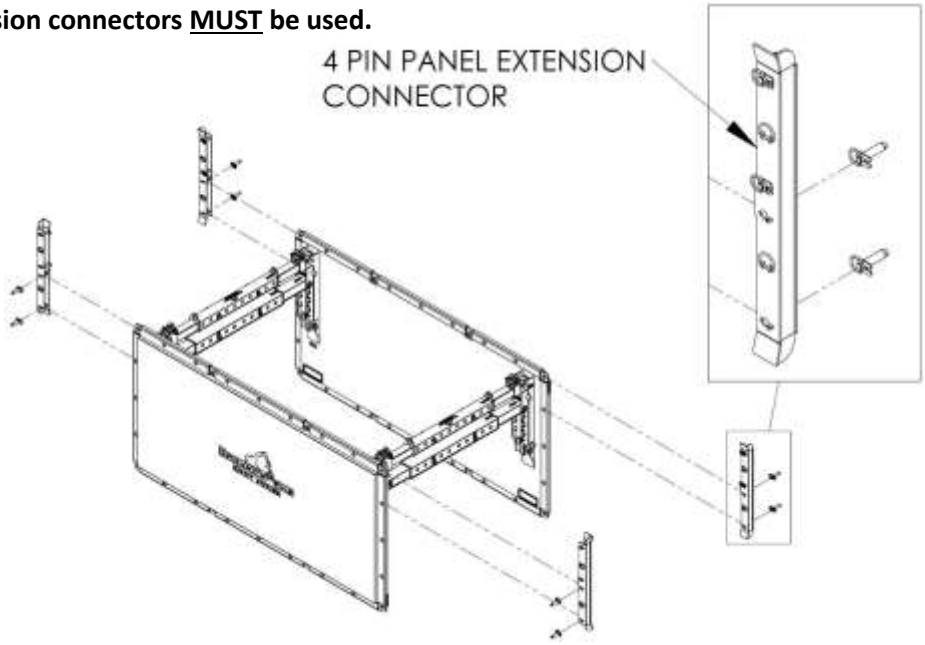


Figure 48: Panel Extensions – Step One

2. Lower the 4ft panels into the 4-pin panel extension connectors and secure with top pins. **NOTE: WHEN USED WITH PANELS LARGER THAN 4FT IN HEIGHT, STRUTS MUST BE USED FOR STRUCTURAL SUPPORT.**

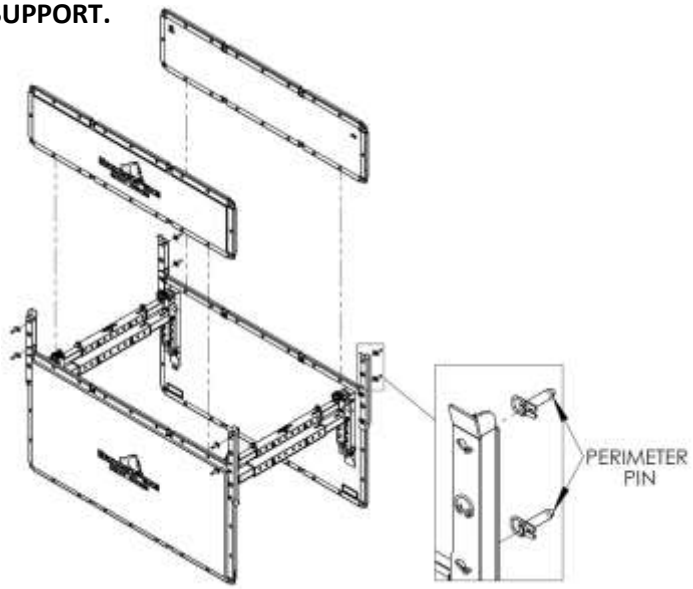


Figure 49: Panel Extensions – Step Two

3. Ensure both upper and lower pins, and at least one inner pin, are engaged and panels are aligned before moving the Trench Box System.

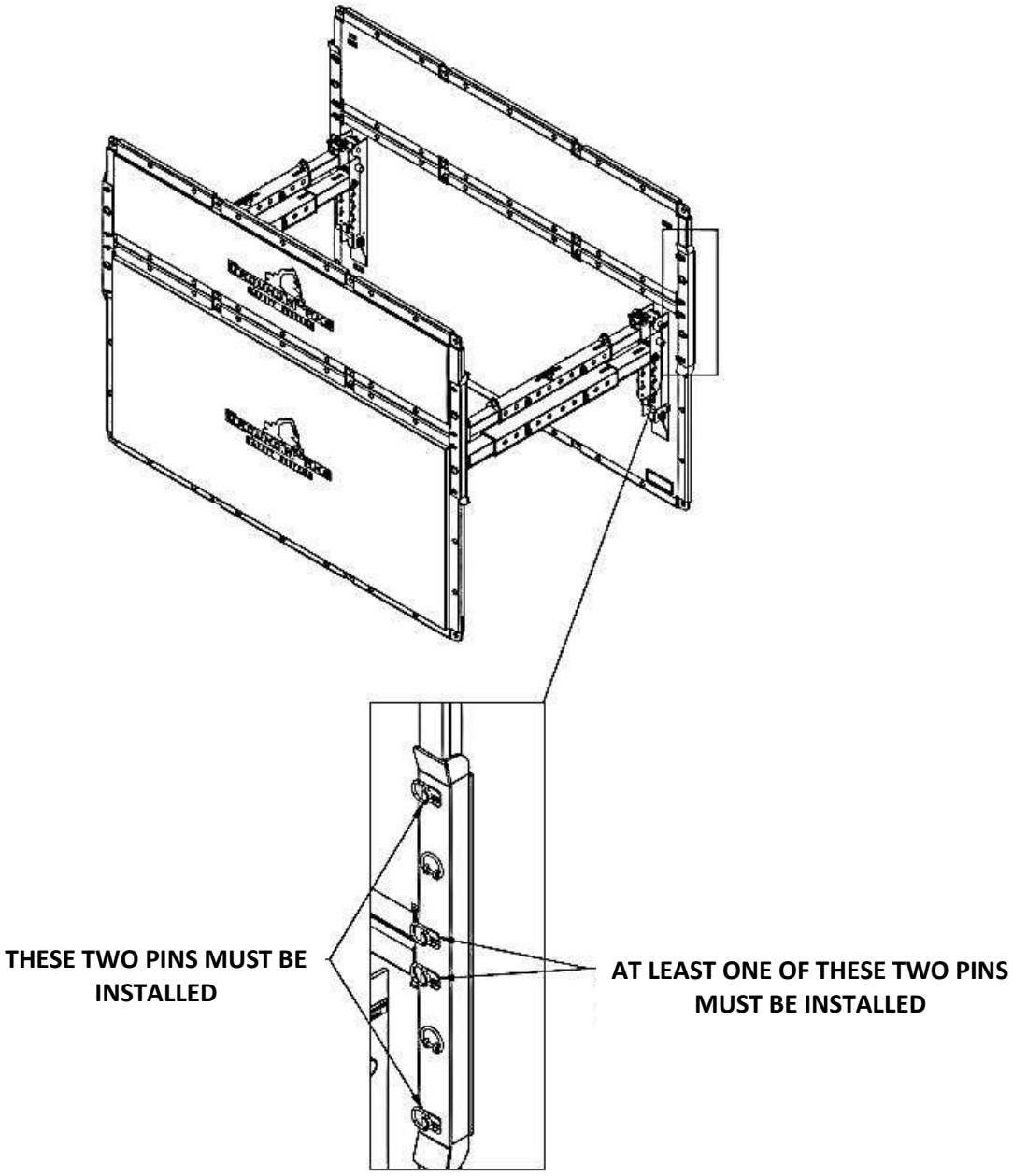


Figure 50: Panel Extensions – Step Three

CORNER CONNECTORS

GroundWorks Safety Systems Corner Connectors can be used in single box and multiple/stacked box configurations to add additional panels to one or both ends of a GroundWorks trench box. These can also be used in 4-sided applications without struts to increase the internal working envelope of a box. Refer to page 57 for further instructions on assembling a 4-sided pit kit.

Depth ratings can be affected when using corner connectors, so it is important to reference the tab data sheet for any panel being secured by the corner connectors. GroundWorks Safety Systems also offers different series of corner connectors to maximize achievable depth ratings. The series class is indicated by the first character on the serial number tag on each corner connector as well as by a different physical appearance. Refer to page 48 for more information.

In order to optimize box configurations, GroundWorks offers corner connectors in 4-pin and 6-pin variations. When using corner connectors, having the correct layout of the different available configurations is detrimental in maintaining the integrity of the trench box. Refer to page 48 for examples of proper corner connection use.

The following details step by step instructions on making a standard GroundWorks trench box into a 4-sided version using both struts and corner connectors.

1. Attach the corner connectors to all four corners of the trench box system and install pins. GWSS recommends that required corner connectors be installed on the panels prior to initial box assembly when possible to simplify assembly. **NOTE: THERE ARE DIFFERENT SIZES OF CORNER CONNECTORS FOR DIFFERENT CONFIGURATIONS. UNLESS OHERWISED NOTED, ENSURE ALL PANEL SIDE CONNECTION POINTS HAVE PINS ENGAGED WHEN USING CORNER CONNECTORS. Refer to page 43 for pin installation.**

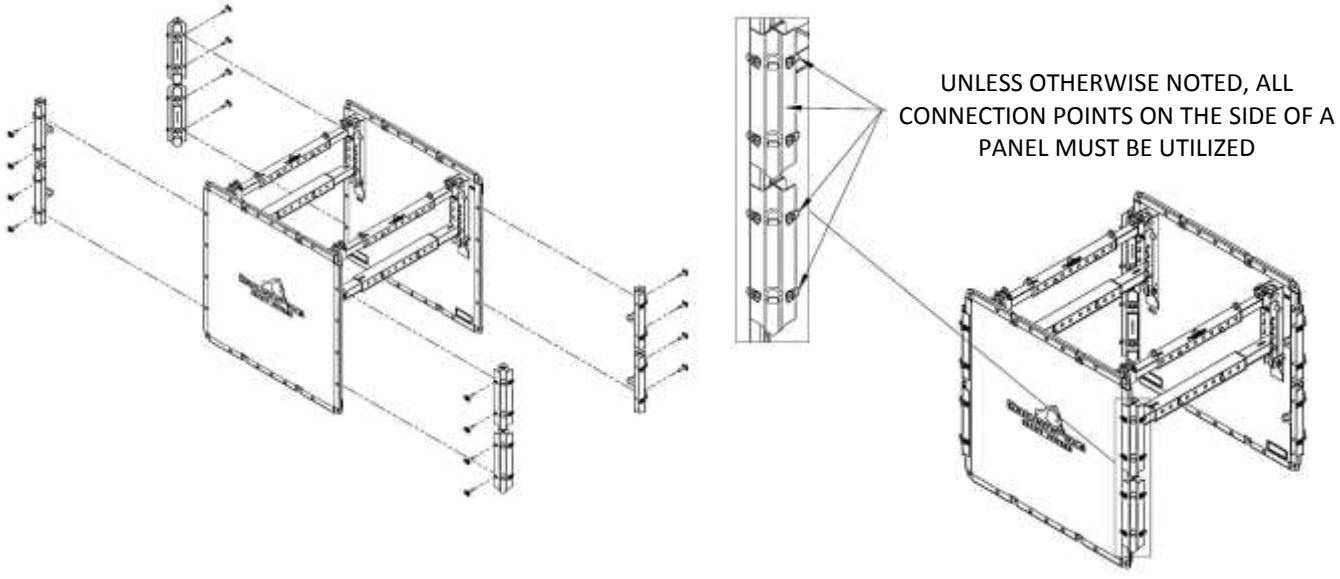


Figure 51: Corner Connectors – Step One

2. Lower the end walls into the corner connectors already attached to the trench box system.

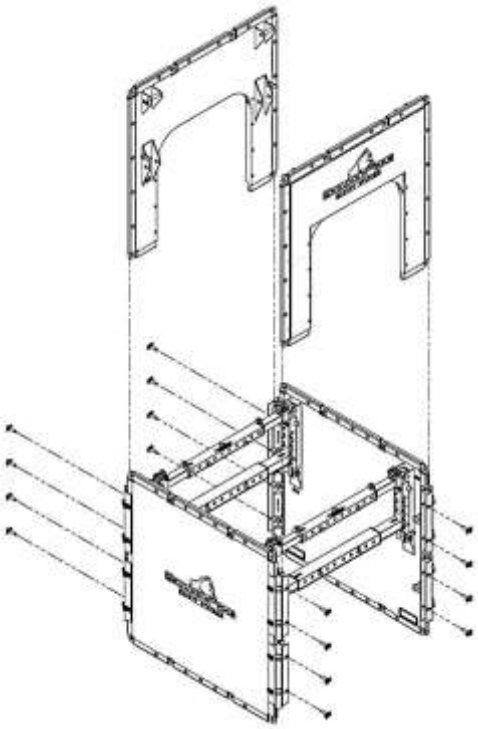


Figure 52: Corner Connectors – Step Two

3. It is now safe to enter the box (whether in-ground or on surface) and install the pins to secure the end gates. By design, the panel is supported laterally by the corner connectors and not the pins. Ensure all pins are reinstalled in the corner connectors.

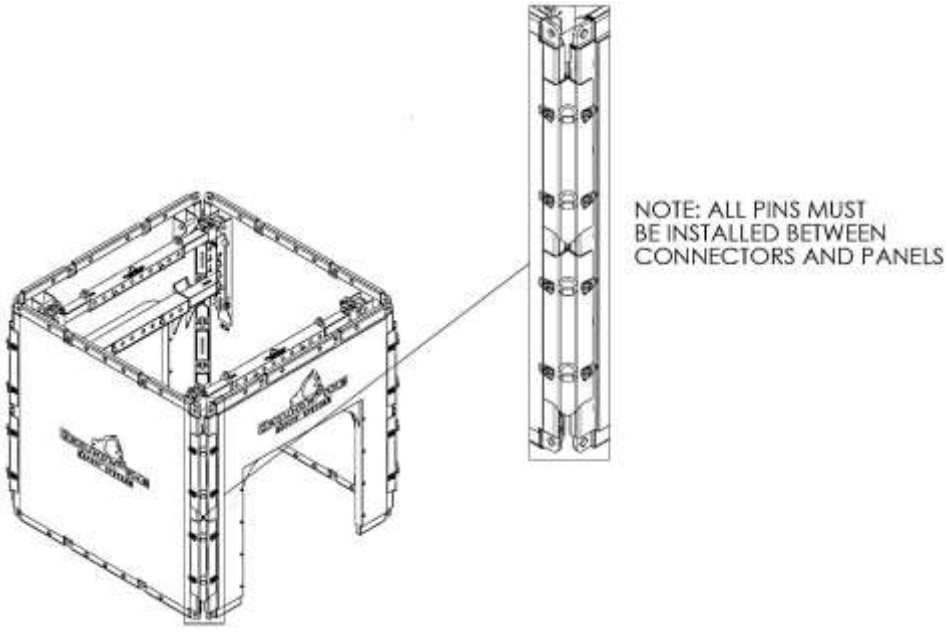


Figure 53: Corner Connectors – Step Three

GWSS HB corner connectors offer increased support for deeper HM panel depths. **The HB corner connectors are only required at the bottom of the box.** When installing, be sure that the long side of the connector is facing downwards, towards the ground. Otherwise the upper corner connector will not fit.

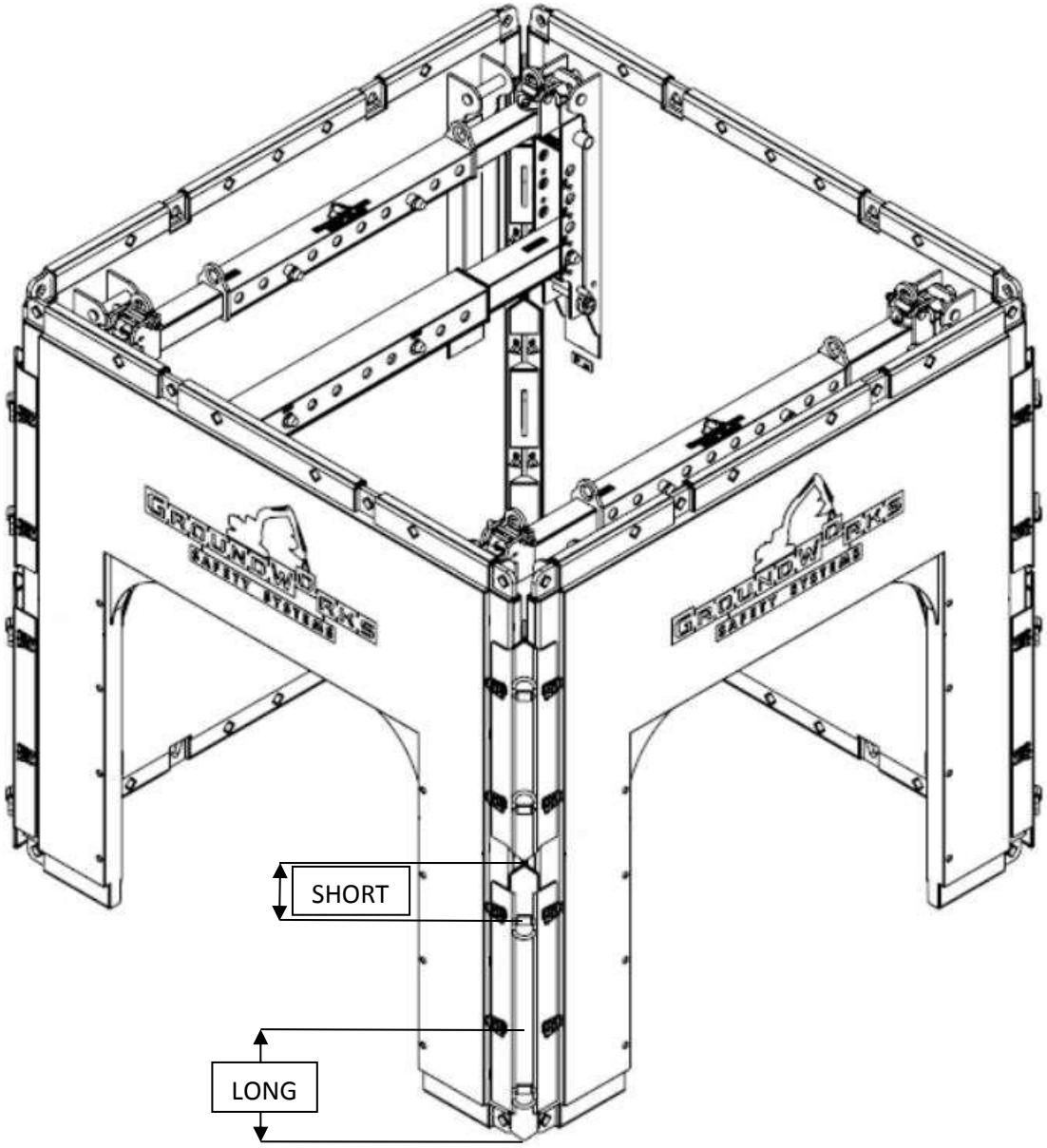


Figure 54: HB Corner Connector Orientation

CORNER CONNECTOR EXAMPLE CONFIGURATIONS

Panels and end gates can be interchanged for different configurations. A panel or end gate can go on any side of the Trench Box System. The tab data sheet of any single system component will limit the depth rating of the system. No depth ratings for any components should be exceeded.

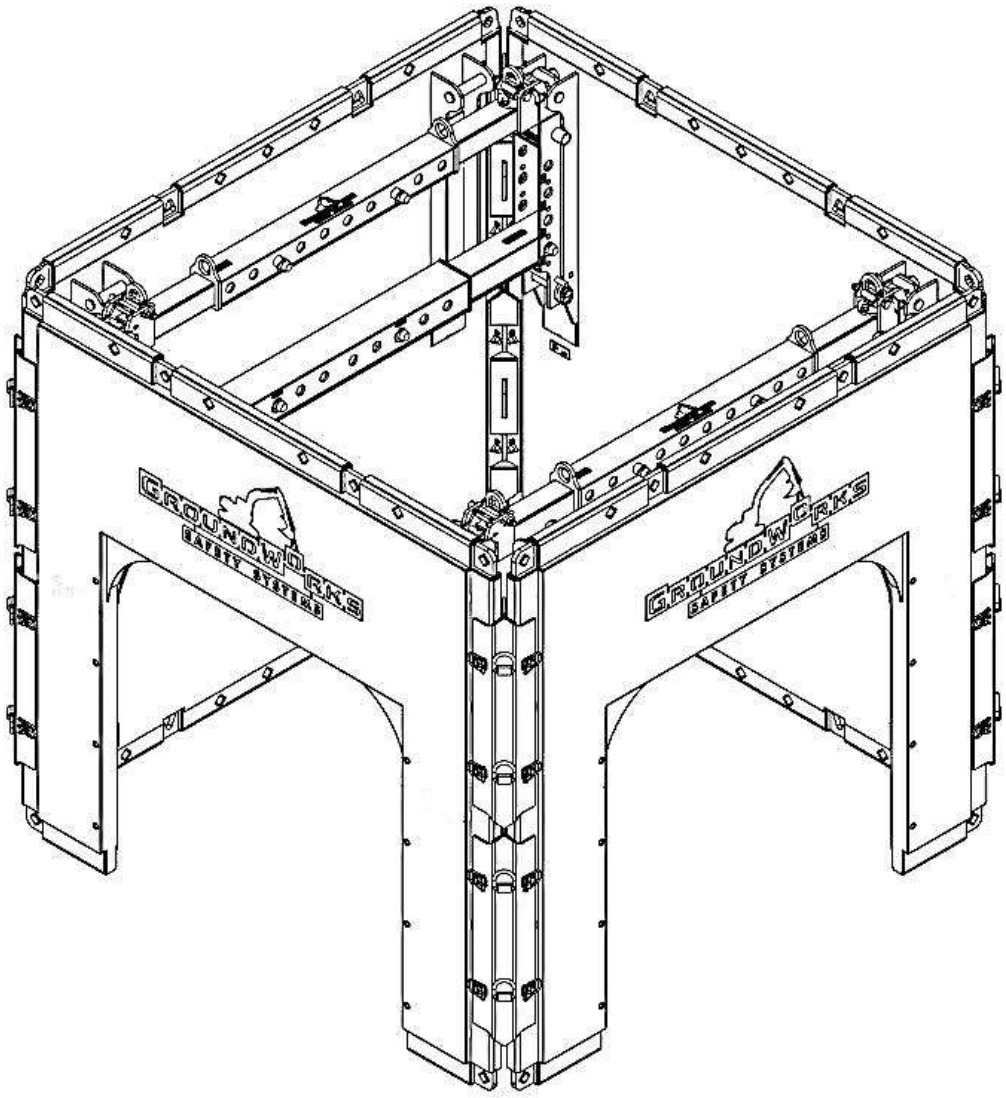


Figure 55: 4 Sided Trench Box with Side and End Gate Panels

Different sizes of panels can be joined to accommodate different job requirements. **WHEN USING CORNER CONNECTORS ENSURE ALL PANEL SIDE CONNECTION POINTS HAVE PINS ENGAGED.** The following are examples of possible Trench Box System setups that can be constructed using corner connectors.

8’ High Panel Box With Corner Connectors

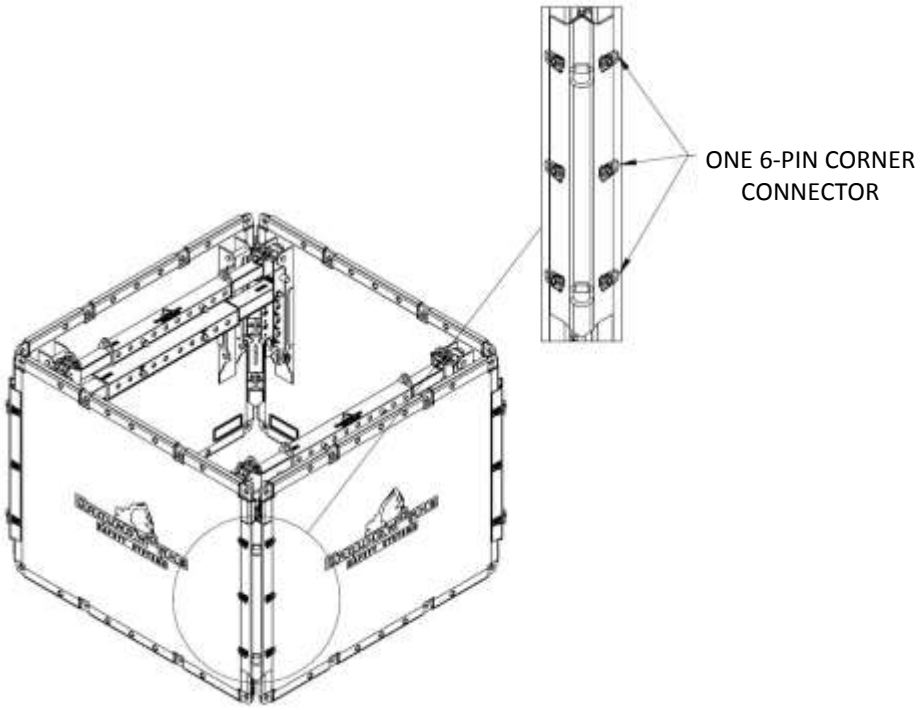


Figure 56

10’ High Panel Box With Corner Connectors

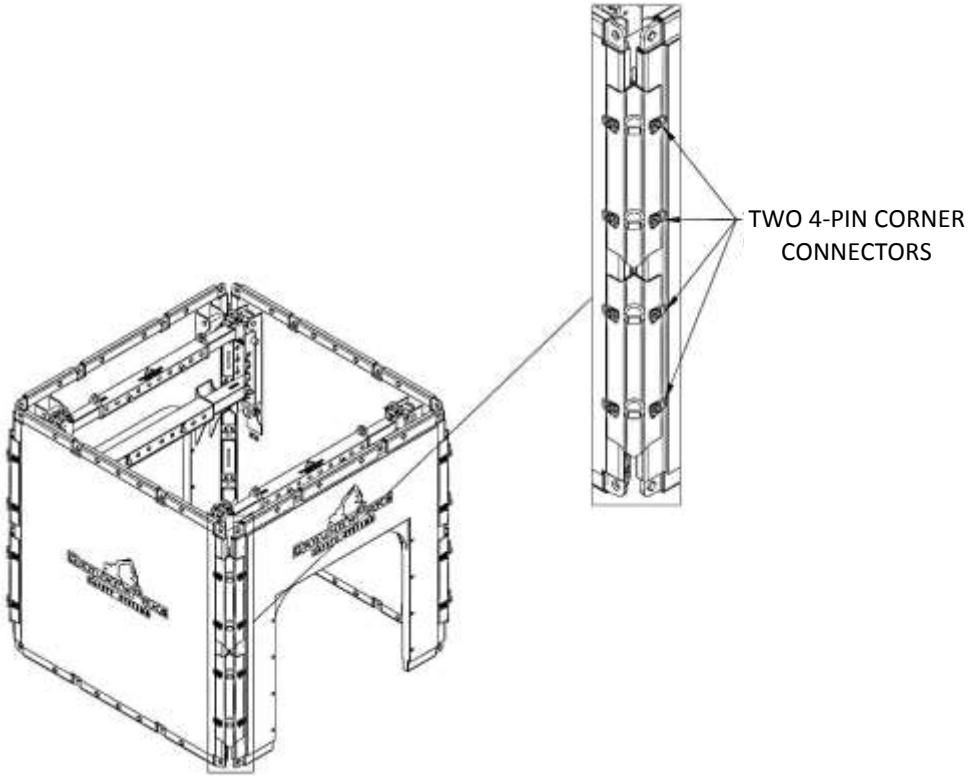
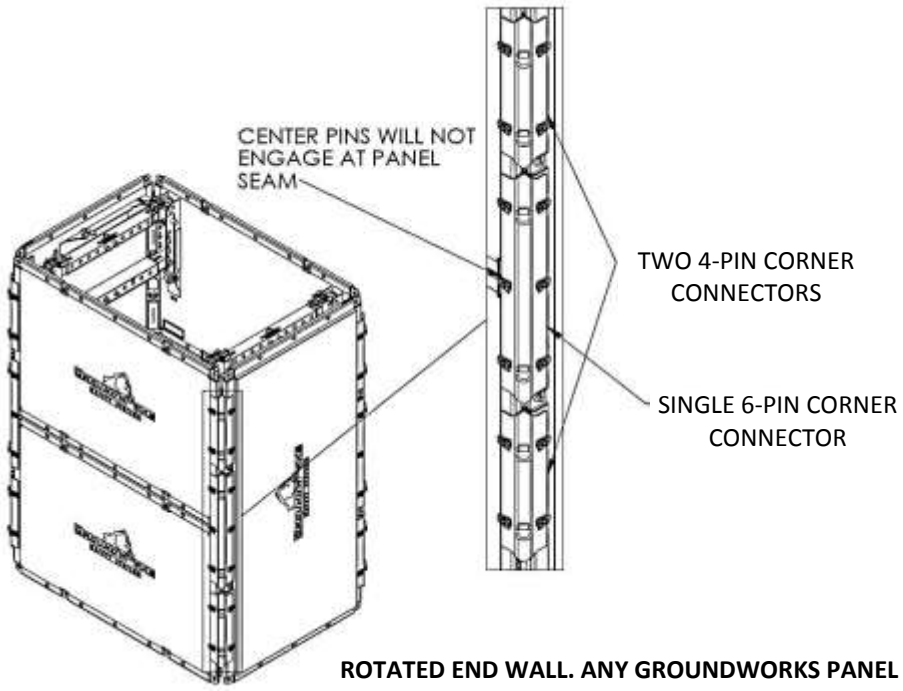


Figure 57

8’ High Side Panels Stacked with 16’ Wide End Panels



ROTATED END WALL. ANY GROUNDWORKS PANEL CAN BE USED IN EITHER A VERTICAL OR HORIZONTAL APPLICATION WHEN SUPPORTED BY CORNER CONNECTORS. REFER TO PANEL TAB DATA SHEET FOR SPECIFIC DEPTH INFORMATION

Figure 58

10’ High Side Panels Stacked with 20’ Wide End Panels

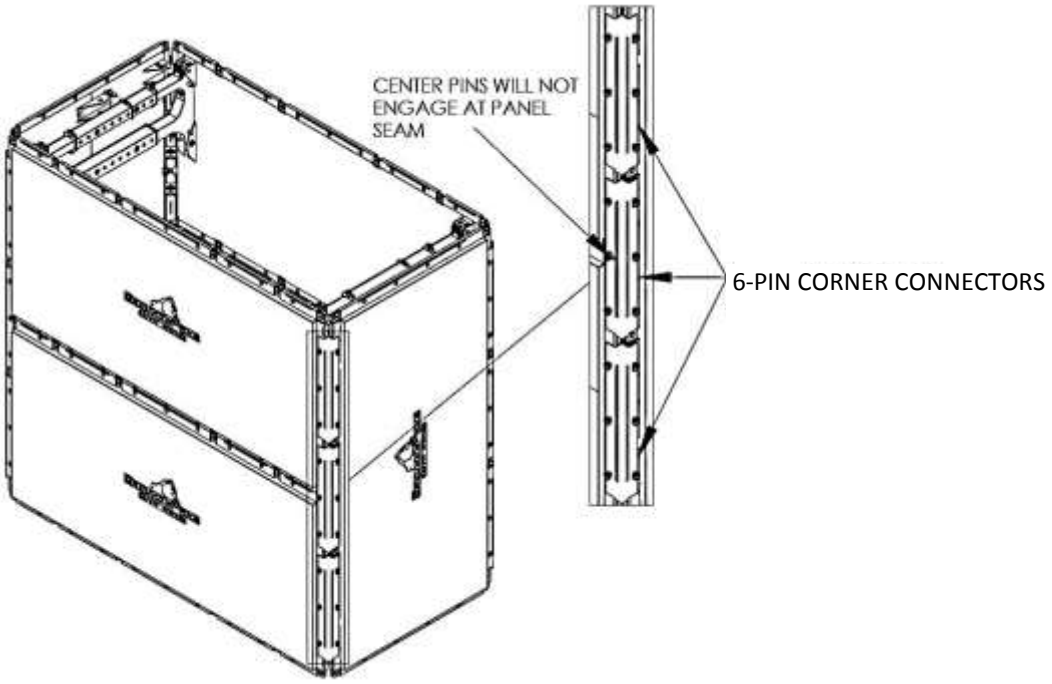


Figure 59

10’ High Panel X 8’ High Panel X 4’ Extension Panel – 3-Sided Box

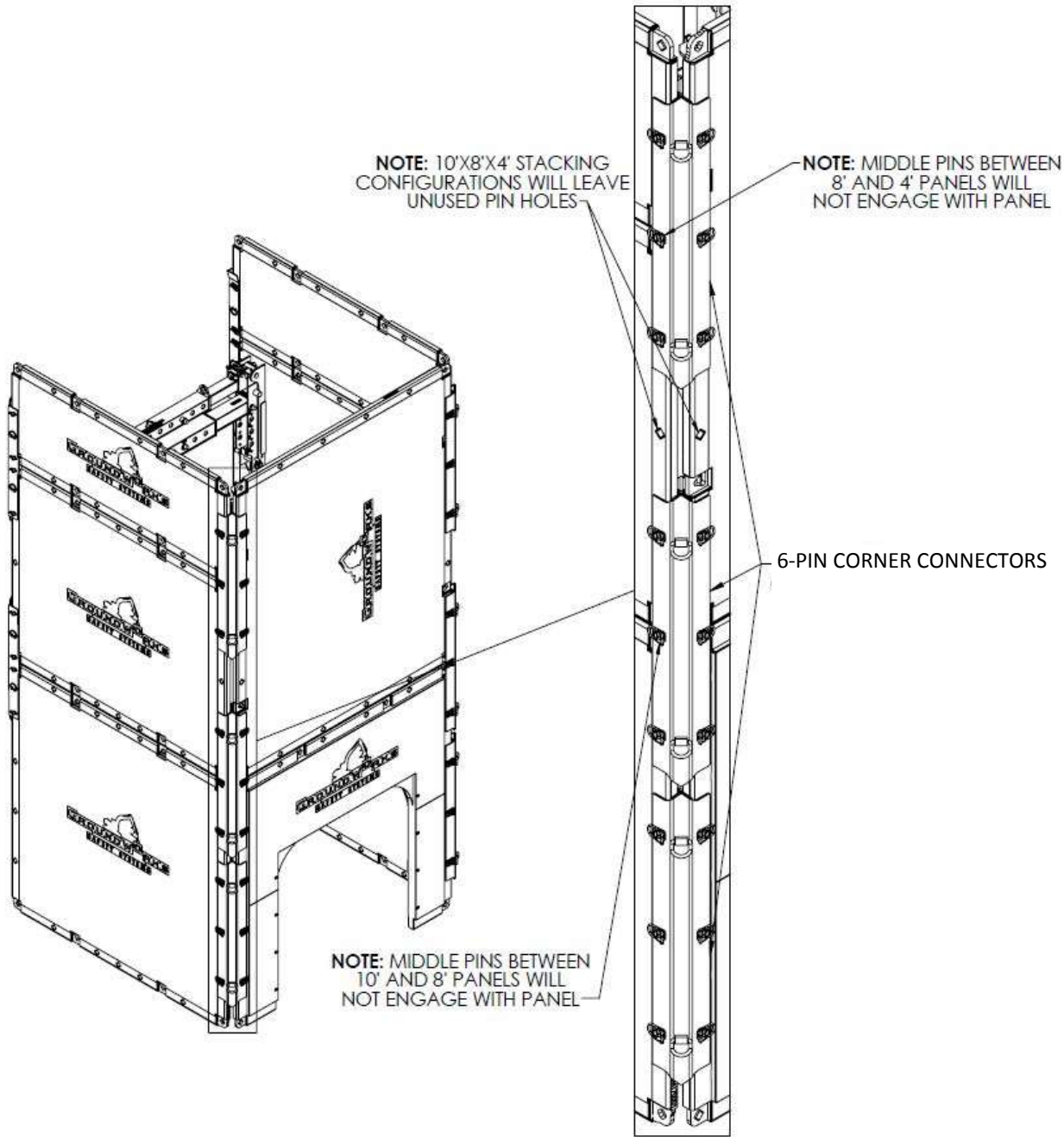


Figure 60

10’ High Panel X 8’ High Panel X 4’ Extension Panel With elevated Gate Panel- 3 Sided Box

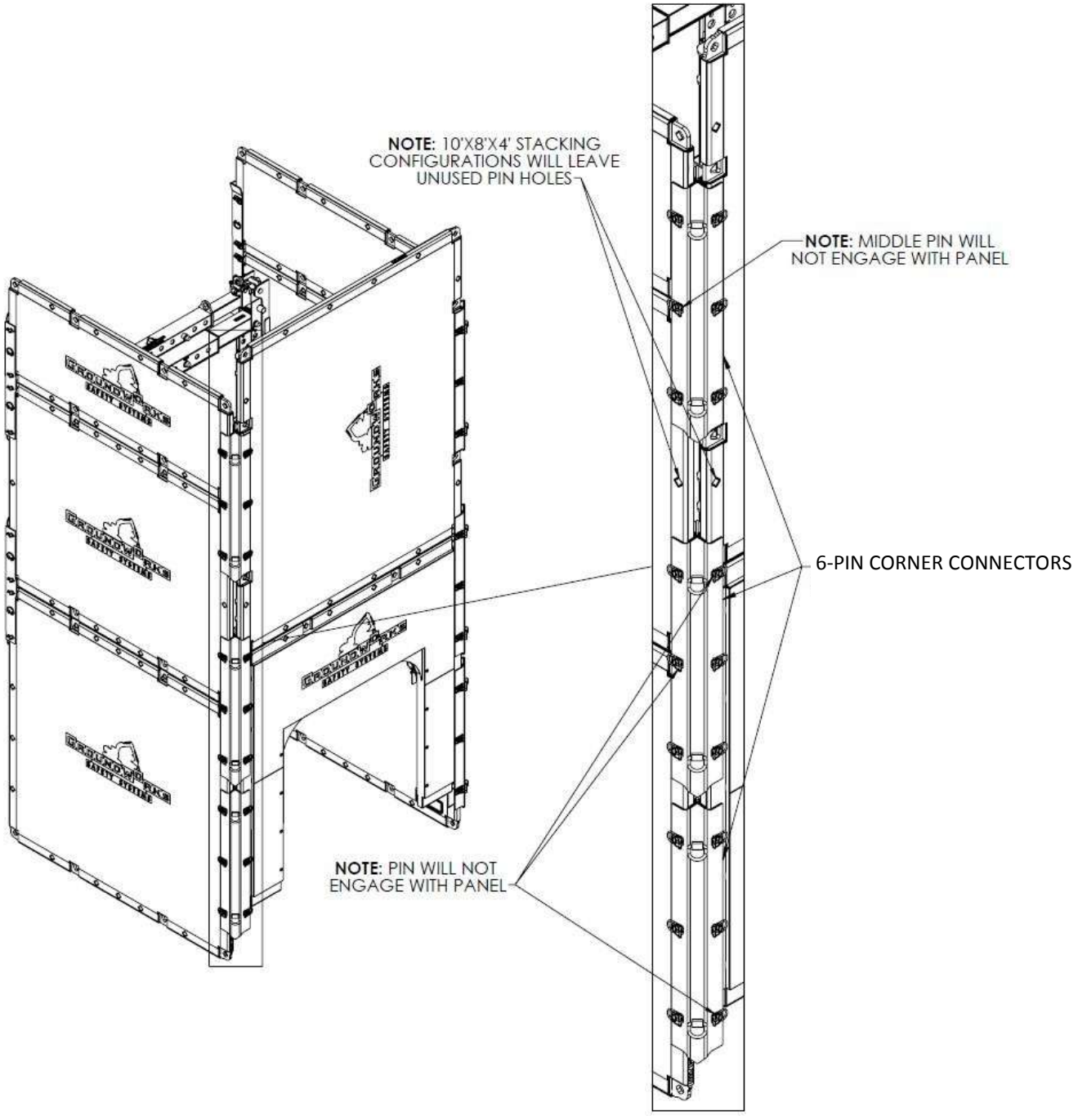


Figure 61

10’ High HM Panel X 10’ High HM Gate Panel

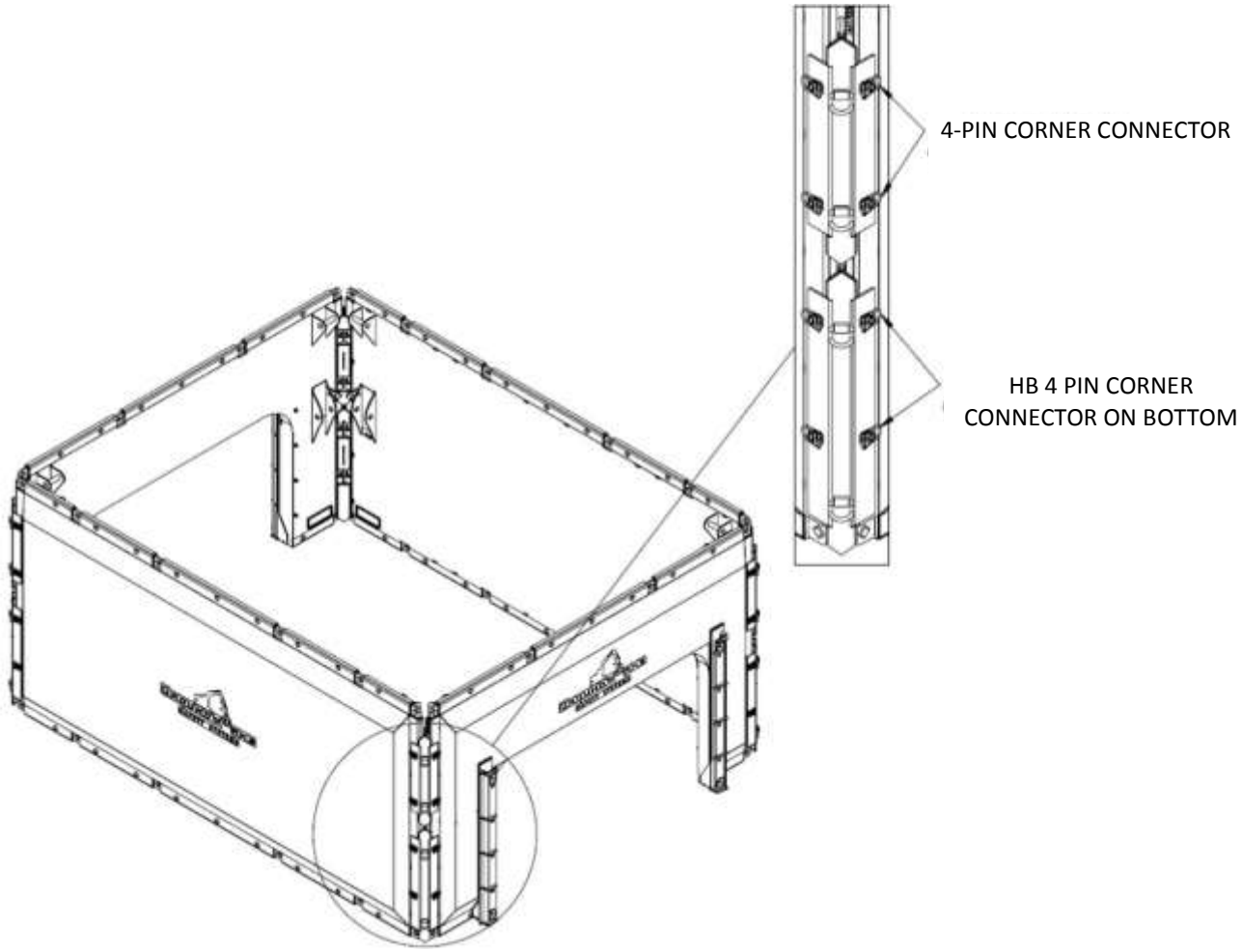


Figure 62

4-SIDED PIT KIT

Any GroundWorks Panels can be used in conjunction with corner connectors to construct a 4-sided box without utilizing struts. GroundWorks refers to this as a “pit kit”. These pit kits are popular in situations that require maximizing the inside working envelope of a box.

The following details the steps required to construct a 4-sided pit kit.

1. Attach the required corner connectors to both “A” and “B” sides of the first panel with perimeter pins.

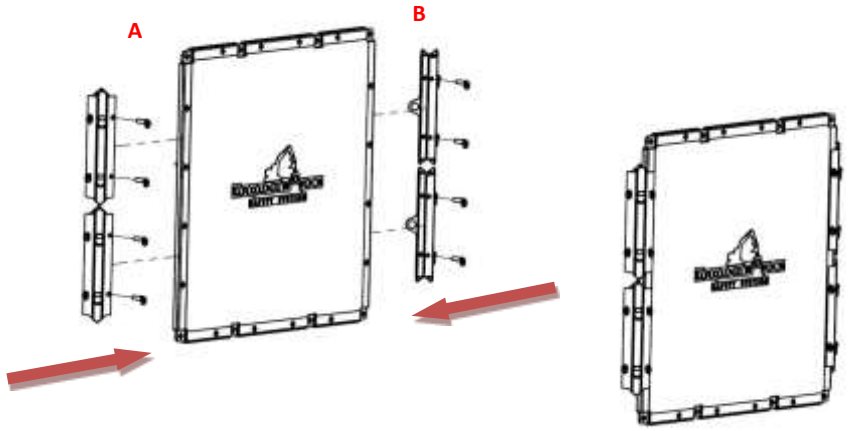


Figure 63: Pit Kit Step One – Corner Connectors on Both Sides of First Panel

2. Attach the required corner connectors to either “A” or “B” side of the second panel with the perimeter pins.

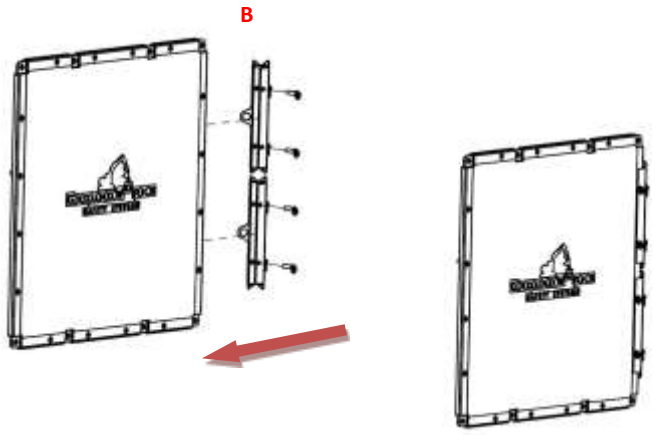


Figure 64: Pit Kit Step Two – Corner Connectors on One Side of Second Panel

3. While supporting the first panel with one machine, use a second machine to slide a second panel into the corner connectors on the first panel.

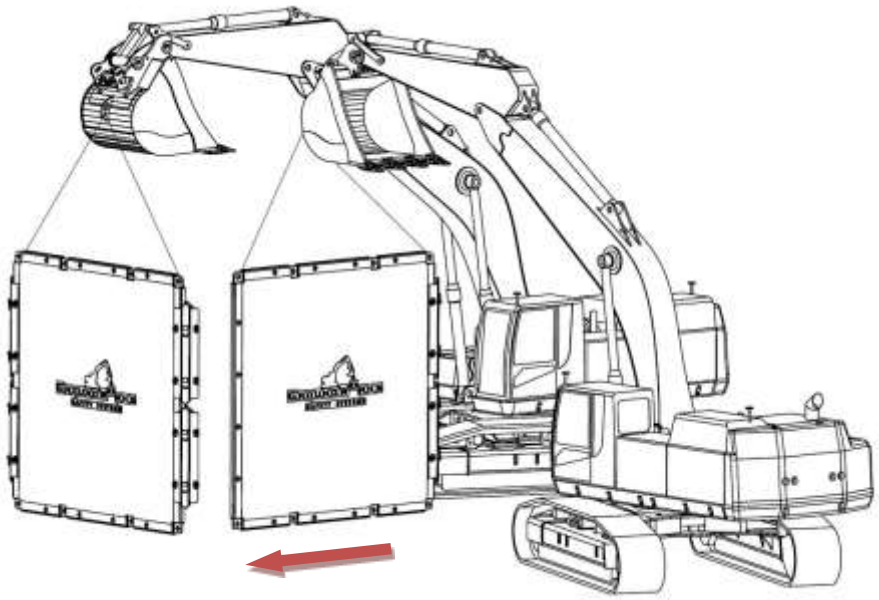


Figure 65: Pit Kit Step Three – Assembling Panel One with Panel Two

4. With the machines supporting the panels in position, install the perimeter pins into the second panel.

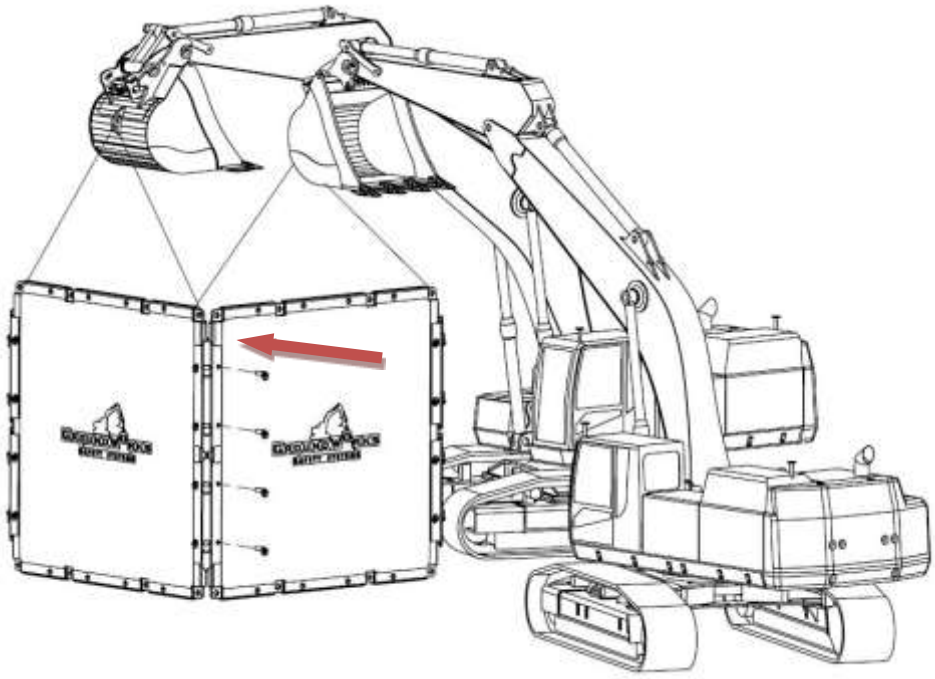


Figure 66: Pit Kit Step Four – Inserting Perimeter Pins

5. Observing which side of the second panel had corner connectors installed in step 2, attach the required corner connectors onto the opposite side of the third panel with perimeter pins.

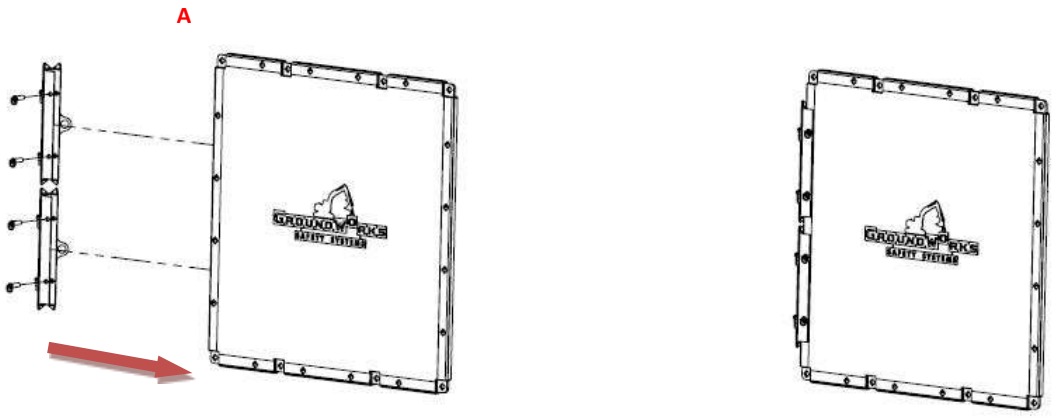


Figure 67: Pit Kit Step Five – Installing Corner Connectors on Third Panel

6. Align the third panel onto the first two standing panels.

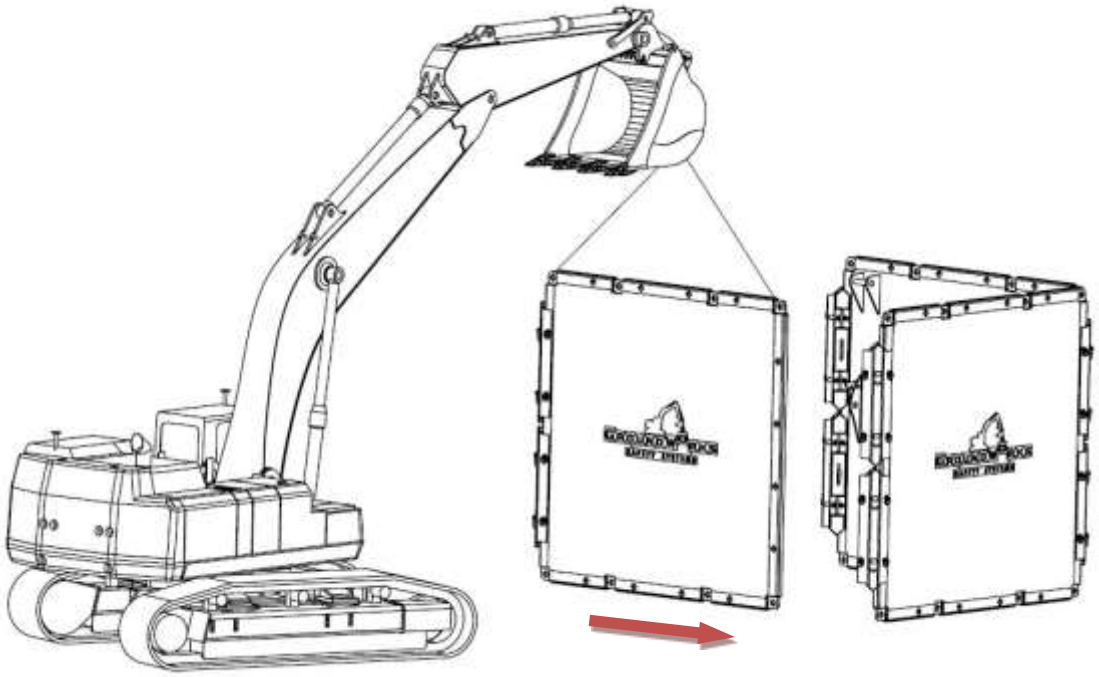


Figure 68: Pit Kit Step Six – Assembling Third Panel with Panels One and Two

7. Continue supporting the weight of third panel with a machine until the perimeter pins have been installed into the third panel.

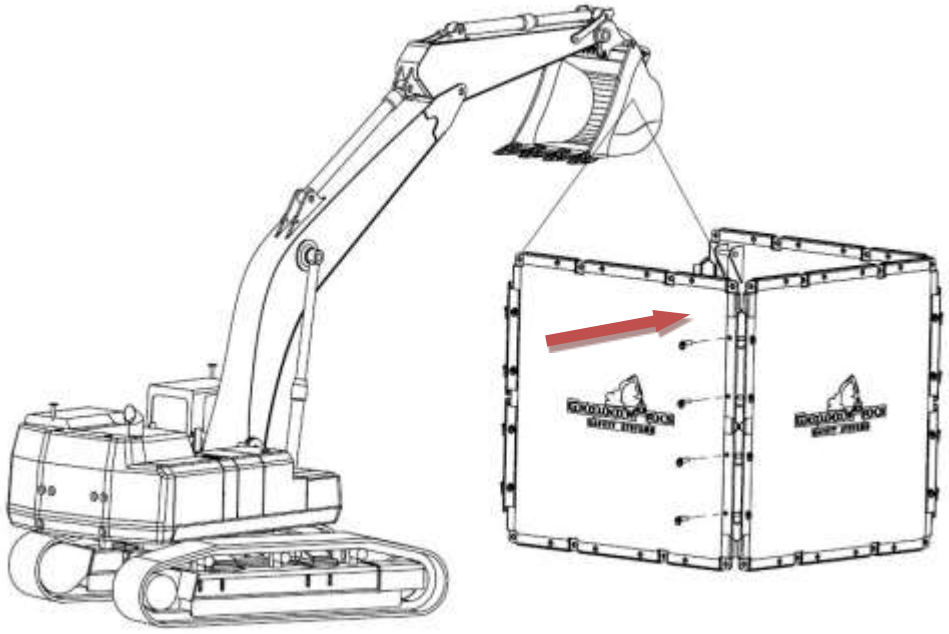


Figure 69: Pit Kit Step Seven – Inserting Perimeter Pins into the Third Panel

8. Lower the fourth panel into position

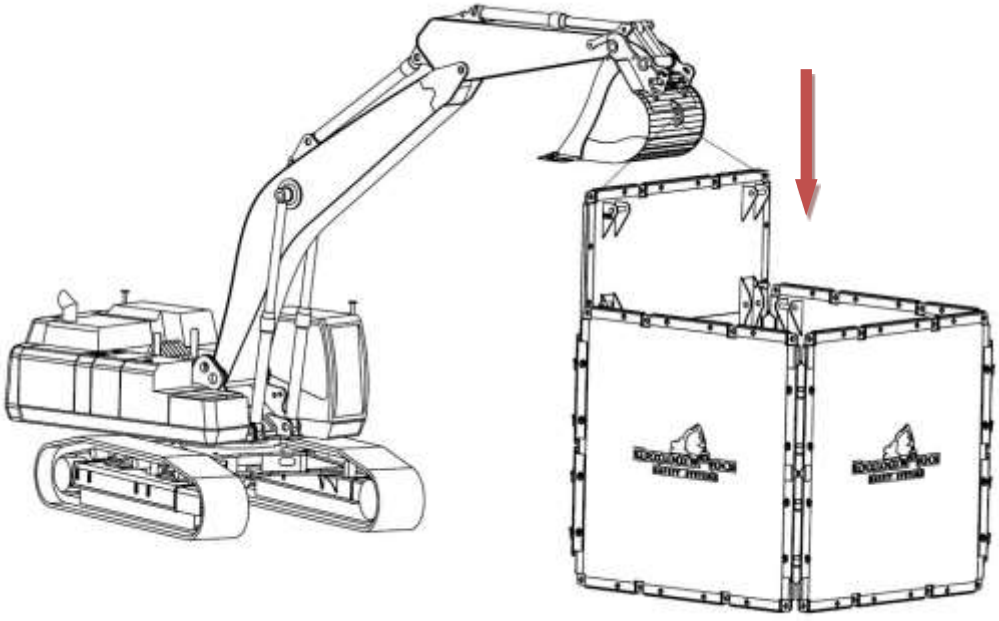


Figure 70: Pit Kit Step Eight – Installing the Fourth Panel

9. Install the remaining perimeter pins to complete assembly. **ENSURE ALL PINS ARE ENGAGED BEFORE MOVING ASSEMBLY**. The 4-sided trench box is now ready for use.

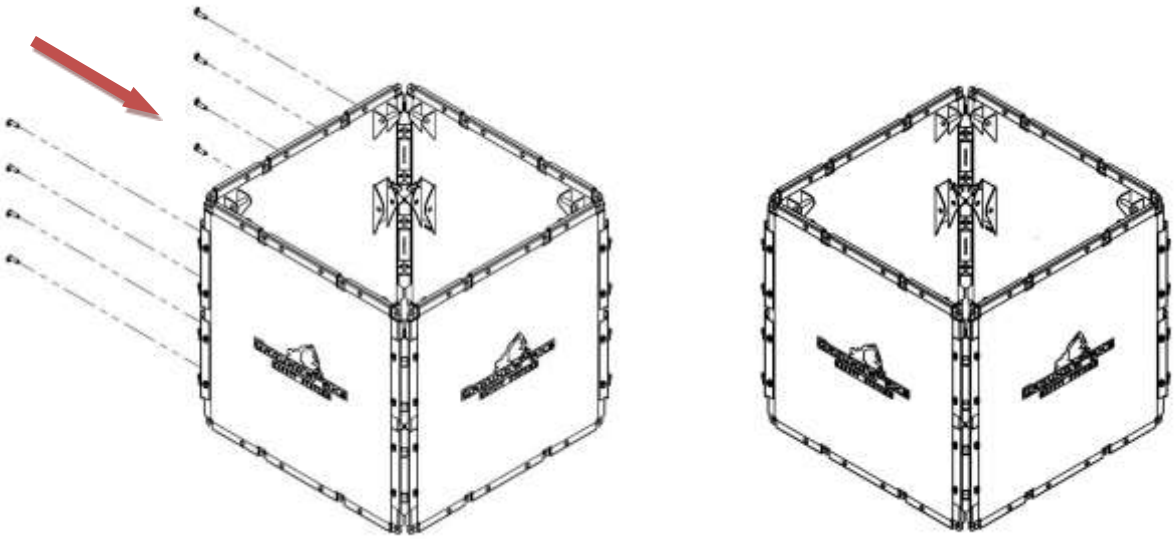


Figure 71: Pit Kit Step Nine – Installing the Last Perimeter Pins

If using 4’ panel extensions, the 4-sided trench box will be built with 6-pin corner connectors on top (see figure 72 below). Then continue with the appropriate steps to attach the 4’ panel extensions.

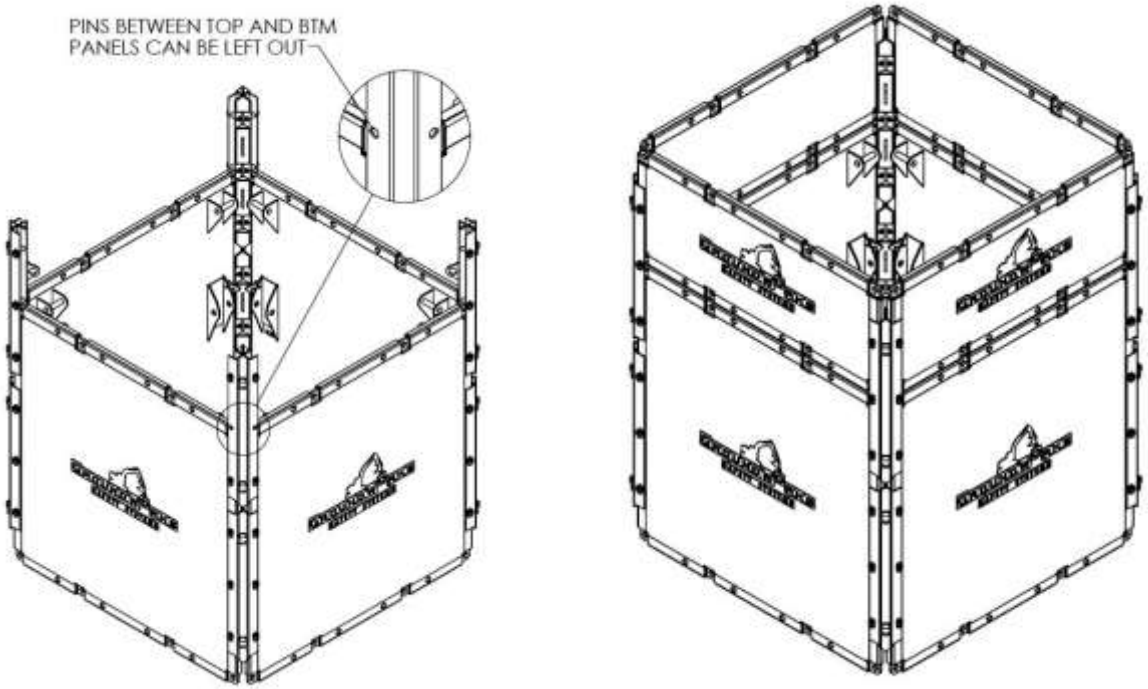


Figure 72: Pit Kit with 4’ Panel Extensions

14’ High Pit Kit

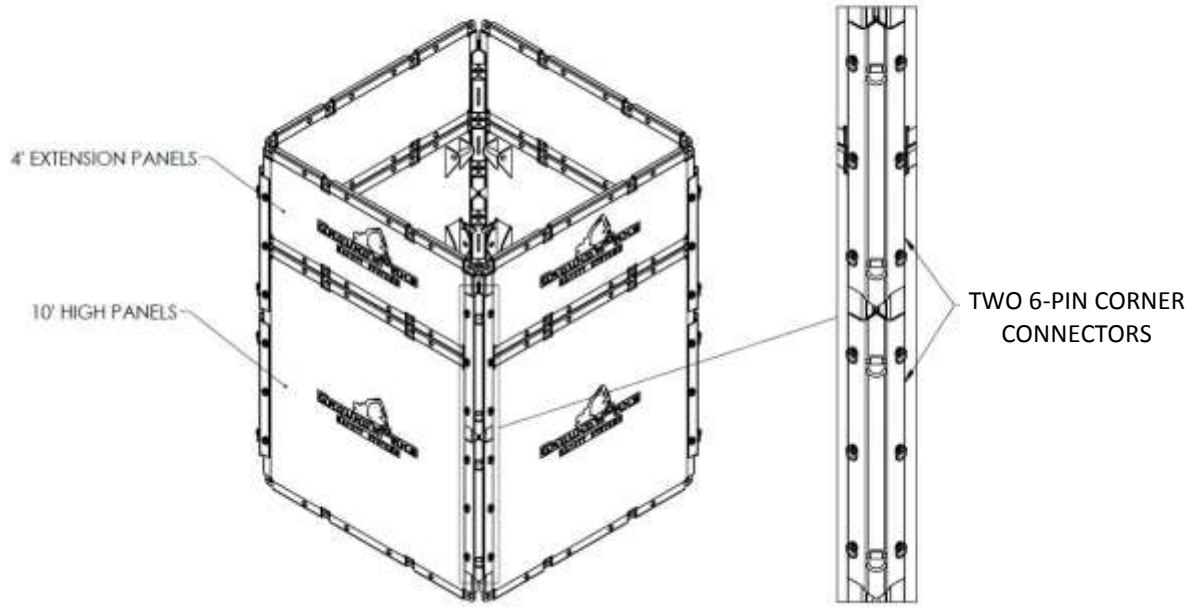


Figure 73: Pit Kit with 10’ Panels and 4’ Panel Extensions

12’ High Pit Kit

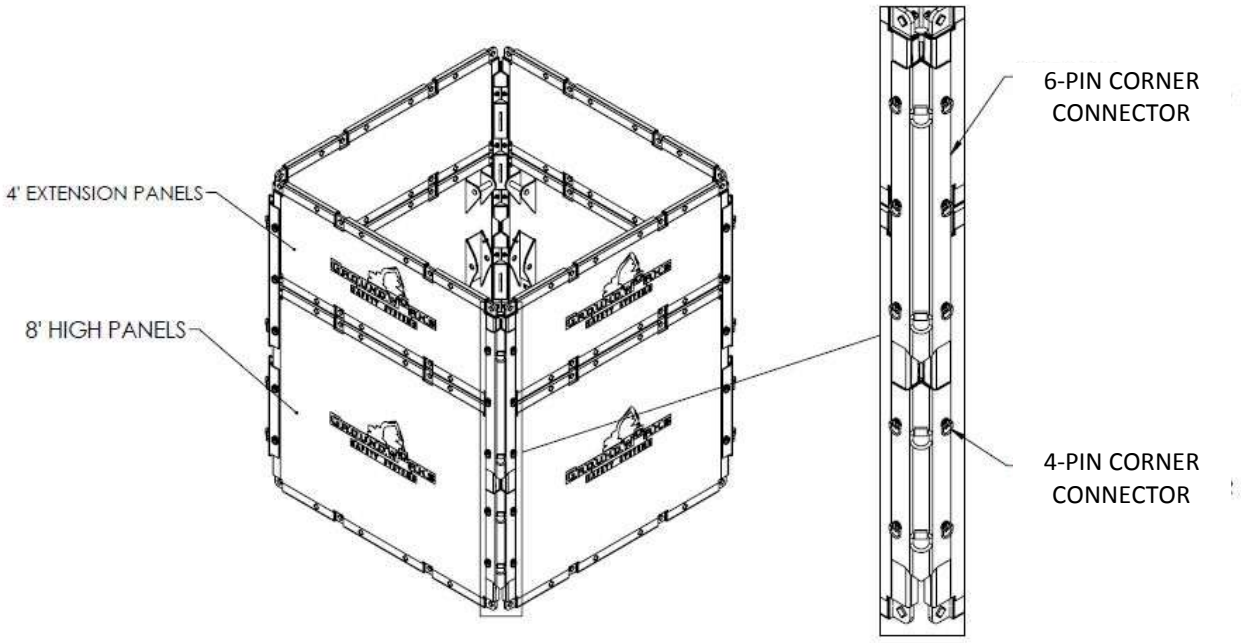


Figure 74: Pit Kit with 8’ Panels and 4’ Panel Extensions

ACCESSORIES

GroundWorks Safety Systems offers a variety of accessories to work in conjunction with the perimeter connection system on their panels. The following are just a few examples of what they offer. For full details on the continuously expanding list of available accessories please contact GroundWorks Safety Systems.

KNIFE EDGE – SET OF 2

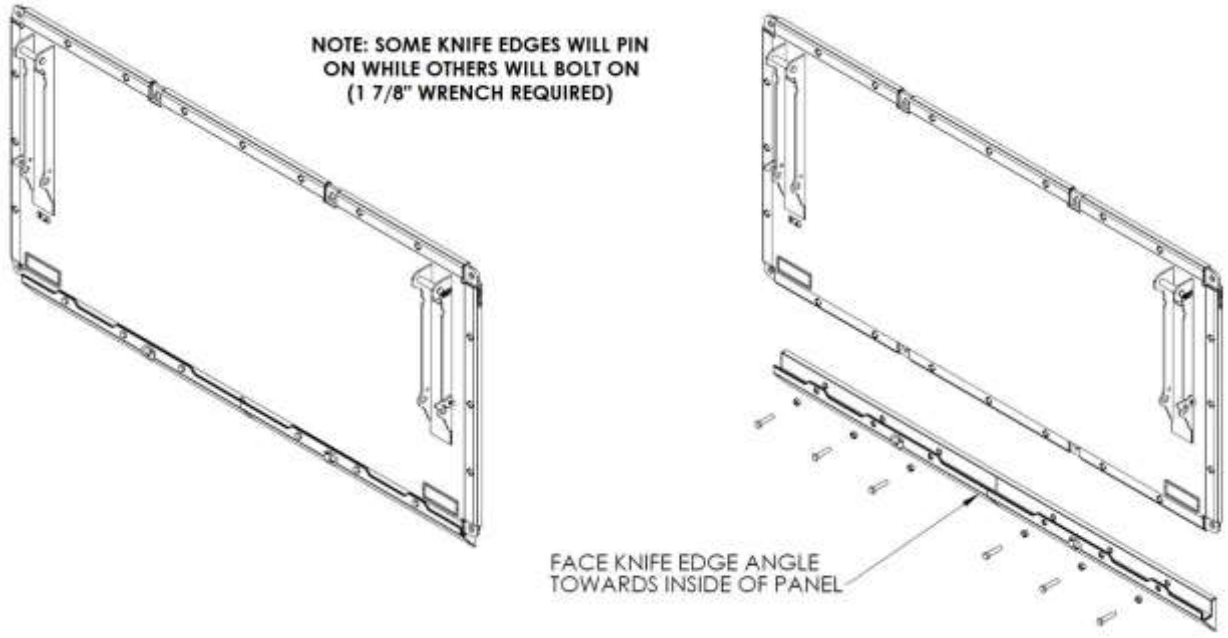


Figure 75

EXTENSION FEET – SET OF 4

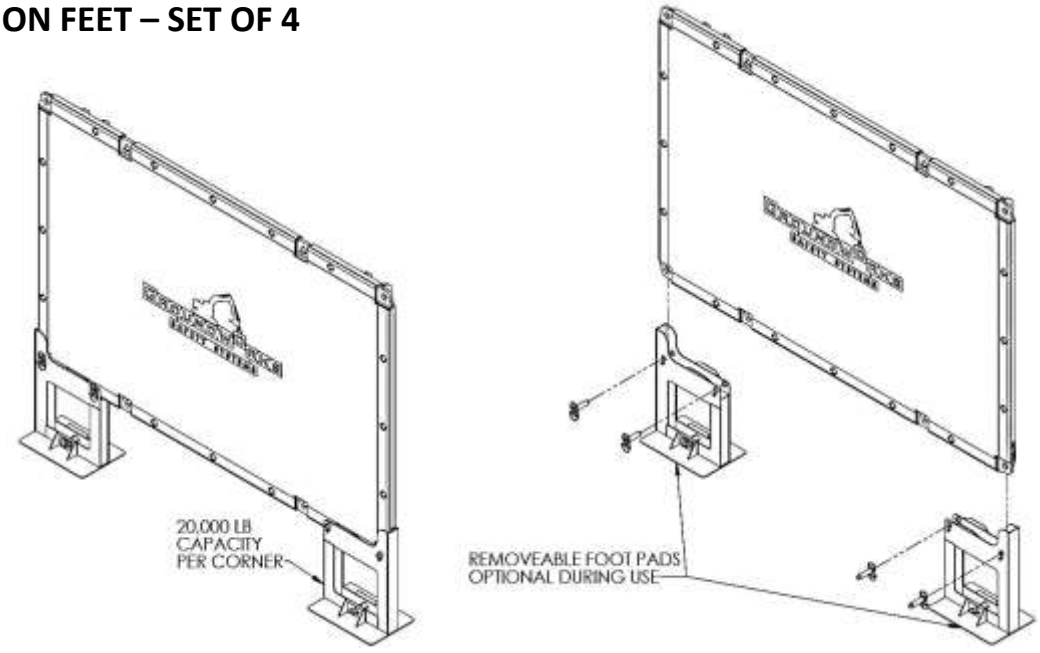


Figure 76

DEFLECTION BAR

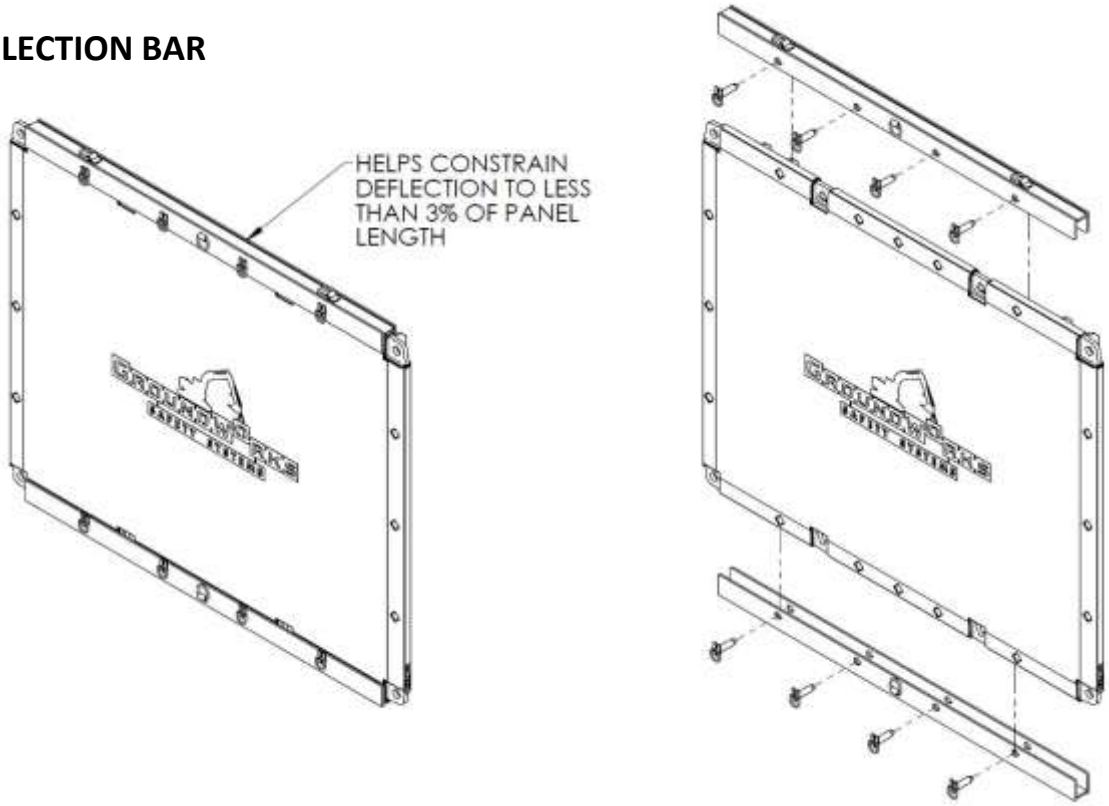


Figure 77

PUSHING PAD – SET OF 4

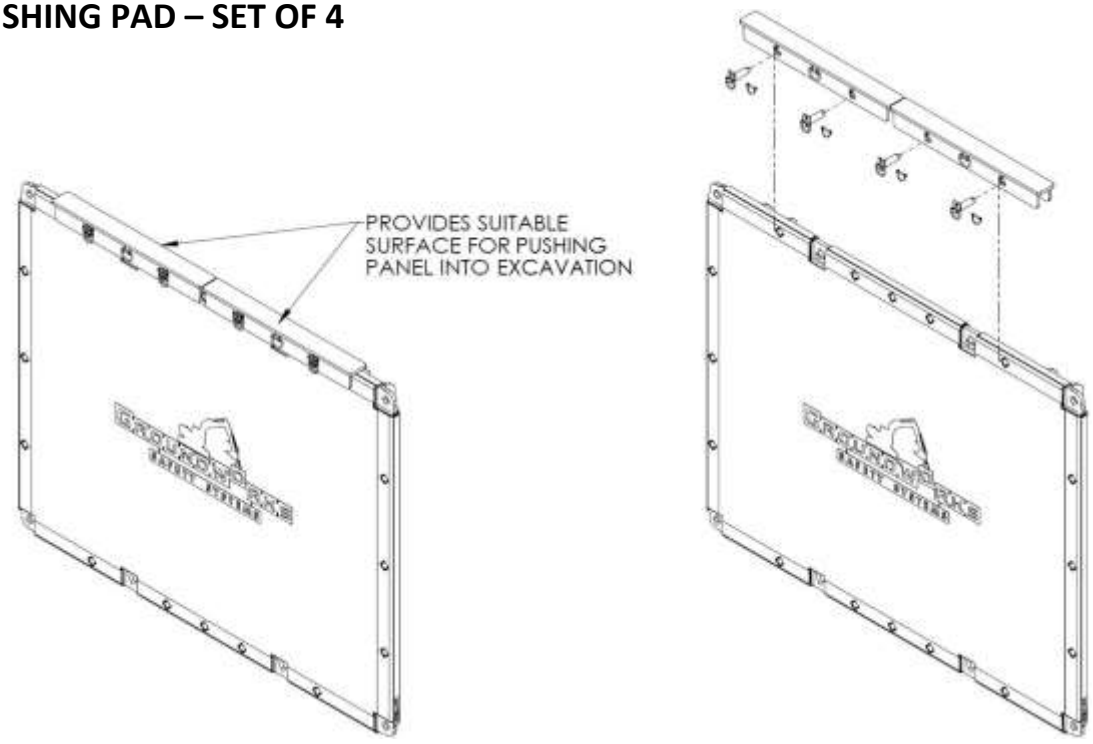


Figure 78

PULL BAR

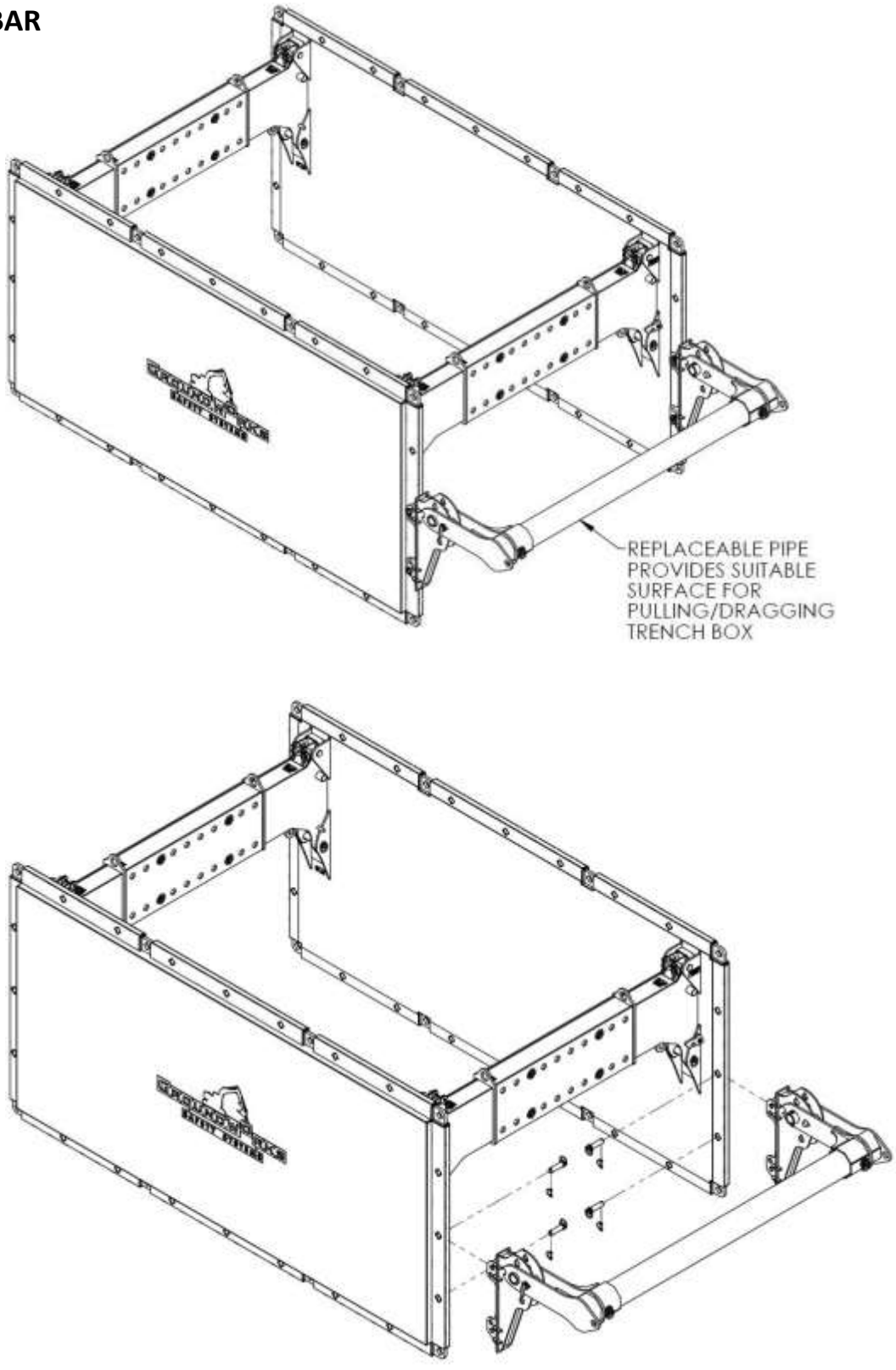


Figure 79

LADDER (SAFETY RAILINGS ALSO SHOWN)

(See page 119 for further instruction)

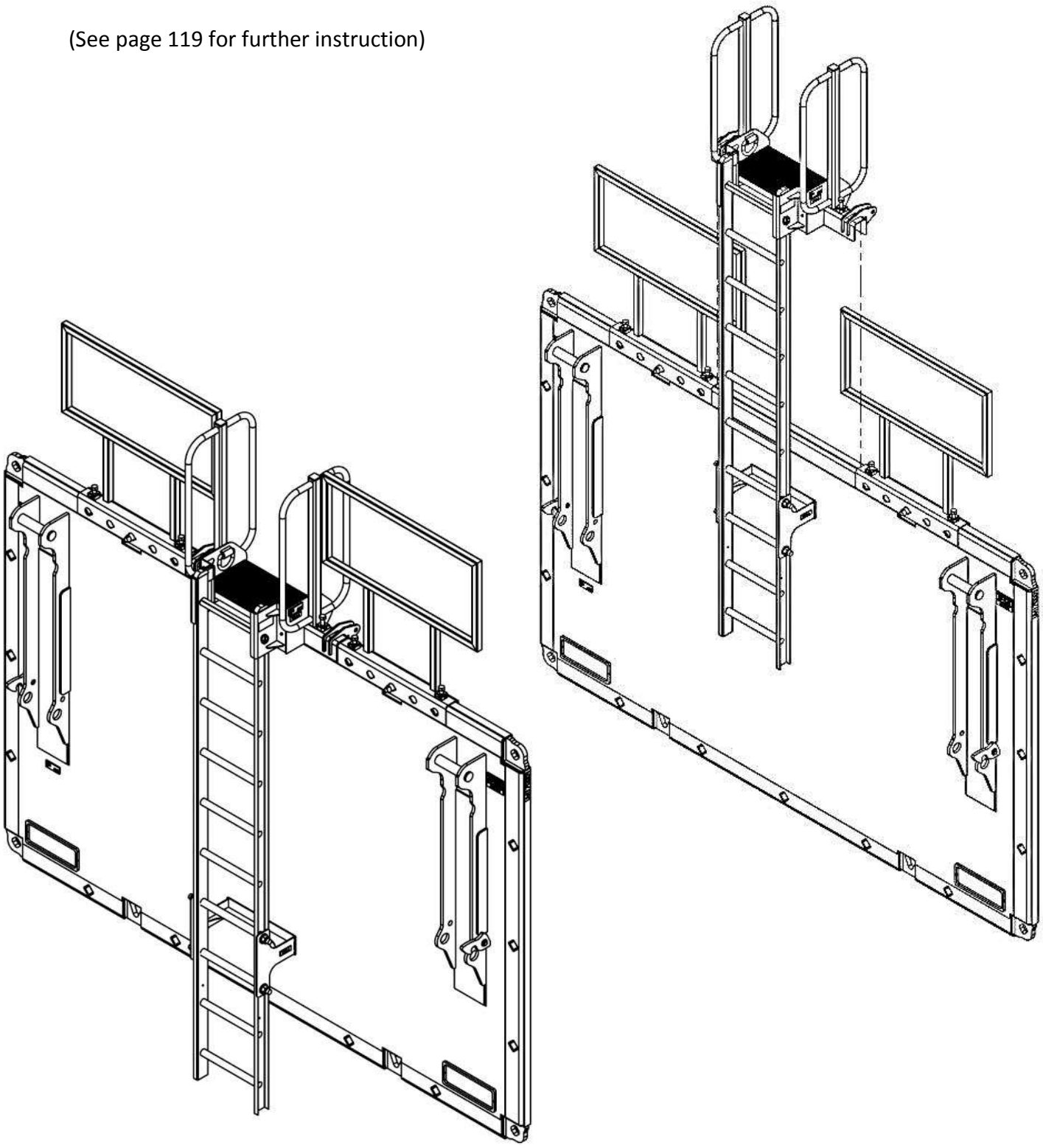


Figure 80

LADDER EXTENSION (See page 122 for further instruction)

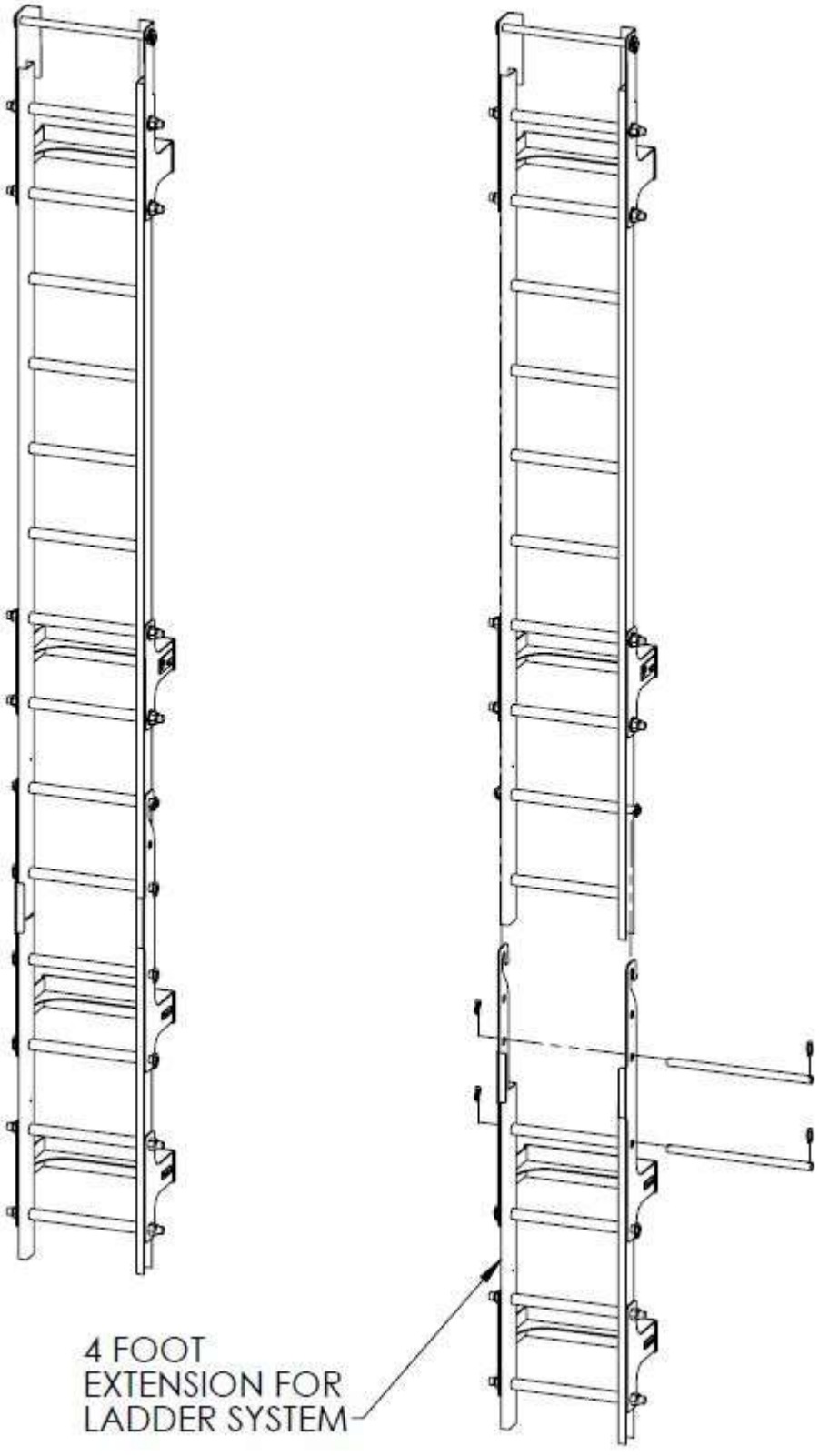


Figure 81

PLATFORM (See page 137 for further instruction)

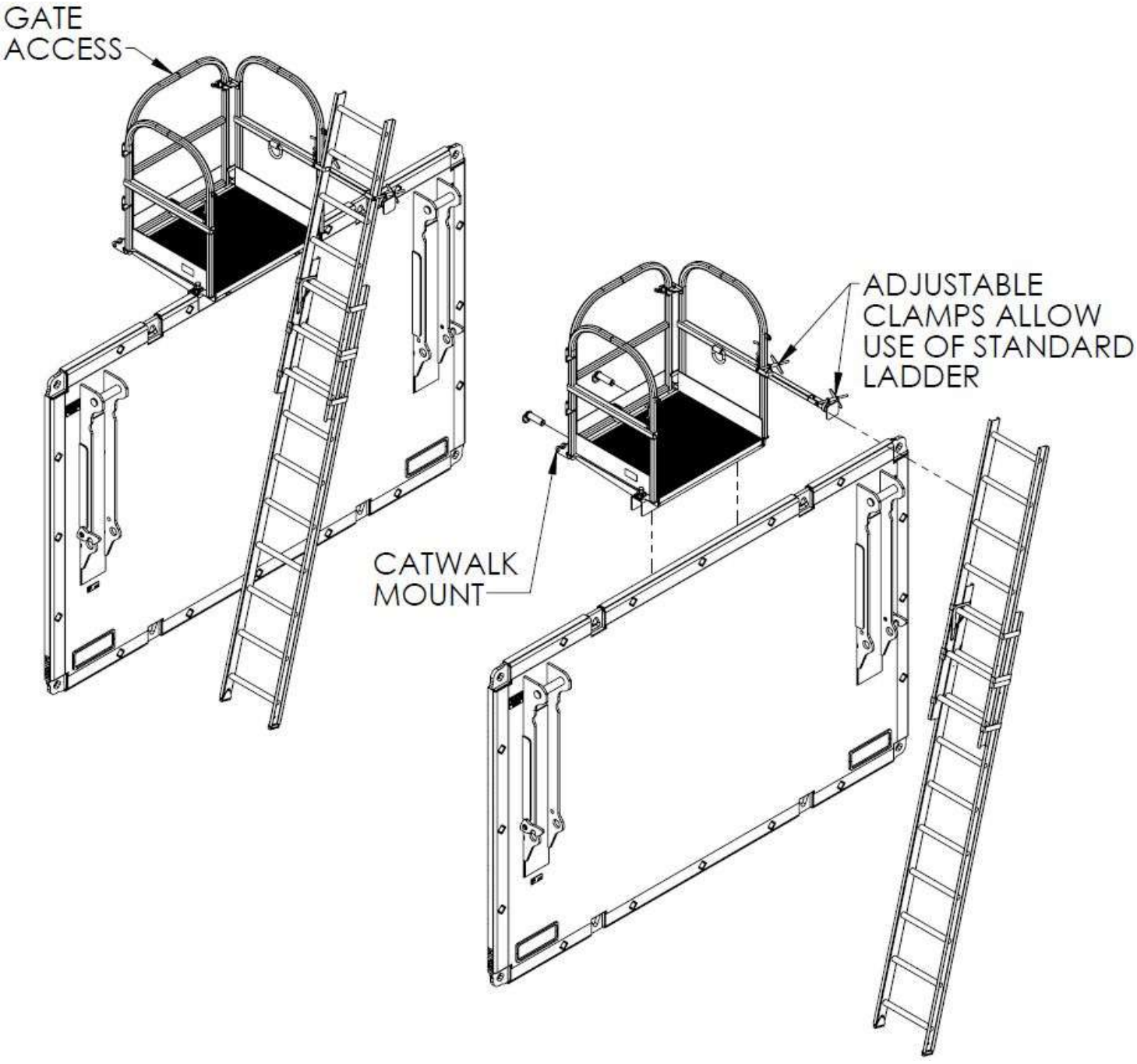


Figure 82

CATWALK (See page 101 for further instruction)

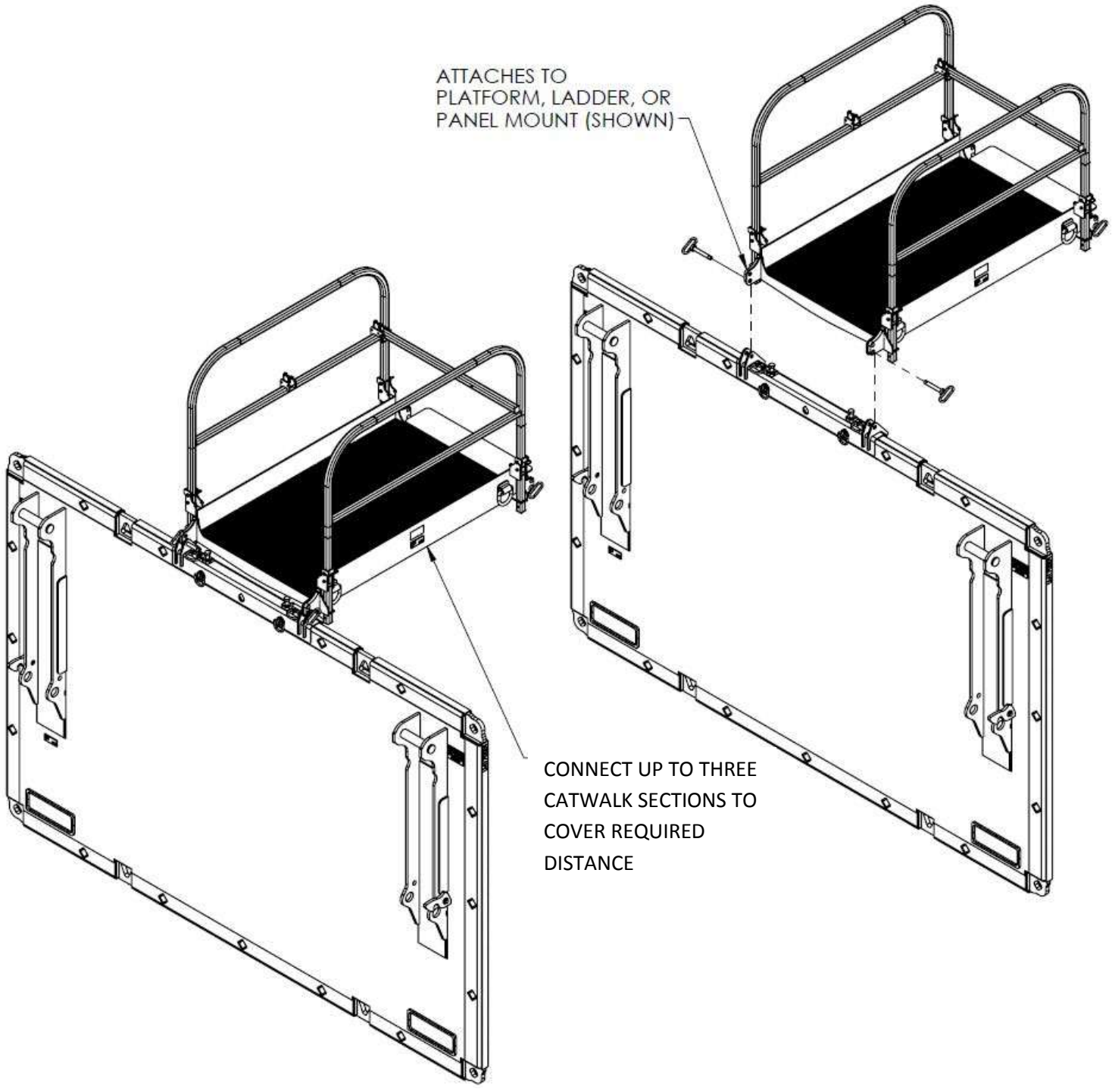


Figure 83

CATWALK PANEL MOUNT

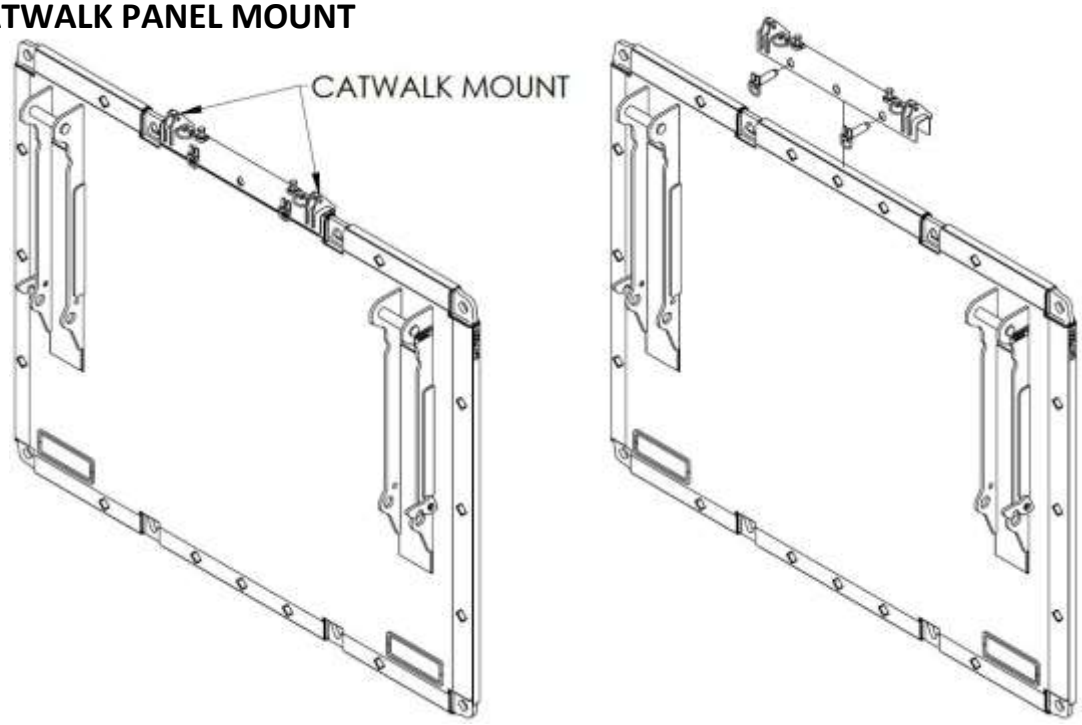


Figure 84

PULL EYES – SET OF 2

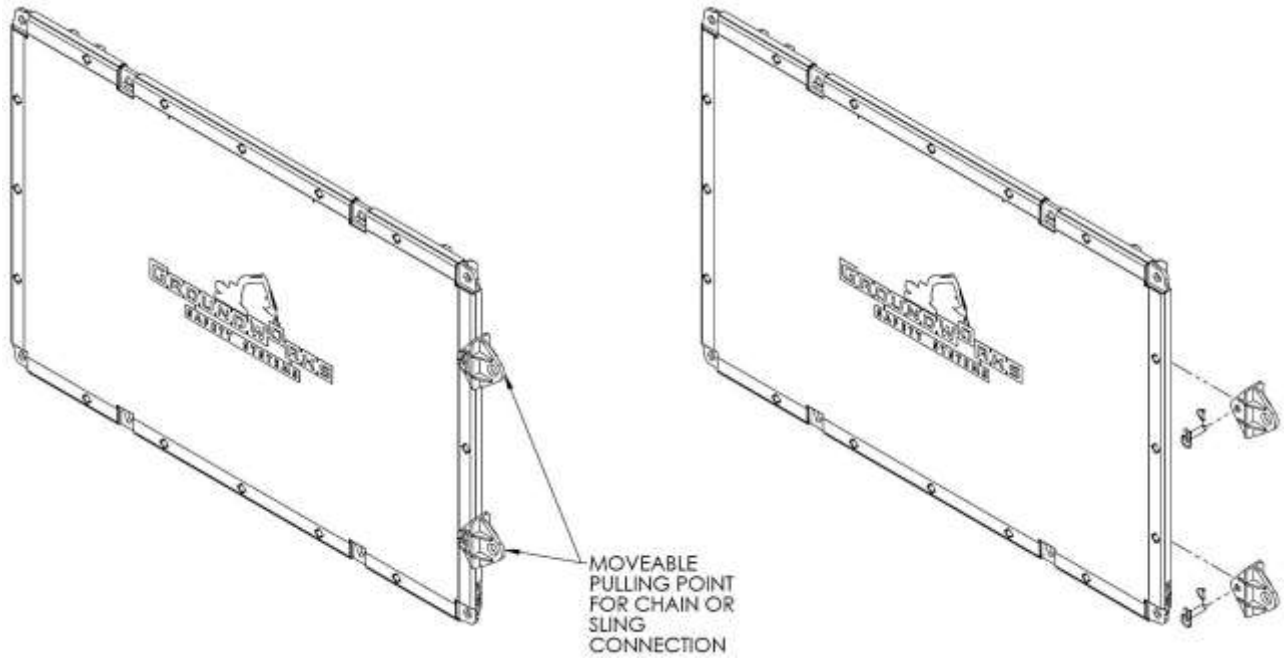
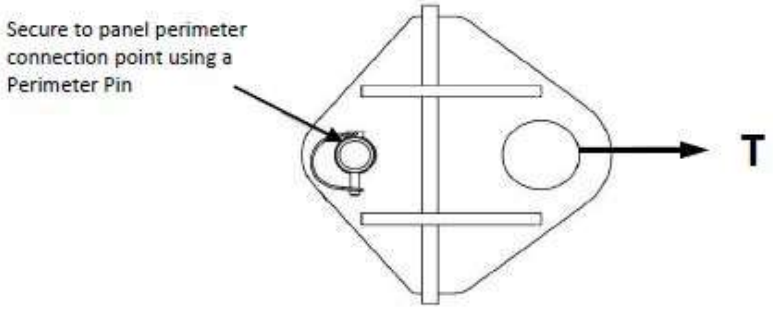


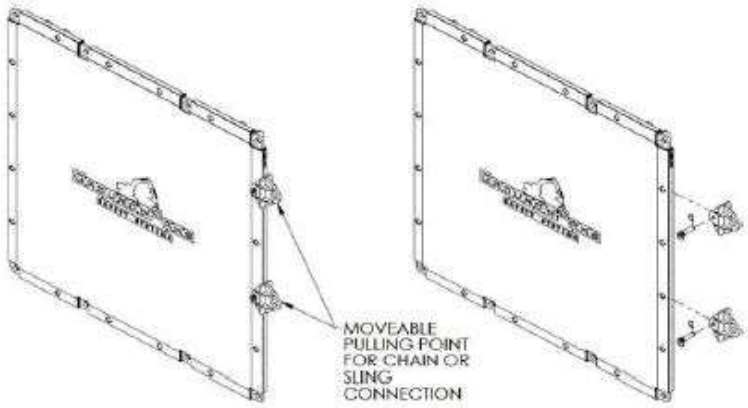
Figure 85

Pulling Eyes



MAXIMUM PULL LOAD
23000 lb

**Rating is based on a safety factor of 3 on ultimate material strength.



WARNING!

FAILURE TO COMPLY WITH MANUFACTURERS INSTRUCTIONS WHEN USING THIS EQUIPMENT MAY LEAD TO INJURY OR DEATH

- Rating is based on a single pulling eye. Multiple pulling eyes can be used on a panel to increase total pulling capacity.
- Ensure perimeter pin is fully engaged and secure in accordance with GroundWorks Safety Systems (GWSS) product manual.
- This rating is based on a safety factor of 3 on minimum ultimate material strength of material used in product.
- Rigging used to pull the shield system must have appropriate load capacity for the pulling arrangement.
- Prior to assembly all pad eyes, associated welds and adjoining structure must be inspected as per the GWSS product manual.
- Damaged components must be removed from service until repaired in a manner acceptable to GWSS.
- Ground personnel must be free and clear of the shield system and pulling arrangement during use.

Liability Considerations

- GroundWorks Safety Systems (GWSS) shall not be liable for damage or injury caused by incorrect use or exceeding capacity of the shield system. No repairs or modifications to GWSS components may be performed without prior written consent.
- Only engineered spreaders and accessory components authorized by GWSS may be utilized with GWSS equipment.
- Each panel and associated attachments shall be inspected prior to, and during each use, following the GWSS inspection guidelines. Damaged components shall be immediately tagged and removed from service.
- Handling and operational sequences different than outlined in the GWSS operational instructions may damage components and void warranty.

DAVIT ARM PANEL MOUNT

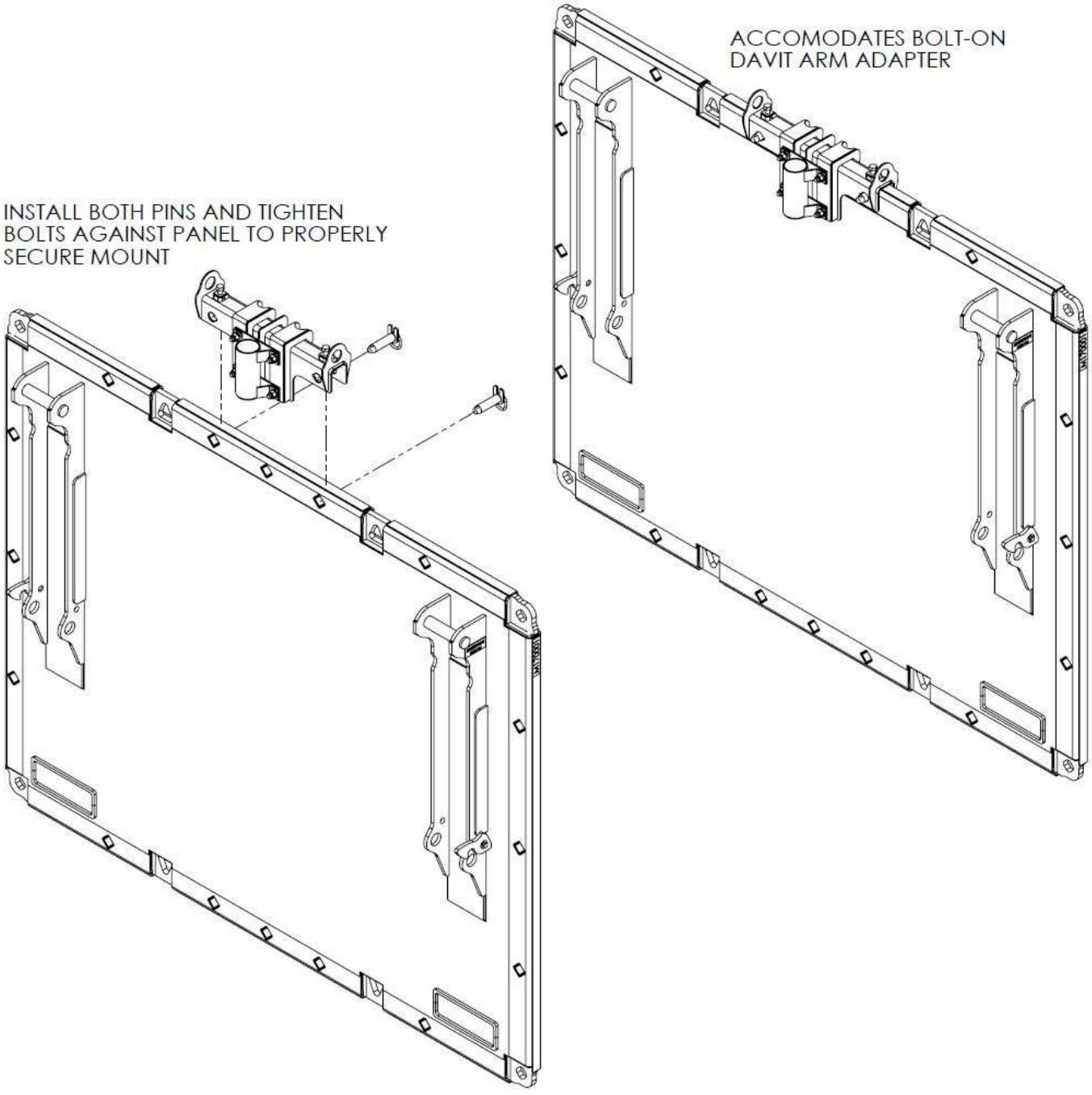


Figure 86

BACKFILLING GUIDELINES

GroundWorks Safety Systems recommends that the space between the trench face and the wall of the trench box be kept to as small of a distance as possible. It is also recommended that the box be supported on either side in order to restrict lateral movement of the box in the trench in the event that sudden lateral loads are applied. The following scenarios represent only some possible situations and it is up to the competent individual on location to ensure safe practices are followed.

Scenario #1: If level of dirt is less than half the height of the panel then box must get backfilled to the same height on the opposite side to prevent lateral movement of the box.

Scenario before backfilling:

Scenario after backfilling:

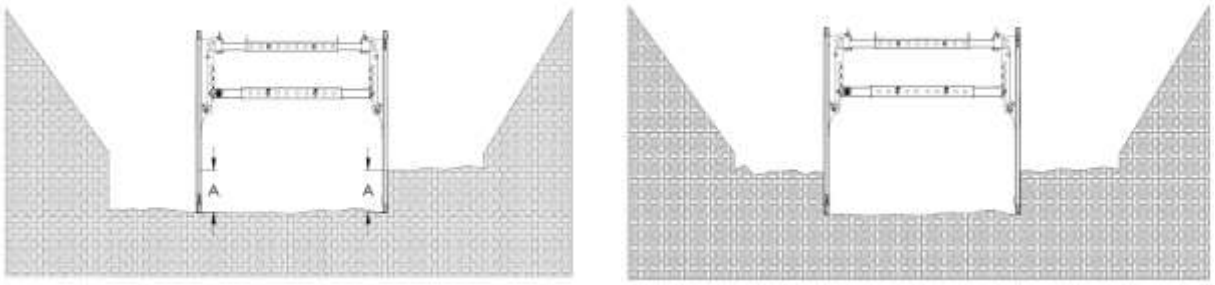


Figure 87

Scenario #2: If level of dirt exceeds half the height of the panel, or if there is a chance that the dirt will sluff then the box must be backfilled to 2/3 its panel height on both sides in order to prevent hazardous movement of the box.

Scenario before backfilling:

Scenario after backfilling:

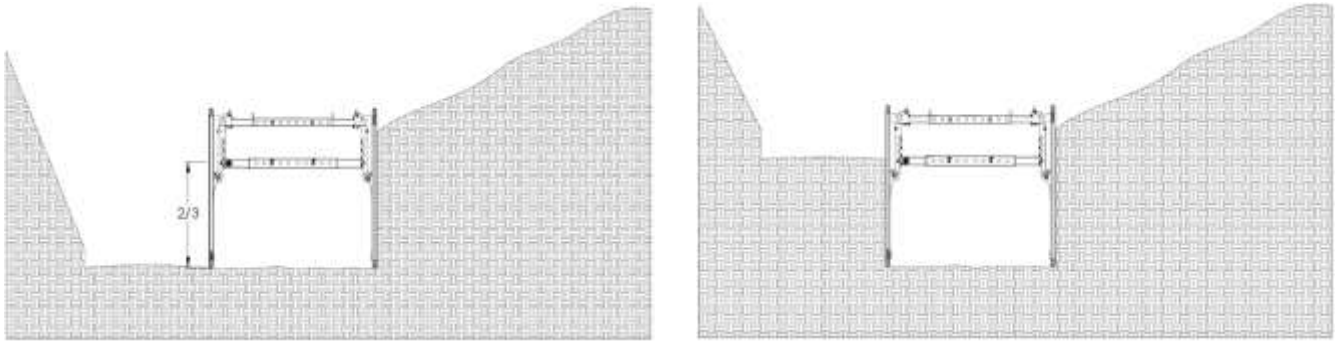


Figure 88

STACKING AND SHIPPING PROCEDURES

Use the following information as recommended guidelines for stacking panels and struts to ensure personnel and public safety in the yard, excavation site, and during transport. Ensure all personnel are free and clear of the system during movement of equipment. Know and obey all relevant regional safety regulations, laws, and any other professional guidelines pertaining to equipment stacking and shipping.

PANELS

1. Before placing the 1st panel, set dunnage to hold it off the ground.
2. Place the 1st panel on the dunnage with the lugs facing upwards.
3. Place the 2nd panel with the lugs facing down and rotated 180 degrees to the 1st panel so that the lugs can sit inside of the provided alignment areas. Panels that are 6 or 8 feet in height will require an offset to allow center lugs to sit inside each other.

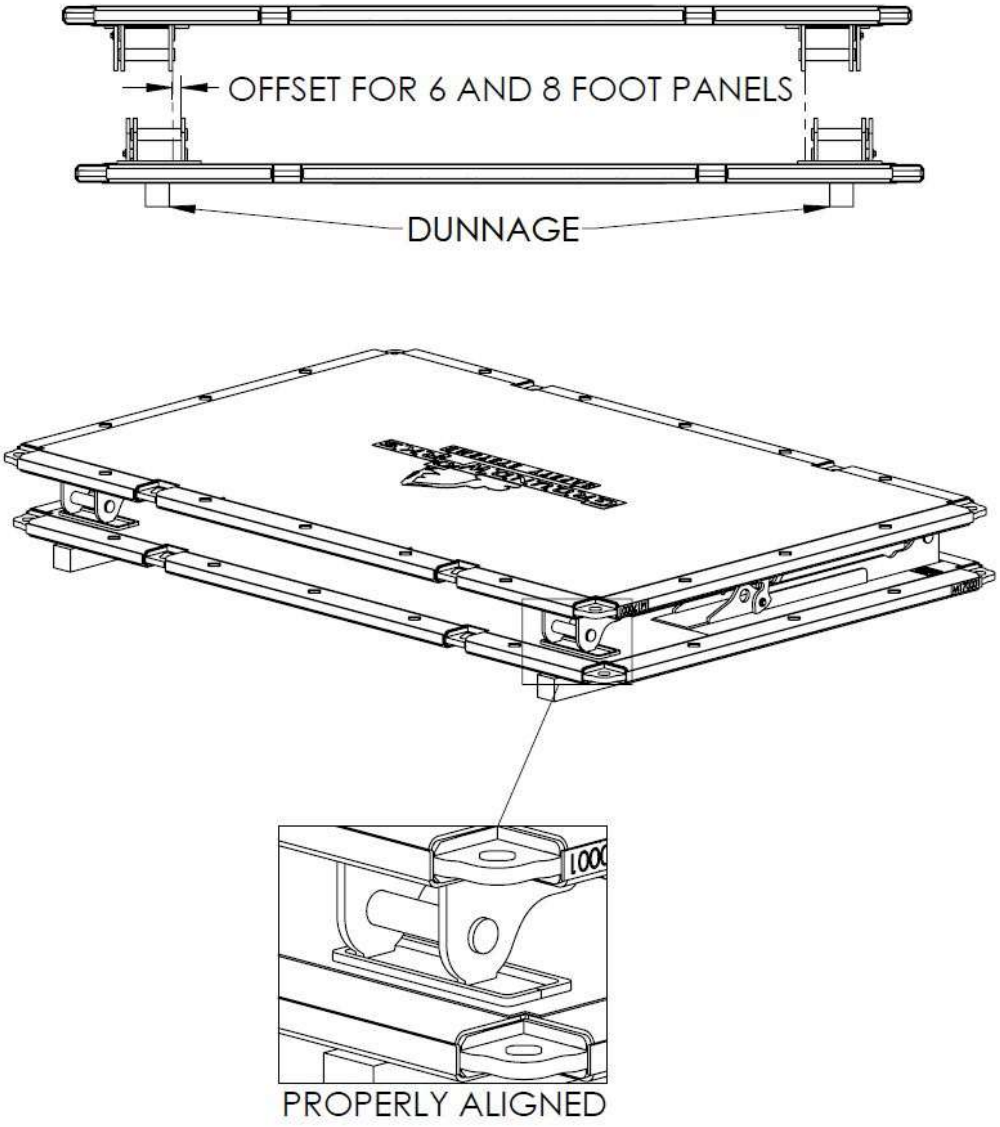


Figure 89

4. Place dunnage on top of the 2nd panel and place 3rd panel in the same orientation as the 1st.

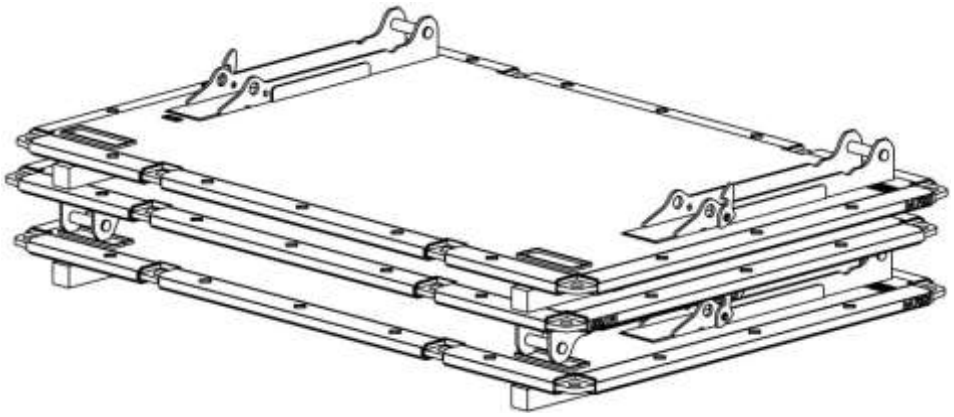


Figure 90

5. Place the 4th panel onto the 3rd in the same orientation as the 2nd panel, only offset to the opposite side. Having an opposite offset will minimize the risk of panels tipping over.

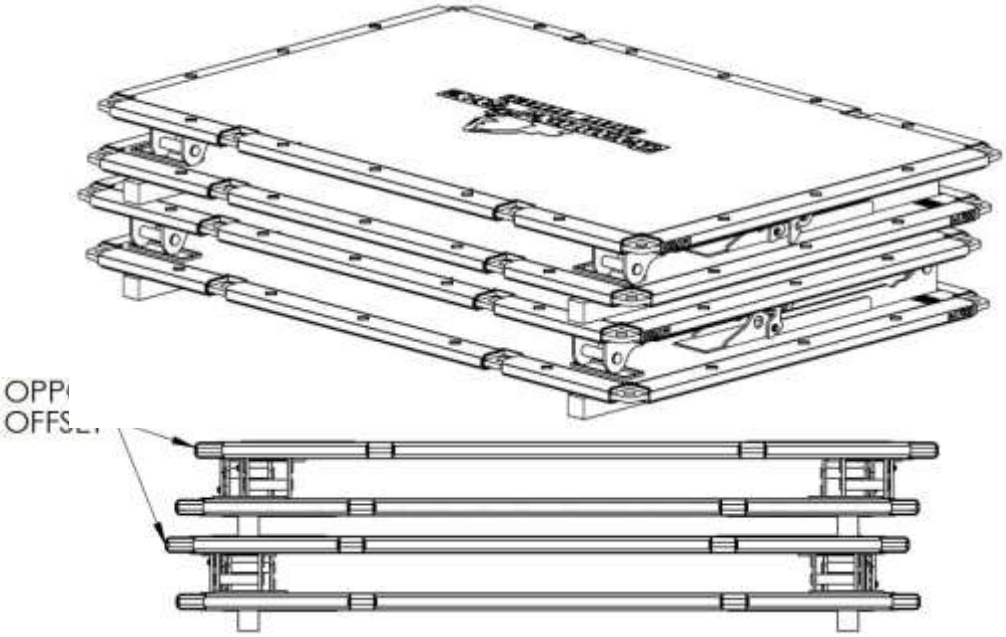


Figure 91

6. Stack additional panels in same orientation as previous four panels.
7. Ensure entire stack is stable and secured to truck or trailer if being transported.

NOTE: GROUNDWORKS RECOMMENDS STACKING PANELS NO MORE THAN 6 PANELS HIGH.

STRUTS

1. Before placing the 1st strut, set dunnage to hold it off the ground.
2. Set 1st strut across dunnage.
3. Stack following struts rotated 180 degrees to previous strut so that the pegs and pocket can be inserted into each other.
4. Stack following struts in same orientation as previous struts.
5. Ensure entire stack is stable and secured to truck or trailer if being transported.

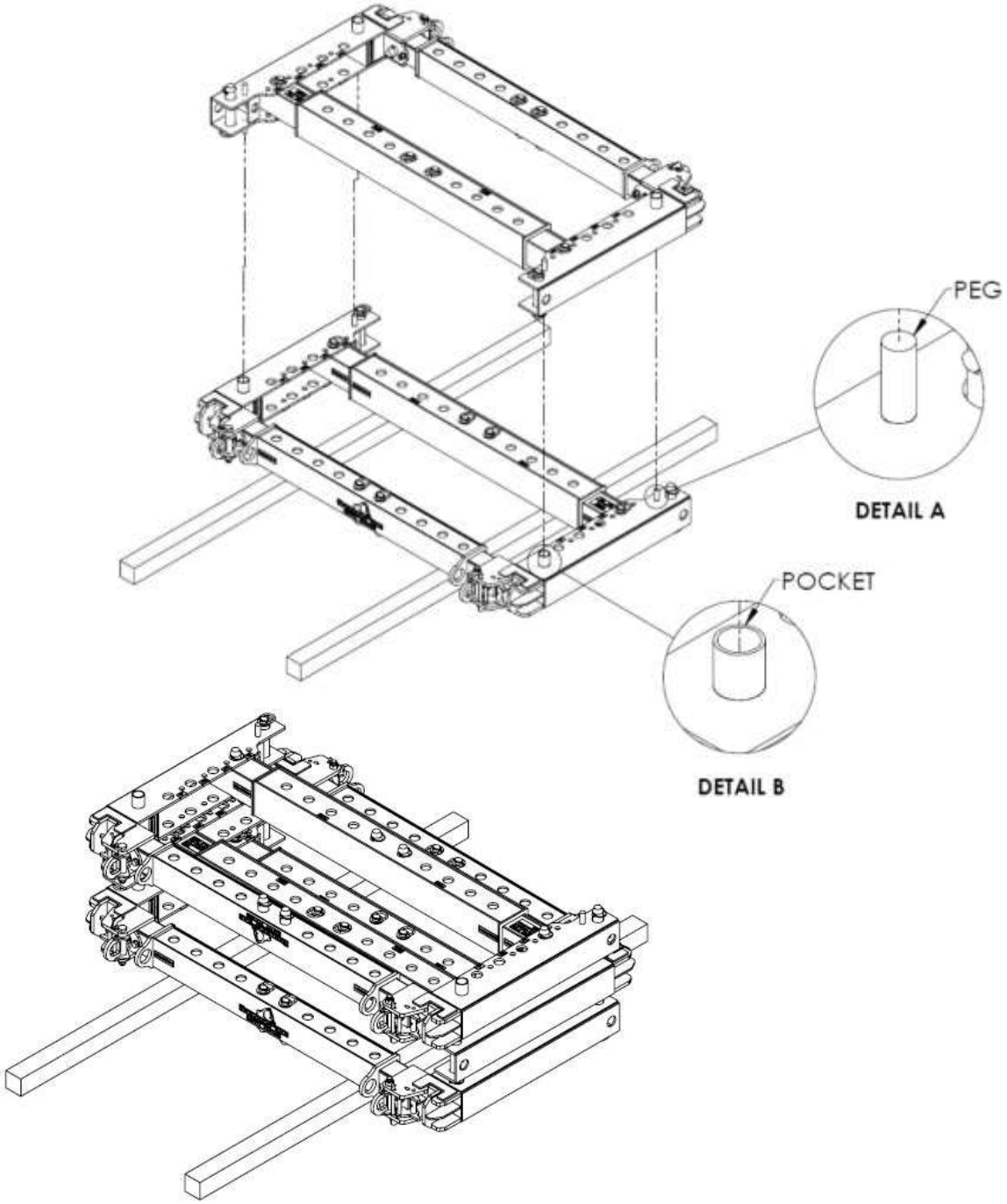


Figure 92

INSPECTION PROCEDURES

The following procedures outline the recommended inspection to confirm that your Gravity Lock Trench Box System is in proper working condition. Use the **GroundWorks Trench Box Inspection Checklists for Panels, Struts and High Arches (after Inspection Procedures)** to aid in, and document, every inspection. A general visual inspection should be done prior to the Trench Box installation and before any personnel enter the excavation. This general inspection includes:

- Ensuring all required parts are present.
- Ensuring no damage affecting the safety and functionality of the system.
- Ensuring that all connections and fasteners are secure.

The following procedures are to be used by the competent person, as defined in the Federal OSHA Excavation Standard (29 CFR, Part 1926, Subpart P), in the structural inspection of the GroundWorks Trench Box System. The following procedures do not encompass all possible damage that can occur to the GroundWorks Trench Box System.

Any parts of the Trench Box System that have damage exceeding specified limits shall be removed from service until appropriate repairs are completed. Clean the Trench Box System prior to inspection to ensure no problems are overlooked. Contact GWSS if any excessive damage is discovered to determine the appropriate repairs. Any repair not authorized in writing by GroundWorks Safety Systems voids all tabulated data and warranty.

PANEL DEFORMATION

Horizontal Panel Deformation

The maximum permanent deflection in the horizontal plane of a panel shall not exceed the following values:

Panels 12 feet in length or less: 1/2”

Panels greater than 12 feet in length: 1 1/4”

Panels greater than 20 feet in length: 2”

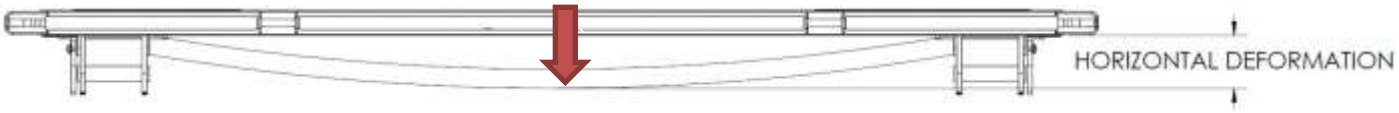


Figure 93

Vertical Sidewall Deformation

The maximum permanent deflection in the vertical plane of a panel shall not exceed the following values:

All shields: 1/2”

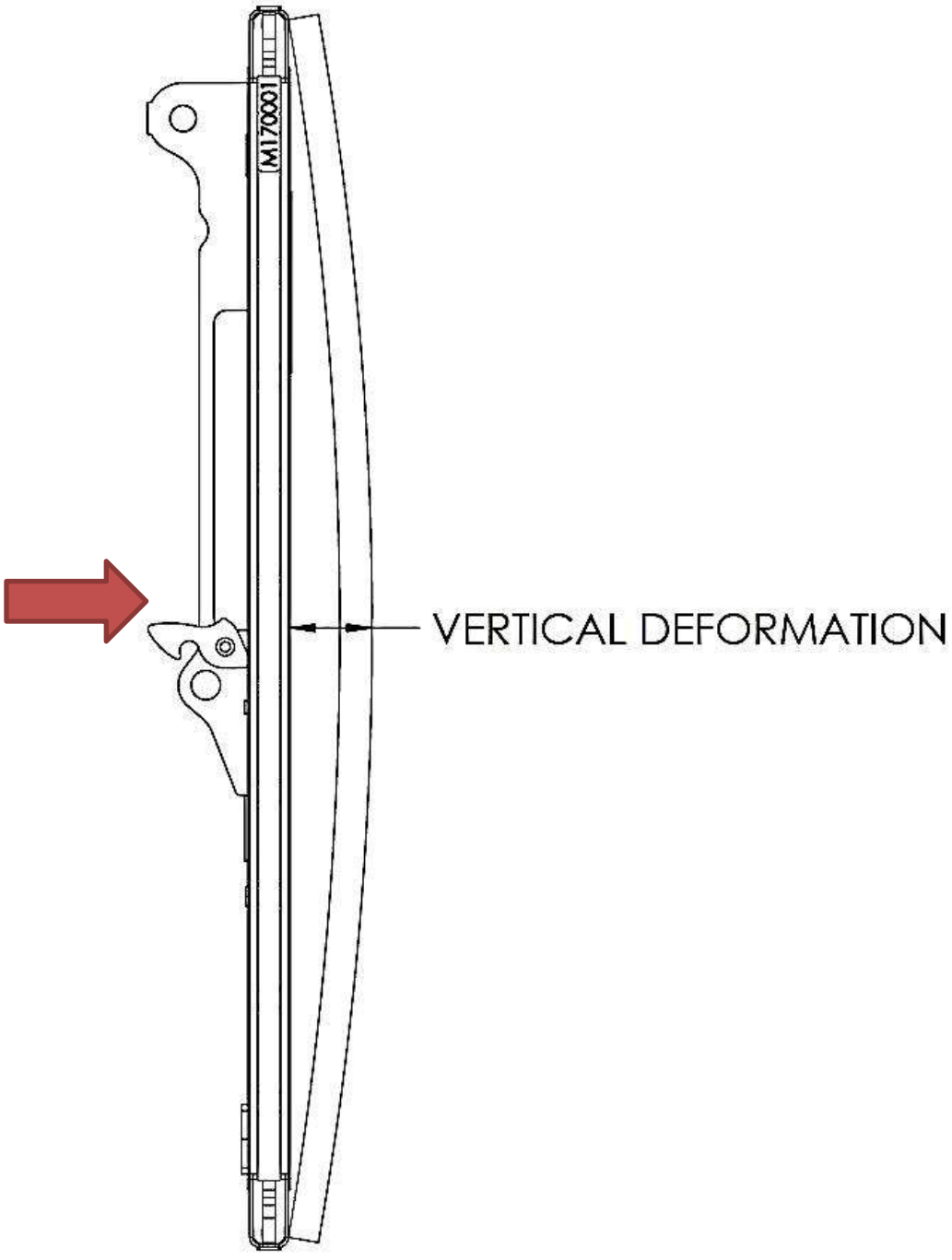


Figure 94

Other Panel Deformation

The maximum permanent deformation of the panel shall not exceed the following values:

Lugging Width: 7 1/2”± 1/4”

Top Lugging Pin Ø: 2” $^{+0}_{-1/16}$

Other Points of Inspection

- Check all perimeter welds and lugging welds for cracking or deformation.
- Check all lift points for cracks or deformation.
  NOTE: Slight wear or deformation on edges of lift points from contact with lifting devices is considered acceptable if the original profile remains undeformed.
- Inspect top lugging pins and lugs for excessive wear or deformation.
- Inspect inner and outer skins for deformation, punctures or tearing.

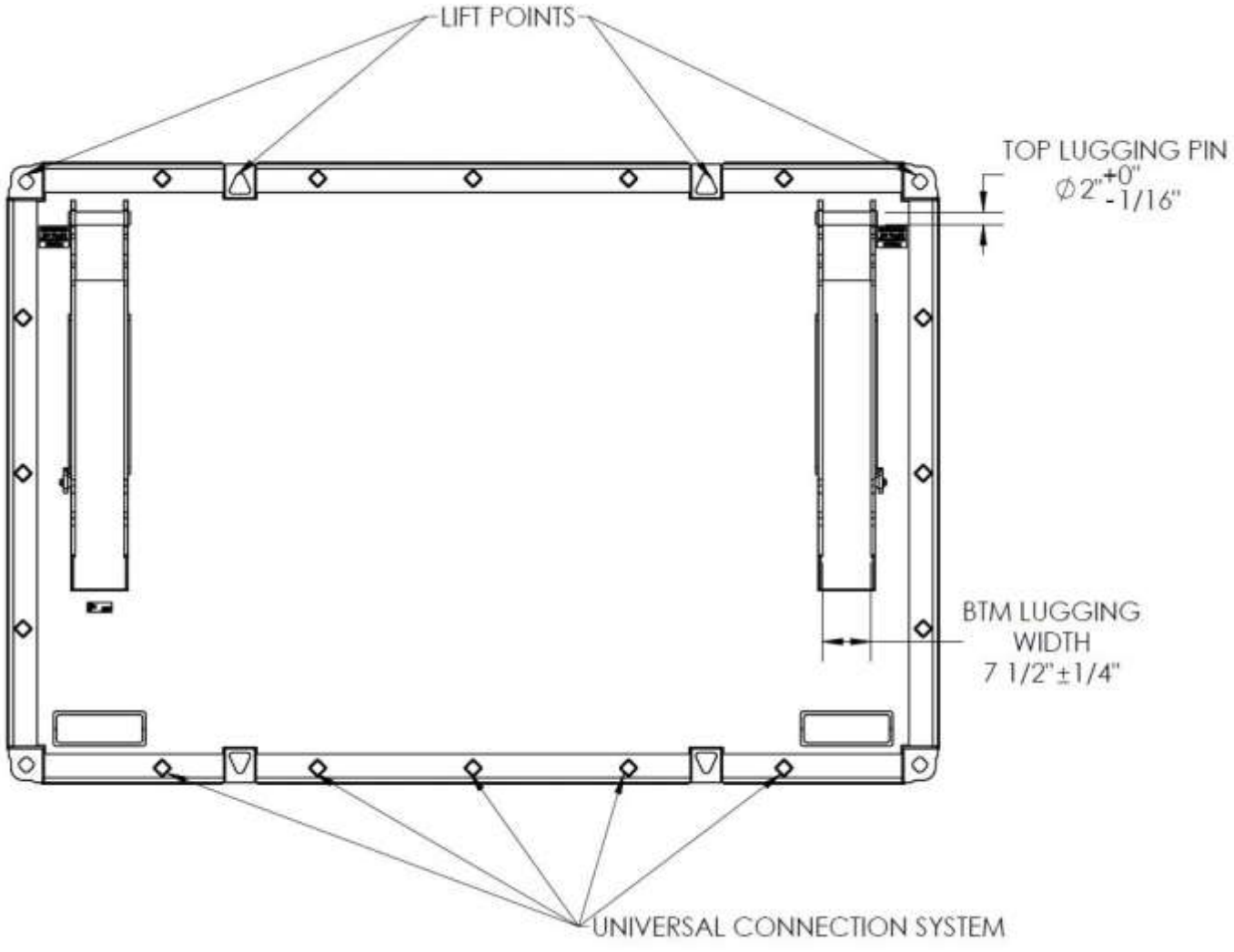


Figure 95

Universal Connection Inspection Procedure

When inspecting the Universal Connection on the perimeter of a GroundWorks Safety System panel, a visual check of the entire perimeter section for deformations or cracking must be performed.

If any type of deformation has occurred, the damaged area needs to be measured to ensure that the connection point is still within tolerance. If at any point the connection system measures over 3-3/16”, then the corresponding section must be marked and repaired. If the inspection reveals any cracking or punctures, these must be fully repaired or the section must be replaced.

Use the reference charts below to properly identify the section of perimeter requiring repair. For a full repair procedure, please contact GroundWorks Safety Systems.

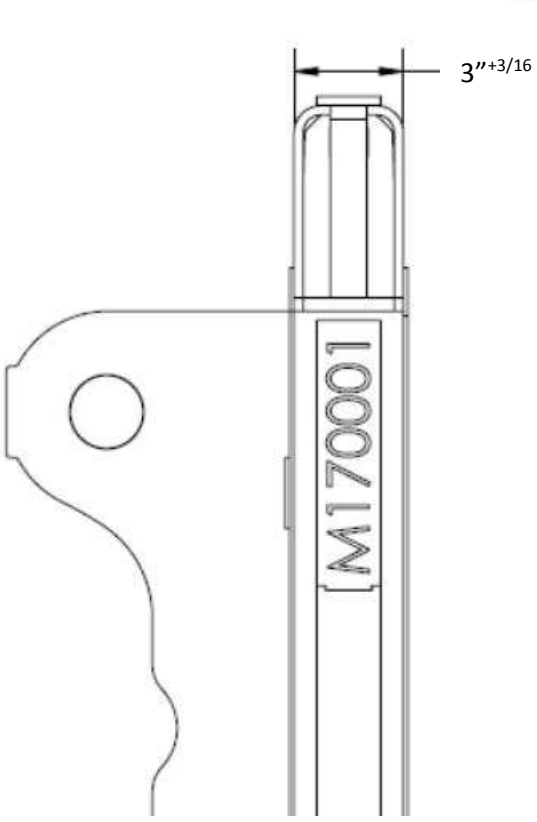
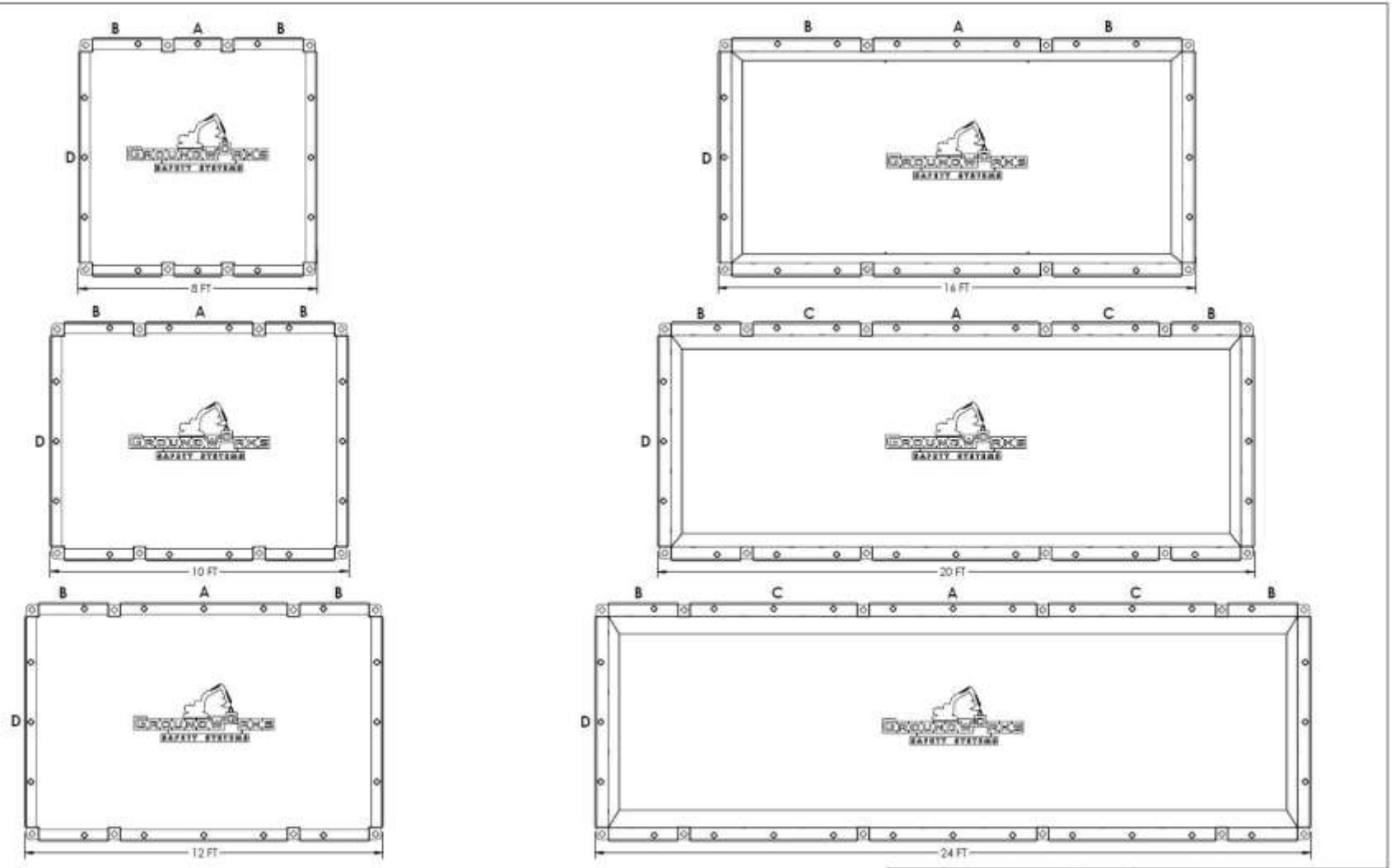
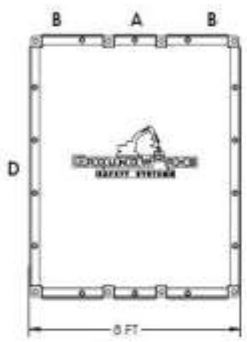
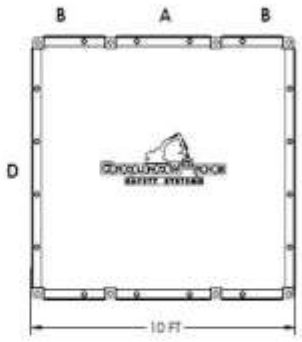


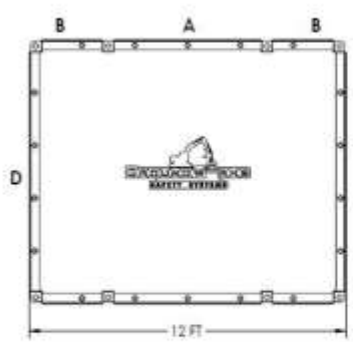
Figure 96

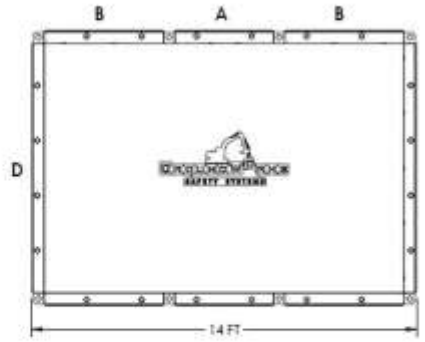


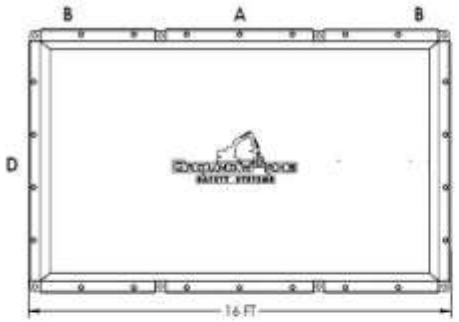
U-CHANNEL IDENTIFICATION -- VIEWED FROM OUTSIDE OF PANEL
8FT

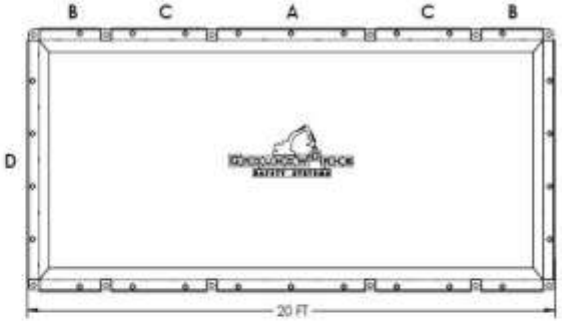


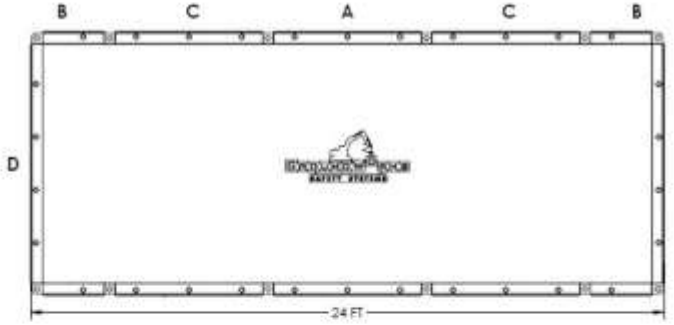












U-CHANNEL IDENTIFICATION -- VIEWED FROM OUTSIDE OF PANEL
10 FT

U-CHANNEL REPAIR PROCEDURE

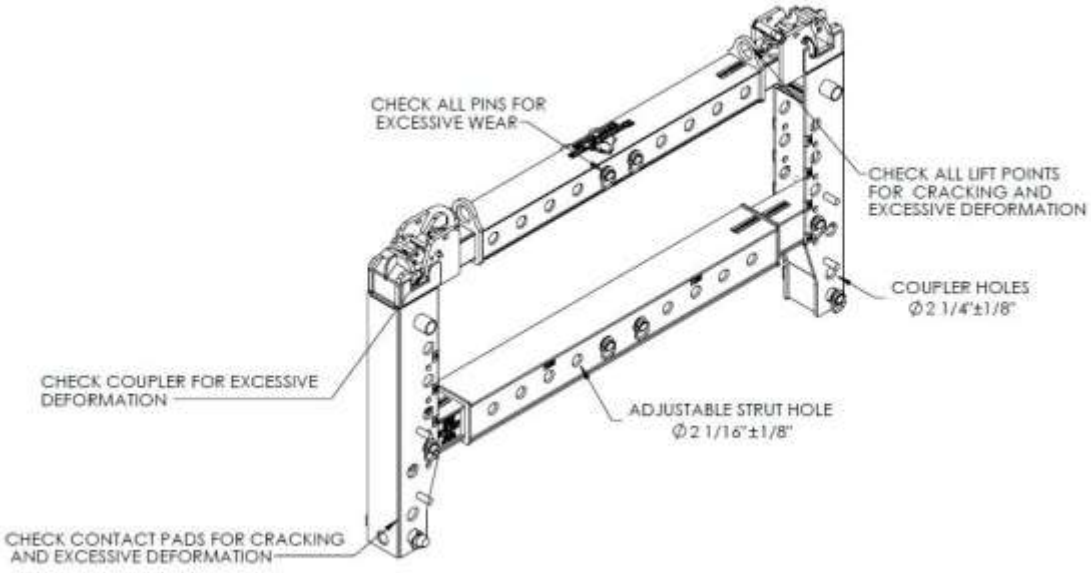
STRUT DEFORMATION

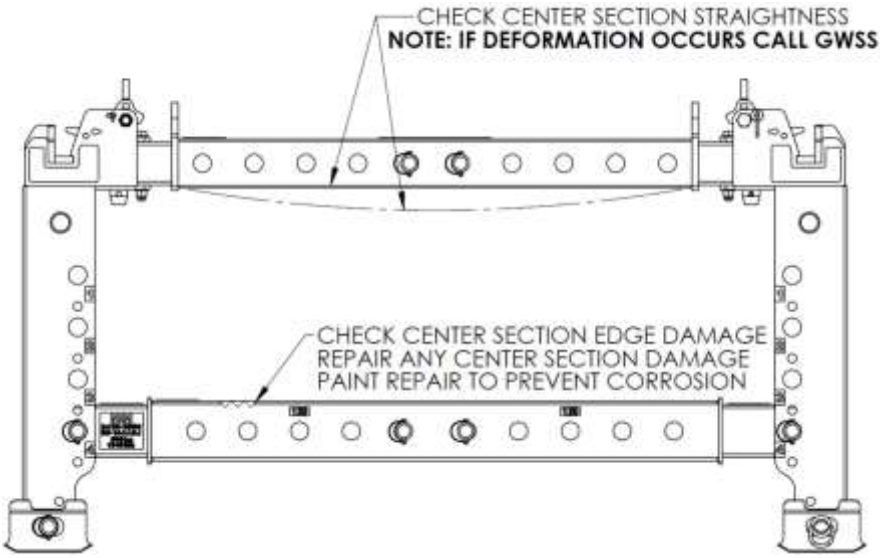
The maximum permanent deformation on both the coupler holes and adjustable strut holes (if applicable) of a strut shall not exceed the following values:

Coupler Holes: 2 1/4" ±1/8"
Adjustable Strut Holes (If Applicable): 2 1/16" ±1/8"

Other Points of Inspection

- Check all welds and entire Strut for cracks and deformation. Pay specific attention to noted areas.
- Check all lift points for cracks or deformation.
  NOTE: Slight wear or deformation on edges of lift points from contact with lifting devices is considered acceptable if the original profile remains undeformed.
- Check center section for straightness and edge damage.





HIGH ARCH DEFORMATION

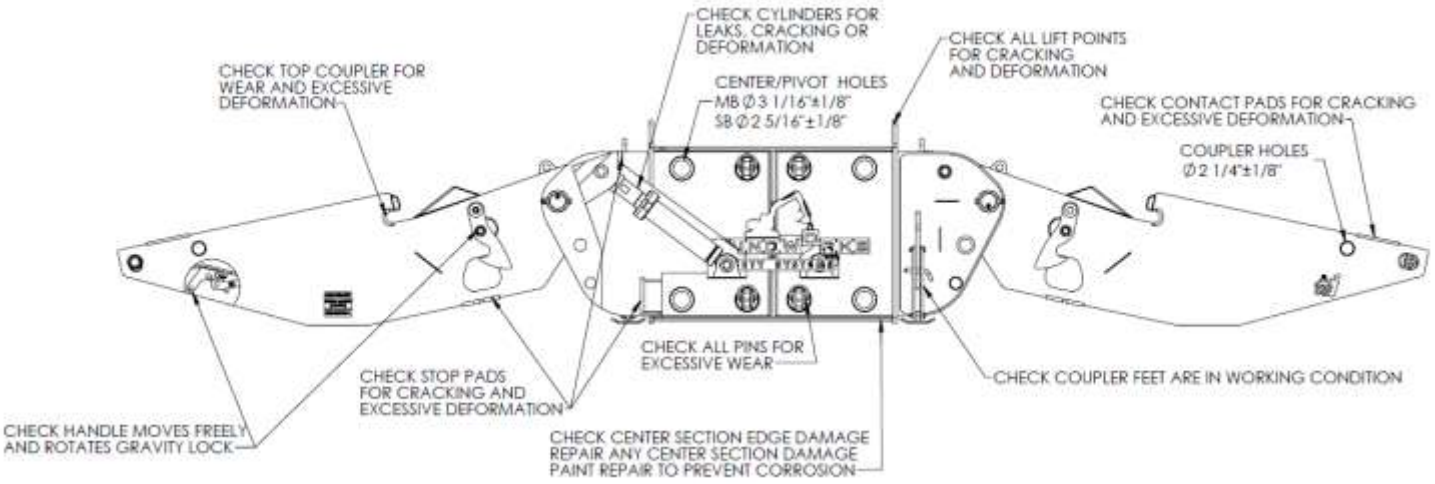
The maximum permanent deformation on both the coupler holes and center/pivot (if applicable) of a High Arch shall not exceed the following values:

Coupler Holes: 2 1/4" ±1/8"

Center and Pivot Holes (If Applicable):
MB: 3 1/16" ±1/8"
SB: 2 5/16" ±1/8"

Other Points of Inspection

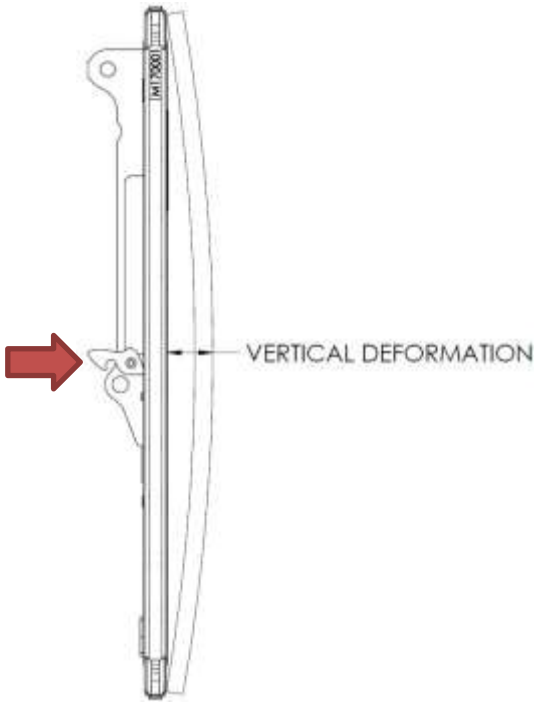
- Check all welds and entire High Arch for cracks and deformation. Pay specific attention to noted areas.
- Check cylinders for leaks, cracking and deformation
- Check handle moves freely and rotates gravity Lock
- Check all lift points for cracks or deformation.
  NOTE: Slight wear or deformation on edges of lift points from contact with lifting devices is considered acceptable if the original profile remains undeformed.
- Inspect side walls for deformation, punctures or tearing.
- Check coupler feet are in working condition

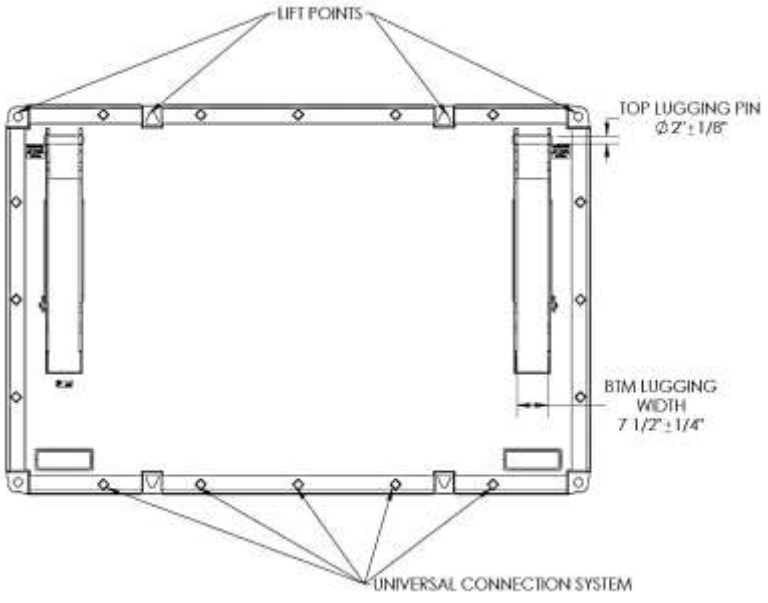


GROUNDWORKS PANEL INSPECTION CHECKLIST

*****If any damage or excessive deformation exceeding acceptable standards is found during inspection, the panel must be removed from service and GWSS must be consulted to determine an appropriate repair before being put back into service*****

INSPECTOR:_____	DATE:_____			
PANEL MODEL:_____	UNIT SERIAL:_____			
	SERIAL#1_____		**SERIAL#2_____**	
ITEM	**PASS**	**FAIL**	**PASS**	**FAIL**
1. HORIZONTAL PANEL DEFORMATION Panels 12ft. in length or less: 1/2” Panels 12ft. to 24ft. in length: 1”				
2. VERTICAL SIDE WALL DEFORMATION All Shields: ±1/2”				
3. LUGGING WIDTH All Shields:±1/8”				
4.TOP LUGGING PIN Ø All Shields:±1/8”				
5.PERIMETER AND LUGGING WELDS Check for Cracking and Deformation				
6. LIFT POINTS AND CONNECTION SYSTEM Check for Cracking and Deformation				
7. CRACKING, WEAR OR DEFORMATION General				
8. ALL PARTS PRESENT Check all required parts are present				

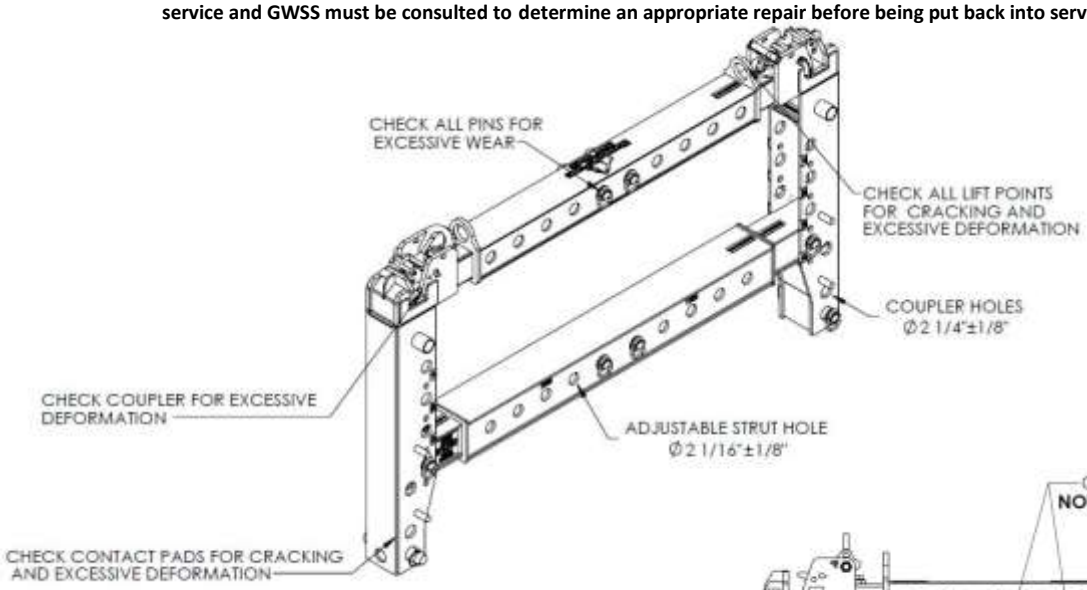


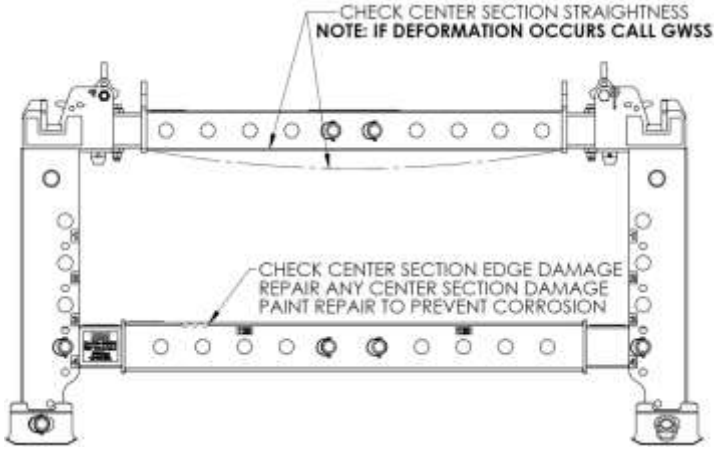


GROUNDWORKS STRUT INSPECTION CHECKLIST

INSPECTOR:_____	DATE:_____							
STRUT MODEL:_____	STRUT SERIAL#:_____							
	COMPONENT 1		**COMPONENT 2**		**COMPONENT 3**		**COMPONENT 4**	
ITEM	**PASS**	**FAIL**	**PASS**	**FAIL**	**PASS**	**FAIL**	**PASS**	**FAIL**
1. COUPLER HOLES All Struts:2 1/4" ±1/8"								
2. ADJUSTABLE STRUT HOLES All Struts:2 1/16" ±1/8" (If Applicable)								
3. TOP COUPLER Excessive Wear or Deformation								
4. ALL PINS Excessive Wear								
5.CONTACT PADS Check for Cracking and Deformation								
6. LIFT POINTS Check for Cracking and Deformation								
7.CRACKING, WEAR OR DEFORMATION General								
8. SIDEWALL PUNCTURES,TEARS General								
9. CENTER SECTION STRAIGHTNESS AND EDGE DAMAGE General								
10. ALL PARTS PRESENT Check all required parts are present								

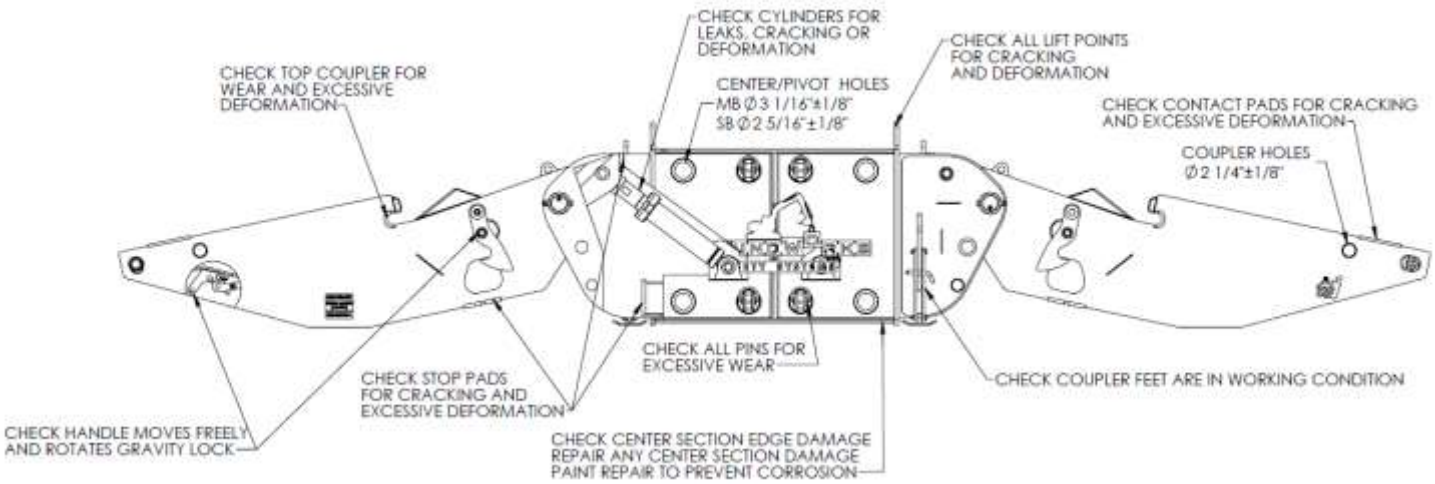
*****If any damage or excessive deformation exceeding acceptable standards is found during inspection, the strut must be removed from service and GWSS must be consulted to determine an appropriate repair before being put back into service*****





GROUNDWORKS HIGHARCH INSPECTION CHECKLIST

INSPECTOR:_____	DATE:_____									
HIGH ARCH MODEL:_____	HIGH ARCH SERIAL#:_____									
	COMPONENT 1		**COMPONENT 2**		**COMPONENT 3**		**COMPONENT 4**		**COMPONENT 5**	
ITEM	**PASS**	**FAIL**	**PASS**	**FAIL**	**PASS**	**FAIL**	**PASS**	**FAIL**	**PASS**	**FAIL**
1.COUPLER HOLES Coupler:2 1/4" ±1/8"										
2.CENTER AND PIVOT HOLES MB:3 1/16" ±1/8" SB:2 5/16" ±1/8"										
3.TOP COUPLERS Excessive Wear or Deformation										
4. ALL PINS Excessive Wear										
5.CONTACT AND STOP PADS Check for Cracking and Deformation										
6.CYLINDERS Check for Leaks, Cracking and Deformation										
7.GRAVITY LOCK AND HANDLE Check Handle Moves Freely and Rotates Gravity Lock										
8. LIFT POINTS Check for Cracking and Deformation										
9.COUPLER FEET Check Coupler Feet Are in Working Condition										
10.CRACKING, WEAR OR DEFORMATION General										
11. SIDEWALL PUNCTURES, TEARS General										
12. CENTER SECTION EDGE DAMAGE General										
13. ALL PARTS PRESENT Check all required parts are present										

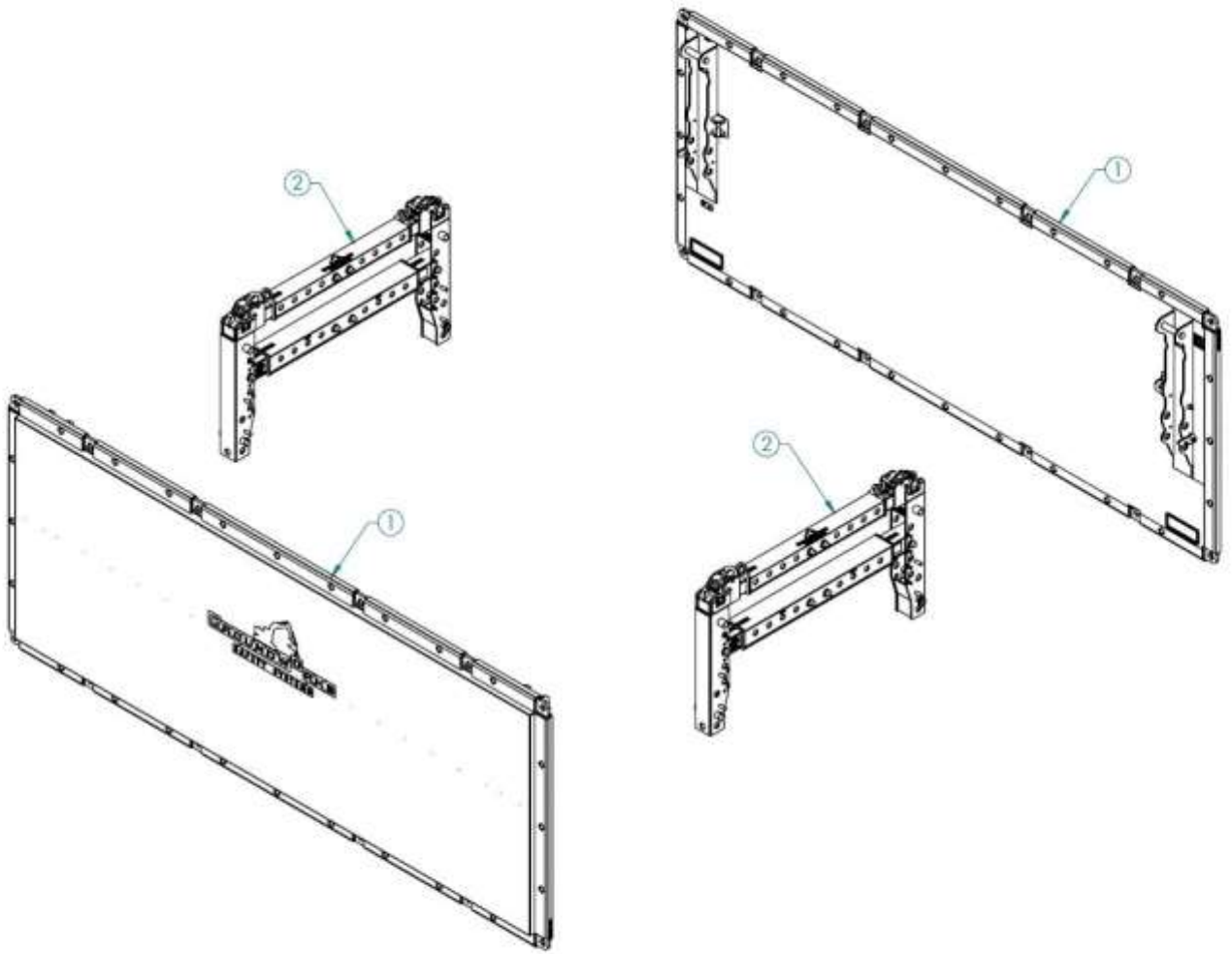


PARTS BREAKDOWNS

(For further details please refer to the GroundWorks Parts Catalogue)

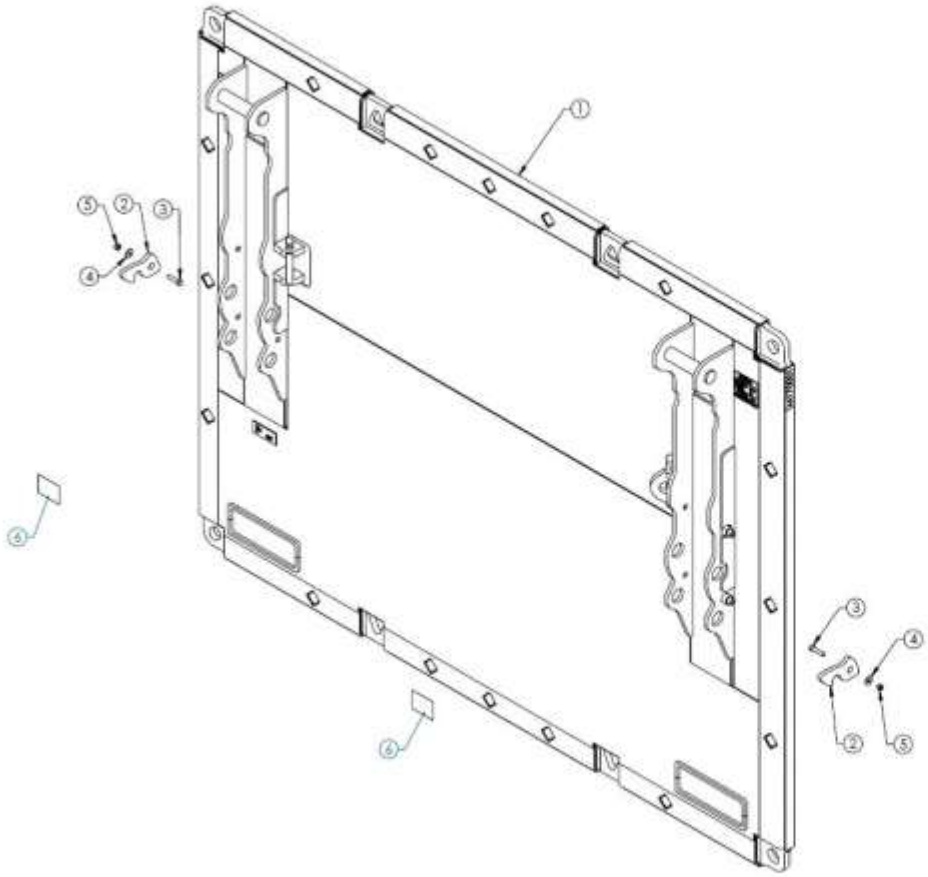
PANEL AND STRUT ASSEMBLY

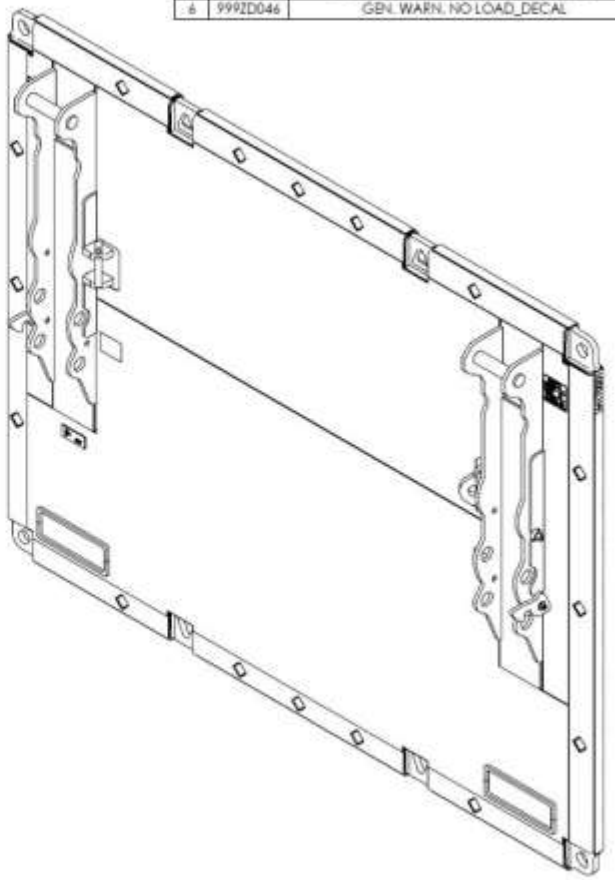
ITEM	DESCRIPTION	QTY.
1	ASMBLY_PANEL_SHORING_MULTI LATERAL	2
2	ASMBLY_ADJ STRUT_SHORING_MULTI LATERAL	2



PANEL ASSEMBLY

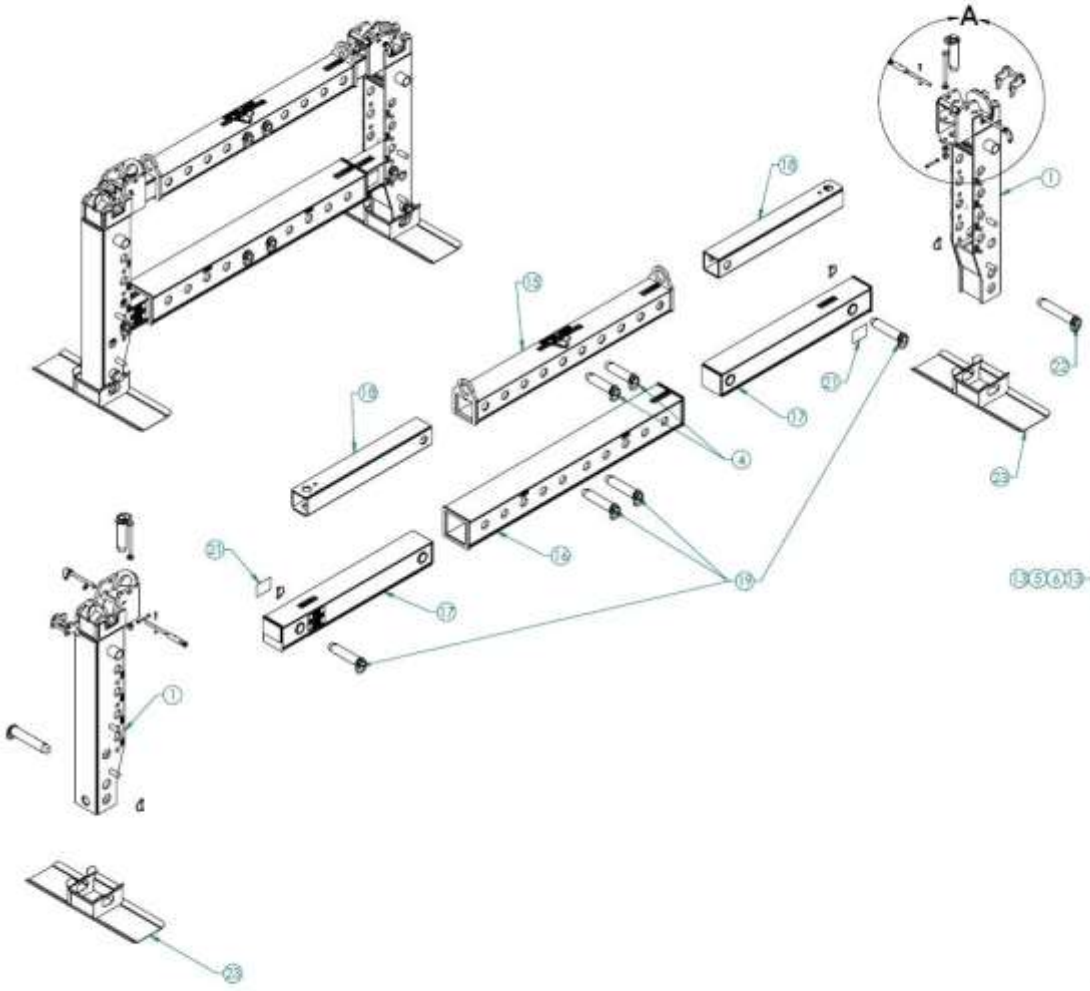
ITEM	Part Config	DESCRIPTION	Config	QTY.
1		WLDMNT_PANEL_SHORING_MULTI LATERAL		1
2	S99VB152	SAFETY CATCH_PANEL _SHORING_BIGBOX	-	2
3	FTL-15212	HEX CAP SCREW GR-8 YZF - 0.5000-13 X 2.250 X 1.250	-	2
4	FTL-33861	FLAT WASHER THRU-HARDENED YZF - 0.5000_FENDER	FENDER	2
5	FTL-37187	HEX NUT_NYLOCK_GR-8 YZF - 0.5000-13	-	2
6	999ZD046	GEN. WARN. NO LOAD_DECAL	GWSS	2





ASSMBLY_PANEL_SHORING_MULTI LATERAL

ADJUSTABLE STRUT ASSEMBLY



ITEM	Part Config	DESCRIPTION	Config	QTY.
1	S99VM0005	WLDMNT_COUPLER_SHORING_MULTI LATERAL	HM	2
2	S99VM0079	WLDMNT_GRAVITY FLIP LATCH_SHORING_MULTI LATERAL	-	2
3	S99VM0085	ASMBLY_PIN_SHORING_MULTI LATERAL	UL 0.625X6.875	2
4	S99VM0181	WLDMNT_PIN_SHORING_MULTI LATERAL	UL 2X6.375	4
5	S99VM0191	ROD_GRAVITY FLIP LATCH_SHORING_MULTI LATERAL	-	2
6	S99VM0190	ROD SPACER_GRAVITY FLIP LATCH_SHORING_MULTI LATERAL	-	2
7	FTL-15009	HEX CAP SCREW GR-8 YZF - 0.2500-20 X 1.500 X 0.750	-	2
8	FTL-15378	HEX CAP SCREW GR-8 YZF - 0.7500-10 X 7.500 X 2.000	-	2
9	FTL-15113	HEX CAP SCREW GR-8 YZF - 0.3750-16x2.5x1	-	2
10	FTL-37183	HEX NUT_NYLOCK_GR-8 YZF - 0.2500-20	-	2
11	FTL-37185	HEX NUT_NYLOCK_GR-8 YZF - 0.3750-16	-	2
12	FTL-37190	HEX NUT_NYLOCK_GR-8 YZF - 0.7500-10	-	2
13	FTL-33819	FLAT WASHER THRU-HARDENED YZF - 0.6250	-	4
14	FTL-33820	FLAT WASHER THRU-HARDENED YZF - 0.7500	-	4
15	-	WLDMNT_TOP CENTER TUBE_SHORING_MULTI LATERAL	-	1
16	-	WLDMNT_BTM CENTER TUBE_SHORING_MULTI LATERAL	-	1
17	-	WLDMNT_BTM SLIDE TUBE_SHORING_MULTI LATERAL	-	2
18	-	WLDMNT_TOP SLIDE TUBE_SHORING_MULTI LATERAL	-	2
19	S99VM0169	WLDMNT_PIN_SHORING_MULTI LATERAL	UL 2X7.5	4
20	FTL-66191	SNAPPER PIN 0.3750 X 2.25 USABLE LENGTH	-	8
21	9992D046	GEN. WARN. NO LOAD_DECAL	GWSS	2
22	S99VM0173	WLDMNT_PIN_SHORING_MULTI LATERAL	UL 2X9.25	2
23	S99VM0062	WLDMNT_COUPLER STAND_SHORING_MULTI LATERAL		2

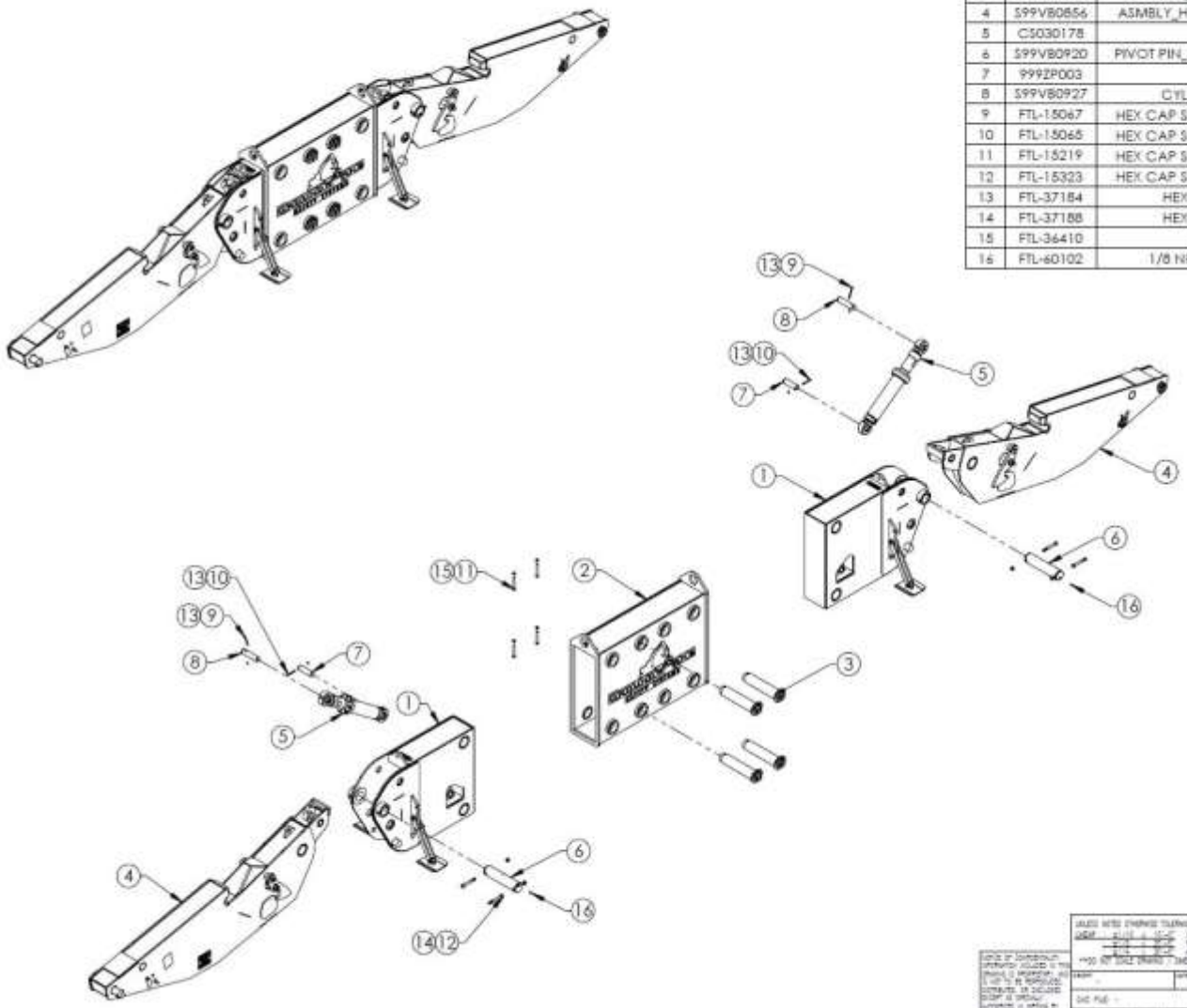
PIN COLOR LEGEND

-GREEN - ITEM #19 (2" x 7-1/2")
-YELLOW - ITEM # 4 (2" x 6-3/8")
-RED - ITEM # 22 (2" x 9-1/4")

ASMBLY_ADJ STRUT_MULTILATERAL

HIGH ARCH ASSEMBLY

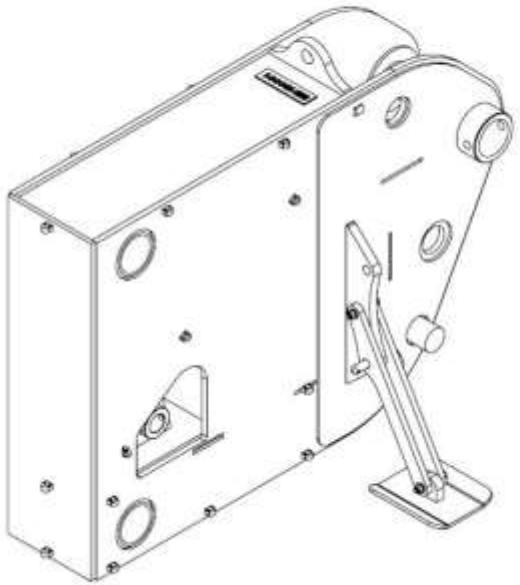
ITEM	Part Config	DESCRIPTION	Config	QTY.
1	-	ASMBLY_HIGH ARCH PIVOT_SHORING_BIGBOX	MB	2
2	-	WLDMNT_HIGH ARCH CENTER_SHORING_BIGBOX	MB	1
3	S99VB0923	WLDMNT_HIGH ARCH PIN_SHORING_BIGBOX	MB	4
4	S99VB0856	ASMBLY_HIGH ARCH COUPLER_SHORING_BIGBOX	MB	2
5	CS030178	ASMBLY_CYL CS_3.0	12 HIGH ARCH	2
6	S99VB0920	PIVOT PIN_HIGH ARCH PIVOT PIN_SHORING_BIGBOX	MB	2
7	999ZP003	PIN_CYL_1.5"	150	2
8	S99VB0927	CYL PIN_HIGH ARCH_SHORING_BIGBOX	MB48 COUPLER	2
9	FTL-15067	HEX CAP SCREW GR-8 YZF - 0.3125-18 X 3.500 X 0.875	-	2
10	FTL-15065	HEX CAP SCREW GR-8 YZF - 0.3125-18 X 3.000 X 0.875	-	2
11	FTL-15219	HEX CAP SCREW GR-8 YZF - 0.5000-13 X 4.000 X 1.250	-	4
12	FTL-15323	HEX CAP SCREW GR-8 YZF - 0.6250-11 X 5.000 X 1.500	-	4
13	FTL-37184	HEX NUT_NYLOCK_GR-8 YZF - 0.3125-18	-	4
14	FTL-37188	HEX NUT_NYLOCK_GR-8 YZF - 0.6250-11	-	4
15	FTL-36410	HEX NUT GR-8 YZF - 0.5000-13	-	4
16	FTL-60102	1/8 NPT STRAIGHT STD ZERK GREASE FITTING	-	2

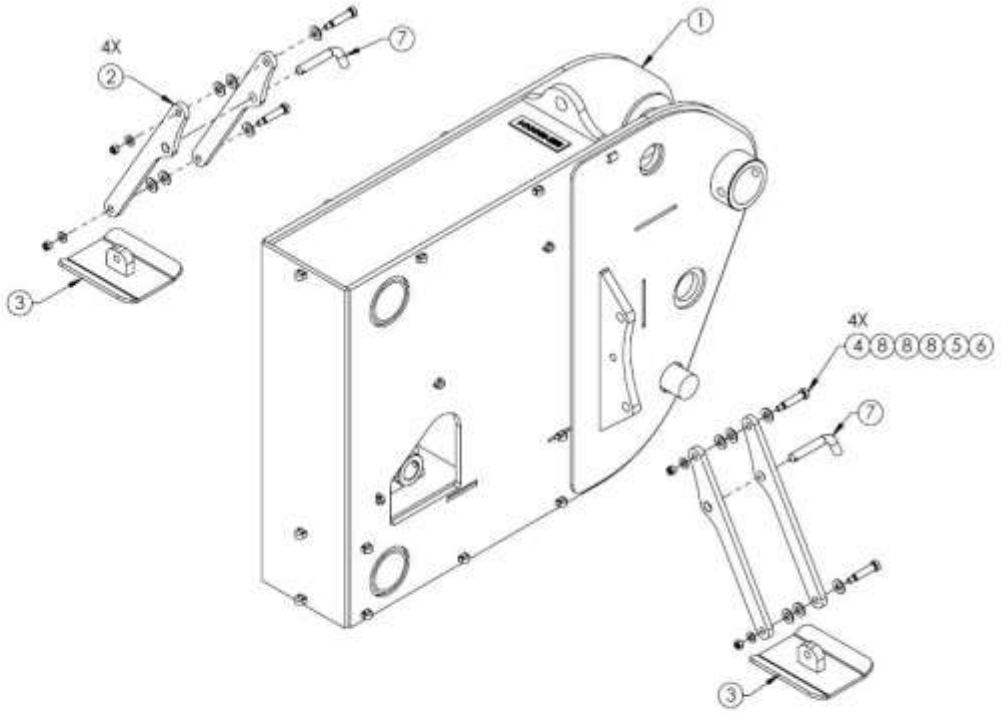


ASMBLY_HIGH ARCH_SHORING_BIGBOX

HIGH ARCH PIVOT ASSEMBLY

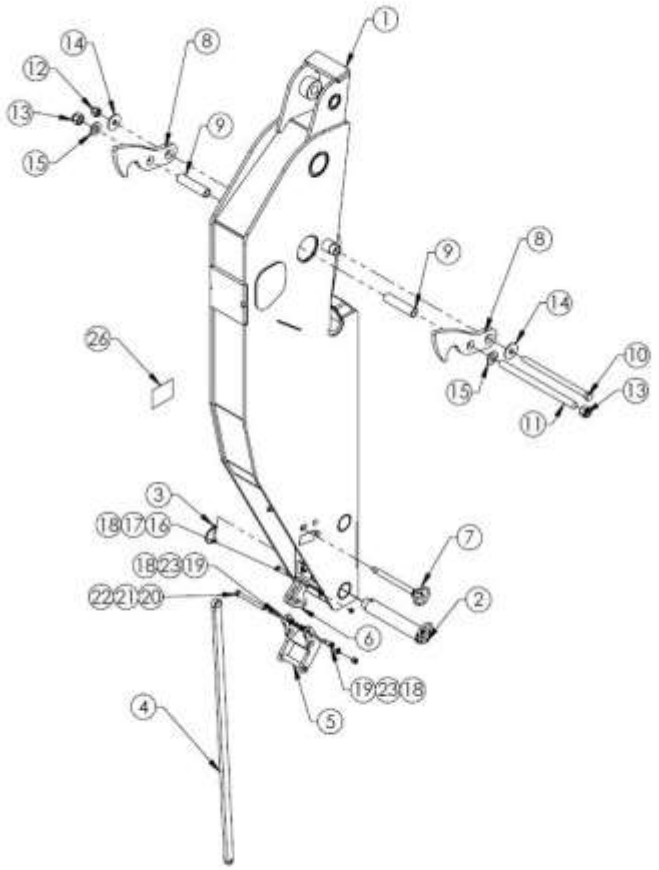
ITEM	Part Config	DESCRIPTION	Config	QTY.
1	-	WLDMNT_HIGH ARCH PIVOT_SHORING_BIGBOX	MB	1
2	S99VB0908	STAND LINK_HIGH ARCH PIVOT_SHORING_BIGBOX	MB48	4
3	S99VB0909	WLDMNT_HIGH ARCH PIVOT FOOT_SHORING_BIGBOX	MB48	2
4	FTL-26354	STEEL SHOULDER SCREW - 0.5000 Shldr X 2.00 X 0.3750-16	-	4
5	FTL-33815	FLAT WASHER THRU-HARDENED YZF - 0.3750	-	4
6	FTL-37185	HEX NUT_NYLOCK_GR-8 YZF - 0.3750-16	-	4
7	66271	HITCH PIN_BENT_TYPE C_0.625 X 3	-	2
8	FTL-33817	FLAT WASHER THRU-HARDENED YZF - 0.5000	-	12



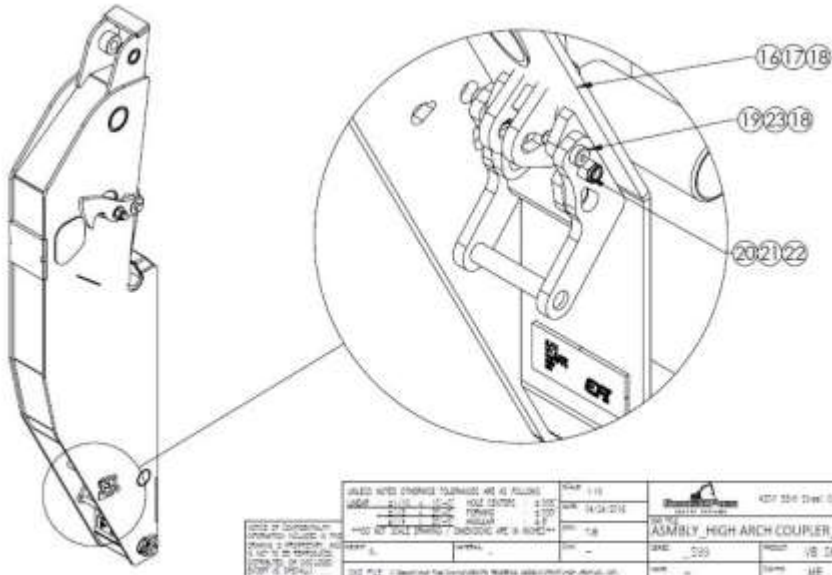


ASSEMBLY_HIGH ARCH PIVOT_SHORING_BIGBOX

HIGH ARCH COUPLER ASSEMBLY



ITEM	Part Config	DESCRIPTION	Config	QTY.
1	S99VB0857	WLDMNT_HIGH ARCH COUPLER_SHORING_BIGBOX	MB	1
2	S99VB2295	WLDMNT_PIN_SHORING_BIGBOX	SAFETY 2X9.75 HIGH ARCH	1
3	FTL-66191	SNAPPER PIN 0.3750 X 2.25 USABLE LENGTH	-	1
4	S99VB0868	EXTENSION ROD_HIGH ARCH COUPLER_SHORING_BIGBOX	MB	1
5	S99VB0892	WLDMNT_HIGH ARCH COUPLER LATCH_SHORING_BIGBOX	MB	1
6	S99VB2298	WLDMNT_HIGH ARCH LINKAGE_SHORING_BIGBOX	MB	1
7	S99VB1519	ASMBLY_PIN_SHORING_BIGBOX	0.75X7.5625	1
8	S99VB0889	SAFETY LATCH_HIGH ARCH COUPLER_SHORING_BIGBOX	MB	2
9	S99VB0938	LOCK SPACER_HIGH ARCH COUPLER_SHORING_BIGBOX	MB	2
10	FTL-15387	HEX CAP SCREW GR-8 YZF - 0.7500-10 X 13.00 X 1.750	-	1
11	49701003	THREADED ROD_HARDWARE_497	1.000-8 UNC-15.000"	1
12	FTL-37190	HEX NUT_NYLOCK_GR-8 YZF - 0.7500-10	-	1
13	FTL-37192	HEX NUT_NYLOCK_GR-8 YZF -1.0000-8	-	2
14	FTL-03749	FENDER WASHER STD ZF - 0.75 X 2.500 X 0.125	-	2
15	FTL-33822	FLAT WASHER THRU-HARDENED YZF - 1.0000	-	2
16	FTL-26353	STEEL SHOULDER SCREW - 0.500 SHLDR X 1.750 X 0.375-16	-	1
17	FTL-33817	FLAT WASHER THRU-HARDENED YZF - 0.5000	-	1
18	FTL-37185	HEX NUT_NYLOCK_GR-8 YZF - 0.3750-16	-	3
19	FTL-26350	STEEL SHOULDER SCREW - 0.5000 Shldr X 1.00 X 0.3750-16	-	2
20	FTL-0153954	HEX CAP SCREW GR-8 YZF - 0.5000-13 X 5.250 X 1.250	-	1
21	FTL-33895	LOCK WASHER REGULAR YZF - 0.5000	-	1
22	FTL-37187	HEX NUT_NYLOCK_GR-8 YZF - 0.5000-13	-	1
23	FTL-33815	FLAT WASHER THRU-HARDENED YZF - 0.3750	-	2
26	999ZD046	GEN. WARN. NO LOAD_DECAL	GWSS	1



ASMBLY_HIGH ARCH COUPLER_SHORING_BIGBOX

LIMITED WARRANTY POLICY

GroundWorks Limited Warranty Policy

GroundWorks Safety Systems warrants each new product to be free of defects in material and workmanship. Its obligation under this warranty being expressly limited to repairing, or at manufacturer's option, replacing free of charge at its fabrication facility, or a recognized repair facility the part proving defective under normal use and service within one year after first use, demo, or delivery/shipment to an end user. Approved warrantable repairs performed by persons not employed by GroundWorks will be repaid as a credit to that company's GroundWorks account.

This warranty covers only new and unused products manufactured by GroundWorks Safety Systems.

Parts claimed to be defective and for which repair or replacement is desired shall be, if requested by GroundWorks, returned transportation prepaid to, GroundWork's fabrication facility for inspection.

LIMITATIONS

GroundWorks is not responsible for failures resulting from normal wear and tear or:

- Any use which GroundWorks judges improper.
- Improper or careless installation, usage, storage or handling, as to any and all of which the manufacturer will be the sole judge.
- Accessories, items, and parts not sold by GroundWorks.
- Abuse, neglect, accident, changes to the product not authorized by GroundWorks, and/or improper repair/maintenance.
- User's unreasonable delay in making the product available after being notified of a potential product problem.

Products not manufactured by GroundWorks are covered only by the warranty extended to GroundWorks by its suppliers.

Completion of warranty repair work does not change or extend this warranty in any way.

Distributors agree to extend only the above warranty to their customers. In the event a distributor offers a customer any additional warranty such as by extending the scope or period of warranty, undertaking a warranty of fitness for any particular purpose, or any other obligation not encompassed in GroundWork's warranty, then the distributor shall be solely responsible for any warranty requirements and shall have no recourse against GroundWorks with respect to said warranty work.

GROUNDWORKS RESPONSIBILITIES

If a defect in material or workmanship is found during the warranty period, GroundWorks will, during normal hours and at a place of business of a GroundWorks dealer or other authorized source:

- Provide (at GroundWork's choice), new or remanufactured or GroundWorks-approved, replacement parts to correct the defect.
- Provide labor needed to correct the defect.

USER RESPONSIBILITIES

The user is responsible for:

- The costs associated with transporting the product.
- Labor costs, except as stated under "GroundWorks Responsibilities".
- Local taxes, if applicable.
- Parts shipping charges in excess of usual surface transportation cost as charged by scheduled carriers.
- Costs to investigate complaints unless the problem is caused by a defect in GroundWorks material or workmanship; subject to "GroundWorks Responsibilities" above.
- Any costs resulting from failure to give GroundWorks timely notice of a warrantable failure and promptly making the product available for repair.

All notices given under or pursuant to this agreement shall be in writing and emailed to sales@gwss.ca or sent postage prepaid to GroundWorks Safety Systems, 4207 53rd Street Close, Innisfail Alberta, T4G1P9.

No terms or conditions, other than those stated herein and no agreement or understanding, oral or written, which in any way purports to modify this warranty, shall be binding on GroundWorks, unless approved in writing by a GroundWorks representative.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE AND THE OBLIGATION AND LIABILITY OF GROUNDWORKS UNDER THIS WARRANTY SHALL NOT INCLUDE ANY TRANSPORTATION OR OTHER CHARGES OR THE COST OF INSTALLATION OR ANY LIABILITY FOR DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES OR DELAYS RESULTING FROM THE DEFECT.

WARRANTY CLAIM PROCEDURE

Before Any Work Is Started

1. Read the Limited Warranty policy
2. Contact GroundWorks for a claim number. When a failure occurs you must notify GroundWorks immediately to obtain authorization to carry out repair. You must provide:

- A description of the fault, an idea of the cause, and a possible repair procedure. Recommended repairs are to be discussed and agreed to by GroundWorks in writing.
- An estimate of repair hours and costs must be established (exclusive of parts provided by GroundWorks).
- An opportunity for GroundWorks personnel to travel by first available public transportation to the site to examine the problem and/or make repairs.

NOTE: Time limit on date of failure to date of report should be within 3 full working days – Saturday, Sunday, and bank holidays not included. Repair parts will be ordered by customer purchase order at this time. Parts will be invoiced by GroundWorks and reimbursed under the terms of this warranty policy if applicable.

After Repairs Are Completed

1. Fill out the Warranty Claim form.
2. Return all damaged parts prepaid to GroundWorks unless directed otherwise by GroundWorks (Damaged parts become the property of GroundWorks).Warranty Claim forms must include:

- GroundWorks product serial number.
- Model and Description of the GroundWorks product.
- Date claim is prepared.
- Delivery date to the original user.
- Date of failure and repair.
- Period of use on the product.
- Your internal reference or claim number.
- An accurate accounting of the work done. Photographs from before and after the repair are helpful in investigating the failure and help expedite your claim.
- Your work order or other documentation to support your claim.
- A listing of parts and raw materials used in the repair. (Please note that we cannot reimburse for parts not purchased from GroundWorks).

NOTE:

1. Only claims with a claim number will be considered.
2. Claim numbers must be obtained before repair work is started.
3. We will not reimburse you for copies of GroundWorks parts you have made elsewhere.
4. Travel time and mileage is not covered by our warranty.
5. We allow $80.00 per hour for warranty work.
6. Failure to observe any of the above procedures could result in a delay of your claim.

NOTES

GroundWorks Customer Satisfaction

GROUNDWORKS SAFETY SYSTEMS

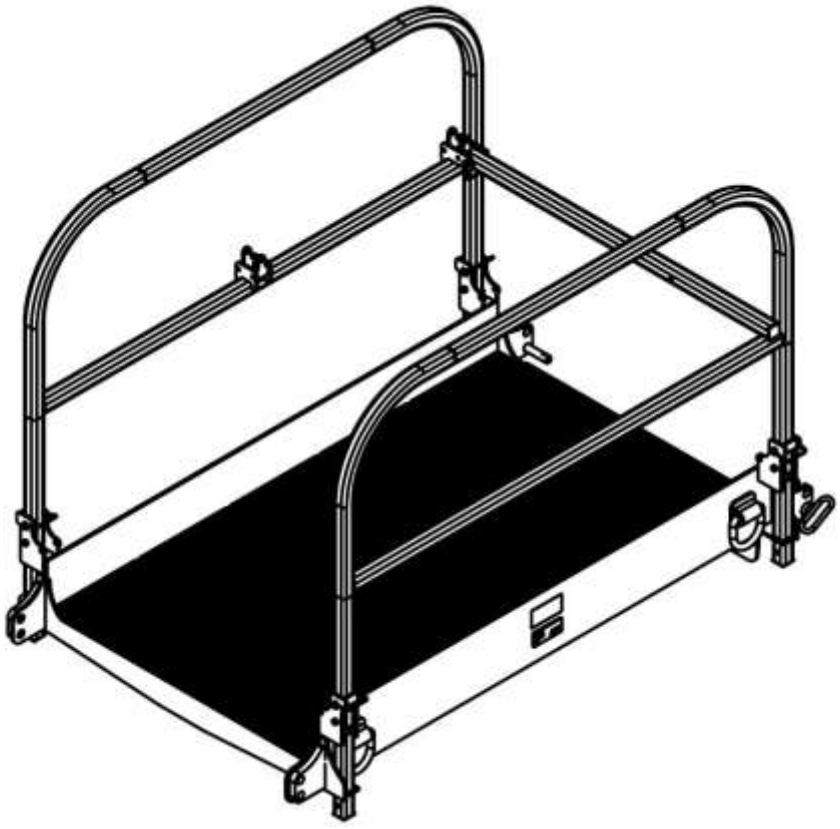
At GroundWorks Safety Systems, we are continuously striving to manufacture the safest, most user friendly and efficient products for our customers. Due to our ever changing and growing product line, information included in this publication is subject to change. If the information included with your system is out of date, updated versions will be available online at gwss.ca or by contacting GroundWorks Safety Systems. At GroundWorks Safety Systems customer satisfaction is of great importance and any feedback is greatly appreciated. Feedback can be sent to GroundWorks by filling out and faxing the below information to GroundWorks or sent by email to Sales@GWSS.CA.

CUSTOMER:		**MODEL :**	
FABRICATION DATE:		**SERIAL #:**	
CUSTOMER PHONE:		**CUSTOMER EMAIL:**	

Feedback:

APPENDIX

CATWALK
PRODUCT MANUAL



PREFACE

Thank you for purchasing a GroundWorks Catwalk System. Contained within this product manual are detailed documents pertaining to safe use procedures, proper maintenance procedures, specifications and parts breakdowns of the GroundWorks Catwalk System.

Please read and understand this manual in its entirety to ensure the performance and safety of your GroundWorks Catwalk System. Read and follow all precautionary notes included to ensure the health and safety of surrounding workers. Failure to do so could result in serious injury or death.

Any questions related to this product that cannot be answered by this text should be directed to your rental company, or GroundWorks customer service at 1-403-227-1001.

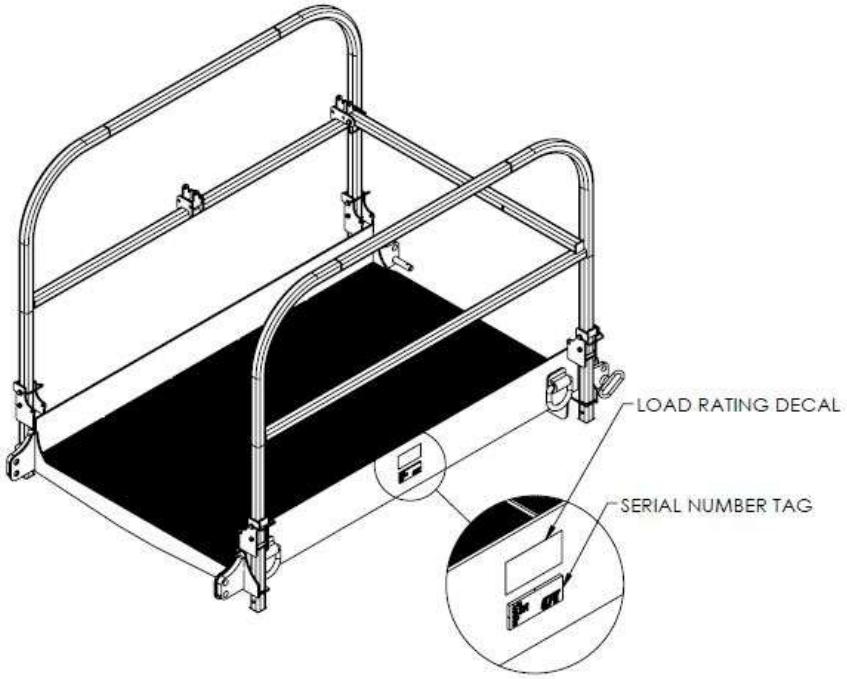
CONTENTS

CATWALK PRODUCT OVERVIEW

The GroundWorks Catwalk System is designed to allow safe entry and exit from the GroundWorks Trench Box System. The GroundWorks Catwalk System must be rigidly connected to a fixed anchor such as a ladder bracket or access platform. The Catwalk System is rated for 700 lb (318 kg), or a maximum concentrated load of 375 lbs (170 kg) per grating section, when installed and used in accordance with GWSS documentation.

SERIAL NUMBER AND DECALS

Every GroundWorks Catwalk System will have a serial number tag on the side of its main weldment (i.e. the primary component of the system, in this case the base of the catwalk). The weldment of the Catwalk System will also have a load rating decal on both sides stating the maximum load of 700 lbs (318 kg), or a maximum concentrated load of 375 lbs (170 kg) per section of grating.



GENERAL SAFETY

READ MANUAL PRIOR TO INSTALLATION

Improper use of this system may result in serious injury or death. **All personnel working on and around the Catwalk System should read this manual thoroughly before use. Failure to perform these tasks as outlined in this manual may result in serious injury or death.**

READ AND UNDERSTAND ALL SAFETY STATEMENTS

Read all safety decals and safety statements in all manuals prior to use of this system. Know and obey all relevant regional safety regulations, laws, and any other professional guidelines pertaining to system use.

KNOW YOUR SYSTEM

Know your system's capabilities, specifications, and assembly procedures before use. Visually inspect the entire system before every use. Check that all hardware and connecting devices are properly installed and secure. Remove and replace any damaged, fatigued, or excessively worn parts as soon as they become apparent. All personnel working with and around the catwalk system should be properly trained, experienced and supervised.

DO NOT MODIFY SYSTEM

Modifications may impair the function, safety, life, and performance of the system. Do not alter or remove any safety equipment from the system. When making repairs, use only the manufacturer's genuine parts and consult GroundWorks to obtain authorized instructions. Failure to do so may void warranty and may result in serious injury or death.

SAFE LIFTING AND TRANSPORTATION PRACTICES

- Do not exceed the lifting capacity of your lifting machine when moving or assembling the catwalk system.
- Ensure all lifting equipment (e.g. chains, slings, wire rope, hooks and clevises) are rated for loads applied during transporting, assembly and disassembly of the catwalk system.
- Never stand under the system, any of its components, or lifting equipment if it is moving or suspended in air. All personnel should be clear of system during movement. GroundWorks recommends using tag lines to assist in the guiding of suspended equipment.

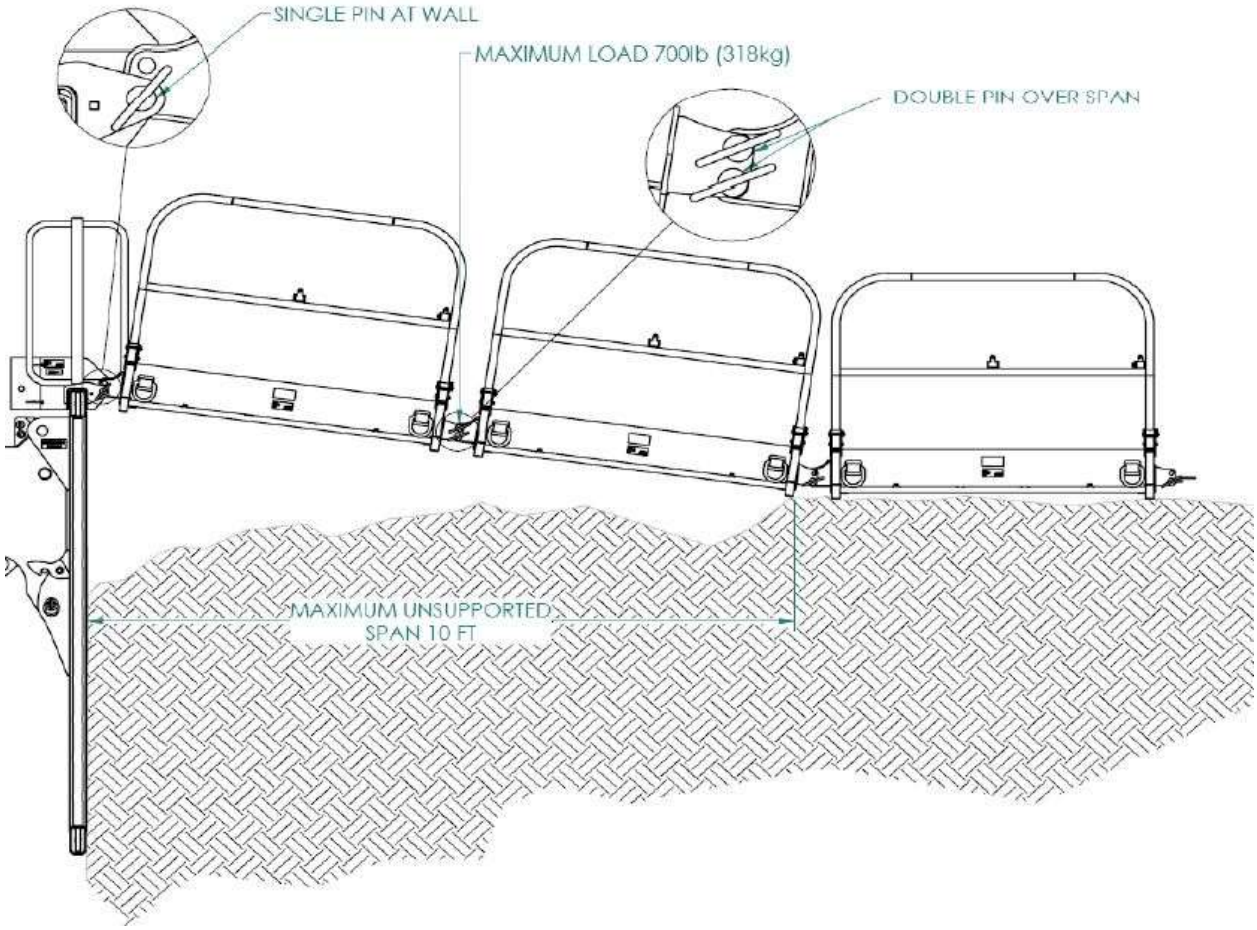
MAINTAINING THE CATWALK SYSTEM

- Before performing any maintenance, ensure the system is placed in a stable position.
- Ensure all personnel performing any maintenance or inspections on the system are qualified and authorized to do so.
- After performing any maintenance or repair, check that the system is in proper working condition. If problems affecting performance and/or safety are discovered, the defect component must be immediately removed from service.
- A proper maintenance and inspection schedule must be developed, performed, and documented on a regular basis. Refer to page 77 for recommended inspection procedures.

USERS OF INDUSTRIAL SHIELDING SYSTEMS ARE RESPONSIBLE FOR CONSTRUCTING AND ENFORCING SAFETY PROGRAMS THAT ARE SPECIFIC TO THEIR APPLICATION. COMPLIANCE TO LOCAL SAFETY CODES MUST BE MAINTAINED WITHIN SUCH PROGRAMS. GROUNDWORKS CANNOT PREDICT EVERY SITUATION THAT MAY INVOLVE HAZARDS, THEREFORE THE WARNINGS AND GUIDELINES PRESENTED IN THIS MANUAL DO NOT CONSTITUTE A COMPREHENSIVE SAFETY PROGRAM.

CATWALK USE AND ASSEMBLY INSTRUCTIONS

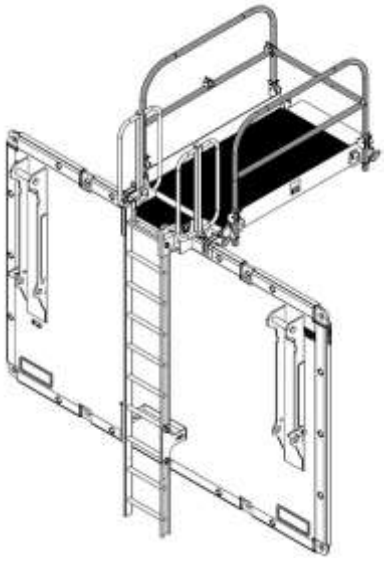
Multiple sections of catwalks can be pinned together to create a safe entry to the trench. The maximum unsupported span of 10ft is shown below. The unsupported joint must be double pinned, and all following catwalks attached must be supported underneath to ensure the safety of the system. The catwalks shall not be used in a free floating or cantilever installation.



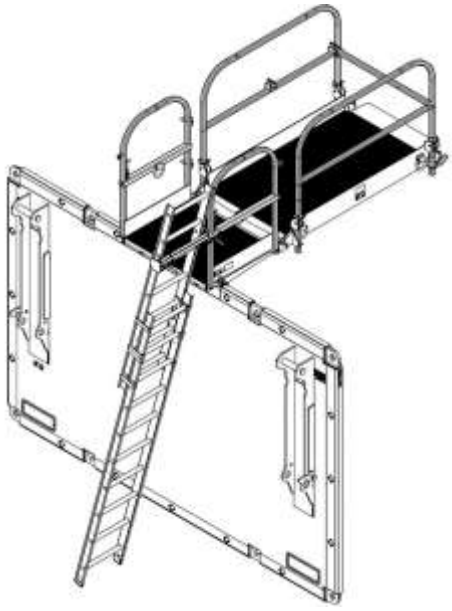
ATTACHMENT VARIATIONS

The GroundWorks accessories that allow Catwalk System attachment are the GroundWorks ladder, the GroundWorks platform and the GroundWorks catwalk panel mount; all three of these configurations are shown below. All three variations use the same hardware and steps to attach the catwalk to the panel.

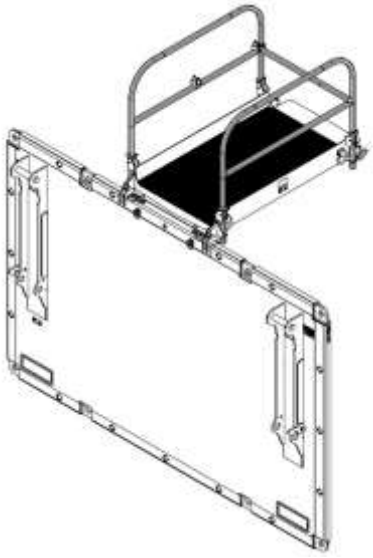
1. Ladder



2. Platform

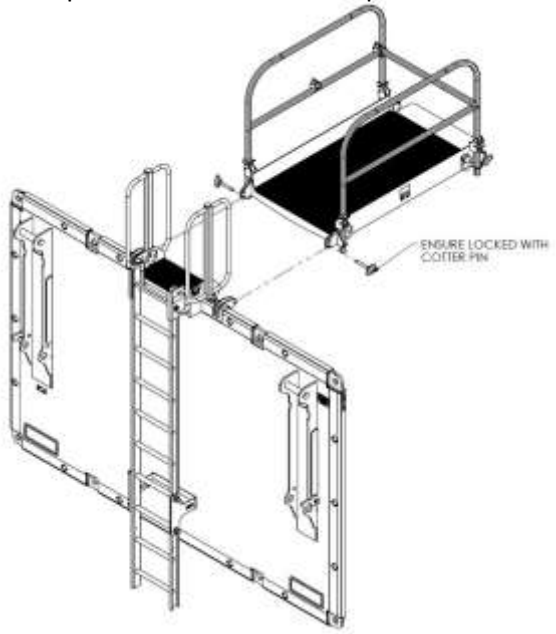


3. Catwalk Panel Mount

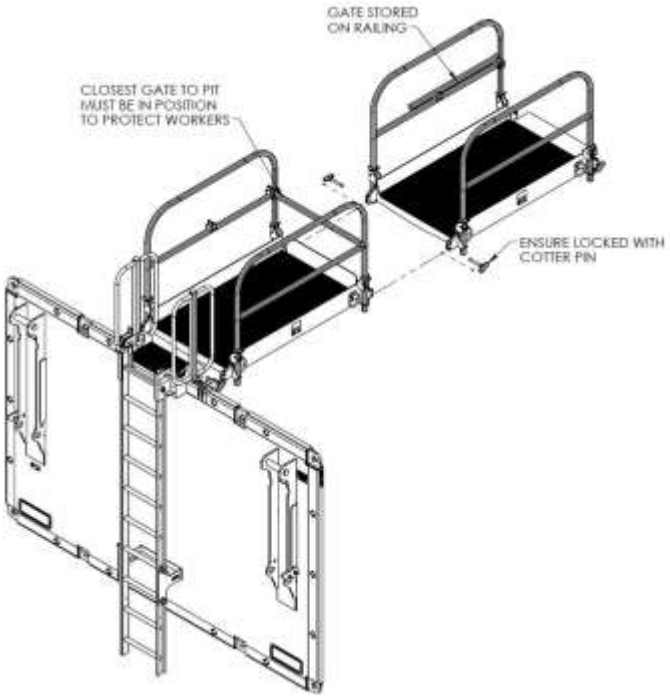


ASSEMBLY INSTRUCTIONS

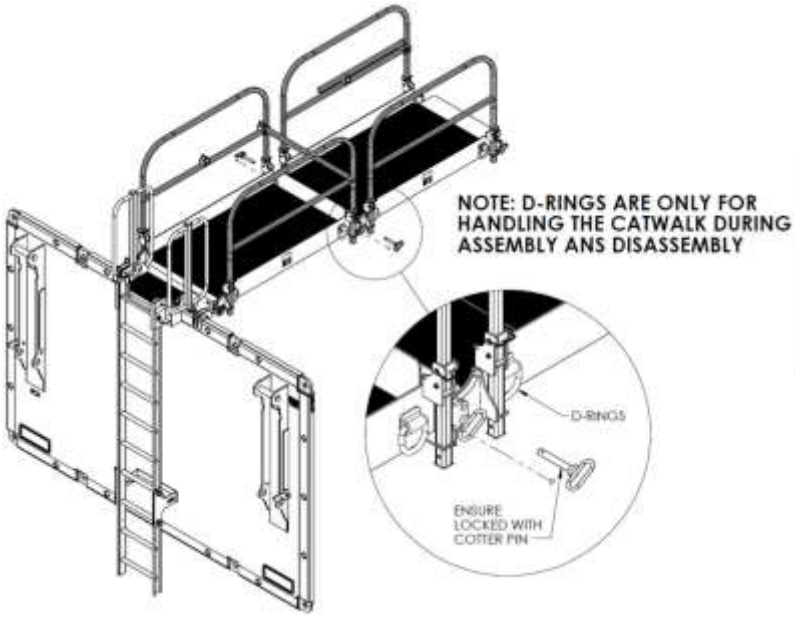
1. Using the D rings on the sides of the catwalk, lift the first catwalk into position. Use hitch and cotter pins to secure catwalk in place.



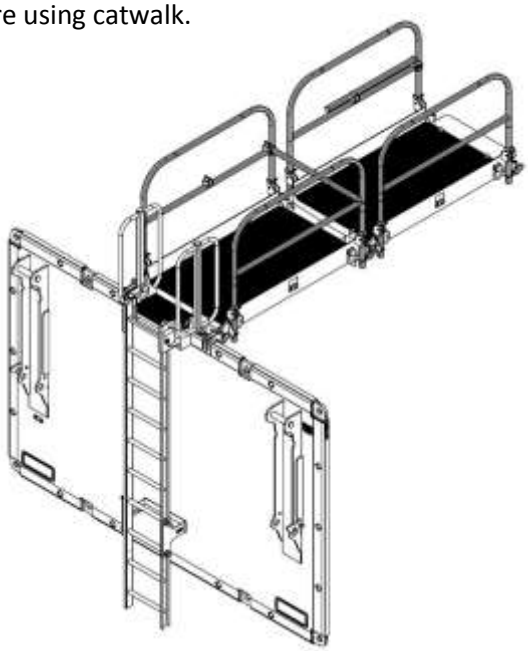
2. Lift the second catwalk into position and secure with hitch and cotter pins.



3. If first pivot is going to be unsupported, double pinning the second hole is required with additional hinge and cotter pins.

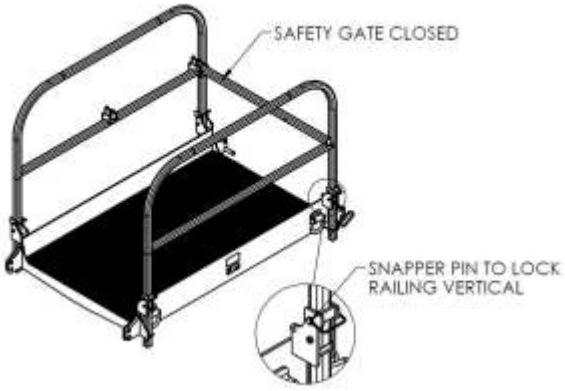


4. Ensure all connections are secure before using catwalk.

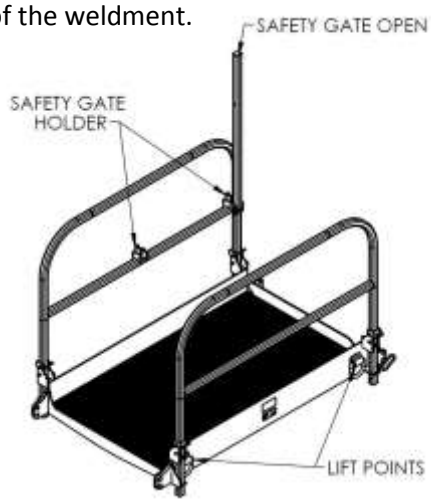


CATWALK FEATURES

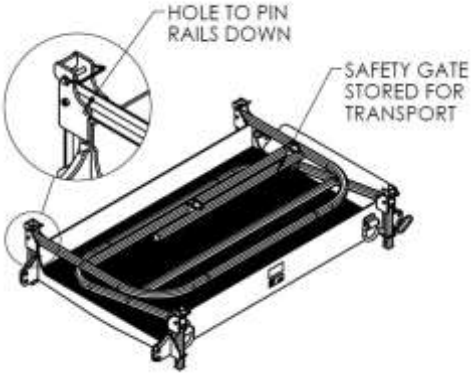
The GroundWorks Catwalk System comes with a gravity closing gate that should always be securely fastened, thus preventing a worker from accidently falling into a trench box (see below). Only the first catwalk entering the trench is required to have the gate operational; all subsequent catwalks may have the gate temporarily removed. The catwalk rails also have the ability to fold down for easier transportation. The picture below shows the 2 snapper pins per railing locked and holding the railings in the upright position.



The picture below shows the safety gate in the open position. Also noted is the safety gate holder, which can be used when the gate is not in use, or during transportation. Lift points for the catwalk are located on the sides of the weldment.



Removing the two railing snapper pins and folding the railings on top of each other allows the catwalk to take up less space and stack easier for transportation. During transportation, move the 2 snapper pins into the extra hole (shown below) to lock the railing down. The safety gate can also be removed and pinned horizontally as shown.



MAINTENANCE

The following procedures and information outline the recommended inspection to confirm your GroundWorks Catwalk System is in proper working condition. A general visual inspection should be done prior to installation and before any personnel use the Catwalk System. Use the **GroundWorks Catwalk Inspection Checklist (After Inspection Procedures)** to aid in, and document, every inspection.

Any parts of the Catwalk System that have damage affecting the safety and functionality of the product shall be removed from service until appropriate repairs are completed. Clean the Catwalk System prior to inspection to ensure no problems are overlooked. Contact GroundWorks if any excessive damage is discovered to determine the appropriate repairs. Any repair not authorized in writing by GroundWorks Safety Systems voids all tabulated data and warranty. When replacing worn components, use only genuine GroundWorks parts.

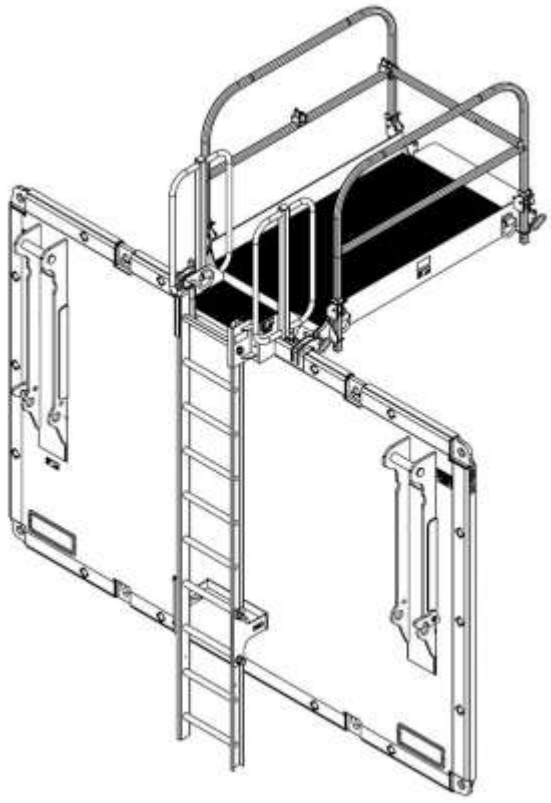
Inspection Procedures

1. Ensure all required parts are present.
2. Check catwalk for damaged grating and rails.
3. Check catwalk weldments for weld cracks and deformation.
4. Ensure that all connections and fasteners are secure.
5. Ensure bracket channel is fully engaged onto panel.
6. Ensure clamp bolts are fully tightened to hold bracket to panel.
7. Ensure no damage affecting the safety and functionality of the system is present.

GROUNDWORKS CATWALK INSPECTION CHECKLIST

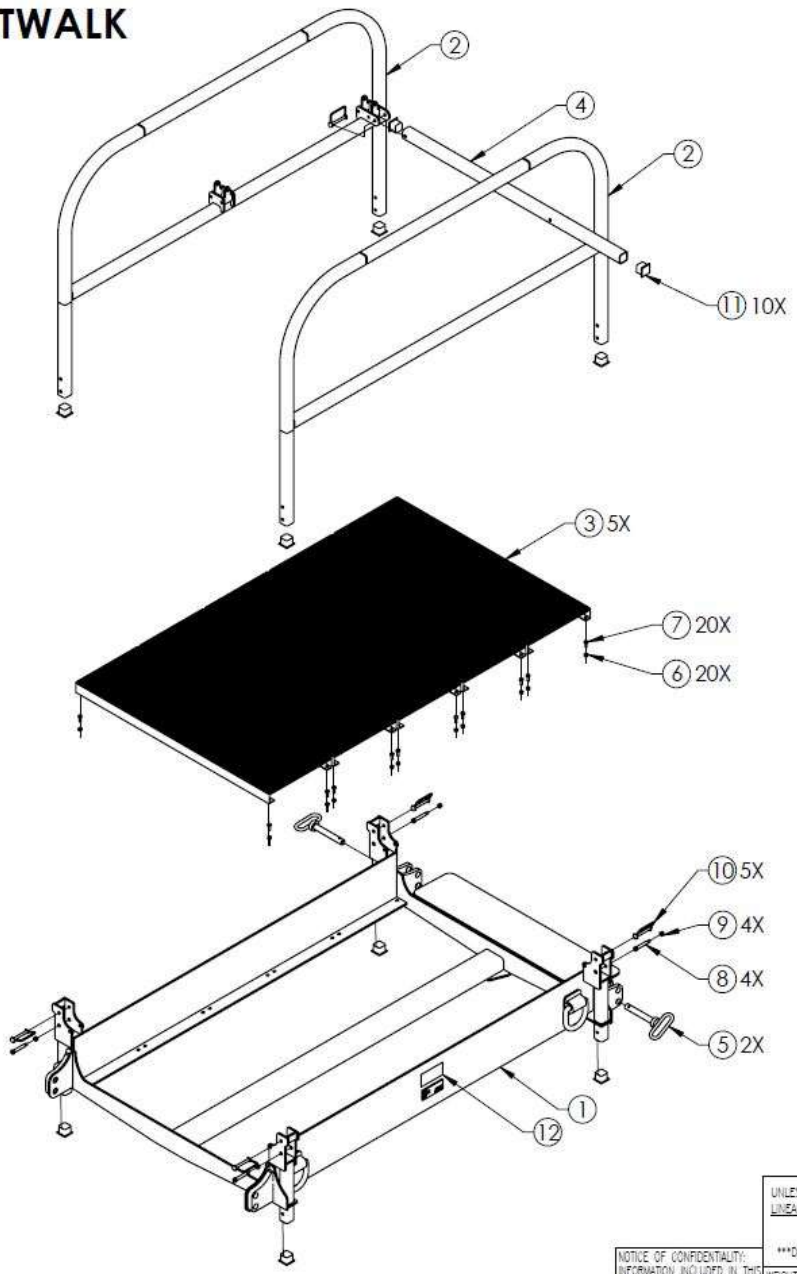
GROUNDWORKS CATWALK INSPECTION CHECKLIST

INSPECTOR:_____	DATE:_____	
LADDER MODEL:_____	UNIT SERIAL:_____	
ITEM	**PASS**	**FAIL**
1. ALL PARTS PRESENT		
2. DAMAGE TO CATWALK GRATING AND RAILS Check for Cracking and Deformation		
3. LADDER WELDMENTS Check for Cracking and Deformation		
4.CONNECTIONS AND FASTENERS Secured and Undamaged Inspect Hitch Pins		
5.BRACKET FULLY ENGAGED ONTO PANEL Check for Misalignment or Gaps		
6. CLAMP BOLTS TIGHT Check for Play		
7. CRACKING, WEAR OR DEFORMATION General		

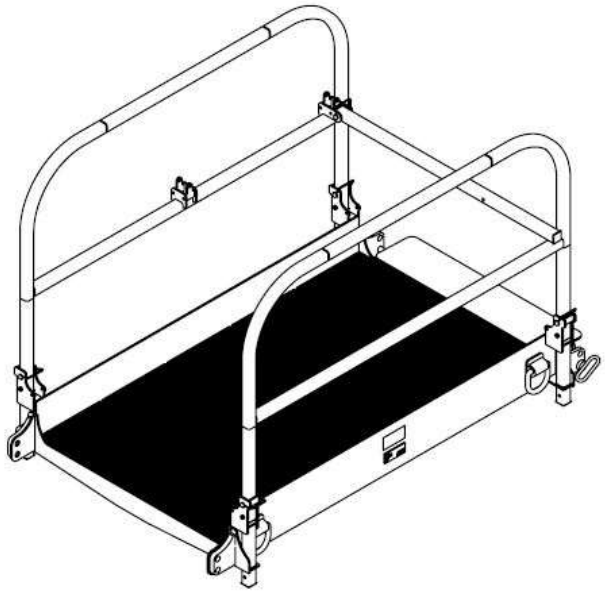


PARTS BREAKDOWNS

CATWALK



ITEM	Part Config	DESCRIPTION	QTY
1	S99VB1770	WLDMNT_CATWALK_SHORING_BIGBOX	1
2	S99VB1764	WLDMNT_CATWALK SIDE RAIL_SHORING_BIGBOX	2
3	S99VB1784	GRATE_CATWALK_SHORING_BIGBOX	5
4	S99VB1941	BAR_CATWALK SIDE RAIL_SHORING_BIGBOX	1
5	MIV-DYN-66253	HITCH PIN_VINYL HANDLE_0.750 X 4.50	2
6	FTL-37183	HEX NUT_NYLOCK_GR-8 YZF - 0.2500-20	20
7	FTL-15003	HEX CAP SCREW GR-8 YZF - 0.2500-20 X 0.750 X 0.750	20
8	FTL-26335	STEEL SHOULDER SCREW 0.375 Shldr x 2.0 x 0.3125-18	4
9	FTL-37184	HEX NUT_NYLOCK_GR-8 YZF - 0.3125-18	4
10	FTL-66190	SNAPPER PIN 0.3125 X 2.50 USABLE LENGTH	5
11	FTL-11130984	PLUG_SQUARE TUBING_1.50	10
12	999ZD038	DECAL_LOAD RATING	2



UNLESS NOTED OTHERWISE TOLERANCES ARE AS FOLLOWS:
LINEAR ±1/16 < 10'-0" HOLE CENTERS ±.005"
±1/8 < 20'-0" FORMING ±.030"
±1/4 > 20'-0" ANGULAR ±.5°
DO NOT SCALE DRAWING / DIMENSIONS ARE IN INCHES

SCALE: 1:22
DATE: 06/06/2017
DWN: RRG
CHK: –
WEIGHT: 325 lbs
MATERIAL: –
CAD FILE: J:\Design\Vault Files\Shoring\WEBSITE RENDERING MODELS\ACCESSORIES\CATWALK\
DATE PLOTTED: October-19-17
SHEET 1 OF 1

GROUNDWORKS SAFETY SYSTEMS
4207 53rd Street Close, Innisfail, Alberta, T4G 1P9
DWG TITLE: ASMBLY_CATWALK_SHORING_BIGBOX
EFI SERIES: _S99
EFI PRODUCT: VB SHORING_BIGBOX
MAKE: –
CONFIG: 5FT
PART NO: AUN29-05
DWG NO:

GROUNDWORKS
SAFETY SYSTEMS

GroundWorks Limited Warranty Policy

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This warranty covers only new and unused products manufactured by GroundWorks Safety Systems.

Parts claimed to be defective and for which repair or replacement is desired shall be, if requested by GroundWorks, returned transportation prepaid to, GroundWork's fabrication facility for inspection.

LIMITATIONS

GroundWorks is not responsible for failures resulting from normal wear and tear or:

- Any use which GroundWorks judges improper.
- Improper or careless installation, usage, storage or handling, as to any and all of which the manufacturer will be the sole judge.
- Accessories, items, and parts not sold by GroundWorks.
- Abuse, neglect, accident, changes to the product not authorized by GroundWorks, and/or improper repair/maintenance.
- User's unreasonable delay in making the product available after being notified of a potential product problem.

Products not manufactured by GroundWorks are covered only by the warranty extended to GroundWorks by its suppliers.

Completion of warranty repair work does not change or extend this warranty in any way.

Distributors agree to extend only the above warranty to their customers. In the event a distributor offers a customer any additional warranty such as by extending the scope or period of warranty, undertaking a warranty of fitness for any particular purpose, or any other obligation not encompassed in GroundWork's warranty, then the distributor shall be solely responsible for any warranty requirements and shall have no recourse against GroundWorks with respect to said warranty work.

GROUNDWORKS RESPONSIBILITIES

If a defect in material or workmanship is found during the warranty period, GroundWorks will, during normal hours and at a place of business of a GroundWorks dealer or other authorized source:

- Provide (at GroundWork's choice), new or remanufactured or GroundWorks-approved, replacement parts to correct the defect.
- Provide labor needed to correct the defect.

USER RESPONSIBILITIES

The user is responsible for:

- The costs associated with transporting the product.
- Labor costs, except as stated under "GroundWorks Responsibilities".
- Local taxes, if applicable.
- Parts shipping charges in excess of usual surface transportation cost as charged by scheduled carriers.
- Costs to investigate complaints unless the problem is caused by a defect in GroundWorks material or workmanship; subject to "GroundWorks Responsibilities" above.
- Any costs resulting from failure to give GroundWorks timely notice of a warrantable failure and promptly making the product available for repair.

All notices given under or pursuant to this agreement shall be in writing and emailed to sales@gwss.ca or sent postage prepaid to GroundWorks Safety Systems, 4207 53rd Street Close, Innisfail Alberta, T4G1P9.

No terms or conditions, other than those stated herein and no agreement or understanding, oral or written, which in any way purports to modify this warranty, shall be binding on GroundWorks, unless approved in writing by a GroundWorks representative.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE AND THE OBLIGATION AND LIABILITY OF GROUNDWORKS UNDER THIS WARRANTY SHALL NOT INCLUDE ANY TRANSPORTATION OR OTHER CHARGES OR THE COST OF INSTALLATION OR ANY LIABILITY FOR DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES OR DELAYS RESULTING FROM THE DEFECT.

WARRANTY CLAIM PROCEDURE

Before Any Work Is Started

1. Read the Limited Warranty policy
2. Contact GroundWorks for a claim number. When a failure occurs you must notify GroundWorks immediately to obtain authorization to carry out repair. You must provide:

- A description of the fault, an idea of the cause, and a possible repair procedure. Recommended repairs are to be discussed and agreed to by GroundWorks in writing.
- An estimate of repair hours and costs must be established (exclusive of parts provided by GroundWorks).
- An opportunity for GroundWorks personnel to travel by first available public transportation to the site to examine the problem and/or make repairs.

NOTE: Time limit on date of failure to date of report should be within 3 full working days – Saturday, Sunday, and bank holidays not included. Repair parts will be ordered by customer purchase order at this time. Parts will be invoiced by GroundWorks and reimbursed under the terms of this warranty policy if applicable.

After Repairs Are Completed

1. Fill out the Warranty Claim form.
2. Return all damaged parts prepaid to GroundWorks unless directed otherwise by GroundWorks (Damaged parts become the property of GroundWorks).Warranty Claim forms must include:

- GroundWorks product serial number.
- Model and Description of the GroundWorks product.
- Date claim is prepared.
- Delivery date to the original user.
- Date of failure and repair.
- Period of use on the product.
- Your internal reference or claim number.
- An accurate accounting of the work done. Photographs from before and after the repair are helpful in investigating the failure and help expedite your claim.
- Your work order or other documentation to support your claim.
- A listing of parts and raw materials used in the repair. (Please note that we cannot reimburse for parts not purchased from GroundWorks).

NOTE:

1. Only claims with a claim number will be considered.
2. Claim numbers must be obtained before repair work is started.
3. We will not reimburse you for copies of GroundWorks parts you have made elsewhere.
4. Travel time and mileage is not covered by our warranty.
5. We allow $80.00 per hour for warranty work.
6. Failure to observe any of the above procedures could result in a delay of your claim.

NOTES

GroundWorks Customer Satisfaction

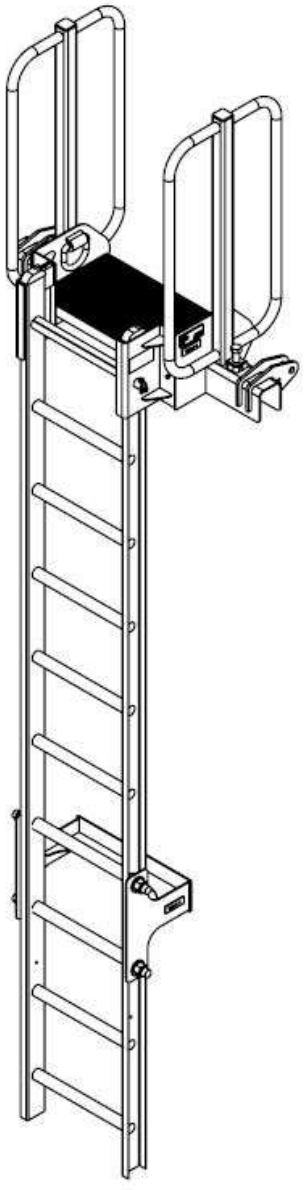
GROUNDWORKS SAFETY SYSTEMS

At GroundWorks Safety Systems, we are continuously striving to manufacture the safest, most user friendly and efficient products for our customers. Due to our ever changing and growing product line, information included in this publication is subject to change. If the information included with your system is out of date, updated versions will be available online at gwss.ca or by contacting GroundWorks Safety Systems. At GroundWorks Safety Systems customer satisfaction is of great importance and any feedback is greatly appreciated. Feedback can be sent to GroundWorks by filling out and faxing the below information to GroundWorks or sent by email to Sales@GWSS.CA.

CUSTOMER:		**MODEL :**	
FABRICATION DATE:		**SERIAL #:**	
CUSTOMER PHONE:		**CUSTOMER EMAIL:**	

Feedback:

LADDER SYSTEM
PRODUCT MANUAL



PREFACE

Thank you for purchasing a GroundWorks Ladder System. Contained within this product manual are detailed documents pertaining to safe use procedures, proper maintenance procedures, specifications and parts breakdowns of the GroundWorks Ladder System.

Please read and understand this manual in its entirety to ensure the performance and safety of your GroundWorks Ladder System. Read and follow all precautionary notes included to ensure the health and safety of surrounding workers. Failure to do so could result in serious injury or death.

Any questions related to this product that cannot be answered by this text should be directed to your rental company or GroundWorks customer service at 1-403-227-1001.

CONTENTS

LADDER PRODUCT OVERVIEW

The GroundWorks Ladder System is designed to allow safe entry and exit from the GroundWorks Trench Box System. The GroundWorks platform, ladder, and bracket system are rated for 300 lb (136kg) when installed and used in accordance with GWSS documentation. The GroundWorks Ladder System can be configured to match different panel heights. A ladder extension bracket can be used to access deeper trench box systems (shown below).

Figure 1: Ladder System

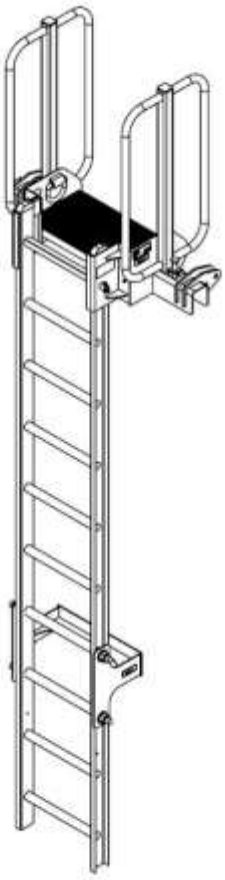
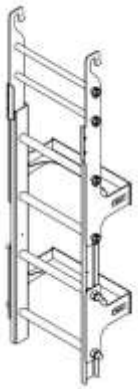


Figure 2: Ladder Extension



SERIAL NUMBER AND DECALS

Every GroundWorks Ladder System will have a serial number tag on the side of its main components. The top bracket of the Ladder System will also have a load rating decal on both sides. The lower bracket of the ladder extension will also have a serial tag.

Figure 3: Ladder System Serial Number Tags and Decals

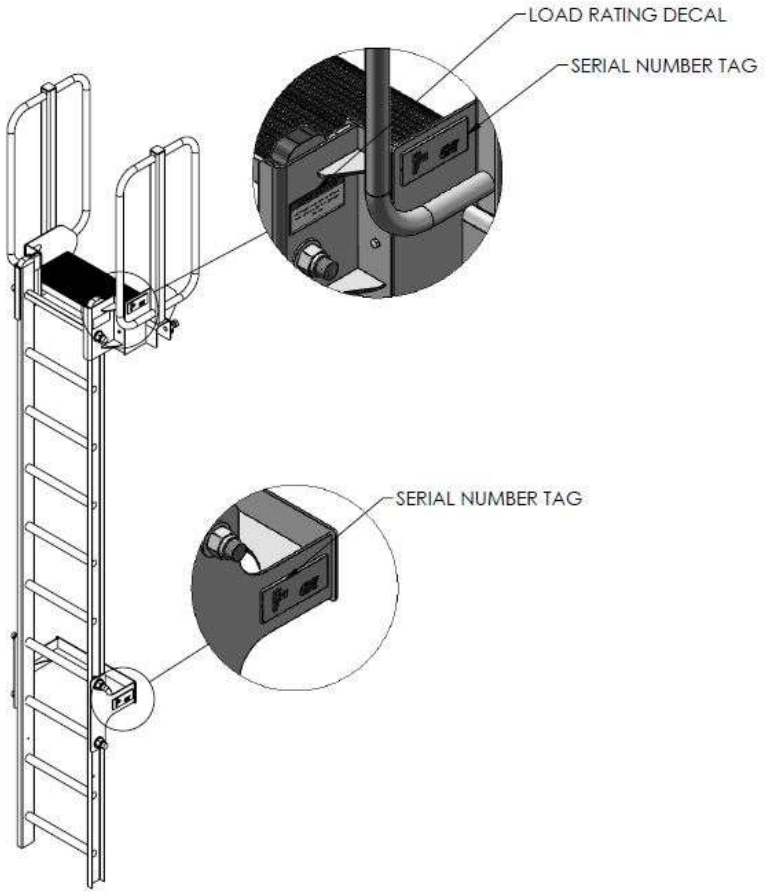
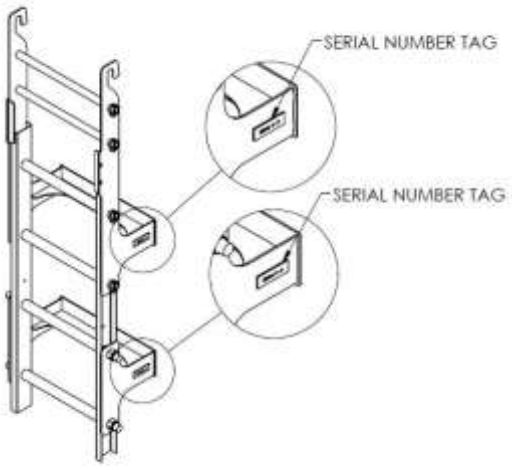


Figure 4: Ladder Extension Serial Number Tag



GENERAL SAFETY

READ MANUAL PRIOR TO INSTALLATION

Improper Use of this system may result in serious injury or death. **All personnel working on and around the Ladder System should read this manual thoroughly before use. Failure to perform these tasks as outlined in this manual may result in serious injury or death.**

READ AND UNDERSTAND ALL SAFETY STATEMENTS

Read all safety decals and safety statements in all manuals prior to use of this system. Know and obey all relevant regional safety regulations, laws, and any other professional guidelines pertaining to system use.

KNOW YOUR SYSTEM

Know your system's capabilities, specifications, and assembly procedures before use. Visually inspect the entire system before every use. Check that all hardware and connecting devices are properly installed and secure. Remove and replace any damaged, fatigued, or excessively worn parts as soon as they become apparent. All personnel working with and around the ladder system should be properly trained, experienced and supervised.

DO NOT MODIFY SYSTEM

Modifications may impair the function, safety, life, and performance of the system. Do not alter or remove any safety equipment from the system. When making repairs, use only the manufacturer's genuine parts and consult GroundWorks to obtain authorized instructions. Failure to do so may void warranty and may result in serious injury or death.

SAFE LIFTING AND TRANSPORTATION PRACTICES

- Do not exceed the lifting capacity of your lifting machine when moving or assembling the ladder system
- Ensure all lifting equipment (e.g. chains, slings, wire rope, hooks and clevises) are rated for loads applied during transporting, assembly and disassembly of the ladder system.
- Never stand under the system, any of its components, or lifting equipment if it is moving or suspended in air. All personnel should be clear of system during movement. GroundWorks recommends using tag lines to assist in the guiding of suspended equipment.

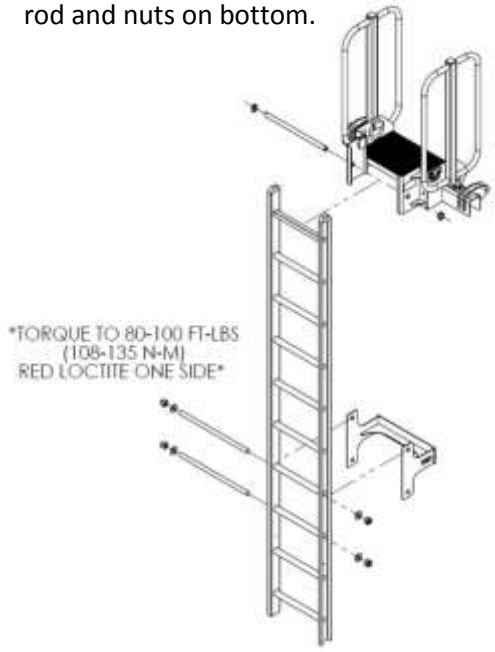
MAINTAINING THE LADDER SYSTEM

- Before performing any maintenance, ensure the system is placed in a stable position.
- Ensure all personnel performing any maintenance or inspections on the system are qualified and authorized to do so.
- After performing any maintenance or repair, check that the system is in proper working condition. If problems affecting performance and/or safety are discovered, the defect component must be immediately removed from service.
- A proper maintenance and inspection schedule must be developed, performed, and documented on a regular basis. Refer to page 128
- for recommended inspection procedures.

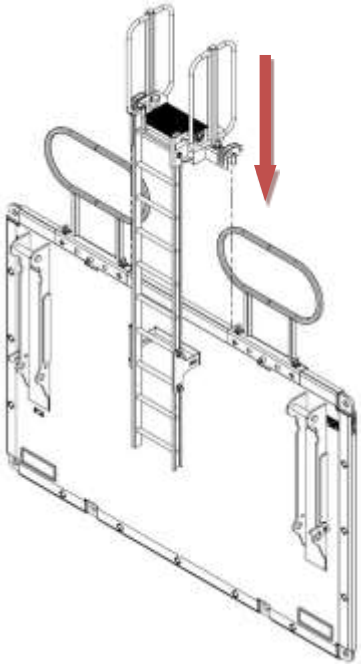
USERS OF INDUSTRIAL SHIELDING SYSTEMS ARE RESPONSIBLE FOR CONSTRUCTING AND ENFORCING SAFETY PROGRAMS THAT ARE SPECIFIC TO THEIR APPLICATION. COMPLIANCE TO LOCAL SAFETY CODES MUST BE MAINTAINED WITHIN SUCH PROGRAMS. GROUNDWORKS CANNOT PREDICT EVERY SITUATION THAT MAY INVOLVE HAZARDS, THEREFORE THE WARNINGS AND GUIDELINES PRESENTED IN THIS MANUAL DO NOT CONSTITUTE A COMPREHENSIVE SAFETY PROGRAM.

LADDER SYSTEM ASSEMBLY INSTRUCTIONS

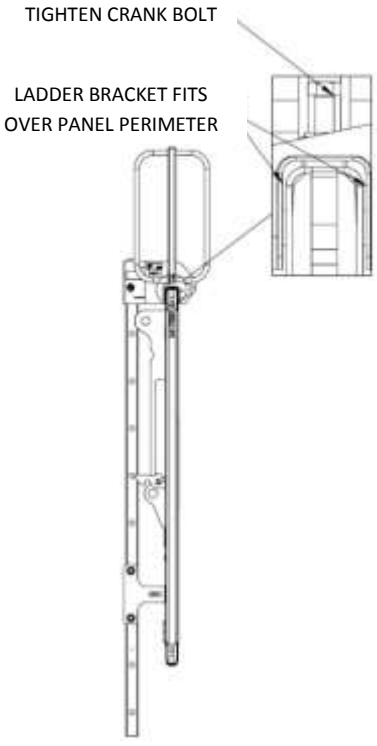
1. Attach ladder to brackets using pipe and lynch pin on top, and threaded rod and nuts on bottom.



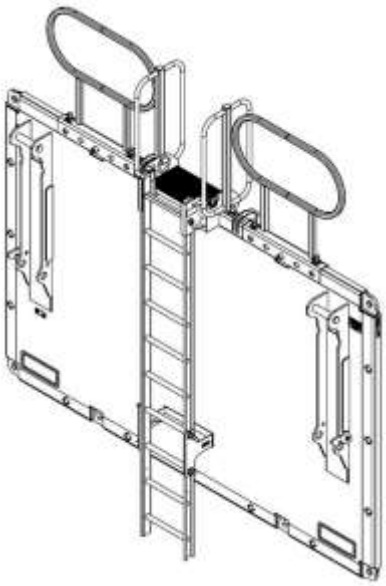
2. Lower ladder and brackets onto panel and use perimeter pins to lock ladder in place.



3. Use the crank bolts on the outside to clamp top bracket onto panel.

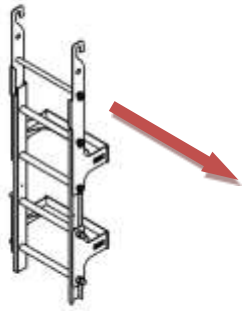


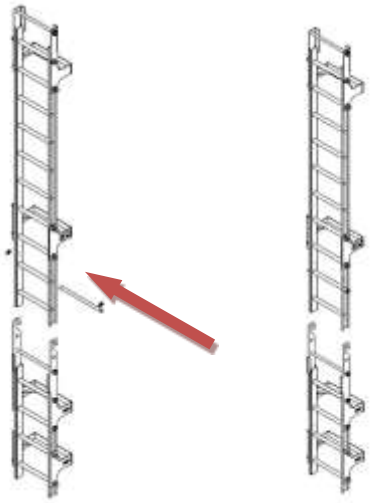
4. Ensure all connections are secure before using ladder.



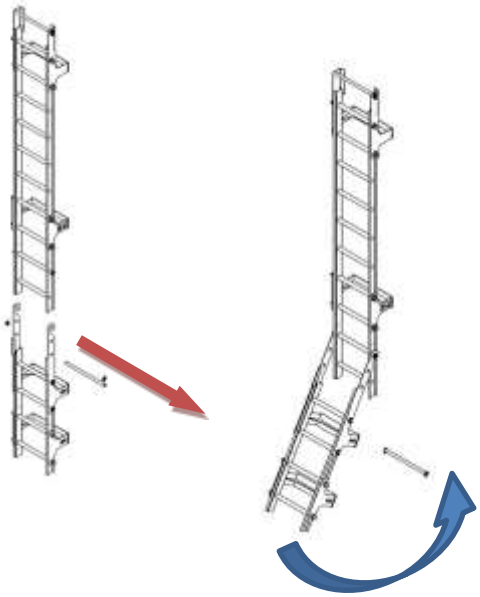
LADDER EXTENSION ASSEMBLY INSTRUCTIONS

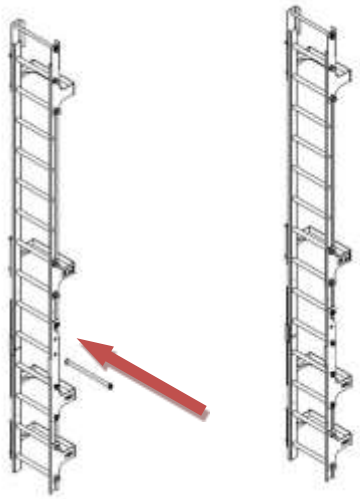
Holder location ➔





1. Remove top pin from holder and insert into second rung from the bottom of ladder.
2. Secure with Lynch pins.





3. Remove lower pin.
4. Engage hooks on pin installed in step 1 to allow ladder extension to swing into position.

5. Install bottom pin through lower rung of top ladder.
6. Secure with Lynch pins.

NOTE: MAKE SURE ALL REQUIRED PINS ARE IN PLACE AND SECURELY FASTENED

MAINTENANCE

The following procedures and information outline the recommended inspection to confirm your GroundWorks Ladder System is in proper working condition. A general visual inspection should be done prior to installation and before any personnel use the Ladder System. Use the **GroundWorks Ladder Inspection Checklist** (after Inspection Procedure) to aid in, and document, every inspection. Both the Ladder System and ladder extension should be inspected regularly.

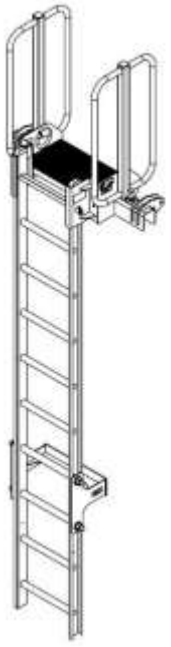
Any Parts of the Ladder System that have damage affecting the safety and functionality of the product shall be removed from service until appropriate repairs are completed. Clean the ladder system prior to inspection to ensure no problems are overlooked. Contact GroundWorks if any excessive damage is discovered to determine the appropriate repairs. Any repair not authorized in writing by GroundWorks Safety Systems voids all certified load ratings and warranty. When replacing worn components, use only genuine GroundWorks parts.

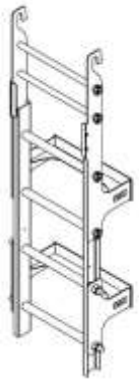
Inspection Procedure:

1. Ensure all required parts are present.
2. Check ladder for damaged rungs and rails.
3. Check ladder weldments for weld cracks and deformation.
4. Ensure that all connections and fasteners are secure.
5. Ensure bracket channel is fully engaged onto panel.
6. Ensure clamp bolts are fully tightened to hold bracket to panel.
7. Ensure no damage affecting the safety and functionality of the system is present.

GROUNDWORKS LADDER INSPECTION CHECKLIST

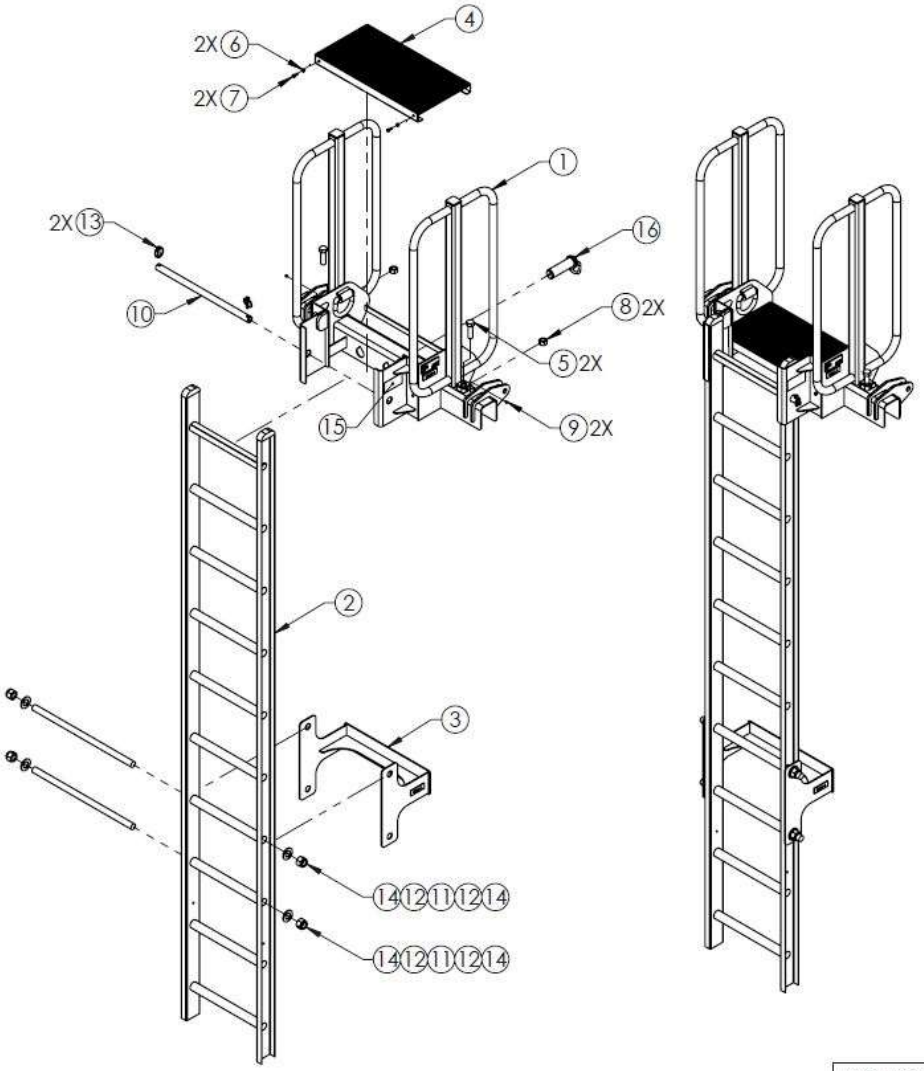
INSPECTOR:_____	DATE:_____	
LADDER MODEL:_____	UNIT SERIAL:_____	
ITEM	**PASS**	**FAIL**
1. ALL PARTS PRESENT		
2. DAMAGE TO LADDER RUNG AND RAILS Check for Cracking and Deformation		
3. LADDER WELDMENTS Check for Cracking and Deformation		
4.CONNECTIONS AND FASTENERS Secured, Ladder Nuts torqued to 80-100 Ft-Lbs Crank bolt torqued to 150-200 Ft-Lbs		
5.BRACKET FULLY ENGAGED ONTO PANEL Check for Misalignment or Gaps		
6. CLAMP BOLTS TIGHT Check for Play		
7. CRACKING, WEAR OR DEFORMATION General		





PARTS BREAKDOWNS

LADDER ASSEMBLY



ITEM	Part Config	DESCRIPTION	QTY
1	S99VB1022	WLDMNT_LADDER MOUNT_SHORING_BIGBOX	1
2	9600- --	LADDER_ALUMINUM_SINGLE	1
3	S99VB1041	WLDMNT_BRACKET_SHORING_BIGBOX	1
4	S99VB1028	GRATE_LADDER_SHORING_BIGBOX	1
5	FTL-15363	HEX CAP SCREW GR-8 YZF - 0.7500-10 X 2.500 X 1.375	2
6	FTL-37183	HEX NUT_NYLOCK_GR-8 YZF - 0.2500-20	2
7	FTL-15003	HEX CAP SCREW GR-8 YZF - 0.2500-20 X 0.750 X 0.750	2
8	FTL-36416	HEX NUT GR-8 YZF - 0.7500-10	2
9	FTL-25436	SOCKET SET SCREW CUP POINT - 0.3125-18 X 0.313	2
10	S99VB2110	TUBE PIN_LADDER EXT_SHORING_BIGBOX	1
11	S99VB1032	THREADED ROD_LADDER_SHORING_BIGBOX FLAT	2
12	FTL-33822	WASHER THRU-HARDENED YZF - 1.0000 LYNCH PIN	4
13	FTL-20712	YZF - 0.3125 X 1.250 USABLE LENGTH HEX	2
14	FTL-37192	NUT_NYLOCK_GR-8 YZF -1.0000-8	4
15	999ZD038	DECAL_LOAD RATING	2
16	S99VB0394	WLDMNT_PERIMETER PIN_SHORING_BIGBOX	1

UNLESS NOTED OTHERWISE TOLERANCES ARE AS FOLLOWS:
LINEAR : ±1/16 < 10'-0" HOLE CENTERS : ±.005"
±1/8 < 20'-0" FORMING : ±.030"
±1/4 > 20'-0" ANGULAR : ±.5°
DO NOT SCALE DRAWING / DIMENSIONS ARE IN INCHES

WEIGHT: 140 lbs MATERIAL: _

SCALE: 1:26
DATE: 17/05/2017
DWN: RRG
CHK: _

CAD FILE: I:\Design\Vault Files\Shoring\WEBSITE RENDERING MODELS\ACCESSORIES\LADDER BRACKET\10FT\

DATE PLOTTED: November-01-17

SHEET 1 OF 1

GROUNDWORKS SAFETY SYSTEMS 4207 53rd Street Close, Innisfail, Alberta, T4G 1P9

DWG TITLE: ASMBLY_LADDER_SHORING_BIGBOX

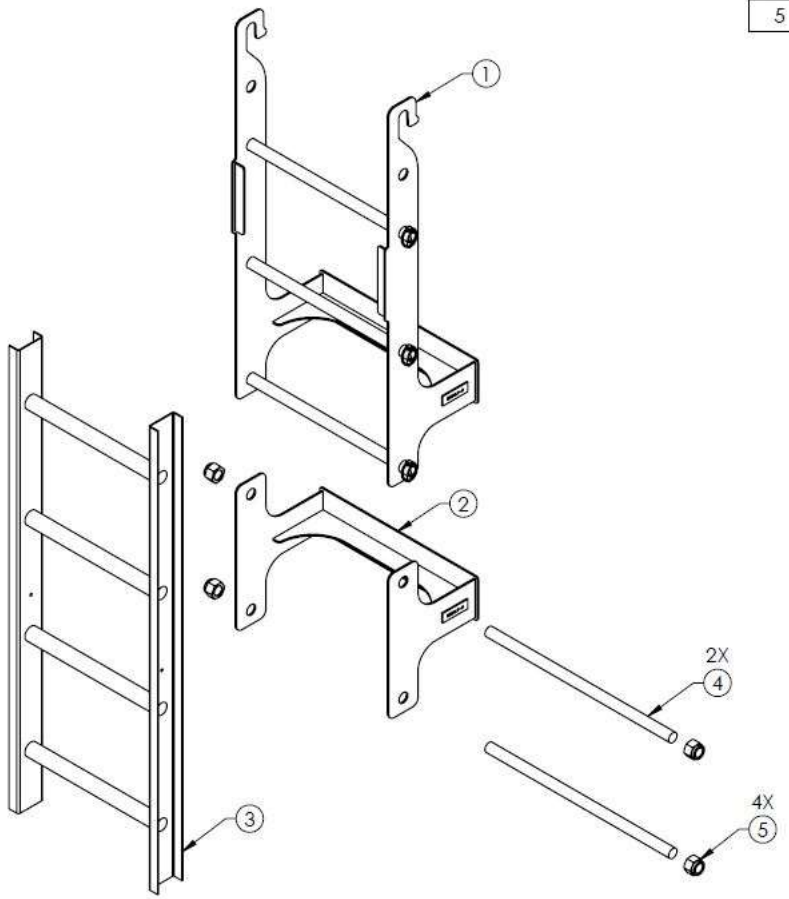
EFI SERIES: _S99 EFI PRODUCT: VB SHORING_BIGBOX

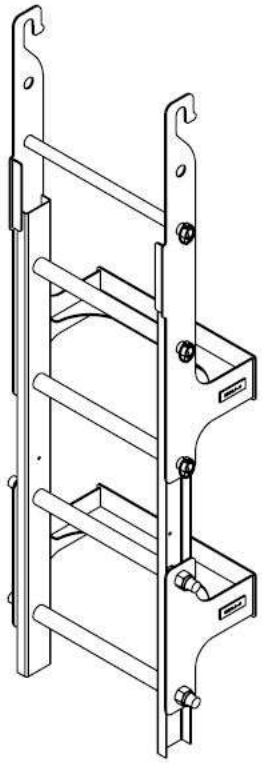
MAKE: _ CONFIG: -- DWG

PART NO: ____ NO:

LADDER EXTENSION

ITEM	Part Config	DESCRIPTION	QTY.
1	S99VB1514	ASMBLY_BRACKET_SHORING_BIGBOX	1
2	S99VB1041	WLDMNT_BRACKET_SHORING_BIGBOX	1
3	9600-04	LADDER_ALUMINUM_SINGLE	1
4	S99VB1032	THREADED ROD_LADDER_SHORING_BIGBOX	2
5	FTL-37192	HEX NUT_NYLOCK_GR-8 YZF -1.0000-8	4





NOTICE OF CONFIDENTIALITY: INFORMATION INCLUDED IN THIS DRAWING IS PROPRIETARY, AND IS NOT TO BE REPRODUCED, DISTRIBUTED, OR DISCLOSED EXCEPT AS SPECIALLY AUTHORIZED IN WRITING BY GWSS INC.

UNLESS NOTED OTHERWISE, TOLERANCES ARE AS FOLLOWS:
LINEAR: ±1/16 < 10'-0" | HOLE CENTERS: ±.005"
±1/8 < 20'-0" | FORMING: ±.030"
±1/4 > 20'-0" | ANGULAR: ±.5°
DO NOT SCALE DRAWING / DIMENSIONS ARE IN INCHES

WEIGHT: 57 lbs | MATERIAL: -

CAD FILE: Z:\Design\Vault Files\Shoring\WEBSITE RENDERING MODELS\ACCESSORIES\LADDER BRACKET\LADDER EXTENSION\

DATE PLOTTED: October-19-17

SCALE: 1:14
DATE: 20/06/2017
DWN: ROH
CHK: -
SHEET 1 OF 1

GROUNDWORKS SAFETY SYSTEMS
4207 53rd Street Close, Innisfail, Alberta, T4G 1P9

DWG TITLE: ASMBLY_LADDER EXT_SHORING_BIGBOX_4FT

EFI SERIES: _S99 | EFI PRODUCT: VB_SHORING_BIGBOX

MAKE: - | CONFIG: -

PART NO: AUN57-04 | DWG NO:

REV:

GROUNDWORKS
SAFETY SYSTEMS

GroundWorks Limited Warranty Policy

GroundWorks Safety Systems warrants each new product to be free of defects in material and workmanship. Its obligation under this warranty being expressly limited to repairing, or at manufacturer's option, replacing free of charge at its fabrication facility, or a recognized repair facility the part proving defective under normal use and service within one year after first use, demo, or delivery/shipment to an end user. Approved warrantable repairs performed by persons not employed by GroundWorks will be repaid as a credit to that company's GroundWorks account.

This warranty covers only new and unused products manufactured by GroundWorks Safety Systems.

Parts claimed to be defective and for which repair or replacement is desired shall be, if requested by GroundWorks, returned transportation prepaid to, GroundWork's fabrication facility for inspection.

LIMITATIONS

GroundWorks is not responsible for failures resulting from normal wear and tear or:

- Any use which GroundWorks judges improper.
- Improper or careless installation, usage, storage or handling, as to any and all of which the manufacturer will be the sole judge.
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- Date claim is prepared.
- Delivery date to the original user.
- Date of failure and repair.
- Period of use on the product.
- Your internal reference or claim number.
- An accurate accounting of the work done. Photographs from before and after the repair are helpful in investigating the failure and help expedite your claim.
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5. We allow $80.00 per hour for warranty work.
6. Failure to observe any of the above procedures could result in a delay of your claim.

NOTES

GroundWorks Customer Satisfaction

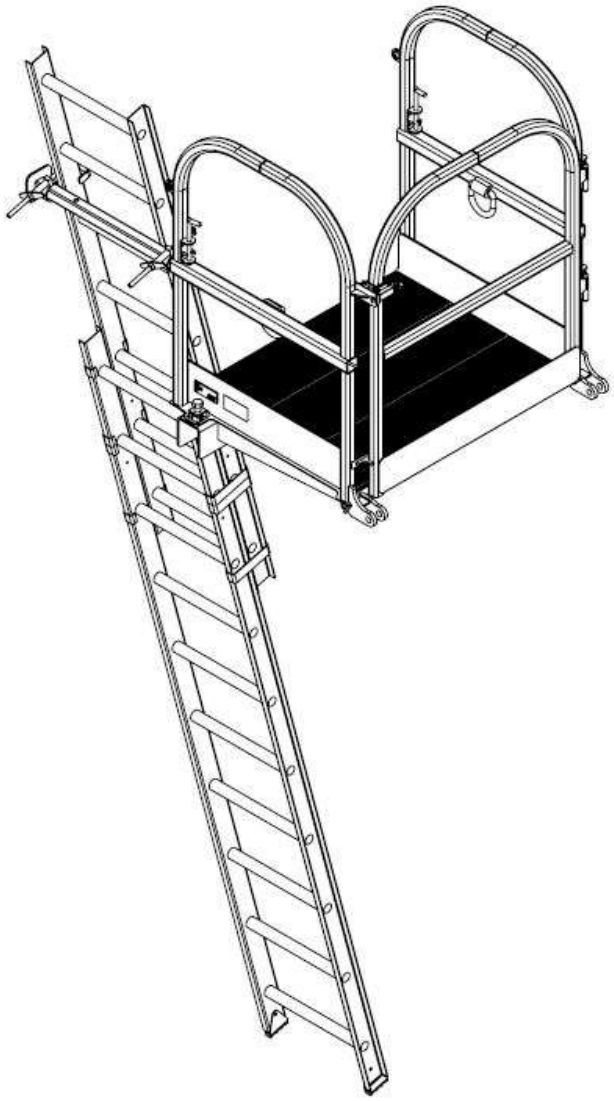
GROUNDWORKS SAFETY SYSTEMS

At GroundWorks Safety Systems, we are continuously striving to manufacture the safest, most user friendly and efficient products for our customers. Due to our ever changing and growing product line, information included in this publication is subject to change. If the information included with your system is out of date, updated versions will be available online at gwss.ca or by contacting GroundWorks Safety Systems. At GroundWorks Safety Systems customer satisfaction is of great importance and any feedback is greatly appreciated. Feedback can be sent to GroundWorks by filling out and faxing the below information to GroundWorks or sent by email to Sales@GWSS.CA.

CUSTOMER:		**MODEL :**	
FABRICATION DATE:		**SERIAL #:**	
CUSTOMER PHONE:		**CUSTOMER EMAIL:**	

Feedback:

PLATFORM
PRODUCT MANUAL



PREFACE

Thank you for purchasing a GroundWorks platform. Contained within this product manual are detailed documents pertaining to safe use procedures, proper maintenance procedures, specifications and parts breakdowns of the GroundWorks platform.

Please read and understand this manual in its entirety to ensure the performance and safety of your GroundWorks platform. Read and follow all precautionary notes included to ensure the health and safety of surrounding workers. Failure to do so could result in serious injury or death.

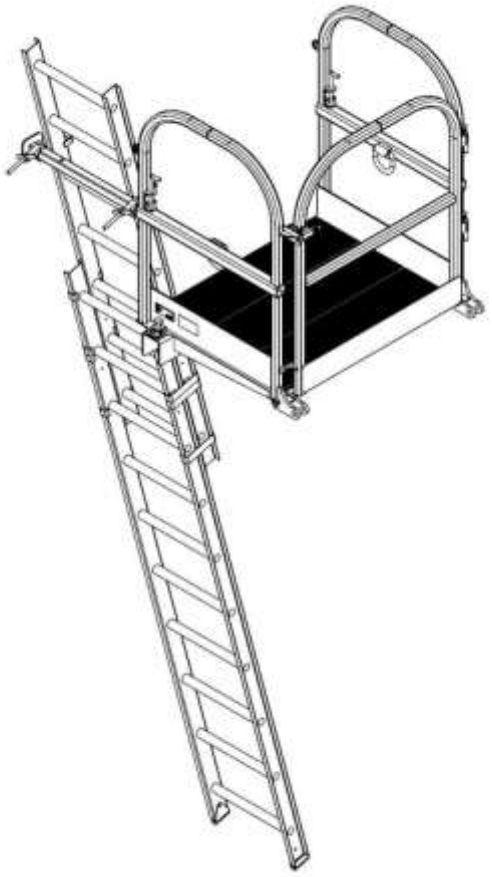
Any questions related to this product that cannot be answered by this text should be directed to your rental company or GroundWorks customer service at 1-403-227-1001.

CONTENTS

PLATFORM PRODUCT OVERVIEW

The GroundWorks platform is designed to allow safe entry and exit from the GroundWorks Trench Box System. The GroundWorks platform is rated for 300 lb (136kg) when installed and used in accordance with GWSS documentation. The GroundWorks platform is design to work with a wide variety of ladders using the included ladder clamps.

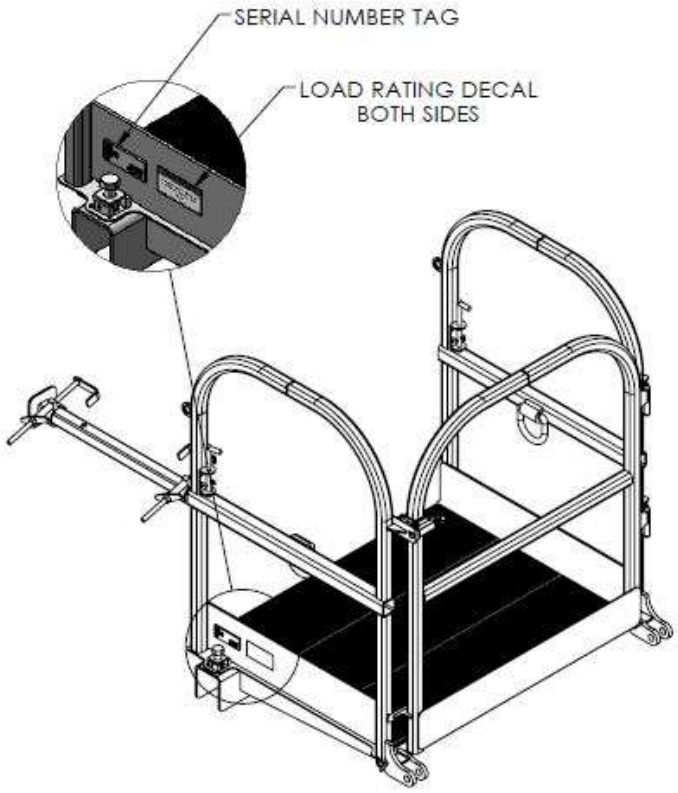
Figure 1: Platform



SERIAL NUMBER AND DECALS

Every GroundWorks platform will have a serial number tag on the side of its main weldment. The main weldment of the platform will also have a load rating decal on both sides.

Figure 2: Platform Serial Number Tags and Decals



GENERAL SAFETY

READ MANUAL PRIOR TO INSTALLATION

Improper Use of this system may result in serious injury or death. **All personnel working on and around the platform should read this manual thoroughly before use. Failure to perform these tasks as outlined in this manual may result in serious injury or death.**

READ AND UNDERSTAND ALL SAFETY STATEMENTS

Read all safety decals and safety statements in all manuals prior to use of this system. Know and obey all relevant regional safety regulations, laws, and any other professional guidelines pertaining to system use.

KNOW YOUR SYSTEM

Know your system's capabilities, specifications, and assembly procedures before use. Visually inspect the entire system before every use. Check that all hardware and connecting devices are properly installed and secure. Remove and replace any damaged, fatigued, or excessively worn parts as soon as they become apparent. All personnel working with and around the platform should be properly trained, experienced and supervised.

DO NOT MODIFY SYSTEM

Modifications may impair the function, safety, life, and performance of the system. Do not alter or remove any safety equipment from the system. When making repairs, use only the manufacturer's genuine parts and consult GroundWorks to obtain authorized instructions. Failure to do so may void warranty and may result in serious injury or death.

SAFE LIFTING AND TRANSPORTATION PRACTICES

- Do not exceed the lifting capacity of your lifting machine when moving or assembling the platform.
- Ensure all lifting equipment (e.g. chains, slings, wire rope, hooks and clevises) are rated for loads applied during transporting, assembly and disassembly of the platform.
- Never stand under the system, any of its components, or lifting equipment if it is moving or suspended in air. All personnel should be clear of system during movement. GroundWorks recommends using tag lines to assist in the guiding of suspended equipment.

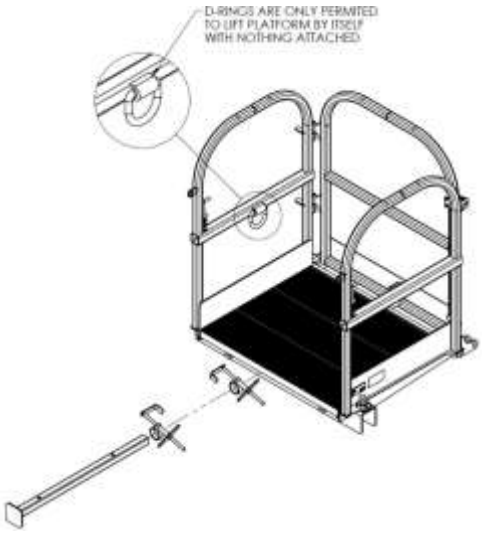
MAINTAINING THE PLATFORM SYSTEM

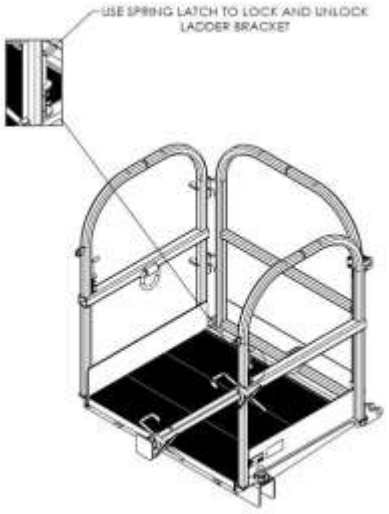
- Before performing any maintenance, ensure the system is placed in a stable position.
- Ensure all personnel performing any maintenance or inspections on the system are qualified and authorized to do so.
- After performing any maintenance or repair, check that the system is in proper working condition. If problems affecting performance and/or safety are discovered, the defect component must be immediately removed from service.
- A proper maintenance and inspection schedule must be developed, performed, and documented on a regular basis. Refer to page 146 for recommended inspection procedures.

USERS OF INDUSTRIAL SHIELDING SYSTEMS ARE RESPONSIBLE FOR CONSTRUCTING AND ENFORCING SAFETY PROGRAMS THAT ARE SPECIFIC TO THEIR APPLICATION. COMPLIANCE TO LOCAL SAFETY CODES MUST BE MAINTAINED WITHIN SUCH PROGRAMS. GROUNDWORKS CANNOT PREDICT EVERY SITUATION THAT MAY INVOLVE HAZARDS, THEREFORE THE WARNINGS AND GUIDELINES PRESENTED IN THIS MANUAL DO NOT CONSTITUTE A COMPREHENSIVE SAFETY PROGRAM.

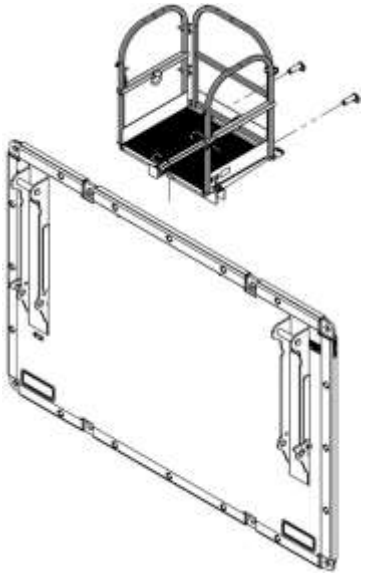
PLATFORM ASSEMBLY INSTRUCTIONS

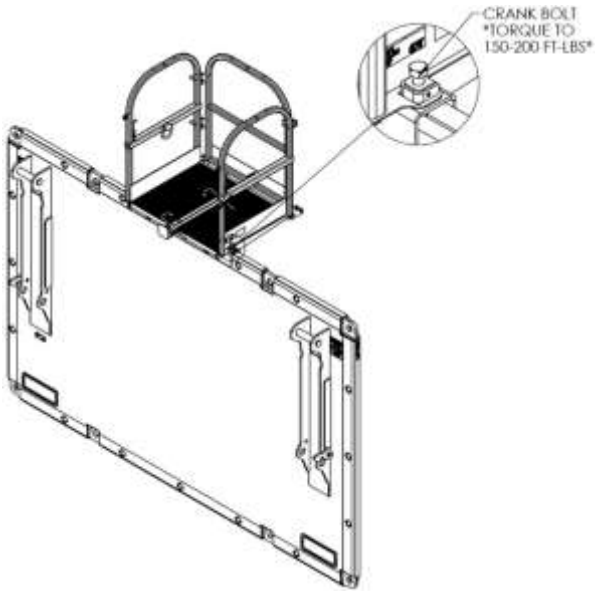
1. Attach bracket and ladder clamps to the main weldment.



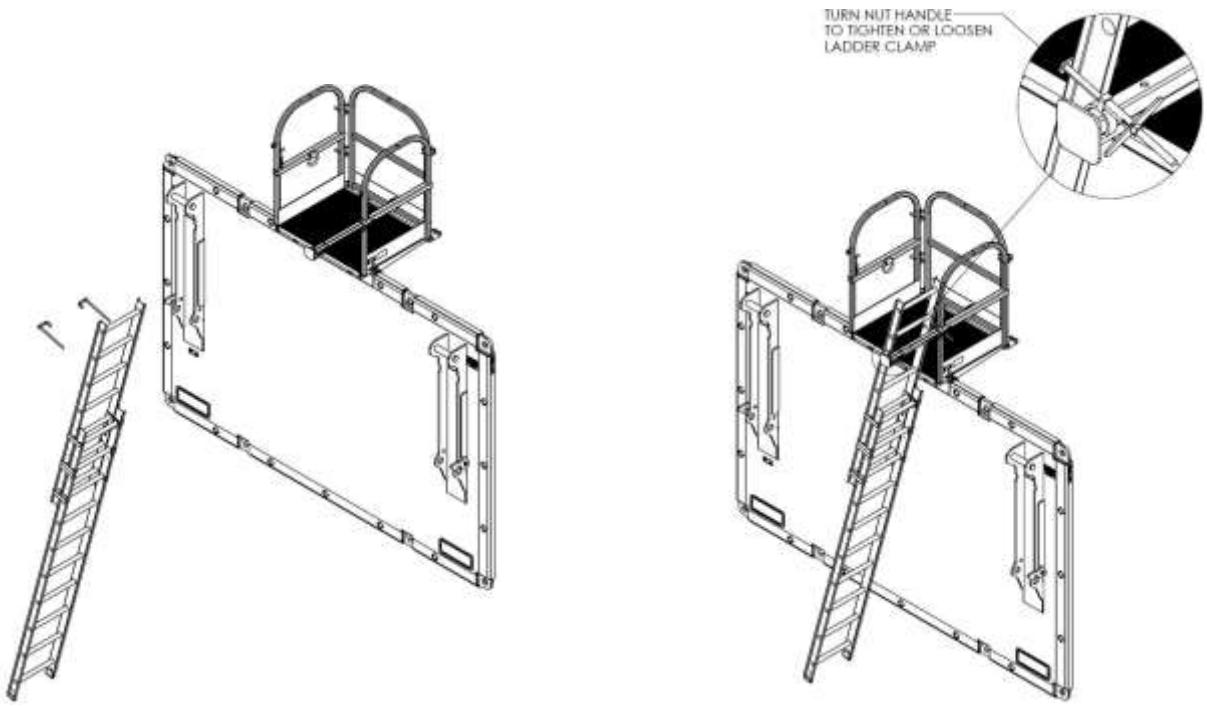


2. Lower platform onto panel and use perimeter pins to lock platform into position.
Then tighten crank bolts to ensure platform is secure.

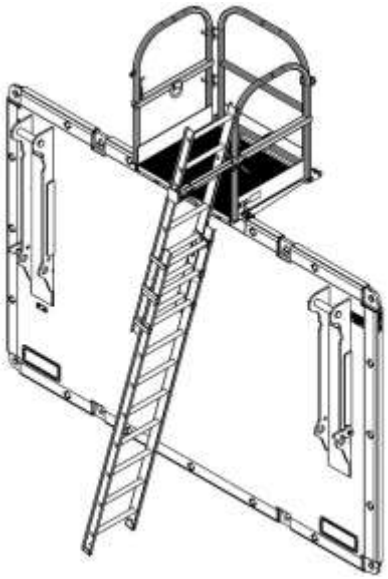




3. Rest ladder onto the platform bracket and use the ladder clamps to secure ladder.



4. Ensure all connections are secure before using the platform or ladder, or injury may result.



MAINTENANCE

The following procedures and information outline the recommended inspection to confirm your GroundWorks platform is in proper working condition. A general visual inspection should be done prior to installation and before any personnel use the platform. Use the **GroundWorks Platform Inspection Checklist** (after Inspection Procedure) to aid in, and document, every inspection.

Any Parts of the platform that have damage affecting the safety and functionality of the product shall be removed from service until appropriate repairs are completed. Clean the platform prior to inspection to ensure no problems are overlooked. Contact GroundWorks if any excessive damage is discovered to determine the appropriate repairs. Any repair not authorized in writing by GroundWorks Safety Systems voids all tabulated data and warranty. When replacing worn components, use only genuine GroundWorks parts.

Inspection Procedure

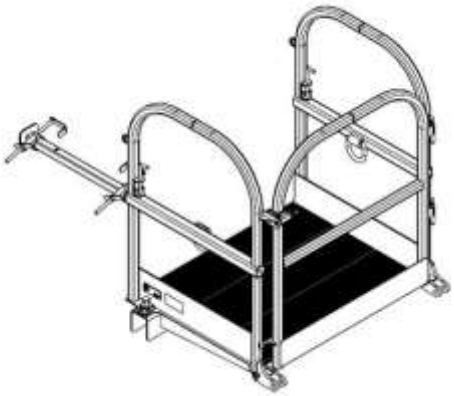
1. Ensure all required parts are present.
2. Check ladder for damaged rungs and rails.
3. Check platform gate to ensure latch is working properly.
4. Ensure ladder clamps are securely holding ladder in place.
5. Check platform weldments for weld cracks and deformation.
6. Ensure that all connections and fasteners are secure.
7. Ensure platform channel is fully engaged onto panel.
8. Ensure crank bolts are fully tightened to hold platform to panel.
9. Ensure no damage affecting the safety and functionality of the system is present.

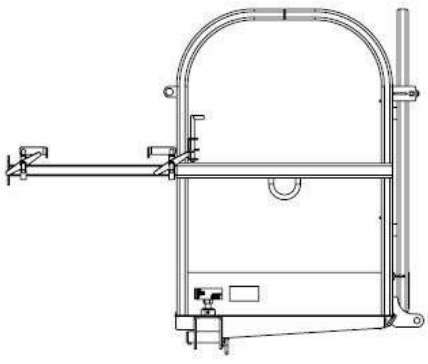
GROUNDWORKS PLATFORM INSPECTION CHECKLIST

GROUNDWORKS PLATFORM INSPECTION CHECKLIST

INSPECTOR:_____	DATE:_____
PLATFORM MODEL:_____	UNIT SERIAL:_____

ITEM	PASS	FAIL
1. ALL PARTS PRESENT		
2. DAMAGE TO LADDER RUNG AND RAILS Check for Cracking and Deformation		
3. PLATFORM GATE Check Functionality of Latch		
4. LADDER BRACKET AND CLAMPS Check Ladder is Securely Held in Place		
5. PLATFORM WELDMENTS Check for Cracking and Deformation		
6.CONNECTIONS AND FASTENERS Secured and Undamaged		
7.PLATFORM FULLY ENGAGED ONTO PANEL Check for Misalignment or Gaps		
8. CRANK BOLTS TIGHT Check for Play		
9. CRACKING, WEAR OR DEFORMATION General		

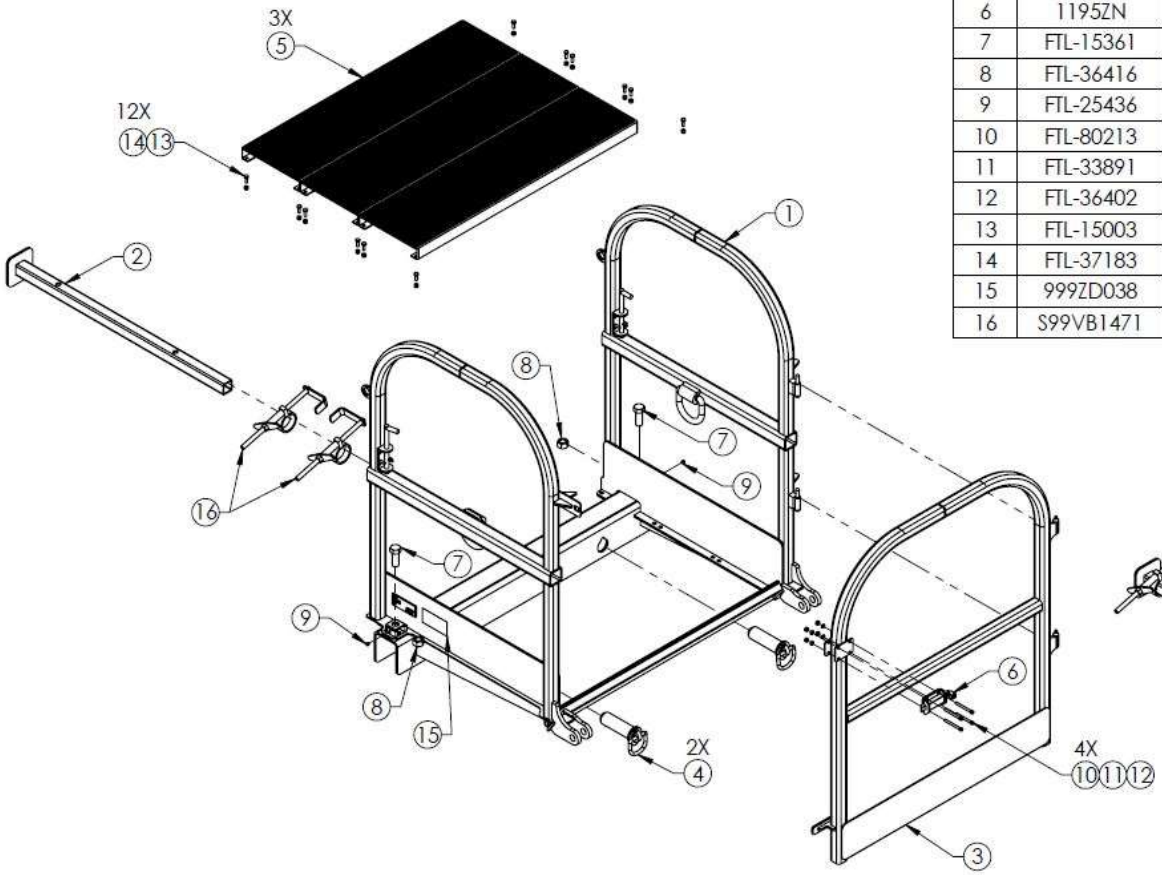


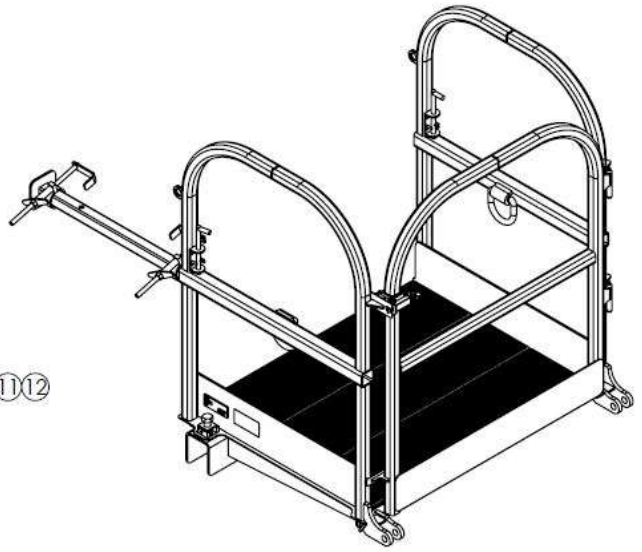


PARTS BREAKDOWNS

PLATFORM

ITEM	Part Config	DESCRIPTION	QTY
1	S99VB1365	WLDMNT_PLATFORM_SHORING_BIGBOX	1
2	S99VB1375	WLMDNT_BRACKET_SHORING_BIGBOX	1
3	S99VB1382	WLDMNT_GATE_SHORING_BIGBOX	1
4	CB1033	WLDMNT_PERIMETER PIN_SHORING_BIGBOX	2
5	S99VB1374	GRATE_PLATFORM_SHORING_BIGBOX	3
6	1195ZN	SLAM LATCH WITH COVER & 0.75 BOLT EXTENSION	1
7	FTL-15361	HEX CAP SCREW GR-8 YZF - 0.7500-10 X 2.000 X 1.375	2
8	FTL-36416	HEX NUT GR-8 YZF - 0.7500-10	2
9	FTL-25436	SOCKET SET SCREW CUP POINT - 0.3125-18 X 0.313	2
10	FTL-80213	SOCKET HEAD CAP SCREW 0.25-20x2.5x1.5	4
11	FTL-33891	LOCK WASHER REGULAR YZF - 0.2500	4
12	FTL-36402	HEX NUT GR-8 YZF - 0.2500-20	4
13	FTL-15003	HEX CAP SCREW GR-8 YZF - 0.2500-20 X 0.750 X 0.750	12
14	FTL-37183	NUT_NYLOCK_0.25-20_YELLOW ZINC_GR.8 LOAD	12
15	999ZD038	DECAL_LOAD RATING	2
16	S99VB1471	ASMBLY_LADDER CLAMP_SHORING_BIGBOX	2





UNLESS NOTED OTHERWISE TOLERANCES ARE AS FOLLOWS:
LINEAR : ±1/16 < 10'-0" HOLE CENTERS : ±.005"
±1/8 < 20'-0" FORMING : ±.030"
±1/4 > 20'-0" ANGULAR : ±.5°
DO NOT SCALE DRAWING / DIMENSIONS ARE IN INCHES

WEIGHT: 250.00 lbs | MATERIAL: _

CAD FILE: Z:\Design\Vault Files\Shoring\WEBSITE RENDERING MODELS\ACCESSORIES\PLATFORM\

DATE PLOTTED: October-19-17

SCALE: 1:19
DATE: 17/05/2017
DWN: RRG
CHK: _
SHEET 1 OF 1

GROUNDWORKS SAFETY SYSTEMS
4207 53rd Street Close, Innisfail, Alberta, T4G 1P9

DWG TITLE: ASMBLY_PLATFORM_SHORING_BIGBOX
EPI SERIES: _S99 | EPI PRODUCT: VB SHORING_BIGBOX
MAKE: _ | CONFIG: _
PART NO: AUN27 | DWG NO:

GROUNDWORKS
SAFETY SYSTEMS

GroundWorks Limited Warranty Policy

GroundWorks Safety Systems warrants each new product to be free of defects in material and workmanship. Its obligation under this warranty being expressly limited to repairing, or at manufacturer's option, replacing free of charge at its fabrication facility, or a recognized repair facility the part proving defective under normal use and service within one year after first use, demo, or delivery/shipment to an end user. Approved warrantable repairs performed by persons not employed by GroundWorks will be repaid as a credit to that company's GroundWorks account.

This warranty covers only new and unused products manufactured by GroundWorks Safety Systems.

Parts claimed to be defective and for which repair or replacement is desired shall be, if requested by GroundWorks, returned transportation prepaid to, GroundWork's fabrication facility for inspection.

LIMITATIONS

GroundWorks is not responsible for failures resulting from normal wear and tear or:

- Any use which GroundWorks judges improper.
- Improper or careless installation, usage, storage or handling, as to any and all of which the manufacturer will be the sole judge.
- Accessories, items, and parts not sold by GroundWorks.
- Abuse, neglect, accident, changes to the product not authorized by GroundWorks, and/or improper repair/maintenance.
- User's unreasonable delay in making the product available after being notified of a potential product problem.

Products not manufactured by GroundWorks are covered only by the warranty extended to GroundWorks by its suppliers.

Completion of warranty repair work does not change or extend this warranty in any way.

Distributors agree to extend only the above warranty to their customers. In the event a distributor offers a customer any additional warranty such as by extending the scope or period of warranty, undertaking a warranty of fitness for any particular purpose, or any other obligation not encompassed in GroundWork's warranty, then the distributor shall be solely responsible for any warranty requirements and shall have no recourse against GroundWorks with respect to said warranty work.

GROUNDWORKS RESPONSIBILITIES

If a defect in material or workmanship is found during the warranty period, GroundWorks will, during normal hours and at a place of business of a GroundWorks dealer or other authorized source:

- Provide (at GroundWork's choice), new or remanufactured or GroundWorks-approved, replacement parts to correct the defect.
- Provide labor needed to correct the defect.

USER RESPONSIBILITIES

The user is responsible for:

- The costs associated with transporting the product.
- Labor costs, except as stated under "GroundWorks Responsibilities".
- Local taxes, if applicable.
- Parts shipping charges in excess of usual surface transportation cost as charged by scheduled carriers.
- Costs to investigate complaints unless the problem is caused by a defect in GroundWorks material or workmanship; subject to "GroundWorks Responsibilities" above.
- Any costs resulting from failure to give GroundWorks timely notice of a warrantable failure and promptly making the product available for repair.

All notices given under or pursuant to this agreement shall be in writing and emailed to sales@gwss.ca or sent postage prepaid to GroundWorks Safety Systems, 4207 53rd Street Close, Innisfail Alberta, T4G1P9.

No terms or conditions, other than those stated herein and no agreement or understanding, oral or written, which in any way purports to modify this warranty, shall be binding on GroundWorks, unless approved in writing by a GroundWorks representative.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE AND THE OBLIGATION AND LIABILITY OF GROUNDWORKS UNDER THIS WARRANTY SHALL NOT INCLUDE ANY TRANSPORTATION OR OTHER CHARGES OR THE COST OF INSTALLATION OR ANY LIABILITY FOR DIRECT, INDIRECT OR CONSEQUENTIAL DAMAGES OR DELAYS RESULTING FROM THE DEFECT.

WARRANTY CLAIM PROCEDURE

Before Any Work Is Started

1. Read the Limited Warranty policy
2. Contact GroundWorks for a claim number. When a failure occurs you must notify GroundWorks immediately to obtain authorization to carry out repair. You must provide:

- A description of the fault, an idea of the cause, and a possible repair procedure. Recommended repairs are to be discussed and agreed to by GroundWorks in writing.
- An estimate of repair hours and costs must be established (exclusive of parts provided by GroundWorks).
- An opportunity for GroundWorks personnel to travel by first available public transportation to the site to examine the problem and/or make repairs.

NOTE: Time limit on date of failure to date of report should be within 3 full working days – Saturday, Sunday, and bank holidays not included. Repair parts will be ordered by customer purchase order at this time. Parts will be invoiced by GroundWorks and reimbursed under the terms of this warranty policy if applicable.

After Repairs Are Completed

1. Fill out the Warranty Claim form.
2. Return all damaged parts prepaid to GroundWorks unless directed otherwise by GroundWorks (Damaged parts become the property of GroundWorks).Warranty Claim forms must include:

- GroundWorks product serial number.
- Model and Description of the GroundWorks product.
- Date claim is prepared.
- Delivery date to the original user.
- Date of failure and repair.
- Period of use on the product.
- Your internal reference or claim number.
- An accurate accounting of the work done. Photographs from before and after the repair are helpful in investigating the failure and help expedite your claim.
- Your work order or other documentation to support your claim.
- A listing of parts and raw materials used in the repair. (Please note that we cannot reimburse for parts not purchased from GroundWorks).

NOTE:

1. Only claims with a claim number will be considered.
2. Claim numbers must be obtained before repair work is started.
3. We will not reimburse you for copies of GroundWorks parts you have made elsewhere.
4. Travel time and mileage is not covered by our warranty.
5. We allow $80.00 per hour for warranty work.
6. Failure to observe any of the above procedures could result in a delay of your claim.

NOTES

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CUSTOMER:		**MODEL :**	
FABRICATION DATE:		**SERIAL #:**	
CUSTOMER PHONE:		**CUSTOMER EMAIL:**	

Feedback: