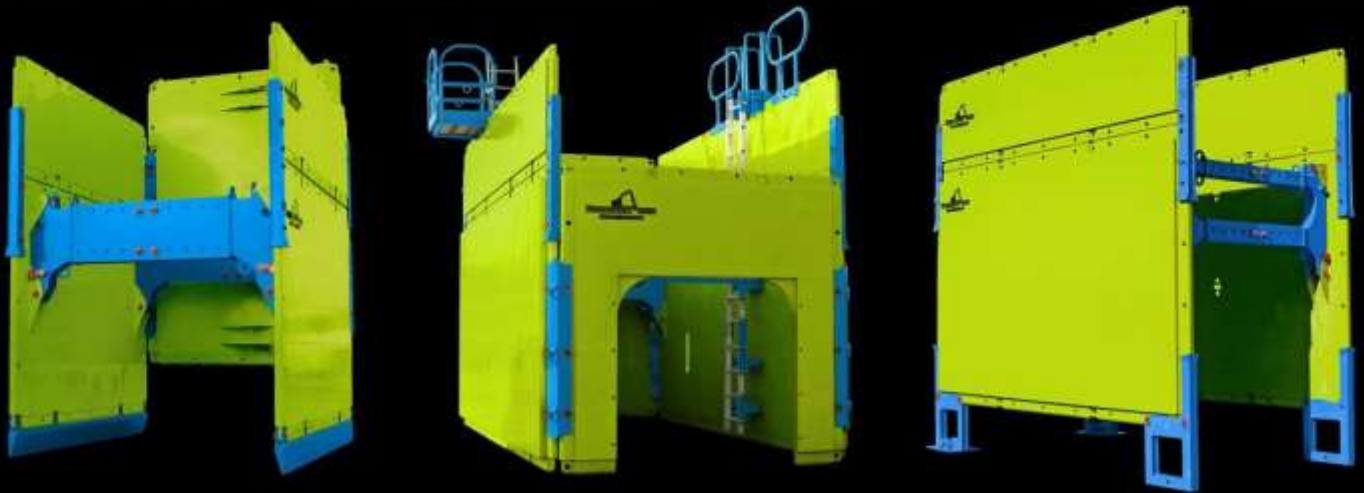




UTILITY LINE TRENCH BOX MANUAL



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 manual should be directed to your Rental Company or GroundWorks Customer Service at 1-403-227-1001.



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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 20 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.

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 Utility Line (UL) Trench Box System is composed of two main components; the panels which provide protection against the wall of the trench, and the strut system which provides the support between the panels. The strut system varies depending on depth requirements and panel sizes. 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.

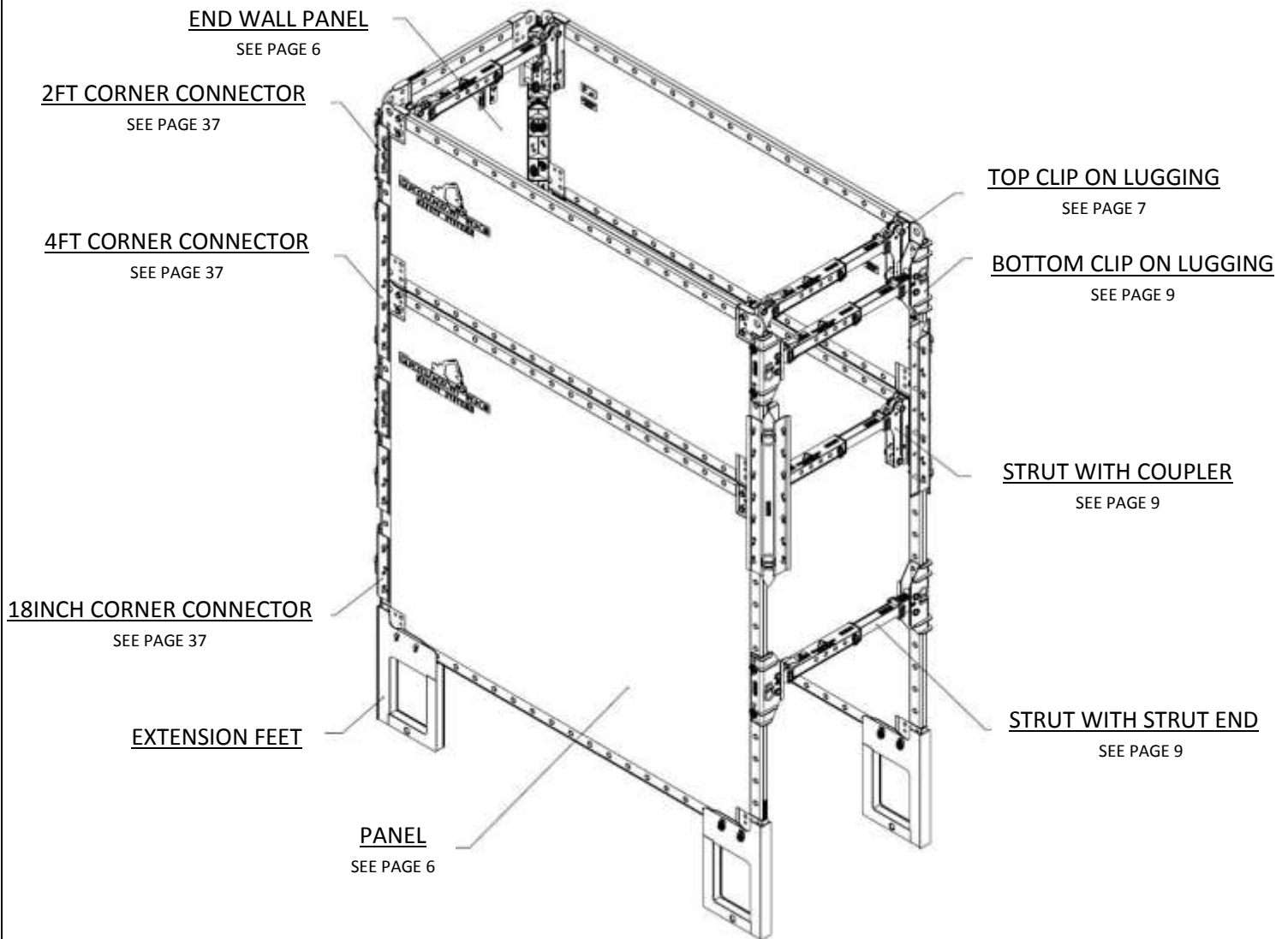


Figure 1: Example of a GroundWorks UL Trench Box

GROUNDWORKS PANELS

Due to the high tensile steel construction, there are 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 UL 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. GroundWorks UL panels can be used in any orientation due to the reversible panel construction, meaning there is no structural difference from one side to the other. GroundWorks recommends fastening the lugging to the same side as the serial number plate in case panel information is required during use.

The panel's serial number tag will be located on the inside of the panel, as shown below. 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.

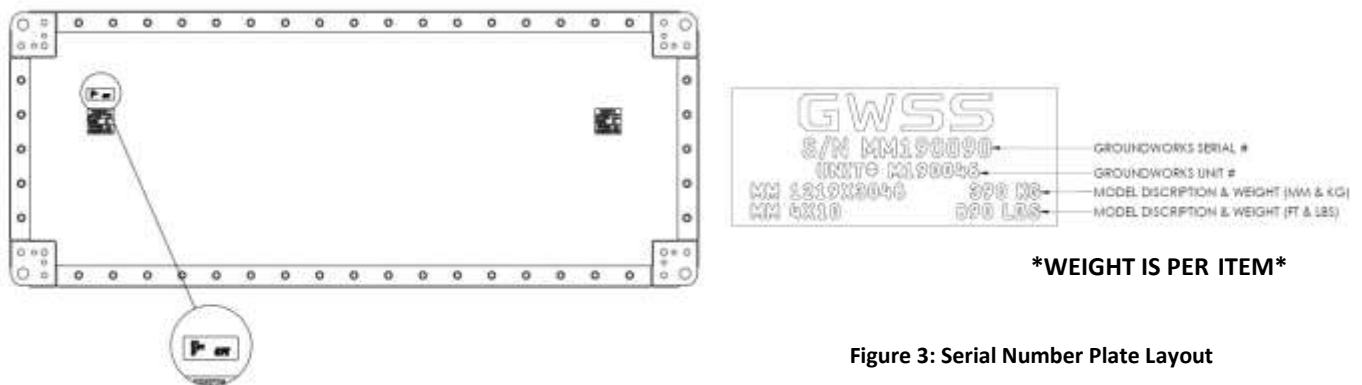


Figure 2: Serial Number Plate Location

The panel's unit number tag will be located on the inside of the panel, 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.

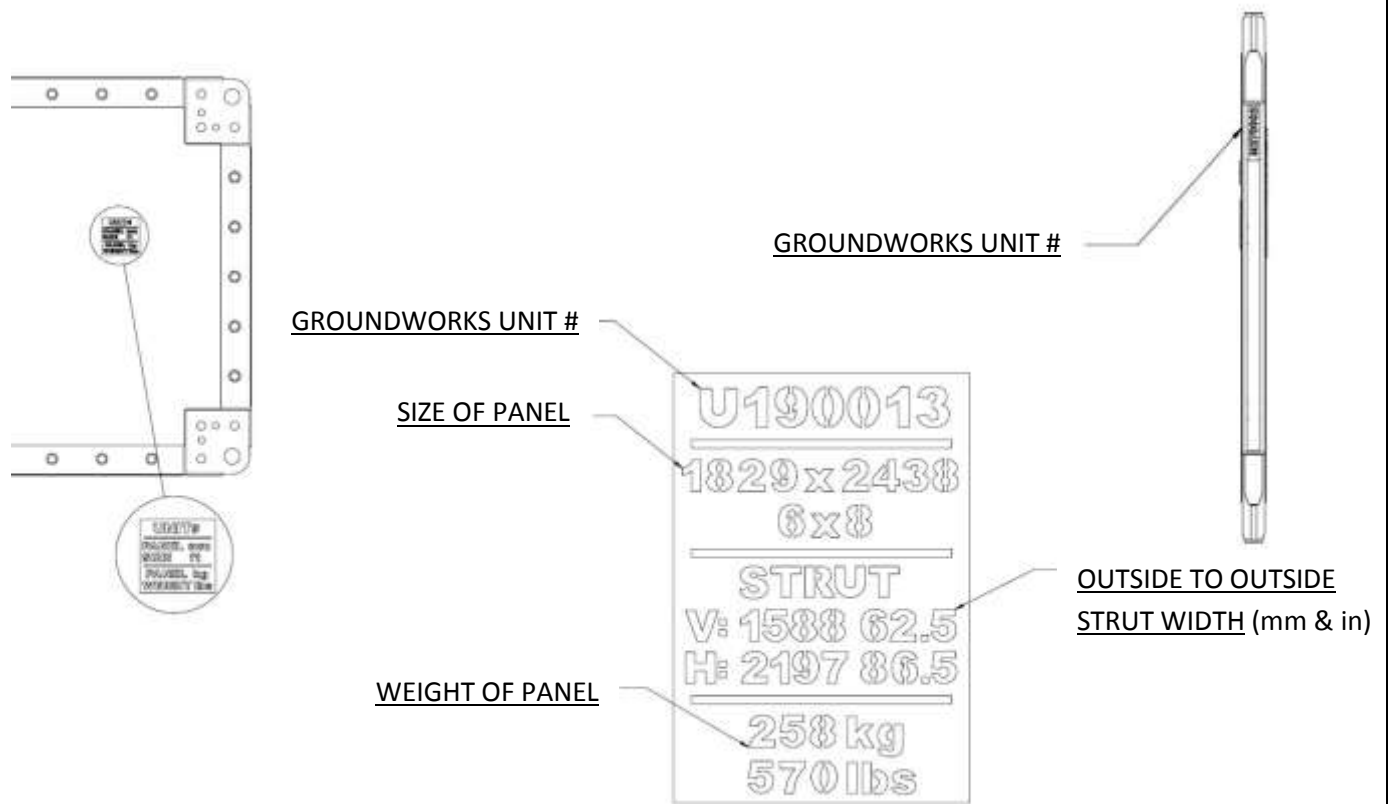


Figure 4: Unit Number Tags

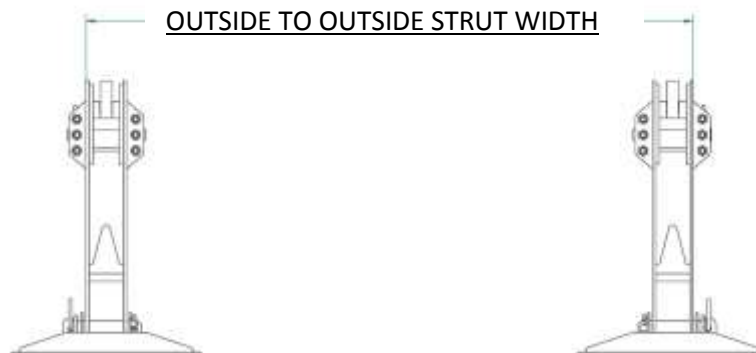


Figure 5: Outside to Outside Strut Width

GROUNDWORKS CLIP ON PANEL LUGGING

GroundWorks Clip on panel lugging allows the user to use the panel in both orientations, for example, the same panel can create a 2'(H)x6'(L) panel or a 6'(H)x2'(L) panel. The top clip on lugging must be installed prior to use while the bottom clip on lugging is installed once the box is assembled. Depending on the panel depth required, the user might require 2 bottom struts to be used. This is explained further in the tabulated data section (See page 14).

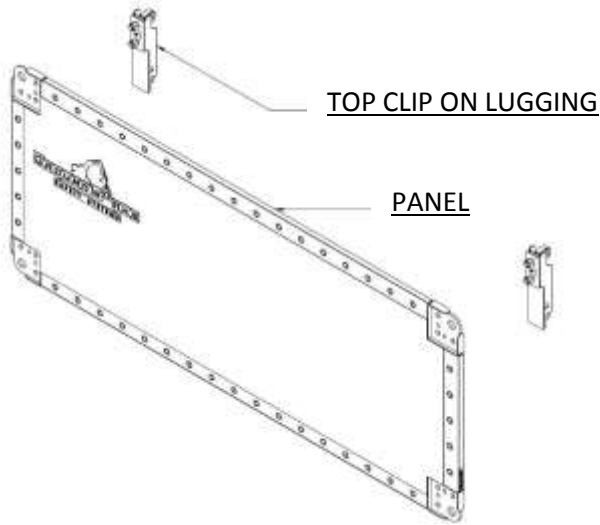


Figure 6: Clip On Lugging to Panel

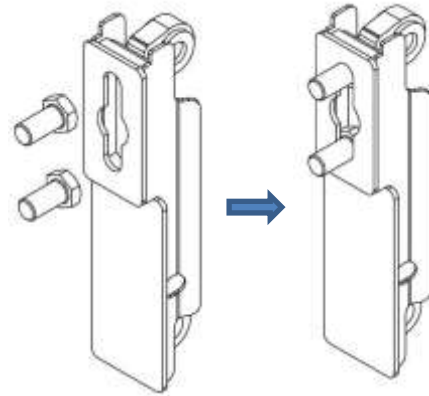


Figure 7: Clip On Lugging Assembly - Step 1

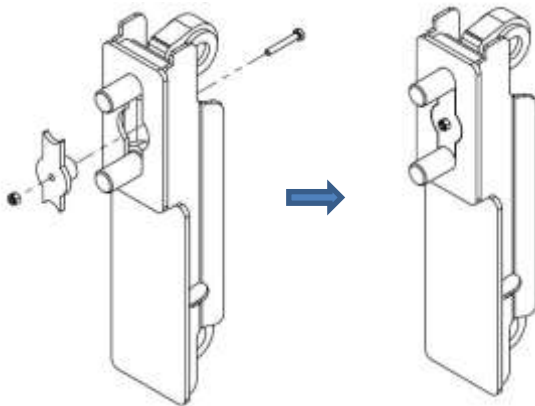


Figure 8: Clip On Lugging Assembly - Step 2

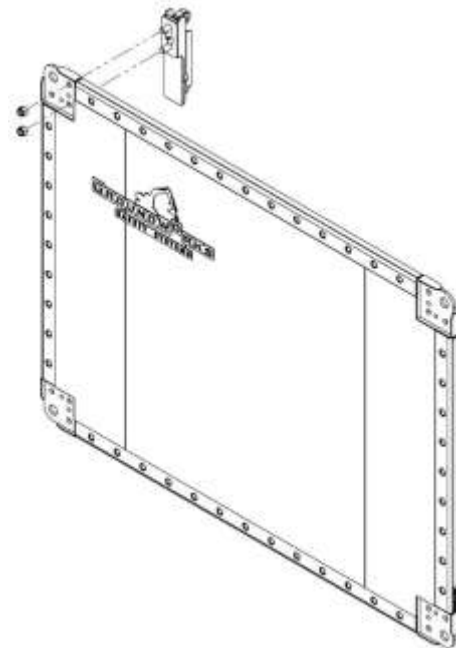


Figure 9: Clip On Lugging Assembly - Step 3

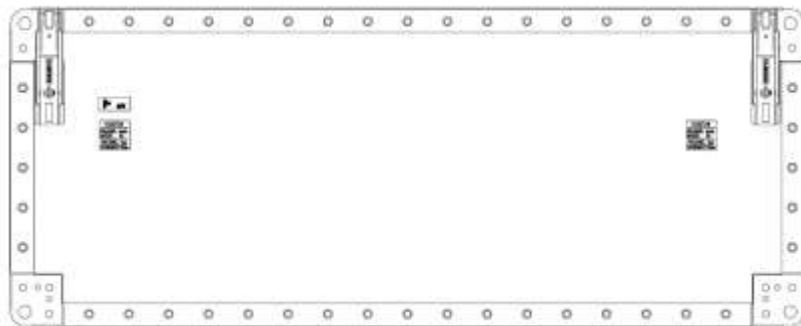


Figure 10: Clip On Lugging Secured to Inside of Panel

Clip On lugging must be firmly secured to the panel using Nylock nuts (1-7/16" wrench req'd) until the two surfaces are lightly contacting, but still allow sliding between the two surfaces. This allows the clip on lugging to freely align with the strut coupler during box assembly.

GROUNDWORKS UTILITY LINE STRUTS

GroundWorks UL Struts are manufactured with interchangeable sections in order to increase versatility and utilization. The strut assembly consists of an upper and lower assembly. Only the upper strut is used for assembly. Once assembled the lower strut is then installed onto the system. The two main components of the upper strut assemblies 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 assembled. The two main components of the lower strut assemblies are the strut ends, located on each end of the strut assembly, and the strut tubes as described above.

The series of each component is indicated on the strut ID plate. The strut ID plate will be located on the top of both strut center tubes (See figure 13). The ID plate will display the strut tube series, adjustable tube lengths, and the weight of the single fully assembled strut (See figure 12). The strut coupler serial tag is located on the inside face of the coupler just below where the top tube connects (See figure 13).

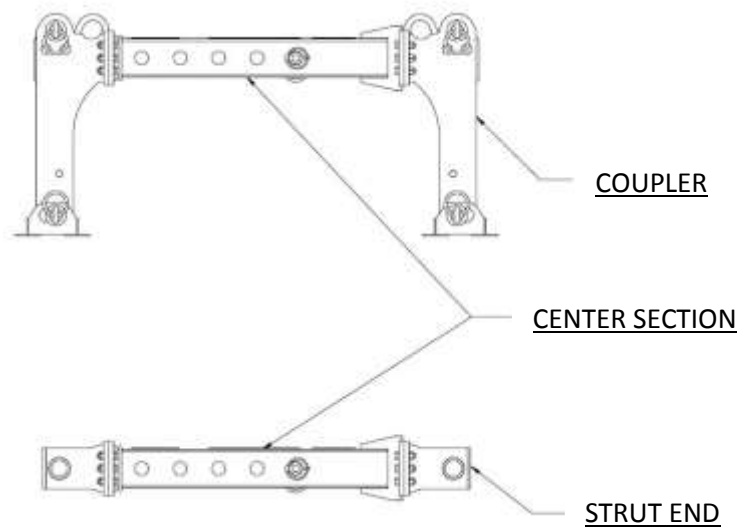


Figure 11: Strut Components

SERIES OF STRUT TUBES

ADJUSTABLE LENGTH OF
STRUT TUBES (mm & in)



WEIGHT OF STRUT

Figure 12: Strut ID Plate Layout

GroundWorks UL 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 when referencing the 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 strut center sections and/or strut slide tubes and couplers to the strut assembly. See Figure 13 for the 10 locations of the serial number identification tags found on adjustable struts.

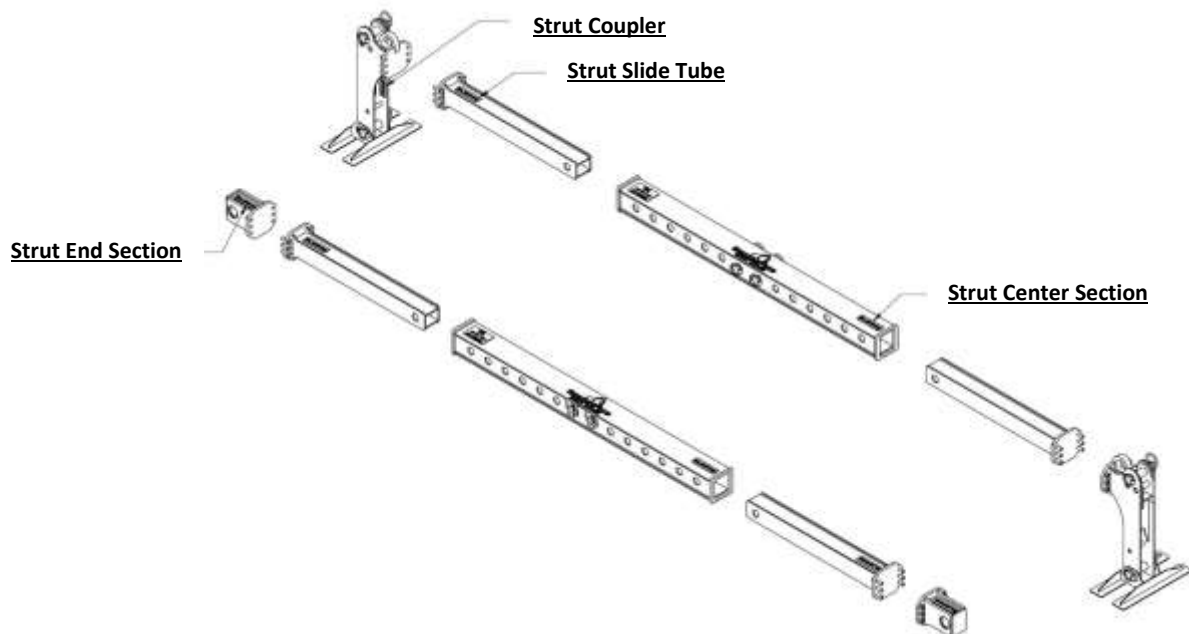


Figure 13: Strut Serial Number Plate Identifying Tag Location

STRUT ASSEMBLY PROCEDURE

1. Identify the coupler along with the correct slide tubes for the required adjustment spread. Fasten slide tubes to the coupler and secure using the provided hardware (9/16" wrench required). Repeat step 1 for the second coupler. Torque hardware to 37 ft/lb.

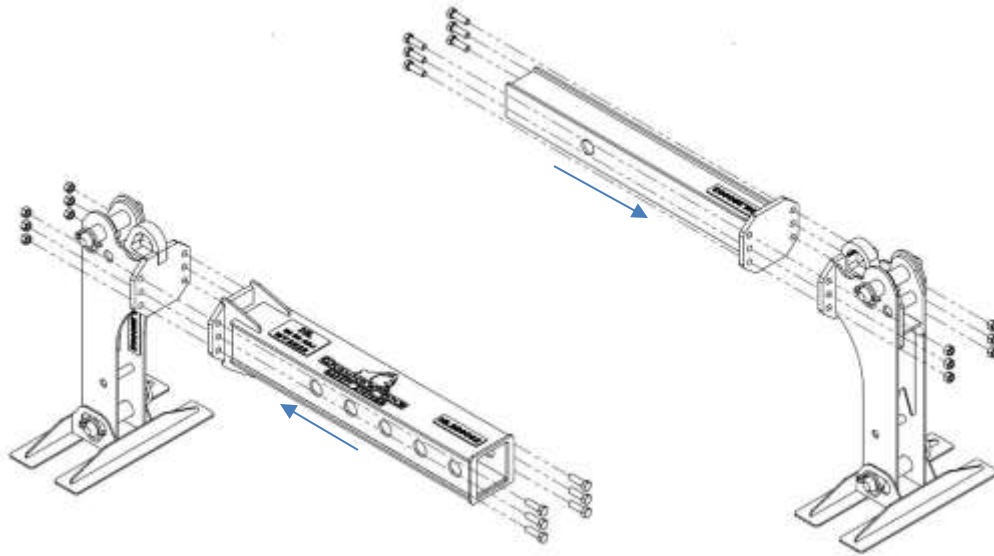


Figure 14: Strut Assembly - Step 1

2. Select desired width by removing pin from center tube.

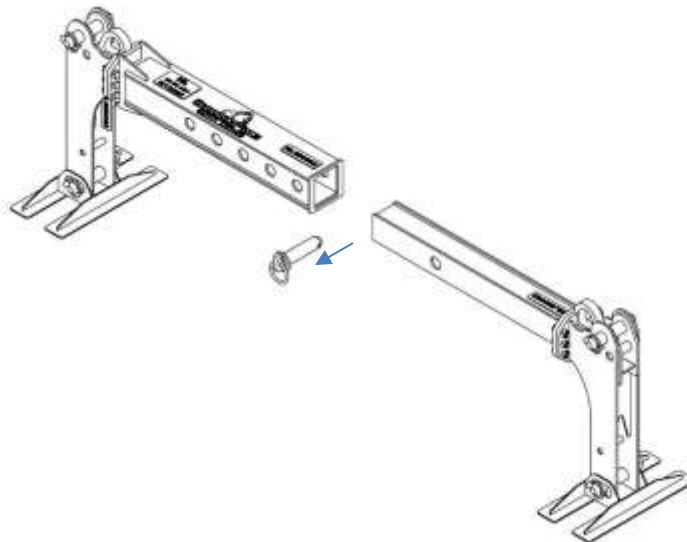


Figure 15: Strut Assembly - Step 2

3. Repeat step 2 for bottom strut assembly. Make sure that the top and bottom strut assemblies are pinned at the same locations on both the top and bottom. The overall length of the top strut will be different than the overall length of the bottom strut when they are set to the same position. ***It is important that the connector tube be either centered in the assembly or to the nearest three-inch increment***

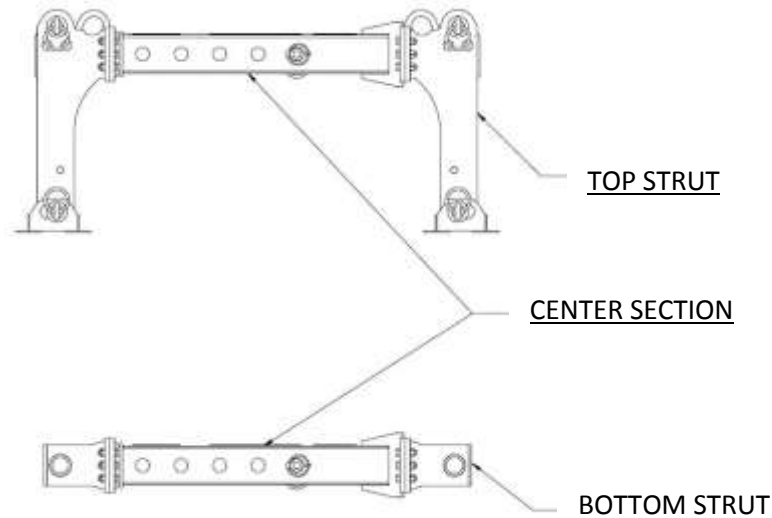


Figure 16: Strut Assembly Step 3

SETTING ADJUSTABLE STRUTS

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

WARNING:

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

1. Remove pin on one side from the center tube.
2. Adjust the strut on disconnected side to the desired width.
3. Reinstall the pin in the center tube.
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 3 inch increment

****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 classes, 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 number will be tied to 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

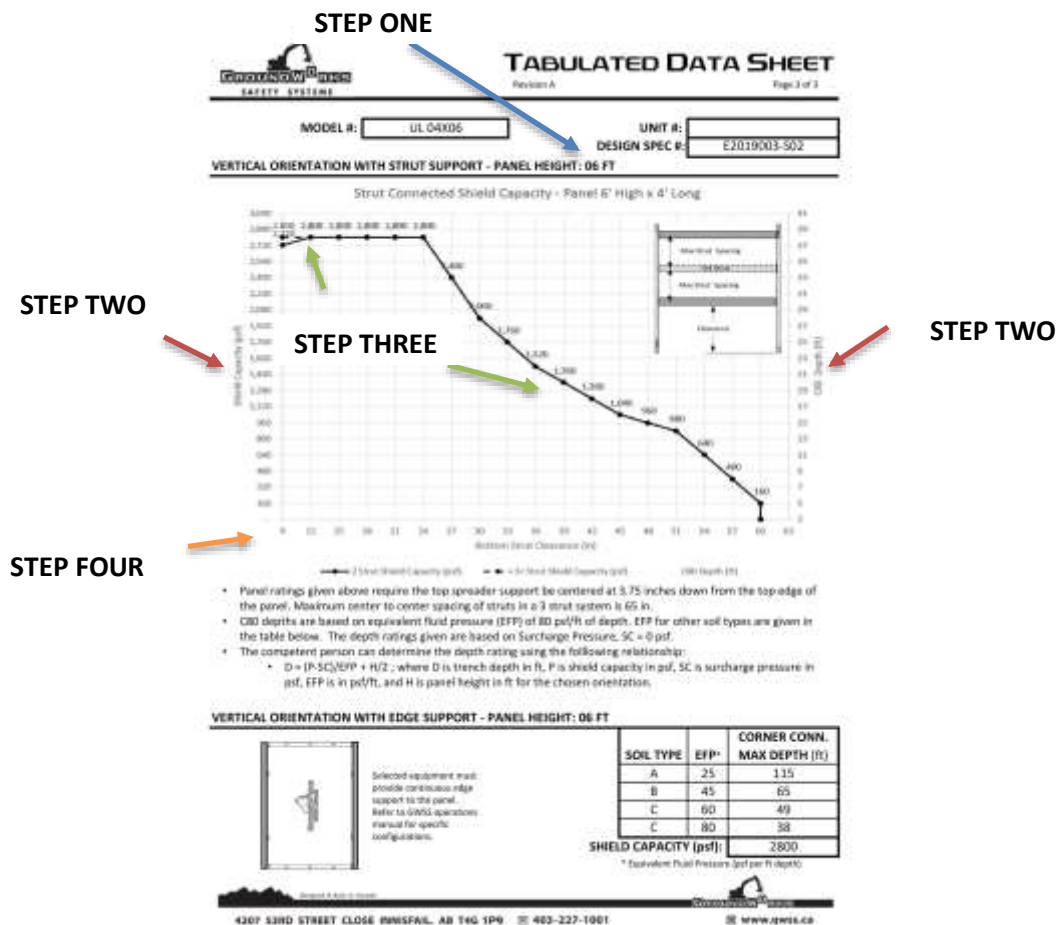
Using this information, the competent individual can reference the tab data associated with the product they have available to ensure that they are operating within the specified parameters.

- All configurations outlined on a GroundWorks tab data sheet are achievable with any strut width selected.



Steps to achieve proper panel capacity:

1. The tabulated data sheets have information for both orientations of the panel. Select the correct sheet for the height of the panel which is denoted at the top of each page above the applicable C-80 depth chart.
2. Choose whether depth or strut clearance is the requirement. Start on the side of the graph that is the requirement:
 - a. For strut clearance you will select the value along the bottom of the graph
 - b. For Panel C-80 depth you will select the value along the right side of the graph
3. Follow the line until it intersects the shield capacity line. NOTE: This line diverges from 2 strut ratings into 3 strut ratings for higher shield capacities.
For 3 strut configurations this requires two bottom strut assemblies. The strut clearance for the 3 strut rating applies to the lower of the two bottom struts. The mid-bottom strut is installed in the center of the upper and lower strut assemblies.
4. Verify panel strut clearance matches tabulated data clearance.



MODEL #:

UNIT #:

FABRICATION DATE:

UNIT WEIGHT:

**SEE BELOW FOR
TAB DATA INSTRUCTIONS**

PANEL DESIGN SPECIFICATION #:

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. Clearance shown assumes a 3" 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.

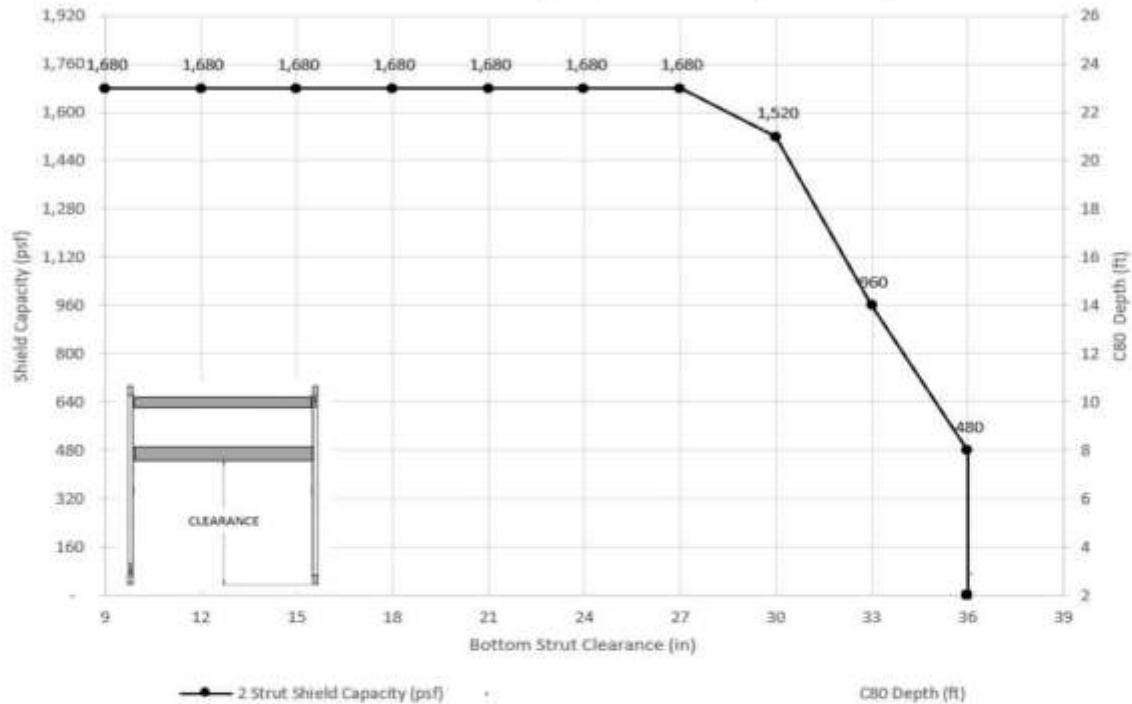
MODEL #: **UL 04X06**

UNIT #:

DESIGN SPEC #: **E2019003-S02**

HORIZONTAL ORIENTATION WITH STRUT SUPPORT - PANEL HEIGHT: 04 FT

Strut Connected Shield Capacity - Panel 4' High x 6' Long



- Panel ratings given above require the top spreader support be centered at 3.75 inches down from the top edge of the panel. Maximum center to center spacing of struts in a 3 strut system is 65 in.
- C80 depths are based on equivalent fluid pressure (EFP) of 80 psf/ft of depth. EFP for other soil types are given in the table below. The depth ratings given are based on Surcharge Pressure, SC = 0 psf.
- The competent person can determine the depth rating using the following relationship:
 - $D = (P - SC) / EFP + H / 2$; where D is trench depth in ft, P is shield capacity in psf, SC is surcharge pressure in psf, EFP is in psf/ft, and H is panel height in ft for the chosen orientation.

HORIZONTAL ORIENTATION WITH EDGE SUPPORT - PANEL HEIGHT: 04 FT



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

| SOIL TYPE | EFP* | CORNER CONN. MAX DEPTH (ft) |
|-----------|------|-----------------------------|
| A | 25 | 69 |
| B | 45 | 39 |
| C | 60 | 30 |
| C | 80 | 23 |

SHIELD CAPACITY (psf): 1680
* Equivalent Fluid Pressure (psf per ft depth)

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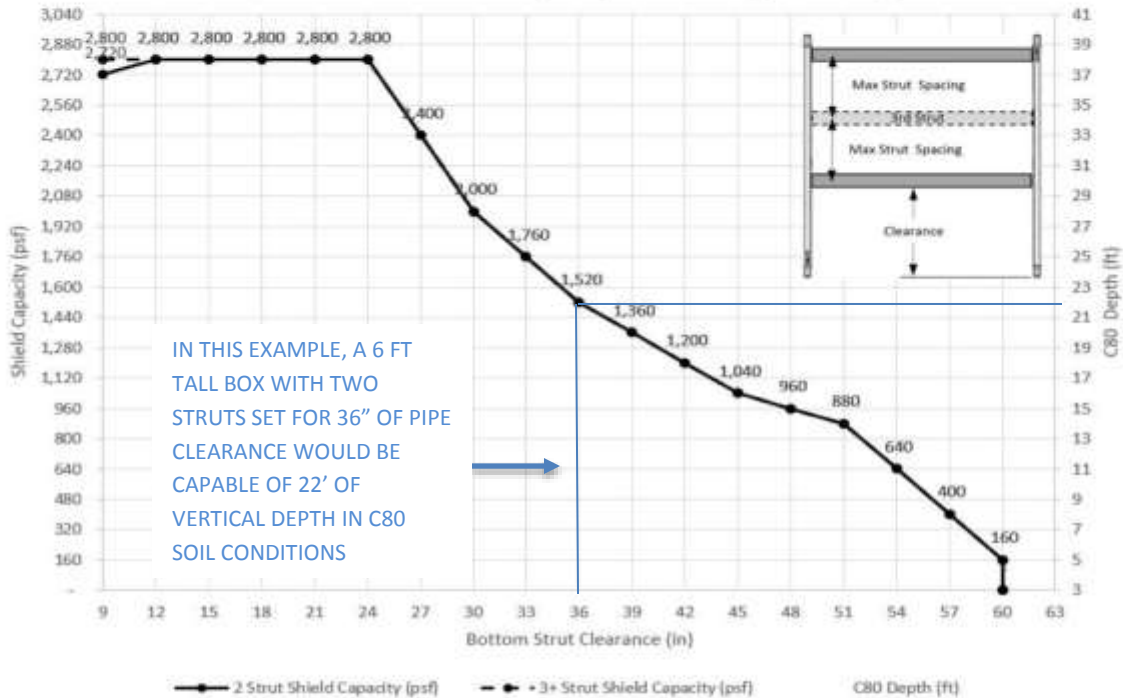
MODEL #: **UL 04X06**

UNIT #:

DESIGN SPEC #: **E2019003-S02**

VERTICAL ORIENTATION WITH STRUT SUPPORT - PANEL HEIGHT: 06 FT

Strut Connected Shield Capacity - Panel 6' High x 4' Long



- Panel ratings given above require the top spreader support be centered at 3.75 inches down from the top edge of the panel. Maximum center to center spacing of struts in a 3 strut system is 65 in.
- C80 depths are based on equivalent fluid pressure (EFP) of 80 psf/ft of depth. EFP for other soil types are given in the table below. The depth ratings given are based on Surcharge Pressure, SC = 0 psf.
- The competent person can determine the depth rating using the following relationship:
 - $D = (P - SC) / EFP + H / 2$; where D is trench depth in ft, P is shield capacity in psf, SC is surcharge pressure in psf, EFP is in psf/ft, and H is panel height in ft for the chosen orientation.

VERTICAL ORIENTATION WITH EDGE SUPPORT - PANEL HEIGHT: 06 FT



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

| SOIL TYPE | EFP* | CORNER CONN. MAX DEPTH (ft) |
|------------------------|------|-----------------------------|
| A | 25 | 115 |
| B | 45 | 65 |
| C | 60 | 49 |
| C | 80 | 38 |
| SHIELD CAPACITY (psf): | | 2800 |

* Equivalent Fluid Pressure (psf per ft depth)

STRUT CLEARANCE

The UL bottom strut allows clearance adjustments in 3 inch increments. To achieve the correct clearance the user needs to be familiar with how the system works. The figure below shows an “X” dimension referred to in the tabulated data as bottom strut clearance.

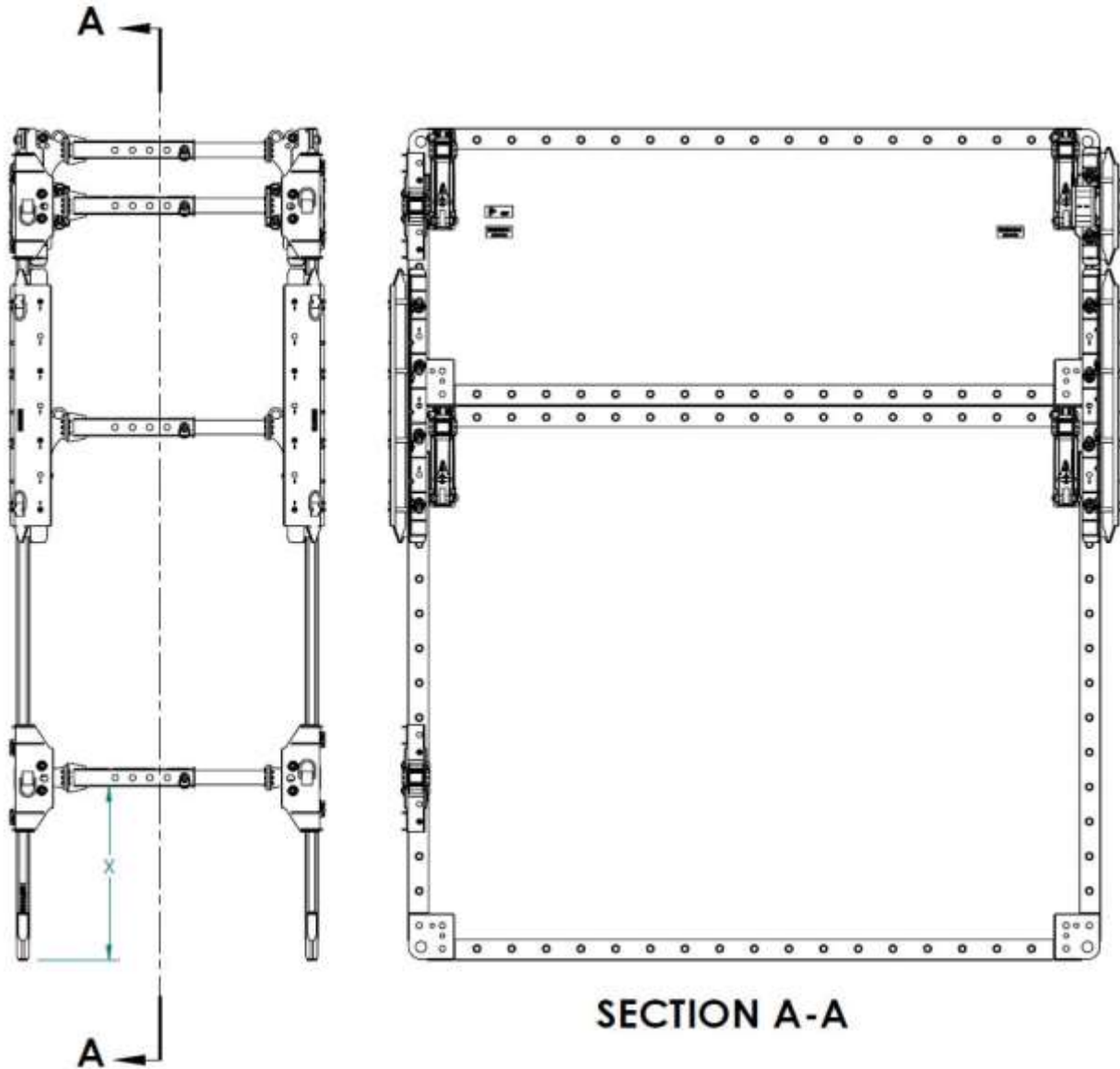


Figure 17: Bottom Strut clearance “X”

The Bottom Clip On Lugging has two sets of holes; a set (Z) for X=odd values (i.e. 9”, 15”, 21”, etc.) and a set (Y) for X=even values (12”, 18”, 24”, etc.) for bottom strut clearance as shown in Figure 18.

LIFTING POINTS

- GroundWorks classifies lifting points into 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 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 ASSEMBLY POINTS FOR REMOVING THE TRENCH BOX FROM EXCAVATION. SEE FIGURE 19 FOR LIFT POINTS ON PANELS AND STRUTS.**

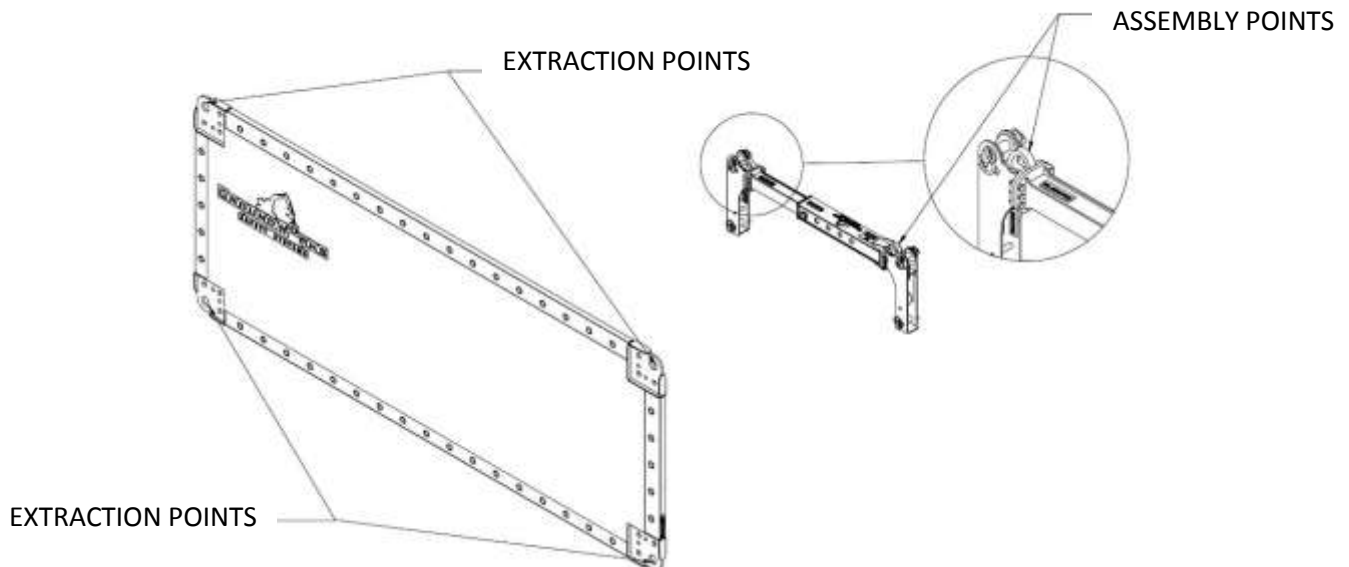


Figure 19: Lift Point Locations

STRUT SPACING

The following will detail the proper procedure to follow when placing struts for box assembly.

1. To set the correct spacing between the struts, match the strut number on the panel unit tag to the distance from outside to outside of struts. Make sure struts are on level and firm ground

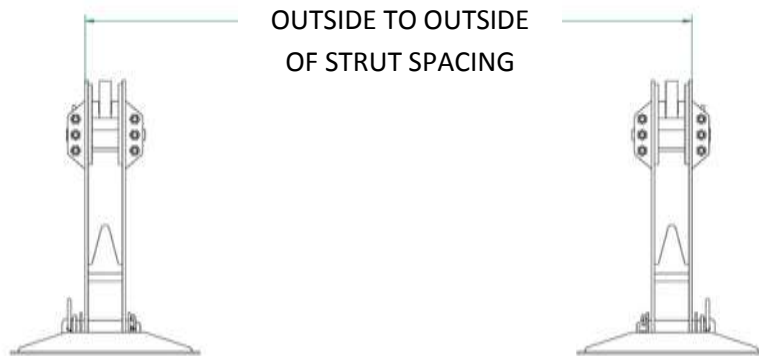


Figure 20: Outside to Outside Strut Spacing

| CLIP ON PANEL LUGGING WIDTH (FT) | OUTSIDE TO OUTSIDE STRUT WIDTH |
|--|--------------------------------------|
| 4 FT | 38.5" |
| 6 FT | 62.5" |
| 8 FT | 86.5" |
| 10 FT | 110.5" |
| 12 FT | 134.5" |

2. Once the correct distance has been set on the first side, check opposite side for correct distance.
3. Struts are ready for installing the panels.

ASSEMBLY

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

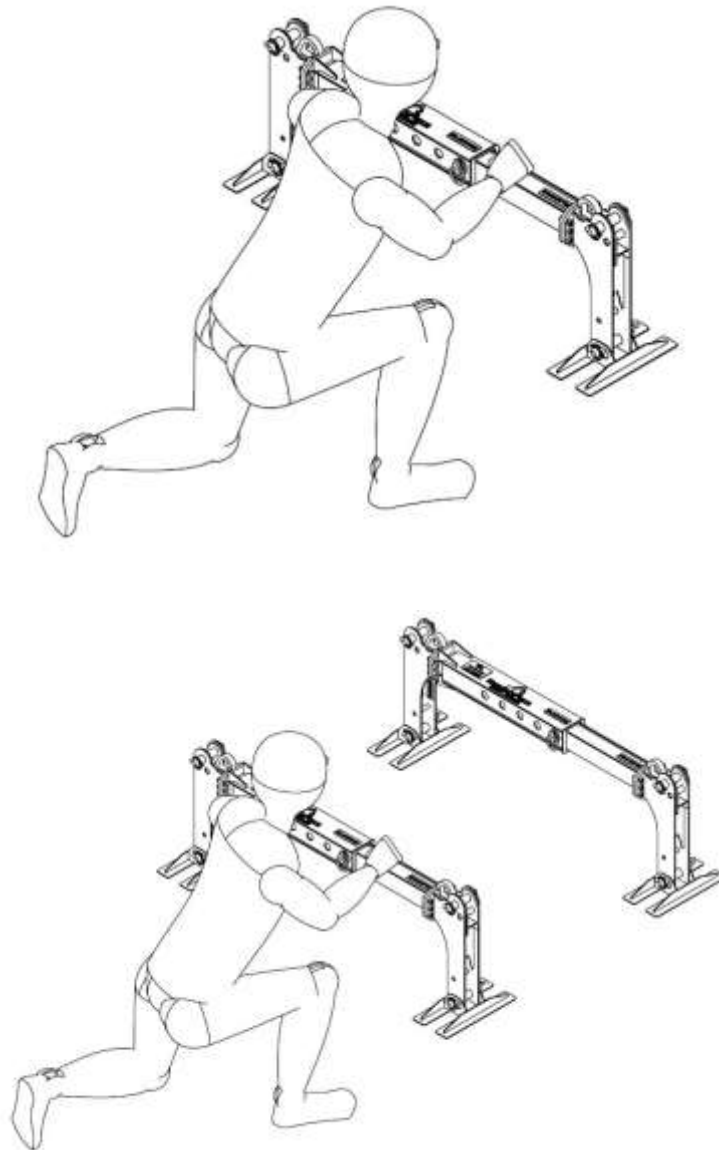


Figure 21: Assembly Step One – Setting Struts in Place

2. Use a measuring device to position struts at correct distance for the panel being used (Refer to panel unit number tag for proper distance). **IF USING ADJUSTABLE STRUTS, SET DESIRED WIDTH AND POSITION BEFORE CONNECTING PANELS (See page 12).**

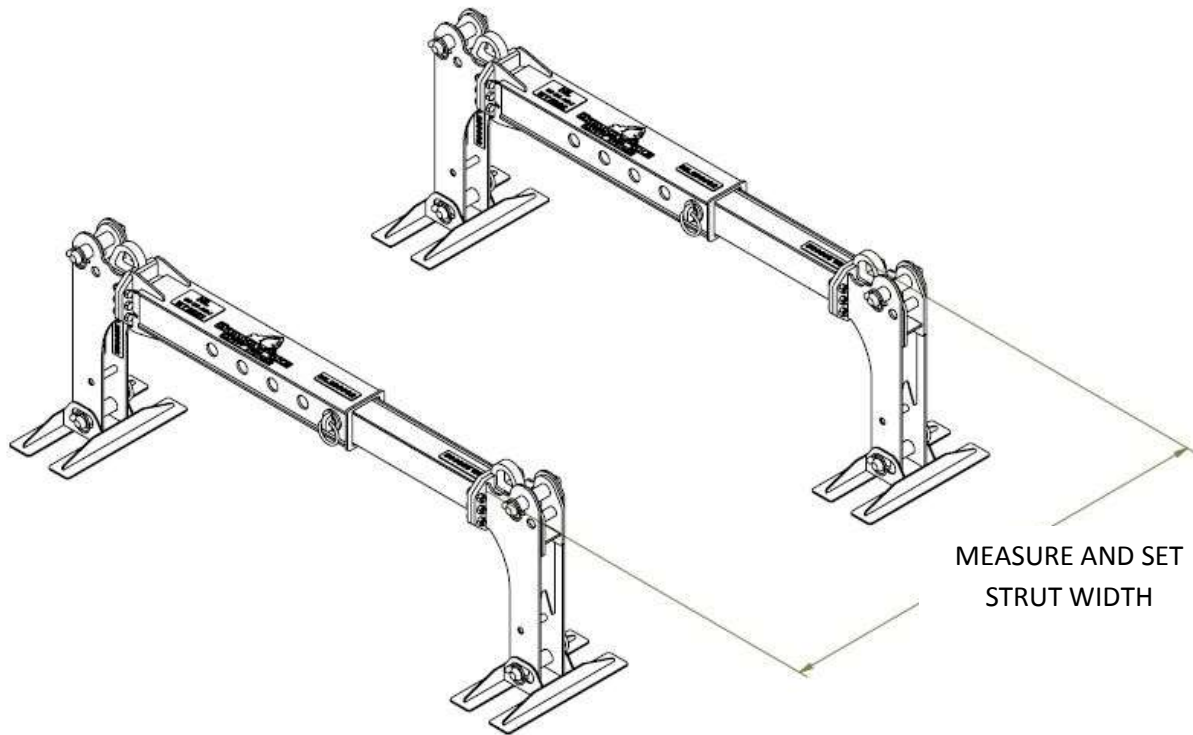


Figure 22: Assembly Step Two – Spacing Struts

3. Ensure the Lock pins are removed from the top catch.

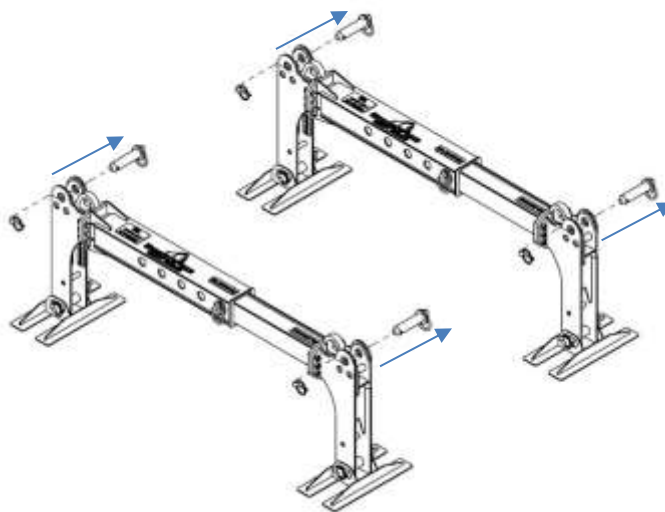


Figure 23: Assembly Step Three – Remove Lock Pin

4. Lower top of panel all the way in to the top catch. Lower the bottom edge of the panel to the ground. Once panel engages catch and panel is on the ground reinstall pin into the secured position.

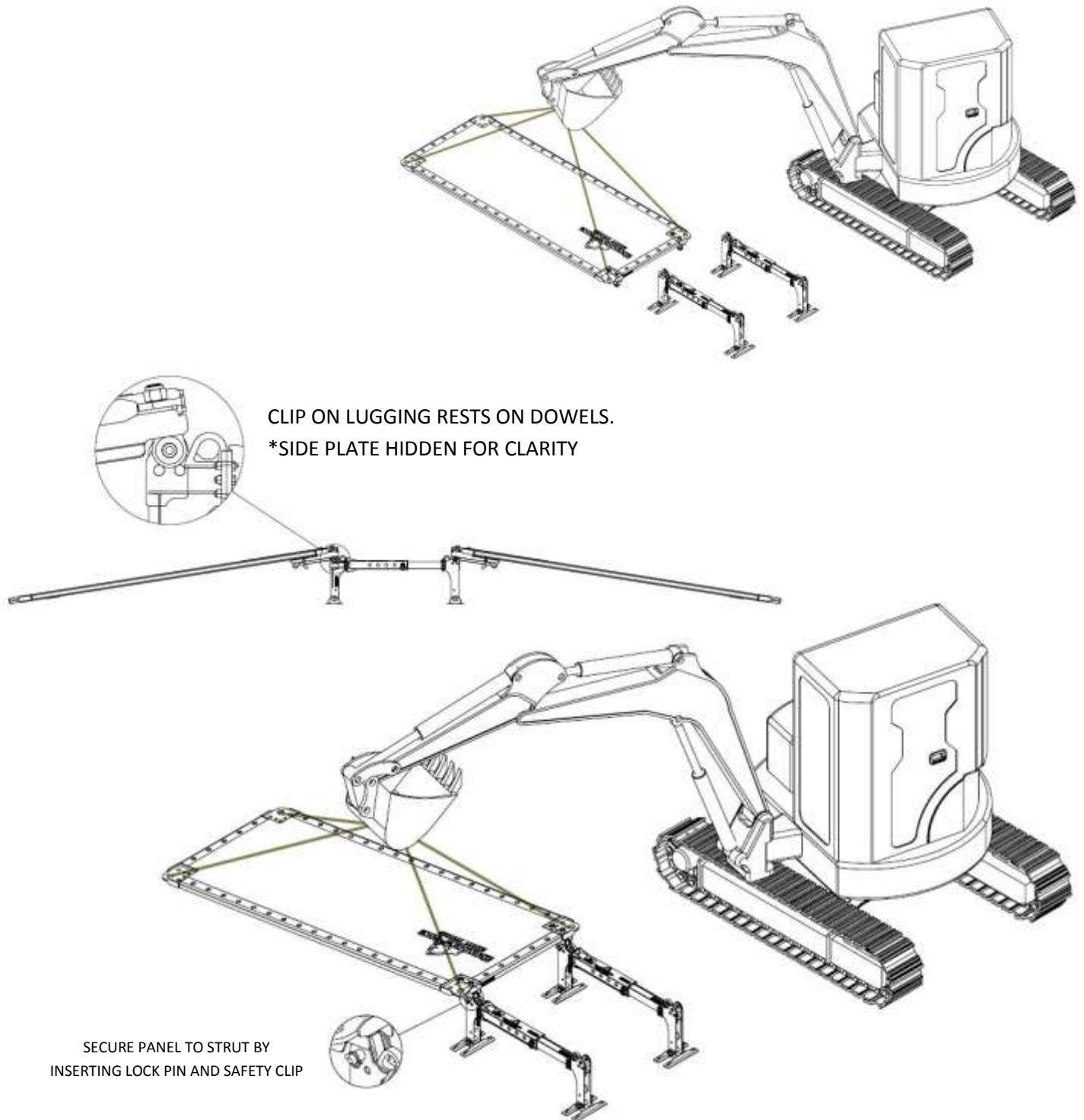


Figure 24: Assembly Step Four – Placing First Panel

5. Repeat steps 3-4 with second panel.

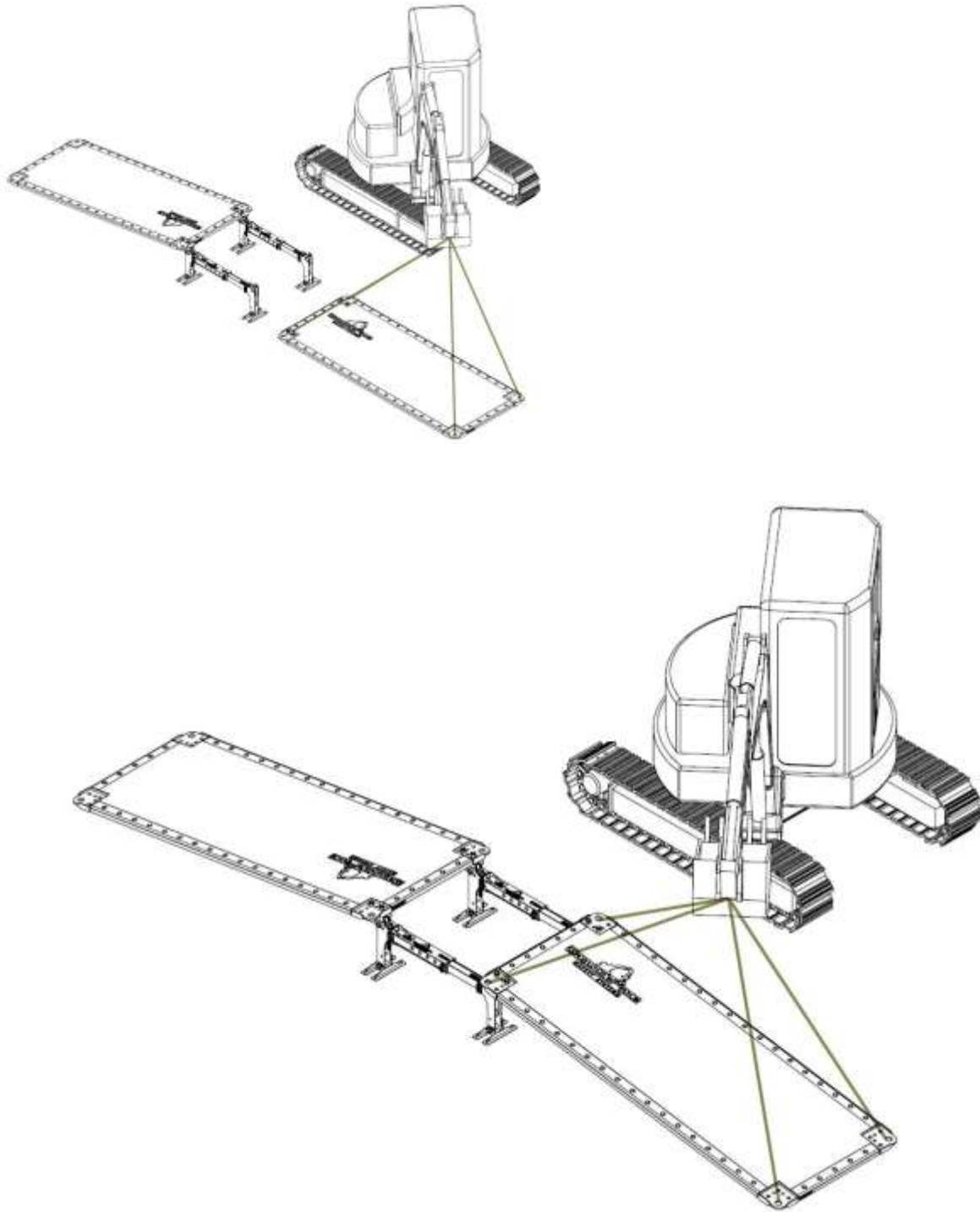


Figure 25: Assembly Step Five – Placing Second Panel

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.

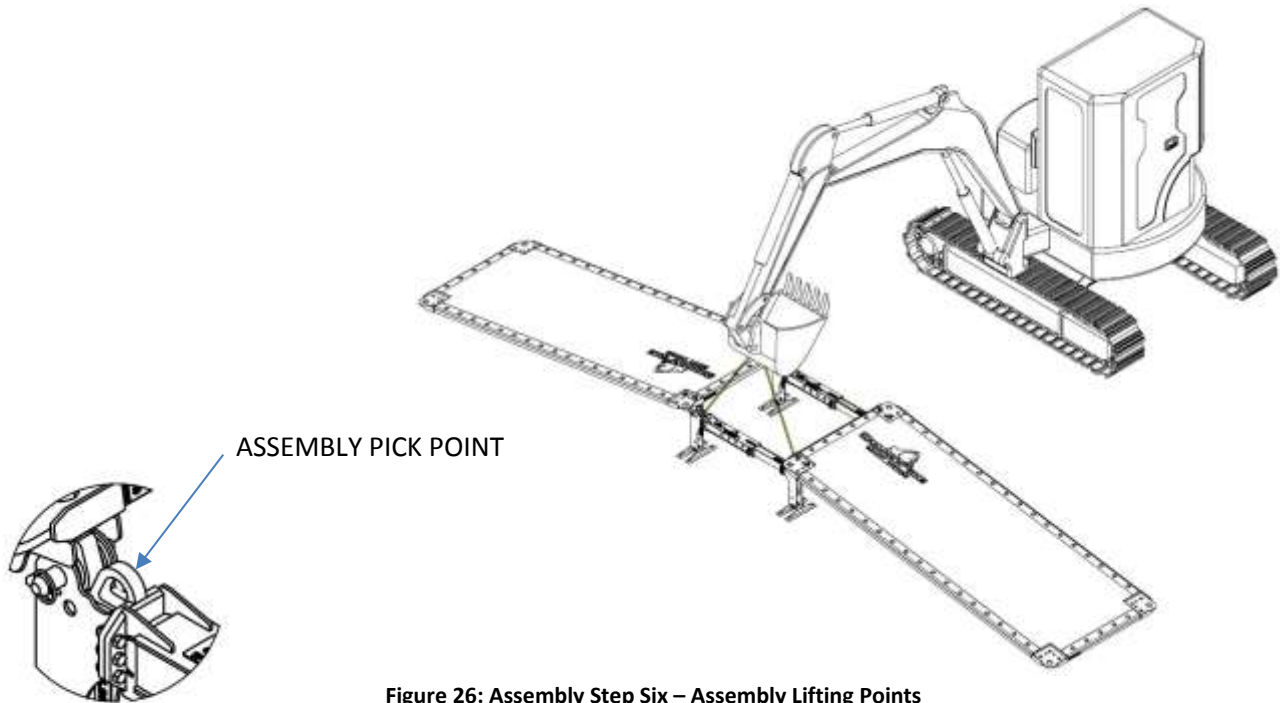


Figure 26: Assembly Step Six – Assembly Lifting Points

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.**

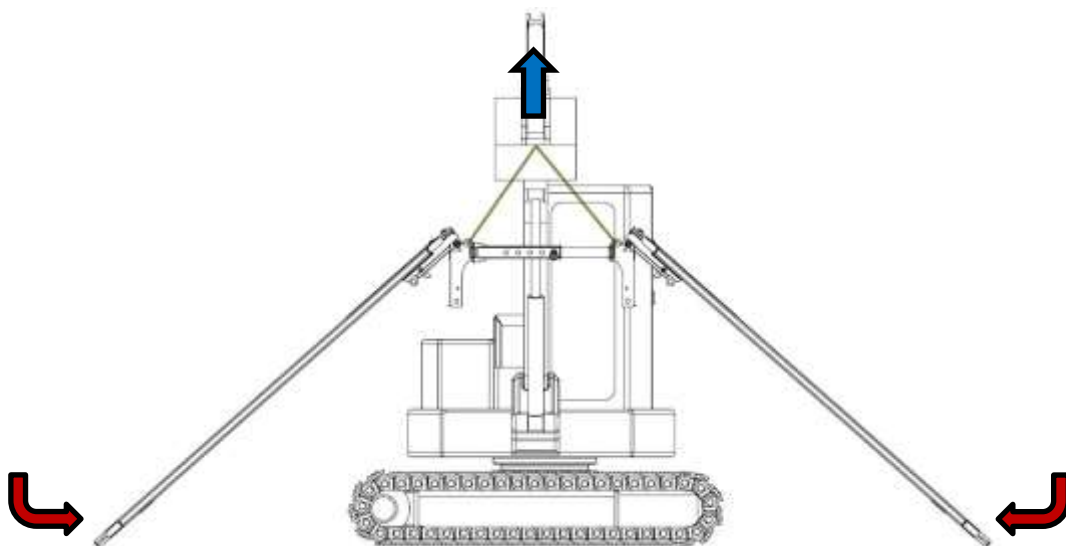


Figure 27: Assembly Step Seven – Lift Panel assembly

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.

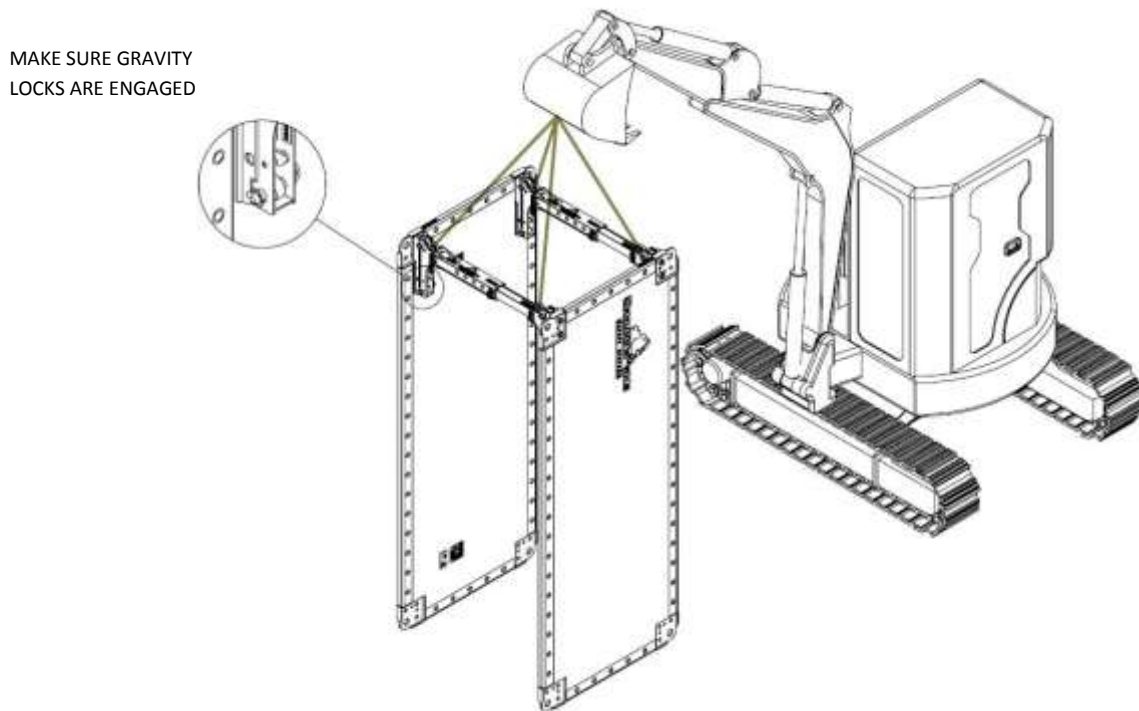


Figure 28: Assembly Step Eight – Securement of the Panels to Top Struts

9. Install bottom clip on lugging at proper location. Lower strut assembly can be installed individually or as one unit.

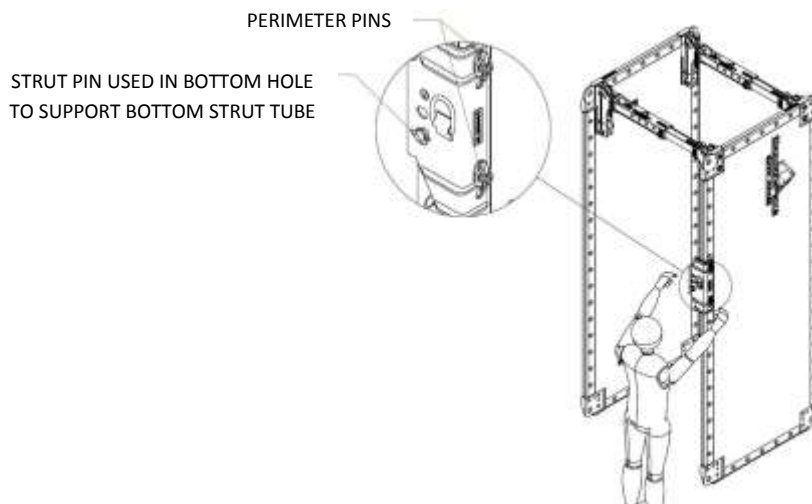


Figure 29: Assembly Step Nine – Install First Bottom Clip On Lugging

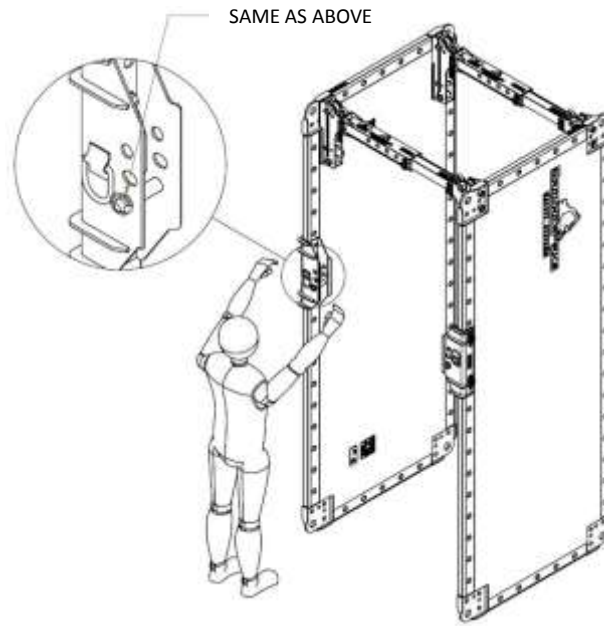


Figure 30: Assembly Step Nine – Install Second Bottom Clip On Lugging

- 10.** Lower bottom strut from the top of the clip on lugging on to the pins shown above. Install lock pin to secure bottom strut to assembly. Repeat for opposite side.

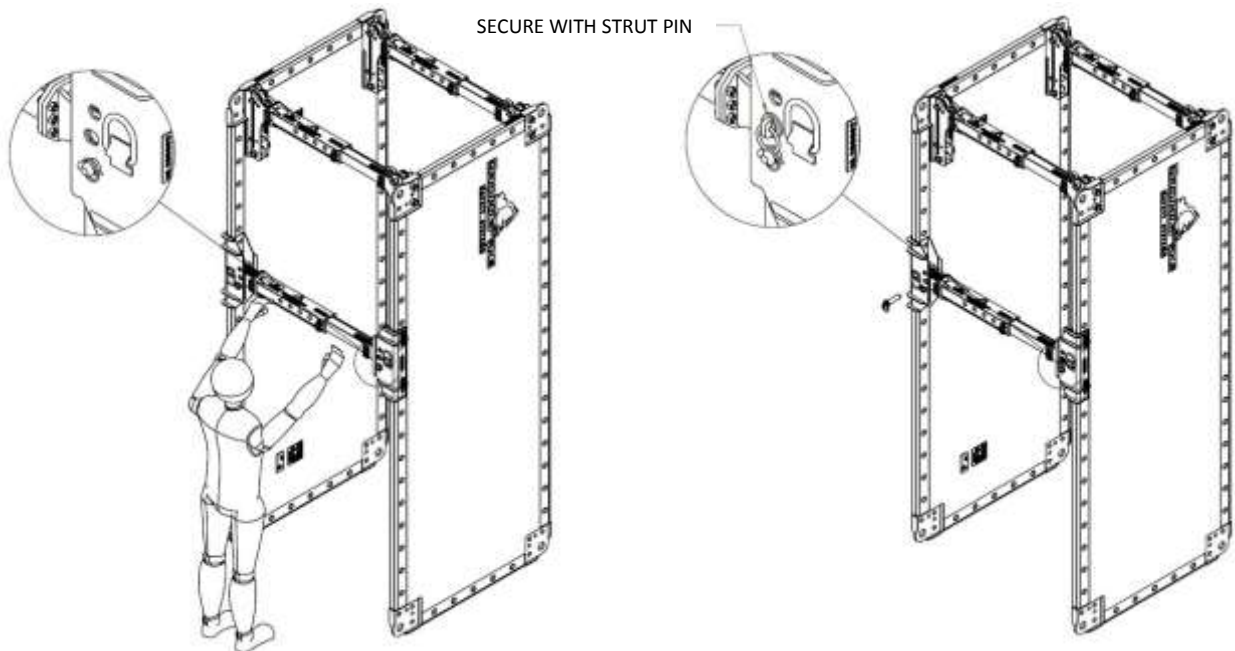


Figure 31: Assembly Step Ten– Install and Secure Bottom Strut Tube

11. Perform a visual inspection to ensure there are no damaged parts and that all connections are secured by required pins and latches. Confirm bottom strut clearance matches tab data requirements.
12. Lift entire system off ground to ensure there are no loose components. Both assembly and extraction points can be used to install box into location.

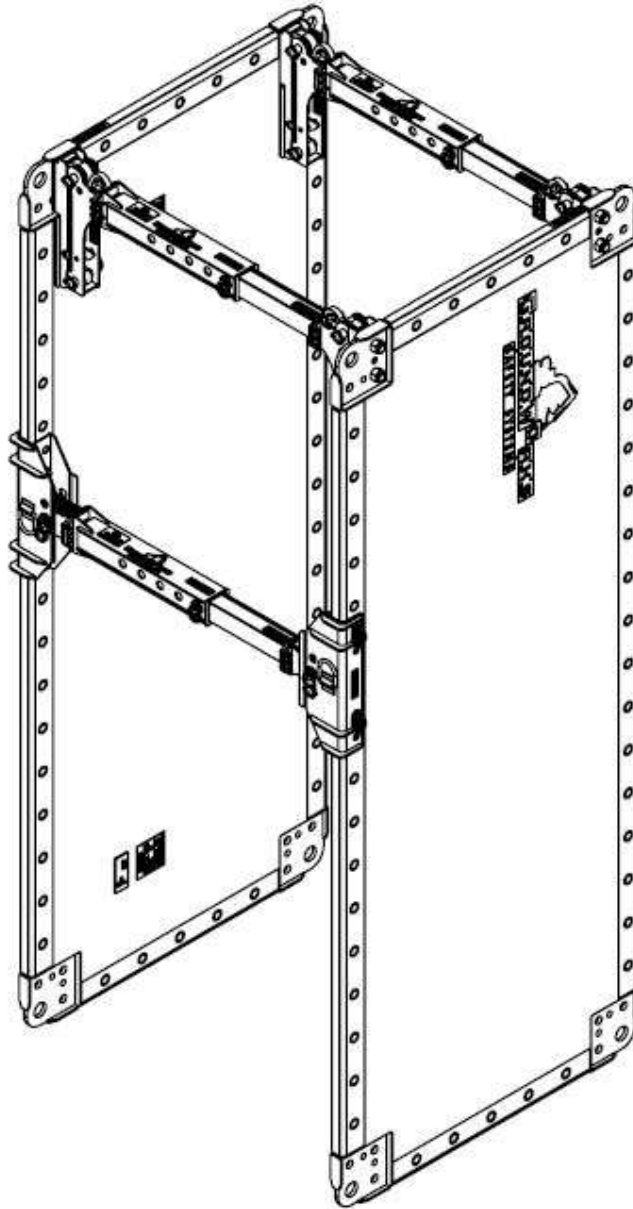


Figure 32: Assembly Step Twelve – Panel Assembly

DISASSEMBLY

1. Ensure work area is clear of all personal unless otherwise noted.
2. Remove bottom strut assembly
3. Tip the Trench Box System on to its side.

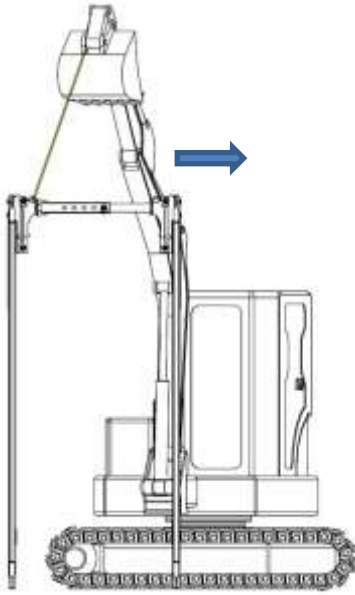


Figure 33: Step 3a - Hook Up Rigging

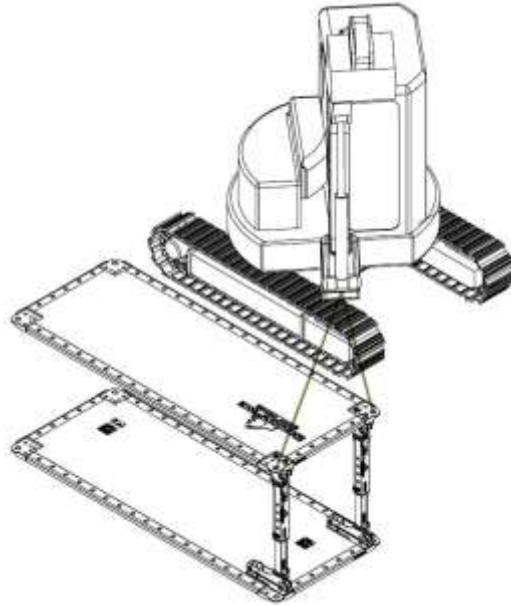


Figure 34: Step 3b – Tip Panel onto Side

4. Remove the bottom coupler pins from the panel on the ground, and ensure gravity latches are disengaged.

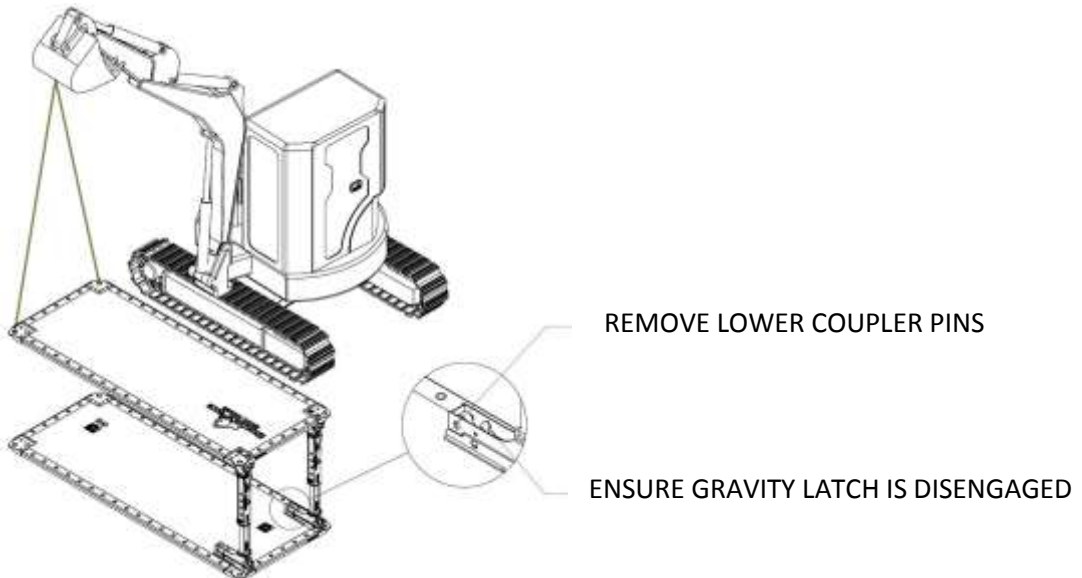


Figure 35: Disassembly Step Four – Remove Bottom Coupler Pins

5. 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.**

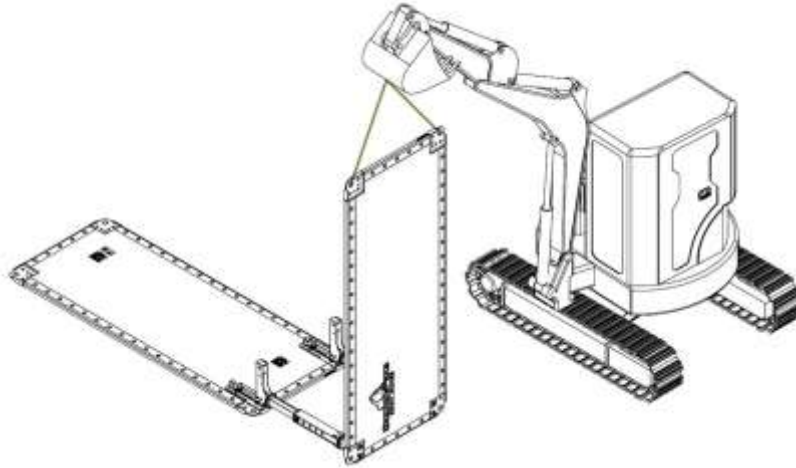


Figure 36: Disassembly Step Five – Unfolding the Box

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

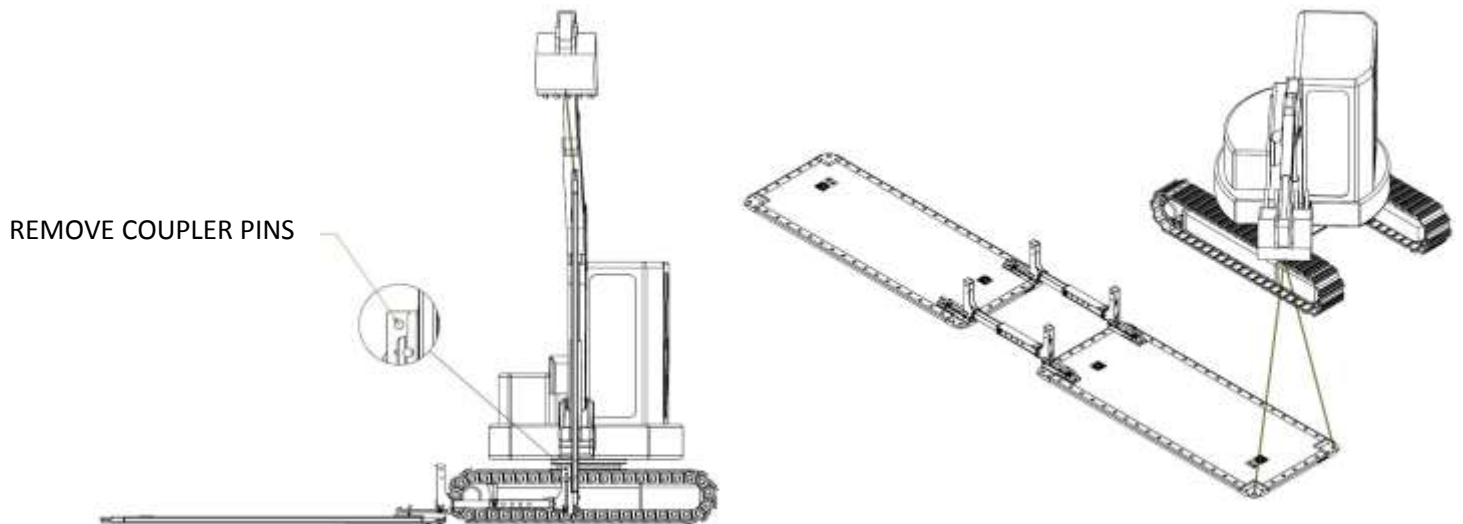


Figure 37: Disassembly Step Six – Lowering Second Panel

7. Install coupler stands and remove pivot pin from strut.

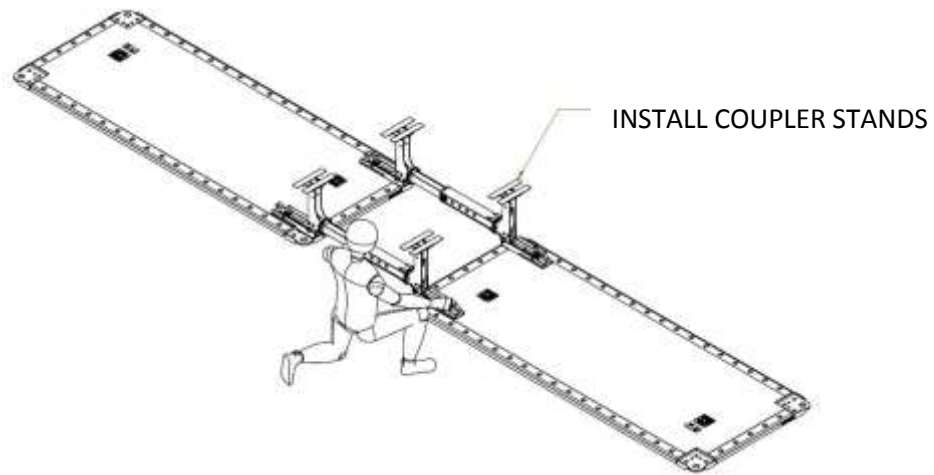
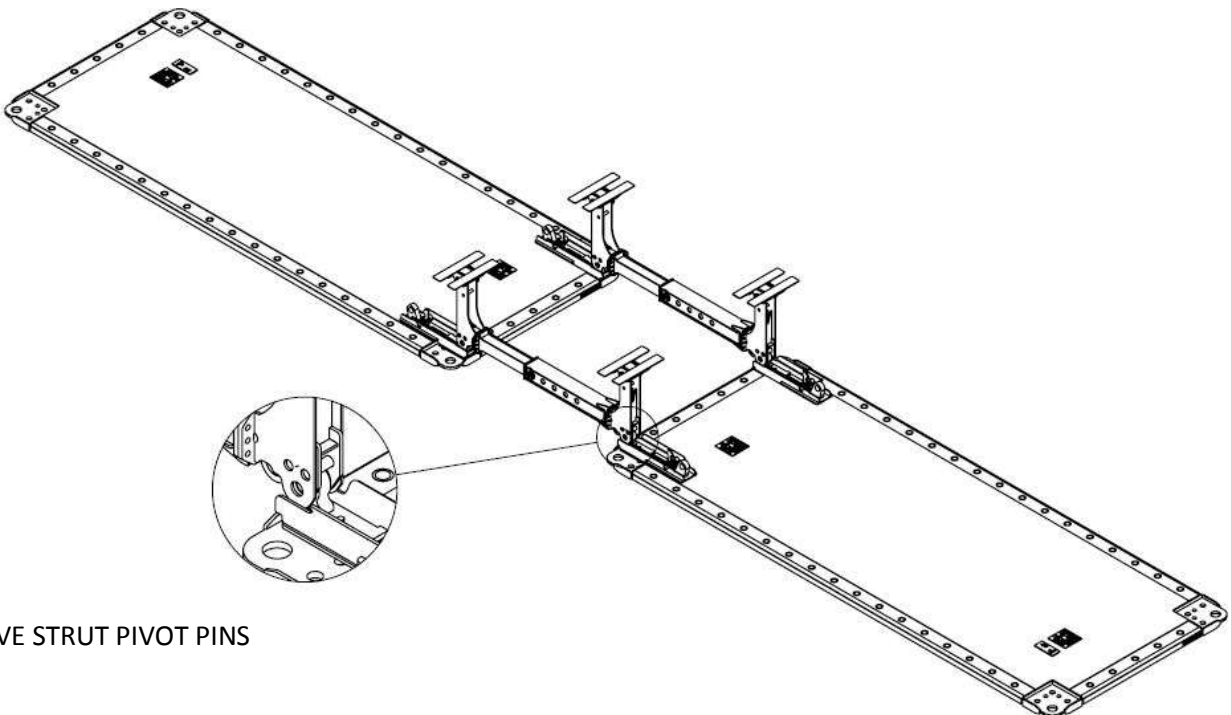


Figure 38: Disassembly Step Seven – Install Coupler Stands

8. Lift the struts free from the panels.



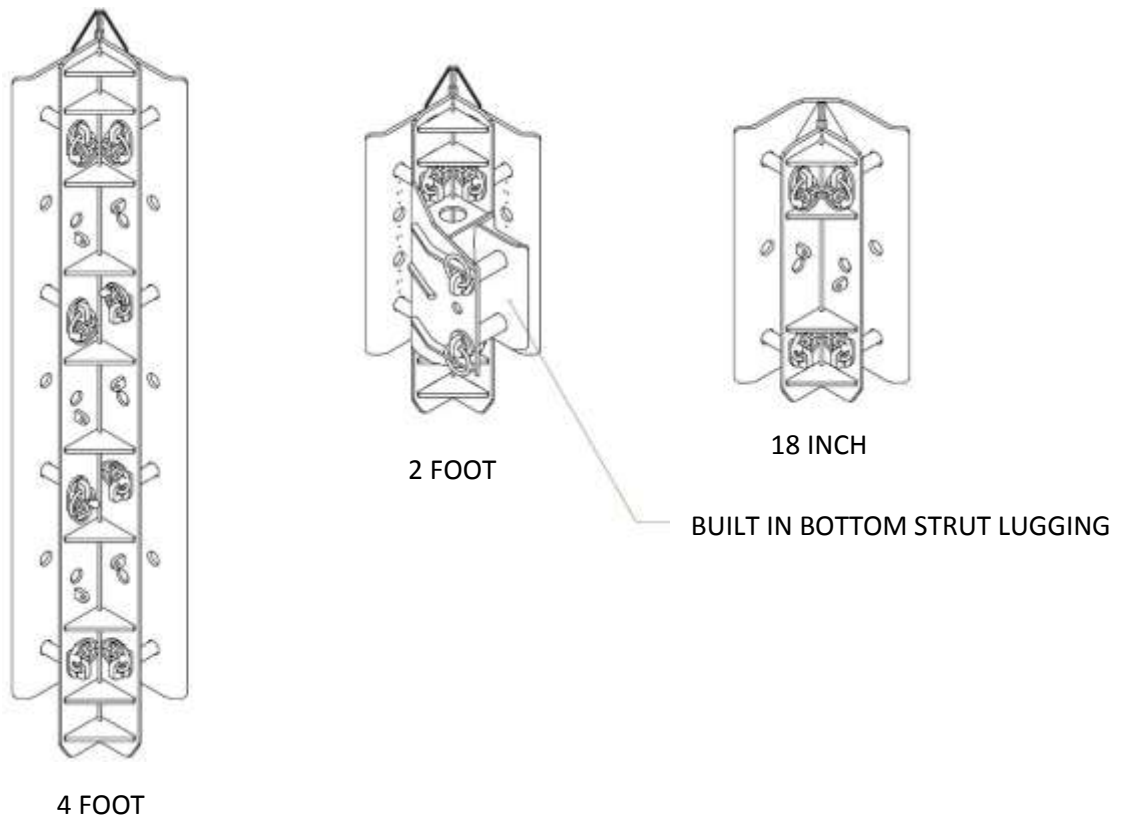
CORNER CONNECTORS

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.

Depth ratings are not affected when using corner connectors. The same depth rating applies to either strut and/or corner connected configurations.

In order to optimize box configurations, GroundWorks offers corner connectors in 18 inch, 2 foot and 4 foot variations. 18 inch and 2 foot corner connectors are interchangeable, 2 pins per edge are required for each while 4 pins are required for 4 foot corner connectors. 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 36 for examples of proper corner connection use. 4 foot corner connectors must be used when stacking boxes, which are centered at the connection point.

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 OTHERWISE NOTED, ENSURE ALL PANEL SIDE CONNECTION POINTS HAVE EVERY SECOND PIN ENGAGED WHEN USING CORNER CONNECTORS.**

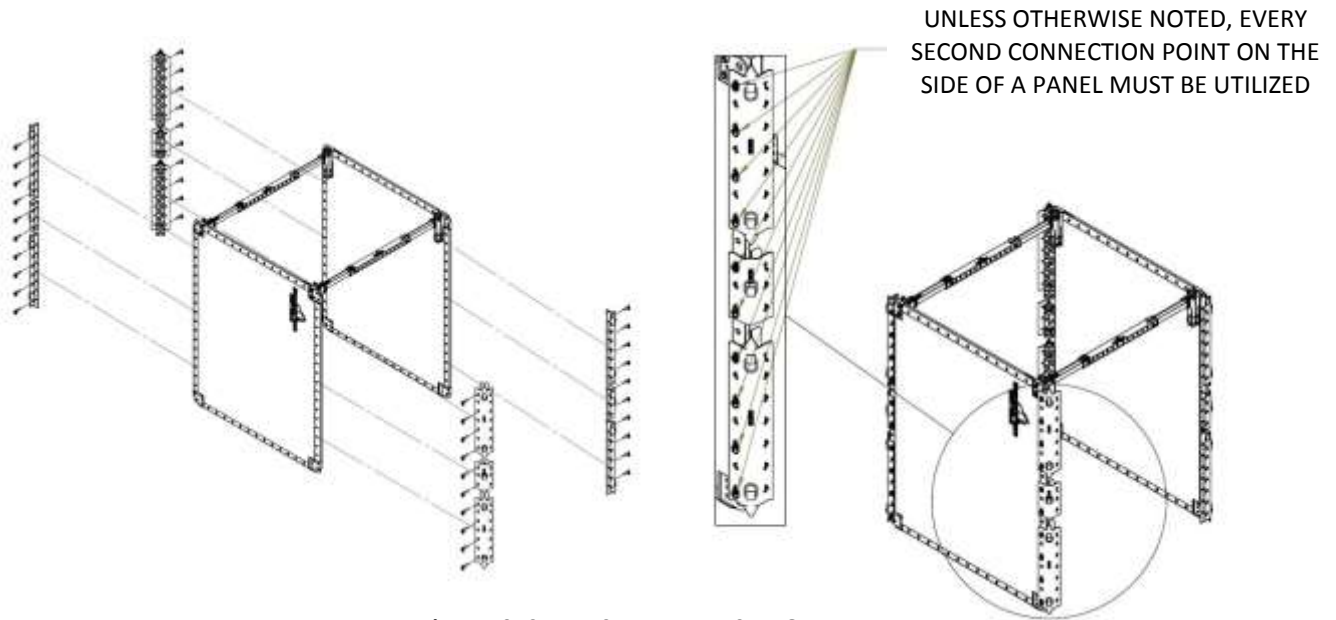


Figure 40: Corner Connectors – Step One

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

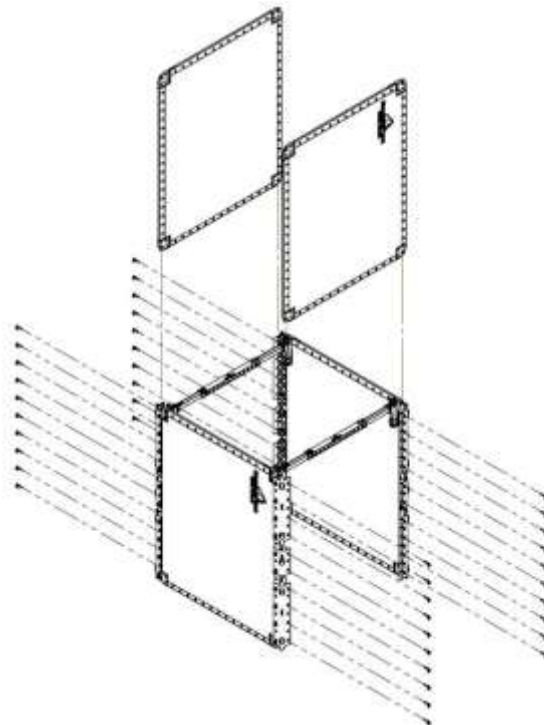


Figure 41: Corner Connectors – Step Two

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.

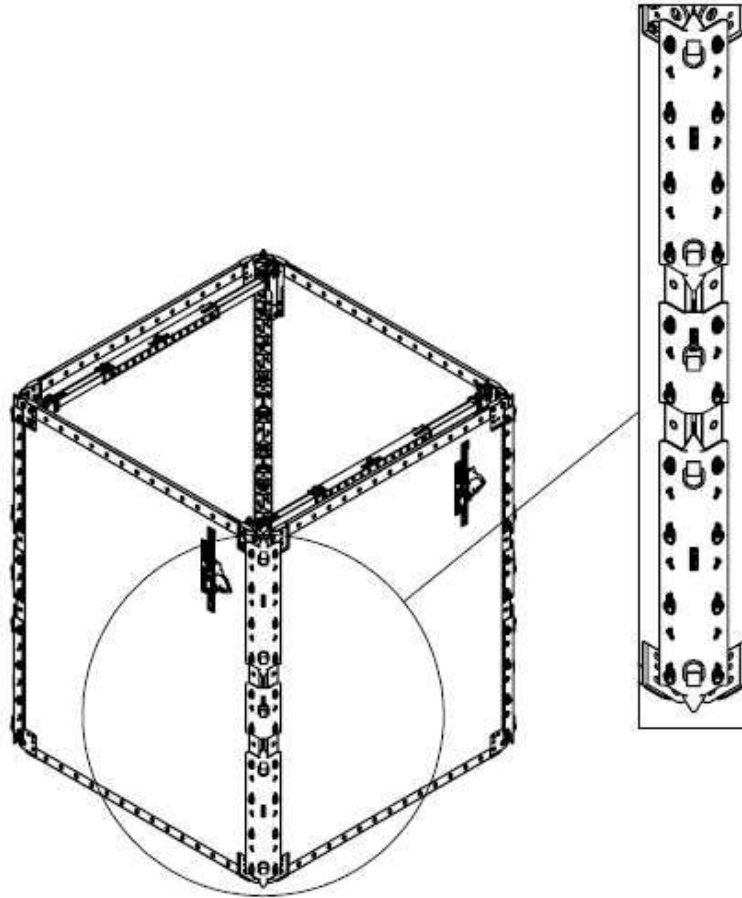


Figure 42: Corner Connectors – Step Three

CORNER CONNECTOR EXAMPLE CONFIGURATIONS

Panels can be interchanged for different configurations. A panel 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.

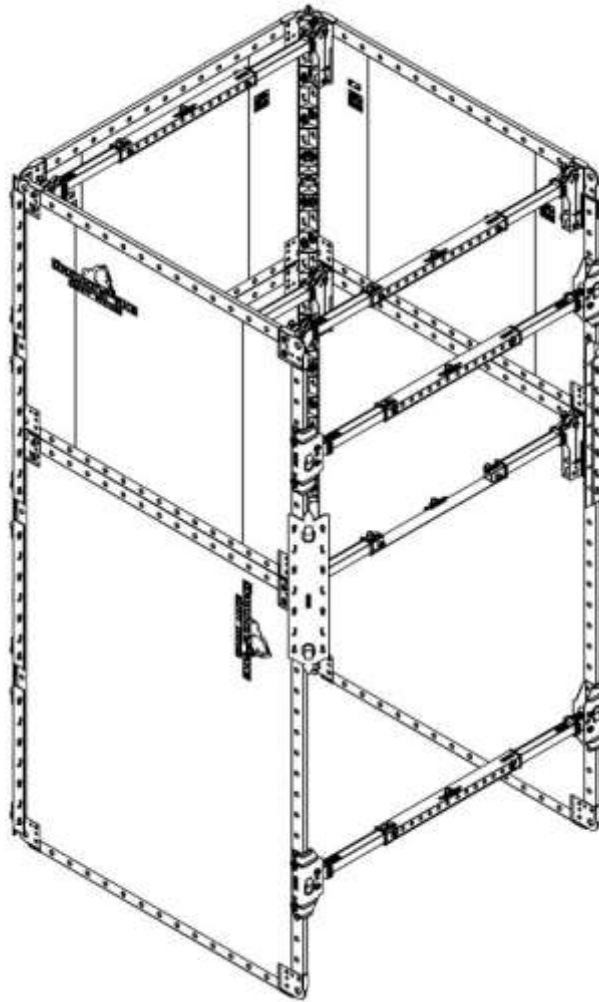


Figure 43: 3-Sided Stacked Utility Box with Side and End Panels

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

Single Box Corner Connector Configurations

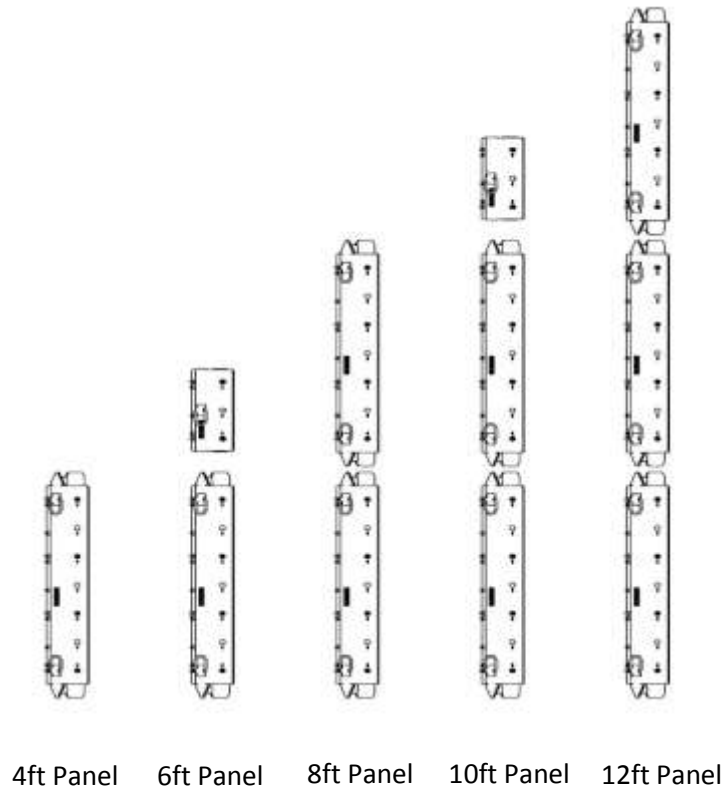


Figure 44: Single Box Corner Connector Configurations

12' High Panel Box with Corner Connectors

ALTERNATIVE CONFIGURATION FOR
12FT HIGH CORNER CONNECTOR

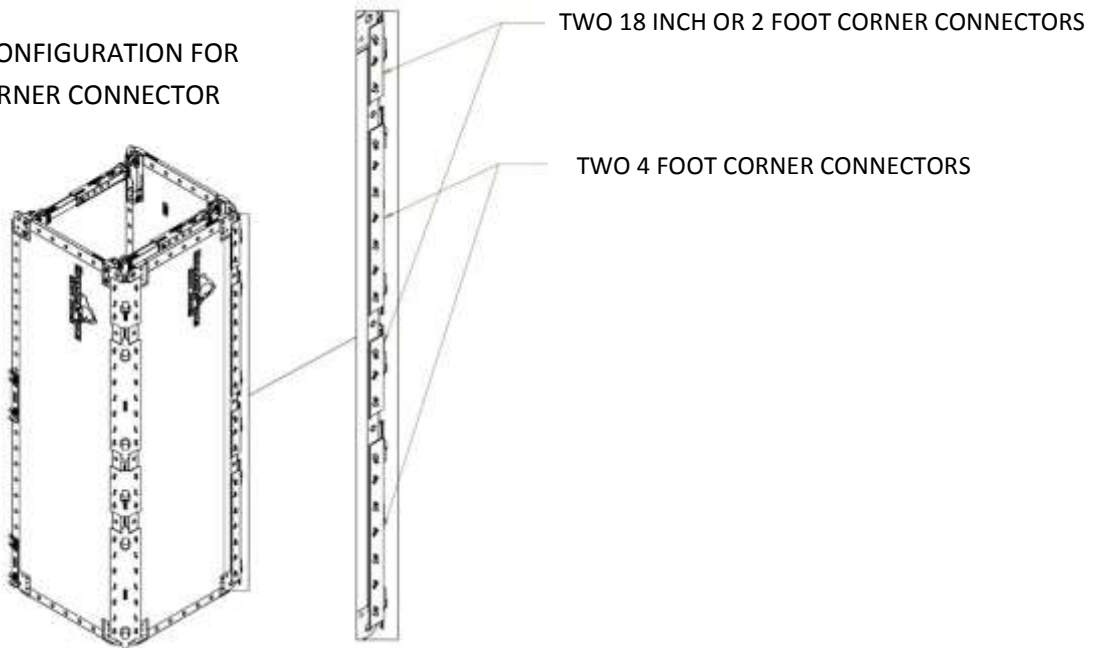


Figure 45: 4L x 4W x 12D 3 Sided Box Configuration

10' High Stacked Box with Corner Connectors

NOTE* 4 FOOT CORNER CONNECTOR FOR
STACKED BOX AT CONNECTION POINT

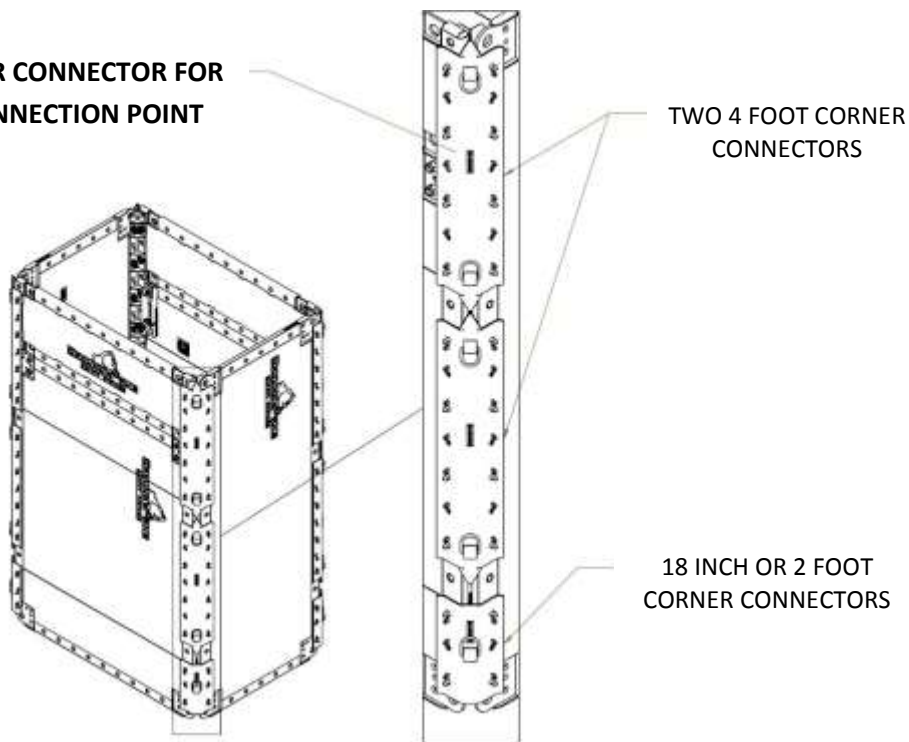


Figure 46: 6L x 4W x 10D Box Configuration

14' High Stacked 3-Sided Box with Corner Connectors

FOUR 4 FOOT CORNER CONNECTORS

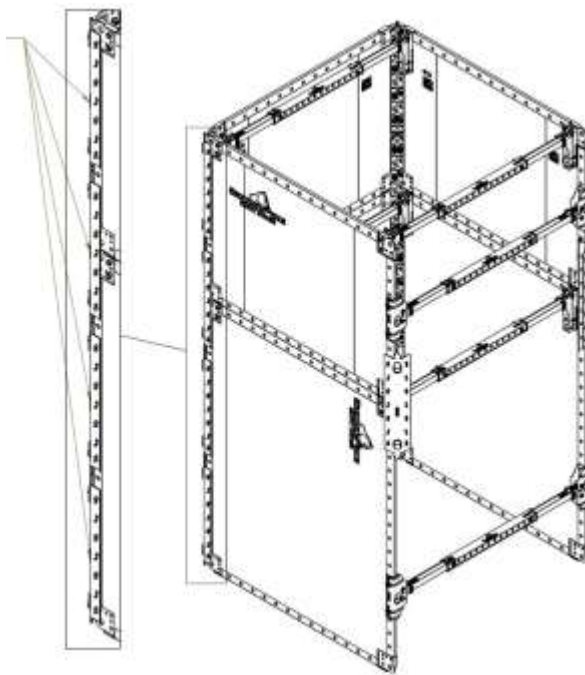


Figure 47: 8L x 8W x 14D 3 Sided Box Configuration

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.

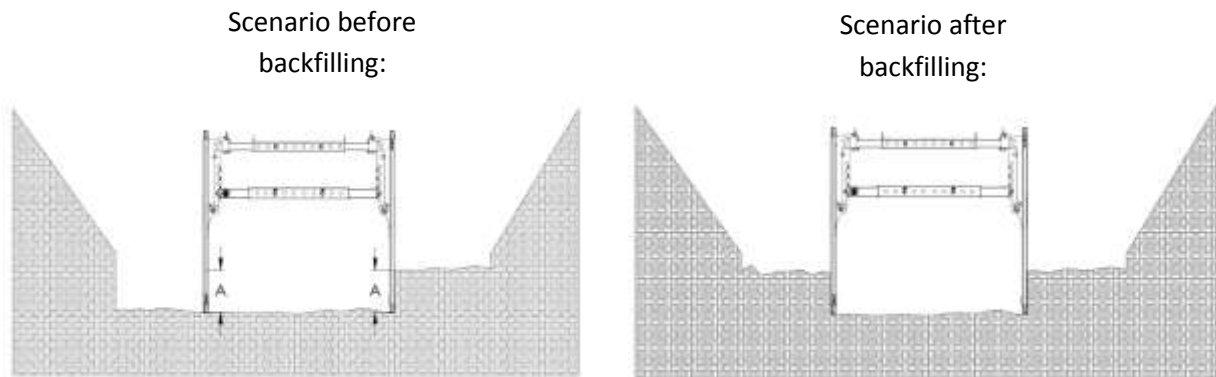
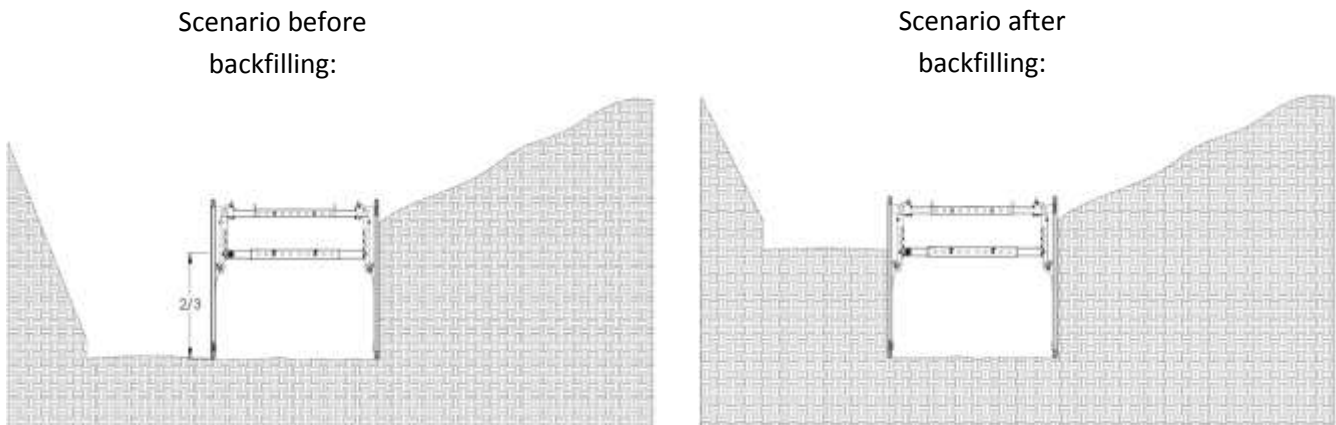


Figure 87

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 $\frac{2}{3}$ its panel height on both sides in order to prevent hazardous movement of the box.



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 the part proving defective under normal use and service within one year after first use, demo, or delivery/shipment to an end user.

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

REV A

