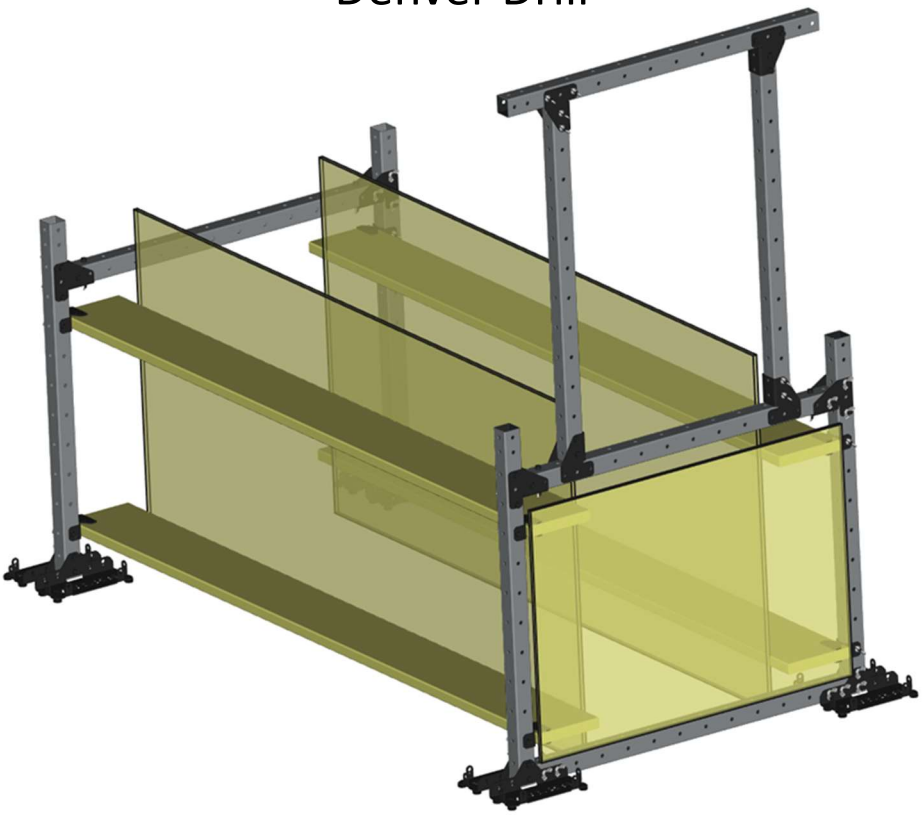
VULKA

FIRE EQUIPMENT

VTS Field Guide:

Denver Drill



SAFETY PRECAUTIONS

ALWAYS Use Personal Protective Equipment

Always wear appropriate P.P.E. including helmet, gloves, and eye protection when setting up and operating this equipment.

Never Exceed Weight Limitations

Weight limitations for this equipment is available in this guide. Under most circumstances, this equipment can support 1500 pounds, inclusive of the weight of lumber/sheathing/materials used.

Never Use Damaged Parts

If a part is bent, cut, dented or otherwise damaged, DO NOT use that part. Replacement parts are available by contacting support@vulkafire.com. Paint/powder coat chipping and scratching are expected in the course of normal use and will not affect the equipment operationally.

Always Use Official Vulka Parts and Hardware

Only use parts and equipment designed for this product. Using anything other that Vulka Fire Equipment approved parts will void the warranty and could lead to failure of the system and subsequent injury. Replacement parts are available by contacting support@vulkafire.com.

Do Not Practice Techniques You Have Not Been Trained On

Firefighting is a dangerous job and the techniques involved could lead to injury, even in a controlled environment, if executed poorly or improperly. Always ensure that instructors are trained and competent in the subject matter being practiced and are appropriately trained to instruct.

Do Not Operate Power Tools or Equipment You Are Not Familiar With

Always follow the manufacturers recommended operating procedures and safety precautions when using power tools and equipment. Failure to do so could result in injury.

Always Use Fall Protection When Operating at Height

Most configurations of this system will not place the user above 4’ off the ground. If using a configuration that exceeds 4’, ensure fall protection is provided per OSHA requirements.

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Overview

The Vulka Training System provides a means to quickly set up a Denver Drill, also known as the Langvardt Drill, in honor of Firefighter Mark Langvardt who tragically lost his life in the line of duty in 1992.

This simulates extricating a downed firefighter out of a narrow window and corridor – a difficult scenario for even seasoned firefighters to perform under stressful conditions. The VTS can be set up to be nearly the same dimensions as the actual scenario that claimed Langvardt's life, are can be modified to be easier or more difficult, depending on the training objective.

Tools & Materials

The following parts and materials will be needed:

- (1) VTS Unit
- (4) Pieces of lumber for studs. Cut to 104" length. Size determines scenario difficulty (explained on next page), but 2x10 nominal lumber is needed for "true" Denver drill dimensions.
    - Alternatively, using uncut 12' length will work but will result in overhang at the back of the structure.
- (3) 4x8 plywood sheets – ½"
- Screws for attaching sheathing to lumber. Drywall screws (2" or greater) are typically okay.
- Screws for attaching lumber to brackets. Metal to wood roofing screws (#8-#14, 1.5" length) are recommended since they provide a gasket to cushion the metal bracket.
- Power drill with bits for roofing screws and drywall screws above.
- Pencil/marker, tape measure
- Circular saw with wood cutting blade
- A-frame ladder
- Rubber mallet
- OPTIONAL: ½" rebar to simulate window bars

Set Up

This Field Guide will cover how to set this configuration up properly:

- Set up tube and brackets
- Attach lumber
- Attach sheathing

See below for more detailed steps and diagrams.

Set Up Time

Set up time should take approximately 15-20 minutes with at least 2 people.

Lumber Size & Dimensions

The true “Denver Drill” has prescribed dimensions associated with it that mirror the conditions firefighters face when trying to rescue Mark Langvardt. The typical dimensions are:

- 28” window width
- 28” corridor width
- 96” corridor length
- 42” sill height

The VTS can get very close to these dimensions (the window width is slightly wider at around 29”) but can also be customized to be more or less difficult. The VTS allows for narrower window dimensions, wider or narrower corridor dimensions, and higher or lower window sill heights.

Corridor Width

The corridor width is determined by the nominal lumber size chosen. For true 28” corridor, 2x10 nominal lumber is needed. For a wider corridor, and therefore easier scenario, the smaller the lumber the wider the corridor will be, with 2x4 being the easiest with a 40” wide corridor.

Corridor Length

Corridor length is determined by the length of the lumber. For a true 96” long corridor, the lumber must be 104” long. The obtain the desired corridor length, take that length and add 8” to it. For example, if a 72” long corridor is needed, the lumber must be 80”. Anything other than a 96” corridor will require cutting plywood to size.

Window Width

The window width can be adjusted by moving the window tube inward for a more narrow window opening. The widest opening possible with this set up is 25” (3” narrower than a “true” Denver drill.

Sill Height

Sill height can be adjusted by raising or lowering the entire window system.

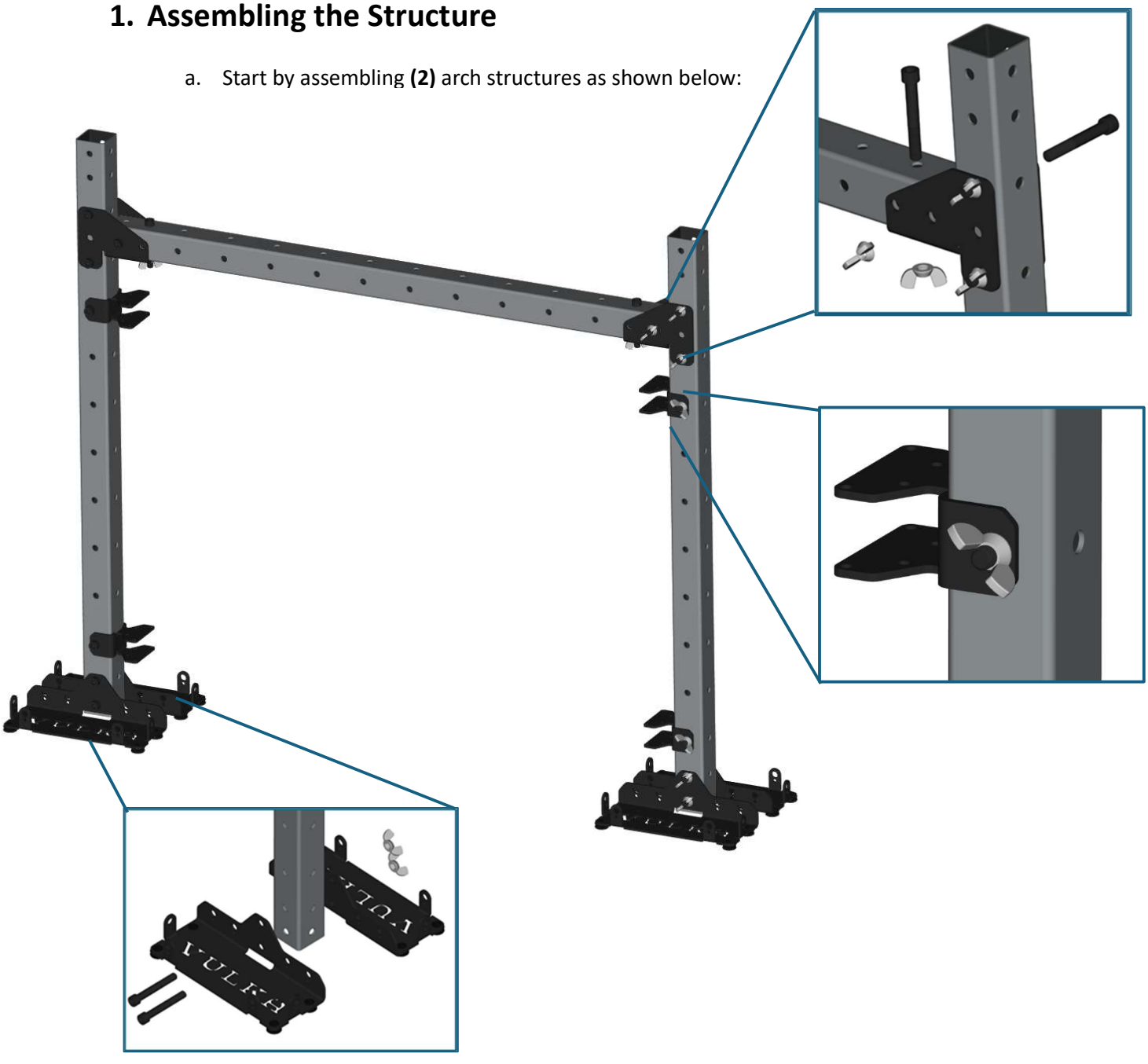
Inserting and Securing Bolts

When securing bolts with wing nuts, bolts should only be hand tight. **Do not overtighten the bolts.** Overtightening the bolts could lead to permanent bending of the brackets and difficulty removing the bolts. Though uncommon, a bolt may require light tapping with a rubber mallet when inserting or removing due to slight hole size variance and/or powder coating thickness – if this is needed, be sure to use as little force as necessary to get the bolt through.

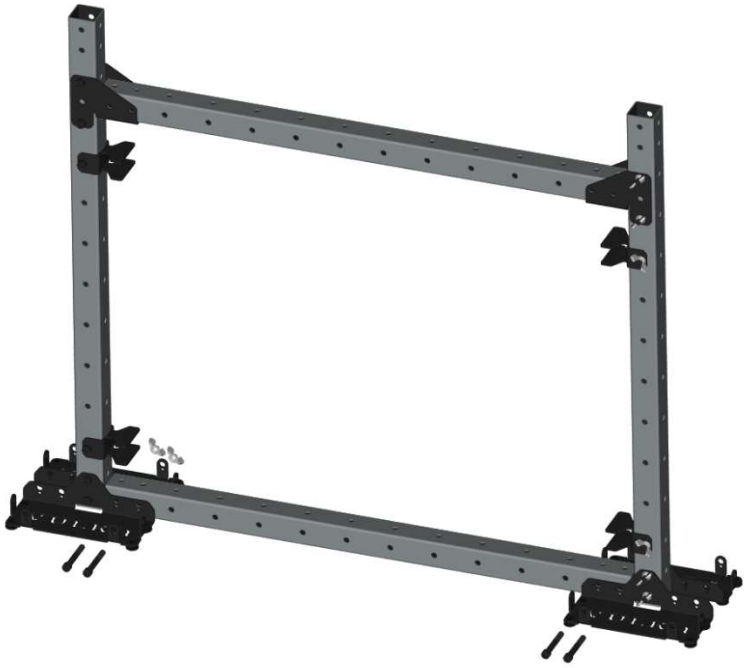
Assembly

1. Assembling the Structure

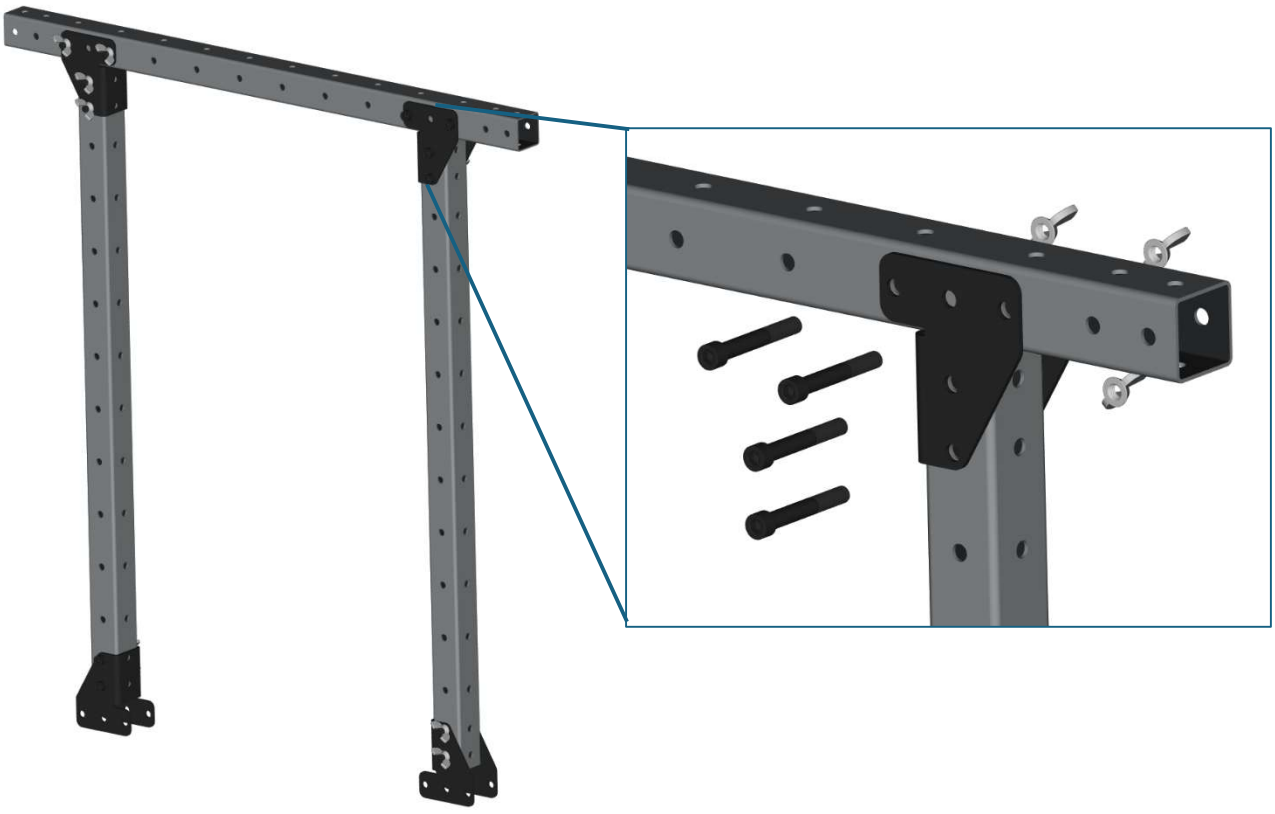
a. Start by assembling **(2)** arch structures as shown below:



b. Place a tube in the bottom of **one** of the arches and secure both sides with 2 bolts:



c. Assemble the window as shown below, which gives an interior window width of 25”:



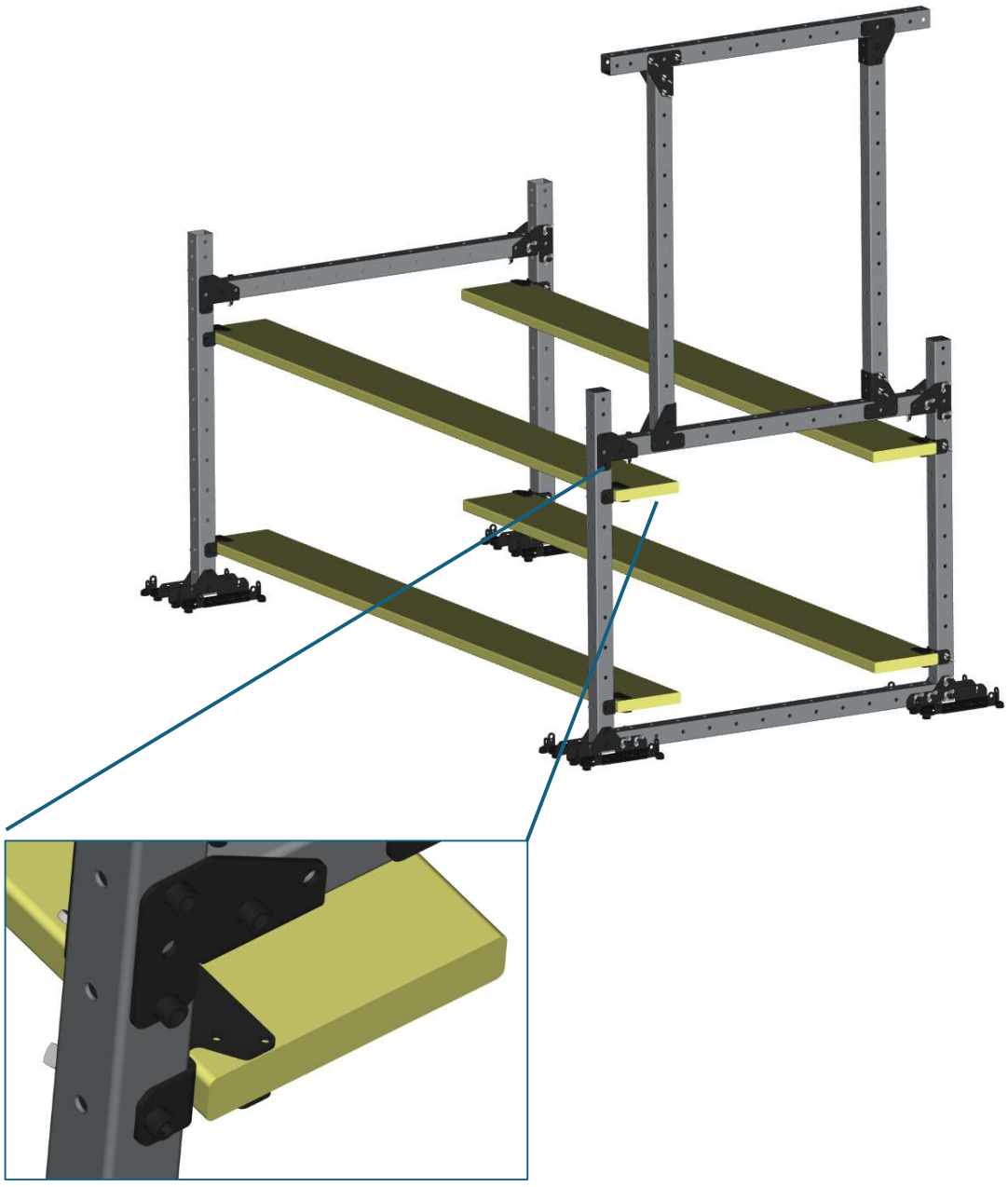
d. Secure the window to the arch with the bottom tube with 2 bolts in each elbow, as shown:

Assembled System (without Lumber):

Assembled structure is shown below. Space the structures approximately 8’ apart to make adding lumber easier. Don’t worry too much about the exact spacing or getting it perfectly square, the lumber will help with this.

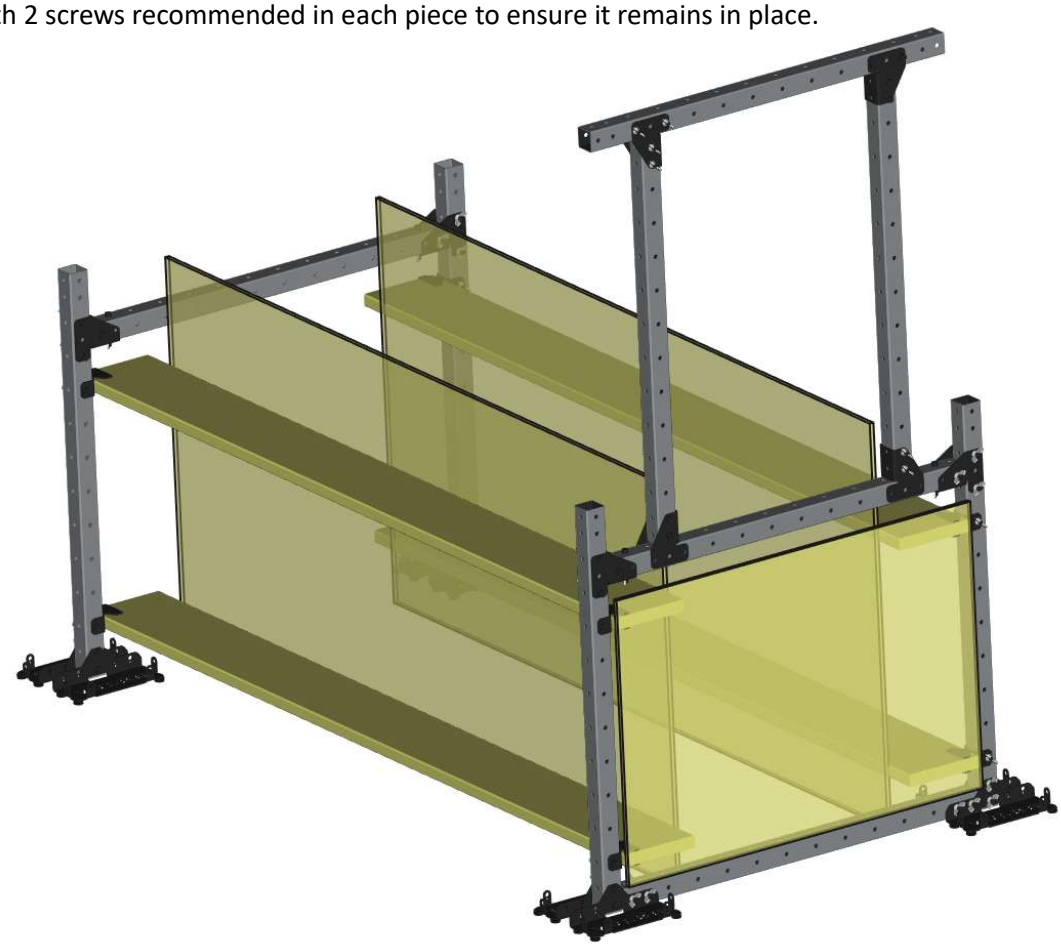
2. Attaching the Lumber

Lumber is then placed directly into the brackets and secured with 2 roofing screws for each bracket. Best practice is to place one screw on each side of each bracket. Align the lumber to the edge of the bracket on both structures, as detailed below. This will ensure slightly more than 8’ between the structures (to allow a little wiggle room for the plywood). If using an uncut 12’ length of lumber, use an 8’ piece of plywood to space the front and back of the structure, with excess lumber overhanging the back.



3. Attaching the Sheathing

The 2 4x8 sheets of plywood or OSB sheathing are secured to the inside side of the lumber with screws. There should be a little extra room to allow the sheathing to sit back from the bolts on the front tube structure. A third sheet of plywood will need to be cut to size to screw into the front of the structure below the window. The size of this sheet depends on the height of the sill. In the configuration shown, this sheet is cut to 48x34 inches. The front sheet is secured to the cross section of the 4 pieces of lumber, with 2 screws recommended in each piece to ensure it remains in place.



4. Final Assembly & Check

Before use, be sure to verify that all bolts are in place and hand tight, and all lumber is secured with screws.

At this point, the VTS is ready for use. Additional materials (window bars, etc.) can be placed if desired. Review safety precautions before training begins.

Question? Concerns? Improvements?

Please be sure to reach out to us at support@vulkafire.com !

General information and additional configurations are available in their own Field Guide. Please be sure to check vulkafire.com.

Add-ons for the VTS are also available at vulkafire.com!

END OF GUIDE