



FRAME MANUAL



OS MATS FRAME ASSEMBLY MANUAL



20' - Diver/Handling Frame



20' - Single Release Frame



40' - Single Release Frame



20' - Dual Release Frame



40' - Dual Release Frame



60' - Dual Release Frame

The purpose of the manual is to instruct you on how to properly assemble each OS Mats Frame. In this first section, each component will be listed and a definition will be given.

Basic Frame Components

The **lifting frame** is the work horse behind the system. The lifting frame is 8' wide by 20' long. It is formed by pipe on the outer edges with I-beam connecting them together. Please see figure 2-1 for a labeled description of a lifting frame. We have 2 sizes of frames, 8" or 10". The difference in sizes is their capacities, which will be addressed later.

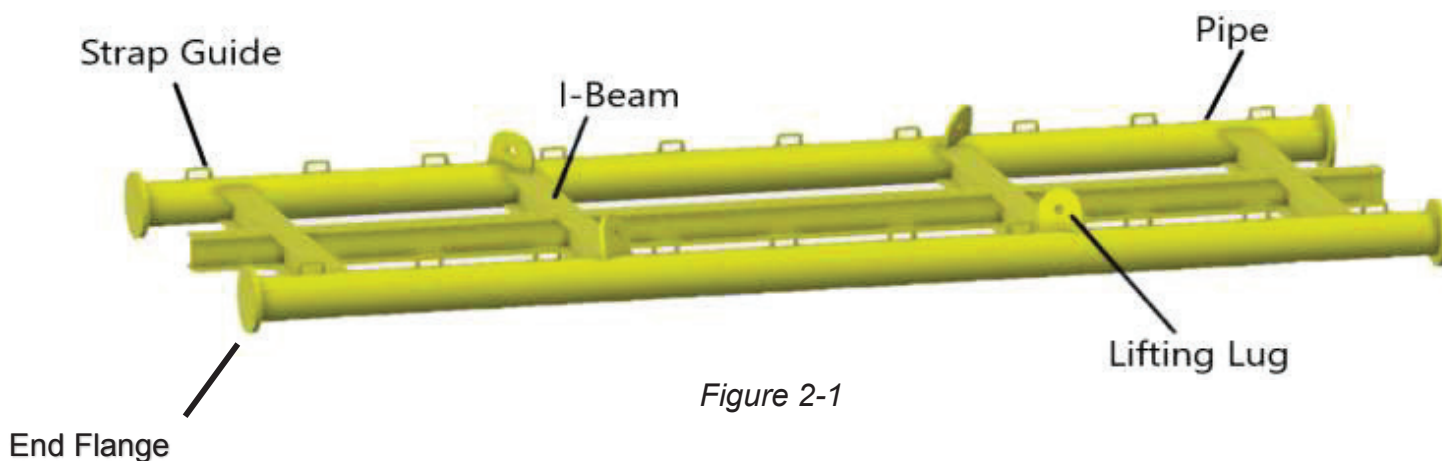


Figure 2-1

The lifting frame needs to be load tested every 5 years, with any load bearing welds visually inspected for cracks every 6 months, and mag particle tested every year. The welds that need to be checked are the welds that connect the lifting lugs to the frame. See figure 2-2 for a labeled description of the certification tag found on a frame.

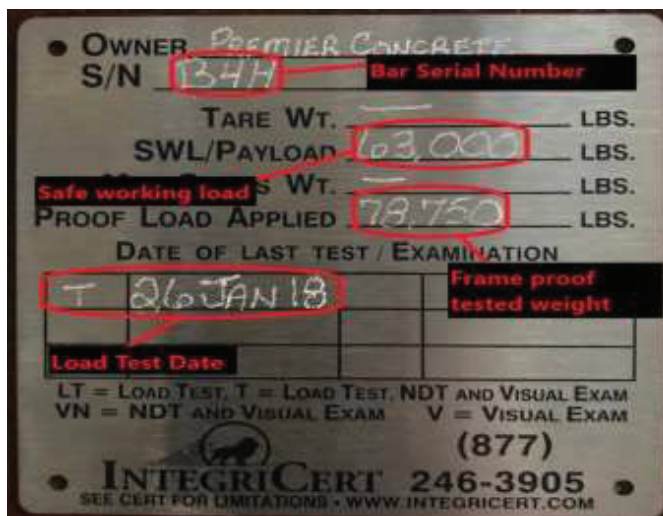


Figure 2-2

Each frame is lifted via crane by utilizing a **bridle**. A bridle is a vee-shaped arrangement of lifting equipment or rigging materials that enable a load to be spread or shared between the 'legs' of the bridle. The 'legs' are made up of steel wire rope, and is typically connected via a "master link". Bridles can have 2-4 'legs', depending on lifting requirements. See figure 3-1 for a labeled description of the bridle.



Figure 3-1

Each bridle is load certified to be able to safely hold the listed weight on the tag. See figure 3-2 for a labeled description of a tag. Each bridle needs to be inspected before using to ensure that there are no wires that are cut or frayed, and that the certification is less than a year old.



Figure 3-2

To connect the bridle to the Frame, a **shackle** is used. A shackle is a U-shaped piece of metal secured with a clevis pin or bolt across the opening, or a hinged metal loop secured with a quick-release locking pin mechanism. Shackles are the primary connecting link in all manner of rigging systems, from boats and ships to industrial crane rigging, as they allow different rigging subsets to be connected or disconnected quickly. The **ONLY** type of shackle that is to be used on a OS Mats Frame, is a bolt type shackle. A bolt type shackle is a shackle that utilizes a bolt, nut, and cotter pin to secure the shackle to the Frame. See figure 4-1 for a labeled description of a bolt type shackle. Figure 4-2 depicts how the bridle is connected to the Frame via the shackle.

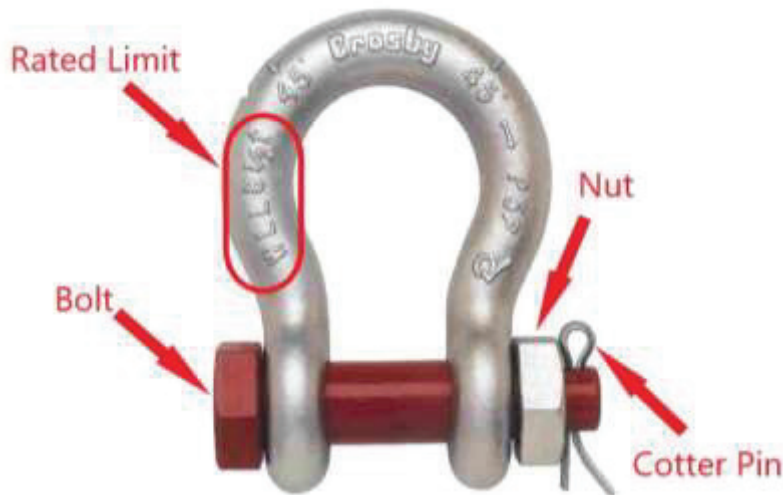


Figure 4-1

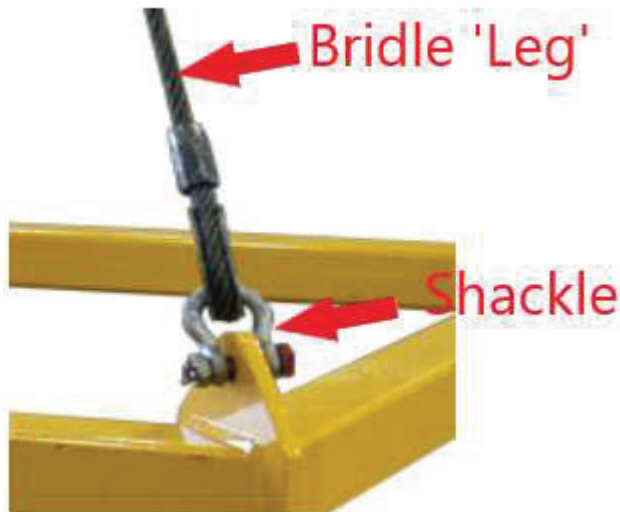


Figure 4-2

Now that you have connected the bridle to the Frame, we will discuss assembling each type of Frame that we offer.

20' Diver/Handling Frame

A **handling** Frame is used when a client needs to unload the mats from the trucks and load them onto a vessel. The **diver** frame is the same set up as a handling frame, except it is used when divers must disconnect the mats under water when they are being installed.

A **diver/handling** frame consists of twenty (20) 2" x 8' slings, (20) 3.25Ton bolt type shackles, and (20) 3Ton hooks with safety latches. A nylon sling can be seen in figure 5-1, and the completed sling assembly can be seen in figure 6-1. The bridle to connect the frame to the crane is a 4-leg bridle, 20'L x 7/8". You would use (4) 4.75Ton Crosby Bolt type shackles are used to secure the bridle to the frame.

Inspection of Nylon Slings

Prior to attaching the slings to the frame, an inspection of the sling needs to be made. First thing to check is the date on the certification tag as shown in figure 5-1. If the date is one year old or later, the sling is not to be used. The next thing to check is for physical wear on the sling. If there is any tears or rips in the sling that are longer than a quarter of an inch, the sling must be discarded.

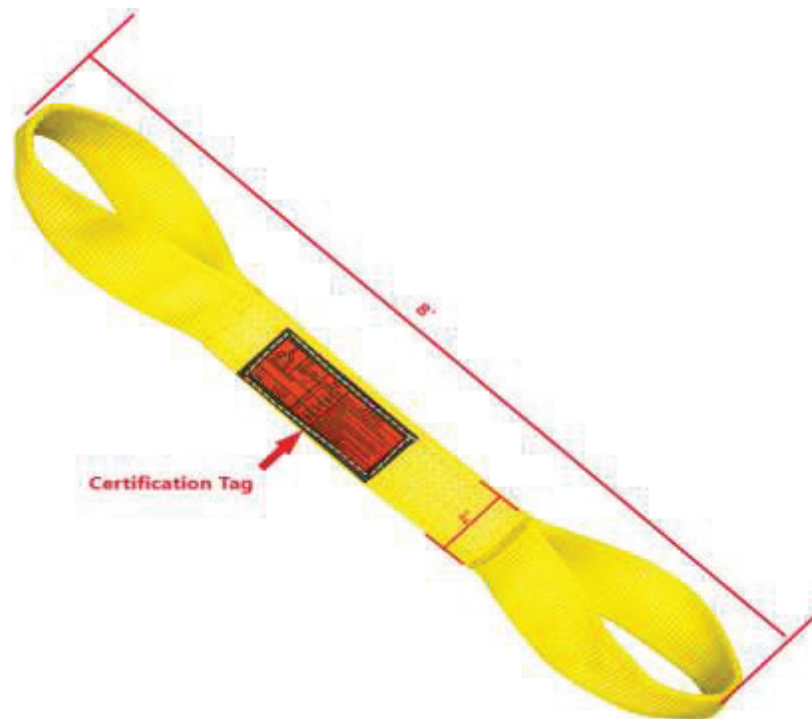


Figure 5-1

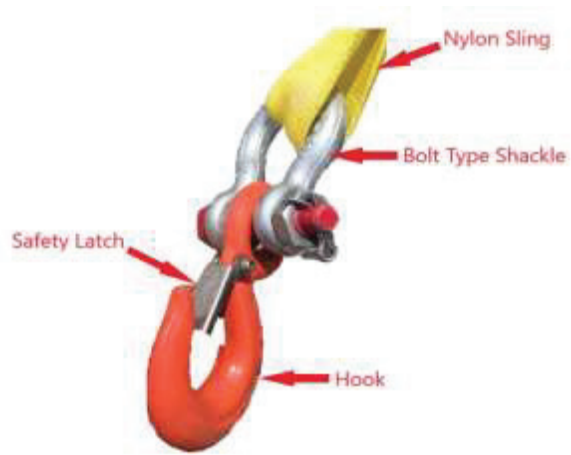


Figure 6-1

If available, a Crosby Shurlock hook is preferred, but the above hook with a working safety latch is sufficient. See figure 6-2 for an example of a Crosby Shurlock hook



Figure 6-2

Attaching the slings to the frame.

Each sling is passed through the strap guide on the frame, and choked to the bar. See figure 7-1 on how to properly attach the sling to the frame by choking.

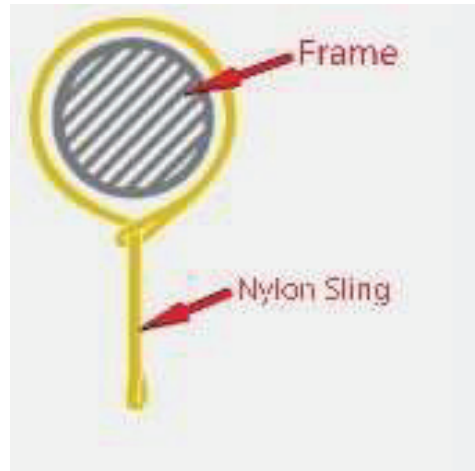
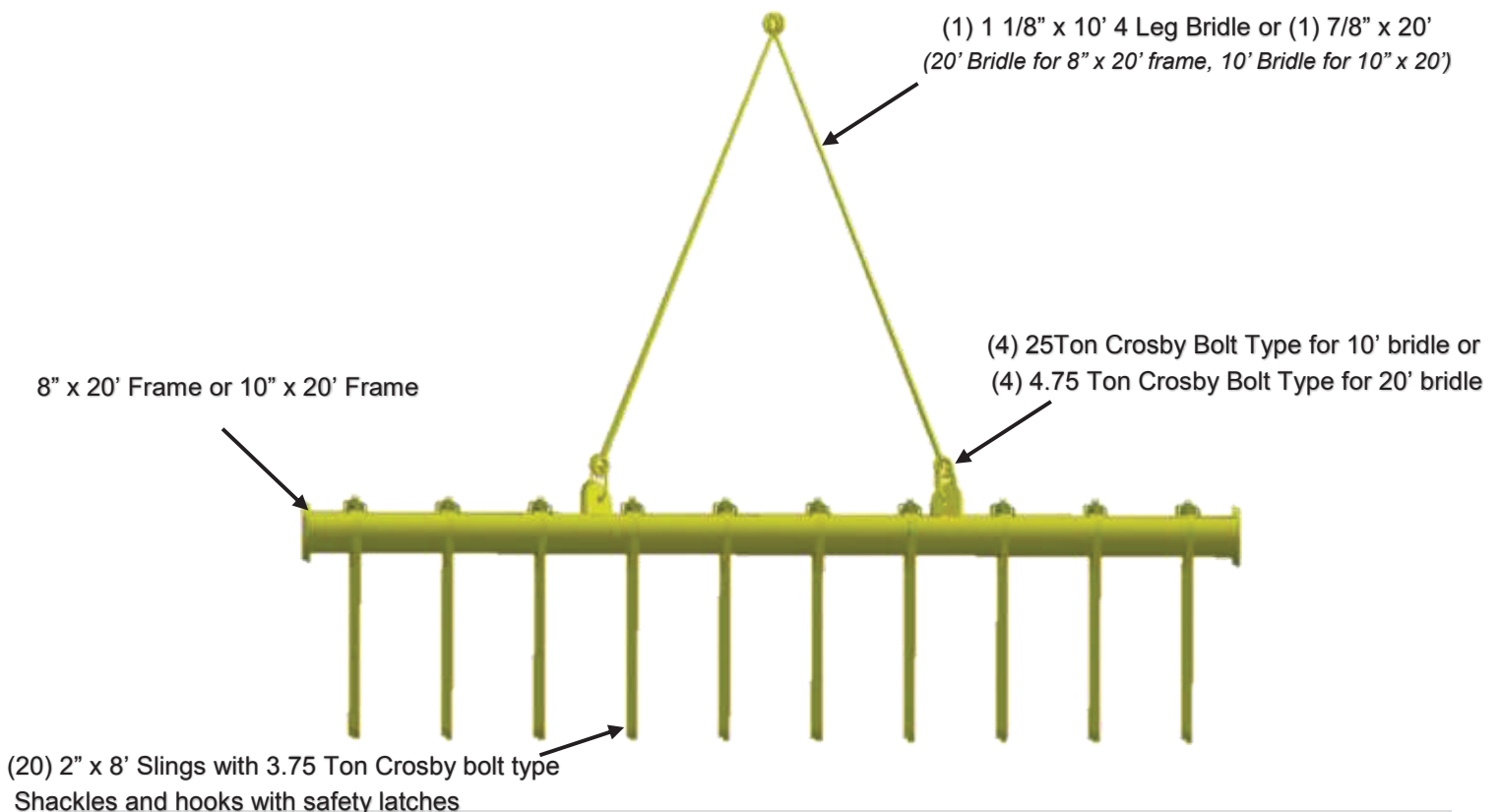


Figure 7-1

Take one end of the sling, pass it through the strap guide on the frame, and then take that end of the sling and open the 'eye' of the other end and pass it through the eye. Pull the slack out to secure the sling to the frame.



20' – Single Release Frame

A single **quick release** frame is a frame with a release mechanism that allows the quick deployment of the mats once they are placed where they are being installed. A quick release can be seen in figure 8-1.

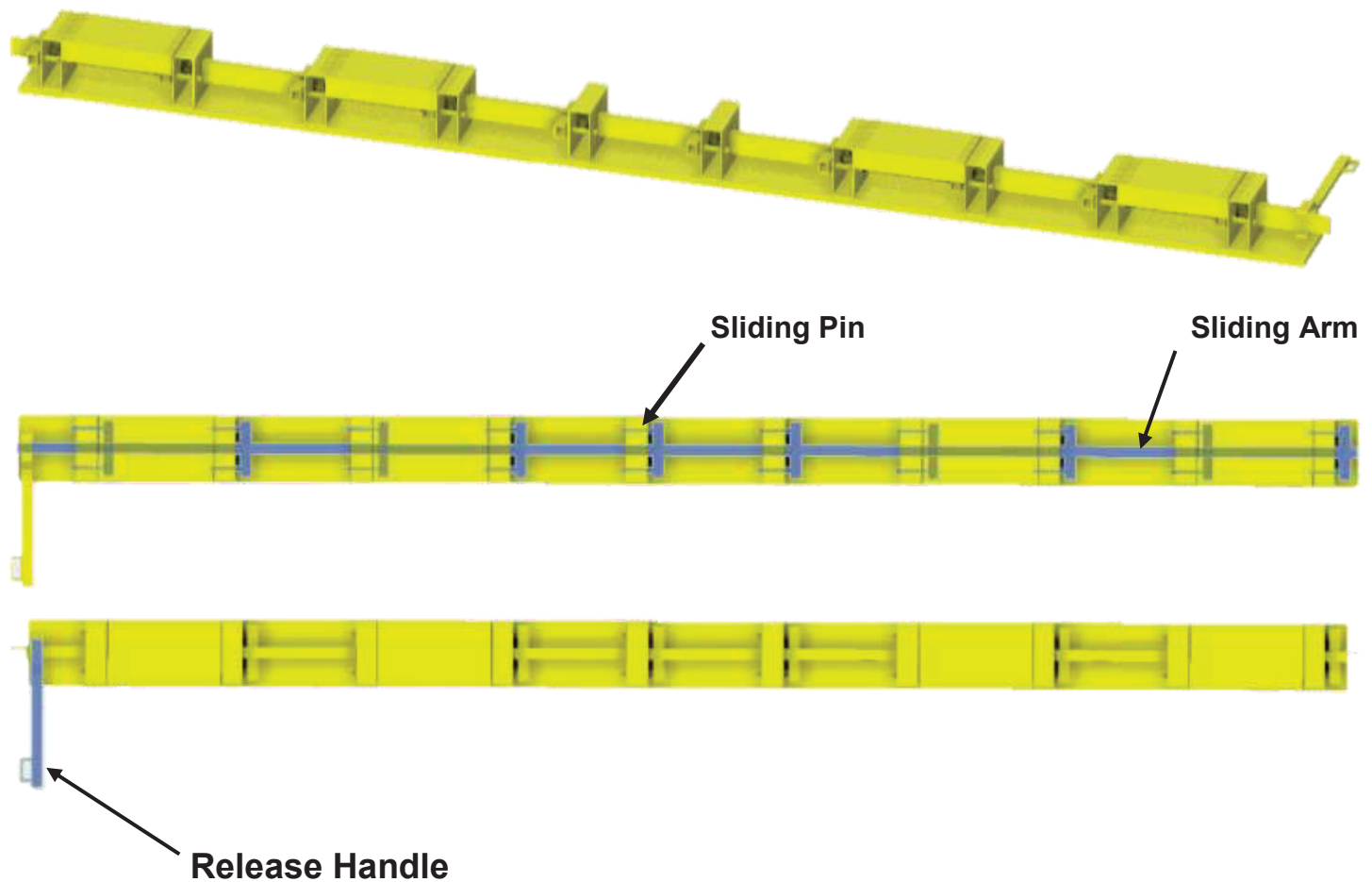


Figure 8-1

A quick release is bolted to the frame using a (8) 18-8 grade, stainless steel bolts. The bolts are 7/8" x 3" x 9TPI (threads per inch) accompanied with (2) flat washers, (1) lock washer and (1) nut. The recommended max ft/lbf (torque) for a 7/8" x 3" x 9TPI is 190ft/lbf.

The release is bolted to the center I-beam that runs the 20' length of the frame. On the I-beam, there is (8) mounting holes that line up with the mounting holes on the bottom plate of the release.

See figure 9-1 for a depiction on how the frame will look with a single release attached.

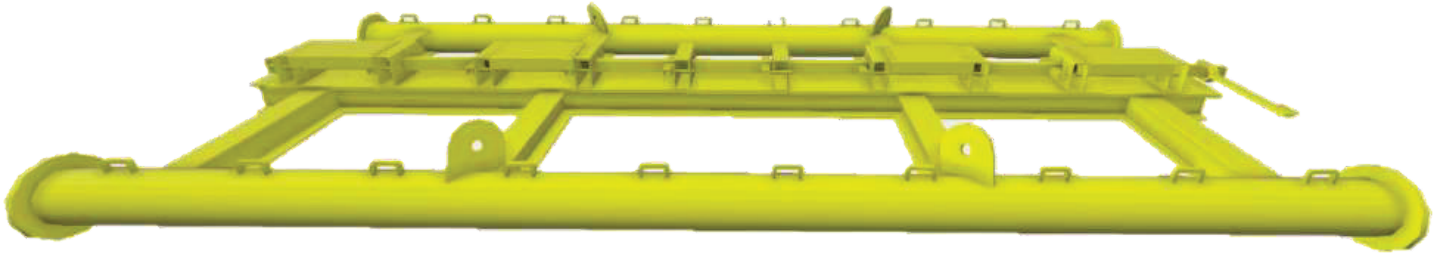


Figure 9-1

The single quick release will utilize (20) 2" x 16' nylon slings for the deployment of the mats. The sling is choked onto the frame as shown previously in figure 7-1. For knowledge purposes, we will explain how the sling would be used for mat deployment, but typically, the customer would be the only one doing this.

After the sling is choked to the frame, you would pass the loose end of the sling through the lifting loop on the mat. Once passed through the lifting loop, the loose end pass back through the strap guide on the frame, and the eye of the sling would be slipped over the sliding pins on the release.

To slide the eye of the sling over the sliding pin, you would have to open the release by pulling in the release handle. By pulling on the release handle, the sliding arm will actuate and the sliding pin will slide to the rear of the housing and allow you to pass the eye over the pin. Demonstration of this is shown in figure 9-2.

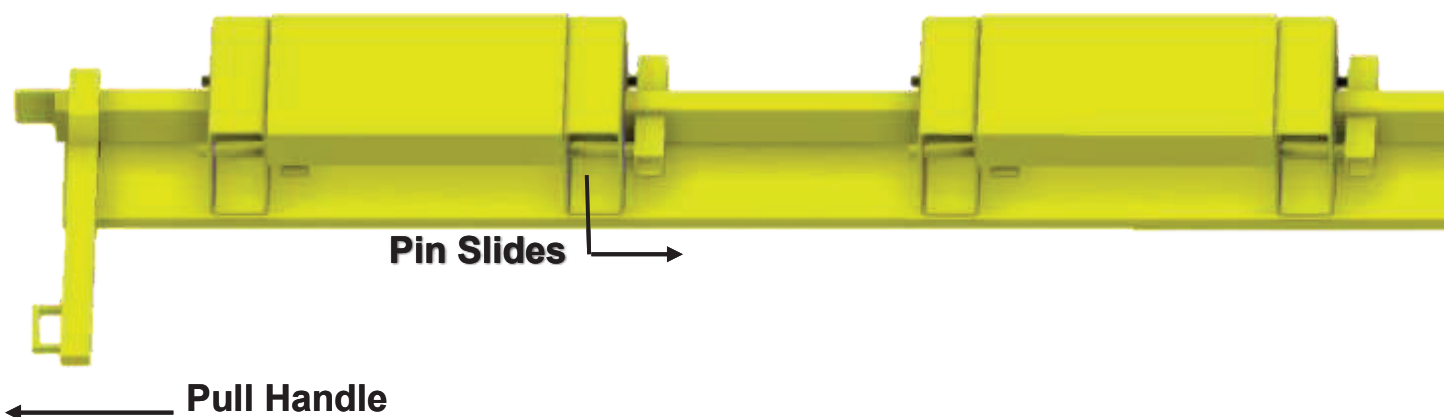


Figure 9-2

Once all slings are attached to the frame, roll them up and zip tie them to the strap guide for shipment.

See figure 10-1 on how the single release frame should look on once the slings are on the frame, and how the eye of the sling goes over the pin of the release. *Note: this depicts how the frame would be used for mat placement, but the slings should be rolled up and secured to the strap guide for shipment as stated before.*

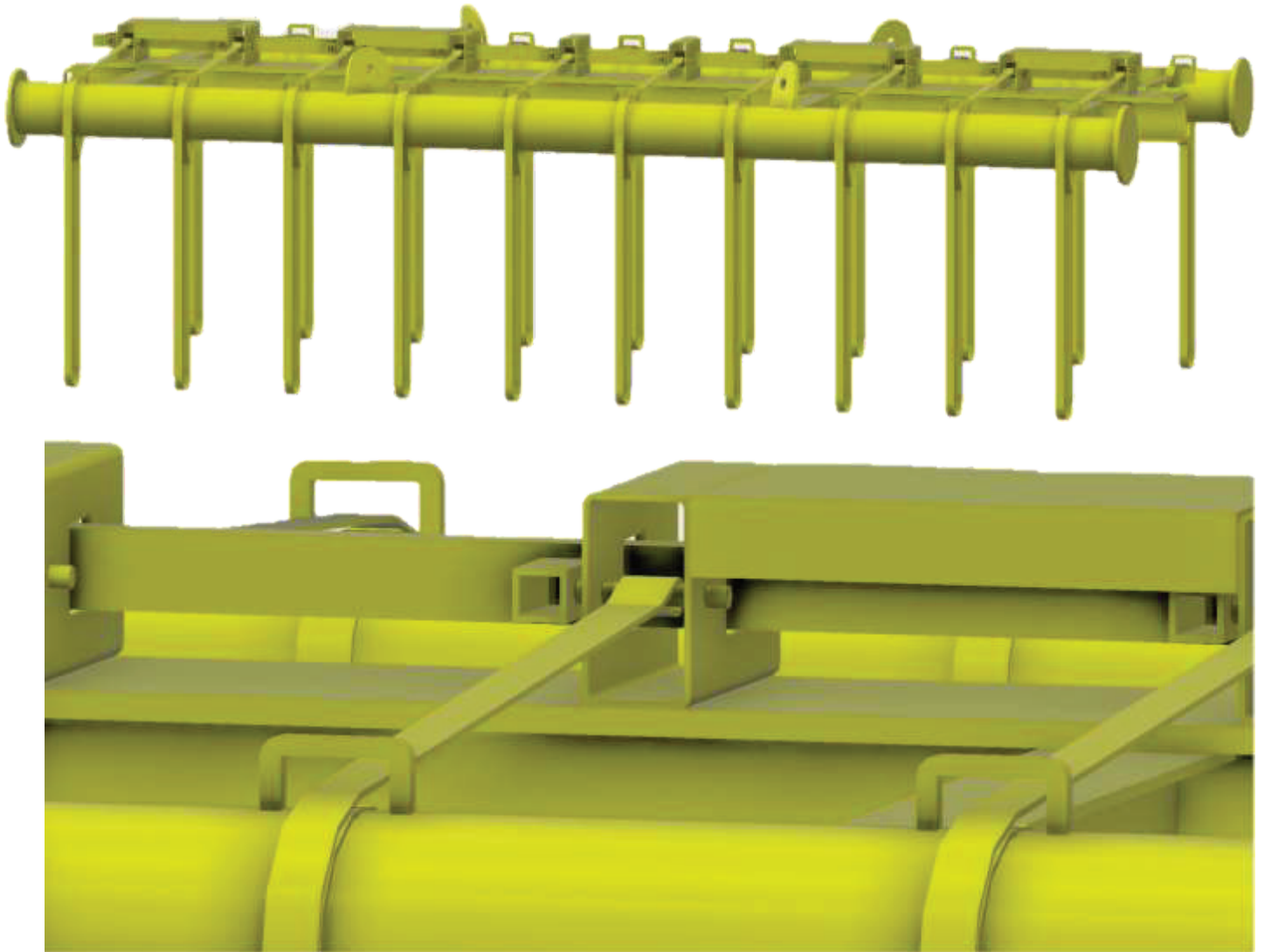
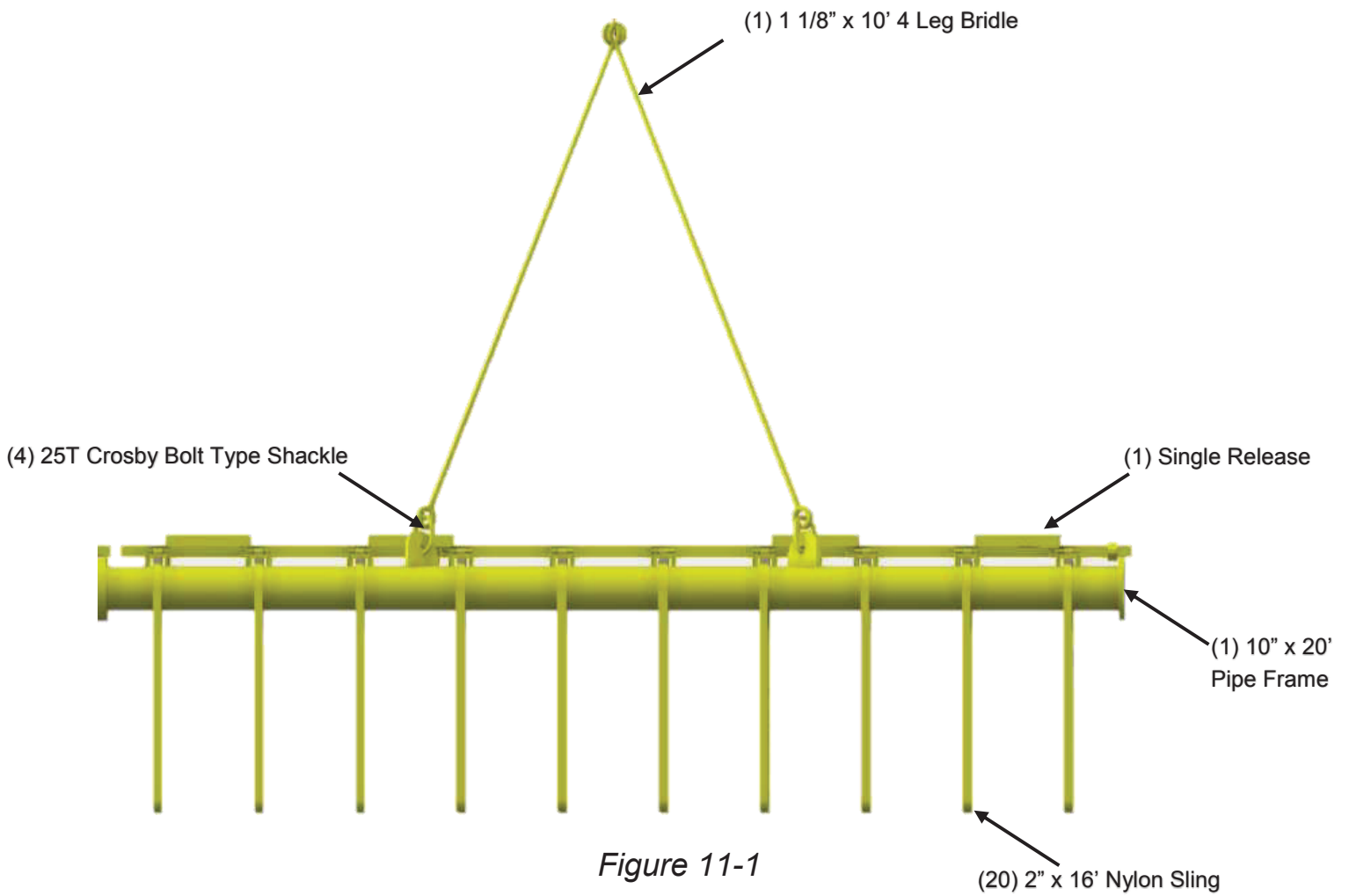


Figure 10-1

See figure 11-1 for a detailed layout of how the single release frame is to be rigged.



20' – Dual Release Frame

A **20' dual release** frame is the same rigging as a single release frame, except it has an additional release on top of the single release, and (20) 2" x 30' nylon slings to accommodate the 2nd release.

The 2nd release is bolted to the top of the 1st release using (8) 18-8 grade, stainless steel bolts. The bolts are $\frac{3}{4}$ " x $3\frac{1}{2}$ " x 10TPI accompanied with (2) flat washers, (1) lock washer and (1) nut. The recommended max ft/lbf for the $\frac{3}{4}$ " x $3\frac{1}{2}$ " x 10TPI is 125ft/lbf.

See figure 12-1 thru 13-2 on how the assembled 20' dual release frame should look, with the colored coded nylon slings attached to it. When assembling dual releases, it is important to note that one release handle needs to be right hand operated, and the other needs to be left hand operated as shown in figure 12-2.

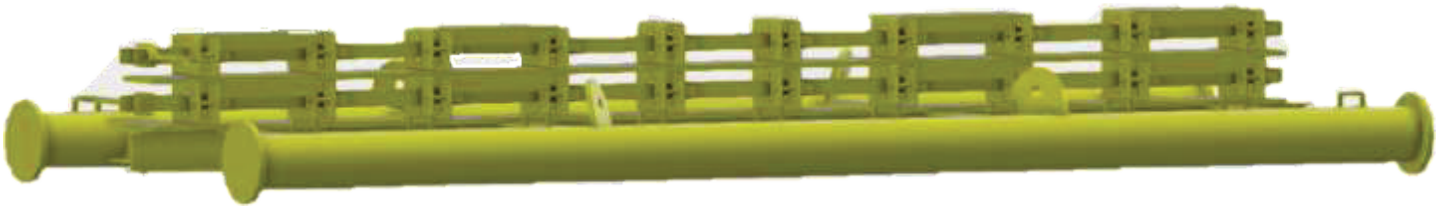


Figure 12-1

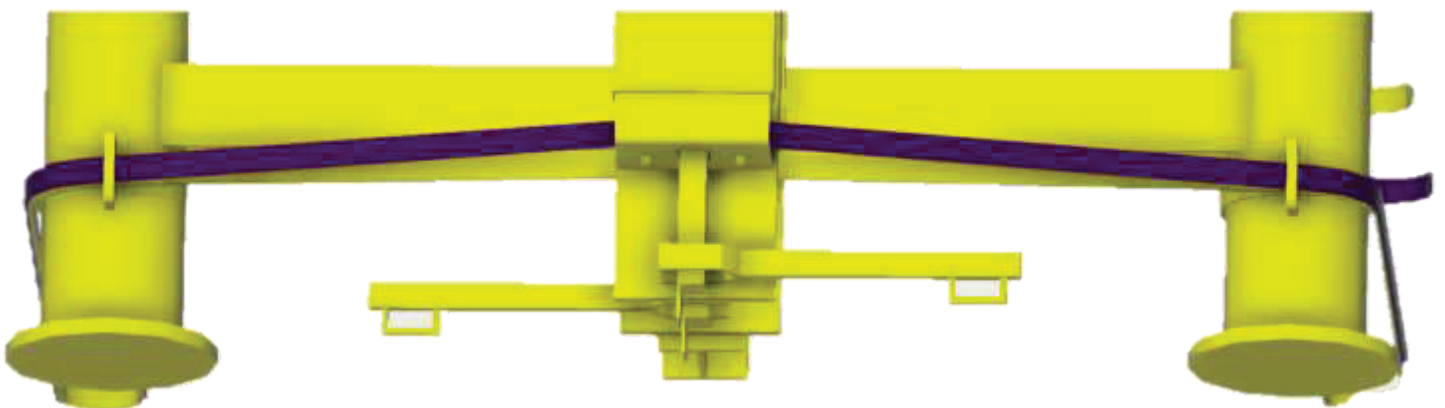


Figure 12-2

When you have a frame with multiple releases, it will be standard that the 16' and 30' slings be different colors so that the different length slings are easily identifiable for the crew rigging the mats to the frame. *Note: this depicts how the frame would be used for mat placement, but the slings should be rolled up and secured to the strap guide for shipment as stated before*

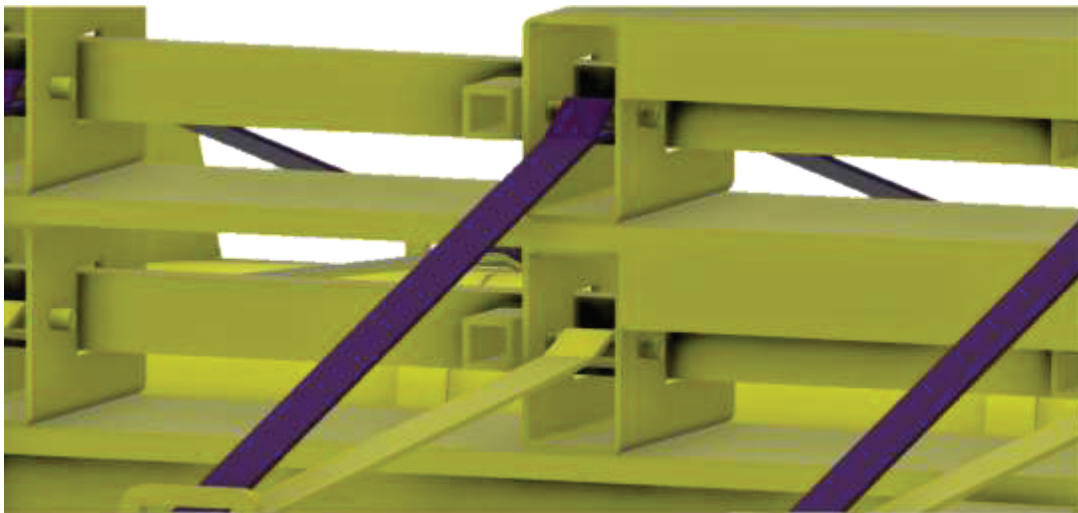


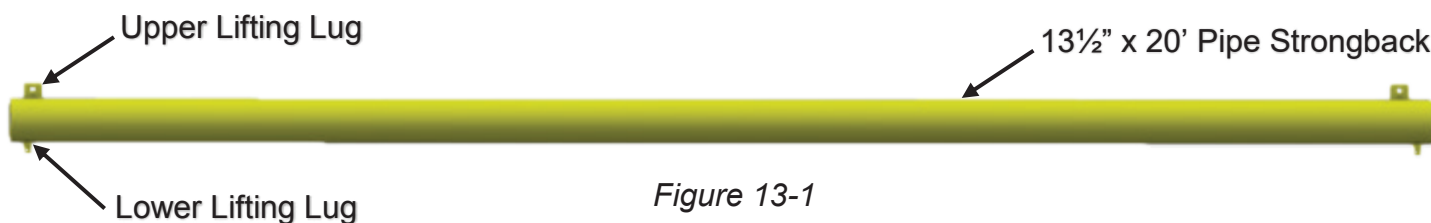
Figure 13-2

The rigging for the dual release frame is the same as the single release frame

40' Single Release Frame

A 40' **single release frame** consists of (2) 10" x 20' frames, (2) releases and (1) 13½" x 20' pipe strongback. The two frames are connected by bolting them together via the end flanges and (24) 18-8 grade, stainless steel bolts. The bolts are 7/8" x 4½" x 9TPI accompanied with (2) flat washers, (1) lock washer and (1) nut. The recommended max ft/lbf for the 7/8" x 4½" x 9TPI is 190ft/lbf.

Once you bolt the frames together, and connect the 4-leg bridles to the frames, a **strongback** will be used to connect the 4-leg bridles down to a 2-leg bridle, and evenly distribute the load when being lifted. A depiction of the strong back can be seen in figure 13-1.



The releases need to be connected together so that you can pull/push the handle, and the entire 40' of release moves at the same time. Figure 14-1 shows the improper way to connect (2) 20' releases when assembling a 40' bar. If you assemble the releases, and function test the release and one side opens or closes completely while the other side does not open or close completely, the connector plate needs to be adjusted.

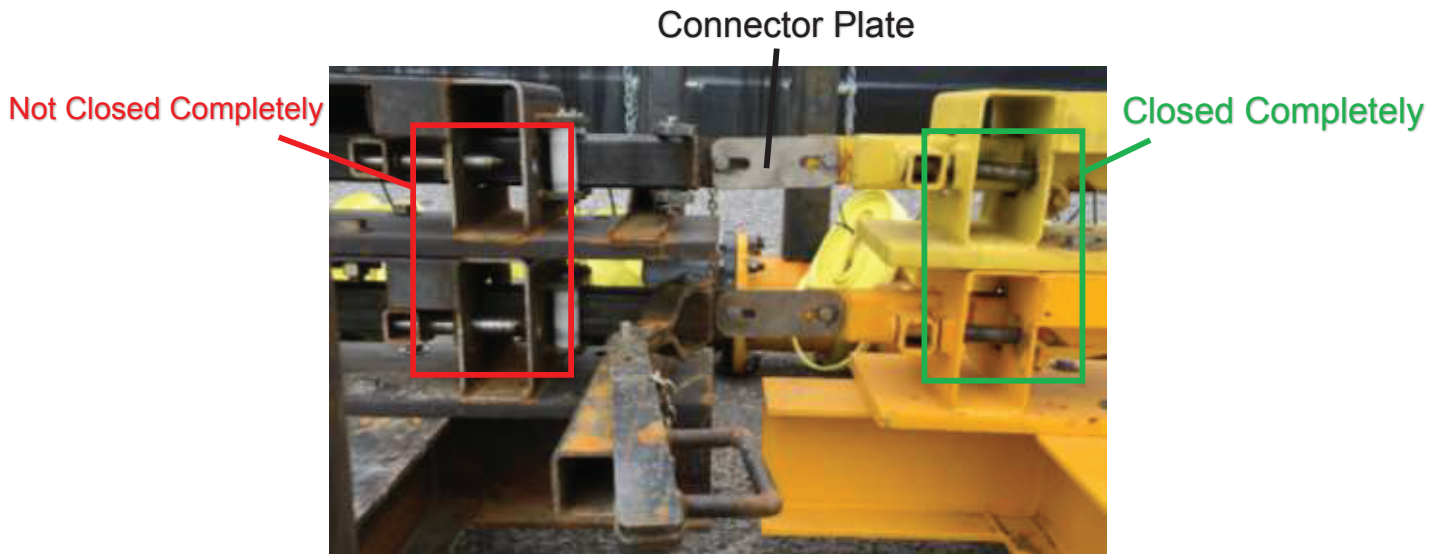


Figure 15-1

Once the releases are function tested and they open and close at the same time, the frame is ready to be used. See figure 15-2 for a detailed drawing on the assembly of a 40' single release frame.

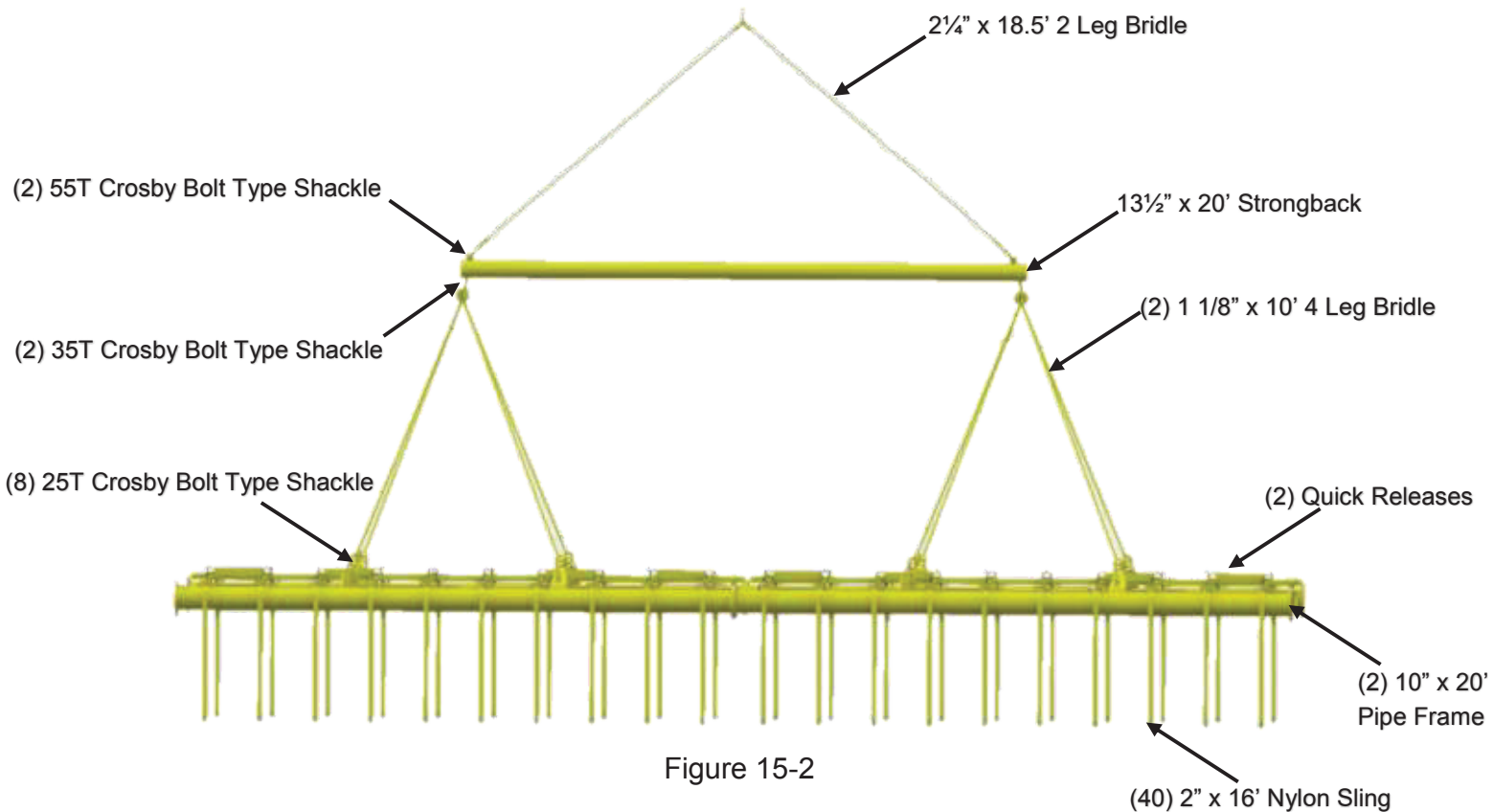


Figure 15-2

40' Dual Release Frame

A **40' Dual Release Frame** consists of (2) 10' x 20' frames, (4) releases, and (1) 13½" x 20' pipe strongbacks. The frame utilizes the same rigging components as the 40' Single Release frame, except it has (4) releases on the frame and both 16' and 30' nylon slings. See figure 16-1 for a detailed drawing on the assembly of a 40' Dual Release Frame.

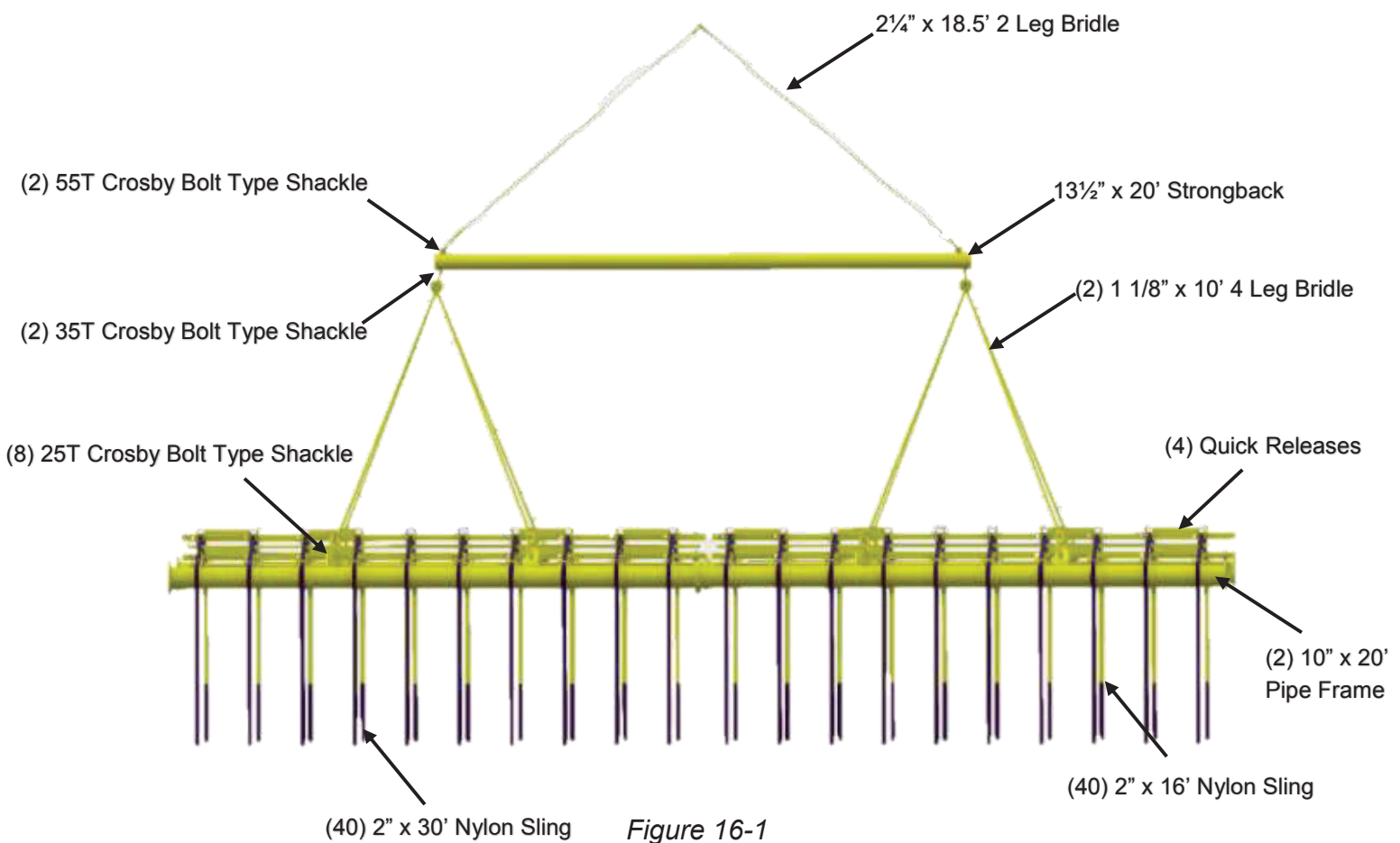
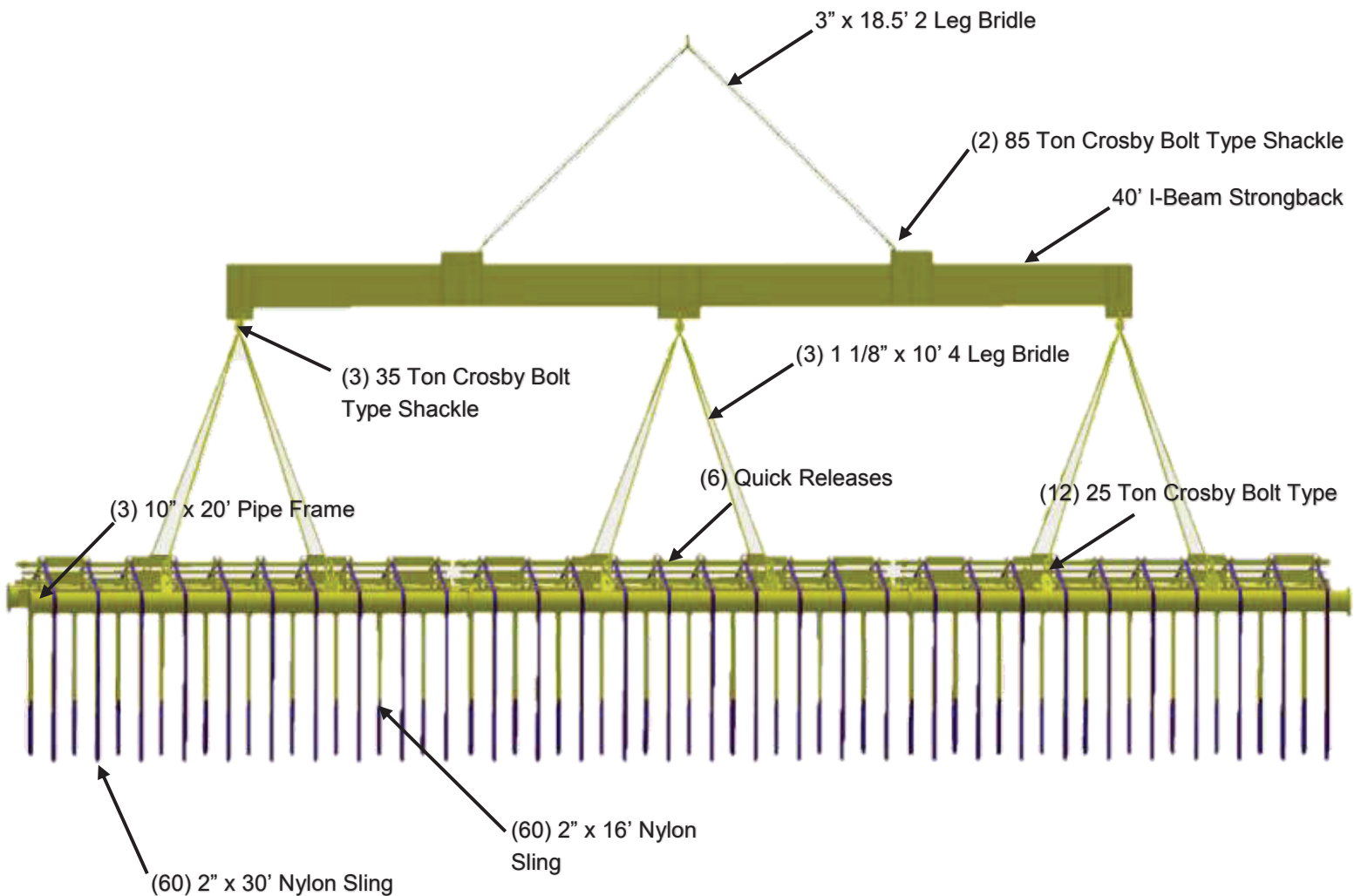


Figure 16-1

60' Dual Release Frame

A **60' Dual Release Frame** consists of (3) 10" x 20' frames, (6) releases, and (1) 40' I-beam strong back. The frame utilizes the same rigging components as the 40' dual release frame, except it uses the 40' I-Beam strong back, and (2) single leg bridles.

See figure 17-1 for a detailed drawing on the assembly of a 60' Dual Release Frame.



For informational purposes only to our clients, listed in figure 18-1 is both the safe working load and how many mats per load that our frames are capable of.

Frame Type	Mats Per Deployment						Frame Lifting Capability (Lbs.)
	8'x20' Mat			8'x40' Mat			
	4.5"	9"	12"	4.5"	9"	12"	
20' Handling Frame	4	2	1	-	-	-	27,000
40' Handling Frame	8	4	2	4	2	1	54,000
20' Single Release Frame	4	2	1	-	-	-	27,000
40' Single Release Frame	8	4	2	4	2	1	54,000
20' Dual Release Frame	10	6	4	-	-	-	63,000
40' Dual Release Frame	20	12	8	10	6	4	126,000
60' Dual Release Frame	30	18	12	-	-	-	189,000

Figure 18-1



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