

RIGGING & MACHINE MOVING

A COMPLETE GUIDE

TYPES OF RIGGING

INDUSTRIAL RIGGING



MACHINERY

Machine rigging utilizes special equipment to lift and transport heavy machinery from one location to another. With rigging services, an industry can repurpose their facilities or change locations entirely with ease.

HEAVY EQUIPMENT

When it comes to rigging extremely heavy objects, cranes and pulley systems are needed. The rigging process can be made all the more complex because of the sheer size of the equipment being moved. Without careful attention and the correct expertise, heavy equipment can be incorrectly moved resulting in serious injury and costly damage.

ENTERTAINMENT RIGGING



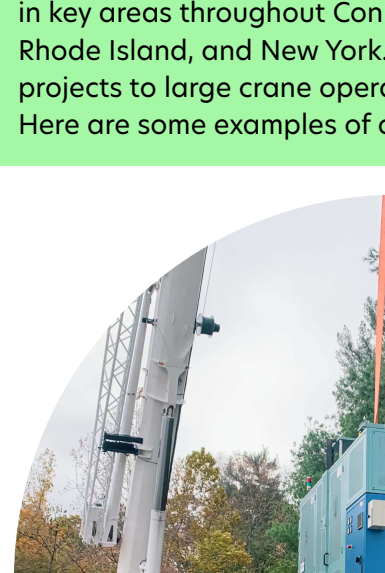
STAGE

Stage rigging refers to how equipment on stage is suspended and/or moved. The ability to move scenery pieces up and out of the way maximizes the space on a stage.

LIGHTING

A rigging system is necessary in creating an effective lighting design for any stage production. The rigging process ensures the quality and security of equipment, crew, and performers. Lighting fixtures need to be hung and focused according to your plot, and further secured with clamps, safety cables, and gels.

CONSTRUCTION RIGGING



STEEL

Steel is one of the heavier loads in the construction industry. Steel will most likely need to be hoisted and lowered using equipment such as forklifts, boom lifts, overhead cranes, etc.

CONCRETE

Much goes into the process of lifting and moving concrete. You have to select the proper rigging - ropes, chains, slings, and inserts - to have a successful lift. Improper lifting could result in concrete damage. Additionally, riggers must consider a concrete load's size, weight, and center of gravity at the start of the rigging procedure.

REGIONAL SERVICES

As we previously mentioned, we offer rigging services in key areas throughout Connecticut, Massachusetts, Rhode Island, and New York. From small in-house projects to large crane operations, we can do it all. Here are some examples of our past rigging projects:



CNC MACHINE

We move everything from DMG Mori DMU machines to USA-made Methods Machine Tools.

DELMAR ELECTRIC GENERAC GENERATOR

The Sullivan Industrial Services Team used a crane operator to ensure the safe placement of a Generac generator.

PRINTING MACHINE

We worked with clients like Amazon's Printing Division & others to move Heidelberg Presses, as well as more modern manufacturers like Fujifilm.

BREWERY TANKS

The Sullivan Industrial Services Crew rigged and installed brewing tanks for Counterweight Brewing Company and New England Brewing Co..

MILLING MACHINES

Our time is always moving milling machines like Bridgeport Millers..

MRI INSTALLATION

Using a crane, we hoisted an MRI machine through the roof of a medical building.

SAFETY CONSIDERATIONS

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Rigging can come with serious risks so it is essential that riggers proceed with caution. Personal protective equipment (PPE) is necessary for any rigging project. Such equipment includes:



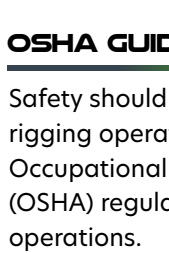
PROTECTIVE CLOTHING

Every rigger should use protective clothing or coveralls that protect their body from welding splashes, chemical splashes, hot oil, water, etc.



SAFETY SHOES

Grounds of many industries or construction sites are littered with cement, chemicals, or even sharp equipment that can cause injury to a rigger's feet.



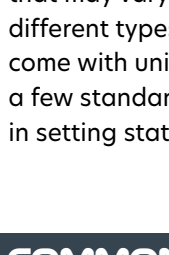
HELMET

Helmets or hard hats ensure safe covering for the head, protecting it from any falling objects.



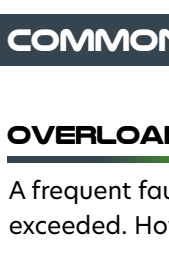
SAFETY GLOVES

Safety gloves should be heat resistant and made from cotton. They should be used for all general operations to protect the hands.



SAFETY HARNESS

Rigging sometimes requires working on elevated heights. To avoid falls and ensure the safety of the rigger, a safety harness is used.



SAFETY GLASSES/GOGGLES

Eyes are one of the most important and sensitive parts of the body. They must be protected from exposure to harmful working conditions that can cause serious eye injuries.

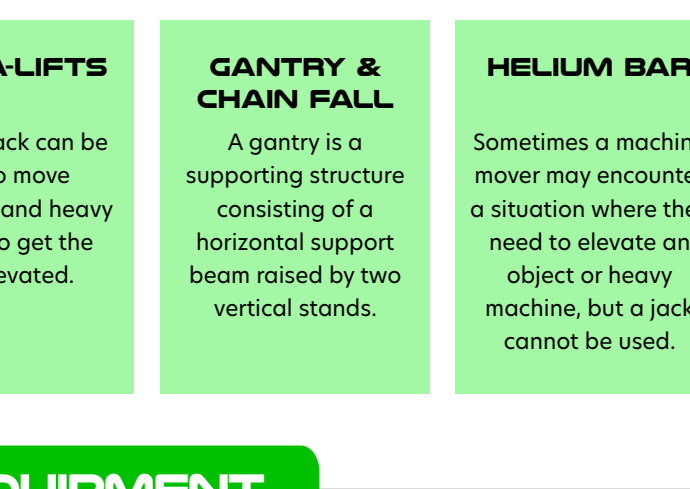
RIGGING SAFETY STANDARDS

OSHA GUIDELINES

Safety should absolutely be the main priority for every rigging operation. To prevent injury or damage, the Occupational Safety and Health Administration (OSHA) regulates the safety of rigging equipment and operations.

STATESPECIFIC REGULATIONS

In the rigging industry, there are a variety of associations that set standards and specific requirements that may vary from state to state. Additionally, different types of jobs and rigging equipment may come with unique safety requirements. Still, there are a few standard organizations that have a major hand in setting statewide rigging requirements.



COMMON RISKS AND HOW TO AVOID THEM

OVERLOADING

A frequent fault in rigging is ignoring weight limits. Every rigging component has a specific capacity that should not be exceeded. However, due to lack of knowledge or in time crunch situations, workers overlook this crucial aspect.

IMPROPER ATTACHMENT

The way rigging components are connected significantly impacts the safety of lifting operations. Improper rigging attachment can lead to load instability, uneven weight distribution, and compromised structural integrity.

ENVIRONMENTAL FACTORS

Before beginning any rigging project, riggers should create a Jobsite Hazard Analysis (JHA). The JHA addresses each hazard and comes up with a precautionary method in response.

COMMON RIGGING TOOLS THAT MAXIMIZE SAFETY

There is a variety of rigging tools needed to work with machinery of substantial size and weight. By using these tools, you can handle such machinery with caution and accuracy. Generally, using the proper rigging tools can increase the safety and efficiency of the overall process. Common rigging tools include:

JACKS	SKATES	ROLL-A-LIFTS	GANTRY & CHAIN FALL	HELIUM BAR
A simple jack can be used to move machinery and heavy objects to get the item elevated.	Skates are essentially industrial roller blades which allow large items to roll across the floor.	A simple jack can be used to move machinery and heavy objects to get the item elevated.	A gantry is a supporting structure consisting of a horizontal support beam raised by two vertical stands.	Sometimes a machine mover may encounter a situation where they need to elevate an object or heavy machine, but a jack cannot be used.

RIGGING EQUIPMENT

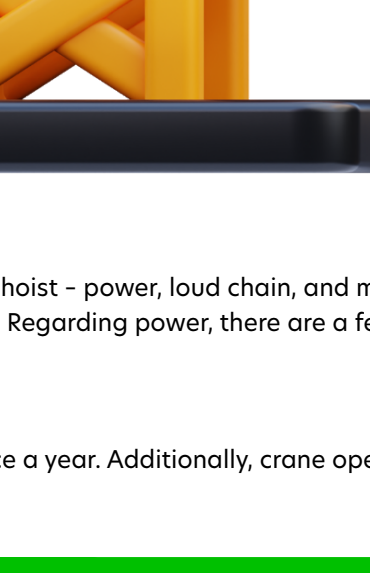
CABLES AND ROPES

MATERIAL TYPES

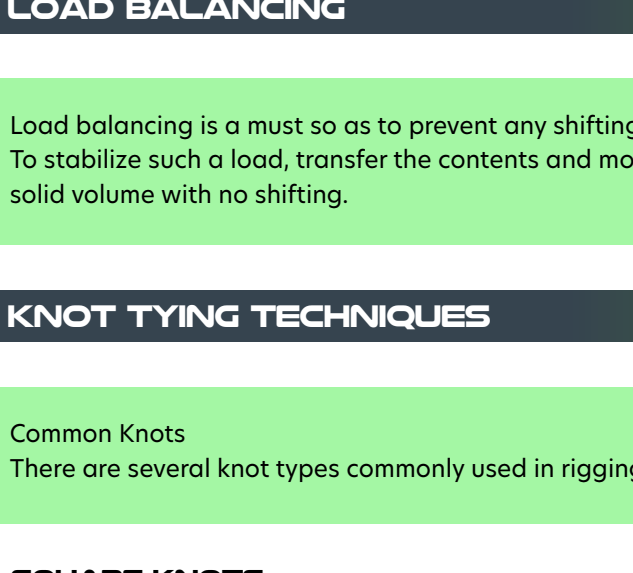
The two primary types of rope used for rigging are manila rope and polyester rope. The natural strength and all around utility of manila rope has made it the standard for quality rope.

MAINTENANCE

Cables and ropes should be stored in a dry, cool, and well-ventilated area away from direct sunlight and other elements. Exposure to UV and moisture can weaken the rope fibers, leading to premature aging and damage. When using the ropes, it's essential to avoid sharp angles and prevent kinks.



HOOKS AND CLAMPS



SELECTION CRITERIA

There are two main types of hooks used for rigging - overhead hooks and non-overhead hooks.

CLEVLOK HOOKS

This line of hooks offers easy installation and are 100% proof tested.

EYE HOOKS

These hooks are designed for overhead lifting and can be used in place of Clevlok hooks.

S HOOKS

"S" Hooks are built and designed for special lifting applications.

PLATE HOOKS

Plate Hooks are designed for lifting plate material in vertical and horizontal orientations.

SORTING HOOKS

Sorting Hooks are designed to lift and move material with long narrow throat openings.

Inspection

Rigging hooks and clamps should be inspected thoroughly before each job. Depending on their condition, they may have to be discarded. For example, rigging hooks that are worn more than 10% of the original dimension or are worn beyond a specific dimension should be discarded.

CRANES AND HOISTS

TYPES OF MOBILE CRANES INCLUDE:

CRAWLER CRANES

Crawler cranes are the largest mobile cranes.

ROUGH TERRAIN CRANES

Known as "RT" cranes, these cranes are designed for "off-roading" in challenging environments such as mud and snow.

ALL-TERRAIN CRANES

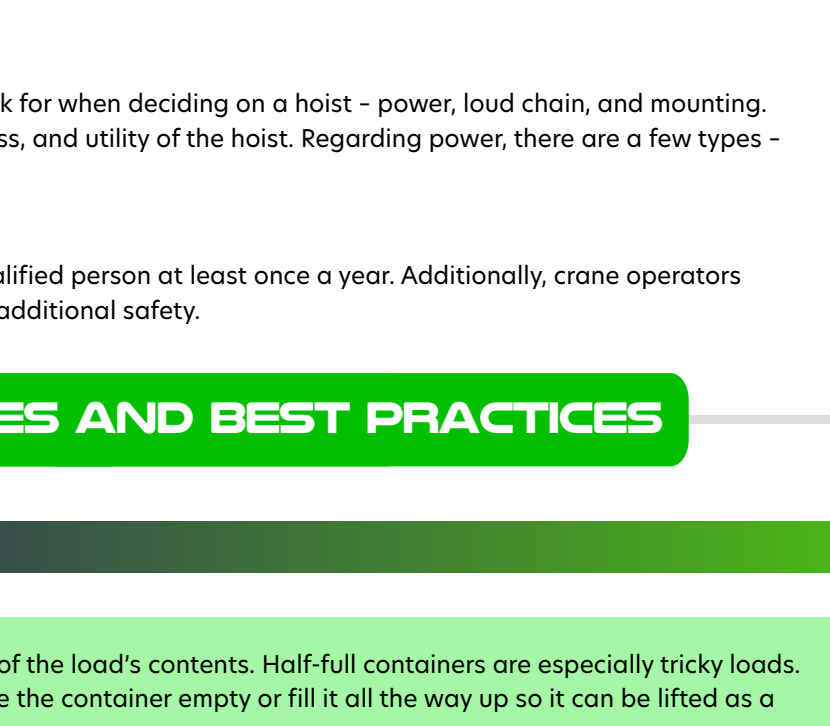
An all-terrain crane can travel both on the road and on most off-road surfaces.

TRUCK CRANES

Truck cranes are made of a boom mounted to a truck bed and are, therefore, road legal.

CARRY DECK CRANES

A carry deck crane consists of a rotating, telescopic boom mounted to a small, flat platform with four wheels.



Moving to hoists, there are three key features to look for when deciding on a hoist - power, load chain, and mounting. Each of these features will impact the cost, effectiveness, and utility of the hoist. Regarding power, there are a few types - pneumatic, electric, and manual.

Operational Guidelines

According to OSHA, cranes must be inspected by a qualified person at least once a year. Additionally, crane operators must be trained to inspect cranes before every use for additional safety.

RIGGING TECHNIQUES AND BEST PRACTICES

LOAD BALANCING

Load balancing is a must so as to prevent any shifting of the load's contents. Half-full containers are especially tricky loads. To stabilize such a load, transfer the contents and move the container empty or fill it all the way up so it can be lifted as a solid volume with no shifting.

KNOT TYING TECHNIQUES

Common Knots

There are several knot types commonly used in rigging procedures. Those knots include:

SQUARE KNOTS

Square knots are composed of two overhand knots turned in opposite ways. It flattens when pulled tight, making it useful for tying loads.

CLOVE HITCHES

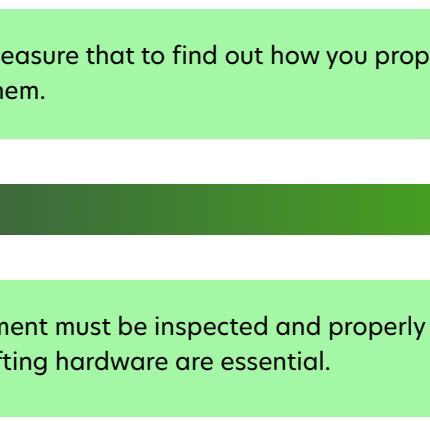
The clove hitch is made by passing the rope's end around an object and then crossing it over the rope's standing part to form a loop, then passing the end around the object again to form a second loop, through which the end is passed.

DOUBLE HALF HITCHES

A double half hitch is formed by making a second half hitch around a rope's standing part.

SHEET BENDS

The sheet bend is made when the end of one rope is passed through a loop of the other, is passed around the loop, and under its own standing part.



Specialized Knots
There are two specialized knots you may incorporate into your rigging project. First, there is the Munter's Hitch. This simple but effective knot allows riggers to lower heavy motors down from high surfaces such as catwalks.

LOAD ANGLES AND SLING TENSION

The sling angle is the angle where the sling meets the load. You need to measure that to find out how you properly choose the piece of rigging you need for the applied force that's going to be on them.

EQUIPMENT INSPECTION AND MAINTENANCE

Above all else, we want to avoid injury in the workplace. To do this, equipment must be inspected and properly maintained. Routinely checking the condition of your rigging, rope pulley blocks, and lifting hardware are essential.

TRAINING AND CERTIFICATION

AVAILABLE COURSES IN CT, MA, RI, AND NY

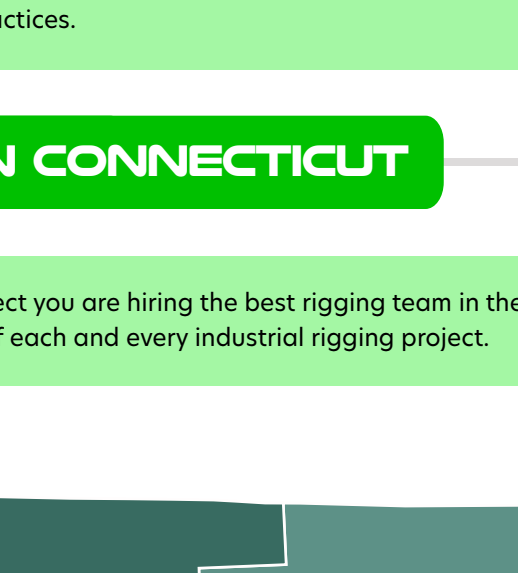
American Crane & Safety offers rigger training courses to those interested in Connecticut, Massachusetts, and Rhode Island.

IMPORTANCE OF CERTIFICATION

To pass rigger certification exams and earn certification, comprehensive training is required to gain adequate technical knowledge and hands-on skills.

HOW TO CHOOSE A TRAINING PROVIDER

When choosing a training provider, look for a program that provides a good combination of technical knowledge and hands-on examples to show application of the principles and techniques taught.



HIRE THE RIGHT RIGGING COMPANY

In this guide, we have given you a thorough and in-depth look into rigging practices. We've touched on types of rigging, rigging equipment, rigging techniques, workplace safety, and training. The information we've discussed is not just for your knowledge, but in sharing this guide, we hope to encourage proper rigging practices.

RIGGING SERVICES NEAR ME IN CONNECTICUT

When you hire Sullivan Industrial Services for your rigging project, you can expect you are hiring the best rigging team in the area. Our consistent focus on safety and efficiency is always at the forefront of each and every industrial rigging project.

