

Safety Policy & Procedure Manual		Section:	Date: 12-8-2015
		Revision: 7-25-2016	
Subject: Rigging			

PURPOSE

This policy is designed to protect the safety of all Light Tower Rentals, Inc. (LTR) personnel and subcontractors during the process of, or as the result of: rigging, lifting, or moving of loads.

RESPONSIBILITIES

LTR is responsible for implementation and enforcement of this policy.

GENERAL

While the qualified rigger is required to know the basic principles and limits of lifting and hoisting equipment, he/she is expected to rely on qualified operators, mechanics, suppliers, engineers, managers, and others involved for valid information, and for competent performance by these other persons in their respective roles.

DEFINITIONS

ANSI: American National Standards Institute

Attachment: A device other than conventional forks or load backrest extension, whether removable or mounted permanently or on the elevating mechanism of a fork truck for handling the load. Popular types are fork extension clamps, rotating devices, side shifters, load stabilizers, rams, and booms.

Cable: A term loosely applied to wire ropes, wire strands, manila ropes, and electrical conductors.

Clip: A fitting used to clamp two parts of wire rope (also known as wire rope clip, wire rope clamp).

Competent Person: One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Crane: A machine used for lifting and lowering a load vertically and moving it horizontally that has a non-manual hoisting mechanism as an integral part.

Equivalent: The word “equivalent” in this policy means; alternative materials, designs, or features that will provide an equal degree of strength and safety.

Forklift Truck: A high-lift self-loading truck equipped with load carriage and forks for transporting and tiering loads.

Hoist: A device that applies a force for lifting or “load movement” lowering, pulling, pushing a load and to apply or release tension.

Lift: Either the maximum safe vertical distance through which a hook or other load attachment device can travel or the hoisting of a load.

Person-In-Charge (PIC): The manager or other responsible person. (See also competent person)

Subject:

Rigging



Public: Person or property not a part of the rigging operation.

Qualified Person: One who, by possession of a recognized degree, certificate, or professional standing or who, by extensive knowledge, training, and experience, has successfully demonstrated an ability and competence to solve problems relating to the subject matter and work.

Qualified Rigger: One whose competence in this skill has been demonstrated by experience satisfactory to the appointed competent person. The term “rigger” or “qualified rigger” in this policy refers to the function performed, and in no way relates to the worker’s classification.

Rated Capacity: The maximum load that a piece of hoisting equipment is designed to carry. Also, the maximum load that an industrial truck or a sling, hook, shackle, or other rigging tackle is designed to carry. At the option of the user, a rated capacity can be assigned that is less than the design-rated capacity.

Rigging: The hardware or equipment used to safely attach a load to a lifting device. The art or process of safely attaching a load to a hoist by means of adequately rated and properly applied slings or related hardware.

Safe Working Load: Load that a piece of rigging equipment can carry safely based on a designed capacity reduced by a factor of safety.

Shackle: A type of clevis normally used for lifting.

Slings: Wire ropes, chains, synthetic web, and metal mesh made into forms, with or without fittings, for handling loads.

Softeners: Protection materials used to prevent damage to slings or loads where slings pass around sharp corners of objects being hoisted.

Strand Clamp: A fitting used to form a loop at the end of a length of strand; consists of two grooved plates and bolts.

Tag line: A rope used to assist in control of a load.

Training: Field, classroom, apprenticeship or other instruction from a person skilled in the subject matter. Any combination of these exposures may be suitable to consider a person trained or qualified. The ability to demonstrate and converse intelligently about the subject matter are indicators of satisfactory training.

Turnbuckle: A device attached to wire rope for making limited adjustments in length. It consists of a barrel and right-and left-hand threaded bolts.

Wire rope: Wire strands laid helically around an axis or a core.

Subject:

Rigging



PERFORMANCE REQUIREMENTS

General

Qualified riggers will be trained and will only perform rigging activities for which their experience and training applies.

Qualified riggers must not use substandard or unsafe equipment or methods. Upon request of a qualified rigger, the competent person will ensure that the qualified rigger is provided information, procedures, and equipment necessary to move the loads without damage or injury to the site, equipment, or personnel.

Qualified riggers will report deficiencies in methods, equipment, information, and training to a competent person.

Critical Operations

A qualified rigger, supervisor or a competent person may determine that an operation is critical, which may require job-specific procedures. When determining what constitutes a critical operation, items for consideration might include the following:

- **Hoisting, Lifting, and Winching Capacity**

When any power or manual mechanical device used for hoisting, lifting or winching is used within 15 percent of its rated capacity (85 percent of its maximum rated load/capacity).

- **Multiple Loads**

When more than one independent load is hoisted at once on one primary hoist line, the operation will be deemed a critical operation. The practice commonly called “Christmas treeing” is included.

- **Lifting of Personnel**

Whenever personnel are lifted, the operation will be deemed critical.

- **Mechanical and Electrical Hazards**

When rigging operations take place in close proximity to electrical or mechanical energy sources that are not locked out and de-energized, and where danger to the riggers or other personnel involved in the rigging activity exists.

- **Hazards of Moving Equipment**

When rigging operations take place in close proximity to moving machinery, vehicles, or equipment, if danger to the riggers or other personnel involved in the rigging activity exists.

- **Hazardous Materials**

When rigging activities occur in environments where the presence or possible release of hazardous materials endanger the riggers or other personnel.

- **Confined Spaces**

When rigging operations take place in a confined space. For purposes of this policy, “confined or enclosed space” means any space having a limited means of egress, is subject

Subject:

Rigging



to the accumulation of toxic or flammable contaminants, or has an oxygen-deficient atmosphere. Confined or enclosed spaces may include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines, and open-top spaces more than 4 feet in depth such as pits, tubs, vaults, vessels, and cofferdams.

- **Lifting Over Personnel**

When loads must be moved over personnel.

- **Public Protection**

When rigging operations take place in close proximity to the public, where danger to the riggers or other personnel involved in the rigging activity exists from foreseeable activity of the public, or where a danger to the public exists from foreseeable consequences of the rigging operation.

- **Multiple Hoists**

Any single lift involving two or more cranes, hoists, or lifting devices regardless of capacity, will be deemed a critical operation.

- **Ground and Support Considerations**

When cranes, hoists, or loads are set on or moved over ground that is not compacted or where underground structures, vaults, trenches, pipelines, pits, or other structures or voids exist or may exist.

- **Temporary Supports**

When loads are set on or moved across temporary structures or supports, or when cranes or hoists are set up on or are supported by temporary structures or supports during the rigging process.

- **Floor/Structure Loading**

When loads are moved across floors, roofs, decks, or other portions of a permanent structure, riggers will give consideration to design loading capacity. If necessary, this will be determined by a qualified person.

- **Weather Conditions**

When weather conditions such as, but not limited to, high winds, storms, lightning, fog, ice or snow may affect the safe operation and endanger the riggers or other persons.

REQUIREMENT FOR A QUALIFIED RIGGER

Rigging in critical operations, as defined in this policy, will be performed under the direction of a qualified rigger.

Subject:

Rigging



OPERATIONAL REQUIREMENTS

General Requirements

When an operation is determined to be critical, a competent person will be appointed who has overall responsibility for the critical rigging operation.

Signaling

Only designated signalers will give signals to an operator (refer to **Figure A** Hand Signals). However, the operator will obey an emergency STOP signal at all times, no matter who gives the signal.

Suspended Loads

Routes for suspended loads will be pre-planned to ensure that exposure to other persons is minimized and that no employee is required to work directly below a suspended load, except for employees engaged in the initial connection of steel or employees necessary for the hooking or unhooking of the load. When working under suspended loads, the following criteria will be met:

- Materials being hoisted will be rigged to prevent unintentional displacement;
- Hooks with self-closing safety latches or their equivalent will be used to prevent components from slipping out of the hook.
- A tagline will be used on all loads to maintain control during the lift.
 - Gloves will be worn
 - Never wrap tagline around arm or leg to stop load swing
 - Never place yourself between an object and load – release the tagline to avoid becoming trapped or pinched

QUALIFICATIONS

Personnel who are designated to use rigging equipment or perform work covered by this policy will be qualified and trained to the level of proficiency consistent with assigned tasks. LTR or other party will be responsible for assessing the knowledge, skills, and abilities of individuals designated as qualified riggers. This person(s) will also supervise and assess lifting, hoisting, and load movement during observed evaluations.

Communication

Riggers will be capable of understanding spoken and written English and must understand the language in use at the location.

Calculation Skills

Have sufficient skills to calculate loads, load weights, safe capacities, and apply other safe rigging principles and procedures. Rigging equipment will have maximum working load limits

Subject:

Rigging



attached to the rigging equipment and under no circumstances will the maximum working load limit be exceeded for a lift.

Skills

Demonstrate the ability to utilize rigging materials and principles.

General Requirements

A qualified rigger will be capable of safely performing rigging operations.

TRAINING

General

Riggers will be trained on the materials, methods, equipment, techniques, communication, and other items as is necessary for safe performance of their specific tasks. Tasks for which qualified riggers may be trained on include (but are not limited to):

- Preparing a load for safe movement
- Assisting in movement or directing the movement of the load
- Safe utilization of various hoisting and load movement equipment
- Selecting components used to assist cranes, hoists, or other equipment to achieve mechanical advantage for the purpose of moving loads.
- Assist in the:
 - Setup
 - Erection
 - Movement
 - Placement
 - Dismantling of cranes and other equipment.

All rigging equipment will be inspected before each use.

Rigging equipment found to be defective will be removed from service.

When not in use all rigging equipment will be stored out of the immediate work area so as not to present a hazard to employees.

If previous training is limited or didn't prepare a rigger for a task, the rigger will not accept the task and management will not assign the task until the rigger is suitably trained.

Additional information from manufacturer(s) of the rigging and hoisting equipment that is used in rigging procedures will be used for training as well, as available and as applicable to the specific rigging situations.

Subject:

Rigging



New or different equipment, methods, situations, techniques, procedures, standards, materials, and unique loads may require special or updated training during planning stages prior to rigging or moving the load(s).

Qualified Riggers will have completed training in the safe application, use, and limitations of the following, if applicable to the person's specific tasks:

- Anchor Points and dead-men
- Synthetic ropes for rigging
- Wire rope
- Chains
- Reeving
- Scaffolds
- Spreader bars and equalizing beams
- Synthetic slings
- Lifting points
- Dollies
- Trolleys
- Tuggers and winches (manual and power)
- Bars and levers
- Come-alongs
- Fiber rope for rigging jacks, jacking systems, and rams
- Forklifts and attachments
- Wire rope slings
- Rigging hitches/knots
- Hooks and similar attachment devices
- Shackles
- Eye bolts
- Turnbuckles
- Links and rings
- Plate clamps
- Softeners
- Cable dogs/grips
- Chain hoists
- End fittings including swages, sockets, splices, connectors, clips, and clamps

When training on items listed above, the following will be considered for each, as applicable:

- Common configurations
- Inspections/testing requirements

Subject:

Rigging



- Tagging and removal from service
- Identify modifications made to equipment
- Maintenance requirements
- Equipment capacity calculations
- Effects of angles or indirect pulling

Training on the following will be conducted when riggers are expected to use these devices:

- Load indicator devices (including scales, dynamometers, load cells, and onboard computers)
- Vacuum lifting/holding devices
- Magnet lifting/holding devices (including remote-operated)

Load Preparation

Qualified riggers will have completed training on the following, if applicable to the person's specific tasks:

- The importance of and/or use of capacity charts
- Mechanical advantages
- Center of gravity
- D/d ratios
- Vectors and angles
- Boom angles and load radius

Planning Activities Prior To and During Load Movement

Qualified riggers will have completed training on the following, if applicable to the person's specific tasks:

- Blind hoists
- Fall protection
- Positioning the load
- Traveling with the load
- Work in close quarters
- Hand signals
- Communication (voice, radio, etc.)
- Procedures for emergencies or unexpected changes
- Procedures for lifting personnel
- Load dynamics
- Load weight estimation/determination
- Boom angle and load radius

Training on This Policy

Subject:

Rigging



Qualified riggers will be trained to understand the contents of this policy.

Previous Training

Training required will be considered satisfied by employees who have completed a nationally approved rigging course or equivalent that includes training on the requirements in this policy.

Retraining

When LTR has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by this policy, the company will retrain each such employee prior to allowing the individual to perform rigging tasks. Circumstances where retraining is required include, but are not limited to:

- Changes in the workplace or tasks which render previous training obsolete
- Changes in the types of rigging systems or equipment to be used render previous training obsolete.
- Inadequacies in an affected employee's knowledge, performance, use of rigging systems or equipment indicate that the employee has not retained the necessary understanding or skill.

RECORDKEEPING

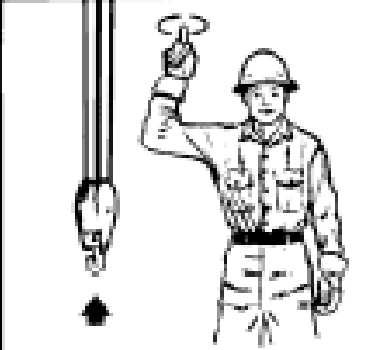
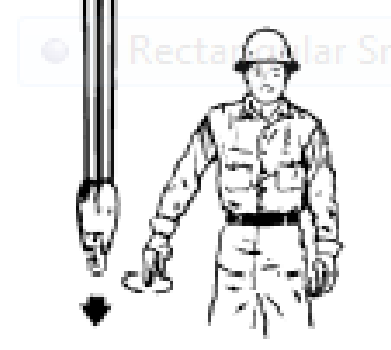
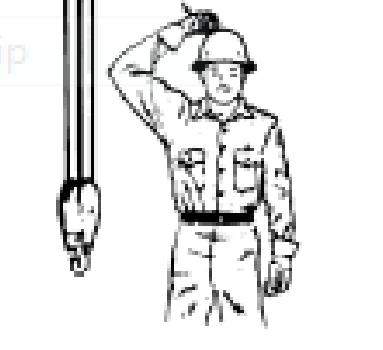
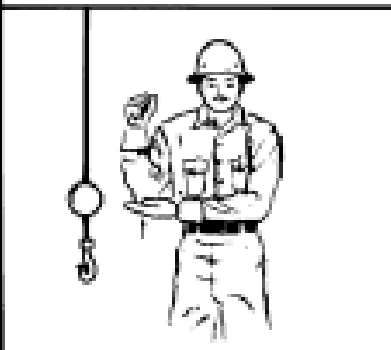
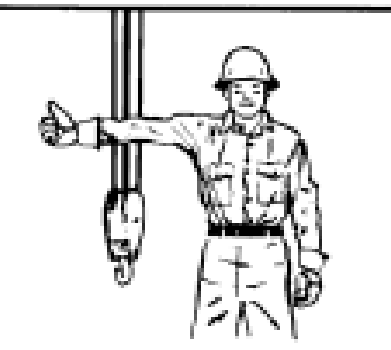
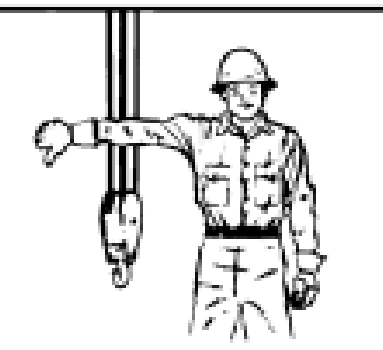
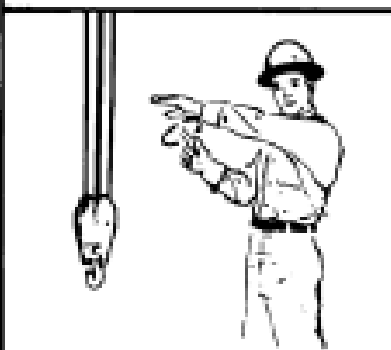
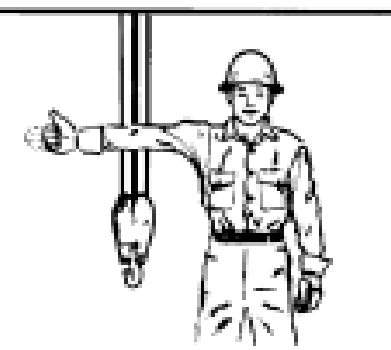
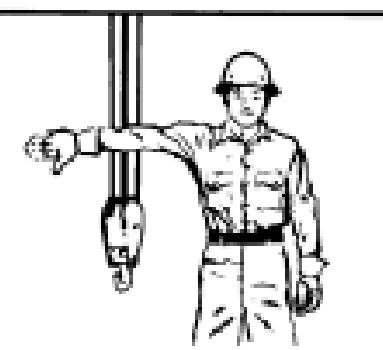
Records of training will be kept by the LTR's Safety Department. Only the most current applicable training records are necessary.

Subject:

Rigging



Figure A - Hand Signals (Page 1 of 3)

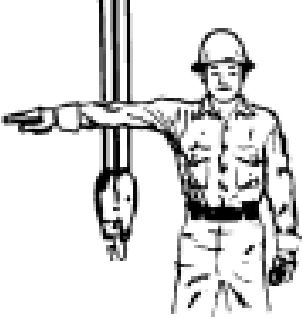
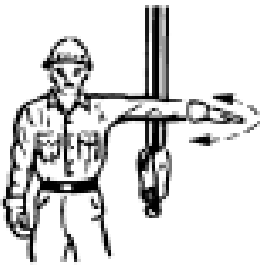
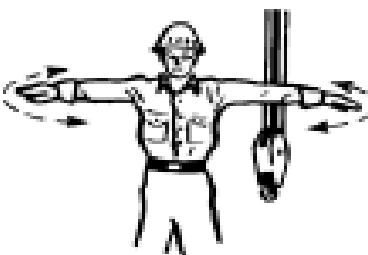
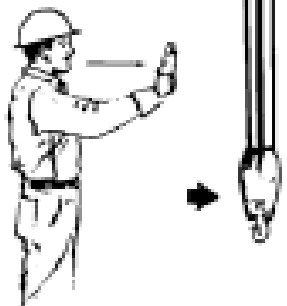
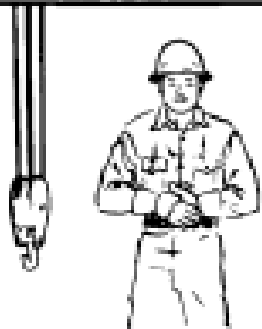
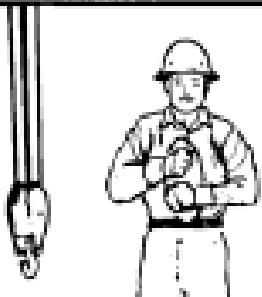
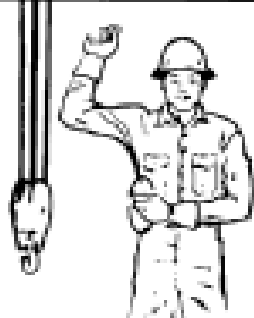
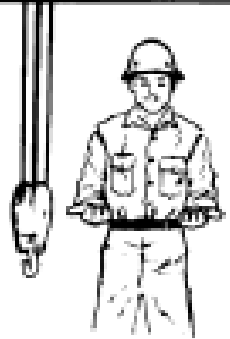
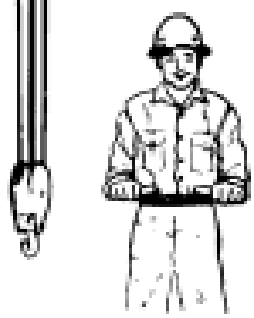
 <p>HOIST. With forearm vertical, forefinger pointing up, move hand in small horizontal circle.</p>	 <p>LOWER. With arm extended downward, forefinger pointing down, move hand in small horizontal circle.</p>	 <p>USE MAIN HOIST. Tap fist on head; then use regular signals.</p>
 <p>USE WHIPLINE (Auxiliary Hoist). Tap elbow with one hand; then use regular signals.</p>	 <p>RAISE BOOM. Arm extended, fingers closed, thumb pointing upward.</p>	 <p>LOWER BOOM. Arm extended, fingers closed, thumb pointing downward.</p>
 <p>MOVE SLOWLY. Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)</p>	 <p>RAISE THE BOOM AND LOWER THE LOAD. With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.</p>	 <p>LOWER THE BOOM AND RAISE THE LOAD. With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.</p>

Subject:

Rigging



Figure A - Hand Signals (Page 2 of 3)

 <p>SWING. Arm extended, point with finger in direction of swing of boom.</p>	 <p>STOP. Arm extended, palm down, move arm back and forth horizontally.</p>	 <p>EMERGENCY STOP. Both arms extended, palms down, move arms back and forth horizontally.</p>
 <p>TRAVEL. Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.</p>	 <p>DOG EVERYTHING. Clasp hands in front of body.</p>	 <p>TRAVEL (Both Tracks). Use both fists in front of body, making a circular motion about each other, indicating direction of travel, forward or backward. (For land cranes only.)</p>
 <p>TRAVEL (One Track) Lock the track on side indicated by raised fist. Travel opposite track in direction indicated by circular motion of other fist, rotated vertically in front of body. (For land cranes only.)</p>	 <p>EXTEND BOOM (Telescoping Booms). Both fists in front of body with thumbs pointing outward.</p>	 <p>RETRACT BOOM (Telescoping Booms). Both fists in front of body with thumbs pointing toward each other.</p>

Subject:

Rigging



Figure A - Hand Signals (Page 3 of 3)

