Reed College Crane Safety Program

June 2024

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1.0 Purpose and Scope

Cranes are an integral part of our work environment. They increase productivity and promote workload efficiency. Reed College has developed this crane safety program in order to identify potential hazards when working with cranes. Reed promotes training to keep crane operators safe. While these safeguards should protect workers in most situations, there is no substitute for personal knowledge and vigilance when working with cranes. This document is meant to provide guidance for Reed College employees as well as employees contracted by Reed College.

This program is intended for all those who use or work around cranes and hoists on the Reed campus. Crane and chain hoist equipment includes the crane in the Reactor bay, hoists in the Grounds workshop, the Performing Arts Building, and the fifth floor Chemistry mechanical room.

2.0 Responsibilities of Positions

2.1 Environmental Health and Safety Department (EHS)

- Provide guidance regarding safe crane usage as requested.
- Oversee and revise crane safety policies as needed.

2.2 Departments

- Each department must notify EHS and Facilities when purchasing a crane for purposes of updating the annual crane inspection list.
- Each department must notify EHS when hiring a contractor that uses a crane on campus.
- Each department must ensure that the crane contractor has a crane safety policy in place that meets or exceeds the standards of this document.
- Each department must ensure campus cranes work is safe and in accordance with OSHA crane safety guidelines.
- Each department must review these safety procedures with new employees as part of new employee training.

2.3 Affected Employees

- All employees must follow crane manufacturer's recommendations and safety guidelines.
- All employees must perform equipment inspections on a regular monthly basis.
- Employees must never operate damaged or faulty equipment in any form as determined by monthly inspections.
- All employees are responsible for reporting unsafe crane use.

2.4 Facilities Maintenance Supervisor

- The Facilities maintenance supervisor must schedule preventative maintenance on an annual basis by a competent person, or by a government or private agency recognized by the U.S Department of Labor.
- The Facilities maintenance supervisor will perform routine repairs on equipment.

3.0 Procedures

This section addresses the safe and proper use of bridge cranes, including ceiling mounted overhead chain lifts and others having the same fundamental characteristics. These procedures follow the guidelines in OSHA 29 CFR 1910.179 for safe crane usage.

3.1 General Requirements

Installation and operation of equipment must meet manufacturer recommendations and OSHA 29 CFR 1910.179 requirements for safe crane usage.

- New and altered cranes must be tested to ensure proper hoisting and lowering, trolley travel, bridge travel, and proper function of limit switches including locking and safety devices. A rated load (the maximum load for which a crane or individual hoist is designed and built by the manufacturer and shown on the equipment nameplate(s)) test is also required.
- Modifications to the crane will be allowed only if the manufacturer has approved the modification and the approval is documented in written form. A qualified engineer checks the new rated load which is then posted on the crane and supporting structure. The supporting structure to which the hoist is attached shall have a safe working load equal to that of the hoist.
- The rated load of a crane must be plainly marked on each side of the crane. If the crane has more than one hoisting unit, each hoist must have its rated load marked on its floor or its load block. The marking must be clearly legible from the ground or floor. These ratings are: Reactor crane - 4 tons; Fifth floor chemistry - 2 tons; Performing Arts - 1 to;, and Grounds workshop - ½ ton.
- A minimum clearance of three inches overhead and two inches laterally must be maintained between the crane and obstructions. It is important to keep passageways or walkways clear so the movements of the crane do not jeopardize personnel safety.
- All hooks must be equipped with a safety latch to prevent loads from becoming detached from the hook.
- Replacement chain must be the same size, grade, and construction as the original chain furnished by the crane manufacturer, unless otherwise recommended by the crane manufacturer.
- Loads shall be attached to hooks by means of slings or other approved devices.
- All operations near overhead lines must be consistent with 29 CFR 1910.333 (c)(3): Overhead line safety requirements.

3.2 Required Inspection

- All cranes must be inspected regularly, before initial use, frequently (monthly) and periodically (yearly). Requirements may be found on the crane safety checklist.
- Before initial use, inspect a new crane to ensure that the crane meets all OSHA safety standards.

3.3 Maintenance Requirements

- A preventative maintenance program follows the crane manufacturer recommendations on daily and periodic maintenance.
- When performing crane maintenance, follow these procedures:
    - All controllers must be in the off position.
    - The main emergency switch must be in the open position and locked out.
    - Post “Out of order,” or “Warning,” signs on the crane and on the floor around the crane.

All safety guards and devices must be back in place or reactivated before placing the crane back into full operation.

4.0 Crane Training

Only those who have fulfilled the requirements of crane training may operate cranes on campus. Training for designated crane operators consists of the following: program review, observation of the crane in use by a trained individual and exhibition of safe use of the crane while a trained operator supervises.

4.1 Handling the Load

- Ensure that all hoist ropes and chains are free from kinks and tangles.
- Do not wrap hoist chains and ropes around the load.
- Attach the load to the load block with the appropriate slings or other approved devices.
- A crane loaded beyond the manufacturers recommended rating of a safe load capacity will create a collapse hazard. Reed’s crane capacities are: reactor crane, 4 tons (8000 pounds); 5th floor chemistry chain lift, 2 tons (4000 pounds); Performing Arts chain lift, 1 tons (2000 pounds); and grounds workshop chain lift, ½ ton (1000 pounds), or the smaller amount of rating of any attachment on crane.
- Ensure that all hoist ropes and chains are free from kinks and tangles.
- Do not wrap hoist chains and ropes around the load.

4.2 Moving The Load

- Before starting a hoist, meet the following conditions:
    - Hoist rope or chain must not be kinked.
    - Safely bring the hook over the load in such a manner to avoid swinging of the hook.

- Before lifting more than a few inches, check the load, it must be well secured and properly balanced in the approved sling or lifting device.
- During hoisting take care to:
    - Avoid sudden acceleration or deceleration of the moving load.
    - Avoid contact with obstructions.
- Do not use the crane for side pulls at any time.
- While individuals are working to attach or detach a load from the hook. There shall be no hoisting or lowering.
- Do not carry loads over people.
- Do not leave the controls when there is a load suspended in the air.
- Test the brakes whenever the load is approaching the maximum load rating. Raise the load a few inches and apply the brakes.
- A warning signal must sound whenever a load or the hook is approaching people.

5.3 Reactor Crane Training

Persons who have fulfilled the requirements of the crane operator training are the only authorized crane operators in the Reed Reactor facility. Training for designated crane operators must consist of a review of the Reactor Crane Training Program, as well as observing use of the crane by a trained individual and then exhibiting safe use of the crane while a trained operator supervises. The reactor office located in Chemistry 102 keeps a record of trained individuals on file.

6.0 References

- Occupational Safety and Health Administration (OSHA) standards 29 CFR 1910.179 for overhead and gantry cranes. 2004
- Occupational Safety and Health Administration (OSHA) standards 29 CFR 1910.180 for crawler locomotive and truck cranes. 2004
- Oregon Occupational Safety and Health Administration (Oregon OSHA) standards division 3 subdivision N 1926.554

Appendix 1: Crane Safety Annual Checklist

Inspect the following items annually for Reed College cranes and hoists. A certified crane professional should complete the inspection. A crane idle for more than 6 months needs this inspection before using. This checklist follows guidelines in accordance with OSHA 1910.179(j)(1) for crane inspection requirements.

Inspect crane for deformed, cracked, or corroded members.	Yes	No
Inspect crane joints for loose bolts or rivets.	Yes	No
Inspect crane for cracked or worn-out sheaves and drums.	Yes	No
Inspect crane for worn, cracked or distorted parts such as pins, bearings, shafts, gears, rollers, locking and clamping devices.	Yes	No
Inspect crane for excessive wear on brake system parts, linings, pawls, and ratchets.	Yes	No
Test load, wind, and other indicators over their full range, for any significant inaccuracies.	Yes	No
Inspect crane for excessive wear of chain drive sprockets.	Yes	No
Inspect electrical apparatus, for signs of pitting or any deterioration of controller contactors, limit switches, and pushbutton stations.	Yes	No
Inspect all functional operating mechanisms for maladjustment interfering with proper operation.	Yes	No
Inspect all hooks for deformation, cracks, or safety latch missing, or deformed.	Yes	No
Inspect all hoist chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations.	Yes	No
Inspect all functional operating mechanisms for excessive wear of components.	Yes	No

Signature: Date:

Appendix 2: Crane Safety Weekly Checklist

The following items are to be inspected weekly for Reed college cranes and hoists in regular use. An employee or student who has fulfilled the crane operator training may perform weekly safety inspections. Cranes and hoists not in regular use are not required to have weekly inspections; such cranes are subject to an annual inspection prior to being used after an idle period of 6 months or longer. Cranes and hoists not in use for more than 1 month, but less than 6 months must have a weekly inspection done prior to use. This checklist has been developed in accordance with OSHA 1910.179(j)(1) for crane inspections requirements.

Inspect all functional operating mechanisms for maladjustment interfering with proper operation. Yes No

Comments:_____

Inspect all hooks for cracks, or safety latch missing, or deformed. Yes No

Comments:_____

Inspect all hoist chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations. Yes No

Comments:_____

Inspect all functional operating mechanisms for excessive wear of components. Yes No

Comments:_____

Signature: _____Date:_____

Appendix 3: Definitions

A "crane" is a machine for lifting and lowering a load and moving it horizontally, with the hoisting mechanism an integral part of the machine. Cranes whether fixed or mobile are driven manually or by power. [OSHA 29 CFR 1910.179(a)(1)

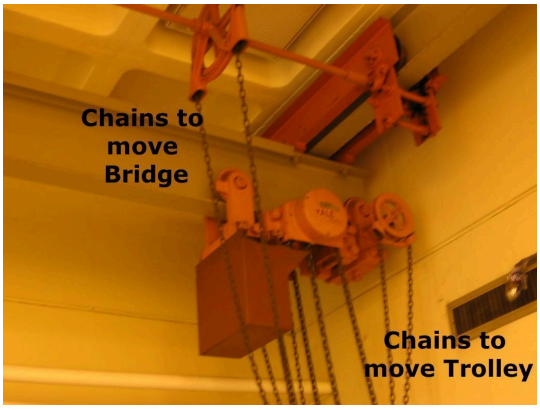
A "hoist" is an apparatus which may be a part of a crane, exerting a force for lifting or lowering. [1910.179(a)(42)]

Rated Load - The maximum load for which a crane or individual hoist is designed and built by the manufacturer and is shown on the equipment nameplate. [1910.179(a)(50)]

Appendix 4: Crane Inventory and Hoist Load Settings

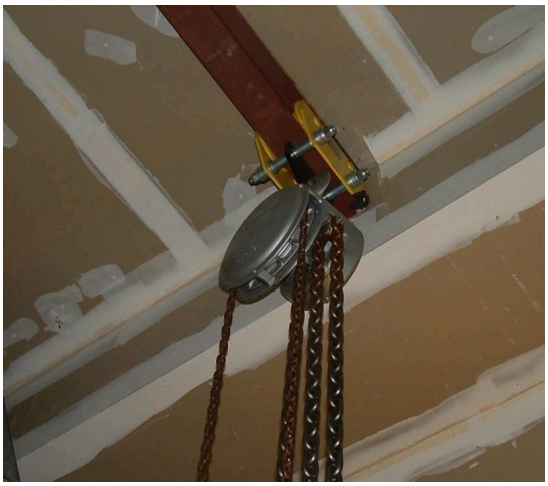
This appendix has been developed to help users identify the types of cranes located on the campus of Reed College, as well as the safe load capacities as recommended by the crane manufacturer.

The Reactor crane is a bridge crane. This crane has a load capacity rating of: 4 tons



The Grounds workshop crane is an overhead chain lift. This chain lift has a load capacity rating of: ½ ton

The 5th floor chemistry mechanical is an overhead chain lift. This chain lift has a load capacity rating of: 2 tons



The Performing Arts crane is an overhead manual chain lift. This chain lift has a load capacity rating of: 1 ton