

Clearheart Construction Co., Inc.

Overhead & Gantry Crane / Rigging

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Overhead and gantry cranes - 1910.179

Crawler locomotive and truck cranes. - 1910.180

Slings. – 1910.184

Cranes, like all pieces of heavy equipment, if not properly operated, inspected and maintained have a potential for causing major bodily injury or property damage. Care must be taken in all facets of crane operation.

Not only do cranes require a thorough annual inspection (a record of the dates and results of these inspections will be maintained by our safety program administrator), they require inspection prior to each use and even during use by a competent person. Any deficiencies will be repaired or replaced before continued use. All inspections will be made by qualified, competent person(s). An inspection form for daily and monthly inspections is found in our project manual. Monthly inspections must be certified by the safety program administrator.

As with all items of machinery, only those operators trained in crane operations and safe work standards and deemed qualified will be designated as authorized persons to operate cranes.

Overhead and Gantry Cranes:

An overhead crane is a machine for lifting and lowering a load as well as moving it horizontally on a fixed runway structure. The hoisting mechanism is an integral part of the crane.

The rated load of the crane must be marked plainly on each side of the crane and, if the crane has more than one hoisting unit, each hoist must have its rated load marked on it or its load block. This marking must be clearly legible from the ground or floor.

Additionally, a substantial and durable load rating chart, with clearly legible letters & figures will be affixed securely in each crane cab and be readily visible to the crane operator while sitting at the control station.

A minimum of 3 inches overhead and 2 inches laterally must be provided and maintained between the crane and obstructions. Where passageways or walkways are provided, obstructions must not be placed so that safety or personnel will be jeopardized by movements of the crane.

In all cases, the operator must always have a clear view of the load.

A CO2 or dry chemical fire extinguisher must be kept in the crane cab or vicinity of the crane. The operator must have had training in the use of fire extinguishers.

Note: under no circumstances will a carbon tetrachloride extinguisher be used.

All exposed moving parts which might constitute a hazard during normal operating conditions must be guarded.

Crane Inspections:

Frequent inspection - Daily to monthly intervals:

1. All functional operating mechanisms for maladjustment interfering with proper operation. Daily.
2. Deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of air or hydraulic systems. Daily.
3. Hooks with deformation or cracks. Visual inspection daily; monthly inspection with a certification record which includes the date of inspection, the signature of the person who performed the inspection and the serial number, or other identifier, of the hook inspected. For hooks with cracks or deformation of more than 15 percent in excess of normal throat opening or more than 10 percent twist from the plane of the unbent hook refer to paragraph (l)(3)(iii)(a) of 29 CFR 1910.179.
4. **Hoist chains**, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations. Visual inspection daily; monthly inspection with a certification record which includes the date of inspection, the signature of the person who performed the inspection and an identifier of the chain which was inspected.
5. All functional operating mechanisms for excessive wear of components.
6. Rope reeving for noncompliance with manufacturer's recommendations.

Periodic inspection - 1 to 12-month intervals:

1. Deformed, cracked, or corroded members.
2. Loose bolts or rivets.
3. Cracked or worn sheaves and drums.
4. Worn, cracked or distorted parts such as pins, bearings, shafts, gears, rollers, locking and clamping devices.
5. Excessive wear on brake system parts, linings, pawls, and ratchets.
6. Load, wind, and other indicators over their full range, for any significant inaccuracies.

7. Gasoline, diesel, electric, or other power plants for improper performance or noncompliance with applicable safety requirements.
8. Excessive wear of chain drive sprockets and excessive chain stretch.
9. Electrical apparatus, for signs of pitting or any deterioration of controller contactors, limit switches and pushbutton stations.
10. All ropes must be inspected at least once a month and a certified record of these inspections will be maintained recording the dates of the inspections and the signature of the person who performed the inspection.

All crane records including frequent (performed by the operator at the start of each shift) and periodic (at 1 to 12 month intervals) inspections used to determine the need for repair or replacement of components to keep the machine in proper operating condition will be maintained. Inspection and maintenance records, the operator's manual, and load charts must be readily available.

Note: Certification records which include the date of inspection, the signature of the person who performed the inspection and the serial number, or other identifier, of the crane which was inspected shall be made monthly on critical items in use such as brakes, crane hooks, and ropes. This certification record shall be kept readily available.

All repairs will be performed by qualified persons.

Before any repairs are started, a warning or “**Out of Order**” sign will be placed on the crane.

Written reports on rated load tests and the test procedures and confirming the adequacy of any repairs or alterations will be maintained.

Rope inspection: A thorough inspection of all ropes in use will be made at least once a month and a certification record which includes the date of inspection, the signature of the person who performed the inspection and an identifier for the ropes shall be prepared and kept on file where readily available.

All inspections will be performed by an appointed or authorized person. Any deterioration, resulting in appreciable loss of original strength will be carefully observed and determination made as to whether further use of the rope would constitute a safety hazard.

All rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed will be given a thorough inspection before it is used. This inspection will be for all types of deterioration and will be performed by an appointed or authorized person whose approval will be required for further use of the rope. A certification

record which includes the date of inspection, the signature of the person who performed the inspection, and an identifier for the rope which was inspected will be prepared and kept readily available.

Electrical Hazards:

It is absolutely imperative that the possibility of electrocution be totally eliminated. This can be accomplished by adhering to the safe distances from various currents noted in Heavy Equipment and Electrical Power Lines, below.

Except where electrical distribution and transmissions lines have been deenergized and visibly grounded at point of work or where insulating barriers (not attached to the vehicle) have been erected to prevent physical contact with the lines, the following clearance -- between any part of the vehicle and the line -- will be observed:

<u>Line Rating</u>	<u>Minimum Clearance</u>
50 kV. or below	10 feet
Over 50 kV.	10 feet plus .04 inch for each 1 kV. over 50 kV, or twice the length of the line insulator, but never less than 10 feet.

In transit, equipment clearance must be a minimum of:

<u>Line Rating</u>	<u>Minimum Clearance</u>
50 kV. or below	4 feet
Over 50 kV. to 345 kV.	10 feet
Over 345 kV. to 750 kV.	16 feet

A ground guide will be designated to observe clearance of the equipment and give warning to the equipment operator in situations where it is difficult for the equipment operator to maintain the desired clearances by visual means.

An overhead wire will be considered energized unless the owner of the line or the electrical utility authorities indicate that it is not energized and it has been visibly grounded.

General Safety:

Dangers associated with cranes include numerous moving parts. These dangers can be minimized or eliminated by ensuring that all guards are in place and not tampered with.

Care must be taken to ensure that areas within the swing radius of the rear of the rotating superstructure of the crane are barricaded to prevent a person from being struck or crushed.

All employees must keep clear of loads that are about to be lifted as well as suspended loads.

Specific requirements for crane installation, set-up, and testing are found in 29 CFR 1910.179.

A preventative maintenance program base upon the crane manufacturer's recommendations will be established.

All **running ropes** will be inspected at least once a month and a certified record of these inspections will be maintained recording the dates of the inspections and the signature of the person who performed the inspection.

All ropes in storage for a month or more will be thoroughly inspected before use and the above inspection records will be maintained.

When using slings made from alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope (conventional three strand construction), and synthetic web (nylon, polyester, and polypropylene), the following **safety practices** will be observed:

- a. Slings shall not be shortened with knots or bolts or other makeshift devices.
- b. Sling legs shall not be kinked.
- c. Slings used in a basket hitch shall have the loads balanced to prevent slippage.
- d. Slings shall be padded or protected from the sharp edges of their loads.
- e. Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.

All slings and associated equipment/attachments will be inspected before use by a competent person for damage or defects. Defective items will be tagged out of service.

Care must be taken while actually operating the crane in hoisting applications as well as when relocating the crane superstructure.

The competent person on site will ensure that the flooring or ground on which equipment is to be placed is substantial enough to safely hold the weight of the load and equipment with adequate safety margin. If the strength of the floor is unknown and/or cannot be determined, a professional engineer will determine the pounds per square foot required and, if necessary, the appropriate shoring to be installed to sustain the weight.

When operating in enclosed spaces, atmospheric testing will be accomplished to ensure clean breathable air. These tests will be recorded and maintained by the safety program administrator.