PURPOSE

The purpose of this procedure is to provide guidelines enabling individual supervisory personnel to develop and implement procedures for the safe handling and storage of materials and to provide guidelines for the inspection of all ropes and cables used for personnel and material handling prior to use and as deemed necessary during their use, in order to ensure the safety of employees.

SCOPE

This procedure applies to all rigging equipment and material storage and handling activities by Midland Engineering Co., Inc.

REFERENCES

29 CFR 1926.251
29 CFR 1926.550
AERIAL MANLIFT SAFETY PROGRAM
CRANES SAFETY PROGRAM

RESPONSIBILITY

Midland Engineering Co., Inc. personnel will initiate a material-handling plan prior to work activity.

All employees shall be keep clear of loads about to be lifted and of suspended loads.

MATERIAL HANDLING SAFE WORK PRACTICE

Recognizing that proper storage and material handling procedures and methods will provide for conservation of materials and equipment, increase productivity by providing a smooth flow of materials as needed, and reduce the number of accidents and injuries usually associated with this function, the following practices must be followed:

Both temporary and permanent storage should be neat and orderly. When planning material storage, a minimum of 24 inches of clearance must be allowed under sprinkler heads. Automatic sprinkler controls and electrical panel boxes must be kept free and unobstructed.

There must be unobstructed access to fire hoses and extinguishers, and access to emergency exits and aisles shall always be maintained. Areas immediately outside of emergency exits shall also be left clear for egress.

Materials shall be segregated as to kind, size, and length, and placed in neat, orderly piles that are safe from failing. If the piles are high, they shall be stepped back as the height increases, and shall be secured by cross piling or cross tying. Piles of materials shall be arranged so as to allow for passageways.

Storage of materials will be facilitated and hazards reduced, with the use of storage bins and racks that are in good condition. Storage racks shall be secured to the wall and/or floor as well as to each other. Damaged racks shall not be used for storage and employees shall not be allowed to climb racks.

Depending on the value of the materials in storage, it may be advisable to provide some type of security to enable the preservation of the materials.

Supervisors must give advance consideration to the size, shape and weight of materials to be handled and plan the most efficient and safest method to accomplish the task. Proper tools shall be provided for the job and alternate methods should be considered.

Employee selection should be considered so that work assignments will match the employee to the job in terms of knowledge and physical abilities. Whenever unusual or hazardous operations are to be performed, prior to commencing the work, employees shall be warned about all possible hazards and given specific safety instructions by their immediate supervisor.

Special precautions shall be taken to prevent hernias and back injuries. Employees naturally tend to bend at the waist and attempt to lift loads with their hands and arms. This is improper and causes injuries, Instead, employees should be cautioned to bend the knees and lift with their legs. Avoidance of these injuries begin with instructing the employee in the correct way to do the work and changing any bad lifting habits. Employee's first efforts following safety instruction should be closely monitored to ensure that proper lifting methods are used.

Maintain proper storage methods and designated areas for flammable and combustible liquids and posting of warning signs, tags, or bulletins as may be required.

Tag lines will be non-conductive and used when necessary to control the platform.

Maintain proper stacking of materials as regard to size, type, and length in piles, shelves, racks, or bins as necessary.

Maintain good housekeeping procedures throughout job site at all times and proper disposal of scrap and waste materials.

Provide the necessary grounding and bonding required for specific materials.

Maintain proper receiving and dispensing of incoming and outgoing materials that will include chocking and blocking of trucks during loading and unloading operations.

Provide proper personal protective equipment that may be necessary for certain products.

Ensure that only properly trained personnel are used in the handling of hazardous materials and to assure that proper material handling methods are used.

Provide prompt reporting of any unsafe conditions or practices that cannot be corrected.

AERIAL MANLIFT/ RIGGING EQUIPMENT SAFE WORK PRACTICE

- REFERENCE THE AERIAL MANLIFT AND CRANES SAFETY PROGRAM
- Only trained authorized individuals can operate a man lift and all training shall be documented.
- Each lift must have a clearly noted rating chart posted permanently where the operator can see it. **Do not exceed the rated maximum loadings listed**.
- Equipment must be inspected regularly. **ALL OSHA, OWNER, & COMPANY FALL PROTECTION RULES MUST BE FOLLOWED WHEN OPERATING LIFTS.**
- Employees shall always stand firmly on the floor of the lift. Don't sit or climb on the edge or use the planks of the lift for a ladder.
- An effective two-way voice communication system can be provided between the operators and stationary people on the ground.
- When required a diaper and wheel covers must be used.
- When rigging equipment is not in use it should be removed from the worksite as to avoid potential hazards.

RIGGER OPERATOR RESPONSIBILITY

- REFERENCE THE AERIAL MANLIFT AND CRANES SAFETY PROGRAM
- It is your responsibility to read and understand the manufacturer's manual(s)and this safety handout before operating an aerial scissor lift.
- Remember that YOU are the key to safety. Good safety practices not only protect you but also protect the people around you.
- Ensure the operating manual is stored in a weatherproof storage compartment.
- Ensure a pre-start inspection is accomplished at the beginning of each shift.
- Report any problems or malfunctions and do not operate prior to repair.
- Make sure you have been properly trained.
- Check the area in which the aerial platform is to be used for possible hazards.
- Ensure that the operation of the aerial platform is within the provisions outlined in the operator's manual.
- Ensure all personnel on the aerial platform comply with the provisions outlined in the operator's manual.
- Brakes shall be set to ensure that the lift does not move when the boom is elevated in a working position with an employee in it.
- Outriggers must be used when lift is extended.
- Transportable outriggers can be used as a method of suspension for ground rigging work for scissor lifts where the point of suspension does not exceed 300 feet above the safe surface.
- Before the lift can be moved the boom shall be inspected to insure that it is properly cradled and outriggers are in the properly stowed position.
- When using outriggers make sure they are totally extended and they are located to support the load.
- If outdoors remember to check for sewers and pipes if loads are very heavy.

When employees are engaged in hooking, unhooking, or guiding the load, or in the initial connection of load to a component or structure and are within the fall zone, all of the following criteria will be met:

- The materials being hoisted will be rigged to prevent unintentional displacement.
- Hooks with self-closing latches or their equivalent will be used in eliminating the hook throat opening.
- The materials will be rigged by a qualified rigger.

ROPE, CABLE, AND SLING Rigging Equipment

PROCEDURE

Although OSHA Standard 29 CFR 1926.251 pertains primarily to rigging equipment for material handling, the rope, cable and sling portions of the standard will be applied to all hoisting equipment, winches, pullers, and safety lines in use by the company. The OSHA guideline regarding visual and detailed inspections, disposition of damaged items, and lubrication procedures will be the policy.

Ropes, cables and slings, regardless of whether they are made of natural or synthetic fibers, steel wire, or metal mesh, are subject to certain hazards that cannot be removed by mechanical means, but only by the exercise of intelligence, care, and common sense. It is therefore essential to have personnel involved in the proper care, use and inspection of this equipment who are competent, careful, and well trained.

VISUAL INSPECTION

Since safety depends on the proper use and care of all types of ropes, cables, slings and rigging equipment a visual inspection of these items must be performed daily by an appointed person. Items to look for while conducting the visual inspection should include the following:

- Deformed, worn or flattened surfaces
- Kinks or severe twists
- Nicks, breaks, frayed or unraveled edges
- Shortened or lengthened rope lays
- Corroded or pitted surfaces

DETAILED INSPECTION

The following, more detailed inspection, must be performed by a designated person at least monthly, or at more frequent intervals, depending on operating conditions and use:

- Run out rope completely and note conditions, such as number of broken strands, broken wires in one lay, reduction in rope diameter, corrosion, shorting of the lay, or fraying.
- Run a soft cloth, preferably cotton, over the entire length of wire rope and examine any rope lays that pick up threads of the cloth.
- Determine the extent of damage due to broken wires, nicks, cuts, frayed, or unraveled edges.
- Ensure that wire rope is properly lubricated.

When any of the above conditions exist and show evidence of abnormal deterioration, the item must be watched and re-inspected daily. If this condition continues to worsen, the item must be condemned and replaced.

DISPOSITION OF DAMAGED RUNNING ROPE

The length and type of service, as well as the severity of operation, must be taken into consideration before determining the disposition of ropes or cables that show signs of damage. Where failure of the rope or cable might endanger life or equipment, the rope cable must be condemned and replaced immediately. In all cases, the rope or cable must be condemned and replaced if any of the following conditions are found to exist.

- Broken Wires: Six or more wires broken in any one wire lay. Three or more wires broken in any one strand of one rope lay.
- Worn Outside Wires: Wearing of one-third or more of the original diameter of the outside individual wires.
- One or more broken strands.
- Kinking, Crushing, Unraveled, or Other Damage: Rope severely kinked, crushed, cut, frayed, bird caged, or unraveled, or any other damage resulting in distortion of the rope structure.
- Heat or Weld Damage: Any evidence of heat damage or weld splatter.
- Corrosion: Considerable corrosion in the valleys between strands or corroded broken wires at end connections.
- Reduction in Diameter: Noticeable reduction from normal rope diameter.

SLINGS

Slings are generally used in conjunction with other material handling equipment for the movement of material by hoisting. Slings are made of alloy steel chain, wire rope, metal mesh, natural or synthetic fiber, or fibers woven into a web. Many manufacturers of slings will produce their slings with a safety mark already on them. An example of this would be a sling with a red colored strand woven right into the material. If the sling has been cut or nicked to the point where the red colored strand is visible, the sling should be replaced immediately. However, since not all manufacturers make this safety mark, it will have to be up to the inspector to determine when the sling should be replaced.

Sling Inspection

- Each day or before each use, the sling and all fastenings and attachments must be inspected for damage or defects by a competent person designated by the company. Damaged slings shall be removed from service per manufacturer's recommendations.

- Additional monthly inspections should be performed during sling use, and where service conditions warrant. Damaged or defective slings must be immediately removed from service and/or replaced.

- Wire rope slings shall not be used if, in any length of eight diameters, the total number of visible broken wires exceeds 10% of the total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect.

- In the case of alloy steel chain slings, the inspection shall include a thorough check for wear, defective welds, deformation of the links, and increase in length. When such defects or deterioration are present, the chain sling must be immediately removed from use.

ROPE CLIPS

Fixtures are usually attached to wire rope by means of wire rope clips, commonly referred to as either "U" clips or "U" bolts. These wire rope clips are also used when making a loop at the end of a wire rope. There is a right way and a wrong way to use a wire rope clip. The correct method for installing a wire rope clip is to attach the clip with the base or saddle over the long or live end of the wire rope. This will allow the clip to develop 81 to 90 percent efficiency and is the only correct method of attaching wire rope clips. The saying, "Never Saddle a Dead Horse" will help prevent incorrect mounting of wire rope clips.

RECORDS

Inspection Records shall be maintained at the Midland Engineering Co., Inc. corporate office.