Crane, Hoist and Sling Safety Program

Overview:

Cranes, hoists and slings pose a serious safety hazard if not used properly. It is the intent of Yale University to ensure all users and owners are trained in the safe operation and the hazards of using cranes, hoists and slings. All equipment, as such, must be safely maintained.

Scope & Applicability:

This program applies to all faculty, staff and students at all Yale University locations.

This program covers the following cranes and hoists: overhead and gantry cranes, semi-gantry cranes, cantilever gantry cranes, wall cranes, monorail cranes, bridge cranes, single girder cranes, overhead hoists, engine hoists or winches, and other hoists and cranes having the same fundamental characteristics.

This program does not cover cab operated cranes and mobile cranes (wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes).

The program covers the following types of slings used at Yale University: alloy steel chain, wire rope, metal mesh, natural and synthetic fiber rope, and synthetic webbing.
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Appendix I: Instructions for Conducting Bridge Crane Operator Evaluations
1.0 References:
(The following have been used as references in the development of this program)

- Personal Protective Equipment Program
- Lockout Tagout Program
- OSHA Publication – Sling Safety - #3072
- ANSI/ASME B30.2 – Overhead and Gantry Cranes
- ANSI/ASME B30.9 – Slings
- ANSI/ASME B30.10 – Hooks
- ANSI/ASME B30.11 – Monorails and Underhung Cranes
- ANSI/ASME B30.16 – Overhead Hoists (Underhung)
- ANSI/ASME B30.17 – Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)
- HMI (Hoist Manufacturers Institute) – Manually Lever Operated Hoist Inspection and Hoist Maintenance Personnel Manual

2.0 Responsibilities:

2.1 Department/School
- Designate individuals as the Responsible Person for the implementation of this program within their work area.
- Ensure adequate funding is available to support this program.

2.2 Responsible Person
- Ensure that responsibilities assigned within this program are carried out within their administrative work area.
- Actively support this program as part of the work area’s overall safety effort.
- Be thoroughly informed of the contents of this program and its application to their areas of responsibility and authority.
- Ensure equipment users comply with all provisions of this program.
- Ensure equipment users receive training appropriate to their assigned tasks and maintain documentation of such training.
- Ensure equipment users are provided with and use appropriate protective equipment.
- Take prompt corrective action when unsafe conditions or practices are observed.
- Investigate injuries and incidents within their work unit related to crane, hoist and sling usage.

2.3 Department of Environmental Health and Safety (EHS)
- Assist work units in implementing the provisions of this program.
- Periodically review and update this written program.
- Periodically evaluate the overall effectiveness of this program.
- Review and approve competent trainers and evaluators.
- Maintain an inventory of equipment covered by this program.
- Determine intervals for frequent and periodic inspections.
- Investigate accidents, incidents, and near misses related to cranes on campus.

2.4 Equipment Users
- Follow the work practices described in this program, including the use of appropriate protective equipment.
- Attend all training required by this program.
- Immediately report any unsafe conditions or concerns related to cranes, hoists or slings to their Responsible Person.

3.0 Definitions:

**Authorized Person (Repair):** Someone with training and experience pertaining to crane and hoist repair, with the expertise to address the specific safety considerations that are unique to cranes and hoists.

**Bridge:** That part of a crane consisting of girders, trucks, end ties, foot walks, and drive mechanism which carries the trolley(s).

**Bridge Crane:** A load lifting system consisting of a hoist which moves laterally on a beam, girder, or bridge which in turn moves longitudinally on a runway made of beams and rails. Loads can be moved to any point within a rectangle formed by the bridge span and runway length.

**Bumper:** A device for reducing impact when a moving crane or trolley reaches the end of its permitted travel, or when two moving cranes or trolleys come into contact. This device may be attached to the bridge, trolley or runway stop.

**Competent Trainer:** A person who has demonstrated familiarity with the type of crane/hoist in their work area. A contractor or equipment vendor who has experience training, crane/hoist operation and is familiar with the equipment is also permitted to be a Competent Trainer.

**Competent Evaluator:** A person in the department/work area who is experienced and competent with the crane, and is familiar with the equipment and its safe operation. The classroom portion of the crane/hoist training must have been successfully completed to be considered competent in regard to conducting the evaluation portion of the crane training. The competent evaluator could be, but is not limited to, a certified operator, supervisor/manager or safety officer.
Crane: A machine for lifting and lowering a load and moving it horizontally, with the hoisting mechanism an integral part of the machine. Cranes can be driven manually or by power.

Department/School: Unit designated for providing necessary funding to meet the requirements of this program to include inspections and repairs.

Designated Person: Person selected or assigned by Yale University or Yale University's representative as being qualified to perform specific duties, including periodic inspections.

Drum: The cylindrical member around which rope is wound for lifting or lowering the load.

End Truck: An assembly consisting of the frame and wheels which support the crane girder(s) and allow movement along the runway.

Floor operated crane: Crane controlled by an operator on the floor or an independent platform using a pendant or non-conductive rope.

Gantry crane: A crane that has a hoist in a trolley which runs horizontally along gantry rails, usually fitted underneath a beam spanning between uprights which themselves have wheels so that the whole crane can move at right angles to the direction of the gantry rails.

Hoist: A suspended machinery unit that is used for lifting or lowering a freely suspended (unguided) load.

Latch Hook: A type of hook with a mechanical device to close the throat opening of the hook.

Limit Device: A device that is operated by some part or motion of a power-driven hoist to limit motion.

Load: The total superimposed weight of the load block and hook.

Monorail: A trolley suspension crane hoist, whose trolley is suspended from a single rail. This type of crane hoist is used to move a load horizontally.

Overhead crane: A crane with a movable bridge carrying a movable or fixed hoisting mechanism and traveling on an overhead fixed runway structure.

Rated Load (Capacity): The maximum load designated by the manufacturer for which a crane or individual hoist is designed and built.
**Reeving:** A system in which a rope or chain travels around drums, sheaves or sprockets.

**Responsible Person:** A person that is accountable for the duties as assigned above. This person could be a Principal Investigator (PI) or manager of the area.

**Rope:** Refers to wire rope unless otherwise specified.

**Sheave:** A grooved wheel or pulley used with a rope or chain to change direction and point of application of a pulling force.

**Trolley:** The unit which travels on the bridge rails and carries the hoisting mechanism.

**Wall mounted jib crane:** A crane with a jib and with or without a trolley. The wall crane is supported from a side wall or columns of a building.

**4.0 General Requirements for Cranes, Hoists and Slings:**

4.1 The Department/School must notify Environmental Health and Safety (EHS) when a crane or hoist is installed to maintain an inventory.

4.2 If the need arises to operate crane or hoists not owned by Yale University, contact EHS for further guidance.

4.3 Only trained users shall operate a crane or hoist.

4.4 Cranes, hoists and slings shall go through frequent and periodic inspections. Intervals for frequent and periodic inspections depends upon the nature of the critical components of the crane and the degree of their exposure to wear, deterioration or malfunction. Inspection intervals for cranes and hoists used infrequently will be determined in agreement with EHS (See 6.6).

4.5 Operators must perform a pre-use inspection of cranes, hoists and chains slings.

4.6 Any unsafe condition noted during an inspection shall be corrected before the equipment is used. Unsafe equipment must be tagged “Out of Service, Do Not Use.”

4.7 Operators shall comply with the manufacturer's specifications and limitations applicable to the operation of the equipment.

4.8 Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations of a qualified engineer competent in this field and such determinations will be appropriately documented and recorded.

4.9 Operators shall follow safe work practices when operating cranes, hoists and slings. (See Appendix G).

4.10 Purchase and operation of all equipment covered by this program requires approval by EHS.

4.11 Assignment of a designated Department/School and Responsible Person is required.

4.12 All equipment must include a capacity label.
4.13 All equipment must be installed and maintained to meet applicable OSHA and ANSI standards. Only authorized personnel shall perform repairs and adjustments.

4.14 All replacement parts shall be the same design as the original or an equivalent design as designated by the manufacturer.

5.0 Training:

5.1 Training must be completed prior to any use of a crane or hoist. Training of crane and hoist operators at Yale University is a two-step process for most cranes/hoists which consists of classroom instruction & hands-on training.

5.2 Classroom instruction, hands-on training and operator evaluations can be conducted by either a competent trainer in the work unit, the equipment manufacturer, a safety consultant and/or a vendor who specializes in crane/hoist training. Documentation of these trainings will be input into the Yale Training Management System.

5.3 In addition to the above requirements, a documented operator evaluation is required for operators of Bridge Cranes. (Appendix H)

5.4 Hands-on training and hands-on evaluation portions of the training can also be conducted by a competent user in the department/work unit who is experienced and competent with the equipment. This person could be a trained operator, supervisor/manager or safety officer.

5.5 Training must be specific to the type of equipment being used.

5.6 Training shall include the following:
   5.6.1 Characteristics of safe crane and hoist operation;
   5.6.2 Inspection procedures;
   5.6.3 Basic load handling considerations;
   5.6.4 Operator responsibilities;
   5.6.5 Communication used during crane and hoist operation; and
   5.6.6 Hands-on equipment training.

5.7 Trainees must successfully complete hands-on training before being allowed to operate the equipment independently. Trainees will be given adequate supervision and time to learn basic operating skills.

5.8 Refresher training in relevant topics will be provided to a crane or hoist operator when any of the following occur:
   5.8.1 The operator has been observed using the equipment in an unsafe manner.
   5.8.2 The operator has been involved in an accident or a near-miss incident.
   5.8.3 The operator is assigned to operate a different type of equipment.
   5.8.4 A condition in the workplace changes in a manner that could affect safe operation of the equipment.
   5.8.5 The crane, hoists and slings standards are updated and conflict with this program.

6.0 Inspections for Cranes, Hoists and Slings:
The Responsible Person shall ensure the following inspections are completed:
6.1 Pre-Use Inspection
   6.1.1 Prior to use the operator shall visually inspect the crane, hoist and/or slings for defects.
   6.1.2 The pre-use inspection will identify conditions that could affect the safe use of the equipment.
   6.1.3 Operators must immediately report any unsafe crane conditions to the Responsible Person who must ensure the necessary arrangements are made for repair.

6.2 Frequent Inspection (Crane and Hoists) – (See Appendix A)
   6.2.1 A documented frequent inspection of all cranes and hoists shall be performed. These inspections must be performed by a designated person.
   6.2.2 Monthly inspections are to be performed. If a crane is rarely used, that interval will be determined in agreement with EHS.

6.3 Periodic Inspection (Cranes and Hoists) – (See Appendix B)
   6.3.1 A documented periodic inspection of all cranes and hoists shall be performed by a designated person.
   6.3.2 All cranes and hoists shall be labeled or marked to show date of last annual inspection.
   6.3.3 Intervals for periodic inspections will be determined in agreement with EHS, but must be performed at least annually.

6.4 Periodic Inspection (Chains and Slings) – (See Appendix C)
   6.4.1 A documented periodic inspection of all chains and slings shall be performed by a designated person.
   6.4.2 Each chain and sling will have a permanent tag physically attached.
   6.4.3 Each chain and sling will be traceable to an NIST standard.
   6.4.4 Intervals for periodic inspections will be determined in agreement with EHS, but must be performed at least annually.

6.5 If any unsafe conditions exist, the equipment shall be removed from service and tagged “Out of Service, Do Not Use.”

6.6 Cranes and Hoists Not in Regular Use
   6.6.1 A unit which has been idle for a period of one month or more shall be given a frequent inspection before placing in service. When applicable, a thorough inspection of wire ropes must be completed.
   6.6.2 A unit which has been idle for a period of six months or more shall be given a frequent and periodic inspection before placing in service.

6.7 Prior to initial use, all new, altered, modified or repaired cranes and hoists shall have the following testing performed by the installation company or third party:
   6.7.1 Hoisting and lowering
   6.7.2 Trolley travel
   6.7.3 Bridge travel
   6.7.4 Limit switches, locking and safety devices
   6.7.5 Load Tests
      6.7.5.1 Shall not be more than 125% of the rated load unless
otherwise recommended by the manufacturer.

7. **Maintenance:**

Preventive maintenance shall be performed as prescribed by the manufacturer as detailed in the owner's manual.

8. **Recordkeeping:**

The Responsible Person shall maintain the following records to meet the requirements of this program:

8.1 A listing of all applicable cranes, hoists and slings.

8.2 A record of training which includes: (Use Appendix F or equivalent)

8.2.1 Name of trainer.

8.2.2 Name of operator.

8.2.3 Date of training (classroom, hands-on training, hands-on evaluation).

8.3 The responsible party will maintain the following records to meet the requirements of this program:

8.3.1 Copies of all frequent inspection records for one year after completion.

8.3.2 Copies of periodic and annual inspection records for at least four years.

8.3.3 Copies of repair records for the life of the equipment.

8.3.4 Copies of load test results for the life of the equipment.

8.4 EHS is responsible for auditing the required records to ensure that the requirements of this program are met.

8.5 EHS will receive and retain training records for training they have provided.

9.0 **Contractors:**

Contractors are required to follow all applicable OSHA regulations and manufacturer’s instructions. Contractors are not permitted to use any crane, hoist or sling owned by Yale University unless given documented authorization by the responsible owner and Environmental Health and Safety.
# Crane/Hoist Frequent Inspection Checklist

**Location:**

**ID number or identifier:**

**Inspector Name (print):**

**Date:**

<table>
<thead>
<tr>
<th>Inspection Item</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load rating marked on each side of the crane.</td>
<td></td>
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<tr>
<td>Load rating of the hoist marked on the hoist or its load block and legible from the ground? (If the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its loading block and this marking shall be clearly legible from the ground.)</td>
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<tr>
<td>At least 3 inches of overhead clearance and 2 inches laterally between crane and obstructions.</td>
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<tr>
<td>All controller functions labeled and legible.</td>
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<tr>
<td>All operational controls and functional operating mechanisms working properly, properly adjusted and no unusual sounds.</td>
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<tr>
<td>Upper limit switch operating properly. It shall be tested with no load on the hook. Extreme care shall be exercised; the block shall be &quot;inched&quot; into the limit device or run in at slow speed.</td>
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<tr>
<td>Excessive wear of components on any functional operating mechanisms.</td>
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<tr>
<td>Deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of the air or hydraulic system.</td>
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<td>Excessive dirt, grease, or foreign matter.</td>
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<tr>
<td>Deformation and/or cracking of the hook, load block, drums and/or sheaves.</td>
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<tr>
<td>Safety latch on crane/hoist load block that automatically closes.</td>
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</table>

**Comments:**
Appendix B

Crane/Hoist Periodic Inspection Checklist

<table>
<thead>
<tr>
<th>#</th>
<th>Inspection Item</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Conduct frequent inspection of equipment. Does it pass the frequent inspection? (See Appendix A)</td>
<td></td>
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<tr>
<td>2</td>
<td>Any deformed, cracked, or corroded members?</td>
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<tr>
<td>3</td>
<td>Are there worn, cracked, or distorted parts such as pins, bearings, wheels, shafts, gears, rollers, locking and clamping devices, bumpers, and stops?</td>
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<tr>
<td>4</td>
<td>Is there excessive wear or improper operation of the brake system parts, linings, pawls, chain sprockets or ratchets?</td>
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<tr>
<td>5</td>
<td>Any cracked or worn sheaves and drums?</td>
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<td></td>
<td></td>
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<tr>
<td>6</td>
<td>Are there loose or missing bolts, nuts, pins or rivets?</td>
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<tr>
<td>7</td>
<td>Is there any signs of pitting or deterioration of controllers, master switches, contacts, limit switches, and push button stations?</td>
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<tr>
<td>8</td>
<td>Are load, wind, and other indicators properly operating?</td>
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<tr>
<td>9</td>
<td>Are the gasoline, diesel, electric, or other power units performing properly?</td>
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<tr>
<td>10</td>
<td>Are stops provided at the limit of travel of the trolley?</td>
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<tr>
<td>11</td>
<td>Corroded, cracked, bent, worn, or improperly applied end connections?</td>
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<tr>
<td>12</td>
<td>Load chain reeving for compliance with hoist manufacturer’s recommendation?</td>
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</tr>
</tbody>
</table>

**Hook:**
13 Are there any gouges, nicks, weld spatter, corrosion, deformation, cracks?

14 Has the hook throat opening increased 5%, not to exceed ¼ inch (6 mm), more than the normal throat opening measured at the narrowest point?

15 Is there any bend or twist from the plane of the unbent hook?

**Wire Rope/Chain:**

16 Is there excessive drive chain stretch?

17 Test the hoist under load in lifting and lowering directions and observe the operation of the chain and sprockets. Does the chain feed smoothly into and away from the sprockets?

18 Does the chain bind, jump, or is noisy? If so, clean chain. If trouble continues inspect the chain and mating parts for wear, distortion, or other damage.

19 Slacken the chain and move the adjacent links to one side to inspect for wear at the contact points. Is wear observed? Is stretching suspected?

20 Is chain lubricated to manufacturer’s requirement?

Refer to owner’s manual for any additional inspection items:

Comments:
# Sling Periodic Inspection Checklist

<table>
<thead>
<tr>
<th>Location:</th>
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</thead>
<tbody>
<tr>
<td>ID number or identifier:</td>
<td></td>
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<tr>
<td>Inspector Name (print):</td>
<td>Date:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item (Slings)</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chain/Slings:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nicks, cracks, breaks, stretches, distortions, twists, gouges, bends, heat damage, discoloration, worn or damaged links and components,</td>
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<tr>
<td>Lack of ability of the chain or components to hinge (articulate) freely,</td>
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<tr>
<td>Pitting, corrosion or weld splatter,</td>
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<tr>
<td>Missing or illegible sling identifications,</td>
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<tr>
<td>Other conditions that cause doubt as to the continued safe use of the sling.</td>
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<tr>
<td><strong>Wire Rope Slings:</strong></td>
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</tr>
<tr>
<td>Broken wires,</td>
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<tr>
<td>Pitting or corrosion,</td>
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<tr>
<td>Localized wear (shiny worn spots), abrasion or scrapes,</td>
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<tr>
<td>Damage or displacement of end fittings, hooks, rings, links, or collars,</td>
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<tr>
<td>Distortions, kinks, bird caging, crushing, or other evidence of damage to wire rope structure,</td>
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<tr>
<td>Missing or illegible sling identifications,</td>
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<tr>
<td>Other conditions that cause doubt as to the continued safe use of the sling.</td>
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<tr>
<td><strong>Synthetic Fiber Rope / Synthetic Webbing Slings:</strong></td>
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<tr>
<td>Melting, charring or burning of any part of the surface,</td>
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<td>Snags, punctures, tears, cuts, fraying, broken or worn stitches,</td>
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<tr>
<td>Change in diameter,</td>
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<tr>
<td>Discoloration,</td>
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<td>Hard or stiff areas,</td>
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<tr>
<td>Wear or elongation exceeding the amount recommended by the manufacturer,</td>
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<tr>
<td>Distortion of fittings,</td>
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<tr>
<td>Missing or illegible sling identifications,</td>
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</tbody>
</table>
Other conditions that cause doubt as to the continued safe use of the sling.

**Metal Mesh Slings:**

- Broken weld or brazed joints,
- Broken wire in any part of the mesh,
- Abrasion, corrosion, distortion, pitting, twisting, bending, cracking, gouging of any component,
- Lack of flexibility,
- Missing or illegible sling identifications,
- Other conditions that cause doubt as to the continued safe use of the sling.

**Comments:**
### Examples of Cranes and Hoists

<table>
<thead>
<tr>
<th>Crane Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jib Crane</strong></td>
<td>A type of crane where a horizontal member (jib or boom), supporting a moveable hoist, is fixed to a wall or to a floor-mounted pillar.</td>
</tr>
<tr>
<td><strong>Wall Crane</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Gantry Crane</strong></td>
<td>A type of crane has a hoist which typically runs horizontally along rail/s.</td>
</tr>
<tr>
<td><strong>Semi Gantry Crane</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Monorail</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Switching Monorail</strong></td>
<td></td>
</tr>
</tbody>
</table>
A load lifting system consisting of a hoist which moves laterally on a beam, girder, or bridge which in turn moves longitudinally on a runway made of beams and rails. Loads can be moved to any point within a rectangle formed by the bridge span and runway length.

**Bridge Crane**

**Mobile Cranes**

*ARE NOT COVERED IN THIS PROGRAM*

**Winches**

*Follow the manufacturer’s recommendations*

**Electric Chain Hoist**

Manually operated hoists

**Lever Hoist**

**Chain Fall Hoist**

**Come Along Hoist**
<table>
<thead>
<tr>
<th><strong>Pneumatic Chain Hoist</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image of Pneumatic Chain Hoist" /></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Electric Wire Rope Hoist</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image2.png" alt="Image of Electric Wire Rope Hoist" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Pneumatic Wire Rope Hoist</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3.png" alt="Image of Pneumatic Wire Rope Hoist" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Engine Hoists</strong></th>
</tr>
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<tbody>
<tr>
<td>Follow the manufacturer’s recommendations</td>
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<tr>
<td><img src="image4.png" alt="Image of Engine Hoists" /></td>
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</table>
## Appendix E

### Examples of Slings

<table>
<thead>
<tr>
<th>Slings</th>
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<tbody>
<tr>
<td><strong>Alloy Steel Chain</strong></td>
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<tr>
<td><strong>Wire Rope</strong></td>
</tr>
<tr>
<td><strong>Metal Mesh</strong></td>
</tr>
<tr>
<td><strong>Natural and Synthetic Fiber Rope</strong></td>
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<tr>
<td><strong>Synthetic Web</strong></td>
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</table>
Appendix F
Crane and Hoist Training Certification Form

Name of Trainer (print):
(Sign):

<table>
<thead>
<tr>
<th>Name (Print)</th>
<th>Date of classroom training</th>
<th>Date of hands-on training</th>
<th>Date of Evaluation (if required)</th>
<th>Signature</th>
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Appendix G

Safe Work Practices of Cranes, Hoists and Chains/Slings

Cranes and Hoists

General:

- A personal protective equipment (PPE) hazard assessment must be performed for the task. PPE considerations should include a hardhat, safety glasses and safety shoes.

- Rated load capacities, recommended operating speeds, special hazard warnings and/or instructions, shall be conspicuously posted on all equipment. Instructions or warnings shall be visible to operators while they are at their control stations.

- Do not exceed the rated load capacity of the crane, hoist, slings or other components. (Keep in mind that the hoist may be higher rated that the rail/beam or vice versa).

- Persons operating the crane, hoist or sling shall inspect all machinery and equipment prior to each use to make sure it is in safe operating condition.

- Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains or other reciprocating, rotating, or other moving parts or equipment shall be guarded if such parts are exposed to contact by users, or otherwise create a hazard.

- No modifications or additions which affect the capacity or safe operation of the equipment shall be made without the manufacturer’s written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

- Disconnect power to a hoist or crane that is unsafe or in need of repair and tag “Out of Service, Do Not Use.”

- Never operate a hoist or crane that in your opinion is UNSAFE TO OPERATE.

Engaging the Load:

- The sling or other device shall be properly seated and secured in the base of the hook.

- The load shall not be applied to the point of the hook or the hook latch.

- Before moving the load, the operator shall be sure chains and wire rope are not kinked or twisted and that multiple part chains or ropes are not twisted about each other.

- The rope or chain must be properly seated on the drum, sheaves or sprockets before the lift takes place.

- Remove slack from the sling, chain or cable before lifting a load.

- The hoist must be centered over the load.
The operator shall not pick up a load more than the rated load of the hoist or crane.

Specific attention should be given to balancing of the load to prevent slipping.

**Moving the Load:**

- The operator shall not engage in any activity that will divert his/her attention from the task.
- The operator shall respond to signals from a designated person only. However, the operator shall obey a stop signal at all times, no matter who gives it.
- The operator shall make sure the load and hoist will clear all obstacles before moving or rotating the load.
- A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.
- The operator shall inch powered hoists and cranes slowly in engagement with a load, but should avoid unnecessary inching and quick reversals of direction.
- A load shall not be lifted more than a few inches until it is well balanced in the sling or lifting device.
- When lifting loads at or near capacity, brake action shall be tested by lifting the load a few inches off the surface to verify that the brakes are holding.
- On rope hoists, the load shall not be lowered below the point where less than two wraps of rope remain on each anchorage of the hoist drum, unless a lower limit device is provided. In this case no less than one wrap may remain on each anchorage of the hoist drum.
- Loads shall not be suspended over personnel, unless unit is specifically designed.
- All users shall be kept clear of loads about to be lifted and of suspended loads.
- Under no circumstances may anyone ride the hook or load.
- Directional movement should be made smoothly and deliberately to avoid swing.
- Never pull a hoist by the controller cable.
- Contact between trolleys (on two trolley cranes) or between trolleys and stops should be avoided.
- The operator shall not use the upper (or lower, if provided) limit device(s) as a normal means of stopping the hoist. These are emergency devices only.

**Placing the Load:**

- Never leave the controls unattended while a load is suspended. If it becomes necessary to leave the controls, lower the load to the floor.
- The load block should be positioned above head level when the hoist is not in use.
• Care shall be exercised when removing a sling from under a landed and blocked load.

**Slings**

• Slings shall be inspected prior to each use to make sure they are in safe operating condition.
• Slings that are damaged or defective shall not be used.
• Slings shall not be shortened with knots or bolts or other makeshift devices.
• Sling legs shall not be loaded more than their rated capacities.
• Slings used in a basket hitch shall have the loads balanced to prevent slippage.
• Slings shall be securely attached to their loads.
• Slings shall be padded or protected from sharp edges of their loads.
• Suspended loads shall be kept clear of all obstructions.
• Hands and fingers shall not be placed between the sling and its load while the sling is being tightened around the load.
• Shock loading is prohibited (abrupt starting or stopping of the load).
• A sling shall not be pulled from under a load when the load is resting on the sling.
• Slings shall be properly stored when not in use so that they are not subject to mechanical damage, moisture, corrosives, extreme temperature or kinking.
# Bridge Crane Operator Evaluation Form

**Trainee Name:**

**Work Area:**

**Evaluator Name:**

**Department:**

**Crane location:**

**Date:**

**NOTE:** Operators must be evaluated on each type of bridge crane.

<table>
<thead>
<tr>
<th>Step</th>
<th>Evaluation</th>
<th>N/A</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pre-use equipment inspection</td>
<td>Did operator utilize demonstrate competency to complete a frequent inspection? If not, was the operator able to explain all the items they were looking for? Was the owner's manual referenced for any additional items to be checked?</td>
<td></td>
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<tr>
<td>2. Load inspection</td>
<td>Was the weight of the load identified as not to exceed the rated capacity? Was load properly secured, balanced and stable?</td>
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<tr>
<td>3. Move plan</td>
<td>Was a destination identified?</td>
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<tr>
<td>4. Control operation</td>
<td>Was operator familiar with all controls? Was load speed and control satisfactory? (no sudden stops or acceleration)</td>
<td></td>
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</tr>
<tr>
<td>5. Worksite Inspection</td>
<td>Was operator aware of activities in the vicinity including personnel and equipment?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6. Post move</td>
<td>Was hoist/crane properly stowed? (Hook near bottom of the hoist) Were slings properly stored? (not subject to mechanical damage, moisture, corrosives, extreme temp., or kinking)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7. Comments</td>
<td><strong>Must be included for all “Failed” tasks. If task is failed the evaluator must explain what was done incorrectly and have the trainee repeat the task until it is completed correctly.</strong></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Trainee Signature:**

**Evaluator Signature:**
Appendix I

Instructions for Conducting Bridge Crane Operator Evaluations

(Note: The evaluation can be done in-house using an experienced and competent Yale person or an outside vendor/safety consultant may be used.)

1. Pre-Requisites:
   a. Completed the classroom portion of a crane / hoist training class.
   b. Review and become familiar with the Yale Crane, Hoist and Sling written program.
   c. Be experienced with the equipment you will be training on.
   d. Review owner’s manual.

2. Make sure the equipment is in safe condition.

3. Make sure the location is safe.

4. Have operator perform each item on the Bridge Crane Operator Evaluation Form. (Appendix H)

5. Assess the operator’s performance. (Appendix H)

6. Explain any “failed” tasks and have operator repeat task.

7. Sign form.

8. File form with designated person. (Supervisor, work unit safety officer, department safety officer, etc.)