

 Portland Community College Health & Safety Manual	Dept: Environmental Health and Safety (EH&S)	
	Function: Facilities Management Services	
	Topic: Chapter 23 — Cranes, Hoists & Slings	
	Board Policy: B507	Revised Date: December 2022

Authority	PCC Board Policy—B507
	Portland Community College is committed to providing a safe and healthy work and educational environment for our employees, students and visitors.

Summary	This plan includes procedures that must be followed by employees when operating cranes and hoists at all PCC locations. It meets all applicable safety regulatory requirements.
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I. PURPOSE

This safety plan (the Plan) outlines Portland Community College's (PCC) requirements for safe use and operation of cranes, hoists and slings at PCC campuses and centers. General administrative, training, and recordkeeping requirements, including inspection criteria and operational procedures, are laid out within this Plan. Department specific equipment, procedures, training and record keeping are the responsibility of each respective department impacted by this plan.

This Plan was established to ensure that employees are protected from hazards associated with crane and hoist operations, the use of slings, and to ensure compliance with Oregon OSHA (OR-OSHA) regulations. Only trained and authorized employees are permitted to operate cranes or hoists. All operators are required to follow the procedures in this chapter as well all manufacturer's recommendations regarding equipment use and safety.

This Plan is applicable solely to the equipment used by departments at PCC for non-construction uses. Subcontractors on site performing construction activities are responsible for their own equipment and operator responsibilities.

II. AUTHORITY

PCC Board Policy – B507

OR OSHA Div 2/N Material Handling

OR OSHA 1910.176 Handling Materials – General

OR OSHA OAR 437-02-0221 Additional Oregon Rules for Handling Materials

OR OSHA OAR 437-02-0228 Oregon General Requirements for Cranes

OR OSHA 1910.179 – Overhead and Gantry Cranes

OR OSHA OAR 437-02-0229 Additional Oregon Rules for Overhead & Gantry Cranes

OR OSHA 1910.184 – Slings

OR OSHA OAR 437-02-0235 Additional Oregon Rules for Slings

OR OSHA Div 3/CC, Cranes and Derricks in Construction

III. RESPONSIBILITY

Department Management:

- Notifying EH&S when considering or executing a crane or hoist purchase
- Ensuring that only trained and authorized employees operate cranes and hoists
- Developing department specific written crane & hoist procedures in line with this Plan
- Maintaining training records which demonstrate an employee's training as a crane operator
- Maintaining crane, hoist, and alloy steel chain sling inspection records
- Ensuring that equipment manufacturer's recommended and required maintenance and inspection services are performed and followed

Environmental Health & Safety:

- Developing and delivering training regarding this Plan to employees
- Representing the College during interactions with regulatory agency representatives
- Annually reviewing the Plan to ensure it reflects current PCC policies, as well as updates to applicable regulatory requirements

Project Managers:

- Notifying EH&S whenever a contractor's operations on PCC property will involve the use of a crane or hoist to ensure that the contractor's crane safety policy meets the standards laid out in this Plan

Crane Operators:

- Conducting inspections as outlined in this Plan and as per manufacturer's requirements
- Following equipment manufacturer's recommendations and safety guidelines related to working load limits and equipment operation
- Never operating damaged or faulty equipment
- Reporting unsafe crane use

Employees:

- Heeding all warnings given by crane or hoist operators when equipment is in use
- Never finding themselves underneath of a suspended load

IV. PROCEDURES

A. General Safety - This section outlines general safety and inspection procedures applicable to all cranes, hoists, and slings as required by OR OSHA regulations. Operating procedures for all equipment, as provided in the manufacturer's instructions, and by the courses taught within each department, through hands-on and teaching instruction, must also be followed.

1. Equipment - This Plan covers the following inventory* of cranes and hoists at the PCC locations shown below:

- OMIC – Crane Type TBD
- Rock Creek Auto Collision – Automotive lifts
- Rock Creek Aviation – Gantry crane
- Rock Creek Diesel Services – Overhead/bridge crane
- Rock Creek Microelectronics – Overhead/bridge crane
- Rock Creek Facilities Maintenance Services Grounds – Automotive lift
- Rock Creek Farm – Automotive Lift
- Rock Creek Think Big – Jib Cranes, overhead/bridge crane
- Swan Island Trade & Industry Center – Crane Type TBD
- Sylvania Automotive Repair – Automotive lifts
- Sylvania Facilities Maintenance Services Grounds – Automotive lifts

*Annual updates to this Plan will include additional cranes and hoists associated with upgrades and new construction.

2. Operator Training – Crane operators are to be trained in the safe use and operation of the cranes they use by reputable, credentialed instructors. Each department using cranes is to establish written procedures for the safe operation of their crane(s).

3. Operator Fitness for Duty - The operator of overhead cranes (cranes and hoists that are two tons or larger) must be a physically fit and thoroughly trained, competent individual, not using, or under the influence of, any drug that could impair physical, visual, or mental reactions or capabilities, and must understand all the regulations regarding crane safety.

4. Rated Load Considerations:

- A common misconception is that a safety factor is built in to indicated load limits and that the operator may exceed the rated load up to the safety factor. The total load must include the total superimposed weight on the load block or hook and includes any lifting devices such as magnets, spreader bars, chains and slings. The rated load of the crane or hoist shall be plainly marked on each side of the crane.
- If the crane has more than one hoisting unit, each hoist and attachment should have the rated load clearly marked. Rated load markings shall be clearly legible from the ground or the floor.
- The total load moved shall not exceed the rated load of the crane or hoist.
- Every load shall be well secured and properly balanced in a sling or other lifting device.

B. Overhead, Gantry & Jib Cranes – The following apply to all overhead, gantry & jib cranes:

1. General Requirements

- Installation/set-up must meet manufacturer recommendations, and current OSHA 29 CFR 1910.179 regulatory requirements. Contact EH&S for details regarding the regulatory requirements.
- New and altered cranes must be tested to ensure proper hoisting and lowering, trolley travel, bridge travel, and proper function of limit switches, locking and safety devices. A rated load test must also be performed in accordance with OSHA 29 CFR §1910.179(k)(1) & (2) and OSHA 29 CFR §1910.180(e)(1) & (2).
- Passages and walkways must be provided to ensure safety of personnel and should be kept free of obstacles.
- Hooks must have a safety latch to prevent loads from bouncing off.

2. Inspections - Overhead crane inspections are divided into two categories: daily (pre-use) inspections and periodic inspections. Example inspection checklists associated with this Plan can be found in *Form 1: Daily Crane Inspection Checklist* and *Form 2: Quarterly Crane Inspection Checklist*. Department managers are free to develop their own inspection checklists for the specific equipment used in their departments so long as they include the applicable OR OSHA inspection criteria.

Daily Inspection should include:

- Checking for deterioration or leakage in lines, tanks, valves, drain pumps and other parts of air or hydraulic systems.
- Rope slings, hooks and other lifting equipment shall be visually inspected prior to each day's use. All parts including chains, cables, ropes, hooks, etc., on overhead and gantry cranes shall be visually inspected daily for deformation, cracks, excessive wear, twists, stretch, or other signs of deterioration that may pose a hazard during use.
- Hooks and chains shall be visually inspected daily, and monthly with a certification record which documents the date of inspection, the signature of the person who performed the inspection, and serial number or other identifier from the equipment. Hooks that have cracks or have more than 15 percent in excess of normal throat opening or more than 10 percent twist from the plane of the unbent hook must be replaced.

Periodic Inspections should occur at quarterly intervals, or after any extended period of cranes not being used. The periodic inspections should include all criteria listed on *Form 2: Quarterly Crane Inspection Checklist*.

Annual Inspections are a type of periodic inspection but must be conducted by a qualified and certified inspector. A complete inspection of the crane shall be performed at least every 12 months. If any defect is found, the crane cannot be operated until the repair or adjustment is made.

C. Safety Procedures for Hoists – The following requirements apply to all hoists, including automobile hoists:

- Ensure the area is clear of people and equipment before operating.
- Ensure all guards are fitted, secure and functional. Do not operate if guards are missing or faulty.
- Ensure the vehicle hoist has operating and maintenance instructions permanently located and clearly visible.
- Check the capacity of the hoist compared to the weight of the vehicle. If vehicle is too heavy, do not proceed.
- Ensure the area is clean and clear of grease, oil.
- Check workspaces and walkways to ensure no slip/trip hazards are present.
- Check that all safety devices are in good condition.
- Ensure support arms are capable of being locked in position.
- Ensure rubber pads are in good condition on all load points.
- Do not operate hoist if it is in a condition of disrepair or deteriorated.
- Center the load on the hoist, ensuring the weight is evenly distributed.
- Only one person shall operate the hoist at a time.
- The hoist must not be operated unless it has a current certificate of inspection.
- Lower the hoist and switch off machine when work is completed.
- Leave the equipment and work area clean and safe.

D. Safety Procedures for Slings

There are different types of slings used with cranes and hoists, including alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope, and synthetic web. Special safety requirements for each of the various sling types can be found in *Appendix B: Alloy Steel Chain Slings*; *Appendix C: Wire Rope Slings*; *Appendix D: Metal Mesh Slings*; *Appendix E: Natural and Synthetic Fiber Slings*; and *Appendix F: Synthetic Web Slings*. The following requirements for safe use apply to all sling types:

- Markings - Slings should be clearly marked (indelibly) with:
 - Name or trademark of manufacturer
 - Work-load limit (WLL) or rated load
 - Diameter or size
 - Serial number
- Inspections:
 - Prior to lifting, users must conduct a daily visually inspection of each sling to be used.
 - Slings are not to be used if any one or more of the following are present:
 - Missing or illegible identification
 - Kinking, crushing, punctures, tears, or any other damage resulting in distortion of the sling's material
 - Evidence of heat damage
 - End attachments that are cracked, deformed, or worn
 - Corrosion of the sling material or end attachments
 - Broken or damaged joints
 - Elongation of material
- Use - Safe Operating Requirements Applicable to All Slings:
 - 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 kinked
 - Slings shall not be loaded in excess of their rated capacities or working load
 - 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 the sharp edges of their loads
 - Suspended loads shall be kept clear of all obstructions
 - All employees shall be kept clear of loads about to be lifted and of suspended loads
 - Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load
 - Shock loading is prohibited
 - Slings shall not be pulled from under a load when the load is resting on the sling
 - Slings must not be used without properly affixed and legible identification markings
- Storage - Store slings in an area and in a configuration where they will not be subjected to mechanical damage, corrosive action, moisture, extreme temperatures, or to kinking.

V. TRAINING

The OSHA standard for Overhead and Gantry Cranes (29 CFR Subpart N 1910.179) states, “Only designated personnel shall be permitted to operate a crane covered by this section” (1910.179(b)(8)). “Designated,” according to 1910.179(a)(35), refers to those individuals deemed to be qualified to operate an overhead crane for a specific application.

While the OSHA standard does not provide a specific training requirement, it refers to ASME B30.2, which states that training must be specific to the equipment and application, at hand. At a minimum, qualified crane operator training must be provided by a certified trainer and cover the following topics:

- Crane and sling terminology
- Crane inspections
- Safe sling use procedures
- Recordkeeping requirements for slings
- The importance of best practices

Additional training may be required for specialized applications. Operators must also be re-trained when, based on the performance of the operator or an evaluation of the operator’s knowledge, there is an indication that retraining is necessary.

VI. RECORDKEEPING

Operator Training Records:

- Each department with trained crane and hoist operators shall retain the operators’ qualifications and operators’ training records for the duration of employment plus at least ten years after the employee has retired or left PCC employment.
- EH&S will maintain training records associated with this Plan and its associated procedures; Training records will be maintained in PCC’s Learning Management System.

Equipment Inspections – Each department with cranes and/or hoists shall:

- Be responsible for retaining all inspection and maintenance records relevant to the cranes and associated equipment. (A copy of these records shall be forwarded to PCC EH&S).
- Retain any written evidence of daily/pre-use inspections for the last year.
- Retain quarterly inspections for the last three years.
- Retain records for the life of the equipment for:
 - Initial load tests on cranes/hoists/rigging for cranes rated less than three tons
 - Quadrennial load tests for cranes rated over three tons

EH&S – Will indefinitely maintain:

- Records of annual shop inspections that include cranes or hoists.
- Records of training provided by EH&S and other entities.
- Copies of load testing