I. Purpose

II. The Orange County Sanitation District (OCSD) is committed to protecting our employees, contractors and the public from unsafe conditions and practices. The Crane Safety Program is a critical element in the success of OCSD’s commitment to that goal. Background

Moving large, heavy loads is a crucial component of OCSD’s operation. Procedures have been developed for these operations, including careful training and extensive workplace precautions. There are significant safety issues to be considered, both for the operators of the diverse "lifting" devices, and for employees in proximity to them.

III. Organizational Units Affected

This program must be understood and complied with by all persons charged with the responsibility of operating, servicing, and managing fixed and mobile cranes, and related equipment on OCSD’s behalf.

IV. Definitions/Acronyms

A. **Boom**: A structural member attached to the revolving superstructure used for guiding and acting as a support for a hook or other end attachment for securing load.

B. **Bridge**: Principal horizontal beam(s) of the overhead crane which supports the trolley.

C. **Crane Operator**: Any person operating a crane.

D. **Critical Lift**: A non-routine crane lift requiring detailed planning and additional or unusual safety precautions.

E. **Counterweight**: Weights used for balancing loads and the weight of the crane in providing stability for lifting.

F. **Chart (Load)**: The manufacturer’s minimum and maximum lifting limitations for any particular crane.

G. **Designated Signal Person**: An individual who is assigned to give recognized hand signals to the crane operator during any crane lifting operation.
H. **Drum:** The spool or cylindrical unit around which wire rope is wound to raise and lower loads.

I. **Ground worker:** An individual who performs a variety of duties to support crane lift operations including unskilled physical labor and specialized equipment operation.

J. **Hoist (Boom):** A hoist drum and rope reeving system used to raise and lower the boom.

K. **Hold-Harmless Agreement:** A contract under which the one party agrees to indemnify, defend and hold harmless a second party, from and against all claims arising out of use of equipment.

L. **Lifting Devices:** Devices that are not normally reeved onto the hoist chain, wire rope, or web strap, such as grabs and other supplemental devices used for ease of handling certain types of loads. The weight of these devices is to be considered part of the load to be lifted.

M. **Lift Supervisor:** Supervisor responsible for direct oversight of a crane lift operation, and ensuring the operation meets OCSD and regulatory requirements for inspection, personal qualification, and site preparations.

N. **Load Chart:** The manufacturer’s absolute limitations of a crane based on structural strength and stability of the crane.

O. **Mechanic:** Performs technical duties and responsibilities in the maintenance, repair, service, and troubleshooting of cranes and other mobile equipment.

P. **Mobile Crane:** Hydraulic or lattice booms on wheeled or crawler-tracked under carriages.

Q. **Outriggers:** Support members attached to the crane’s carrier frame which is used to raise the crane off the rubber wheels for increased capacity and stability.

R. **Overhead Crane:** Any hoisting device where the hook-and-line mechanism runs along a horizontal beam that runs along two rails or the hook-and-line mechanism runs along a cantilevered (jib) boom arm.

S. **Pendant Control:** Suspended push button controls from crane to floor for operator control of functions.

T. **Qualified Person:** A person designated by the employer who by reason of training, has demonstrated the ability to safely perform all assigned duties and, when required, is properly licensed.

U. **Qualified Rigger:** A person who is trained to handle and move loads during a crane lift operation.

V. **Rated Capacity:** The maximum load values shown on a load chart for a particular crane configuration.

W. **Reeving:** Refers to a rope system in which the rope travels around drums and sheaves.
Subject: Crane Safety Program

X. Safety & Health Supervisor: Supervises and coordinates activities and operations within the Risk Management Division at OCSD.

Y. Rated Load: The maximum load for which a hoist is designated by the manufacturer.

Z. Rope: For all hoisting operations any reference to rope will mean wire rope.

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

BB. Shock Loading: A sudden or unexpected load that is imposed upon a crane, or related equipment.

CC. Spotter: A safety observer whose sole task is observing and warning against the unsafe approach to hazards, such as overhead power lines.

DD. Tower Cranes: A crane having a revolving boom with counterweight mounted on a vertical mast or tower.

EE. Trolley: Carries drum and hoist mechanism and travels on the bridge rail.

V. Policy Statement

A. The OCSD Crane Safety Program has been developed to provide our employees and contractors with safe methods for working with cranes and related equipment (e.g., rigging).

B. OCSD employees may be required to operate OCSD cranes and related equipment as part of their job duties. To minimize risks to people and property OCSD restricts the operation of all cranes to those persons who have been properly trained, authorized, or certified to operate cranes.

C. The Crane Safety Program applies to all OCSD employees as well as contractors conducting crane work while on any OCSD property. The intent of this program is to control crane hazards by ensuring the following:

1. Equipment is maintained and operated according to manufacturer’s recommendations.

2. Responsible persons are trained.

3. Safe work practices and safety regulations are followed.

4. Environmental conditions affecting lift operations are monitored.

5. Critical Lift Plans are developed for high hazard lifts.

VI. Responsibilities

A. Lift Supervisors shall:

1. Make sure operators are properly trained and qualified (See Section XI).

2. Ensure that crane contractors have satisfactory procedures for inspection of equipment (see Section 8).
**Crane Safety Program**

3. Ensure that riggers are familiar with equipment manufacturer’s procedures.

4. Coordinate communications between the crane operator and others working near the crane.

5. Thoroughly evaluate ground conditions, wind speed, overhead power lines, and develop a procedure or cancel crane lift operations in the event of severe weather warnings.

6. Develop and follow a general lift plan or a written Critical Lift Plan.

7. Ensure that certifications for all cranes and operators on site are current.

8. Keep workers clear of hoisted loads.


**B. Crane Operators shall:**

1. Crane Operators shall be required to pass a written or oral examination and a practical operating examination offered by OCSD unless they are able to furnish satisfactory evidence of qualifications and experience. Qualification shall be limited to the specific type of equipment for which the operator is examined. Crane training must be current at the time of use for the type of crane used.

2. Crane Operators and operator trainees should have normal depth perception, field of vision, reaction time, manual dexterity, coordination, no tendencies towards dizziness, and shall meet the following physical qualifications:
   a. Vision at least 20/30 Snellen in one eye and 20/50 in the other, with or without corrective lenses.
   b. Ability to distinguish colors regardless of position of colors, if color differentiation is required for the operations.
   c. Adequate hearing, with or without a hearing aid, for a specific operation.
   d. Sufficient strength, endurance, agility, coordination, and speed of reaction to meet the demands of equipment operation.

3. Read the operator manual for each crane operated.

4. Conduct a pre-use inspection.

5. Use the crane manufacturer’s load chart for each crane.

6. Know the weight of each load.

7. Follow the manufacturer’s procedures for proper outrigger deployment.

8. Check the condition of the ground and blocking materials regularly.

9. Check for overhead power lines and other obstructions.

10. Take into consideration, wind and temperatures when making any lift.
Subject: Crane Safety Program

11. Respond to signals from the person who is directing the lift, or an appointed signal person. When a signal person or a crane follower is not required as part of the crane operation, the operator is then responsible for the lifts.

12. The operator shall obey a stop signal at all times, no matter who gives it.

13. Do not operate equipment if wire rope is not seated in drum or sheave grooves.

14. Do not use a crane for the purpose of pushing or pulling.

15. Avoid hoisting, moving or swinging suspended loads over or near workers.

16. Do not engage in any activity that diverts attention while operating the crane.

17. Stop and refuse to handle loads, if there is a safety concern.

C. Spotters, Riggers, and Ground Workers shall:

1. Use standard hand signals (see Appendix A).

2. Be observant of hoisting operations in your work area.

3. Be observant and watch for signs of problems during each lift.

4. Check for overhead power lines and other obstructions.

5. Use rigging in accordance with manufacturers recommendations.

6. Never work or position yourself directly under a suspended load.

7. Use only slings or chains that are rated for the load being lifted.

8. Only use appropriate rigging devices for lifts.

D. Crane Mechanics shall:

1. Be qualified to make adjustments and repairs.

2. Ensure all maintenance, inspections and testing conducted is based on manufacturer’s recommendations, and specific site conditions.

3. Seek approval in writing of crane manufacturer for any modifications of the crane that will change the structural or lift characteristics of the equipment.

4. Ensure all maintenance related inspections occur at frequency specified by the manufacturer, or Cal/OSHA (see Section 8).

E. Safety & Health Supervisor shall:

1. Review and approve critical lift plans and hold-harmless agreements for OCSD property or projects.

2. Coordinate quarterly inspections for OCSD rigging.
A. **All Cranes**

1. All crane load charts are to be clearly legible and in clear view from the operator’s position.

2. The rated load of a crane must be clearly marked on each side of a crane.

3. Equipment must not be operated in excess of rated capacity.

4. Cranes shall have all required signage and decals on the crane body.

5. No one is permitted to ride on loads, hooks, or slings of any hoist or crane.

6. The empty hook, headache ball, or block should not swing freely.

7. Cranes shall be equipped with the applicable safety devices (see Appendix B).

8. When hoisting personnel or using bridge as a work platform:
   a. A body harnesses must be used for fall protection.
   b. Personal fall arrest and positioning systems must be anchored to a substantial part of the equipment, as approved by the Critical Lift Plan.
   c. Fall restraint systems must be anchored to any part of the equipment capable of withstanding twice the maximum load. A personal fall arrest systems is permitted to be anchored to the crane’s hook (or other part of the load line) when approved by a Critical Lift Plan.
   d. Employees exposed to fall hazards during equipment operation must receive training in Fall Protection.

9. Shall be inspected at the intervals indicated in the applicable section of this policy by the designated and qualified person(s).

B. **Overhead and Gantry cranes**

1. Markings
   a. Crane
      
      1) The rated load of the crane shall be marked on each side of the crane bridge girder, or other component attached to the crane bridge girder, and shall be legible from the ground or floor.

   b. Hoist
      
      1) The rated load of the hoist shall be marked on the hoist or trolley unit or its load block and shall be legible from the ground or floor.

      2) If the crane has more than one hoisting unit, each hoist shall have its rated load marked on the hoist or trolley unit or its load block and each rated load marking shall be legible from the ground or floor.
Subject: **Crane Safety Program**

a) The combined load applied to all hoists on a crane shall not exceed the rated load of the crane.

2. **Warnings**
   a. Floor-operated and remote-operated cranes shall have a safety label or labels affixed to the pendant station or load block. The label or labels shall include cautionary language against:
      1) Lifting more than the rated load
      2) Operating hoist when load is not centered under hoist
      3) Operating hoist with twisted, kinked, or damaged chain or rope
      4) Operating damaged or malfunctioning crane
      5) Lifting people
      6) Lifting loads over people
      7) Operating a rope hoist with a rope that is not properly seated in its groove
      8) Operating manual motions with other than manual power
      9) Removing or obscuring safety label
   b. Cab-operated and pulpit-operated cranes shall have a safety label or labels affixed in the cab or pulpit. The labels shall include cautionary language against:
      1) Lifting more than the rated load
      2) Operating hoist when load is not centered under hoist
      3) Operating hoist with twisted, kinked, or damaged chain or rope
      4) Operating damaged or malfunctioning crane
      5) Lifting people
      6) Lifting loads over people
      7) Operating a rope hoist with a rope that is not properly seated in its groove
      8) Removing or obscuring safety label
   c. A label shall be affixed on all electrical control enclosures. The shall include, but not be limited to, information such as:
      1) Disconnect power and lockout/tagout disconnecting means before removing cover or servicing this equipment.
2) Do not operate without cover in place.

3. Inspections

   a. Frequent inspections: Shall be conducted by a designated person at least before each use, or as specifically indicated by the manufacturer, including observation during operation for any deficiencies that might appear between regular inspections. Any deficiencies shall be carefully examined and a determination made as to whether they constitute a hazard. Frequent inspections shall include but not be limited to the following items:

   1) Operating mechanisms for proper operation, proper adjustment, and unusual sounds; such as, but not limited to, squeaking, grinding, grating, etc.

   2) Verify operation of the upper limit device(s) under no-load conditions.

   3) Tanks, valves, pumps, lines, and other parts of air or hydraulic systems for leakage.

   4) Hook attachment and securing means.

   5) Rope for proper spooling onto the drum(s) and sheave(s).

   6) Warning device(s) for proper operation.

   b. Periodic Inspection: shall be performed by a qualified person at least monthly, depending on the cranes activity, severity of service, and environment, or as specifically indicated below. These inspections shall include all items listed under frequent inspection and items such as the following. Any deficiencies shall be examined and determination shall be made as to whether they constitute a hazard.

   1) Deformed, cracked, or corroded members.

   2) Loose or missing fasteners, such as, but not limited to, bolts, nuts, pins, or rivets.

   3) Cracked or worn sheaves and drums.

   4) Worn, cracked, or distorted parts such as pins, bearings, shafts, gears, rollers, and locking and clamping devices, bumpers and stops.

   5) Excessive wear on brake and clutch system parts.

   6) Excessive wear of chain drive sprockets and excessive chain stretch.

   7) Deterioration of controllers, master switches, contacts, limit switches, and push-button stations, but not limited to these items.

   8) Wind indicators for proper operation.
Subject: Crane Safety Program

9) Gasoline, diesel, electric, or other power plants for proper operation.

10) Motion limit devices that interrupt power or cause a warning to be activated for proper performance. Each motion shall be inched or operated at low speed into the limit device with no load on the crane.

11) Roper reeving for compliance with crane manufacturer's design.

12) Function, instruction, and safety information signs, labels, or plates for legibility and replacement.

4. Operation
   a. Attaching the Load

   1) The hoist chain or hoist rope shall be free from kinks or twists and shall not be wrapped around the load.

   2) The load shall be attached to the load block hook by means of slings or other devices.

   3) Care shall be taken to make certain that the load, sling, attachments, and load block clear all obstacles.

   b. Moving the Load

   1) The appointed person directing the lift shall ascertain that:

   a) The load, sling, or lifting device is seated in the bowl of the hook.

   b) The load is secured, balanced, and positioned in the hook, sling, or lifting device before the load is lifted more than a few inches.

   c) Hoist chain or rope is not kinked.

   d) Multiple part lines are not twisted around each other.

   e) The hook is brought over the load in such a manner as to minimize swinging.

   f) The rope is seated in the drum grooves and in the sheaves, if there is or has been a slack rope condition.

   2) During lifting, care shall be taken that:

   a) There is no sudden acceleration or deceleration of the moving load.

   b) The load does not contact any obstructions.

   3) Cranes shall not be used for side pulls.

   4) The operator shall not cause the crane to lift, lower, or travel while anyone is on the load or hook.
Subject: **Crane Safety Program**

5) The operator shall not carry loads over people.

6) The operator shall check the hoist brake(s) at least once each shift if a load is approaching the rated load is to be handled. This shall be done by lifting the load a short distance and applying the brake(s).

7) The load shall not be lowered below the point where two wraps of rope remain on each anchorage of the hoisting drum unless a lower limit device is provided, in which case no less than one wrap shall remain.

8) When two or more cranes are used to lift a load, one qualified person shall analyze the operation and instruct other personnel involved in the proper positioning, rigging of the load, and the movements to be made. A critical lift plan is required when utilizing two or more cranes.

9) The operator shall not leave the position at the controls while the load is suspended over an area accessible to people.

c. Parking the Load

1) The operator shall not leave a suspended or a load unattended unless specific precautions have been instituted and are in place.

2) The load block should be lifted above head level for storage when the crane is not in use.

d. Access to the bridge walkway shall be provided by a ladder, stairs or other safe means.

e. When starting the bridge and when the load or hook approaches personnel, a warning signal shall be sounded.

f. Exposed moving parts, such as gears, set screws, projecting keys, chains, and chain sprockets, which constitute a hazard under normal operating conditions, shall be guarded.

g. Brake and braking means shall be provided for Overhead and Gantry Cranes.

h. Trolley Brakes and Braking Means:

1) Each power-driven trolley unit of the crane shall be equipped with either a braking means or have trolley drive frictional characteristics that will provide stopping and holding functions, under conditions where the rails are dry. Bridge Brakes and Braking Means

2) A power-driven bridge shall be equipped with either a braking means or have bridge drive functional characteristics that will provide stopping and holding functions, under conditions where the rails are dry.

i. Clearance shall be maintained between the crane and the building, as well as between parallel running cranes and cranes operating at different elevation, under all operating conditions.
Subject: **Crane Safety Program**

  j. When necessary to provide service platforms, must comply with following requirements:

  1) The dimension of the working space in the vertical direction from the floor surface of the platform to the nearest overhead obstruction shall be a minimum of 48 inches at the location where a person is performing a function while on the platform.

  2) Service platforms shall have a clear passageway at least 18 inches wide, except at the bridge drive mechanism where no less than 15 inches of clear passageway shall be allowed.

  3) The dimension of the working space in the direction of access to live (energized) electrical parts that are likely to require examination, adjustment, servicing, or maintenance while energized shall be a minimum of 30 inches.

  4) The door(s) of electrical control cabinets shall either open at least 90 degrees or be removable.

  5) Service platforms shall have a slip-resistant walking surface.

  6) Service platforms shall be provided with guard railings and toe boards.

  7) Guard railings shall be at least 42 inches high and shall be provided with an intermediate railing.

   k. A portable fire extinguisher, with a basic minimum extinguisher rating of 10 BC, shall be installed in the cab.

   l. Using an overhead bridge platform as a work platform requires a Critical Lift Plan approved by the Safety & Health Supervisor.

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**C. Mobile and Locomotive Cranes**

1. Load Rating Chart

   a. A durable rating chart(s) with legible letters and figures shall be provided with each crane and attached in a location accessible to the operator while at the controls. The data and information to be provided on these charts shall include, but not be limited to, the following:

   1) A full and complete range of manufacturer’s crane load ratings at all stated operating radii, boom angles, work areas, boom lengths and configurations, jib lengths and angles (or offset), as well as alternate ratings for use and non-use of optional equipment on the crane such as outriggers and extra counterweights, which affect ratings.

   2) A work area chart for which capacities are listed in the load rating chart.

   3) Where ratings are limited by structural, hydraulic, or factors other than stability, the limitations shall be shown and emphasized on the rating charts.
Subject: Crane Safety Program

4) In areas where no load is to be handled, the work area figure and load rating chart shall so state.

5) Recommended reeving for the hoist lines shall be shown.

6) If the weight of any portion of the hoist rope is required to be considered as part of the crane’s lifted load, the method for determining such rope weight shall be provided.

b. In addition to the data required on the load rating chart, the following information shall be shown either on the rating chart or in the operating manual:

1) Recommended parts of hoist reeving, size, and type of rope for various crane loads

2) Recommended boom hoist reeving diagram, where applicable; size, type, and length of rope

3) Tire pressure, where applicable

4) Cautionary or warning notes relative to limitations on equipment and operating procedures, including indication of the least stable direction

5) Position of the gantry and requirements for intermediate boom suspension, where applicable

6) Instructions for boom erection and conditions under which the boom, or boom and jib combinations, may be raised or lowered

7) Whether the hoist holding mechanism is automatically controlled, manually controlled, whether freefall is available, or any combination thereof

8) The maximum telescopic travel length of each boom telescopic section

9) Whether sections are telescoped with power or manually

10) The sequence and procedure for extending and retracting the telescopic boom section

11) Maximum loads permitted during the actual boom extending operation, and any limiting conditions or cautions

12) Hydraulic relief valve settings specified by the manufacturer

2. Inspection

a. Frequent inspections: Shall be conducted by a designated person at least before each use, or as specifically indicated by the manufacturer, including observation during operation for any deficiencies that might appear between regular inspections. Any deficiencies shall be carefully examined and a
Subject: Crane Safety Program

determination made as to whether they constitute a hazard. Frequent inspections shall include but not be limited to the following items:

1) All control mechanisms for maladjustment interfering with proper operation: daily, when used.

2) All control mechanisms for excessive wear of components and contamination by lubricants or other foreign matter.

3) Operational aids for malfunction: daily, when used.

4) All hydraulic hoses, particularly those that flex in normal operation of crane function, should be visually inspected once every working day, when used.

5) Hooks and latches for deformation, chemical damage, cracks, and wear.

6) Rope reeving for compliance with crane manufacturer’s specifications.

7) Electrical apparatus for malfunctioning, signs of excessive deterioration, dirt, and moisture accumulation.

8) Hydraulic system for proper oil level: daily, when used.

9) Tires for recommended inflation pressure.

b. Periodic Inspection: shall be performed by a qualified person at least monthly, depending on the cranes activity, severity of service, and environment, or as specifically indicated below. These inspections shall include all items listed under frequent inspection and items such as the following. Any deficiencies shall be examined and determination shall be made as to whether they constitute a hazard.

1) Deformed, cracked, or corroded members in the crane structure and entire boom.

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, and locking devices.

5) Excessive wear on brake and clutch system parts, linings, pawls, and ratchets.

6) Any significant inaccuracies of operational aids.

7) Lack of performance and compliance with safety requirements of gasoline, diesel, electric, or other power plants.
Subject: Crane Safety Program

8) Excessive wear of chain drive sprockets and excessive chain stretch.

9) Cracked crane hooks.

10) Malfunctioning travel steering, braking, and locking devices.

11) Excessively worn or damaged tires.

12) Hydraulic and pneumatic hose, fittings, and tubing.
   a) Evidence of leakage at the surface of the flexible hose or its junction with the metal and couplings.
   b) Blistering or abnormal deformation of the outer covering of the hydraulic or pneumatic hose.
   c) Leakage at threaded or clamped joints that cannot be eliminated by normal tightening or recommended procedures.
   d) Evidence of excessive abrasion or scrubbing on the outer surface of a hose, rigid tube or fitting. Means shall be taken to eliminate the interference of elements in contact or otherwise protect the components.

13) Hydraulic and pneumatic pumps and motors
   a) Loose bolts or fasteners.
   b) Leaks at joints between sections.
   c) Shafts seal leaks.
   d) Unusual noises or vibration.
   e) Loss of operating speed.
   f) Excessive heating of the fluid.
   g) Loss of pressure

14) Hydraulic and pneumatic valves
   a) Cracks in valve housing.
   b) Improper return of spool to neutral position.
   c) Leaks at spools or joints.
   d) Sticking spools.
   e) Failure of relief valves to attain correct pressure setting.
   f) Relief valve pressures as specified by the manufacturer.
Subject: **Crane Safety Program**

15) Hydraulic and Pneumatic Cylinders

   a) Drifting caused by fluid leaking across the piston.

   b) Rod seals leakage.

   c) Leaks at welded joints.

   d) Scored, nicked, or dented cylinder rods.

   e) Dented case (barrel).

   f) Loose or deformed rod eyes or connecting joints

16) Hydraulic Filters

   a) Evidence of rubber particles on the filter element, which may indicate hose, "O" ring, or other rubber component deterioration. Metal chips or pieces on the filter may denote failure in pumps, motors, or cylinders.

3. Operation

   a. Handling the Load

      1) Size of the Load

         a) No crane shall be loaded beyond the specifications of the load rating chart, except for test purposes.

         b) The load to be lifted shall be within the rated capacity of the crane in its existing configuration.

         c) When loads that are not accurately known are to be lifted, the designated person responsible for supervising the lifting operations shall ascertain that the weight of the load does not exceed the cranes ratings at the maximum radius at which the load is to be handled.

      2) Attaching the Load

         a) The hoist rope shall not be wrapped around the load.

         b) The load shall be attached to the hook by means of slings or other devises of sufficient capacity.

      3) Holding the Load

         a) The operator shall not leave the controls while the load is suspended.

         b) No person should be permitted to stand or pass under a suspended load.
Subject: **Crane Safety Program**

c) As an exception to those circumstances requiring a load to held suspended for a period of time exceeding normal lifting operations, the operator may leave the controls provided that, prior to that time, the appointed individual and operator shall establish the requirements for restraining the boom hoist, telescoping, load, swing, and outrigger functions, and provide notices, barricades, or whatever other precautions may be necessary.

4) Moving the Load

a) The person directing the lift shall see that
   1) The crane is level and, where necessary, blocked
   2) The load is well secured and balanced in the sling or lifting device before it is lifted more than a few inches
   3) The lift and swing path are clear of obstructions
   4) All persons are clear of the swing radius of the crane counterweight

b) Before starting to lift, the following conditions should be noted:
   1) Wheels or tracks must not be off the ground unless the crane is properly supported on outriggers.
   2) The hoist rope shall not be kinked.
   3) Multiple-part lines shall not be twisted around each other.
   4) The hook shall be brought over the load in such a manner as to minimize swinging.
   5) If there is a slack rope condition, it shall be determined that the rope is seated on the drum and in the sheaves as the slack is removed.
   6) The effect of ambient wind on the load and on crane stability.

c) During lifting operations, care shall be taken that
   1) There is no sudden acceleration or deceleration of the moving load
   2) Load, boom, or other parts of the machine do not contact any obstruction

d) Side loading of booms shall be limited to freely suspended loads. Cranes shall not be used for dragging loads sideways.

e) The operator should avoid carrying loads over people.

f) On wheel-mounted cranes, no loads shall be lifted over the front area, except as specified by the crane manufacturer.
Subject: **Crane Safety Program**

**g)** The operator shall test the brakes each time a load approaching the rated load is handled by lifting it a few inches and applying the brakes.

**h)** Any time outriggers are used, the outriggers shall be extended or deployed per the crane manufacturer’s load/capacity chart specifications and set to remove the machine weight from the wheels, except for locomotive cranes.

**i)** Neither the load nor the boom shall be lowered below the point where less than two full wraps of rope remain in their respective drums.

**j)** When lifting loads with locomotive cranes without using outriggers, the manufacturer’s instructions shall be followed regarding truck wedges or screws. When using outriggers to handle loads, the manufacturer’s instructions shall be followed.

**k)** A crane with or without a load shall not be traveled with the boom so high that it may bounce back over the cab.

**l)** When rotating the crane, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radius at which it can be controlled. A tag or restraint line shall be used when rotation of the load is hazardous.

**m)** Personnel shall not ride the bare hook or a load of material suspended from the hook.

4. When working near power lines, cranes shall comply with the following safe work practices:
   **a)** Assume all overhead lines are energized and potentially dangerous.
   **b)** Stay at least 10 feet away, if the overhead power line is 50kV or less.
   **c)** Stay at least 15 feet away, if power line is over 50kV to 200kV.

5. A fire extinguisher of not less than 10-ABC rating shall be kept in serviceable condition and readily accessible to the operator.

6. If a crane is to travel with a lifted load, the employer must ensure that a Critical Lift Plan is submitted to the Safety & Health Supervisor for approval.

**D. Tower Cranes**

1. Manufacturer’s specification regarding design, erection, operation, and safety must be available onsite.

2. A Cal/OSHA permit is required before a tower crane is erected, climbed, or dismantled.

**E. Hoists**

1. Manually Lever Operated Hoists
Subject: Crane Safety Program

a. Marking
   1) The rated load of the hoist shall be marked on the hoist or load block.
   2) Each control actuator shall be marked to indicate the direction of resistant movement.
   3) The hoist shall be marked with manufacturer's identification as follows:
      a) Name of manufacturer
      b) Manufacturer's model or serial number
   4) Warnings
      a) Lifting more than the rated load
      b) Operating the hoist when it is restricted from forming a straight line with the direction of loading
      c) Operating the hoist with a twisted, kinked, or damaged chain
      d) Operating a damaged or malfunctioning hoist
      e) Lifting people
      f) Lifting loads over people
      g) Operating a hoist with lever extension
      h) Removing or obscuring the warning label

b. Inspection
   1) Frequent Inspection
      a) Shall be conducted by a designated person at least before each use, or as specifically indicated by the manufacturer, including observation during operation for any deficiencies that might appear between regular inspections. Any deficiencies shall be carefully examined and a determination made as to whether they constitute a hazard. Frequent inspections shall include but not be limited to the following items:
         (1) Operating mechanisms for proper operation, proper adjustment, and for unusual sounds such as, but not limited to, binding noise of the chain, bearing squeal
         (2) Hooks
         (3) Hook latches, if used, for proper operation
         (4) Load chain reeving for compliance with recommendations of the hoist manufacturer or a qualified person.
Subject: Crane Safety Program

(5) Hoist lever for bends cracks, or other damage.
(6) Damage to the support for the hoist.

2) Periodic Inspection

a) Shall be performed by a qualified person at least monthly, depending on the cranes activity, severity of service, and environment, or as specifically indicated below. These inspections shall include all items listed under frequent inspection and items listed below. Any deficiencies shall be examined and determination shall be made as to whether they constitute a hazard.

b) Covers and other items normally supplied to allow inspection of components should be opened or removed for the inspection and then closed or replaced before restoring the hoist to normal operation unless further maintenance is required.

c) The following items shall be inspected:

(1) The inspection items listed under “Frequent Inspection”
(2) Fasteners for evidence of loosening
(3) Load blocks, suspension housings, levers, chain attachments, clevises, yokes, suspension bolts, shafts, gears, bearings, pins, rollers, and locking and clamping devices for evidence of wear, corrosion, cracks, and distortion
(4) Hook retaining nuts or collars, and pins; welds or rivets used to secure the training members for evidence of damage
(5) Load sprockets or idler sprockets for evidence of damage and wear.
(6) The brake mechanism on friction brake hoists for evidence of worn, glazed, or oil contaminated friction disks; worn pawls, cams, or ratchets; corroded, stretched, or broken pawl springs.
(7) Supporting structure or trolley, if used, for evidence of damage
(8) Labels for legibility and replacement
(9) End connections of load chains for evidence of wear, corrosion, cracks, damage, and distortion including over travel restraints.
(10) The hoist and hoist mounting, for evidence of missing items

c. Operation

1) Before Operating Hoist

a) The supporting structure or anchoring means shall have a load rating at least equal to that of the hoist.

b) The operator shall be familiar with all operating controls of the hoist, and shall be instructed as to warnings on the hoist, the
Subject: **Crane Safety Program**

hoisting practices, and the operator’s manual provided by the hoist manufacturer.

c) If adjustments or repairs are necessary, or any defects are known, the operator shall report this promptly to the appointed person.

d) Hoists shall be used only in locations that will allow the operator to be free of the load.

e) The operator shall have firm footing or otherwise be secured before operating the hoist.

f) The operator shall have access to the operating lever.

g) The operator shall not operate a hoist that bears an out-of-order sign.

h) The operator shall not adjust or repair a hoist unless qualified to perform maintenance on the hoist.

i) The chain shall not be used as a ground for welding.

j) A welding electrode shall not be touched to the chain or any other part of the hoist.

k) Hoists shall not be operated by other than hand power of one operator.

l) Hoists shall not be operated with an extension on the lever.

2) Handling the Load

a) The hoist chain shall not be wrapped around the load.

b) The load shall be attached to the load hook by suitable means.

c) The sling or other device shall be properly seated in the base (bowl) of the hook. Hook latch shall not be allowed to support any part of the load.

d) The load shall not be applied to the point of the hook.

e) Before applying the load, the operator shall be sure the load chain is not kinked or twisted or that multiple parts of the chain are not twisted about each other.

f) The hoist shall not be operated unless chain is seated properly on the sprockets.

g) The operator shall not apply a load beyond the rated load appearing on the hoist or load block, except during properly authorized tests.
Subject: **Crane Safety Program**

h) Hoists shall not be operated until the load block, chain, and hoist body are directly in line with the direction of loading to avoid side pull.

i) The hoist body or frame shall not bear against any object or the supporting structure.

j) Specific attention should be given to balancing of the load and hitching or slinging to prevent slipping of the load.

k) The operator shall not release the hoist lever until the ratchet pawl is engaged and the lever is at rest.

l) The operator shall not engage in any activity that will divert the operator’s attention while operating the hoist.

m) The operator shall not apply a load to the hoist until the operator and all other personnel are clear of the load.

n) The operator shall make sure a load clears any obstacles before moving.

o) A load shall not be moved more than a few inches until it is well balanced in the sling or lifting device.

p) When starting to lift or pull, the operator should move the load a few inches and then check the hoist for proper holding action. The operation shall be continued only after the operator has verified that the hoist is operating properly.

q) The hoist shall not be used to lift, support, or otherwise transport people.

r) The operator should not leave a loaded hoist unattended unless specific precautions have been instituted and are in place.

2. Overhead Hoists

   a. Marking

      1) The rated load of the hoist shall be marked on the hoist or its load block and shall be legible from the ground.

      2) The hoist shall be marked with the manufacturer’s identification information, on a plate or label attached to the hoist, or cast, forged or stamped on the hoist, as follows:

         a) Hand Chain-Operated Hoist

            (1) Name of manufacturer

            (2) Manufacturer’s model or serial number

         b) Electric-Powered Hoist
Subject: Crane Safety Program

(1) Name of manufacturer
(2) Manufacturer’s model or serial number
(3) Voltage of AC or DC power supply and phase and frequency of AC power supply
(4) Circuit ampacity

3) Warnings

a) All hand chain-operated hoists shall have affixed to the hoist or load block, a label or labels displaying information concerning operating procedures. The label or labels shall include cautionary language against

(1) Lifting more than rated load
(2) Operating hoist with twisted, kinked, or damaged chain
(3) Operating damaged or malfunctioning hoist
(4) Lifting people
(5) Lifting loads over people
(6) Operating hoist with other than manual power
(7) Removing or obscuring label

b) All electric-powered and air-powered hoists shall have affixed to the hoist, load block, or controls, a label or labels displaying information concerning operating procedures. The label or labels shall include cautionary language against

(1) Lifting more than the rated load
(2) Operating hoist when load is not centered under hoist
(3) Operating hoist with twisted, kinked, or damaged chain or rope
(4) Operating damaged or malfunctioning hoist
(5) Lifting people
(6) Lifting loads over people
(7) Operating a rope hoist with a rope that is not properly seated in its groove
(8) Removing or obscuring a label

b. Inspection

1) Frequent Inspection
a) Shall be conducted by a designated person at least before each use, or as specifically indicated by the manufacturer, including observation during operation for any deficiencies that might appear between regular inspections. Any deficiencies shall be carefully examined and a determination made as to whether they constitute a hazard.

b) Frequent inspections shall include but not be limited to the following items:

(1) Operating mechanisms for proper operation, proper adjustment, and for unusual sounds

(2) Hoist upper limit device of electric- or air-powered hoists, without a load on the hook at the beginning of each shift. Care shall be exercised. The load block shall be inched into its limit device or run in at slow speed on multi-speed or variable-speed hoists

(3) Hoist braking system for proper operation

(4) Lines, valves, and other parts of air systems for leakage

(5) Hooks

(6) Hook latches, if used, for proper operation

(7) Rope or load chain reeving for compliance with recommendations of the hoist manufacturer

2) Periodic Inspection

a) Shall be performed by a qualified person at least monthly, depending on the cranes activity, severity of service, and environment, or as specifically indicated below. These inspections shall include all items listed under frequent inspection and items such as the following. Any deficiencies shall be examined and determination shall be made as to whether they constitute a hazard. Covers and other items normally supplied to allow inspection of components should be opened or removed for the inspection and then closed or replaced before restoring the hoist to normal operation unless further maintenance is required.

b) The following items shall be inspected:

(1) The inspection items listed under “Frequent Inspection”

(2) Fasteners for evidence of loosening

(3) Load blocks, suspension housings, levers, chain attachments, clevises, yokes, suspension bolts, shafts, gears, bearings, pins, rollers, and locking and clamping devices for evidence of wear, corrosion, cracks, and distortion

(4) Hook retaining nuts or collars, and pins; welds or rivets used to secure the training members for evidence of damage

(5) Load sprockets, idler sprockets, drums, and sheaves for evidence of damage and wear
Subject: Crane Safety Program

(6) The brake mechanism on hand chain hoists for evidence of worn, glazed, or oil contaminated friction disks; worn pawls, cams, or ratchets; corroded, stretched, or broken pawl springs

(7) The motor brake and load brake on electric- or air-powered hoists for evidence of wear

(8) Electrical apparatus on electric-powered hoists for evidence of pitting or deterioration of controller contacts

(9) Supporting structure or trolley, if used, for evidence of damage

(10) Label or labels for legibility

c. Operation

1) Before Operating Hoist

a) The operator shall be familiar with all operating controls of the hoist and be instructed in the operation(s) to be performed.

b) If adjustments or repairs are necessary, or any defects are known, the operator shall report this promptly to a designated person.

c) The operator shall not operate a hoist that bears an out-of-order sign.

d) The operator shall not adjust or repair a hoist unless qualified to perform maintenance of a hoist.

e) The chain or rope shall not be used as a ground for welding.

f) A welding electrode shall not be touched to the chain or rope.

g) Hand chain-operated hoists shall only be operated with hand power, with no more than one operator per hand chain.

2) Applying the Load

a) The hoist rope or chain shall not be wrapped around the load.

b) The load shall be attached to the load hook by suitable means,

 c) The sling or other device shall be properly seated in the base (bowl or saddle) of the hook. The hook latch shall not be allowed to support any part of the load.

 d) The load shall not be applied to the point of the hook.

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

f) The hoist shall not be operated unless the rope or chain is seated properly on the drum, sheaves, or sprockets.
Subject: **Crane Safety Program**

g) Hoists shall not be operated unless the hoist unit is centered over the load, except when authorized by a qualified person who has determined that the components of the hoist and its mounting will not be overstressed. Should it be necessary to pick a load that is not centered under the hoist unit, precautions shall be taken to control the swing of the load when it is picked clear of its support.

h) Special attention should be given to balancing of the load and hitching or slinging to prevent slipping of the load.

3) Moving the Load

a) The operator shall not engage in any activity that will divert the operator’s attention while operating the hoist.

b) 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.

c) The operator shall not lift or lower a load with the hoist until the operator and all other personnel are clear of the load.

d) The operator shall make sure the load and hoist will clear all obstacles before moving or rotating the load.

e) The operator shall inch powered posted slowly into engagement with a load, but should avoid unnecessary inching and quick reversals of direction.

f) A load shall not be lifted more than a few inches until it is well balanced in the sling or lifting device.

g) Each time a load approaching rated capacity is handled, the operator shall check hoist brake action by lifting the load just clear of supports and continuing only after verifying that that the brake system is operating properly.

h) 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.

i) The operator shall avoid carrying loads over people.

j) The operator shall avoid swinging the load or load hook when traveling the hoist.

k) On trolley-mounted hoists, contact between trolley or between trolleys and stops should be avoided.

l) 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.
F. Slings, ropes, and attachments

1. Damaged or defective slings shall be taken out of service and may only be repaired by the manufacturer or a qualified person.

2. Selection and installation of equipment on cranes must meet recommendations of the rope manufacturer, crane manufacturer, or a qualified person.

3. Fiber core ropes must not be used for boom hoist reeving.

4. Rotational resistant ropes may be used at the discretion and under the guidance of a qualified person. Chain or wire rope slings shall not be shortened with knots, bolts, or other makeshift devices.

5. Slings shall not be kinked, knotted, loaded in excess of their rated capacities, or be pulled from under a load when the load is resting on the sling and damage to the sling may result.

6. Slings shall be set to avoid slippage, be padded or protected from the sharp edges of their loads, and slings used in a basket hitch shall have the loads balanced to prevent slippage.

7. Suspended loads shall be kept clear of all obstructions.

8. Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.

9. Shock loading is prohibited.

10. Only use slings with permanent affixed identification markings that show the maximum load for each sling.

11. Inspection

   a. Frequent inspection – Shall be conducted by a designated person at least before each use, or as specifically indicated by the manufacturer, including observation during operation for any deficiencies that might appear between regular inspections. Any deficiencies shall be carefully examined and a determination made as to whether they constitute a hazard. Frequent inspections shall include but not be limited to the following items:

      1) Any condition that may result in a hazard shall cause the sling to be removed from service. Slings shall not be returned to service until approved by a qualified person.

   b. Periodic inspection – A complete inspection for damage of the sling shall be performed by a qualified person at least monthly, depending on the activity, severity of service, and environment, or as specifically indicated below. These inspections shall include frequent inspection items and items such as the following. Any deficiencies shall be examined and determination shall be made as to whether they constitute a hazard.

      1) An alloy steel chain sling shall be removed from service if conditions such as the following are present:
Subject: **Crane Safety Program**

a) Missing or illegible sling identification.

b) Cracks or breaks.

c) Excessive wear, nicks, or gouges.

d) Stretched chain links or components.

e) Bent, twisted, or deformed chain links or components.

f) Evidence of heat damage.

g) Excessive pitting or corrosion.

h) Lack of availability of chain or components to hinge (articulate) freely.

i) Weld splatter.

j) Other conditions, including visible damage, that cause doubt as to the continued use of the sling.

G. Signaling

1. A designated signal person must be provided when the equipment travel is not in full view of the operator.

2. When using hand signals, the Standard Methods must be used (see Appendix A, Figure A-1).

3. Signals must be suitable for the site conditions, and tested before beginning operations, if necessary.

4. The operator must safely stop operations if the ability to transmit signals is interrupted.

5. When a device is used to transmit signals for one crane (or multiple cranes), it must be on a dedicated channel, and the operator must use a hand-free device for reception of signals.

   Applicable hand signal charts (See Figures C-1 thru C-3) must be posted conspicuously on equipment or in the vicinity of the operations.

VIII. **Use of OCSD Equipment**

In the event a contractor must use an OCSD-owned crane, the contractor must submit Hold-Harmless Agreement, and a training verification form to Risk Management for approval. These forms are available from Risk Management.

IX. **Critical Lift Plans**

A. Before making a critical lift, a Critical Lift Plan must prepared by a qualified person.
Subject: Crane Safety Program

1. The Critical Lift Plan should be documented in writing and made available to all personnel involved in the lift.

2. A pre-lift meeting involving the participating personnel (i.e. crane operator, lift supervisor, rigger) should be conducted prior to making a critical lift.

3. The Critical Lift Plan should be reviewed by Risk Management ensure that the project team is prepared to safely conduct the lift. A sample Critical Lift Plans contained in Appendix C and can be located on Risk Management’s SharePoint site.

B. Critical Lift Planning

1. Crane lifts are classified into two categories: critical lifts and general lifts. Critical lifts shall have the following additional planning requirements:
   a. A qualified person shall prepare the Critical Lift Plan (see Appendix C-1 for sample plan). The qualified person preparing the plan may be the crane operator, lift supervisor, or designated rigger, and shall include the other qualified individuals in the lift plan.
   b. The plan shall be documented, and a copy provided to the contractor, resident engineer, and an OCSD Risk Management representative for review prior to any critical lift.
   c. The plan shall be reviewed by, and signed by, all personnel involved with critical lift.

2. The Critical Lift Plan shall be used when any of the following characteristics or conditions exists:
   a. Anytime a load will be lifted over an occupied building.
   b. Any lift which meets or exceeds 75% of the crane’s capacity at the given radius as posted in the load chart for the specific crane and its configuration.
   c. Any lift that requires two or more cranes.
   d. Any lift of 100,000 pounds or more.
   e. Any lifts involving of personnel platforms.
   f. Using a crane where fully extended outriggers and/or the 360 degree load chart (if applicable) cannot be used.
   g. Operating a crane in a position where it could possibly exceed the minimum distances from overhead power lines.
   h. Any lifts over operating facilities where they may endanger personnel, the public, or a project schedule.
   i. Any operations involving traveling with a lifted load.
   j. Using a bridge platform as a work platform (See Special Operations).

3. The Critical Lift Plan shall include details of:
   a. The make, model and capacity of the crane and a proof of current inspection and/or testing.
b. Exact weight of the load to be lifted and all rigging components that adds to the weight.

c. The manufacturer’s maximum load limits for the entire range of the lift as listed in the load charts shall also be specified.

d. The rigging plan shall show lift points, rigging procedures and the required lifting hardware.

e. The plan shall describe ground conditions, outrigger or crawler track requirements, and if necessary, the design of mats or cribbing.

f. Weather conditions or environmental conditions under which lift operations must be stopped.

g. Operational signaling, coordination and communication requirements for the lift operation.

h. Any site obstructions (buildings, boom clearances, etc.)

i. Drawings and any other detailed information required to ensure the safe and successful execution of the lift.

j. Crane operator acknowledgement of reserved radio frequency prior to execution of the lift.

C. Examples of Critical Lift Operations

1. Special Lift Operations – Personnel Handling
   
a. The use of a crane to hoist employees on a personnel platform is prohibited, except when the use of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous. In addition to the aforementioned requirements for a Critical Lift Plan, the additional conditions for lifting personnel with a crane shall be:

   1) Crane capacity must be reduced by 50%
   2) Outriggers must be properly extended with crane leveled.
   3) No lifts shall be made on an auxiliary load line while personnel are suspended on a platform.
   4) Hooks used shall be of a type that can be closed and locked.
   5) Bosun’s (Boatswain’s) chairs may be used instead of a personnel platform, if the employer can demonstrate to OCSD Risk Management that use of a personnel platform is infeasible due to circumstances at the worksite.
   6) Fall Protection must be provided per Cal/OSHA Standards.
   7) Follow all manufacturers’ recommendations for the use of a Bosun’s (boatswain’s) chair or personnel platform.

2. Overhead Bridge Platforms or Walkways as Work Platforms
Subject: Crane Safety Program

a. Using overhead bridge platform for work, such as changing overhead lights, is permissible provided a Professional Engineer or the crane manufacturer has determined that work can safely be performed from the platform or walkway. This determination will need to be in writing. For OCSD operations, an assessment of the platform by a third-party Professional Engineer is required. Additional provisions placed on this type of operation include:

1) Fall protection and standard guardrails shall be provided and used.

2) Ladders shall not be erected and/or used on cranes to gain access to areas that are not directly accessible from a crane without the use of a ladder.

3) Machinery and live electrical equipment shall be guarded or de-energized.

4) Work from cranes shall be performed only when a crane is stationary.

5) The crane control pendant shall be in the possession and under control of those performing the work on the bridge or platform.

6) A crane shall not be moved until all employees on the crane are in locations where they will not be exposed to injury.

7) Signs, which indicate work is being performed, shall be posted whenever work is performed from a crane. Such signs shall be visible from the floor.

8) Lockout/Tag-out procedures shall be implemented.

9) Safe egress to and from a crane shall be provided.

X. Inspection

A. Inspections shall be performed at the intervals indicated in the applicable section of this policy, and conducted or coordinated by the designated and qualified person(s).

B. Inspection checklists can be found on Risk Management’s SharePoint site under “Safety Documents” in the “Crane Inspection” folder.

C. OCSD mobile crane maintenance, and OCSD overhead and gantry crane inspections shall be coordinated by Facilities Engineering. All maintenance must be conducted in accordance with the manufacturer’s recommended procedures. All guards removed during maintenance shall be reinstalled, and all safety devices reactivated after maintenance is performed. The equipment shall be tested for proper operation before being returned to service after maintenance is performed.

XI. Training

A. Operators of Cranes
Subject: Crane Safety Program

1. Cranes shall only be operated by qualified personnel certified by an accredited certifying entity, such as the National Commission on the Certification of Crane Operators (NCCCO). In addition, they shall only be operated by the following:
   a. Designated and trained persons
   b. Trainees under the direct supervision of a designated person
   c. Maintenance and test personnel, when it is necessary in the performance of their duties
   d. Crane inspectors
   e. No one other than personnel specified above shall enter a crane cab or pulpit, with the exception of persons such as supervisors, whose duties require them to do so, and then only in the performance of their duties and with the knowledge of the operator or other appointed personnel.

2. Operators of mobile cranes above 7.5 tons lifting capacity or 25 feet of boom must carry certification during crane operation. In cases where other personnel (e.g., contractors) will be using these devices, they shall be similarly trained. The certification exemption for cranes less than 7.5 tons applies to maintenance tasks for general industry, not construction tasks as defined by OSHA. An employee who is not certified is allowed to operate equipment over 7.5 tons and a boom longer than 25 feet, only as an Operator-in-Training.

3. Each OCSD employee (i.e., rigger, signal person, and spotter) involved in crane operations must be trained in the hazards associated with crane hoist/lifting operations. Training shall include a classroom and practical examination covering, at minimum, the following topics:
   a. Overhead power line awareness,
   b. Crush/pinch points prevention,
   c. Fall Protection, and
   d. Lockout/Tagout procedures.
   e. Each employee must be evaluated (e.g., tested) on the training topic to ensure the training provided is understood.

B. Designated Signal Persons

1. A Designated Signal Person shall:
   a. Complete training from qualified trainer (mobile and tower cranes only).
   b. Know, understand, and be competent in the types of signals used.
   c. Have a basic understanding of the equipment operation and limitation.
   d. Be competent in the Standard Methods for hand signals, understand signal person requirements contained in Appendix A.

C. Qualified Riggers

1. A Qualified Rigger shall:
   a. Be trained in the selection, inspection, and rigging practices for the rigging devices used.
Subject: Crane Safety Program
   b. Demonstrate the ability to solve problems related to rigging loads.
   c. Appropriately trained for hazards (e.g., confined space) encountered during rigging operation.

D. Mechanics Performing Maintenance
   1. A Mechanic performing maintenance on a crane shall:
      a. Operate equipment only when, operation is critical for a maintenance task.
      b. Be familiar with the equipment, or operate under the direct supervision of a qualified operator.
      c. Be qualified to perform maintenance on the equipment.

XII. Recordkeeping

All records created or generated in the course of this procedure shall be legible and stored in a way that they are readily retrievable in facilities or electronic document/content management systems that provide a suitable environment to prevent damage, deterioration, or loss. Records may be in the form of any type of media, such as hard copy or electronic media. The OCSD Records Retention Schedule is the official procedure governing the retention, retirement, and destruction of District records. Document owners should use these schedules to determine the item and series that best fit their records. Document owners are responsible for insuring that documents are properly marked, indexed, and filed for their projects or area of responsibility.

XIII. Exceptions/Conditions/Provisions

XIV. References

A. Cal/OSHA, Title 8 Sections 4884 -5048, General Industry Safety Orders.
B. Cal/OSHA, Title 8 Sections 1604-1619.4 and 1718, Construction Safety Orders.
G. American Society of Mechanical Engineers (ASME) B30.17-2006 and B30.2 -2011, Overhead and Gantry Cranes.
H. American Society of Mechanical Engineers (ASME) B30.5-2007, Mobile and Locomotive Cranes.
I. American Society of Mechanical Engineers (ASME) B30.9-2010, Slings.
Subject: Crane Safety Program


M. American Society of Mechanical Engineers (ASME) B30.16-2009, Overhead Hoists (Underhung).

XV. Revision History

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<td>01/15/13</td>
<td>Rod Collins</td>
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<td>09/21/15</td>
<td>Heather Davis</td>
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Figure A-1: Recommended Hand Signals for Controlling Crane Operations
Figure A-2: Recommended Hand Signals For Boom Equipment Operations
Figure A-3: Recommended Hand Signals for Overhead Crane Operations

- **HOIST**: With forearm vertical, forefinger pointing up, move hand in small horizontal circle.
- **LOWER**: With arm extended downward, forefinger pointing down, move hand in small horizontal circles.
- **BRIDGE TRAVEL**: Extended forward, hand slightly raised, make push motion in direction of travel.
- **TROLLEY TRAVEL**: Palm up, fingers closed, thumb pointing in direction of motion, jerk hand horizontally.
- **STOP**: Arm extended, palm down, move arm back and forth.
- **EMERGENCY STOP**: Arms extended, palms down, arms back and forth.
- **MULTIPLE TROLLEYS**: Hold up one finger for block marked “1” and two fingers for block marked “2”. Regular signals follow.
- **MOVE SLOWLY**: Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal (hoist) slowly shown as example 1.
- **MAGNET IS DISCONNECTED**: Operator spreads both her palms up.
APPENDIX B

Safety Devices and Operational Aids

The following safety devices and operational aids are required on all cranes covered by this policy, except gantry and overhead cranes, and cranes with less than 1 ton lift capacity. In addition, boom hoist limiting devices are not required for mobile cranes with a rated capacity of 3 tons or less.

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</tr>
<tr>
<td>jib limiting device</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>jib stop</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>jib angle indicator</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

* Boom hoist limiting devices are not required for mobile cranes with a rated capacity of 3 tons or less.
# APPENDIX C

Figure C-1: Critical Lift Plan Form (page 1)

**CRANE CRITICAL LIFTS**

<table>
<thead>
<tr>
<th>Date of Planned Lift:</th>
<th>Today's Date:</th>
<th>Designated Crane Operator:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisor Responsible for lift:</td>
<td>Description of the item to be lifted:</td>
<td></td>
</tr>
<tr>
<td>Weight of item to be lifted:</td>
<td>Was the weight estimated?</td>
<td>If estimated, by whom?</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Was the weight confirmed?</td>
<td>Confirmed by whom?</td>
<td>Method of verification:</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

**Type of Lift:**

- □ Over Occupied Building
- □ Lift meets/exceeds 100,000 lbs
- □ 75% (or more) of Load Limit
- □ Involving Personnel Platform
- □ 2 or more cranes
- □ Other: __________

**HOISTING EQUIPMENT**

<table>
<thead>
<tr>
<th>Type of unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross lifting capacity?</td>
</tr>
<tr>
<td>Designated rigger or tag man:</td>
</tr>
<tr>
<td>Rigging to be used:</td>
</tr>
</tbody>
</table>

**INSPECTION OF HOISTING EQUIPMENT**

<table>
<thead>
<tr>
<th>Lift unit inspector:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rigger inspector:</td>
</tr>
<tr>
<td>Date lifting unit was inspected:</td>
</tr>
<tr>
<td>Date rigging was inspected:</td>
</tr>
</tbody>
</table>

**SCHEDULE OF OPERATIONS**

<table>
<thead>
<tr>
<th>Time:</th>
<th>Location:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the area clear of personnel?</td>
<td>Were the equipment inspections and operations performed?</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

| Were any discrepancies noted by the rigger or operator? | If yes, please explain: |
| Yes | No |

*Rev 0: 06-23-2016*
<table>
<thead>
<tr>
<th>CRANE CRITICAL LIFTS (CONT'D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the item a freely suspended (free to move) load?</td>
</tr>
<tr>
<td>If the load is not freely suspended, describe the holding forces (i.e., &quot;load must be lifted off of mounting bolts&quot;, etc.)</td>
</tr>
<tr>
<td>If eyebolts or similar lifting attachments are used, have they been verified to be sufficient size and capacity?</td>
</tr>
<tr>
<td>Name of the individual that verified the capacity of the attachments:</td>
</tr>
<tr>
<td>Diagram the path that the load is to follow:</td>
</tr>
<tr>
<td>Is there sufficient clearance for the load at every point along the path?</td>
</tr>
<tr>
<td>Verified by whom:</td>
</tr>
<tr>
<td>Has an individual been designated to observe any area that most people could move into the load path?</td>
</tr>
<tr>
<td>If so, whom:</td>
</tr>
<tr>
<td>Crane Operators Signature:</td>
</tr>
<tr>
<td>Supervisor’s Signature:</td>
</tr>
<tr>
<td>Risk Management’s Signature:</td>
</tr>
<tr>
<td>Comments:</td>
</tr>
</tbody>
</table>

Rev 0: 06-23-2010