



RIGGING

Select, Inspect, Connect and Control Every Load

POLICY STANDARD

Loads shall be rigged by employees qualified for the assigned work. Rigging shall be identified, inspected, compatible, protected and used within its rated capacity. The load path and fall zone shall be controlled, and no employee shall stand beneath a suspended load.

PHEIFER BROTHERS CONSTRUCTION CO., INC.

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Table of Contents

SECTION	TOPIC	PAGE
1	Purpose, Scope, Definitions and Responsibilities	3
2	Qualified Riggers, Signal Persons and Training	4
3	Lift Planning, Load Data and Critical Lifts	5
4	Rigging Selection, Capacity and Sling Angles	6
5	Inspection, Identification and Removal from Service	7
6	Slings, Hardware and Below-the-Hook Devices	8
7	Connecting, Test Lifts, Tag Lines and Load Control	9
8	Fall Zones, Landing, Storage and Special Conditions	10
9	Bridge, Girder, Concrete and Demolition Rigging	11
10	Multi-Crane, Personnel and Specialized Lifts	12
11	Emergency Actions, Records and Program Review	13
12	Field Rigging Checklist	14
13	Test Your Knowledge	15

POLICY RELATIONSHIP

This policy addresses rigging gear and rigging work. The Crane and Hoisting Operations Policy governs crane setup, capacity, operator requirements and operation. Steel erection, pile driving, powered equipment, material handling and marine work may impose additional requirements.

Primary Regulatory References

- 29 CFR 1926.251 - Rigging equipment for material handling
- 29 CFR 1926.1401, 1926.1404(r) and 1926.1417 - crane definitions, assembly/disassembly rigging and operation
- 29 CFR 1926.1419-.1422 - signals and signal-person requirements
- 29 CFR 1926.1425 - keeping clear of the load
- 29 CFR 1926.1432 - multiple-crane lifts
- 29 CFR 1926.753 - steel-erection hoisting and rigging
- Manufacturer instructions and applicable ASME B30 practices

1. Purpose, Scope, Definitions and Responsibilities

Purpose and Scope

- Prevent dropped loads, sling/hardware failure, struck-by, caught-between, crushing and uncontrolled-load incidents during heavy-highway, bridge, yard, shop and support operations.
- Applies to company-owned, rented and subcontractor rigging used with cranes, hoists, excavators or other equipment legally configured for lifting. More protective project, manufacturer or regulatory rules govern.

Definitions

- Qualified rigger: a rigger who meets OSHA's qualified-person criteria for the particular rigging task; qualification is task-specific, not a universal card.
- Competent person: one capable of identifying existing and predictable hazards and authorized to correct them.
- Working load limit (WLL): maximum load permitted for a component in its stated configuration and conditions. Never use breaking strength as WLL.
- Fall zone: area where the load or rigging could fall, shift, tip or travel if control is lost.
- Below-the-hook device: beam, spreader, clamp, magnet, lifter or other device between the hook and load.

Management / Program Administrator

- Provide suitable gear, qualified personnel, inspection systems, engineering and time to plan lifts. Maintain controlled records and remove unapproved gear.

Foreman / Lift Director

- Plan the lift; verify weight, capacity, route, rigging, people, communication, ground and conditions; coordinate affected employers and stop unsafe work.

Qualified Rigger

- Select, inspect, connect, protect and control rigging; direct adjustments; keep people clear; stop when load data or conditions are inadequate.

Operator / Signal Person / Employees

- Operator follows the lift plan and signals while retaining authority to stop. Signal person is qualified when required. Employees respect barricades and never enter beneath a suspended load.

2. Qualified Riggers, Signal Persons and Training

When a Qualified Rigger Is Required

- Use a qualified rigger whenever employees are within a crane load fall zone while hooking, unhooking, guiding or making an initial connection; for crane assembly/disassembly rigging; steel-erection rigging; and whenever required by the lift plan or standard.
- Only employees assigned by the foreman and qualified for the gear, hitch, load and conditions may rig a load.

Qualification

- Demonstrate knowledge and practical ability in load weight/center of gravity, sling and hardware identification, hitches, angles, D/d effects, edge protection, inspection, load control and applicable rules.
- Qualification shall match the task. Experience with web slings does not automatically qualify a person for engineered girder lifts, magnets, plate clamps, multiple-crane lifts or custom devices.

Signal Person

- A signal person is required when the operator cannot fully see the load/travel path or as otherwise required. The person shall meet 1926.1428 qualification requirements and be documented.
- Use OSHA standard hand signals unless an equally effective approved system is used. Only one person gives routine signals; anyone may give stop/emergency stop.
- If communication is interrupted or a signal is misunderstood, safely stop until communication is restored and understood.

Training

- Train before assignment and after new gear/load, changed conditions, incident, unsafe act or knowledge deficiency. Provide hands-on inspection and hitching practice.
- Toolbox talks reinforce but do not replace qualified-rigger or signal-person qualification.

Records

- Document name, evaluator, date, equipment/rigging types, tasks and limitations. Supervisors verify qualification before each assignment.

3. Lift Planning, Load Data and Critical Lifts

Pre-Lift Planning

- Identify load description, verified weight, center of gravity, pick points, dimensions, orientation, travel path, landing, crane/equipment capacity, rigging configuration, weather, utilities, traffic, public and adjacent work.
- Confirm the crane hook, block and rigging weight are included in total load; verify lift radius and configuration with the operator.
- Establish fall zone, barricades, essential employees, tag-line method, signals/radios, escape paths and stop triggers in the JHA/lift briefing.

Load Weight and Center of Gravity

- Use marked/engineered weights, shipping documents, drawings, manufacturer data, calculated material weights or other reliable means. Guessing is prohibited.
- Locate center of gravity so the hook is vertically above it and the load will not tip. Account for fluids, concrete buildup, trapped water, soil, attachments and eccentric components.

Pick Points

- Use engineered or manufacturer-approved lifting points. Verify welds, inserts, anchors, lugs and surrounding material are designed, installed and cured/accepted for the imposed force.
- Do not attach to guardrails, rebar, handholes, piping, lifting eyes of unknown capacity or structural members not approved for lifting.

Critical / Complex Lifts

- A written, approved lift plan is required when company/project criteria identify unusual risk, including multiple cranes, personnel, high percentage of capacity, major girders, lifts over traffic/rail/water/occupied areas, blind or restricted lifts and custom devices.
- The plan identifies responsible persons, calculations, rigging sketch, sequence, communication, exclusion and contingency. Conduct a documented pre-lift meeting.

Changing Conditions

- Stop and revise the plan for changed radius, weight, pick point, crane configuration, rigging, route, wind, ground, visibility or simultaneous operations.

4. Rigging Selection, Capacity and Sling Angles

Rated Capacity

- Every sling and component shall have legible manufacturer identification and WLL. Do not use unidentified gear or exceed the lowest-rated component.
- Capacity depends on material, size, hitch, number of legs, sling angle, D/d ratio, bending, temperature, chemicals and manufacturer limits.

Sling Angles

- Measure the sling angle from horizontal unless the manufacturer/chart states otherwise. As the angle decreases, leg tension rises sharply.
- Determine leg tension using an approved chart/calculation. Do not assume load weight divided by number of legs. Unequal geometry, stiffness or center of gravity may prevent equal loading.
- Company expectation: avoid horizontal angles below 30 degrees unless a qualified lift plan and manufacturer data specifically authorize the configuration.

Hitches

- Vertical hitch: load supported by one leg; prevent rotation/sliding.
- Choker hitch: capacity is reduced; place choke correctly, protect sling and ensure the body—not fitting—takes the choke. Double-wrap when needed for control and permitted.
- Basket hitch: balance load, prevent sling separation/rollout and use a spreader when required. Do not allow the load to tip out.

Compatibility

- Hooks, shackles, master links and sling eyes must seat freely without point/side loading, crowding or forcing. Use correct shackle type and pin.
- Never shorten with knots, bolts, makeshift devices or by twisting. Do not shock load, drag rigging, pull from under a load or use rigging as a towing/recovery device unless designed for it.

Environmental Effects

- Follow manufacturer limits for heat, cold, chemicals, UV, moisture, sharp edges, welding current and contaminated loads. Use a different material where compatibility is uncertain.

5. Inspection, Identification and Removal from Service

Required Inspections

- Inspect rigging before use on each shift and as necessary during use. A designated competent person inspects each sling and all fastenings/attachments daily before use; severe service requires additional inspection.
- Complete periodic inspections at the frequency required for the rigging type, use, service severity and manufacturer. Maintain records where required, including alloy-chain periodic inspections.

Inspect For

- Missing/illegible tag; overload evidence; unauthorized repair; distortion, cracks, nicks, gouges, corrosion, heat/arc damage, worn bearing surfaces, stretched openings, bent pins, damaged latches or threads.
- Wire rope: broken wires, kinks, birdcaging, crushing, abrasion, heat, corrosion, core protrusion, damaged eyes/end fittings and diameter reduction.
- Synthetic web/round: cuts, tears, holes, snags, abrasion, melted/charred areas, acid/alkali damage, broken stitching, exposed core yarns, knots and damaged fittings.
- Chain: stretched/bent/twisted links, gouges, cracks, wear beyond limits, heat damage, defective hooks/couplers and unapproved repairs.

Removal from Service

- Immediately tag and physically segregate defective or unidentified gear so it cannot be reused. Do not leave rejected gear in the lift area.
- Follow OSHA and manufacturer removal criteria; when uncertain, remove from service and obtain qualified/manufacturer disposition.

Repairs

- Only the manufacturer or a qualified repair organization may repair as permitted. Field welding, heating, bending, grinding, splicing or makeshift repair is prohibited.
- Repaired equipment shall be inspected, tested/certified and reidentified as required before release.

Storage

- Clean, dry and store on racks away from traffic, weld spatter, chemicals, sunlight/heat, sharp edges, crushing and contamination. Remove unused rigging from the immediate work area.

6. Slings, Hardware and Below-the-Hook Devices

Wire Rope Slings

- Protect against sharp edges and small-radius bending; use correct thimbles and terminations. Never saddle a live rope with prohibited makeshift clips or alter fabricated slings.
- Do not kink, choke on fittings or use hands near a tightening bight. Follow the tag for hitch and angle capacity.

Synthetic Slings

- Use approved sleeves/softeners that prevent cutting without hiding critical damage. Edge protection must stay positioned throughout the lift and be adequate for the edge and pressure.
- Never expose to welding sparks, hot surfaces or incompatible chemicals. Follow manufacturer instructions for temperature and contamination.

Alloy Chain Slings

- Use alloy chain identified for overhead lifting. Do not use hardware-store chain, transport chain or load binders as lifting slings.
- Use approved shortening devices; never knot or bolt links. Periodic inspection and repair records shall meet 1926.251.

Shackles, Hooks and Eyebolts

- Verify markings, WLL, pin/bolt, body and threads. Seat the load in the hook bowl; do not tip/side/back load unless specifically rated.
- Use self-closing latches or equivalent where required. Never wire a damaged latch shut as a substitute for repair.
- Load eyebolts in their rated direction. Use shoulder eyebolts/swivel hoist rings for angular loading as approved; verify thread engagement and seating.

Beams, Clamps, Magnets and Custom Devices

- Use current inspection/marketing and manufacturer instructions. Confirm orientation, thickness/range, surface condition and minimum load requirements for clamps/magnets.
- Special custom grabs, hooks, clamps and lifting accessories shall be marked with safe working load and proof-tested to 125 percent before use as required by 1926.251(a)(4).

7. Connecting, Test Lifts, Tag Lines and Load Control

Before Connection

- Stable and block the load against roll, shift or collapse. Keep hands/feet out of pinch points; use tools or blocking for alignment.
- Verify hook over center of gravity, sling legs untwisted, hardware seated, pins secured, latches closed, edge protection positioned and loose material removed/secured.

Taking Slack

- Clear personnel, then take slack slowly. Watch every leg, pick point and component for seating, snagging, shifting or unequal loading.
- Never stand inside a bight, beneath the hook, between the load and a fixed object, or where a sling could sweep/tighten.

Test Lift

- Raise only a few inches and stop. Verify balance, brake/control, rigging seating, pick-point integrity, clear path and absence of unintended movement.
- Lower and correct any tilt, slip, overload indication, abnormal sound, deformation or unstable condition. Do not adjust rigging on a suspended load unless fully controlled under an approved method.

Tag Lines

- Use nonconductive tag lines when they safely control rotation/swing and do not create entanglement, snagging, electrical or fall hazards.
- Hold from outside the fall zone with a clear release path. Never wrap a tag line around the hand/body or use it to pull a load into position against crane side loading.

Travel and Landing

- Move smoothly; avoid shock loading, sudden starts/stops and side pulling. Maintain clearance from structures, utilities and people.
- Prepare stable dunnage/cribbing before arrival. Only essential employees may receive the load; keep hands clear and use tools. Fully support and de-tension before disconnecting.

8. Fall Zones, Landing, Storage and Special Conditions

Fall-Zone Control

- Plan routes that minimize employee exposure. Barricade and enforce the area where the load, rigging or material could fall, swing, tip or shift.
- No employee may be directly under a suspended load. Only employees permitted by the applicable standard and essential to hooking, guiding, initial connection or landing may enter the fall zone.
- When employees are permitted in the crane fall zone, rig to prevent unintentional displacement, use required self-closing hook latches/equivalent and use a qualified rigger.

Suspended Loads

- Do not leave a suspended load unattended. Do not work on, ride or climb a suspended load.
- If operation stops, land and secure the load when practicable. Protect against wind, hydraulic/mechanical failure and public access.

Landing and Stacking

- Dunnage, cribbing, racks and foundations shall support the load without crushing, rolling or collapse. Maintain access to remove slings without placing hands/body under the load.
- Secure long, round, stacked or eccentric material before releasing rigging. Do not remove the crane connection until stability is verified.

Weather and Visibility

- Stop when wind, lightning, ice, fog, darkness or precipitation prevents load control, reliable communication or compliance with equipment/manufacturer limits.
- Account for large surface area of forms, panels, girders and containment material. Wind can overload or rotate the load below the crane's general operating limit.

Electrical / Railroad / Traffic

- Establish power-line clearances and required planning under the Crane/Electrical policies. Conductive rigging/tag lines require additional control.
- Lifts over or adjacent to live traffic or rail require owner/agency coordination, closures or protective plans; never rely solely on flagging beneath a suspended load.

9. Bridge, Girder, Concrete and Demolition Rigging

Structural Steel / Girders

- Use engineered pick points and lift/erection sequence addressing member stability, camber, rotation, diaphragms/bracing, temporary supports and wind.
- Use spreader beams/multiple points when needed to control bending and sling angles. Do not release until required connections and temporary bracing are complete.
- Steel-erection work shall meet 1926 Subpart R, including qualified-rigger inspection and fall-zone requirements.

Concrete Forms / Precast / Barriers

- Verify form lifting hardware, inserts, anchors and concrete strength. Remove loose tools and concrete; control panels against sail effect.
- Rig buckets and hoppers to prevent unintentional displacement; keep nonessential employees out of the fall zone. Never stand beneath a concrete bucket.

Demolition

- Determine actual weight, connections, hidden reinforcement, trapped material and how the member will react when cut. Support before cutting and follow the engineered demolition sequence.
- Do not use the crane/rigging to tear free an attached member unless engineered and within equipment limits. Avoid shock loading from sudden release.

Pile Driving / Marine Work

- Use manufacturer-approved lifting points and dedicated procedures for leads, hammers, sheet pile, templates and vibratory equipment. Control rotation and pinch points.
- On barges, account for list, trim, movement, environmental limits and secure landing areas. Coordinate with the Pile Driving, Working Over Water and Crane policies.

Equipment Rigging

- Attachments or excavators used for lifting shall have approved lift points, capacity data, operators and configurations. If covered by Subpart CC, all applicable crane requirements apply.

10. Multi-Crane, Personnel and Specialized Lifts

Multiple-Crane Lifts

- A qualified person shall plan lifts using more than one crane, and the work shall be directed by a lift director meeting 1926.1432. Use written procedures, load distribution calculations and coordinated communication.
- Account for unequal load sharing, crane deflection, radius changes, ground, sequencing and one crane taking more load. Conduct a documented meeting with all involved.

Personnel Hoisting

- Rigging material-handling gear is not a personnel system. Personnel platforms are permitted only when all applicable 1926.1431 requirements and company approval are met.
- Never ride hooks, headache balls, slings, forks, buckets or loads. Personnel baskets, bridles and attachment points require specified design, inspection, proof test and trial lift.

Multiple-Lift Rigging

- Multiple-lift rigging for structural steel is permitted only when every requirement of 1926.753(e) is met, including a purpose-designed assembly, qualified employees and prescribed limits. It is not a general material-handling method.

Custom / Engineered Lifts

- Obtain written manufacturer or registered-professional-engineer design for custom devices, unusual load paths, nonstandard pick points or configurations outside published data.
- Proof testing does not replace design. Test area shall be barricaded and results documented by a qualified source.

Blind / Remote / Night Lifts

- Use qualified signal persons, dedicated radios, lighting without glare, redundant stop communication and a controlled path. Stop after lost communication.
- Do not use cameras alone where depth, obstruction or blind-zone conditions require a signal person.

Approval

- Critical, multiple-crane and personnel lifts require management/project approval in addition to field planning. Owner requirements may impose lower thresholds.

11. Emergency Actions, Records and Program Review

Immediate Stop Conditions

- Unknown/changed load weight or center of gravity; missing tag; damaged/incompatible gear; unstable test lift; slipping edge protection; failed pick point; unexpected attachment; people in fall zone; lost signal; weather or utility conflict.
- Any employee may give stop/emergency stop. The operator shall obey and safely stop.

Dropped / Shifted Load

- Stop equipment, keep everyone out, call emergency services for injury or instability and protect the scene. Do not rush in or attempt recovery beneath an unstable load.
- Land or secure only under an approved recovery plan using adequate equipment and qualified personnel. Treat damaged rigging and lifting equipment as out of service.

Electrical Contact

- Assume rigging, load and equipment are energized. Warn others away, contact 911 and the utility, and follow the Electrical/Crane emergency procedure. Do not touch or approach until confirmed de-energized and released.

Incident Preservation

- Preserve gear, tags, configuration, lift plan, photos, crane data, signals/radio information, inspection and witness records. Do not alter or discard gear until authorized.

Records

- Maintain qualification/evaluation, daily and periodic inspections, chain records, custom-device design/proof tests, lift plans, permits, incidents and corrective actions.
- Identify gear by unique number where practical. Maintain traceability to manufacturer data, certificates and repairs.

Review and Enforcement

- Review annually and after incident, gear failure, new equipment or regulatory/manufacture change. Printed copies are uncontrolled unless formally issued.
- Overloading, using untagged/damaged gear, unauthorized modification, entering beneath a load or continuing after stop is subject to corrective action.

12. Field Rigging Checklist

VERIFY	EXPECTATION
People	Qualified rigger and required signal person identified; operator/lift director briefed
Load	Verified weight, center of gravity, dimensions, contents and approved pick points
Equipment	Crane/configuration/radius and total load capacity verified under Crane policy
Rigging	Tags legible; WLL/hitch/angle/D/d/environment compatible; lowest component adequate
Inspection	Slings, hardware, hook/latch, device and pick points inspected this shift
Protection	Sharp edges, heat, chemicals, abrasion and small-radius bending controlled
Connection	Pins secured, fittings seated, legs untwisted, loose material removed/secured
Path / fall zone	Route, barricades, landing and essential-person limits established
Communication	One routine signal person; hand/radio method tested; stop signal understood
Test lift	Balance, seating, stability, brake and clearances checked a few inches up
Conditions	Wind, lighting, traffic, rail, water, utilities and simultaneous work acceptable
Closeout	Load supported/secured before disconnect; gear reinspected, cleaned and stored

PROJECT / LOCATION:	DATE / SHIFT:
LOAD / VERIFIED WEIGHT:	CRANE / OPERATOR:
QUALIFIED RIGGER:	SIGNAL PERSON:
RIGGING / HITCH / ANGLE:	PICK POINTS / PROTECTION:
ROUTE / FALL ZONE / LANDING:	CHANGES / CORRECTIVE ACTION:

13. Test Your Knowledge

Circle the best answer. Review missed questions with your foreman.

1. When must rigging be inspected? A. Once a month B. Before use each shift and as conditions require C. Only after a lift	2. What should happen to an untagged sling? A. Remove it from service B. Estimate its capacity C. Use it for light loads
3. What happens as sling angle from horizontal decreases? A. Leg tension decreases B. Nothing C. Leg tension increases	4. Who may give an emergency stop signal? A. Only the foreman B. Anyone recognizing danger C. Only the signal person
5. What is the first step after raising a load a few inches? A. Stop and verify balance, seating and control B. Swing immediately C. Add workers below	6. Where may a worker stand during tightening? A. Inside the bight B. Beneath the hook C. Outside the bight, fall and pinch zones
7. When may a load pass over employees? A. If they wear hard hats B. Never as a normal practice C. If the load is light	8. What should be used for a sharp edge? A. Effective, compatible edge protection B. Cardboard without evaluation C. A knot in the sling
9. Who plans a multiple-crane lift? A. Any operator B. The newest rigger C. A qualified person under the required coordinated plan	10. What should happen if signal communication is lost? A. Continue slowly B. Stop until communication is restored C. Guess the next movement

EMPLOYEE: _____

DATE: _____

ANSWER KEY: 1-B | 2-A | 3-C | 4-B | 5-A | 6-C | 7-B | 8-A | 9-C | 10-B