



Mechanical Lifting and Rigging Protocol

Hierarchy Level: Procedure	Document Type: Protocol	
Document Owner: EHS	Applies to: Devon US	Doc ID: 112972208
Revision Date: 12/22/2020	Review Cycle: Every 3 Years	Effective 10/27/2014

ABOUT THIS PROTOCOL

Purpose	This protocol was established to ensure Devon implements safe work practices that meet or exceed OSHA’s mechanical lifting and rigging requirements to prevent damage or harm to equipment, facilities, or employees.
Objective	This protocol defines requirements for the safe use of mechanical lifting equipment and requirements for personnel responsible for lifting and rigging operations.
Scope	This protocol covers general lifting requirements, specific requirements for cranes, forklifts, hoists, service trucks, gin pole trucks, applies to all Devon operated equipment and facilities/sites where mechanical lifting and rigging operations are performed.
Applicability	Employees performing, overseeing or responsible for mechanical lifting and rigging operations. Contractors will have their own program that meets or exceeds Devon’s Mechanical Lifting and Rigging Protocol.
Variances	None.
Superseded Documents	None.



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1.0 RESPONSIBILITIES

Division/Business Unit Leadership

- Reinforce adherence to this protocol and provide resources for application of the protocol.
- Ensure employees receive required training.

Line Supervisor

- Understand how this protocol applies to personnel in their area of responsibility.
- Ensure employees have training, skills, knowledge and understanding to comply with this protocol.
- Check periodically to ensure the requirements of this protocol are being met.

Environmental, Health and Safety

- Provide technical resources and tools for protocol application.
- Monitor compliance through the audit process.

Devon Employees

- Adhere to the requirements of this protocol.
- Identify and report gaps in this protocol.
- Complete required training.

Contract Company Representative

- Comply with regulatory requirements and follow the Devon EHS protocols.

2.0 TERMS AND DEFINITIONS

2.1 Mechanical Lifting & Rigging Terms and Definitions

Anti-Two-Blocking - a system that alerts the operator when the hook block or auxiliary ball comes near the boom head of the crane and prevents contact.

Attachment - a device, other than conventional forks or load backrest extensions, for handling a load that is either mounted permanently on or removable from the elevating mechanism of a Forklift.

Auxiliary Hoist - a supplemental hoisting unit of a lighter capacity and usually higher speed than the main hoist.

Boom-Angle Indicator - an accessory that measures the angle of the boom from the vertical base to its raised horizontal position.

Clearance - the amount of space between two objects.

Competent Person - Is an individual who has received training and is knowledgeable of the material, is capable of identifying hazards, and has the authority to correct them.

Electrically Classified Area - a location in which flammable gases or vapors are, or may be, present in the air in quantities sufficient to produce explosive or ignitable mixtures, which requires electrical equipment to be gas tight (see National Electrical Code and American Petroleum Institute [API] Recommended Practice [RP] 500).

Gin Pole Truck - a winch truck equipped with a pair of poles and hoisting equipment for use in lifting heavy machinery.

Hoist - a device that applies a force for lifting or lowering.

Jib - an extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles.

Load Block - the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended from the boom point or by hoisting wire ropes.



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Load Ratings - crane ratings (in pounds) established by the manufacturer in accordance with paragraph (c) of Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.180.

Operator - an individual who is certified to run the equipment.

Outriggers - extendable or fixed metal arms that attach to the mounting base and rest on supports at the outer ends.

Personnel Platform (Crane) - a platform that is used to transport personnel and is used in conjunction with a crane.

Personnel Platform (Forklift) - a platform that is attached to the forks of a forklift and is used to hoist personnel.

Qualified Crane Operator - Crane Operators must hold a National Commission for the Certification of Crane Operators (NCCCO), National Center for Construction Education and Research (NCCER) certificate.

Qualified Person - a person who, by possession of a recognized degree, certificate, or professional standing, or who by knowledge, training, or experience, can successfully demonstrate the ability to solve or resolve problems relating to the subject matter or the work.

Rated Capacity - the maximum weight a mobile piece of equipment can transport and stack at a specified load center and for a specified load elevation as designated by the manufacturer.

Rigging - the act or process of safely attaching a load to a hook by means of adequately rated and properly applied slings and related hardware.

Service Crane - a crane that is mounted on a mechanic's truck (e.g., Auto Crane, Lift Moore). Typically mounted on top of the service bed.

Signaler - a person who is qualified by experience with lifting/rigging operations and knowledgeable of the standard hand signals in **Appendix A**.

Slings - wire ropes, chains, synthetic web, and metal mesh made into forms, with or without fittings, for handling loads.

Tag Line - a device used to prevent rotation of a load or aid in the positioning of a load.

Wire Rope - device made completely or mainly with wire strands.

2.2 General Terms and Definitions

Area - individual operating fields or components that collectively comprise a Region. Areas normally include an area office.

Area Office - a field office with assigned employees that support an area. (e.g., Cuero, Artesia, etc.).

Business Unit - individual components that collectively comprise a Division. Business Units may also be referred to as Basins.

Contract Company Representative - a contractor who is assigned responsibilities, oversight and acts as Devon's on-site representative following and implementing the protocol steps as an employee would, for a specific task that requires adherence to Devon EHS Protocols.

Division - the division operations of Devon are Strategic Services, Corporate, Facilities and Pipeline, and U.S.

Enterprise Classification Structure - is part of Devon's strategic plan for managing information assets. The ECS is the published list of all records classes, the period of time for retaining each and their designated disposition.

Facility - a collection of structures, piping, valves, vessels, tanks, compression, and processing equipment located in close geographic proximity are involved directly in the development, production, processing or delivery of oil and gas to market (e.g., a tank battery, drill- site, well-site, compressor station, pipeline, and gas plant).

Field EHS - a titled position that provides EHS guidance and support within a Division.



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Line Supervisor - a titled position that has assigned authority and responsibility for financials, production, maintenance, projects and personnel for a defined area.

Person-in-Charge (PIC) - a person that has been authorized by Devon to perform specific tasks to comply with this Devon protocol and/or regulatory requirements related to EHS. The PIC is defined in all protocols in the second column of the protocol section.

Region/District - individual components that collectively comprise a Division.

3.0		PROTOCOL												
3.1		General Lifting Requirements												
Step	Person In Charge (PIC)	Action												
3.1.1	Line Supervisor	Verify operators of mechanical lifting equipment meet the Devon operator qualification requirements listed in Appendix B.												
3.1.2	Operator	Do not overload or exceed the mechanical lifting equipment's load ratings/rated. Note: Homemade lifting attachments and rigging are prohibited.												
3.1.3	Line Supervisor	Verify mechanical lifting equipment modifications are made with the manufacturer's written approval. If modifications are made written documentation including, load chart, instruction plates, tags or details, will be updated.												
3.1.4	Employee	Do not work under or walk under suspended loads. Note: For those activities where working under a load (e.g., applying the tool string, bottom hole assembly (BHA)), is the only option required, a JHA/SOP will be developed to address the additional precautions and the document will be reviewed during the pre-task meeting.												
3.1.5	Employee	Do not operate equipment while talking or texting on cellular telephones.												
3.1.6	Operator	Verify personnel are not in or on the equipment being lifted prior to lifting. Note: See section 3.4 when lifting personnel with a crane.												
3.1.7	Operator	Do not drive on raised platforms/flooring not designed for powered industrial trucks/mobile cranes without the approval from a Registered Professional Engineer.												
3.1.8	Line Supervisor	Locate, identify, and communicate existing overhead electrical hazards during pre-task tailgate safety meetings.												
3.1.9	Line Supervisor	While in transit, a minimum four-foot clearance for overhead powerlines is required for any equipment with a boom, mast, or rotating arm. If the powerline is greater than 50 kV, add 4 inches for every 10 kV. Note: only qualified electrical employees may use tools such as hot sticks to move or de-energize overhead electrical lines.												
3.1.10	Line Supervisor	While in transit, vehicles, equipment and loads need to maintain an appropriate clearance distance to energized overhead powerlines. Identify powerlines along the route closer than the minimum clearance listed below.												
		<table border="1"> <thead> <tr> <th>Voltage Range (phase to phase)</th> <th>Minimum Clearance</th> </tr> </thead> <tbody> <tr> <td>0 - 300 V</td> <td>1 foot</td> </tr> <tr> <td>301 - 750 V</td> <td>2 feet</td> </tr> <tr> <td>751 - 15,000 V</td> <td>3 feet</td> </tr> <tr> <td>15 - 50 kV</td> <td>4 feet</td> </tr> <tr> <td>50 kV and up</td> <td>4 feet plus 4 inches for every 10 kV</td> </tr> </tbody> </table>	Voltage Range (phase to phase)	Minimum Clearance	0 - 300 V	1 foot	301 - 750 V	2 feet	751 - 15,000 V	3 feet	15 - 50 kV	4 feet	50 kV and up	4 feet plus 4 inches for every 10 kV
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		<ul style="list-style-type: none"> If proper clearance cannot be maintained, the line must be de-energized and/or raised by a qualified, licensed electrician, or an alternate route must be identified and used. If the line cannot be raised or de-energized, and an alternate route is not available; a risk assessment with written approval from the responsible Devon Operations Manager and notification to the Operations Vice President and EHS Manager is required prior to proceeding. Note: only qualified electrical employees may use tools such as hot sticks to move or de-energize overhead electrical lines. Specific to drilling, complete a route survey and detailed route assessment. Assessment should identify obstructions and hazards to normal and oversized loads, such as overhead power lines, bridges, overpasses and cattle guards for each route (see Devon Rig Move Hazard Mitigation Procedure for additional details).
3.1.11	Line Supervisor	<p>While operating on site, de-energize overhead electrical lines when any equipment with a boom, mast or rotating arm is planned to come within 10 feet of electrical lines up to 50 kV (voltages exceeding 50kV see chart below). If the line cannot be de-energized a risk assessment with written approval from the responsible Devon Operations Manager and notification to the Operations Vice President and EHS Manager is required prior to proceeding.</p> <p>Note: The PIC must be on site when individuals are working within 10 feet of energized overhead power lines.</p> <p>Note: For overhead power lines greater than 50kv the distance chart below must be followed:</p> <ul style="list-style-type: none"> 50kV to 200kV - 15ft (4.6m) Clearance 200kV to 350kV - 20ft (6.1m) Clearance 350kV to 500kV - 25ft (7.6m) Clearance 500kV to 750kV - 35ft (10.7m) Clearance 750kV to 1000kV- 45ft (13.7m) Clearance <p>Over 1000kV - the minimum clearance distance must be established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution.</p>
3.1.12	Line Supervisor	Ensure equipment and/or material is not stored or parked underneath and/or within 15 feet on either side of energized electric lines.
3.1.13	Line Supervisor	Ensure cones, goal posts (see attachment C), or other warning markers are installed 15 feet from the energized electric lines running across or parallel to the work site.
3.1.14	Employee	Use non-conductive tag lines to guide and position suspended loads. Tag lines must be of sufficient length to keep workers out of fall path.
3.1.15	Employee	Stop work if unsafe conditions are present.
3.2	Cranes	This section specifies operation, inspection, maintenance, and testing requirements for using different mobile crane types (e.g., commercial crawler cranes, locomotive cranes, wheel-mounted cranes, etc.). These cranes have a structure mounted on a carrier which is capable of rotating 360 degrees and have boom-raising and lowering capabilities.
Step	Person In Charge (PIC)	Action



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General Crane Operational Requirements		
3.2.1	Line Supervisor	Ensure cranes meet their intended design specifications (e.g., without unapproved modification, damage, without proper guarding, etc.)
3.2.2	Line Supervisor	<p>Verify the following during crane operations:</p> <ul style="list-style-type: none"> • A pre-use inspection of the equipment has been completed. • Stability factors that may affect the load are considered prior to making the lift: <ul style="list-style-type: none"> ○ Freely suspended loads ○ Wind or ground conditions ○ Condition and inflation of tires ○ Boom lengths ○ Operating speeds • Soil and ground conditions are evaluated during set-up for stability & that crane mats, timbers, or cribbing is used when needed to distribute the weight from outriggers. • The operator has a load-rate chart. • The crane is not loaded beyond its rated capacity. • Ensure cranes with a variable-angle boom have a boom-angle indicator that is visible to the operator as well as a device that shows the boom's extended length. • Equip cranes with an anti-two-blocking device. • Ensure cranes are equipped with a positive-latching load hook.
3.2.3	Operator	Modify or re-rate cranes only when the modifications or supporting structures are analyzed thoroughly by a qualified engineer or by a manufacturer of cranes.
3.2.4	Operator	Ensure a 10#BC or larger fire extinguisher is available in the cab. The extinguisher shall be maintained in a serviceable condition as defined in NFPA 10.
3.2.5	Employee	Do not ride the load or hook.
3.2.6	Line Supervisor	<p>Do not permit the crane to pull a load sideways.</p> <p>Note: Skidding a Rig with the cranes mast providing stabilization while using the auxiliary winch at the base of the crane is acceptable.</p>
3.2.7	Operator	Follow manufacturer's recommendations regarding adjusting load capacity or stopping work based on wind speed.
3.2.8	Operator	<p>Install barricade tape around the crane and the lift radius, or the PIC may use a spotter, separate from the signaler, to ensure approaching pedestrians, vehicles, etc. are clear from overhead hazards.</p> <p>Two steps -</p> <p>Install barricade tape around the crane and superstructure, to keep individuals from entering the superstructure turning radius (i.e., the area around the crane and outriggers).</p> <p>Communicate during the pre-task safety meetings where overhead hazards will exist during the lifting operation. When necessary use a spotter to ensure approaching people and vehicles stay clear of these areas.</p>
Crane Inspection and Maintenance		



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3.2.9	Operator	<p>Conduct and document a pre-use inspection of the crane prior to use:</p> <ul style="list-style-type: none"> At a minimum, manufacturer’s recommendations for a pre-use inspection must be followed (see Appendix D for sample inspection form). In addition to the crane, the hoist wire rope or chain and associated hardware (e.g., hooks and slings) shall be visually inspected by the operator or qualified person. <p>Note: In the event defects cannot be immediately resolved, notify your supervisor and remove the equipment from service by placing a red tag which states “OUT OF SERVICE” on the equipment.</p>
3.2.10	Operator	Ensure deficiencies found during the pre-use or monthly inspection have been repaired or replaced before the crane is placed into service.
3.2.11	Line Supervisor	Ensure qualified personnel perform crane monthly maintenance inspections.
3.2.12	Line Supervisor	Ensure a preventive maintenance program is established based on the crane manufacturer’s recommendations.
3.2.13	Line Supervisor	Retain the maintenance history of the crane throughout its service life.
Crane Operations - Hand Signals		
Step	Person In Charge (PIC)	Action
3.2.14	Operator	Ensure a signaler is present when the operator does not have full view of the lifting operation. Standard hand signals shall be used. See Appendix A for diagrams of crane hand signals.
3.2.15	Operator	Recognize signals only from the signaler to guide and control movements of the equipment and load.
3.2.16	Operator	Ensure personnel acting as signaler during crane operations is clearly identified to the crane operator and personnel onsite, (e.g., different colored hard hat, high visibility garment - orange FRC vest, etc.).
3.2.17	Operator	Place a second signaler who can see both the primary signaler and the crane operator, to relay signals, when the operator cannot see the primary signaler.
3.2.18	Operator & Signaler(s)	Discuss and agree on special signals in the pre-task tailgate for operations not covered by standard hand signals. Special signals will not conflict with standard hand signals.
3.2.19	Signaler	<p>Discuss signals being used, prior to the lift, when voice communication is being used.</p> <p>Note: Radio communication will be on a different frequency than the Operating Area.</p>
3.3	Critical Lifts	
Step	Person In Charge (PIC)	Action
3.3.1	Line Supervisor	<p>Classify the following crane activities as critical lifts:</p> <ul style="list-style-type: none"> Load weight greater than 75 percent of crane capacity. <ul style="list-style-type: none"> Determined by the load chart located in the crane and the angle of the lift Personnel are lifted by cranes using personnel man lift basket. Lifting over occupied structures



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		<ul style="list-style-type: none"> Lifting over above ground in-service operation equipment containing hydrocarbons (e.g., process vessels, process lines, storage tanks, etc.). Within 25 feet of power lines Any lift that requires the use of multiple cranes Any lift deemed high risk/high exposure (e.g., production critical, configuration of load, limited visibility, etc.).
3.3.2	Line Supervisor	Ensure a Critical Lift Supervisor has been assigned who will be responsible for overseeing lift activities. The Critical Lift Supervisor can also serve as the certified rigger.
3.3.3	Operator	Complete a Critical Lift Plan prior to making a critical lift. Note: The crane providers lift plan can be completed, if it is deemed adequate.
3.3.4	Operator	Conduct a pre-lift meeting involving the following participants to discuss and approve the critical lift plan prior to performing the lift. The following parties shall participate in the meeting: <ul style="list-style-type: none"> Lift Supervisor Crane Operator Person In Charge (PIC) Signaler Line Supervisor Rigger Note: In the event that the PIC or Line Supervisor is not present for the pre-lift meeting, a designated Devon Representative must be notified electronically to achieve project approval prior to start-up.
3.3.5	Operator	Perform a practice lift prior to making the lift when the following conditions exist: <ul style="list-style-type: none"> Hoisting personnel, or When deemed necessary during the pre-lift meeting. Note: The following conditions must exist during the practice lift: <ul style="list-style-type: none"> Conditions for a practice lift will closely simulate actual conditions involving weight, rigging selection and configuration, load movement path, and other relevant factors. The same crew, using the same mechanical lifting equipment, will perform the practice lift.
3.4	Lifting Personnel with Cranes	
Step	Person In Charge (PIC)	Action
3.4.1	Line Supervisor	Use cranes to lift personnel only when it is not possible or the risk is greater using conventional means such as a ladder, stairway, aerial lift, elevated work platform, or scaffold.
3.4.2	Operator	Follow the requirements in Appendix C and complete the checklist when personnel are lifted by mechanical lifting equipment.
3.4.3	Line Supervisor	Boatswains chair, rigging hardware and associated hardware must be capable of supporting, without failure, at least five times the maximum intended load. Refer to OSHA 29 CFR 1926.452(o)(3)-(o)(7) for boatswain chair design specifications. Note: Specially designed Derrick Rig Harness (soft seat harnesses with "D" rings located in the front) can be used in accordance with the manufacturer's recommendations. This does not include rescue harnesses or other similar devices for lifting of personnel. Note: Lifting and/or pulling personnel using a backhoe, trackhoe, front-end loader, or other earth moving equipment is strictly prohibited.
3.4.4	Line Supervisor	Prohibit man-basket use during wind speeds in excess of 20 mph.
3.5	Rigging	



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The information presented in this section provides guidance for safely handling lifted loads. Diagrams in Appendix F illustrate lifting and rigging principles and good and bad rigging practices.

Step	Person In Charge (PIC)	Action
Rigging Requirements (Slings/Straps/Lifting Chains)		
3.5.1	Line Supervisor	Verify that the Rigger has completed formal training.
3.5.2	Rigger	Ensure slings are labeled, regardless of grade and construction, with the sling manufacturer, working load limits, length, diameter, proof-test certification number, and date of proof test.
3.5.3	Rigger	Consult with the sling manufacturer when a question arises concerning sling ratings, use, care, and/or inspection.
3.5.4	Rigger	Use a four-leg sling for hookup before moving any container or basket with four-point pad eye placement.
3.5.5	Rigger	Visual pre-use inspections shall be conducted by the Operator of the equipment.
3.5.6	Rigger	Ensure annual documented inspections of the rigging equipment are completed.
Rigging Requirements (Tag lines)		
3.5.7	Rigger	Use tag lines to guide, snub, or otherwise control the load. Tag lines shall be long enough to assist in stabilizing and guiding the load to avoid having rigger personnel under the load.
3.5.8	Rigger	Do not use a tag line which has a knot or loop at the end of the rope. Ends shall be braided back into the rope, taped, or left frayed.
3.5.9	Rigger	Position tag lines prior to lifting to prevent the tag line from hanging on adjacent objects as the load is being lifted.
3.5.10	Rigger	Use tag lines at each end of tubular or casing lifts, unless doing so creates an additional hazard.
3.5.11	Rigger	Use non-conductive tag lines to guide and position suspended loads. Tag lines must be of sufficient length to keep workers out of fall path.
Rigging Inspections See Appendix F for diagrams of good and bad rigging practices.		
3.5.12	Rigger	<p>Visually inspect rigging accessories at the beginning of each work shift/tour or prior to use for the following (records not required):</p> <ul style="list-style-type: none"> • Manufacturer's tag attached • Wear • Corrosion • Cracks • Nicks and gouges • Distortion (e.g., bending or twisting) • Evidence of heat damage from any cause <p>Note: See Appendix G for sling inspection guidelines. Note: In the event defects cannot be immediately resolved, notify your supervisor and remove the equipment from service by placing a red tag which states "OUT OF SERVICE" on the equipment.</p>
3.6	Hoists	



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Hoists described in this section include hand-powered, air-powered, and electric-powered hoists that are not permanently mounted. Types of equipment include overhead hoists, jib cranes/hoists, and manual-lever-operated hoists (e.g., wire rope, chain, and web-strap types). Overhead and gantry hoists include a top-running single or multiple-girder bridge with top-running trolley hoists, a top-running single-girder bridge with underhung trolley hoists, and monorails/underhung cranes.

Step	Person In Charge (PIC)	Action
General Hoisting Operational Requirements		
3.6.1	Line Supervisor	Ensure hoists are free from damage and/or without unapproved modification, proper guarding, etc.
3.6.2	Line Supervisor	Ensure hoists and/or their load blocks are permanently marked with the hoist's load capacity: <ul style="list-style-type: none"> Labels will be affixed to the hoist, load block, or controls that display the warning or other legend designed to bring attention to the operator.
3.6.3	Line Supervisor	Ensure support structures, including trolleys and monorails, are marked and rated at least equal to the hoist.
3.6.4	Operator	Conduct a visual pre-use inspection prior to operating.
3.6.5	Operator	Determine the weight of the load and do not exceed the hoist's rated capacity.
3.6.6	Operator	Operate hand-chain-operated hoists with hand power only and with no more than one operator per hand chain.
3.6.7	Operator	Do not use a lever extension (cheater bar) on manual-lever-operated hoists.
3.6.8	Operator	Verify all personnel are clear of the equipment.
3.6.9	Operator	Do not leave a suspended load unattended.
Hoist Inspection and Maintenance		
3.6.10	Line Supervisor	Annual inspections shall be conducted by a certified hoist inspector. The inspection reports shall be signed and dated for each hoist inspected and placed on file at the site where they are readily available. <p>Note: In the event defects cannot be immediately resolved, notify your supervisor and remove the equipment from service by placing a red tag which states "OUT OF SERVICE" on the equipment.</p>
3.6.11	Line Supervisor	Establish a maintenance program per the manufacturer's recommendations. <p>Note: If manufacturer's recommendations are not available, a Devon-specific maintenance program will be developed.</p>
3.7	Service Cranes	
This section specifies operation, inspection, maintenance, and testing requirements for using different service crane types (e.g., Auto Crane, Liftmoore).		
Step	Person In Charge (PIC)	Action
3.7.1	Operator	Whenever possible, use equipment on solid level ground.
3.7.2	Operator	Conduct a documented pre-use inspection prior to use.
3.7.3	Operator	Ensure no one walks or stands under the boom or any suspended load.



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3.7.4	Operator	Do not exceed the rated capacity of the crane with the load.
3.7.5	Operator	Never operate the boom while the vehicle is in motion.
3.7.6	Operator	Never leave a suspended load unattended.
3.7.7	Operator	Ensure load capacity is clearly marked on the equipment.
3.7.8	Line Supervisor	Ensure qualified personnel perform crane maintenance to the manufacturer's specifications.
3.8	Gin Pole Trucks	
Step	Person In Charge (PIC)	Action
General Gin Pole Truck Operational Requirements		
3.8.1	Line Supervisor	Gin Pole rating should be developed under the guidance of a qualified person. This rating should be based on the rating of the original equipment, purchased parts and analysis of the built parts by a qualified person and a lift test.
3.8.2	Operator	Do not raise or lower personnel using a gin pole truck.
3.8.3	Operator	Do not allow personnel to ride on the outside of trucks or on loads, buckets, or hooks suspended from gin poles.
3.8.4	Operator	Do not carry loads over personnel.
3.8.5	Operator	Do not leave a suspended load unattended.
3.8.6	Operator	Rack poles before departing location.
Gin Pole Truck Inspection and Maintenance		
3.8.7	Operator	Perform a visual inspection prior to initial use (see Appendix D).
3.9	Lifting Loads with Backhoes & Trackhoes	
Step	Person In Charge (PIC)	Action
Backhoes & Trackhoes - Operational Requirement		
3.9.1	Operator	Follow operator's manual when lifting loads with a Backhoe or Trackhoe: <ul style="list-style-type: none"> • Specific load ratings at different radii and boom positions • Determining where to attach the lifting sling(s) to the buckets on the backhoe or loader. Note: Most manufacturers address where the load should be attached.
3.9.2	Operator	Conduct and document a pre-use inspection of the equipment prior to use during lifting and rigging activities. <p>Note: In the event defects cannot be immediately resolved, notify your supervisor and remove the equipment from service by placing a red tag which states "OUT OF SERVICE" on the equipment.</p> <p>Note: Excavation and other earth moving activities will be excluded from the documented pre-use inspection requirement.</p>



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3.9.3	Operator	Use a shackle and/or fastener to attach sling(s), when buckets are equipped with a lifting eye located on the back of the bucket. Note: Because of sharp edges chain slings may be used. Note: Some backhoes are designed with a lifting eye or attachment point on the bucket. Others have designated holes on the bucket linkage as suitable lifting points (see Appendix E).
3.9.4	Operator	Follow the directions found in the Lifting Requirements (Appendix E) when attaching a chain for lifting on buckets without lifting eyes.
3.9.5	Operator	Do not attach slings to the lifting arms of the loader, or around any of the hydraulic lift cylinders.
3.9.6	Line Supervisor	Ensure equipment modifications are performed with prior written approval from the manufacturer.
3.9.7	Operator	Employees working as a spotter or a signaler will wear an article of clothing that will distinguish them from the other workers in the area.
3.9.8	Operator	Never carry passengers on equipment.
3.10	Powered Industrial Forklifts	
Step	Person In Charge (PIC)	Action
Powered Forklift Operational Requirements		
3.10.1	Line Supervisor	Ensure forklifts are free from damage and without unapproved modification. Note: Ensure forklift modifications are performed with prior written approval from the manufacturer.
3.10.2	Operator	Complete a pre-use inspection prior to use on each shift/tour (See Appendix D for sample inspection sheet).
3.10.3	Operator	Do not exceed the rated capacity of a forklift and attachment combination.
3.10.4	Operator	Operators must maintain proof of training on their person.
3.10.5	Operator	Follow the requirements below when lifting personnel with a forklift: <ul style="list-style-type: none"> Use a platform approved for hoisting personnel that is secured to the lifting carriage and/or forks Provide fall protection restraining devices (e.g., railings, harness, retractable lifeline, etc.)
3.10.6	Operator	Do not permit passengers to ride on forklifts.
3.10.7	Operator	Operate forklifts with an automatic horn, whistle, or other sound-producing device when the vehicle is backing up.
3.10.8	Operator	When operating forklifts in explosive atmospheres only use the appropriately designated equipment. Both Diesel powered (DX) and electrically powered (EX) designated forklifts are approved for these environments.
3.10.9	Operator	Verify forklifts with internal combustion engines which operate in enclosed areas (e.g., warehouses, shops, etc.) do not exceed 35 ppm for an 8-hour (17.5 for 12-hour) time weighted average (TWA) for Carbon Monoxide.
3.10.10	Operator	Do not operate forklifts near overhead installations (e.g., lights, wiring, pipes, or sprinkler systems) without a spotter.



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3.10.11	Operator	Wear a seat belt while operating a forklift.
3.10.12	Operator	Rigging shall only be attached to manufacturer approved lifting points on the forklift. Note: Rigging directly to the forks or carriage is prohibited per manufacturer.
3.10.13	Operator	Slow down at corners, cross aisles, and intersections and sound the horn when vision is obstructed. Obey all traffic signs.
3.10.14	Operator	Lower forks as close to the ground as possible, when the forklift is in motion.
3.10.15	Operator	Slow down for wet and slippery surfaces.
3.10.16	Operator	Keep feet and hands inside the confines of the forklift.
3.10.17	Operator	Back down a grade or ramp with a load; go forward on upgrades.
3.10.18	Operator	Lower forks to the ground, put controls in neutral, and set the brake when dismounting a forklift. Note: The forklift can be left idling when the operator will be within 25 feet after dismounting.
Forklift Inspection and Maintenance		
3.10.19	Line Supervisor	Document all pre-use forklift inspections prior to initial use of the shift/tour (See Appendix D).
3.10.20	Operator	Ensure damages found during the pre-use or planned inspection which adversely affect safety are addressed before the forklift is placed into service. Note: In the event defects cannot be immediately resolved, notify your supervisor and remove the equipment from service by placing a red tag which states "OUT OF SERVICE" on the equipment.
3.10.21	Operator	Verify forklifts and attachments are permanently marked with the required applicable manufacturer's data: <ul style="list-style-type: none"> • Load capacity plates and markings must be replaced when they become damaged or illegible
3.10.22	Operator	Perform maintenance of forklifts to the manufacturers' recommendations. Note: Attachments shall be included in the scheduled maintenance program.
3.11	Other Lifting Equipment	
Step	Person In Charge (PIC)	Action
3.11.1	Line Supervisor	The following pieces of equipment do not require operator certification or critical lift plans but do require pre-use inspection and documented training to operate the equipment. <ul style="list-style-type: none"> • Drilling Operation (Derrick) • Side Boom Pipe Layer • Workover Rig • Coil Tubing Unit
3.11.2	Line Supervisor	Document inspections of equipment prior to use for equipment listed in Step 3.11.1. Note: Rigs require initial inspection prior to spud (for an example, refer to Devon EHS for Pre-Spud Checklist)



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3.11.3	Line Supervisor	When two cranes are used during the coil tubing process, the critical lift process will be followed (see section 3.3.1). This includes the cranes holding up hoses and cables that are attached to the coil tubing unit.
3.11.4	Line Supervisor	Perform maintenance of equipment according to manufacturer's recommendations.

4.0 RECORDKEEPING

Step	Person In Charge (PIC)	Action
4.1	Employee	Forward Devon related equipment records to Line Supervisor/Field EHS for filing.
4.2	Line Supervisor/Field EHS	File records as noted below:

Record	File Location & Number	Retention Time	Enterprise Classification Structure Code
Forklift Maintenance and Inspection Forms	See Field Office File Directory/ See Contractor	1 year	EH70
Hoist Maintenance and Inspection Forms	See Field Office File Directory/ See Contractor	1 year	EH70
Crane Maintenance and Inspection Forms	See Field Office File Directory / See Contractor	Life of the Crane	EH70
Lifting Sling Maintenance and Inspection Forms	See Field Office File Directory/ See Contractor	1 year	EH70
Gin Pole Truck Maintenance and Inspection Forms	See Contractor	See Contractor	
Critical Lift Worksheet	See Field Office File Directory	1 year	EH70
Crane Operator Medical Evaluations	See Contractor	30 years	

EVT = Form is superseded or discontinued

CY = Current year

Note: The Records Management Enterprise Classification Structure Code is listed as a reference, which should be used when records are sent to stored records.

5.0 TRAINING REQUIREMENTS

Step	Person In Charge (PIC)	Action
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5.1	Line Supervisor/Field EHS	Verify Devon Employees and Contract Company Representatives who will be involved in mechanical lifting and rigging have been trained on this protocol and any other relevant procedures before assigning them to mechanical lifting and rigging duties.
5.2	Forklift Operator	Complete initial and requalification forklift (i.e., powered industrial truck) training, with refresher training every three years.
5.3	Hoist Operator	Complete initial and requalification hoist operators training, with no refresher training necessary.
5.4	Crane Operator	Complete initial crane operator training, with refresher training at a minimum every five years.
5.5	Gin Pole Truck Operator	Complete initial gin pole truck operator training, with no refresher training needed.
5.6	Rigger	Complete initial and requalification material handling—nonhazardous (e.g., slings, hookup, and other) training. Complete re-qualification every five years.

6.0 REFERENCES

ANSI B30.5, Safety Code for Crawler, Locomotive, and Truck Cranes, 1968 (or latest revision)
ANSI B56.1, Safety Standard for Low Lift and High Lift Trucks
ANSI/UL 558, Internal Combustion Engine-Powered Industrial Trucks
ANSI/UL 583, Electric Battery-Powered Industrial Trucks
ASME B30.16, Overhead Hoists (Underhung)
ASME B30.21, Manually Lever-Operated Hoists
ASME B56.6, Rough Terrain Fork Lift Trucks
NFPA 10, Standard for Portable Fire Extinguishers
NFPA 505, Fire Safety Standard for Powered Industrial Trucks Including Type Designation, Areas of Use, Maintenance, and Operation
IADC Oil Field Gin Pole Guidelines
OSHA 29 Code of Federal Regulations (CFR) 1910.179, Overhead and Gantry Cranes
OSHA 29 CFR 1910.180, Crawler Locomotive and Truck Cranes
OSHA 29 CFR 1910.1000, Air Contaminants Standard
OSHA 29 CFR 1926.452 - Additional Requirements Applicable to Specific Types of Scaffolds
OSHA 29 CFR 1926 Subpart CC, Cranes and Derricks in Construction
OSHA 29 CFR 1926.602(c), Material Handling Equipment
Society of Automotive Engineers (SAE) Standard J765, Crane Load Stability Test Code, October 1990 (or latest revision)

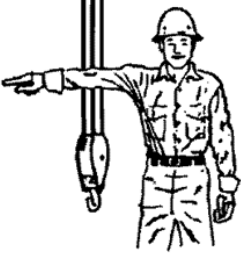
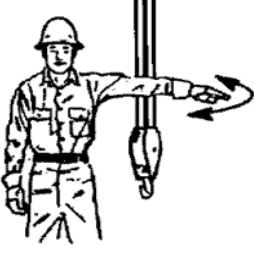
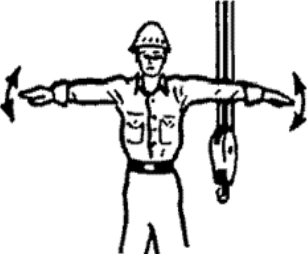
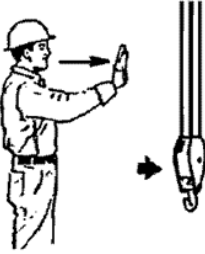

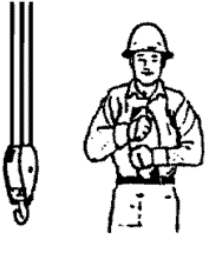


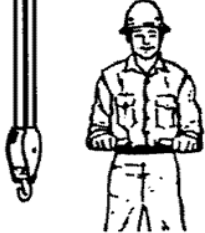
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Appendix A – Crane Hand Signals

Signalers must be clearly identified to the crane operator and personnel onsite (See step 3.2.16)

<p>HOIST</p>	<p>LOWER</p>	<p>USE MAIN HOIST</p>
<p>With forearm vertical, forefinger pointing up, move hand in small horizontal circles.</p>	<p>With arm extended downward, forefinger pointing down, move hand in small horizontal circles.</p>	<p>Tap fist on head, then use regular signals.</p>
<p>USE WHIPLINE (Auxiliary Hoist)</p>	<p>RAISE BOOM</p>	<p>LOWER BOOM</p>
<p>Tap elbow with one hand, then use regular signs.</p>	<p>Extend arm, fingers closed, thumb pointing upward.</p>	<p>Extend arm, fingers closed, thumb pointing downward.</p>
<p>MOVE SLOWLY</p>	<p>RAISE THE BOOM & LOWER THE LOAD</p>	<p>LOWER THE BOOM & RAISE THE LOAD</p>
<p>Use one hand to give any motion signal and place other hand motionless above hand giving the motion signal. (Hoist slowly shown as example.)</p>	<p>With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.</p>	<p>With arm extended, thumb point down, flex fingers in and out as long as load movement is desired.</p>

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<p>SWING</p>	<p>STOP</p>	<p>EMERGENCY STOP</p>
<p>Extend Arm, point with finger in direction of swing of boom.</p>	<p>Extend arm, palm down; move arm back and forth horizontally.</p>	<p>Extend both arms, palms down, and move arms back and forth horizontally.</p>
		
<p>TRAVEL</p>	<p>DOG EVERYTHING</p>	<p>TRAVEL (Both Tracks)</p>
<p>Extend arm forward, hand open and slightly raised; make pushing motion in direction of travel.</p>	<p>Clasps hands in front of body.</p>	<p>Use both fists in front of body, making a circular motion about each other, indicating direction of travel, forward or backward (for land cranes only).</p>
		
<p>TRAVEL (One Side Track)</p>	<p>EXTEND BOOM (Telescoping Booms)</p>	<p>RETRACT BOOM (Telescoping Booms)</p>
<p>Lock the track on side indicated by raised fist. Travel opposite track indicated by circular motion of other fist, rotated vertically in front of body (for land cranes only).</p>	<p>Hold both fists in front of body, thumbs point outward.</p>	<p>Hold both fists in front of body, thumbs pointing toward each other.</p>



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Appendix B – Devon Operator Qualification Requirements

Equipment	Initial Training Requirements	Training Methods	Training Frequency	Additional Requirements	References								
<p>Cranes Mobile cranes (e.g., commercial mounted truck cranes, crawler cranes, locomotive cranes, and wheel-mounted cranes) shall be Certified Crane Operators through an ANSI Accreditation Program (NCCCO or NCCER)</p>	<p>Meet the following general requirements:</p> <ul style="list-style-type: none"> • Complete an operator training written examination with a passing score of at least 80 percent. • Complete basic “hands-on” rigger training. • Receive “hands-on” training and successfully complete the practical operations evaluation specific to the type of crane to be operated. 	<p>A third-party crane certification is required.</p> <p>Examples of third-party agencies that certify are, but are not all inclusive:</p> <table border="0"> <tr> <td>Crane Tech</td> <td>800.290.0007</td> </tr> <tr> <td>ATS</td> <td>800.678.8149</td> </tr> <tr> <td>CICB</td> <td>866.746.3529</td> </tr> <tr> <td>AP</td> <td>888.501.1355</td> </tr> </table>	Crane Tech	800.290.0007	ATS	800.678.8149	CICB	866.746.3529	AP	888.501.1355	<p>Qualification for operators is for a period not to exceed five years, unless the supervisor revokes the qualification earlier.</p>	<p>Physical qualifications for employees operating cranes every five years with a current physical examination conducted by the employee’s personal physician or by a qualified medical professional scheduled through a known clinic (check state regulations—they may differ).</p>	<p>ASME B30.5-3.1.2</p>
Crane Tech	800.290.0007												
ATS	800.678.8149												
CICB	866.746.3529												
AP	888.501.1355												



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Equipment	Initial Training Requirements	Training Methods	Training Frequency	Additional Requirements	References
Certified Rigger (Required for critical lifts - see section 3.3.1)	<ul style="list-style-type: none"> • A “hands-on” rigger-training course • A written examination with a passing score of at least 80 percent • A performance evaluation 	A third-party rigger qualification is required.	Qualification for operators is for a period not to exceed five years, unless the supervisor revokes the qualification earlier.	Requalification for Devon employees includes the following: <ul style="list-style-type: none"> • Completion of a requalification-training program and written examination • Evaluation of performance 	1926.1404 Qualification process established through ANSI Accreditation Program (NCCCO or NCCER)
Competent Rigger (Required for routine lifts)	Classroom Lecture	Internal or outsourced through a third party.	Initial Training Only	None	None



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Equipment	Initial Training Requirements	Training Methods	Training Frequency	Additional Requirements	References
<p>Hoists Hand-powered, air-powered, and electric-powered hoists that are not permanently mounted on overhead cranes.</p> <p>Types of equipment include overhead hoists, jib cranes/hoists, and manual-lever-operated hoists (e.g., wire rope, chain, and web-strap types).</p>	Formal Instruction	Lecture, web-based training, video, PowerPoint with exam, or written material. Evaluation through written or oral exam is required.	None	None	1926.753



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Equipment	Initial Training Requirements	Training Methods	Training Frequency	Additional Requirements	References
Service Cranes	Meet the following general requirements: <ul style="list-style-type: none"> • Basic Interactive classroom training 	None	None	None	ASME B30.5
Gin Pole Trucks (also includes stinger trucks and winch trucks)	Demonstrate knowledge of the following: <ul style="list-style-type: none"> • Equipment operating characteristics • Inspection of the gin pole truck • Limitations • Rigging, hoisting and movement of loads the gin pole truck is expected to handle • Safety features • Operating procedures 	Demonstration of the operator's skills with the type of equipment for which the operator is being evaluated.	None	None	IADC Oilfield Gin Pole Trucks



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Equipment	Initial Training Requirements	Training Methods	Training Frequency	Additional Requirements	References
<p>Backhoe/Front End Loader (being used with forks or a fork attachment).</p> <p>Individuals that will be operating earth moving equipment be trained on their specific type of equipment or have attended a forklift training class for the rough terrain forklifts.</p> <p>Course can be given internally, or operators can attend a forklift training class for rough terrain vehicles.</p>	Formal Instruction	Lecture, web-based training, video, PowerPoint with exam, or written material. Evaluation through written or oral exam is required.	None	None	Devon Best Practice
	Demonstration	Trainer will provide class with a demonstration of equipment performed by the trainer	None	None	
	Evaluation	<p>Evaluation of the operator's skills with the type of equipment for which the operator is being evaluated. This includes a hands-on review of the following elements:</p> <ul style="list-style-type: none"> • Controls and instrumentation • Steering and maneuvering • Visibility • Attachments - Fork adaptation, operation and the use limitations • Vehicle capacity • Vehicle stability • Inspection and maintenance • Refueling • Operating limitations 	None	None	



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Appendix B – Devon Operator Qualification Requirements

Equipment	Initial Training Requirements	Training Methods	Training Frequency	Additional Requirements	References
<p>Powered Industrial Trucks (e.g., forklifts, platform lift Trucks, Motorized hand trucks, powered pallet jacks)</p> <p>(All 3 methods of training and evaluation are required)</p> <p>A forklift trainer must have knowledge and previous training, and experience to train others how to safely operate forklift in the employer's workplace.</p>	Formal Instruction	Lecture, web-based training, video, PowerPoint with exam, or written material. Evaluation through written or oral exam is required.	<p>Not to exceed three years, unless the supervisor is required to recertify the operator's qualification earlier. Causes for re-training within 30 calendar days of the event include:</p> <ul style="list-style-type: none"> • Operator has been observed to operate the vehicle in an unsafe manner, • operator has been involved in an incident or near-miss incident, • operator is assigned to drive a different type of truck, or • a condition in the workplace changes in a manner that could affect safe operation of the truck. 	<p>Program for requalification for Devon operators includes the following:</p> <ul style="list-style-type: none"> • Completion of a written or oral evaluation relevant to the type of equipment used or participation in a requalification-training program • A demonstration of the operator's skills 	<p>OSHA 1910.178 - Powered Industrial Trucks</p>
	Practical Training	<ol style="list-style-type: none"> 1. Demonstrations performed by the trainer and 2. Practical exercises performed by the trainee 			
	Demonstration	Demonstration of the operator's skills with the type of equipment for which the operator is being evaluated.			



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Appendix C Lifting Personnel by Mechanical Lifting Equipment

Using a crane to hoist personnel involves additional precautions to ensure proper safety measures are applied as described in 29 CFR 1926.1431. The personnel hoisting rules are written in performance-oriented language that allows some flexibility in deciding how to provide the best protection for personnel.

A crane shall not be used to hoist personnel, except when the erection, use, and dismantling of the conventional means of reaching the work site (e.g., personnel hoist, ladder, stairway, aerial lift, elevating work platform, or scaffold) would be more hazardous or is not possible because of structural design or work site conditions.

Operations

Cranes used to hoist personnel onshore must be placed on firm ground, and the crane must be level.

The crane operator must always have full control over the movement of the personnel platform. Any movement must be performed slowly and cautiously without sudden jerking of the crane or the platform. Wire rope used for personnel lifting must have a minimum safety factor of seven (i.e., it must be capable of lifting seven times the maximum permitted load) except where rotation-resistant rope is used. In that case, the line should be capable of supporting, without failure, at least 10 times the maximum intended load.

When the occupied personnel platform is in a stationary position, all brakes and locking devices on the crane must be set.

The combined weight of the loaded personnel platform and its rigging must not exceed 50 percent of the rated capacity of the crane.

Instruments and components

A crane with a variable-angle boom must have a boom-angle indicator which is visible to the operator. A crane with a telescoping boom must be equipped with a device which clearly shows the boom's extended length; otherwise, the load radius must be accurately determined before hoisting workers.

Cranes must also be equipped with one of the following features:

- An anti-two-blocking device which prevents contact between the load block or overhaul ball and the boom tip
- A two-block damage feature which deactivates the hoisting action before damage occurs
- Additional features may include high-angle/low-angle kickout devices

The load-line hoist drum must have a system or device on the power train, in addition to the load hoist brake, that regulates the lowering rate of speed of the hoist mechanism (i.e., controlled load lowering). Free fall shall be prohibited.

Personnel platforms

A personnel platform may be referred to as a powered platform, man lift, vehicle-mounted platform, aerial lift, or man basket used to elevate personnel to a work site or level.

Platforms used for lifting personnel must be designed with a minimum safety factor of five by a qualified engineer or a qualified person who is competent in structural design. The suspension system must be designed to minimize tipping when personnel move on the platform.

Each personnel platform must be provided with a standard guardrail system which is enclosed by a solid board or expanded metal with no more than 1/2-in. openings from the toe board to the mid-rail to keep tools, materials, and equipment from falling on personnel below. The platform must also have a grab rail inside the entire perimeter, overhead protection (when needed), adequate headroom and a plate or other permanent marking clearly indicates the platform's weight and the rated load capacity or maximum intended load.



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Appendix C – Lifting Personnel by Mechanical Lifting Equipment, Continued

An access gate, if provided, must not swing outward during hoisting and must have a restraining device to prevent accidental opening. Personnel must not be exposed to any rough edges on the platform. All rough edges must be ground smooth to prevent injury.

All welding must be performed by a qualified welder who is knowledgeable of weld grades and types, as well as the materials specified in the platform design.

Loading

The rated load capacity of the platform must not be exceeded. Only authorized personnel and tools, equipment, and materials needed for the job shall be allowed on the platform. Materials and tools must be secured and evenly distributed to balance the load while the platform is in motion. The platform shall not be used for hoisting materials or tools when not hoisting personnel.

Rigging

When a wire rope bridle is used to connect the platform to the load line, the bridle legs must be connected to a master link or shackle so that the load is evenly positioned between the legs. Bridles used as a connection for the personnel platform must not be used for any other purpose.

Attachment assemblies (e.g., hooks) must close and lock to keep the hook throat from opening. An alloy anchor-type shackle with a bolt, nut, and retaining pin may be used as an alternative. Moussing (i.e., using wire rope to close the hook opening) shall not be permitted.

Inspection and testing

A trial lift must be made before personnel are hoisted. During the trial lift, the platform must be loaded to its anticipated lift weight. The lift must start at ground level, or at the platform entry location, and proceed to each location where the platform is to be hoisted and positioned.

A personnel platform pre-use checklist should be used to document the necessary test and inspection.

The crane operator must check all systems, controls, and safety devices to verify that

- They are functioning properly.
- No interferences are present.
- All configurations necessary to reach work locations allow the operator to remain within the 50 percent load limit of the hoist's rated capacity.

If a crane is moved to a new location or returned to a previously used one, the trial lift must be repeated before hoisting personnel.

After the trial lift, the personnel platform must be hoisted a few inches and inspected to confirm that it remains secured and properly balanced.

Before personnel are hoisted, a qualified individual must verify that

- Hoist ropes are free of kinks.
- Multiple-part lines are not twisted.
- The primary attachments are centered over the platform.
- No slack in the wire rope is present. If the rope is slack, the hoisting system must be inspected.

After the trial lift, a thorough inspection of the crane, rigging, personnel platform, and ground must be performed by a competent person to determine if the lift test produced adverse effects on any component or structure. Defects found during inspections must be corrected and a retest conducted.



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Appendix C – Lifting Personnel by Mechanical Lifting Equipment, Continued

When initially brought to the job site, and after repairs or modifications are completed, the platform and rigging must be proof tested to 125 percent of the platform's rated capacity. This is achieved by holding the overloaded platform in a suspended position for five minutes.

The platform and rigging must then be re-inspected for defects. If any problems are detected, they must be corrected, and another proof test must be conducted. This process shall be repeated until the competent person feels that it is safe to begin hoisting personnel.

Pre-lift meeting

The PIC must hold a meeting with all personnel involved in the hoisting operation (i.e., crane operator, signal person[s], individuals to be lifted, and person responsible for the hoisting operation) to review this program's requirements and the procedures to be followed before any lift operations are performed.

This meeting must be held before the trial lift at each new work site and must be repeated for any new personnel assigned to the operation.

Safe work practices

All personnel can contribute to safe hoisting operations and help reduce the number of associated incidents and injuries. Personnel must adhere to the following safe work practices:

- Never "ride the load"; use only platforms specifically designed for personnel lifting.
- Always use tag lines, unless their use would create an unsafe situation.
- Keep all body parts inside the platform during raising, lowering, and positioning.
- Secure the platform to the structure where the work is performed, unless securing it to the structure creates an unsafe situation.
- Wear a harness system with a lanyard. The lanyard must be attached to the lower load block or overhaul ball or to a structural member within the personnel platform. If the hoisting operation is performed over water, the employee must wear a U.S. Coast Guard-approved life jacket or buoyant work vest instead of a belt or harness, in accordance with OSHA 29 CFR 1926.106.

Crane operators must adhere to the following safe work practices:

- Never leave crane controls when the engine is running or when the platform is occupied.
- Stop all hoisting operations if signs of a severe storm or other impending danger are present.
- Stay in view or in direct communication with the operator or signal person.
- Do not make any lifts on another load line of a crane that is being used to hoist personnel.

Crane movement

Personnel hoisting shall be prohibited while the crane is traveling, except when a competent person demonstrates this is the least hazardous way to accomplish the task.

When cranes are moving while hoisting personnel, the following rules shall apply:

- Travel must also be limited to the radius of the boom during the lift.
- The boom must be parallel to the direction of travel.
- A complete trial run must take place before employees occupy the platform.
- If the crane has rubber tires, the condition and air pressure of the tires must be checked and the chart capacity for lifts must be applied to remain under the 50 percent limit of the hoist's rated capacity.



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Mechanical Lifting & Rigging Protocol

Appendix C – Lifting Personnel by Mechanical Lifting Equipment, Continued

Personnel Platform Pre-use Checklist for Use with Cranes (Example)

Location:		Date:	
Step	Description	Completed	
1	Conduct a proof test with a load of 125 percent of the rated capacity for five minutes before lifting personnel. (This can be done during the trial lift.)		
2	Conduct a trial lift with the personnel platform unoccupied and loaded to the anticipated lift weight to each location where the platform is to be positioned. Complete the trial lift before hoisting employees and whenever the crane is moved.		
3	Conduct a visual inspection after each trial lift or proof test. Obtain a determination from a competent person whether testing exposed any defects to the crane, rigging, platform, or crane base. If any defects are identified, conduct a retest after such defects are corrected.		
4	Conduct a pre-lift meeting with the crane operator, employees to be lifted, person responsible for the task, and the signal person (if necessary) to discuss lift procedures and safety requirements.		
Please sign after all tests and inspections are complete:			
Crane Operator			
Person in Charge			
Signal Person			
Employees to be Lifted			



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Appendix D - Inspection Frequencies and Example Checklists

The responsibility for verifying that proper inspection and preventive maintenance is performed lies with the facility supervisor. Each supervisor should prepare a complete listing of all lifting and hoisting equipment under their control to confirm that required inspection and maintenance are performed.

Equipment	Inspection Frequency (documentation required)	Reference
Mobile Crane	Monthly Annual	29 CFR 1910.180, ASME B30.5 by third party
Overhead and Monorail Cranes	Annual	29 CFR 1910.179, ASME B30.17, B30.2 (also see hoists)
Gin Pole truck	Pre-Shift Annual	IADC Oilfield Gin Pole Trucks Guidelines
Forklift	Pre-Shift/Tour	29 1910.178
Hoist	Daily (undocumented)	29 1910.179(j)(2)(i), ASME B30.5
Hoists	Annual	29 CFR 1910.179, ASME B30.16
Auto Crane	Pre-Shift	Manufacturer's information
Lifting Chain	Annual	29 CFR 1910.184, ASME B30.9,
Wire Rope Sling	None	29 CFR 1910.184, ASME B30.9
Synthetic Web Sling	None	29 CFR 1910.184 ASME B30.9
Heavy Duty Winches	Quarterly	Manufacturer's information
Aerial Lifts	None	29 CFR 1926.453, manufacturer's information

Appendix C provides several sample inspection forms for use by operations. Individuals performing inspections shall be qualified to inspect the equipment. Third party vendors can inspect Devon owned equipment with the use of their own forms. Devon will maintain copies of Devon owned equipment inspection forms.



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Appendix D - Inspection Frequencies and Example Checklists, Continued Forklift Inspection Form (Example)

Forklift Serial #:		Location:				
Inspector Name:		Date:				
Step	Components	YES	NO	N/A		
1	Battery: Charge OK; Electrolyte / Water Full					
2	Engine Oil: Full; Not Due for Change					
3	Transmission Fluid: Full; Fluid Clean					
4	Engine Belts: Operate Smoothly; No Pieces Missing					
5	Radiator Level: Full					
6	Markings, Warning Decals, Data Plate: Securely Attached & Readable					
7	Overhead Guard: Securely Attached					
8	Operator Restraint System: Fully Functional & Securely Attached					
9	No Visible Leaks					
10	Tires: In Good Condition & Fully Inflated					
11	Brakes, Service: Function Smoothly: Do Not Fade					
12	Brakes, Parking: Function Smoothly; Hold Securely					
13	Accelerator Linkage: Functions Smoothly					
14	Light (Head, Tail, Operating, Warning): Work Properly					
15	Hydraulic Fluid: Full; Fluid Clean					
16	Hydraulic Hoses; No Signs of Wear					
17	Hydraulic System: Hydraulics Do Not Drift					
18	Mast Chain and Stops: In Good Condition/Function Properly					
19	Fuel: Tanks Fastened Securely; Covers & Connections in Place					
20	Steering: Operates Smoothly					
21	Drive Direction: Forward & Reverse Smoothly					
22	Tilt: Operates Smoothly in Both Directions					
23	Hoist: Operates Smoothly in Both Directions					
24	Forks: Attached Securely; Not Bent; Not Damaged					
25	Ammeter: Functions Properly					
26	Engine Oil Pressure Gauge: Functions Properly					
27	Fuel Level Gauge: Functions Properly					
28	Temperature Gauge: Functions Properly					
29	Operating Hours Meter: Functions Properly					
30	Horn: Operational					
31	Backup Alarm: Operational					
Remarks: An explanation of all "No" responses shall be listed below including corrective action taken.						



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Appendix D - Inspection Frequencies and Example Checklists, Continued
Rigging Inspection Form (Example)

Location: _____ Date: _____

Project: _____

Rigging Equipment	Manufacturer	Certification No:	Working Load Limit	Inspection Process								
				Load Hook and Blocks - spread, twisted	Cracked or Worn Sheaves/Drums	Bridge Wheel	Lubrication	Slings for broken wickers	Kinking, cutting un-stranding, and bird caging	"Flattening" on rope for core exposure, reduction in diameter	Abrasions, corrosion, and pitting	
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												

Additional Comments:

Signature: _____ Date: _____



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Mechanical Lifting & Rigging Protocol

Appendix D - Inspection Frequencies and Example Checklists, Continued Alloy Steel Chain Slings Inspection Form (Example)

Type of Equipment				Inspector Name			
Hoist I.D./Serial #				Signature			
Location				Date of Inspection	PASS/FAIL		
Step	Components				YES	NO	N/A
1	Verify proper sling markings:						
	Size		Reach				
	Number of legs		Manufacturers Grade				
	Manufacturers Name		Rated Load				
2	Hang the chain up in a vertical position and inspect chain links and attachments for wear:						
	Bent/Stretched Links		Hinge Damage				
	Scores/Abrasions/heat damage		Cracked Links				
3	Visually inspect for kinks, nicks, gouges and corrosion						
4	Visually inspect hooks and remove from service if any of the following conditions are identified:						
	Distortion, such as bending and twisting >10 degrees or manufacturer's recommendation						
	Increased throat opening >15% or manufacturer's recommendation						
	Wear 10% or manufacturer's recommendation						
	Cracks, nicks, gouges						
Latches on hooks that do not seat properly, do not rotate freely, are missing, or show permanent distortion.							
5	Comments:						

Mechanical Lifting & Rigging Protocol

Appendix D - Inspection Frequencies and Example Checklists, Continued Link-by-Link Inspection

Lift each groove from its seat and inspect for grooving. Where grooving is noticeable, check the stock diameter for reduction in area. If the reduction in diameter is 10 percent or greater, the sling shall be discarded.

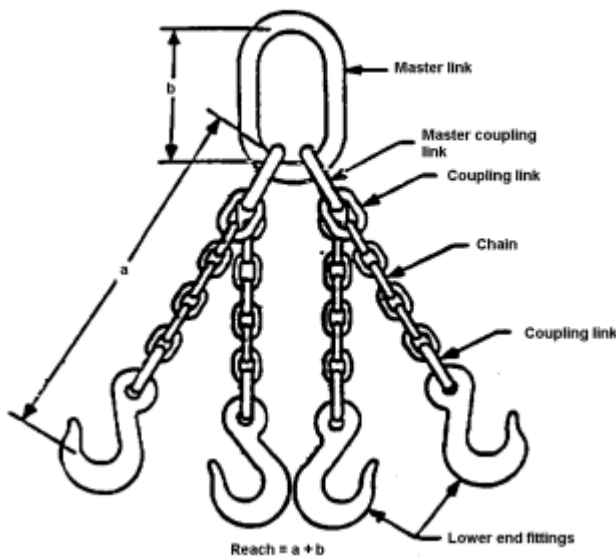
Check for cracks, nicks, and corrosion pits in welded area, shoulders, or other sections of each link.

Check for twisted or bent links.

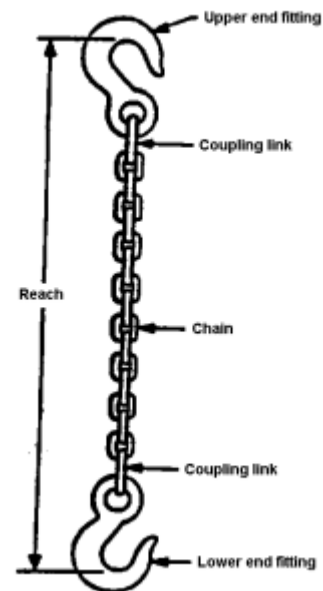
Maximum Allowable Wear at Any Point of Link

Chain Size	Maximum allowable Wear
1/4"	3/64"
3/8"	5/64"
1/2"	7/64"
5/8"	9/64"
3/4"	5/32"
7/8"	11/64"
1"	3/16"
1-1/8"	7/32"
1-1/4"	1/4"
1-3/8"	9/32"
1-1/2"	5/16"
1-3/4"	11/32"

Quadruple Leg Slings



Single Leg Slings



Chain Sling Major Components



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Appendix D - Inspection Frequencies and Example Checklists, Continued Mobile Cranes Inspection Form (Example)

Make		Model		Serial #		
Engine Type		Engine Model				
Inspector				Date		
Components	OK	Adjust	Repair	Change	N/A	Notes
Check air cleaner and blowout						
List hours on filter Hours_____						
Check water level and antifreeze reading						Reading
Check engine oil/filter Hours_____						Added?
Check transmission oil/filter Hours_____						Added?
Check hydraulic oil/filter Hours_____						Added?
Check battery water level						Added?
Cleaned terminals						
Check battery cables for insulation and cover						
Check for any visible cracks in booms						
Check for any visible cracks in outriggers						
Lower frame						
Turntable						
Check fuel filters						
Check fuel strainer						
Check fan belts						
Check front differential						
Check rear differential						
Check planetaries (lf,rf,lr,rr)						
Check all lugnuts and tighten if needed						
Check tire condition and air pressure						
Check anti-two block						
Check back-up alarm						
Check back-up light						
Check boom angle indicator						
Check load charts attached						
Check books and manuals						
Check fire extinguishers-charged						
Check heater, defroster, and fan						
Check all hydraulic functions						
Check all hydraulic pressures						
Check all instrument gauges						
Check wipers						
Personnel pinch points marked or isolated						
Check all lights (headlights, brake, and turn signal)						



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Appendix D - Inspection Frequencies and Example Checklists, Continued Mobile Cranes Inspection Form (Example), Continued

Components	OK	Adjust	Repair	Change	N/A	Notes
Marker lights						
Worklights						
Check air pressure setting psi						
Check brakes						
Check for outrigger pads						
Check for proper lever kits						
Check park brake						
Run transmission stall test in all gears						
Check wire rope and ensure good condition						
Check sheaves for damage						
Check brake fluid level						
Check for any oil leaks and list below						
Check radiator hoses and clamps						
Check jib or auxiliary sheave and all pins						
Check safety cable						
Check pennant cable						
Check rotec (maximum 0.125 slack)						
Check torque on rotec bolts						
Check swing box oil						
Wash machine						
Clean inside cab						
Check seat and seat belts						
Clean windows and mirrors						
Check decals (apply if needed)						
Grease machine (upper, lower, boom)						
Check slider pads						
Check hourmeter						
Check blocks–sheave condition						
Check latch condition						
Check hook condition						
Check headache ball–latch condition						
Check hoist oil level						
Check wipers						
Check horn						
Additional Comments:						



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Mechanical Lifting & Rigging Protocol

Appendix D - Inspection Frequencies and Example Checklists, Continued Overhead and Monorail Hoists/Monorails Inspection Form (Example)

Type of Equipment		Inspector Name		
Hoist I.D./Serial #		Signature		
Location		Date of Inspection		
Step	Components	YES	NO	N/A
1	Supporting structure and trolley, if used, are in good condition and are free from damage or deterioration			
2	Upper limit device is operating properly			
3	Air lines, valves, and junctions are free from leakage			
4	No evidence of worn, cracked, or distorted parts (e.g., pins, bearings, wheels, shafts, gears, rollers, locking and clamping devices, bumpers, switch baffles, interlock bolts, nuts, or rivets)			
5	Equipment is free from loose bolts, nuts, and rivets			
6	Brake system parts are free from excessive wear (required during annual inspection)			
7	Controllers, master switches, limit switches, and push-button stations are in good condition and free from damage or deterioration			
8	Boom angle indicator is functioning			
9	Load chart is displayed and legible			
10	Controls (push buttons) are marked and legible			
11	Hook shows evidence of deformation or cracks, exhibits more than 15 percent in excess of normal throat opening, or has more than a 10-degree twist from the plane of the unbent hook			
12	Hook latches operate properly			
13	Hook retaining nuts or collars and pins, and welds or rivets used to secure the retaining members are free from damage			
14	Hoist load chain demonstrates excessive wear, twist or distorted links, or excessive stretch			
15	Hoist rope is free from defects (e.g., broken wires, kinks, corrosion, cuts, or excessive wear)			
16	Load chain is free from defects (e.g., binding, cracks, distortion, corrosion, stretch, or excessive wear)			
17	Rope or load-chain weaving is in good condition			
18	No evidence of worn, corroded, or distorted parts (e.g., load blocks suspension housing, hand-wheel sheaves, chain attachments, clevises, yokes, or suspension bolts)			
Remarks: An explanation of all "No" responses shall be listed below including corrective action taken.				



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Appendix D - Inspection Frequencies and Example Checklists, Continued Daily Visual Hoist Inspection Requirements (Typically Not Documented)

Hand-Chain-Operated Hoists

1. All functional operating mechanisms for maladjustment and unusual sounds
2. Hooks for damage or deformation
3. Hook latch for damage or deformation
4. Load chain for gouges, nicks, corrosion, or other damage

Electric or Air-Powered Hoists

1. All functional operating mechanisms for maladjustment and unusual sounds
2. Hooks for damage or deformation
3. Hook latches for damage or deformation
4. Load chain for gouges, nicks, corrosion, or other damage
5. Upper limit devices for proper operation
6. Air lines, valves, and other parts for leakage
7. Hoist rope for damage or distortion (e.g., corrosion, broken or cut strands, kinking, or crushing)

Auto Cranes

1. All functional operating mechanisms for maladjustment and unusual sounds
2. Vehicle level and stable; outriggers deployed
3. Emergency brake set
4. Hoist rope for damage or distortion (e.g., corrosion, broken or cut strands, kinking, or crushing)
5. Hook latches for damage or deformation
6. Hooks for damage or deformation
7. Lines, valves, and fittings free of leakage
8. All controls (i.e., electrical and hydraulic) cycled to ensure proper function



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Appendix D - Inspection Frequencies and Example Checklists, Continued Service Cranes (Auto Cranes/Truck Cranes) Inspection Form (Example)

Type of Equipment		Inspector Name		
Hoist I.D./Serial #		Signature		
Location		Date of Inspection		
Step	Components	YES	NO	N/A
1	Supporting structure and trolley, if used, are in good condition and are free from damage or deterioration			
2	Upper limit device is operating properly			
3	Air lines, valves, and junctions are free from leakage			
4	No evidence of worn, cracked, or distorted parts (e.g., pins, bearings, wheels, shafts, gears, rollers, locking and clamping devices, bumpers, switch baffles, interlock bolts, nuts, or rivets)			
5	Equipment is free from loose bolts, nuts, and rivets			
6	Brake system parts are free from excessive wear (required during annual inspection)			
7	Controllers, master switches, limit switches, and push-button stations are in good condition and free from damage or deterioration			
8	Boom angle indicator is functioning			
9	Load chart is displayed and legible			
10	Controls (push buttons) are marked and legible			
11	Hook shows evidence of deformation or cracks, exhibits more than 15 percent in excess of normal throat opening, or has more than a 10-degree twist from the plane of the unbent hook			
12	Hook latches operate properly			
13	Hook retaining nuts or collars and pins, and welds or rivets used to secure the retaining members are free from damage			
14	Hoist load chain demonstrates excessive wear, twist or distorted links, or excessive stretch			
15	Hoist rope is free from defects (e.g., broken wires, kinks, corrosion, cuts, or excessive wear)			
16	Load chain is free from defects (e.g., binding, cracks, distortion, corrosion, stretch, or excessive wear)			
17	Rope or load-chain weaving is in good condition			
18	No evidence of worn, corroded, or distorted parts (e.g., load blocks suspension housing, hand-wheel sheaves, chain attachments, clevises, yokes, or suspension bolts)			
Remarks: An explanation of all "No" responses shall be listed below including corrective action taken.				



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Appendix D - Inspection Frequencies and Example Checklists, Continued Gin Pole Truck Inspection Form (Example)

Date:		Time:		Truck #:			
Gin Truck Owner:		Make:					
Facility Name and Location:		Vin:					
Inspector:		Year:					
#	Component(s)	SAT	UNS	N/A	CDI	Correction Date	Correction Confirmed
Truck (Outside)							
1	Clearance, Tail and Headlights in place – clean and operational						
2	Stop and Turn lights in place - clean and operational						
3	Working Lights in place - clean and operational						
4	Wiring free of damage and installed to prevent damage from moving parts						
5	Reflectors and Reflective tape in place						
6	Windshields free of damage and wipers operational						
7	Exhaust free of leaks and in good condition						
8	Fuel Tanks free of leaks and steps in good condition						
9	Cab and Hood securement in place and free of damage						
10	Mirrors in place and free of damage						
11	Back-up Alarm in place and operating						
12	Steering linkage and Gear boxes secured and free of excessive wear						
13	Front Axle Tires: Wheels and fasteners free of damage and within tread depth guidelines 4/32"						
14	Front Brake Assembly free of damage and excessive wear						
15	Front Suspension Components free of damage and excessive wear						
16	Drive Axle Tires: Wheels and Fasteners free of damage and within tread depth guidelines 2/32"						
17	Drive Axle Brake Assembly free of damage and excessive wear						
18	Drive Axle Suspension Components free of damage and excessive						
Truck (Inside)							
19	Horn in place and operational						
20	Low Air Warning device operating correctly						
21	Wiring free of damage and installed to prevent damage from moving parts						
22	Seats and Seatbelts secured and operational						
23	5 lbs. ABC Fire Extinguisher mounted, charged and has annual inspection						
24	Triangle Warning Reflectors in place and in good shape						
25	Current paperwork for Truck and Trailer in place and legible						
26	Current Annual DOT Inspection Sticker						
27	Truck free of excessive air leaks						
27	Fully stocked First Aid / Body Fluid Clean-up Kit available						
29	Winch Controls in working order, properly mounted and free of damage						
Truck (Bed)							
30	Bed and Winch mounts free of cracks and damage						
31	Bed free of cracks (fifth wheel and or pin, sheep's tail, headache, etc.)						



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Appendix D - Inspection Frequencies and Example Checklists, Continued Gin Pole Truck Inspection Form (Example)

32	Gin Poles external welds and ends free of cracks and excessive wear*						
33	Lower Gin Pole pins and securement devices free of cracks and excessive wear*						
34	Sky Pin free of cracks and excessive wear*						
35	Sky Bridal / Wishbone free of cracks and excessive wear*						
36	Toggle Link(s) free of cracks and excessive wear *						
37	Tailboard Block(s) free of cracks and excessive wear Rating in tons:						
38	Sky Block(s) free of cracks and excessive wear* Rating in tons:						
39	Bottom Guy Block(s) free of cracks and excessive wear* Rating in tons:						
40	Top Guy Block(s) free of cracks and excessive wear* Rating in tons:						
41	# 1 Winch Line (active portion) free of damage Line size:						
42	# 2 Winch Line (active portion) free of damage Line size:						
43	# 3 Winch Line (active portion) free of damage Line size:						
44	Tail chain(s) free of cracks and excessive wear						
45	Winch Line Termination Device free of cracks and excessive wear						
46	All Lifting Slings and Bridles tagged and free of excessive wear						
47	Chains and Binders free of excessive wear and damage (ratchet binders only)						
48	Chart indicating the current rated load of the truck is posted on (add space) (in) the truck.						
<p>* Annual Inspection includes all the above. In addition, items 32 – 36 are to be disassembled as necessary and non-destructive testing completed and documented. NDT documentation is to be attached to this form. Items 37 – 40 should be inspected as per the manufacturer's recommended procedures.</p>							
Inspector's Signature:				Repairman's Signature:			
Comments:							
<p>SAT - Satisfactory Condition UNS - Unsatisfactory Condition N/A - Not Applicable CDI - Corrected During Inspection</p>							



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Mechanical Lifting & Rigging Protocol

Appendix D - Inspection Frequencies and Example Checklists, Continued Backhoe Inspection Form (Example)

Type of Equipment		Inspector Name		
Serial #		Signature		
Machine Hours		Date of Inspection		
Step	Components	YES	NO	N/A
1	Loader Bucket (e.g., hydraulics, linkage, cylinders, retainers, cracks, etc.)			
2	Boom (e.g., hydraulics, cylinders, cracks, etc.)			
3	Stick and Controls (e.g., pivot, reach, etc.)			
4	Frame			
5	Outriggers (If appropriate)			
6	Steps, Handholds			
7	Windshield/wipers/washers			
8	Engine Coolant			
9	Radiator			
10	Hydraulic Oil Cooler			
11	Hydraulic Oil Tank			
12	Fuel tank			
13	Fire Extinguisher			
14	Engine Oil			
15	Hoses, Belts, Air Filter			
16	Horn, back up alarms, lights			
17	Seat Belts			
18	Cab Interior			
Remarks: An explanation of all "No" responses shall be listed below including corrective action taken.				



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Appendix D - Inspection Frequencies and Example Checklists, Continued Trackhoe Inspection Form (Example)

Type of Equipment		Inspector Name		
Serial #		Signature		
Machine Hours		Date of Inspection		
Step	Components	YES	NO	N/A
1	Loader Bucket (e.g., hydraulics, linkage, cylinders, retainers, cracks, etc.)			
2	Boom (e.g., hydraulics, cylinders, cracks, etc.)			
3	Stick and Controls (e.g., pivot, reach, etc.)			
4	Blade Cutting Edge			
5	Ripper/Ripper Shank (If applicable)			
6	Frame			
7	Outriggers (If appropriate)			
8	Steps, Handholds			
9	Windshield/wipers/washers			
10	Engine Coolant			
11	Radiator			
12	Hydraulic Oil Cooler			
13	Hydraulic Oil Tank			
14	Fuel tank			
15	Fire Extinguisher			
16	Engine Oil			
17	Hoses, Belts, Air Filter			
18	Horn, back up alarms, lights			
19	Seat Belts			
20	Cab Interior			
21	Track Inspection (e.g., greased, tightness, linkages maintained, etc.)			
Remarks: An explanation of all "No" responses shall be listed below including corrective action taken.				

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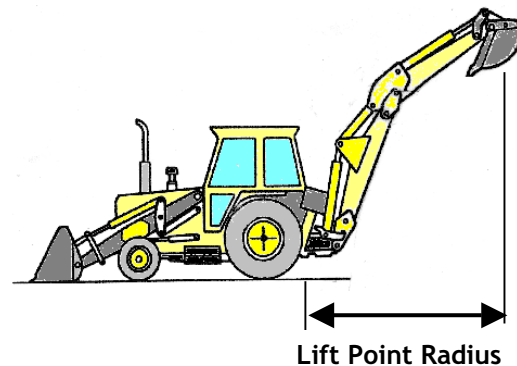
Appendix E - Backhoe Lifting Requirements

Tractor

Lifting Loads

The operator's manual for each machine will include a section on lifting with the backhoe. When lifting a load with the backhoe, refer to the operator's manual for specific load ratings at different radii and boom positions.

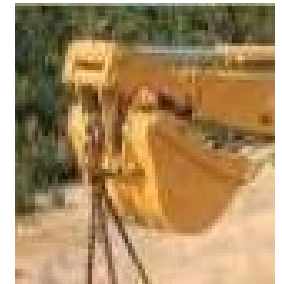
Radius - refers to the horizontal distance from the swing hinge pin to the point on the bucket where loads are attached (See the figure to the right).



Attaching the Load

When determining where to attach the lifting sling(s) to the bucket, an operator should first refer to the operator's manual. Most manufacturers state where the load should be attached.

Most manufacturers have included a lifting eye or attachment point on the bucket as shown in the pictures to the right. Others have designated holes on the bucket linkage as suitable lifting points.



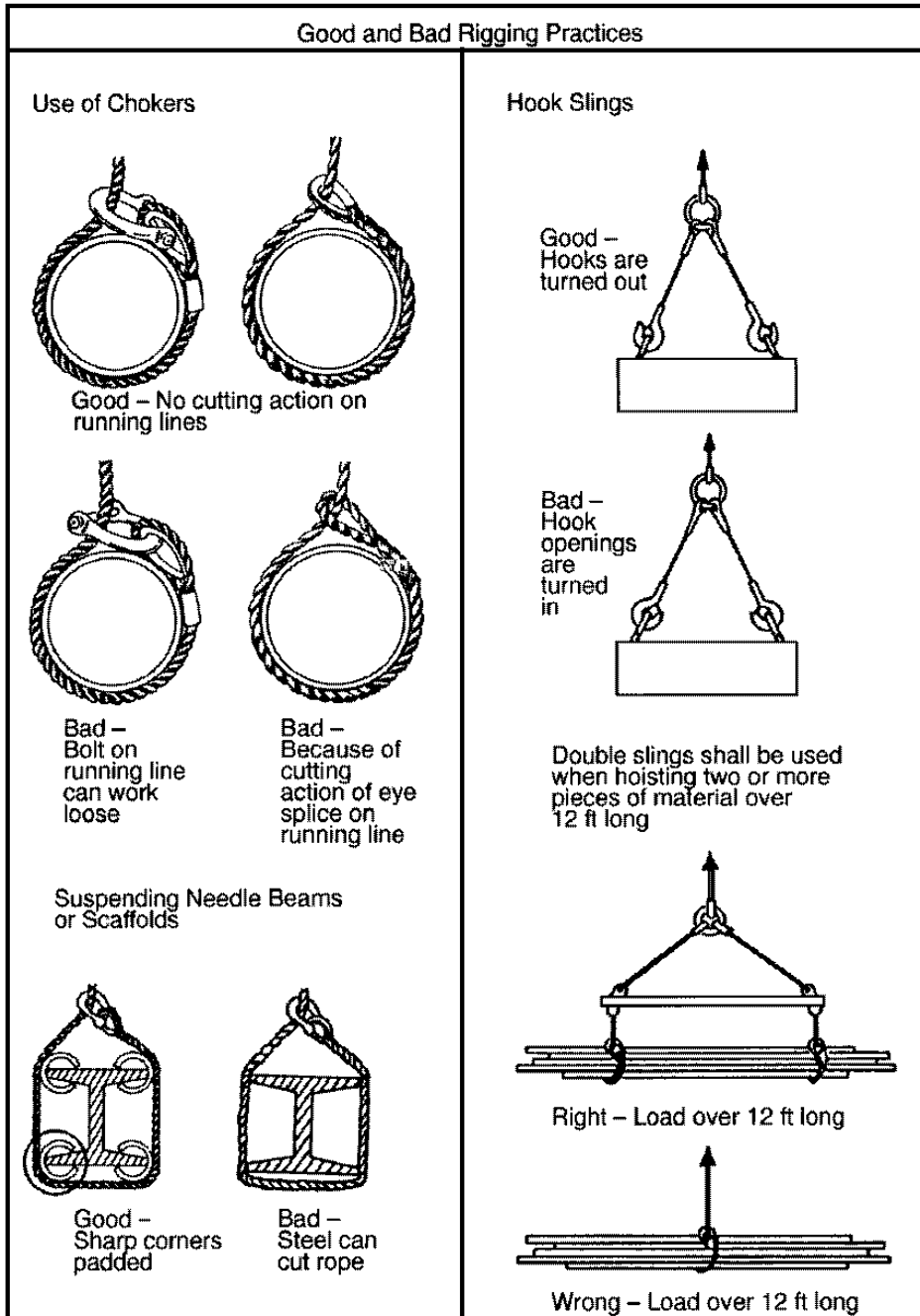
Attaching the Load to the Loader

The operator's manual for each machine includes a section on load capacity for the loader bucket. On some machines, lifting capacity is limited by the capacity of the hydraulic system. Some buckets come with lifting eyes welded to the back side and the rigging equipment can be attached at these points. Slings should not be attached to the lifting arms of the loader, or around any of the hydraulic lift cylinders.



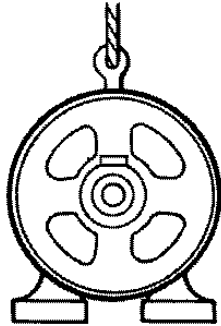
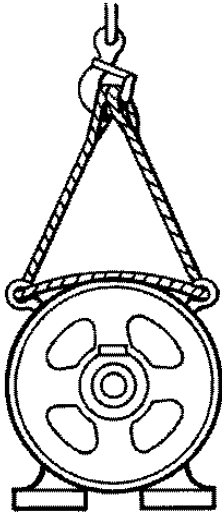

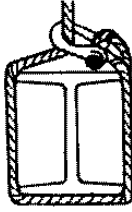




Mechanical Lifting & Rigging Protocol

Appendix F - Diagrams of Good and Bad Rigging Practices



Mechanical Lifting & Rigging Protocol

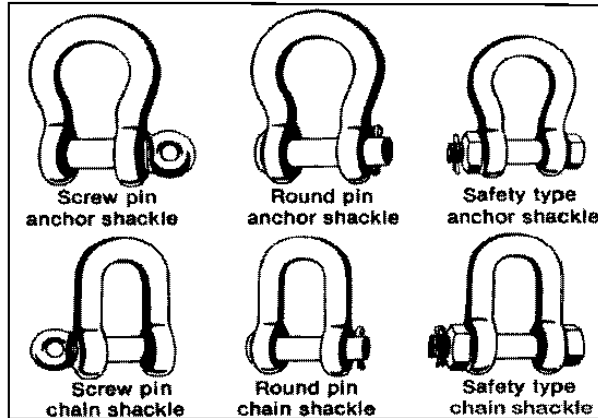
Appendix F - Diagrams of Good and Bad Rigging Practices, Continued

Good and Bad Rigging Practices	
<p>Eyebolts</p>  <p>Good practice—vertical lift on eyebolt</p>  <p>Bad practice – lifting on eyebolts from an angle reduces safe loads as much as 90%</p>	<p>Hoisting Structural Steel</p>  <p>Good – Use space blocks and pad corners</p>  <p>Bad – Can bend flanges and cut rope</p> <p>Eye Splices</p>  <p>Good practice – Note use of thimble in eye splice</p>  <p>Good practice – Use of thimble in eye splice</p>  <p>Bad practice – Wire rope knot with clip. Efficiency 50% or less</p>  <p>Bad practice – Thimble should be used to increase strength of eye and reduce wear on rope</p>

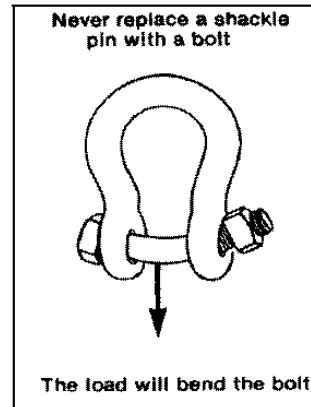
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Appendix F - Diagrams of Good and Bad Rigging Practices, Continued

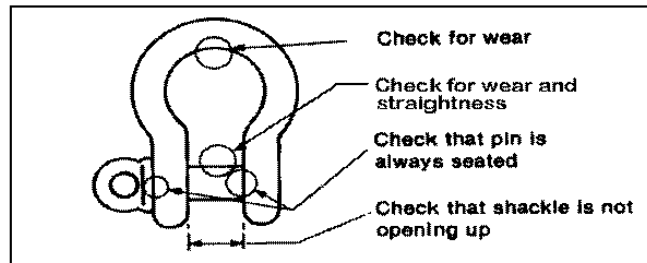
Typical shackles



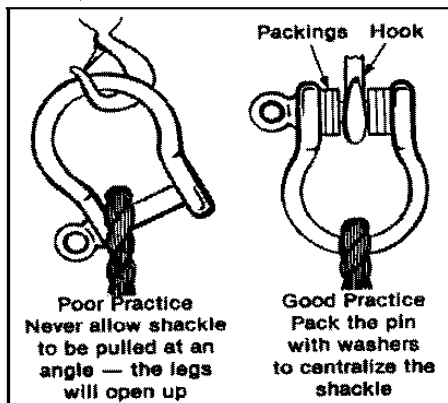
Replacing shackle pins



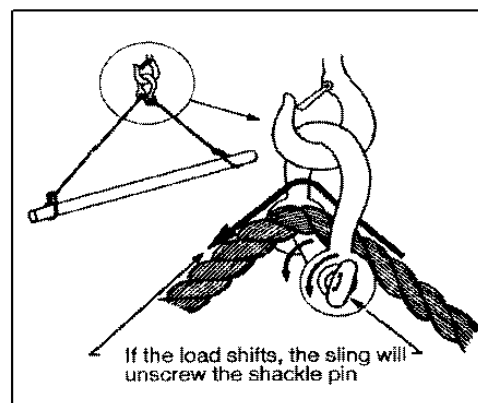
Shackle inspection areas



Eccentric shackle loads



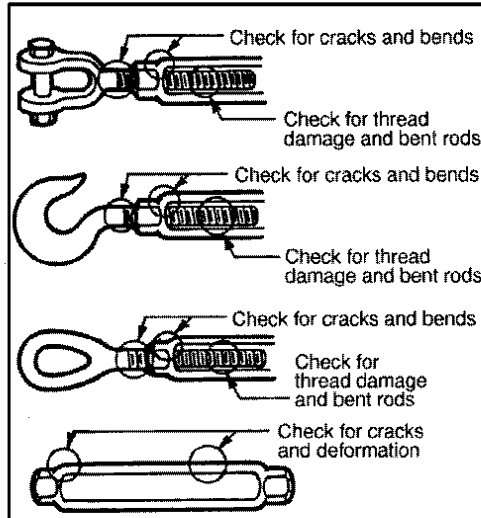
Do not use screw pin shackles if the pin can roll under load and unscrew



Mechanical Lifting & Rigging Protocol

Appendix F - Diagrams of Good and Bad Rigging Practices, Continued

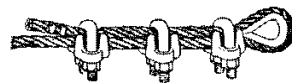
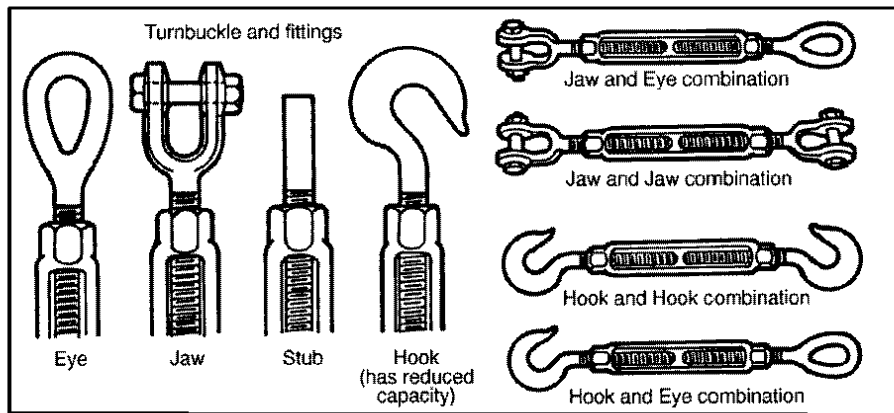
Turnbuckle Inspection Areas



Turnbuckles

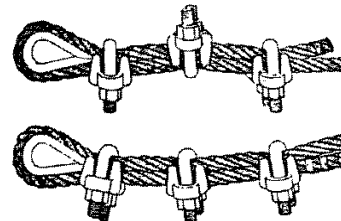
End fitting, stock diameter (in.)	Safe working load (SWL) of any combination of jaw end fittings, eye end fittings, and stub end fittings (lb)	
	SWL of any turnbuckle having a hook end fitting (lb)	SWL of any turnbuckle having a hook end fitting (lb)
1/4	500	400
5/16	800	700
3/8	1,200	1,000
1/2	2,200	1,500
5/8	3,500	2,250
3/4	5,200	3,000
7/8	7,200	4,000
1	10,000	5,000
1 1/4	15,200	5,000
1 1/2	21,400	7,500
1 3/4	28,000	—
3	37,000	—
2 1/2	60,000	—
2 3/4	75,000	—

Turnbuckles



Note that the base of the clip bears against the live end of the wire rope, while the "U" of the bolt presses against the dead end.

Figure 11-12. Wire-rope clips—right way.



The "U" of the clips should not bear against the live end of the wire rope because of the possibility of the rope being kinked or crushed.

Figure 11-13. Wire-rope clips—wrong way.



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Mechanical Lifting & Rigging Protocol

Appendix G - Sling Inspection Guidelines

These guidelines apply to all slings used for lifting purposes and made from alloy steel chain, sewn synthetic webbing, and wire rope. Synthetic rope, natural fiber rope and metal mesh slings are not recommended for overhead lifting in Devon operations.

The operator of the hoisting/lifting device is responsible for verifying that slings are acceptable for lifting.

Welding or modification of any sling component is prohibited unless performed by the sling manufacturer.

Alloy Steel Chain Slings

Only alloy steel chain with a design safety factor of 4 to 1 is acceptable for sling/lifting use.

All alloy steel chain slings shall have permanently affixed durable identification tags stating the size, manufacturer's grade, rated load capacity, reach, number of legs and sling manufacturer. A serial number or other means of identification is required either on the manufacturer's tag or a separate tag.

All attachments shall have a rated load at least equal to that of the alloy steel chain with which they are used.

Every new, repaired, or reconditioned alloy steel chain sling shall be proof tested by the manufacturer or an equivalent entity. A certificate of the proof test shall be maintained on file.

Wire Rope Slings

A minimum design safety factor of 5 to 1 shall be maintained for wire rope slings and attachments. Load ratings for wire rope slings shall be based on nominal wire rope strength, nominal splicing or end attachment efficiency, and load/sling configuration.

Wire rope slings shall be marked or have permanently affixed durable identification stating rated capacity and the manufacturer's name.

All welded end attachments shall be proof tested by the manufacturer at twice their rated load capacity. A certificate of the manufacturer's proof test shall be maintained on file. (Proof test requirements apply only to welded end attachment-type slings). Cable clamps should not be used as end attachments for slings.

Wire rope slings shall be immediately removed from service if any of the following conditions are present:

- Ten randomly distributed broken wires in one rope lay or five broken wires in one strand in one rope lay
- Wear or scraping of one-third the original diameter of outside individual wires
- Kinking, crushing, bird caging, or any other damage resulting in distortion of the wire rope structure
- Evidence of heat damage
- End attachments that are worn, cracked, or deformed
- Hooks that have opened more than 15 percent of the normal throat opening measured at the narrowest point or twisted more than 10 degrees from the plane of the unbent hook
- Corrosion of the rope or end attachments



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Mechanical Lifting & Rigging Protocol

Appendix G - Sling Inspection Guidelines, Continued

Synthetic Webbing Slings

The minimum design safety factor for synthetic web slings shall be 5 to 1.

Each sling shall display a manufacturer's tag indicating the following:

- Name or trademark of the manufacturer
- Manufacturer's code or stock number
- Rated loads for the types of hitches used
- Type of synthetic web material

Synthetic web slings shall be immediately removed from service if any of the following conditions are present:

- Acid or caustic burns
- Melting or charring of any part of the sling
- Holes, tears, cuts, or snags
- Excessive abrasive wear
- Knots in any part of the sling
- Excessive pitting or corrosion, or cracked, distorted, or broken fittings
- Other visible damage that causes doubt as to the strength of the sling

Sling Attachments

Shackles and similar approved attachments shall be examined in accordance with the equipment with which they are attached. Shackles should be examined for distortion, twisting and excess wear. The pin shall not bind during installation. Any of these conditions shall call for the removal and destruction of the shackle.

Attachment B - Critical Lift Worksheet

1. Project name/plant	2. Crane contractor	3. Lift date	4. Lift location
5. Crane manufacturer	6. Model number	7. Serial number	8. Total boom/boom ext. and/or jib length (ft.) at time of lift
9. Max. radius during lift (pick, swing, and set)	10. Swing direction and degrees of swing	11. Lift elevation (ft.) ____ Max. ____ Min.	12. Boom angle ____ Pick ____ Set
13. Is jib and/or boom extension used? ____ Yes ____ No If Yes, Length (ft.) ____ Erected () ____ Weight (ft.) ____ Stowed () ____		14. Load description and weight:	
15. Component weight: Jib/boom extension: _____ Headache ball Size: _____ Wt.: _____ Load block Size: _____ Wt.: _____ Auxiliary boom head: _____ Weight of cable (load fall): _____ Slings, rigging, shackles, and other _____ Lifting beam or bars: _____ Allowance for unaccounted material in equipment: _____ Other: _____ Total weight: _____		16. Who determined weight of load and lift? Name: _____ How: _____	
		17. Total lift load (block 14 + 15)	18. Load % of crane capacity (divide block 17 by crane cap.)
		19. Rigging safety factor 5 to 1? Yes ____ No ____	20. Rigging accessories size and condition: Slings: _____ Shackles: _____ Other: _____
21. (add space) Tag line(s) present? Yes ____ No ____	22. Parts of wire rope on block present?	23. Ground Stable: Yes ____ No ____ If no, precautions taken: _____ Crane Mats Yes ____ No ____	
24. Hazards: Electrical ____ Yes ____ No If yes, explain: Underground ____ Yes ____ No If yes, explain: Overhead ____ Yes ____ No If yes, explain: Others ____ Yes ____ No If yes, explain:		25. Inspection/testing: Certification date: _____ Periodic inspection date: _____	
26. Wind Speed: _____mph/km	27. Attach sketch ____ Done	28. Additional precautions ____ Done	
29. Pre-lift meeting (JHA) Date: ____/____/____	30. Signatures:		
Lifting Company Representative	Date	PIC	Date
Lifting Supervisor	Date	Line Supervisor	Date
Crane Operator	Date	Rigger	Date

Attachment B - Critical Lift Worksheet, Continued

1. Enter the name of project or plant.
2. Enter the contractor company name.
3. Enter the date the lift is to be made.
4. Indicate the location of the plant or construction site of the lift.
5. Enter the manufacturer's name of the crane used to perform the lift.
6. Enter the manufacturer's model number of the crane used to perform the lift.
7. Enter the manufacturer's serial number of the crane used to perform the lift.
8. Indicate the length of the main boom and the length of jib (if equipped) that is to be on the crane at time of the
9. Indicate the maximum radius the load is expected to achieve during the lift cycle of pick, swing, and set.
10. Indicate the crane's swing direction (right or left) and degree of swing.
11. Indicate the maximum and minimum elevation (in ft) that the load is required to reach.
12. Indicate the crane's boom angle at the beginning (pick) and end (set) of the lift.
13. Check (√) "Yes" or "No". If "yes" is checked, complete the jib length and weight space for the configuration of
14. Identify the load to be lifted and weight the job. Then check (√) either "Erected" or "Stowed."
15. Calculate the total weight based on jib extension, load block, cables, rigging equipment (e.g., slings, webbing, shackles, etc.)
16. Enter the name of the person who determined the load's weight and how this determination was made.
17. Indicate the total weight of the load by adding blocks 14 and 15 together.
18. Indicate the percentage of the crane's lift capacity by dividing block 17 and Crane Capacity
19. Verify that the rigging equipment (e.g., shackles and chokers) used to perform the lift has a 5 to 1 safety factor by comparing ratings of each item against the amount of the load it is to support. If all rigging items are determined to have a capacity rating five times the supported load, enter a check mark (√) in the "Yes" block; if not, enter a check mark (√) in the "No" block.
20. Enter the size of chokers and shackles used for the lift and their physical condition.
21. Enter a check mark (√) in the appropriate box if a tag line is to be used.
22. Enter the number of parts in the load handling line during the lift.
23. It is the responsibility of the contract company to determine the soil conditions and whether the ground can support the equipment based on slope, compaction, and firmness of the soil. If appropriate, indicate the need for crane mats under tracks of outriggers.
24. Indicate whether an electrical hazard is in the vicinity of the lift area (e.g., pick, swing, or set crane movements) by entering a check (√) in the appropriate box. If "Yes" is checked, indicate the distance to the electrical hazard and in which direction, amount of voltage, height above ground of the lines, location above or below ground, and other information.

Indicate any existing underground hazards in crane setup area. If "Yes" is checked, explain what type of hazard (e.g., water, sewer, drainage, or electrical) and at what depth.

Indicate any other hazards located in the lift area that would interfere with the lift operations. If "Yes," state the type of hazard involved and the distance to it.
25. Verify Crane certification and testing records
26. Use Wind Indicator to determine wind speed
27. Include drawing of the lift that includes the radius, load location and destination location
28. Identify any additional precautions taken based on hazards
29. The pre-lift meeting participants normally address special setting or placement details, confirm timing, and coordinate other activities in the area during the lift.
30. Have all individuals sign the form in the order listed.

Attachment C

