Material Handling Equipment and Operations

Short description

The purpose of this section is to protect personnel against hazards and other unexpected conditions associated with material handling equipment operations. For the purpose of this section, material handling equipment includes cranes and powered industrial trucks (PIT).

Contact person

Andrew Richardson	HSEQ
Name	Functional Department
770-613-2999	arichardson@cce-inc.com
Phone number	Email address

Responsible

Brent LeVander	HSEQ
Name	Functional Department

Approval

Geoff Preisman	President and CEO
Name	Title

Content

1 Objective and area of application

This section establishes the minimum requirements for work practices to assure the safety of Centennial employees, subcontractors, guests, visitors and other affected personnel who work with or around material handling equipment as part of their job duties.

Centennial expects subcontractors to have an equivalent dedication to HSEQ as outlined in this section. Centennial requires subcontractors to adopt, implement and enforce rules and practices necessary to protect the health and safety of personnel the environment and quality according to the contract scope of work and specifications.

2 Superior and additional applicable documents

1000_GP_11_01_en_6.0 Global Policy on Health, Safety, Environment and Quality (HSEQ)

ANSI B56.1

This section of the HSEQ Manual applies to all Centennial employees and subcontractors who are performing work in Centennial facilities and project sites. There may be more stringent requirements than this section as defined by specific State, local or contact specific material handling requirements. If there is a conflict between this section and other applicable regulations, the more stringent will apply.

3 Definitions

The following definitions of terms are important for an understanding of this section.

Term	Definition
Attachment	Any device that expands the range of tasks that can be done by the equipment. Includes, but are not limited to: hooks, magnets, grapples, clamshell buckets, orange peel buckets, concrete buckets, drag lines, personnel platforms, augers or drills and pile driving equipment
Boom	An inclined spar, strut, or other long structural member which supports the upper hoisting tackle on a crane or derrick. Typically, the length and vertical angle of the boom can be varied to achieve increased height and reach when lifting loads. Booms can usually be grouped into general categories of hydraulically extendible, cantilevered type, latticed section, cable supported type or articulating type
Centennial	All Centennial employees, joint venture employees, subcontractors and business partners
Center of gravity	The point in the object around which its weight is evenly distributed. If you could put a support under that point, you could balance the object on the support
Competent person	Person who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees and has authority to take prompt corrective measures to eliminate or

	protect against those hazards
Counter weight	Weight used to supplement the weight of equipment to provide stability when lifting loads by counterbalancing those loads
Equipment criteria	Manufacturer supplied instructions, recommendations, limitations and specifications
Hoist	A mechanical device for lifting and lowering loads by winding a line onto or off a drum
Hoisting	The act of raising, lowering or otherwise moving a load in the air with equipment covered by this section of the HSEQ Manual. As used in this section, "hoisting" can be done by means other than wire rope/hoist drum equipment
HSEQ	Health, Safety, Environment and Quality
HSEQ Director	Leads the HSEQ Team
Load	Refers to the object(s) being hoisted and/or the weight of the object(s); both uses refer to the object(s) and the load-attaching equipment, such as, the load block, ropes, slings, shackles, and any other ancillary attachment
Multi-purpose machine	A machine that is designed to be configured in various ways, at least one of which allows it to hoist (by means of a winch or hook) and horizontally move a suspended load. For example, a machine that can rotate and can be configured with removable forks/tongs (for use as a forklift) or with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch
OSHA	Occupational Health and Safety Administration
PEL	Permissible Exposure Limit
PIT	Powered industrial truck
Powered industrial truck	A mobile, power-propelled truck used to carry, push, pull, lift, stack, or tier materials
PSO	Project Safety Officer
Qualified Person	An individual that has been trained and holds the proper certification for the assigned task
Ramp	An inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood
ROPS	Roll-over protective structure
RPE	Registered Professional Engineer
Side load	A load applied at an angle to the vertical plane of the boom
Sling	A strap, usually constructed of nylon material, which can be used to lift objects
SSR	Senior Site Representative
Swing radius	Area of the rear of the rotating superstructure of a crane or other equipment capable of rotating in a horizontal plane
Tag line	A rope (usually fiber) attached to a lifted load for purposes of controlling load spinning and pendular motions or used to

stabilize a bucket or magnet during material handling operations

4 Cranes

This section describes the requirements for Centennial subcontractor personnel and lower tier contractors, who may operate material handling equipment that can hoist, lower and horizontally move a suspended load. Suppliers who are delivering materials (such as pre-fabricated or pre-cast concrete components) to facilitate construction activity shall follow the requirements of this section. Only qualified personnel may operate equipment of this type (see section 4.3 for crane operator qualification requirements). All crane lift and/or hoisting activities shall only be permitted with a fully complete and approved Crane Lift and Rigging Plan (Appendix 1).

This section applies to power-operated equipment, when used in construction that can hoist, lower and horizontally move a suspended load.

Such equipment includes, but is not limited to:

- Articulating cranes
- Crawler cranes
- Floating cranes
- Cranes on barges
- Locomotive cranes
- Mobile cranes
- Multi-purpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load
- Industrial cranes
- Dedicated pile drivers
- Service/mechanic trucks with a hoisting device
- Pedestal cranes
- Portal cranes
- Overhead and gantry cranes
- Side boom cranes
- Derricks
- Tower cranes
- Digger derricks when used for activities other than auguring holes for power poles carrying electric or telecommunication lines, placing and removing poles, and for handling associated materials for installation on, or removal from the poles

The general requirements for the use of cranes are as follows:

- Cranes shall be set on firm and stable ground surface
- Cranes shall be set up level to within one degree
- Cribbing shall be used on all crane lifts unless manufacturer guidance permits lifting without the use of cribbing
- The swing radius of all cranes shall be barricaded to prohibit personnel or equipment from entering
- A distance of three feet shall be maintained between the swing radius of the crane and any obstruction
- Crane operators shall not engage in any practice that will divert their attention while operating the equipment

- Operators, riggers, and signal persons shall wear personal protective equipment in accordance with Section 11.5
- Prior to operating a mobile crane, the operator shall make a complete walk around the equipment to ensure that people are clear of the equipment, all equipment is in a safe condition, and to identify any overhead electrical hazards
- Confirm safe site conditions - checking for hazardous weather, excessive wind, and icing
- Verify that ground conditions at work locations are firm, stable, drained, graded and provide adequate support and ensure that the blocking is stable, adequately supported, and of sufficient strength
- Barricades, warning signs or other methods shall be used to prevent entry into a lift area or turn radius of the crane. Traffic patterns and pedestrian safety shall be considered
- All controls shall be tested by the operator prior to operating the equipment. Any malfunctions shall be corrected or repaired before operating the crane
- Operators will respond to signals only from a trained Signal Person
- All loads shall be rigged by a Qualified Rigger
- The operator is responsible to secure any unattended hoisting equipment
- At no time shall persons work under a suspended load and suspended loads shall not be left unattended without proper safeguards and loads shall never be hoisted over persons
- Whenever there is any doubt as to safety, the operator has the authority and obligation to stop all hoisting activities and refuse to handle loads until safety has been assured

4.1 Crane lift plan approval and additional documentation

Required approval for non-critical crane lift plans includes the following:

- SSR
- PSO/Superintendent

The following documents shall be provided in addtion to the Crane Lift and Rigging Plan Template (Appendix 1):

- A copy of the crane operator’s license
- A copy of the crane operator’s current medical evaluation
- A copy of the qualified rigger’s card or documentation of qualification
- A copy of the signal person’s card or documentation of training (if applicable)
- A copy of the annual and monthly crane inspection
- Wire rope certification
- A copy of the crane load chart
- A sketch of the site layout and rigging type and configuration
- RPE design and approval for custom rigging or spreader bar etc. (if applicable)
- Utility owner voltage information (if applicable)

4.2 Work area inspection

Prior to conducting any overhead hoisting activities the work area shall be surveyed for potential hazards that may affect hoisting or other adjacent activities.

Hoisting area clearances shall be verified for the following items:

- Boom/load height
- Boom/load swing radius

- Clearance from overhead power
- Potential pedestrian, vehicle or buildings

4.3 Qualified operators

Qualified operators for cranes shall pass both:

- A written examination that includes the safe operating procedures for the particular type of equipment the applicant will be operating, and technical understanding of the subject matter criteria required in 29 CFR 1926.1427(j)
- A practical exam showing the applicant has the skills needed to safely operate the equipment, including the ability to properly use load chart information and recognize items required in the shift inspection

Operators of equipment that is included in this section shall be qualified through one of the following methods:

- A certificate from a nationally accredited crane operator testing organization
- Qualification from the employer through an audited employer program (as detailed in Section 4.3.2, herein)
- Qualification by the US Military (only applies to employees of Department of Defense or Armed Forces and does not include private contractors)
- Licensing by a state or local government (if that licensing meets the minimum requirements set forth by OSHA)

Note: When a state or local government requires a crane operator license, the crane operator shall be licensed accordingly to meet OSHA requirements.

4.3.1 Nationally accredited testing organization

The testing organization shall be accredited by a nationally recognized accrediting agency and test according to the criteria listed in 29 CFR 1926.1400. This certification is portable from employer to employer. The certificate shall note the type and capacity of equipment for which the operator is tested and qualified. The certificate and qualification is valid for 5 years.

Nationally accredited crane testing organizations include:

- National Commission for the Certification of Crane Operators (NCCCO)
- National Center for Construction Education and Research (NCCER)
- Crane Institute of America Certification (CIC)
- Operating Engineers Certification Program (OECP)

4.3.2 Audited employer program

An employer may provide a crane operator testing program under the oversight of an independent third-party auditor. An accredited crane operator testing organization shall certify the auditor to evaluate the administration of written and practical tests. The auditor shall conduct audits of the employer's program according to nationally recognized auditing standards. Crane operator qualification under an employer program is only valid while the operator is an employee of the employer who manages the audited employer program and operating a crane for the employer. The qualification is valid up to 5 years.

4.3.3 Armed forces or military

This qualification applies only to civilian employees of the Department of Defense or Armed Services and is not portable. This qualification does not include employees of private contractors.

4.3.4 State or local government

This license is obtained from a government entity, such as a city or state that has a required certification program which meets 29 CFR 1926.1400. This license is not portable outside the boundaries of the government entity that issues the license and is valid for a maximum of 5 years.

4.4 Assembly and disassembly

Subcontractors and lower tier contractors shall comply with all manufacturer guidelines and limitations regarding assembly and disassembly. However, subcontractors may develop site specific procedures for assembly and disassembly if the procedures are developed by a "qualified person" and specific provisions are met such as providing adequate support and stability for all parts of the equipment, and positioning employees involved to minimize exposure to any unintended movement or collapse.

4.4.1 Assembly/disassembly director

Crane assembly and disassembly shall be supervised by an Assembly/Disassembly (A/D) director. The A/D director shall meet the criteria for both a "competent person" and a "qualified person," or shall be a "competent person" assisted by a "qualified person."

- The A/D director shall understand the applicable procedures
- The A/D director shall review the procedures immediately prior to beginning work unless he or she understands the procedures and has used them before for that equipment type and configuration
- The A/D director shall ensure that each member of the crew understands his or her tasks, the hazards of the tasks, and any hazardous positions or locations to avoid.
- The A/D director shall verify all capacities of equipment used, including rigging, lifting lugs, etc.
- The A/D director shall also address hazards associated with the operation, including 12 specified areas of concern:
    - site and ground conditions
    - blocking material,
    - proper location of blocking
    - verifying assist crane loads
    - boom & jib pick points
    - center of gravity
    - stability upon pin removal
    - snagging
    - struck by counterweights
    - boom hoist brake failure
    - loss of backward stability
    - wind speed and weather

Upon completion of assembly, but before use, the equipment shall be inspected by a qualified person to ensure that it is configured in accordance with the manufacturer equipment criteria. If these criteria are unavailable, a qualified person, with the assistance of an RPE shall develop the appropriate configuration criteria and ensure that these criteria are met.

4.4.2 Outriggers and stabilizers

Outriggers and stabilizers shall be used on all crane lifts except those specifically designed for lifting without outriggers and stabilizers (rubber tires). Manufacturer guidance and approval is necessary for any lift in which outriggers and stabilizers are not used.

When outriggers or stabilizers are used or are necessary they shall be:

- Fully extended or, if permitted by manufacturer procedures, deployed as specified in the manufacturer's load chart
- Set to remove equipment weight from the wheels
- Outrigger floats, if used, shall be attached to the outriggers; stabilizer floats, if used, shall be attached to the stabilizers
- Visible to the operator or to a signal person during extension and setting
- Outrigger and stabilizer blocking shall be placed under the float/pad of the jack or, if there is no jack, under the outer bearing surface of the outrigger or stabilizer beam
- Blocking shall also be sufficient to sustain the loads and maintain stability and shall be properly placed

4.5 Qualified rigger

A qualified rigger is a rigger who meets the criteria for a qualified person. A qualified rigger shall have the ability to properly rig the load for a particular job. It does not mean that a rigger shall be qualified to do every type of rigging job. Each load that requires rigging has unique properties. However, this experience does not automatically qualify the rigger to rig unstable, unusually heavy or eccentric loads that may require a tandem lift, multiple-lifts, or use of custom rigging equipment.

A qualified rigger shall be able to demonstrate:

- Basic safety rules when working around cranes and loads hoisted overhead
- Ability to recognize potential worksite operating hazards
- Ability to perform visual inspections and rejection criteria for hoisting wire rope, hoisting chain, hook/block and the working area
- Understand the selection, inspections, rating, rejection criteria and proper use of rigging hardware including the reduction for angle loading
- Understanding of the selection and ratings of basic sling hitches
- Understand and be able to demonstrate the safe use of tag lines for guiding loads and maintaining stability

Personnel shall be verified to be a qualified rigger through either of the below methods:

- Third party qualified evaluator
  - The rigger has documentation from a third-party qualified evaluator showing that he or she meets the qualification requirements
- Employer's qualified evaluator (not a third party)
  - The employer's qualified evaluator assesses the individual, determines the individual meets the qualification requirements, and provides documentation of that determination. This assessment may not be relied on by other employers (not portable)

4.6 Qualified signalperson

A qualified signalperson is one who:

- Knows and understands the type of signals used at the project site
- Is competent in using these signals
- Understands the operations and limitations of the equipment, including the crane dynamics involved in swinging, raising, lowering and stopping loads and in boom deflection from hoisting loads
- Knows and understands the relevant signal person qualification requirements specified in 29 CFR 1926.1400
- Passes an oral or written test and a practical test

Personnel shall be verified to be a qualified signalperson through either of the below methods:

- Third party qualified evaluator
  - The signal person has documentation from a third-party qualified evaluator showing that he or she meets the qualification requirements
- Employer's qualified evaluator (not a third party)
  - The employer's qualified evaluator assesses the individual, determines the individual meets the qualification requirements, and provides documentation of that determination. This assessment may not be relied on by other employers (not portable)

A signal person shall be required whenever:

- Any point of operation is not in full view of the operator
- The operator's view is obstructed in the direction the equipment is traveling
- Either the operator or the person handling the load determines that a signal person is needed because of site-specific safety concerns

4.7 Overhead loads

The following are the basic requirements for handling hoisted overhead loads:

- Overhead loads shall be attached to the hook by means of slings or other rated hoisting devices that are of sufficient capacity
- Personnel shall not be permitted to ride the hook or load
- Loads shall not be rigged in a manner that would side load the crane
- All loads shall be balanced utilizing the center of gravity of the load
- All personnel shall be clear of the load before hoisting

4.8 Critical lifts

The following hoisting activities are considered critical lifts:

- Lifts involving hazardous materials
- Hoisting personnel
- Lifts involving more than one crane
- Lifts where the center of gravity could change
- Lifts that the operator believes should be considered critical
- Lifts of 75% or more of the rated load capacity of the crane load chart
- Lifts without the use of outriggers using rubber tire load charts
- Lifts using more that one hoist on the same crane
- Lifts involving non-routine or technically difficult rigging arrangements (e.g. multiple lift rigging assemblies)
- Lifts involving submerged loads
- Lifts out of the operators view or line of sight

All critical lifts shall be planned and executed using both the Crane Lift Qualification and Rigging Plan (Appendix 1) and the Critical Lift Addendum (Appendix 2) or other approved plans. The Critical Lift Addendum shall be approved by the crane operator and reviewed by the Competent Person, Centennial Representative, HSEQ team Representative, and SSR prior to any critical lift.

4.9 Inspections and maintenance

Each mobile crane shall be maintained according to the manufacturer's specifications and inspected by a qualified inspector using the Centennial Crane Inspection Checklist (Appendix 3) or other acceptable checklist. Any and all deficiencies shall be corrected before use.

Inspections frequency includes:

- Before each use- cranes shall be visually inspected by the operator to make sure it is in safe operating condition, and all controls tested
- Monthly
- Annual/Comprehensive
- Equipment not in regular use- equipment that has been idle for three (3) months or more shall have a documented inspection

5 Powered industrial trucks (PIT)

Powered industrial trucks are mobile, power-driven vehicles used to carry, push, pull, lift, stack, and hoist material (includes multi-purpose machines and telehandlers).

All powered industrial trucks used on Centennial project sites are required to meet the design and construction requirements for powered industrial trucks established in the American National Standards Institute (ANSI) Standard for Powered Industrial Trucks, Part II, ANSI B56.1. Warnings plates, placards and markings shall be in place, shall not be covered over with paint which may obscure the identification information and the nameplates shall be maintained in a legible condition.

Modifications and additions which affect capacity and safe operation without the manufacturer's prior written approval are prohibited. Capacity charts, operation, and maintenance instruction plates, tags or decals shall be modified accordingly.

Power-operated industrial trucks shall not be used in atmospheres containing hazardous concentrations of dust or where flammable gases or vapors are, or may be, present in quantities sufficient to produce explosive or ignitable mixtures. If the location is believed to be hazardous or contain any hazardous materials, the PSO/Superintendent, SSR or a member of the HSEQ team shall be consulted in advance.

5.1 General requirements

- PIT shall have the rated capacity clearly posted on the vehicle so as to be clearly visible to the operator
- No modifications or additions which affect the capacity or safe operation of the equipment shall be made without the manufacturer's written approval
- All high lift rider industrial trucks shall be equipped with overhead guards
- Unauthorized personnel shall not be permitted to ride on powered industrial trucks

- PITs with internal combustion engines shall not be operated in areas where carbon monoxide levels may exceed PEL
- PITs shall be equipped with a load backrest to prevent the load from falling toward the truck when the load is elevated and tilted backward
- PITs shall be equipped with an operational horn in its original location as provided by the manufacturer
- PITs shall be equipped with a reverse travel alarm
- The PIT manufacturer's operator's manual shall be accessible to operators and maintained with the PIT

5.2 PIT operators

Each PIT operator shall be qualified to operate the specific equipment that will be used. The operator shall be determined to be qualified to operate a PIT safely, as demonstrated by the successful completion of the training and evaluation described in this section. Personnel who have not yet been trained to operate PITs shall be prohibited from operating PITs on Centennial project sites.

Operator training shall consist of a combination of formal instruction (lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical evaluation of the trainee) and evaluation of the operator's performance in the workplace.

5.2.1 Operator training

Operator training and evaluation will be conducted by personnel who have the knowledge, training, and experience to train and evaluate PIT operators. PIT operators qualification is valid for three years from the date of initial qualification.

Training for PIT operators shall address the following minimum requirements:

- Operating instruction, warning, and precautions for the types of truck the operator will be authorized to operate
- PIT controls and instrumentation: location, purpose, and operation
- Differences between a powered industrial truck/forklift and an automobile
- Engine or motor operation
- Steering and maneuvering
- Visibility (including restrictions due to loading)
- Vehicle capacity
- Vehicle stability
- PIT inspection and maintenance (operator level)
- Refueling and/or changing of batteries
- Operating limitations, including jobsite specific related topics (e.g., surface conditions, pedestrian traffic, hazardous locations, overhead power etc.)

5.2.2 Operator re-training

Operator re-training shall be provided for PIT operators:

- When the operator has been observed to operate the vehicle in an unsafe manner
- When the operator has been involved in an accident or near-miss incident
- When the operator has received an evaluation that reveals that the operator is not operating the truck safely
- When the operator is assigned to drive a different type of truck, or a condition in the workplace changes in a manner that would affect the safe operations of a forklift
- At least every three years

5.3 Pre-use inspection

All PITs shall be inspected prior to use for potential hazards that may be encountered from a damaged PIT and shall be performed at least daily by the qualified operator. If at any time a PIT is found to be in need of repair, defective, or in any way unsafe, the PIT shall be removed from service until it has been restored to a safe operating condition.

The pre-use inspection shall cover, at a minimum, the following elements:

- Inspect the mast for broken or cracked weld points and any other visible damage
- Fluid levels- oil, water, and hydraulic fluid
- Leaks, cracks or any other visible defect including hydraulic hoses and mast chains
- Tire condition and pressure including cuts and gouges
- Condition of the forks, including the top clip retaining pin and heel
- Load backrest extension
- Finger guards
- Safety decals and nameplates. Ensure all warning decals and plates are in place and legible. Check that information on the nameplate matches the model and serial numbers and attachments
- Operator manual on truck and legible
- Operator compartment. Check for grease and debris
- All safety devices are working properly including the seat belt.
- Fire extinguisher placed, inspected and serviceable
- Overhead guard (ROPS, FOPS etc.)
- Hydraulic cylinders
- Manufacturer approved load handling attachments
- Front, tail and brake lights
- Horn and reverse alarm

5.4 Lifting below the tines (free rigging)

Free rigging is the direct attachment to or placement of rigging equipment (slings, shackles, rings, etc.) onto the tines of a powered industrial truck for a below-the-tines lift. This type of lift does not use an approved lifting attachment. Although free rigging is a common practice, it could affect the capacity and safe operation of a PIT and is strictly prohibited on all Centennial project sites.

Modifications and additions which affect the capacity and safe operation shall not be performed without PIT manufacturer's written approval or RPE design and approval. Load charts and maintenance instruction plates, tags, or decals shall be changed accordingly. Manufacture approved PIT attachments shall be used to lift below the tines since this may affect the capacity and center of gravity of the PIT. Operators shall be trained in the use of attachments and dynamics of lifting below the tines. Rigging for lifting below the tines shall be completed by a qualified rigger (see section 4.5).

6 Hydraulic hoisting and lifting (PIT or excavating equipment)

A PIT or hydraulic excavating equipment may only be used to lift or hoist loads if permitted by the equipment manufacturer. The hoisting of loads with a PIT or hydraulic excavating equipment with rigging requires an approved Hydraulic Lifting Plan (Appendix 4) in accordance with paragraph 4.1 of this section and an AHA specific to the transportation or hoisting operation. If hoisting procedures are not available by the manufacturer, then hoisting is prohibited. Hydraulic Lifting Plans shall be approved by the Competent Persona and reviewed by the Centennial Representative prior to any hoisting activity.

Operations involving the use of PITs or hydraulic excavating equipment to hoist using rigging for the transportation or setting of loads require different operator skills and considerations than standard operations performed with this equipment. When PITs or hydraulic excavating equipment is used to hoist loads utilizing hooks, slings, chains or other rigging the following considerations shall apply:

- Proper operating procedures in accordance with the equipment manufacturer's operating manual
- Written proof of qualifications of equipment operator, riggers and signalpersons
- Proper use and availability of the manufacturer's load rating capacities or load chart
- Proper use of rigging including positive latching devices to secure the load and rigging
- Inspection of rigging prior to hoisting (capacity tags must be affixed to rigging)
- Tag lines shall be used to control the load
- Establishment of a sufficient swing radius (equipment, rigging and load)
- Stability of surfaces beneath the equipment
- Hooks, eyes, slings, chains or other rigging shall not be attached directly to the tines of a PIT or hung from the teeth of a bucket during the transportation or hoisting of a load
- Only manufacturer approved attachment points shall be used to attach rigging and the load
- Loads shall be lifted the minimum height necessary to clear the ground or other obstacles and carried as low as possible when the equipment is traveling
- Loads shall not be lifted over personnel
- Adequate clearance shall be maintained from electrical sources

7 Additional training

Employees and subcontractors shall be trained in the specific hazards associated with material handling equipment and their responsibilities and assignments.

Training shall be provided to all affected personnel and, at a minimum, include:

- Hazards related to material handling equipment
- Work practices and selection of appropriate equipment and rigging
- Methods of evaluating site conditions prior to lifting or hoisting
- Inspection procedures
- Specific requirements of this procedure
- Emergency procedures

Retraining is required when:

- Changes in the workplace render previous training incomplete or obsolete
- Changes in the types of material handling equipment to be used render previous training incomplete or obsolete
- Inadequacies in an employee's knowledge or use of material handling equipment indicate that the employee has not retained the requisite understanding or skill

8 Amendment history

Date	Version	Revised content
03.06.2014	1.0	Initial Preparation
04.06.2015	1.1	Addition of “hydraulic hoisting”- paragraph 6 and Appendix 4
12.06.2016	1.2	Clarification on responsible parties for Critical Lift Addendum approval
01.01.2018	2.0	Updates to Paragraph 2 Superior Documents to add the Group Policy and Global Standards, Paragraph 3 Definitions (Centennial, HSEQ Director and Qualified Person), Paragraph 4.5 Qualified Rigger (verification), Paragraph 4.8 Critical Lifts (approval), Appendix 1 (footnote removed, signatures changed and logo), Appendix 2 (signatures changed and logo), Appendix 3 (logo) and Appendix 4 (signatures changed and logo)
07.01.2019	2.1	Updates to Appendix 1 (Plan Author added), Appendix 2 (Plan Author added) and Appendix 4 (Plan Author added)
01.01.2020	2.2	Updates to Paragraph 2 Superior Documents and Appendices 1, 2 and 4 (Approvals)
01.02.2026	2.3	Updates to Paragraph 4.8, Paragraph 6, Appendix 1, Appendix 2, and Appendix 4 to reflect required signatures from updated Safety Plan Signature Matrix

9 Appendix

Appendix 1: Crane Lift and Rigging Plan (0206500_CP_11_23_en_A1.5)

Appendix 2: Critical Lift Addendum (0206500_CP_11_23_en_A2.4)

Appendix 3: Crane Inspection Checklist (0206500_CP_11_23_en_A3.1)

Appendix 4: Hydraulic Lifting Plan (0206500_CP_11_23_en_A4.4)

Crane Lift and Rigging Plan

0206500_CP_11_23_en_A1.5

CENTENNIAL
A BILFINGER COMPANY

General Information

Plan Author: _____

Company Name: _____ Project Name & No: _____

Lift Date: _____ Point of Contact: _____ Contact Phone #: _____

Crane Operator Information

Name: _____ License #: _____ Expiration Date: _____

License Type: ☐ *NCCO/TLL (swing cab)* ☐ *NCCCO/TSS (fixed cab)* ☐ *Other* _____

Medical Physical Type: _____ Expiration Date: _____ (3 year)

Crane Information

Owner: _____ Make: _____ Model: _____ Gross: _____ Ton

Inspection/Certification Date: _____ ☐ *Decal on Crane (required)* ☐ *Periodic Report (required)*

Crane Configuration: ☐ *On Main Boom* ☐ *On Jib* ☐ *On Outriggers/Stabilizers*

Load Rating Chart Supplied: ☐ *Main Boom on Outriggers/Stabilizers* ☐ *Jib*

Hoist Line Class: ☐ *Standard* ☐ *Rot Res* Breaking Strength: _____ lbs SWL: _____ lbs

Winch: ☐ *Main* ☐ *Aux* Parts of Line Used: _____ Total Line Capacity: _____ lbs

Assembly/Disassembly Director *(fulfills role as Lift Director & Site Supervisor per ASME)*

Name: _____ Employer: _____ Phone #: _____

Competent Person: ☐ *Yes* ☐ *No* Qualified Person: ☐ *Yes* ☐ *No*

Set Up Procedures Implemented: ☐ *Crane Manufacturer's* ☐ *Company Specific (attach copy to this plan)*

Qualified Rigger

Name: _____ Employer: _____

Rigger Card Type: ☐ *Employer (provide documentation)* ☐ *3rd Party* ☐ *National Certification*

Card Expiration Date: _____ Qualified Person for Rigging Tasks: ☐ *Yes* ☐ *No*

Qualified Signalperson

Name: _____ Employer: _____

Signal Card Type: ☐ *Employer (provide documentation)* ☐ *3rd Party* ☐ *National Certification*

Card Expiration Date: _____ Qualified Person for Signal Tasks: ☐ *Yes* ☐ *No*

Instructions for Page 1

Contact Information: Use this section to gather all contact information necessary. Make sure you have every section filled with all appropriate phone and cell phone numbers.

Crane Operator: Take information directly off the crane operator's Certification ID card. We recognize NCCCO, CIC, NCCER and OECP Certifications. If the operator provides another type of operator qualification card (internal company, US Military or other), take a copy of the card and consult with CSM as soon as possible. Operators must produce a current medical physical certification. Your state may also require seizures and mental capacity that will not be on a DOT physical.

Crane Information: Name and owner of the crane could be a subcontractor and/or a rental company.

- Monthly inspections require a competent person to perform them and records (includes 14 items) be provided of the most current prior month's inspection. Annual inspections require inspections by a qualified person which include issuing the annual inspection sticker and providing a copy of the annual inspection (21 items) per 1926.1412.
- Note the configuration the crane will be in during the lifts and secure a copy of the appropriate rating chart from the crane. Note the diameter and class of the wire rope along with the Breaking Strength. Divide breaking strength by 3.5 for standard cable or 5 for rotation resistant cable to arrive at the SWL. Note which winch is being utilized for the lift and how many parts of line will be used to make the pick. Multiply the SWL x parts of line used to get total line capacity.
- Note the stamped capacity of the load hook and check to see if the hook used has an installed safety latch (larger hooks will not have or require one).

Assembly/Disassembly Director (AD) (fulfills role as Lift Director and Site Supervisor per ASME):

- Procure the name and title. Can be the operator for simple lifts.
- Ensures all rigging is performed by a Qualified Person and load is stable before hoisting.
- Follows either a) manufacturer guidelines or b) company specific guidelines for setup (contact CSM).
- Ensures the crew understands tasks, hazards, hazardous positions and to notify if out of sight.
- Accounts for ground bearing pressure, identifies hazardous locations, cribbing, hazardous locations, verify assist crane rating and load, load COG, pinch point hazards, hoist brake testing, loss of stability, wind speed force and effect of weather.

Qualified Rigger Onsite

- Get the name of the certified rigger, his 3rd party Certification Card and Issuer. This certification card should be in the riggers name only with no company on it. –OR-
- Get the name of the qualified rigger, his 3rd party or Company Qualification Card and Issuer. This qualification card is company specific and is not portable from one company to another.

Qualified Signalperson Onsite

- Only Required when (1) The point of operation is not in full view of operator or (2) the operator's view is obstructed in the direction the equipment is traveling.
- Get the name of the qualified signalperson, his 3rd party or Company Qualification Card and Issuer. This qualification card is company specific, is not portable and documentation must be on site.
- They have been verified that they understand types, modes and meanings of the signals, crane dynamics, effects of signals on the crane, hazards associated with craning and signaling, the new regulations for working around energized power lines. They have passed a written and/or oral exam and demonstrated knowledge via practical evaluation.

Project Site Conditions

Overhead Hazards: ☐ No ☐ Yes *(if yes, identify controls):* _____

Underground Hazards: ☐ No ☐ Yes *(If yes, identify controls):* _____

Ground Conditions: ☐ Level / Firm / Supportive ☐ Poor *(explain):* _____

Cribbing: ☐ Yes *(must be implemented) (cribbing size recommended):* _____

Power Line Hazard *(<350kV line) (for >350kV, use 50 ft barrier boundary)*

Overhead Power Lines: ☐ No ☐ Yes *(voltage and document):* _____

Demarcation Boundary 20 ft: ☐ N/A ☐ 360 deg ☐ Limited area *(explain):* _____

20 ft Clearance Distance: ☐ Cannot reach w/crane ☐ Could reach w/crane ☐ will encroach w/crane

Proximity Decision: ☐ Maintain 20 ft clearance ☐ De-energize & ground ☐ Use table "A" clearance

Table Clearances: ☐ Voltage (utility) ☐ Warning lines w/proximity alarm ☐ Warning lines w/spotter

Lift and Rigging Plan

Load Description: _____ Load Weight: _____ lbs

Projected Measurements: Radius: _____ ft Boom Angle: _____ deg Boom Length: _____ ft

Chart Used: ☐ Main Boom ☐ Jib ☐ On Outriggers Load Rating Chart x 0.75 _____ lbs

Spreader Bar: ☐ N/A ☐ Mfg. ☐ Site Made (PE approval) Shackles: size _____ Rating _____ tons

Winch: ☐ Main ☐ Aux Parts of Line Used: _____ Total Line Capacity: _____ lbs

Slings: Type _____ Size _____ In-line Rating _____ Length _____

Horizontal Angle _____ Additional Stress _____ % Hitch Configuration _____

Lift & Rigging Sketch

Approved By: Crane Operator: _____ Date: _____

Reviewed By (Signature): Competent Person: _____ Date: _____

Centennial Representative: _____ Date: _____

Instructions for Page 3

Site Conditions:

- Ensure the underground search has been conducted.
- Document any overhead encumbrances or hazards.
- Ground must be evaluated for crane and load support.
- If action is required, indicate who is going to take the appropriate action.
- All cranes on Centennial/JV jobsites need to be cribbed. Cribbing should be double the size of the float pad.

Power Line Hazard *(<350kV line= 20ft) (for greater >350kV line use 50ft barrier boundary)*

- You must identify the max radius utilized either as a limited use area or 360° via a demarcation line.
- If no part of the crane, line, rigging, load or accessories can reach to within 20 feet of an energized power line, then clearly mark the 20 foot barrier and no signal person is required.
- If the crane can come within 20 feet of the power line (in any direction), the lines must be de-energized and grounded -OR –
- Clearly mark the 20 foot boundary, utilize a qualified signal person/spotter and do not encroach inside the minimum safe distances outlined in the OSHA "A" Table.

Lift and Rigging Plan

- Known load weight and load configuration for appropriate rigging.
- #1 task is to rig for load stability and be level in rigging.
- Get projected set down measurements from the dry run with the crane.
- Identify all rigging hardware and spreader bars utilized and verify ratings are appropriate.
- Verify all rigging components are labeled or tagged with capacity ratings.
- Identify and verify all slings utilized capacity ratings are sufficient for the load weight and additional sling angle stress imposed on them.
- If any questions arise, consult the qualified rigger and CSM prior to elevating the load.

Lift or Rigging Sketch

Take time to draw out the position of the crane, height and radius in relation to set down area, distances from the load, buildings, distances from hazards, lines of demarcation and 20 foot power line barrier zone. You should also sketch the shape of the load, load weight, rigging hitches, lengths and types of slings and any other configurations utilized .

Required Documentation Checklist

- ☐ Copy of Operator's License
- ☐ Copy of Operator's Medical Cert.
- ☐ Copy of Riggers Card or Cert.
- ☐ Copy of Annual Crane Insp. Cert.
- ☐ Copy of Monthly Crane Insp Cert.
- ☐ Copy of Crane Load Rating Chart
- ☐ Sketch of Site Layout and Rigging
- ☐ Copy of Company Crane Setup
- ☐ Utility Owner Voltage Information
- ☐ PE spreader bar or custom rigging

Critical Lift Addendum

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Type of Critical Lift *(select all that apply)*

- ☐ 75% of the rated capacity of the crane load chart
- ☐ Lift with more than one crane (tandem lift)
- ☐ Lift involving hazardous materials or explosives
- ☐ Multiple lift rigging (steel erection only)
- ☐ Lift using more than one hoist on the same crane
- ☐ Lift where the center of gravity could change
- ☐ Barge mounted crane lifts (If crane traveling while lifting load)
- ☐ Hoisting personnel
- ☐ Lift out of the operator's view*
- ☐ Lift that crane operator believes is critical
- ☐ Crane operations where the load is placed or removed underwater
- ☐ Lift without the use of outriggers using rubber tire load chart
- ☐ Lift involving non-routine or technically difficult rigging arrangements

Critical Lift Plan Requirements *(All Lifts)*

Significant portion of plan is on the Mobile Crane Lift Qualification and Lift Plan Form (MCLQLP). Load & Rigging cannot be estimated; verify load & rigging on MCLQLP

Provide: Height _____ Length _____ Width _____

Environmental Conditions *(Verify that none are present and/or sufficient)(place check mark next to current conditions)*

☐ *Wind ☐ Lighting ☐ Ice ☐ Visibility ☐ Lightning ☐ Storm Warning

**Work must cease at 20 MPH Winds (or crane manufactures recommendation) for work re-evaluation. Must have wind measuring device on site.*

Provide site drawing of Crane Placement, Adjacent Equipment and Facilities *(Attach to this plan)*

Floating Crane Checklist *(perform/provide the following)*

- ☐ Naval Architectural Analysis-Load Chart & Lift Parameters
- ☐ Wind speed and direction in clear view of operator
- ☐ Plan describing operating base/platform condition and any potential list or trim
- ☐ Inspection of host vessel (barge/pontoon) is required by a competent person

Multiple Lift Rigging

- ☐ Only structural steel can be used
- ☐ Multiple Lift Rigging (Certified) must be used
- ☐ Maximum of 5 members per lift

Personnel Lifts

- ☐ Requires CSM interaction and approval

Approved By

Crane Operator Signature: _____ Date: _____

Reviewed By (Signature Required)

Competent Person: _____ Date: _____

Centennial Representative: _____ Date: _____

Centennial HSEQ Team: Date: _____

Centennial SSR: _____ Date: _____

Crane Inspection Checklist

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CENTENNIAL
A BILFINGER COMPANY

Company Name: _____ Project Name & # _____

Site Conditions	Sat	Unsat	N/A	Comments
Proper Crane Site Access:	____	_____	____	_____
Ground Conditions Firm Stable:	____	_____	____	_____
Underground Hazards Verified:	____	_____	____	_____

Visual Inspection/Verification

	Sat	Unsat	N/A	Comments
1) Lift & Qualification Plan	____	_____	____	_____
2) Operator's Manual	____	_____	____	_____
3) Load Chart	____	_____	____	_____
4) Boom (Jib/Attachments)	____	_____	____	_____
5) Boom Angle Indicator	____	_____	____	_____
6) Anti-Two Block	____	_____	____	_____
7) Outrigger Float Pads	____	_____	____	_____
8) Cribbing	____	_____	____	_____
9) Rigging	____	_____	____	_____
10) Hoist Line	____	_____	____	_____
11) Specialty Lifting (PE Stamp)	____	_____	____	_____
12) Hydraulic Leaks	____	_____	____	_____
13) Block/Hook/Sheaves/Latch	____	_____	____	_____
14) Yearly Crane Insp. Sticker	____	_____	____	_____
15) Warning Labels	____	_____	____	_____
16) Fire Extinguisher	____	_____	____	_____
17) Barricade Swing Radius	____	_____	____	_____
18) Pedestrian/Vehicle Hazards	____	_____	____	_____

Any Unsatisfactory remarks on this form represent a no-lift situation

Critical Lift Determination:

-75% of the rated capacity of the crane load chart
-Lift where the center of gravity could change
-Lifting with more than one crane (tandem lift)
-Multiple lift rigging (steel erection only)
-Lifts using more than one hoist on the same crane
-Lifts involving non-routine or difficult rigging arrangements
-Crane operations where the load is placed or removed underwater
-Lifts the operator believes should be considered critical
-Barge mounted crane lifts
-Lift involving hazardous material/explosives
-Hoisting personnel
-Lifts without use of outriggers (on tire chart)
-*Lifts out of the operator's view (see note)

If any of these conditions exist, please use "Critical Lift Addendum" with this form.

Lift Review (Centennial/JV personnel)

Name:_____ **Signature:**_____ **Date:**_____

Crane Inspection Instructions

Site Conditions: Centennial/JV are responsible for providing adequate site conditions such as site access and firm, stable and level ground conditions.

Visual Inspection/Verification:

1) Verify that a lift and qualification has been completed, submitted and approved by the PSO and SSR. Verify that the same crane and personnel are present.
2) The crane's operator's manual is present and legible.
3) The crane's load chart is available for review and within sight of the operator.
4) The boom, jib and attachments are in adequate condition and operational.
5) The boom angle indicator is present and operational.
6) The anti-two block device is present and operational.
7) Outrigger float pads and used and adequate dimensions.
8) Cribbing is used on all lifts and the proper dimensions for the crane.
9) The rigging is in good condition, has capacity tags, configured correctly as to not impose unacceptable sling stresses.
10) Inspect hoist line for damage, corrosion and lifting capacity.
11) If specialty lifting equipment is used (spreader bar, etc.), a PE must approve the equipment.
12) Inspect hydraulic units for damage and leaks.
13) Inspect the block, hook, latch and sheaves for damage, distortion, corrosion and capacity.
14) Locate the annual crane inspection sticker (on the crane itself).
15) Locate warning labels on the crane (power lines, keep clear, etc.) and ensure that they are present.
16) At least one dry chemical or CO fire extinguisher with a minimum rating of 10 B:C is installed in the cab or at the machinery housing.
17) Barricades must be erected to protect personnel from the swing radius of the crane and pinch points.
18) Personnel and vehicles should be kept clear of the area of operation during crane lifts.

Critical Lift Determination

*Note for "Lift outside of operator's view": If hand signals via a qualified signalperson in view of the operator or radio communication are available and in use, load does not exceed two tons and is determined to be a routine lift by the Assembly/Disassembly director then the lift may be deemed as non-critical.

Cribbing Guide

Crane Capacity divided by 5 = Sq Feet of cribbing per pad

Example: 30 Ton Crane (30/5) = 6 Sq Feet per pad

*Note: Cribbing may have to be stepped; increase each pad by only 200%

Hydraulic Lifting Plan (Forklift/Excavator)

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Instructions: Complete the Forklift Suspended Lifting plan template below. This plan should include site specific details regarding suspended load lifting activities when using an approved forklift lifting attachment.

Project Title: _____ Plan Author (name): _____

Subcontractor (company name): _____ Date: _____

Pre-Construction Conference – Accomplished by Site Superintendent prior to the start of Lifting activities. The purpose of such conference is to develop and review the site-specific forklift suspended load plan that will meet the requirements OSHA 1926.1400 & Corp of Engineers EM 385-1-1 (if applicable).

Hoisting Equipment Description

Make / model: _____

Equipment is equipped with an approved lifting attachment device? ☐ Yes ☐ No

Tabulated data and or product information of approved lifting attachment device will be kept on site? ☐ Yes ☐ No

Lifting attachment manufacturer / model #: _____

Equipment / lifting attachment load chart capacity: _____

Note: Operator must ensure that (if equipped and if required via Load Chart) the forklift outriggers are fully extended and ground conditions are suitable for lifting activities.

Personnel

Equipment Operator (name): _____

When using a forklift does the operator have a valid / current forklift operator's license? ☐ Yes ☐ No

Forklift operator license expiration date: _____

Qualified Rigger (name): _____

Qualified Rigger has a current / valid proof of training? ☐ Yes ☐ No

Qualified Rigger training expiration date: _____

Qualified Signal Person (name): _____

Qualified Signal Person has a current / valid proof of training? ☐ Yes ☐ No

Qualified Signal Person training expiration date: _____

Competent person (name): _____

Copies of personnel certifications / licenses / training must accompany this plan.

Rigging Configuration

Type of rigging to be used: _____

Explain type of rigging (i.e. synthetic slings, wire rope choker, 4 legged bridal, etc.)

Rigging Safe Working Load (SWL): _____ lbs. SWL tags attached to rigging? ☐ Yes ☐ No

Rigging configuration sketch/diagram (use space below):

Load description: _____

Known load weight: _____ lbs. Rigging length: _____ feet

Hitch configuration: _____ Shackles (if used) size/rating: _____

Rigging horizontal angle if applicable: _____ Additional Stress: % _____

Site Conditions

Overhead hazards: ☐ Yes ☐ No
If yes, please explain: _____

Underground hazards: ☐ Yes ☐ No
If yes, please explain: _____

Ground conditions: _____

Are overhead power lines present? ☐ Yes ☐ No
If yes, list voltage: _____ Volts Will forklift and/or load encroach within 20ft? ☐ Yes ☐ No

20ft clearance distance: ☐ Cannot reach ☐ Could reach

Proximity decision: ☐ Maintain 20ft clearance ☐ De-energize and ground power lines
☐ Use OSHA table A clearances

Plan Approval

Competent Person: _____ Date: _____

Plan Review

Centennial Representative: _____ Date: _____