



SECTION IX
MILTON J. WOOD

MOBILE CRANE SAFETY



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MOBILE CRANE SAFETY

I. PURPOSE AND SCOPE

These policies and procedures are intended to provide a safe working environment for crane operators and all site personnel.

These policies and procedures apply to all employees, subcontractors, subcontractor's employees, crane rental companies, crane operators, crane users, and any other persons, organizations entering or operating crane equipment for any Milton J. Wood project.

The criteria and standards for the safe operation of cranes shall include the following:

- Manufacturer's Recommendations and Requirements
- ANSI (American National Standards Institute)
- ASME (American Society of Mechanical Engineers)
- OSHA (Occupational Safety and Health Administration)
- MSHA (Mining Safety and Health Administration)

This crane procedure does not purport to restate all these regulations, but should be used for clarification and additional criteria required while operating crane equipment on Milton J. Wood jobsites.

This program applies to power-operated equipment 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, straddle cranes, sideboom cranes, derricks and variations of such equipment.

Exceptions: Machinery listed above that has been converted or adapted for a non-hoisting/lifting use, power shovels, excavators, wheel loaders, backhoes, loader backhoes, track loaders; tow trucks and auto wreckers when used to clear wrecks and haul vehicles; forklifts (unless configured to hoist and lower by means of a winch or hook, and horizontally move a load), machinery that hoists or lowers by using a come-a-long or chain fall.

II. CRANE USER'S RESPONSIBILITIES

Project Superintendent:

- Cease any operation which does not comply with policy or procedures.
- Suspend crane operations until all unsafe conditions are eliminated.



- Notify all affected employees at the beginning of each shift of any needed adjustments or repairs to the crane and all alternative measures that may be use.
- Provide full support to crane operators to eliminate operator's safety concerns.
- Ensure all lift plans if required are completed and reviewed.
- Ensure all mobile lifting equipment is inspected, maintained and repaired as required by this program.
- Review Pre-lift Checklist to ensure completeness of all lift plans.
- Review crane reports and submit to corporate office as required.
- Ensure that adequate information about ground conditions is obtained from the Client or controlling entity.

Lift Director (May be Project Superintendent)

- Be competent and either qualified or work with a qualified person.
- Determines the type of lift plan needed.
- Determines if the lift should be deemed "Critical" or "Engineered".
- Notifies CFO of all Critical and/or Engineered Lifts.
- Oversees the development of the lift plan.
- Review the Pre-Lift Checklist to ensure completeness.
- Submits a copy of all Critical, Engineered, or Tandem Lifts to the Corporate Safety Office for approval.
- Reviews the lift plan with the Superintendent, Subcontractor, Crane Crew, Riggers and Signal Persons.
- Ensure all operators are properly qualified/certified.
- Ensure riggers and signal person(s) have required training.
- Determine method of communication with the operator.
- Ensure each personnel platform is proof tested by a qualified inspector.
- Ensure all personnel lifts are carried out in accordance with company policy.
- Maintain all test files and ensure they are readily available.

Subcontractor

- Provide project superintendent with scheduled time of crane arrival, general crane information such as crane size, type, owner, lift information including any critical lift plans a minimum of 72 hours prior to scheduled arrival date of the crane.
- Comply with crane safety policy and procedures.
- Ensure that the crane and the crew are working within all regulatory ruling guidelines.
- Provide all subcontractor crane operators with a copy of the crane safety criteria prior to arrival on the Milton J. Wood project.
- Shall ensure that the crane company has provided Milton J. Wood's management with a "certificate of insurance" and acceptable endorsement naming Milton J. Wood and the project owner and the subcontractor as additional insured on its general liability coverage.
- Shall agree that any delays and down time due to the determination or correction of any crane deficiency shall be at the subcontractor's expense.



Crane Owner

- Ensure required training and qualification of operators under his employment when operating equipment leased to Milton J. Wood.
- Provide all required documentation such as manufacturers load charts, manufacturers maintenance criteria, and proof of all safety certifications consistent with the state and/or federal requirements upon arrival to the site.
- If a crane has a safety hazard or a crane owner's employed operator commits an unsafe operation, the crane owner shall provide a proposed plan of action to eliminate the safety concern.
- Crane owners shall provide Milton J. Wood management with a "certificate of insurance" and acceptable endorsement naming Milton J. Wood and the project owner and the subcontractor as additional insured on its general liability coverage.
- Further, the crane owner shall ensure that each rented crane comes equipped with:
 - Operator's Manual
 - Load Charts
 - Fire Extinguisher
 - Back Up Alarm
 - Inspection Forms (Daily and Monthly)

Assembly/Disassembly Director

- Be both competent and qualified.
- Understand and adhere to Safe Assembly/Disassembly Procedures (Attachment XII)

Crane Oiler

- Shall not operate any crane equipment unless he has the qualifications of a crane operator as defined above.
- Notify the operator immediately if he determines that a lift is unsafe to be performed.

Controlling Entity

- Ensure that ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with supporting materials, the equipment manufacturer's specifications for adequate support and degree of level of the equipment are met.
- Inform the user of the equipment and the operator of hazards beneath the equipment set-up area (such as voids, tanks, utilities) if those hazards are identified in documents (such as site drawings, as-built drawings, and soil analyses) that are in the possession of the controlling entity (whether on or off-site) or the hazards are otherwise known to the controlling entity.
- In the event there is no controlling entity for the project, then the employer with site authority, such as the GC, shall make arrangements for ground preparations to be made.

Crane Operator

- Shall be experienced, trained and qualified to operate the size of crane, type of crane, and type of work to be performed on the Milton J. Wood project.



- Shall provide proof of any training certificates or licenses possessed attesting to his crane operation skill, knowledge and experience.
 - For crane operations requiring certified operators, operators must be accredited by a national recognized accrediting agency for the size and type of equipment used.
 - Exception: For equipment with a rated hoisting/lifting capacity of 2,000 lbs or less, the operator must only show training documentation for the type of equipment he will be using. (Such as vendor, Milton J. Wood or Union training documents).
- Shall comply with Milton J. Wood crane safety policy and procedure and all manufacturer procedures applicable to the operational function of the equipment, including its use with attachments.
- If he/she determines a lift is unsafe to perform, shall refuse to continue the operation of the crane with the full support of Milton J. Wood in eliminating the safety hazard.
- Certified crane operators must meet the physical qualification of ASME B30.5 and successfully pass a D.O.T. physical every three years.
- All operators shall report any unsafe condition, near miss incident, or accident to his supervisor immediately.

III. OPERATOR QUALIFICATION AND CONDUCT

- Operators must be qualified and/or certified for the type of crane operation they are performing.
- Operators must be able to pass a written or oral examination and a practical operating examination or furnish evidence of qualification and experience for the specific type of equipment he is to operate.
- Any operator performing a lift for Milton J. Wood must be trained on the type of crane they are to operate. Most lifts will be performed by union journeyman operators which have completed a four-year training program and/or have been certified.
- All operators performing critical lifts must be certified by a nationally recognized accrediting organization such as NCCI.
- All Milton J. Wood operators shall complete refresher training at least every four years. Training shall include standard updates, accident trends, hazard awareness, fall protection, fire extinguisher training, crane inspection and load calculations.
- All operators must keep crane accreditations current, training current and medical qualifications current.
- The operator shall be familiar with the equipment and its proper care.
- All necessary repairs and/or adjustments shall be reported immediately to the supervisor. He must also inform the next operator, if applicable.
- The operator is responsible for all lifts under his direct control. If safety is in question, he must talk with the supervisor before proceeding and cancel the lift until it can be done safely.



IV. INSPECTION, TESTING, MAINTENANCE

All inspections, repairs, tests, and related documentation will be in accordance with OSHA CFR 1926.1412, our company policy, and any other standards which may apply including ANSI B30.5. (For easy reference, refer to ANSI B30.5 which is available at the Jacksonville office.)

Inspection Frequency:

- Post Assembly: Upon completion of assembly by a qualified person.
- Shift Inspection: Prior to each shift by the operator.
- Monthly Inspection: Before the 5th of each month by the operator or other qualified person.
- Annual Inspection: Last quarter of each year by a third party.
- Severe Service Inspection: After service completion by a qualified person.
- Idle Equipment Inspection: Before use by a qualified person
- Repair/Adjusted Equipment Inspection: Before return to service by a qualified person.

Inspection Criteria

- Post Assembly: Upon completion of assembly the equipment is inspected by a qualified person to ensure it is configured in accordance with the manufacturer's equipment criteria. Where the manufacturer's equipment criteria are unavailable the qualified person must ensure that criteria is developed by a qualified person or by a registered professional engineer familiar with the type of equipment involved, if needed. Post Assembly Inspection form must be signed by the qualified inspector and given to the jobsite supervisor and/or lift director. (See Attachment XIII)
- Shift Inspection: The operator must begin with a visual inspection prior to each shift, which must be completed before or during that shift. The inspection is an observation for apparent deficiencies. The items noted on the daily crane inspection checklist as they apply (per manufacturers' recommendations) should be performed every 10 hours of service or daily. The proper procedure for daily inspections is as follows:

Perform a visual inspection to look for apparent deficiencies: Complete form C-2 "Inspection Verification - Daily Crane Inspection" (see Attachment I). These forms should be kept in each crane with weather tight cabs or located on site in the office trailer. If no deficiencies are found, sign and date under the appropriate column.

However, if any deficiencies are found or any maintenance performed, continue to form C-3 (Daily Inspection Log, Attachment II) and form C-4 (Operator Daily



Maintenance Report (Attachment III). Complete and sign both forms. The “Daily Crane Inspection” (Form C-2, Attachment I) should be completed before commencement of work. Any problems and/or maintenance should be noted on form C-3 (Attachment II) along with the Operator’s Daily Maintenance Report (C-4, Attachment III).

Notify your supervisor of any deficiencies immediately. The superintendent will sign or initial C-4, C-5 to verify he was been informed of the deficiencies. The operator will give a copy of these forms to the superintendent who will forward them to the Jacksonville Equipment Manager so service can be scheduled, if needed.

Operations are prohibited while any safety device fails to work properly. Operational aids must also be in good working order, but operations may be allowed if an operational aid is being repaired and a qualified person has approved a specified temporary alternative measure. (See “Repairs to Operational Aids”).

Wire Rope Inspections: A competent person must conduct a visual inspection before each shift. All Category I, II or III deficiency must be checked by a qualified person for determination if the rope has to be replaced. (See Attachment V for more information.)

- Monthly Inspection: The monthly inspection by a competent person shall be documented on the monthly crane inspection report. These are included in the “Daily Crane Log” booklet. It is the supervisor’s responsibility to ensure the monthly report is completed and that arrangements are made to correct any deficiencies noted on the inspection form. A copy is to sent to the Jacksonville Equipment Manger before the 5th of each month and one copy is kept on file at the jobsite for three months

A documented inspection must also be performed on all wire ropes, including running ropes. (See Attachment V for more information).

- Annual Inspection: The annual inspection is to be performed by a Third Party Certified Crane Inspector. A documented load test will be performed as part of this annual inspection. A copy of the annual inspection must be maintained for 12 months. A copy of the last annual inspection must be available at the jobsite.

At least every 12 months, unless not feasible due to set-up, a more detailed inspection must be documented that includes wire rope that is normally hidden during daily/monthly inspections, etc. (see Attachment V for more details)

- Severe Service: Where the severity of use/conditions is such that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity,



prolonged exposure to a corrosive atmosphere), all crane operations must be stopped until the crane is inspected by a qualified person.

- **Idle Equipment:**
Equipment that is idle for 3 months or more must be inspected by a qualified person using the criteria of “Monthly” inspection.
- **Repaired/Adjusted Equipment:**
Equipment that has had a repair or an adjustment that relates to safe operation must be inspected by a qualified person after such a repair or adjustment has been completed. The inspection must include functional testing of the repaired/adjusted parts and other components that may be affected by the repair/adjustment.
- If manufacturer’s procedures regarding inspections call for more comprehensive or require more frequent inspections than allotted for in this program, then manufacturer’s recommendations must always be followed.
- Four-year internal vessel/floatation device inspection: An inspection performed by a qualified person who has expertise with respect to vessels/floatation devices must be retained for a minimum of four years. A copy of the inspection must be readily available when using cranes on barges.

Crane Maintenance and/or Repair

Maintenance and repair personnel must meet the definition of a qualified person with respect to the equipment and maintenance/repair tasks being performed.

Jobsite superintendents are responsible for ensuring that all inspection and maintenance procedures are being followed at all times while a crane is assigned to his jobsite.

Maintenance, inspection and repair personnel are permitted to operate the equipment only where all of the following are met:

- The operation is limited to those functions necessary to perform maintenance, inspect the equipment, or verify its performance.
- The personnel either:
 - Operate the equipment under the direct supervision of a qualified operator, or
 - Are familiar with the operation, limitations, characteristics and hazards associated with the type of equipment.

Maintenance checks should be performed daily, weekly, and monthly. All maintenance actions should be recorded on Form C-4, Operator Daily Maintenance Report (Attachment III). This includes all maintenance procedures such as topping off fluids, replacing a belt, etc. A copy of the Operator Daily Maintenance Report must be given to the supervisor each day;



Modifications or additions which affect the capacity or safe operation of equipment are prohibited except when all of the following are met.

- The Manufacturer approves the modifications/additions in writing or a registered professional engineer who is a qualified person with respect to the equipment involved. (If the manufacturer refuses or fails to review the proposed modification/addition within 30 days a PE may be used).
- The load charts, procedures, instruction manuals and instruction plates, tags, decals are modified as necessary to accord with the modification/addition.
- And the original safety factor of the equipment is not reduced.

Repairs to Operational Aids

- Category I: Operational aids in this category must be repaired no later than seven (7) days after the deficiency occurs or if parts have to be ordered, seven (7) calendar days of receipt of the parts. Devices that fall into this category include: Boom hoist limiting device, luffing jib limiting device, anti two-blocking device (when required).
- Category II: Operational aids in this category must be repaired no later than 30 calendar days after the deficiency occurs or if parts have to be ordered, the repair must be completed within seven (7) calendar days of receipt of the parts. Operational devices in this category include: Boom angle or radius indicator, Jib angle indicator, Boom length indicator and Load weighing and similar devices.
- Category III: Articulating cranes manufactured after November 8, 2011. Operational aids include: Auto overload prevention device, load weighing device, load moment indicator, or load moment limiter. (Must have at least one); Outrigger/stabilizer position sensor; Hoist drum rotation indicator.

V. REQUIRED CRANE EQUIPMENT

Decals for Cranes (Must be Legible)

- Annual DOT Inspection (Road traveling cranes)
- Rated Capacity
- “Do not operate within 10’ of electrical wires”
- “Warning – Stand Clear of Swing”
- “Extend to Here” (On outriggers to assure full extension)
- “No Step” (On outriggers)
- Rated load capacities, Recommended Operating Speed (Visible to operator while at control station).
- Standard Hand Signals (either on crane or in immediate work area).



Safety Devices for Cranes (Easily Accessible to the Operator)

(Operations must not begin unless all of the devices listed below are in proper working order. Operations must safely stop if any of these devices stops working properly.)

- All cranes **MUST BE** equipped with a level and a load chart and other procedures applicable to the safe operation, such as the operator's manual.
This requirement does not apply to portal cranes, derricks, land cranes/derricks on barges, pontoons vessels or other means of floatation.
- Boom stops, except for derricks and hydraulic booms
- Jib stops (if a jib is attached) except for derricks
- Equipment with foot pedal brakes must have locks.
- Hydraulic outrigger jacks and hydraulic stabilizer jacks must have an integral holding device/check valve.
- Equipment with rails must have rail clamps and rail stops, except for portal cranes.
- All cranes must have a fully charged, currently inspected 10 lb, dry chemical fire extinguisher.
- Horn that is either built into the equipment or is on the equipment and readily available to the operator.
- A record of the last annual inspection must be on the crane or at the jobsite.
- Additional safety devices for Cranes/Derricks on barges:
 - Barge, pontoon, vessel or other means of floatation list and trim device which must be located in the cab or at the operator's station.
 - Positive equipment house lock.
 - Wind speed and direction indicator when a competent person determines wind to be a factor that needs to be considered.

Operational Aids for Cranes

(The devices listed below are required on all equipment unless otherwise specified.)

- Boom hoist limiting device
- Luffing jib limiting device
- Anti two-blocking device
Exception: Does not apply to lattice boom equipment used for dragline, clamshell, magnet, drop ball, container handling, concrete bucket, marine operations that do not involve lifting personnel, and pile driving work. Does not apply to floating cranes/derricks on barges except when hoisting personnel or hoisting over an occupied cofferdam or shaft.
- Boom angle or radius indicator *(Does not apply to articulating cranes)*
- Jig angle indicator *(Does not apply to articulating cranes)*
- Boom length indicator *(Does not apply to articulating cranes.)*
- Load weighing and similar devices *(Does not apply to dragline, clamshell, magnet, drop ball, container handling, concrete bucket, and pile driving work performed on a land crane/derrick on barges.)*



- Outrigger/stabilizer position sensor/monitor (*Equip manufactured after 11/8/2011*)
- Hoist drum rotation indicator (*Equip manufactured after Nov 8, 2011*)

Temporary Alternative Measures for Operational Aids

Operations must not begin unless the listed operational aids are in proper working order, except where an operational aid is being repaired and a specified temporary alternative measure is being used.

Category I

Operational aids in this category must be repaired no later than seven (7) days after the deficiency occurs or if parts have to be ordered, within seven (7) calendar days of receipt of the parts.

- **Boom Hoist Limiting Device**
Temporary Alternative Measure:
 - *Boom angle indicator.*
 - *Clearly mark the boom cable so that it is easily seen by the operator.*
 - *Clearly mark the boom cable so that it is easily seen by the spotter.*
- **Luffing Jib Limiting Device**
Temporary Alternative Measure:
 - *Same as boom hoist limiting device except to limit the movement of the luffing jib rather than the boom hoist.*
- **Anti Two-Blocking Device**
(On Land Cranes/Derricks on barges, an anti two-block is only required when hoisting personnel or hoisting over an occupied cofferdam or shaft.)
Temporary Alternative Measure:
 - *Clearly mark the cable so that it is easily seen by the operator in sufficient time to stop the hoist to prevent two-blocking or use a spotter.*

Category II

Operational aids in this category must be repaired no later than 30 calendar days after the deficiency occurs or if parts have to be ordered, the repair must be completed within seven (7) calendar days of receipt of the parts. Operational Aids with temporary alternative measures are as follows:

- **Boom Angle or Radius Indicator**
Temporary Alternative Measure:
 - *Measure radii or boom angle with a measuring device.*
- **Jib Angle Indicator**
Temporary Alternative Measure:
 - *Ascertain the main boom angle and then measure the radii or jib angle with a measuring device.*
- **Boom Length Indicator (one or more of the following)**
Temporary Alternative Measure:
 - *Mark the boom with measured marks to calculate boom length,*
 - *Calculate boom length from boom angle and radius measurements, or*
 - *Measure the boom with a measuring device.*
- **Load Weighing and Similar Devices**



Temporary Alternative Measure:

- *Use a source or a calculation recognized by the industry.*

Category III – Articulating Cranes Manufactured After November 8, 2011

- Auto Overload Prevention Device, Load Weighing Device, Load Moment Indicator, or Load Moment Limiter (Must have at least one.)

Temporary Alternative Measure:

- *Use a source or a calculation recognized by the industry.*

- Outrigger/Stabilizer Position Sensor

Temporary Alternative Measure:

- Operator must verify that the position of outriggers/stabilizers is correct.

- Hoist Drum Rotation Indicator

Temporary Alternative Measure:

- *Mark the drum to indicate the rotation of the drum and install mirrors or other means necessary for the operator to see the mark.*

Pre-Operation Check or Testing:

The superintendent must notify all affected employees at the beginning of each shift of any needed adjustments or repairs and all alternative measures.

The operator must verify that all controls are in the proper starting position and that all personnel are in the clear.

If there is a service tag, warning tag/sign on the equipment, the operator shall not activate the switch or start the equipment until the sign has been removed by a person authorized to remove it.

VI. LIFT PLANS INCLUDING CRITICAL, TANDEM AND PRE-ENGINEERED

All lifts require planning. Small routine lifts may be as simple as the completion of a thorough Job Hazard Analysis. More complicated lifts may require a Lift Plan. All lifts must be evaluated to determine if a Job Hazard Analysis is adequate or if a Lift Plan is necessary. The lift supervisor will determine the planning requirements. All lifts in Table 1 require a lift plan; some may even be deemed “Critical Lifts”.

JHA (Job Hazard Analysis)

If a Job Hazard Analysis will be used, it must be very thorough and include all phases of assembly, use and disassembly. It may be necessary to break the lift into three or more JHAs. The JHA must address all potential hazards including pinch points, falls, crushing hazards, power lines, etc. and the measures that will be in place to protect the employees.

Lift Plan Determination

Lift plans consist of drawings, specifications and procedures as necessary to accurately access all important load factors and site factors relating to the lift. Sound engineering



and planning is the responsibility of the site superintendent, the lift director and/or project manager associated with the lift. The site superintendent and/or project manager who has responsibility for the lift will make the determination if a lift plan is needed and if it meets the criteria of a Critical Lift.

The following is a list of lifts that would require a lift plan. The site superintendent and/or project manager who has responsibility for the lift should consider the lift for critical-lift status when a “Yes” response is recorded in the following table:

TABLE 1

Yes	No		
		*	Damage would result in a release of radioactive or hazardous material exceeding established Permissible Environmental Limits.
		*	The item if damaged would be irreplaceable or not repairable and is vital to a system, facility, or project operation.
		*	The cost to replace or repair the item, or delay in operations if having the item damaged would have a negative substantial impact on facility or process.
		*	Load or Crane components will be closer to Electrical Source than twenty feet. .
		*	Use of non routine rigging configurations.
		*	The item although non critical is to be lifted above or in close proximity to a critical item.
		**	Load will be over operating facility where personnel may be endangered.
		*	Lifts to and from water or the crane is set up closer to an excavation or body of water than the water is deep.
		**	Personnel in cages/man-baskets attached to equipment not designed for the explicit purpose of lifting people.
		*	Traveling with a load greater than 50% of capacity in a given set-up or as recommended by the manufacturer.
		*	Floating Crane or land crane on barge will be used.
			The operator cannot see the load at all times.
		*	More than one crane/derrick will be supporting the load.
		**	Lift is 80% or more of a mobile crane’s maximum capacity.
		**	Two cranes will be used and the load share equals more than 75% of one or both crane’s chart rating for the maximum radius that will be experienced.
		***	Two cranes or Rebar cage with more than 2 running blocks for multiple lift points.
		**	Structural Steel Operations in which lift (1) exceeds 75% of the crane’s rated capacity or (2) requires the use of more than one crane or derrick. (1926.751)

* Generally is considered a critical lift, depending on the situation and equipment used.

** Required as Critical



*** Required as Engineered

All lifts must follow corporate procedures subject to review, approval and records management policies of the corporate office. This includes the signed reading acknowledgement for individuals performing the actions of the procedure, specifically the Lift Director of the lift and the crane operator.

The following is the minimum level of information required for completing an adequate lift plan:

Elevation View Drawing of the crane, load, and any nearby structures, which could cause interference. This drawing must be made to scale and should note:

- Crane manufacturer(s), model(s), and counterweights(s) if variable
- Boom length(s) and lifting radius(i)
- Maximum load elevation during lifting procedure
- Any jibs or special lifting devices required
- Minimum number of parts of crane hoist line required for lifting the load
- All required slings, shackles, and other rigging components identified by capacity, size, length, and location
- Calculated center of gravity of load.

Plan View Drawing of the crane, load, and nearby structures, which could cause interference. This drawing must be made to scale and should note:

- Route that transport will take to position the load for lifting.
- Initial lifting position of the load including radius. Lifting radius must be accurately determined.
- Final placement position of the load including radius. Lifting radius must be accurately determined.
- Location of the crane(s) including tail swing limits.
- Route that crane(s) will take if walking with the load, as well as associated matting requirements.
- Any utilities located within the work zone. Underground facilities - piping, ducts, etc. - must be accurately located.
- Space may be needed to assemble crane.
- Planning must include load transportation considerations, e.g., how to get the load close enough to the crane. This may be a function of the type of crane being used, for example, since some cranes perform better in certain sectors (quadrants) of operation than others.

Lift Analysis, including

- Tabulation of the gross load weight, including the weight of all blocks and rigging tackle.
- Rigging attachment points and special rigging requirements.
- Gross rated capacity of the crane in the configuration specified.



- Calculation of the percentage of the crane's rated capacity at which the lift will be made.
- Crane-imposed soil loads must be determined. Soil analysis may be needed to verify crane-imposed loads can be safely supported.
- Allowable weather conditions for the lift and the effect of wind loading.
- Sequence of work, including lift-off, steady state conditions, and set-down of load (including positions where there is a shift in the location of the center of gravity, for the pick points).

All potential complicating issues for any lift must be addressed in the lift plan. However, for a relatively simple operation, the above items may provide sufficient information and even be organized onto one drawing.

Lift Safety Survey Procedure

- Review the lift plan (JHA for small, routine lifts) with Superintendent, Subcontractor, and Crane Crew.
- Record Crane Data and Operator/Oiler Certifications/background (as needed).
- Survey boom and accessories gear prior to assembly of crane.
- Evaluate the crane and all critical components.
- Evaluate Ground Conditions.
- Evaluate Site Hazards (Power Lines, Process Lines, etc.).
- Evaluate the below-the-hook lifting devices.
- Evaluate the set up of the crane and the area where the lifts will be performed.
- Evaluate the weight of lifts and the load chart criteria.
- Evaluate the operation of the crane during setup and while performing lifts.
- Provide survey report to superintendent that includes completed forms with any restrictions or plans of actions.

Completion of the Lift Plan:

Once the need for a lift plan has been determined, the superintendent or project manager in charge of the lift will complete the lift plan (Attachment XI). All lift plans must be designed to ensure all the federal requirements are met. The plan must be developed by a competent, qualified person. Once the plan has been completed, the supervisor will decide if the lift meets the criteria of a "Critical Lift".

Critical Lifts:

All lifts deemed as "Critical" must have clearance from the company CFO. These lifts may require additional insurance which must be secured before the lift can occur. All critical lift plans must also be copied to the Corporate Safety Office for review and possible audit.

Engineered Lift

All lifts at or above 90% of the cranes rated capacity for the crane configuration in use or other highly hazardous lifts, (such as one that may require two cranes or rebar cage with more than two running blocks for multiple lift points), must have a PE stamped lift plan.



Rigging drawings must be included. All engineered lift plans must also be copied to the Corporate Safety Office for review and possible audit.

Tandem Lifts:

Lifts requiring two pieces of equipment (two cranes, a crane and a forklift) must have a lift plan. If one crane’s load share is equal to or more than 75% of the crane’s chart rating for the maximum radius, it is deemed a critical lift.

Pre-Lift Checklist

Once the lift plan or Job Hazard Analysis is completed the lift director will review the Pre-Lift Checklist (Attachment VII) to ensure all relative items have been addressed. Once the lift director verifies the completeness of the lift plan, he/she will then forward a copy of the plan to the Corporate Safety Office. All Critical Lifts and Pre-Engineered lifts must be reviewed by the Corporate Safety Office before the lift may proceed.

VII POWER LINE SAFETY

Assembly/Disassembly

No part of the crane, line or load shall be able to reach within 20 feet of a power line during set up. Any exception to this requirement would require a lift plan. Assembly/disassembly below power lines is prohibited, unless the line is de-energized and grounded.

Normal Crane Operations

Before beginning work, identify the work zone and either mark boundaries, use range limiting devices or range control warnings or define the work zone as the area 360 degrees around the equipment, up to the equipment’s maximum working radius.

Determine if any part of the crane, line or load (including rigging and lifting accessories) could get within:

- 20 feet of a power line 350kV or less
- 50 feet for all lines over 350kV but less than 1000 kV

If yes, you must either:

- Option 1: De-energize and ground
- Option 2: Maintain 20 or 50 foot clearance
- Option 3: Use Table A and conduct a planning meeting with crew.

TABLE A

Voltage (kV)	Minimum Clearance Distance (feet)
Up to 50	10
50 to 200	15
200 to 350	20
350 to 500	25
500 to 750	35



750 to 1000	45
Over 1000	As established by the line owner

When encroachment precautions are required under Options 2 or 3, the following requirements must be met:

- Planning meeting with the operator and other affected workers and review the location of the power line(s) and the steps that will be used to prevent encroachment/electrocution.
- If tag lines are used, they must be non-conductive.
- Erect and maintain an elevated warning line, barricade or line of signs, in view of the operator, equipped with flags or similar high-visibility markings, at 20 feet from the power line (Option 2) or at the minimum approach distance under Table A (Option 3)
- Implement at least one of the following:
 - A proximity alarm set to give the operator sufficient warning to prevent encroachment.
 - A dedicated spotter who is in continuous contact with the operator who must:
 - Be equipped with a visual aid to assist in identifying the minimum clearance distance.
 - Be positioned to effectively gauge the clearance distance.
 - When necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.
 - Give timely information to the operator so that the required clearance distance can be maintained.
 - A device that automatically warns the operator when to stop movement, such as a range control warning device.
 - A device that automatically limits range of movement, set to prevent encroachment.
 - An insulating link/device, installed at a point between the end of the load line (or below) and the load.
- If the operator is unable to see the elevated warning line, a dedicated spotter must be used in addition to one of following:
 - A proximity alarm set to give the operator sufficient warning to prevent encroachment.
 - A device that automatically warns the operator when to stop movement, such as a range control warning device.
 - A device that automatically limits range of movement, set to prevent encroachment.
 - An insulating link/device, installed at a point between the end of the load line (or below) and the load.
(All such devices must comply with the manufacturer's procedures for use and conditions of use.)
- All power lines are presumed to be energized unless confirmed to be de-energized by the utility owner/operator AND visibly grounded at the worksite.
- All power lines are presumed to be un-insulated.
- Dedicated spotters shall understand limitations of insulating links, proximity alarms, and range control devices, if used.
- Dedicated spotters shall meet the same training requirements as Signal Persons.
- There must be at least one electrocution hazard warning sticker conspicuously placed in the cab of the crane.



Equipment Operations Closer than Table A Zone

Equipment operations in which any part of the equipment, load line, or load (including rigging and lifting accessories) is closer than the minimum approach distance under Table A to an energized line is prohibited. EXCEPTIONS TO THIS MUST BE APPROVED BY THE CORPORATE SAFETY OFFICE. A “Working Closer Than Table A Approval Form” must be completed along with a detailed lift plan (Attachment VI).

Traveling Under or Near Power Lines With No Load

These procedures may be used along with Table T for equipment traveling under or near a power line on a construction site with no load.

- The boom/mast and boom/mast support are lowered sufficiently to meet the requirements in this section.
- The clearances specified in Table T of this section are maintained.
- The effects of speed and terrain on equipment movement (including movement of the boom/mast) are considered so that those effects do not cause the minimum clearance distances in Table T of this section to be breached.
- If any part of the equipment while traveling will get closer than 20 feet to a power line, a dedicated spotter who is in continuous contact with the operator will be used. The dedicated spotter must:
 - Be positioned to effectively gauge the clearance distance.
 - If necessary, use equipment that enables the spotter to communicate directly with the operator.
 - Give timely information to the operator so that the required clearance distance is maintained.
- When traveling at night or in conditions of poor visibility, additional precautions must be taken to ensure the minimum clearance distances in Table T are not breached. These include but are not limited to:
 - Illumination of the power lines or other means of identifying the location of the lines.
 - Identification and use of a safe path of travel.

TABLE T

Voltage (Nominal, kV, Alternating Current)	While Traveling – Minimum Clearance Distance (feet)
Up to 0.75	4
Over .75 to 50	6
Over 50 to 345	10
Over 345 to 750	16
Over 750 to 1,000	20



VIII SAFE OPERATING PROCEDURES

Lift Supervisor

All lifts requiring a lift plan must be supervised by a competent and qualified person.

Operator

- The operator must not engage in any practice or activity that diverts his/her attention while actually engaged in operating the equipment; such as cell phones (other than when used for signal communication).
- The procedures applicable to the operation of the equipment, including rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions and operator's manual must be readily available in the cab at all times for use by the operator. (*Exception: derricks*)
- Whenever there is a concern for safety, the operator has the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.
- The operator shall not leave the controls while a load is suspended except where all of the following are met.
 - The operator remains adjacent to the equipment and is not engaged in other duties,
 - The load is to be held suspended for a period of time exceeding normal lifting operations
 - The competent person determines it is safe to do so and implements measures necessary to restrain the boom hoist and telescoping, load, swing, and outrigger or stabilizer functions.
 - Barricades or caution lines and notices are erected to prevent all employees from entering the fall zone.
 - **No** employees are permitted in the fall zone.
 - **EXCEPTION:** These provisions do not apply to working gear (such as slings, spreader bars, ladders and welding machines) where the weight of the working gear is negligible relative to the lifting capacity of the equipment as positioned and the working gear is suspended over an area other than an entrance or exit.
- The operator will use three point contact when mounting and dismounting the crane and must always be facing the crane while mounting/dismounting.
- The operator will respond to signals from the designated signal person, if available. If no signal person is required, the operator is responsible for the lift.
- The operator shall maintain a safe distance between power lines and any part of the crane or load.
- If equipment repairs or adjustments are necessary the operator must inform the superintendent in writing.
- Safety devices and operational aids shall not be used as a substitute for the exercise of professional judgment by the operator.



- The equipment must not be operated in excess of its rated capacity or in any manner that would cause it to exceed its rated capacity.
- The weight of the load must be determined by either:
 - Source recognized by the industry
 - Calculation recognized by the industry
 - Or by other equally reliable means
- The operator must begin hoisting the load to determine if it exceeds 75% of the maximum rated capacity of the longest radius that will be used during the lift operation. If it does, the operator must not proceed with the lift until the weight of the load is verified.
- The boom or other parts of the equipment must not contact any obstruction.
- The equipment must not be used to drag or pull loads sideways.
- On wheel-mounted equipment, no loads must be lifted over the front area, except as permitted by the manufacturer.
- The operator must test the brakes each time a load that is 90% or more of the maximum line pull is handled by lifting the load a few inches and applying the brakes. In duty cycle and repetitive lifts where each lift is 90% or more of the maximum line pull, this requirement applies to only the first lift.
- Neither the load nor the boom must be lowered below the point where less than two full wraps of rope remain on their respective drums.
- Traveling with a load (if not prohibited by the manufacturer) must be planned and supervised by a competent person.
- Rotational speed must ensure the load does not swing out beyond the radius at which it can be controlled.
- A tag line must be used to prevent rotation of the load that could be hazardous.
- Brakes must be adjusted to prevent unintended movement.
- Operator(s) must obey any emergency stop signal regardless of who gives it.

Riggers

- All riggers applicable to crane operations must be competent in the inspection of rigging hardware, attachment devices, slings, chokers, wire rope.
- All riggers must be trained on the proper inspection, use, selection and maintenance of all types of rigging apparatuses and the applications they will be used for.
- Qualified riggers must complete a training course that includes classroom (with tests) and hands on demonstration. Only qualified riggers shall be used:
 - In structural steel operations covered under CFR1926.251
 - For Critical Lifts
 - When working under loads is required
 - When performing multiple lift rigging procedures
 - When rigging is needed during assembly/disassembly
 - For the annual comprehensive inspection of wire rope.



Signal Person

- A signal person must be utilized:
 - When the point of operation, meaning the load travel or the area near or at load placement is not in full view of the operator.
 - When the equipment is traveling, the view in the direction of travel is obstructed.
 - Site safety concerns or the operator determines it is necessary.
- Signaling operations will be done only by trained personnel. Each signal person must:
 - Know and understand the types of signals used.
 - Be competent in the application of the type of signals used.
 - Have a basic understanding of equipment operation and limitations.
 - Know and understand the rules and requirements for signal person(s).
 - Demonstrate that he/she meets these requirements through an oral or written test, and through a practical test.
- Signals must be by hand, voice audible or “new” signals.
- When using hand signals the Standard Method must be used, except where infeasible or where an operation or use of an attachment is not covered in the Standard Method. When using non-standard hand signals there must be a meeting between the signal person, the operator and lift director (if applicable) and an agreement must be reached on the type of hand signals that will be used.
- Hand signal charts must be either posted on the equipment or conspicuously posted in the vicinity of the hoisting operations.
- The signals used must be appropriate for site conditions.
- During operations the ability to transmit signals between the operator and the signal person must be maintained. If the ability is interrupted, the operator must safely stop operations requiring signals until it is reestablished and a proper signal is given and understood.
- If the operator becomes aware of a safety concern and needs to communicate with the signal person, the operator must safely stop operations. Operations must not resume until the operator and signal person agree that the problem has been resolved.
- The operator will take signals from only one signal person at a time, except the signal to stop.
- All directions given to the operator must be from the operator’s perspective.
- The signal person and the operator may use radios with a designated channel set up just for lifts in situation where the operator’s vision may be obstructed.
- Where a signal person is in communication with more than one crane/derrick a system must be used for identifying the crane/derrick each signal is intended for.
- Prior to beginning operations, the operator, signal person and lift director (if used) must contact each other and agree on the voice signals that will be used.
- Each voice signal must contain three elements given in the following order: (1) function (such as hoist, boom, etc.), direction and/or (2) speed; function, (3) stop command.



- The operator, signal person and lift director (if there is one) must be able to communicate in the language used.

Keeping Clear of the Load

- No person shall be permitted to stand or pass under a suspended load.
- While the operator is not moving a suspended load, no employee must be within the fall zone, except for employees:
 - Engaged in hooking, unhooking or guiding a load
 - Engaged in the initial attachment of the load to a component or structure, or
 - Operating a concrete hopper or concrete bucket.
- When employees are engaged in hooking, unhooking, or guiding the load, or in the initial connection of a load to a component or structure and are within the fall zone, all of the following criteria must be met:
 - The materials being hoisted must be rigged to prevent unintentional displacement,
 - Hooks with self-closing latches or their equivalent must be used (Exception: J hooks are permitted to be used for setting wood trusses).
 - The materials must be rigged by a qualified rigger.
- Only employees needed to receive a load are permitted to be within the fall zone when a load is being landed.
- During a tilt-up or tilt-down operation, only employees essential to the operation are permitted in the fall zone, but no employee must be directly under the load.
- Boom free fall is prohibited when any employee is in the fall zone of the boom or load, and load line free fall is prohibited when any employee is directly under the load.

Hazardous Conditions/Areas

- When crane operations create a hazardous condition from the crane's exhaust fumes entering into nearby confined spaces or excavations, air monitoring will be conducted to ensure employees are not exposed to concentrations of toxic fumes above the PEL.
- Entry to hazardous areas shall be restricted with warning line, control lines, or barricades if feasible. When unfeasible or when using a crane on a barge, a combination of warning signs and high visibility markings may be used on the equipment that identify the hazard area.
- Employees shall be trained how to recognize struck by, pinch/crush hazard areas posed by rotating superstructure and how to understand warning signs on signs and equipment.
- Employees must ensure that the operator is aware when he/she is going to a hazardous area out of the operator's sight.
- The operator must not rotate a superstructure until he is informed by a prearranged signal system that the employee who entered an out of sight hazardous location is in a safe position.
- A system must be instituted to coordinate operations when any part of a crane/derrick is within the working radius of another crane/derrick.



Fall Protection

- For non assembly/disassembly work: Fall protection is required for employees who are on a walking/working surface with an unprotected side or edge more than six (6) feet above a lower level with the following exceptions:
 - Moving point to point along a horizontal lattice boom that has been lowered to the ground and supported.
 - While at a work station or going to and from a work station.
 - Employee is at or near the draw-works (when the equipment is running)
 - In the cab
 - On the deck.
- For assembly/disassembly work: Fall protection is required for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above the lower level, except when the employee is:
 - At or near draw works (when the equipment is running),
 - In the cab or
 - On the deck.
- Anchorages may be any substantial part of the boom or to any substantial piece on the equipment (using the correct fall protection equipment).
- A personal fall arrest system is permitted to be anchored to the crane/derrick's hook (or other part of the load line) where all of the following conditions are met:
 - A qualified person has determined that the set-up and rated capacity of the crane/derrick (including the hook, load line and rigging meets or exceeds the requirements in CFR 1926.502(d) (15).
 - The equipment operator must be at the work site and informed that the equipment is being used for that purpose.
 - No load is suspended from the load line when the personal fall arrest system is anchored to the crane/derrick's hook or other part of the load line).
- Each employee who may be exposed to fall hazards while on, or hoisted by equipment, must be properly trained on the fall protections requirements of this program and the applicable fall protection standards.

Hoisting Personnel

The use of equipment to hoist employees is prohibited except where it can be demonstrated that the erection, use and dismantling of conventional means of reaching the work area, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform, or scaffold would be more dangerous, or is not possible because of the project's structural design or worksite conditions. A qualified and competent supervisor specifically responsible for the lift shall make this determination.

A critical lift plan is required when one or more employees are hoisted (Attachment XI). For each personnel lifting procedure, the lift director shall authorize the use of a crane-suspended work platform and shall attest to the need for the operation through a written



justification attesting to that need. A statement describing the operation and the time frame shall be signed by the authorizing supervisor and copied to the Jacksonville Corporate Safety Office (Attachment VIII). The original statement shall be maintained at the jobsite. A designated lift director shall be assigned for the entire personnel lifting operation. All critical lift procedures must be followed.

The designated lift director shall complete a Pre-Lift Checklist for Suspended Personnel Platforms (Attachment IX). Only certified operators and qualified riggers will be used for any personnel lifting operations. The Pre-lift Checklist for Suspended Personnel Platforms shall be completed along with a Critical Lift Plan. These must be copied to the Corporate Safety Office at least 24 hours prior to the lift date.

Proof Testing

- At each new jobsite prior to hoisting personnel, the personnel lift platform, rigging and hook block shall be proof tested by a qualified inspector to 125 percent of the personnel platform's rated capacity.
- The platform must be lowered by controlled lowering, braked and held in a suspended position for a minimum of five minutes with the test load suitably distributed on the personnel platform.
- After proof testing a competent person must inspect the platform and rigging to determine if the test has been passed. Any deficiencies revealed by inspection, or by the proof test, must be corrected and another proof test conducted.
- Any modification or repair to the personnel lift platform or rigging requires retesting.
- Personnel hoisting must not be conducted until the competent person determines that the platform and rigging have successfully passed the proof test.
- Test reports kept on file and readily available to appointed personnel.

Pre Lift Meeting (Attachment X)

- A pre lift meeting will be held prior to the trial lift to review the procedure. Attendees shall include a qualified operator, a qualified signal person, qualified riggers, persons to be lifted, and the lift director.
- All procedures for leaving and entering the personnel platform and the points of entry/exits shall be reviewed along with the emergency rescue plan. This meeting shall be held at each new work location and shall be repeated for any employees newly assigned to the operation. Special precautions will be reviewed as necessary for personnel performing work from the suspended platform.

Pre Lift Set-Up Inspection

The lift director and the operator shall determine:

- The crane is uniformly level within 1 percent of level grade and on firm footing.
- Outriggers or stabilizers when equipped are fully extended and locked. The amount of extension must be the same for all outriggers and stabilizers and in accordance with manufacturer procedures and load charts.



- Hoisting personnel within 20 feet of a power line that is up to 350kV and hoisting personnel within 50 feet of a power line that is over 350 kV is prohibited except for work covered under CFR 1926 Subpart V “Power Transmission and Distribution.
- The total weight of the loaded personnel lift platform (including personnel) and related rigging does not exceed 50 percent of the crane rating under the planned conditions of use.
- The personnel lift platform is not loaded beyond its rated load capacity.
- The number of employees occupying the personnel platform does not exceed the number required for the work being done or the manufacturer’s recommendation, whichever is less.

Personnel platforms used to hoist employees using a mobile crane must meet the following requirements:

- Must be capable of supporting, without failure, its own weight and at least five (5) times the maximum intended load.
- Must have a plate or other permanent marking specifying its empty weight and its rated load capacity or maximum intended load.
- Anchorage points within the platform for attaching personnel fall protection lanyards.
- The platform operator’s manual must be in the platform.
- Platform access gates, including sliding or folding types, shall have a positive acting device to restrain the gate from accidental opening. Swinging type access gates shall open only to the interior of the personnel lift platform.
- Designed by a qualified person familiar with structural design and attachment/suspension system used for hoisting personnel.
- Designed to minimize tipping of the platform due to movement of employees.
- Welding of the personnel platform and its components must be performed by a certified welder familiar with the weld grades, types and materials specified in the weld design.
- When the occupied personnel platform is in a stationary working position, the load and boom hoist brakes, swing brakes and operator actuated secondary braking and locking features, (such as pawls or dogs) or automatic secondary brakes must be engaged.
- In addition to the use of hard hats, employees must be protected by overhead protection on the personnel platform when employees are exposed to falling objects.
- Must be used only for employees, their tools and the materials necessary to do their work. Platforms must not be used to hoist materials or tools when not hoisting personnel, (except during trial lifts). Materials must be secured to prevent displacement and evenly distributed within the confines of the platform while it is suspended.
- **EXCEPTION:** Boatswain’s Chairs may be used to hoist employees in certain situations with pre-approval from the Corporate Safety Office. Applications are limited to:
 - Into and out of drill shafts that are up to 8 feet in diameter.
 - Pile driving operations.



- Solely for transfer to or from a marine worksite.
- Storage-tank (steel or concrete) shaft and chimney operations.

Platform Suspension System

- Wire rope, shackles, rings master links and other rigging hardware must be capable of supporting without failure at least five times the maximum intended load applied or transmitted to that component.
- Sling suspension systems shall utilize a master link or safety type shackle to connect the personnel lift platform to the load block to ensure the load is evenly divided.
- The sling, bridle and other associated rigging included in the suspension system attaching the personnel lift platform to the hoist line shall not be used for any other purpose when not hoisting personnel.
- Hooks used in the connection between the hoist line and the personnel lift platform (including hooks on overhaul ball assemblies, lower load blocks, bridle legs, or other attachment assemblies or components) must be of a type that can be closed and locked when attached, or of a type that can be closed and locked eliminating the throat opening.
- Shackles used in any part of the suspension system shall be of the alloy anchor type (bolt-type shackle with nut and cotter pin or the screw type with a screw pin secured from accidental removal).
- Other detachable devices, if used, must also be of the type that can be closed and locked to the same extent as hooks or shackles.
- All eyes in wire rope slings shall be fabricated with thimbles.
- Wire rope clips wedge sockets, or knots shall not be used in suspension system sling assemblies.
- Synthetic webbing, natural or synthetic fiber rope shall not be used for the suspension systems.
- Chain sling suspension systems shall use a minimum of grade 80 chain.

Trial Lifts

- Immediately prior to each shift, before personnel initially enter the personnel platform, the operator and signal person shall conduct a trial lift. The trial lift shall include:
 - Loading the unoccupied platform to at least the maximum anticipated load.
 - Making the trial lift from the location where personnel will enter the platform to each location where the platform will be hoisted and positioned.
 - Ensuring crane systems, controls, operator aids and safety devices are activated and fully operational.
 - Ensuring no interferences exist.
 - Ensuring the lift will not exceed 50 percent of the equipment's rated capacity at any time during the lift.
 - The load radius to be used during the lift has been accurately determined.
- The trial lift shall be repeated whenever:
 - A mobile crane is moved and set up in a new location or returned to a previously used location.



- When the lift route is changed, unless the operator determines that the safety of the hoisted personnel is not affected.
- When a different operator is assigned to the lift.

Pre-lift Inspection

- Immediately after the trial lift, prior to lifting personnel, the competent person must:
 - Conduct a visual inspection of the crane, rigging, base support on ground and the personnel lift platform. Any defects that are a safety hazard shall be corrected prior to hoisting.
 - Confirm the test weight has been removed.

Lifting Personnel

- Prior to hoisting personnel with a personnel lift platform, the platform shall be lifted a few inches and inspected by a competent person to ensure that it is secure and balanced.
- The following must be determined to exist by a competent person before the lift of any personnel proceeds:
 - No hazardous conditions exist with the platform and its rigging.
 - The hoist line is not wrapped around any part of the platform.
 - Hoist ropes are free of kinks or other deficiencies.
 - Multiple-part lines are not twisted around each other.
 - The primary attachment point is centered over the platform.
 - Ropes are properly seated on drums and sheaves.
 - The crane is within 1% of level.
 - The crane has an anti two-block installed and functional.
- Any problems found during the trial lift and subsequent inspection(s) that creates a safety hazard must be corrected before hoisting personnel.
- Employees being hoisted or working in a personnel lift platform must:
 - Remain in continuous sight of and in direct communication with the operator or signal person. If visual contact with the operator is not possible, and the use of a signal person would create a greater hazard for that person, direct communication alone (such as a two-way radio) may be used.
 - Keep all body parts inside the suspended platform during raising, lowering, and horizontal movement to avoid pinch points. *(This provision does not apply to an occupant of the platform when necessary to position the platform or while performing the duties of a signal person).*

IX SUPPLEMENTAL REQUIREMENTS-LAND CRANES/DERRICKS ON BARGES

- The work area may be controlled by either erecting control lines, warning lines or similar barriers, or by the combination of warning signs and high visibility markings on the equipment that identify the hazard area. Control measures must be maintained and employees must be trained to understand what the markings signify.
- “Keeping Clear of the Load” is not applicable to the section.



- These additional safety devices are required:
 - Barge, pontoon, vessel or other means of floatation list and trim device which must be located in the cab or at the operator's station.
 - Positive equipment house lock.
 - Wind speed and direction indicator when a competent person determines wind to be a factor that needs to be considered.
- Operational Aids
 - An anti two-block is required only when hoisting personnel or hoisting over an occupied cofferdam or shaft.

X. WIRE ROPE

Selection & Installation

- Selection of replacement wire rope must be in accordance with the recommendations of the wire rope manufacturer, the equipment manufacturer or a qualified person.
- Wire rope must be compatible with the safe functioning of the equipment.
- Fiber core ropes must not be used for boom hoist reeving, except for derricks.
- Rotation resistant ropes may be used for boom hoist reeving only when the following requirements are met:
 - The drum must provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used.
 - Boom free fall is prohibited.
 - Requirements of ASME B30.5-2004 sections 5-1.3.2(a)(2) through (a)(4), (b) and (d) incorporated by reference, see 1926.6) except that the minimum pitch diameter for sheaves used in multiple rope reeving is 18 times the nominal diameter of the rope used (instead of the value of 16 specified in section 5-1.3.2(d).
 - All sheaves used in the boom hoist reeving system must have a rope pitch diameter of not less than 18 times the nominal diameter of the rope used.
 - The operating design factor for the boom hoist reeving system must be not less than five.
 - The operating design factor for these ropes must be the total minimum breaking force of all parts of rope in the system divided by the load imposed on the rope system when supporting the static weights of the structure and the load within the equipment's rated capacity.
 - When provided, a power-controlled lowering system must be capable of handling rated capacities and speeds as specified by the manufacturer.

Definitions of Wire Rope

- Type I Rotation Resistant Wire Rope - standard rope constructed to have little or no tendency to rotate or, if guided, transmits little or no torque. It has at least 15 outer



- strands and comprises an assembly of at least three layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.
- Type II Rotation Resistant Wire Rope - stranded rope constructed to have significant resistance to rotation. It has at least 10 outer strands and comprises an assembly of two or more layers of strands laid helically over a center in two or three operations. The direction of lay of the outer strands is opposite to that of the underlying layer.
 - Type III Rotation Resistant Wire Rope - stranded rope constructed to have limited resistance to rotation. It has no more than nine outer strands, and comprises an assembly of two layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.

Requirements:

- Types II and III with an operating design factor of less than 5 must not be used for duty cycle or repetitive lifts.
- Rotation resistant ropes (including Types I, II, III) must have an operating design factor of no less than 3.5.
- Type I must have an operating design factor of no less than 5, except where the wire rope manufacturer and the equipment manufacturer approves the design factor in writing.
- Types II and III must have an operating design factor of no less than 5 (for non-duty, non-repetitive lifts) except where the following requirements are met:
 - A qualified person must inspect the rope. The rope must be used only if the qualified person determines that there are no deficiencies constituting a hazard. In making this determination, more than one broken wire in any one rope lay must be considered a hazard.
 - Operations must be conducted in such a manner and at such speeds as to minimize dynamic effects.
 - Each lift made must be recorded in the monthly and annual inspection documents. Such prior uses must be considered by a qualified person in determining whether to use the rope again.
- Rotation resistant ropes must not be used for boom hoist reeving, except where the following requirements are met.
 - Rotation resistant ropes may be used as boom hoist reeving when load hoists are used as boom hoists for attachments such as luffing attachment or boom and mast attachment systems. Under these conditions all of the following requirements must be met.
 - The drum must provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used.
 - The requirements in 1926.1426(a) (irrespective of the date of manufacture) and 1926.1426(b).
 - The requirements of ASME B30.5-2004 section 5-1.3.2(a)(2) through (a)(4), (b) and (d) (incorporated by reference, see 1926.6) except that the minimum pitch diameter for sheaves used in multiple rope reeving is 18 times the



nominal diameter of the rope used (instead of the value of 16 specified in section 5-1.3.2(d)).

- All sheaves used in the boom hoist reeving system must have a rope pitch diameter of not less than 18 times the nominal diameter of the rope used.
- The operating design factor for the boom hoist reeving system must be not less than five.
- The operating design factor for these ropes must be the total minimum breaking force of all parts of rope in the system divided by the load imposed on the rope system when supporting the static weights of the structure and the load within the equipment's rated capacity.
- When provided, a power-controlled lowering system must be capable of handling rated capacities and speeds as specified by the manufacturer.
- Wire rope clips used in conjunction with wedge sockets must be attached to the unloaded dead end of the rope only, except that the use of devices specifically designed for dead-ending rope in a wedge socket is permitted.
- Socketing must be done in the manner specified by the manufacturer of the wire rope or fitting.
- Prior to cutting a wire rope, seizing must be placed on each side of the point to be cut. The length and number of seizing must be in accordance with the wire rope manufacturer's instructions.

XI MANDATORY TRAINING REQUIREMENTS

Understanding must be verified either by oral or written examinations and/or through demonstration.

Overhead Power Lines

Each operator and each crew member assigned to work with equipment in close proximity to a power line must receive training on the following:

- Procedures to be followed in the event of electrical contact with a power line:
 - Information regarding the danger of electrocution from the operator simultaneously touching the equipment and the ground.
 - Importance of the operator's safety of remaining inside the cab except when there is an imminent danger of an explosion, or other emergency that necessitates leaving the cab.
 - The safest means of evacuating from energized equipment.
 - The danger of potentially energized zone around the equipment (step potential).
 - The need for crew in the area to avoid approaching or touching the equipment and/or the load.
 - Safe clearance from power lines. (Table A)
- All power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be de-energized and visibly grounded at the worksite.



- Power lines are presumed to be un-insulated unless the utility owner/operator or a registered engineer who is a qualified person with respect to electrical power transmission and distribution confirms that a line is insulated.
- Limitations of an insulating link/device, proximity alarm, and range control (and similar) device, if used.
- The procedures to be followed to properly ground equipment and the limitations of grounding.

Signal Persons/Designated Spotters

- Types of Signals Used
- Application of the types of signals used
- Basic equipment operations and limitations, including crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads.
- Standard Hand Signals
- Duties and Responsibilities of Signal Person(s)
- Hazards such as Electrical, Struck By, Pinch/Crush Hazards

Fall Protection:

- Must be trained on all applicable sections of Fall Protection in this program.
- Must be trained on applicable fall protection standards.

Struck By/Pinch/Crush Hazards

- Swing radius hazards

Operators:

- Qualified or Certified by nationally accredited organization

Competent Persons and Qualified Persons

- Relative rules and regulations applicable to their roles.

Crush Points

- Keep clear of holes, and crush/pinch points
- Rotating superstructure hazards

Lock, Tag and Try

- Tag out and start up procedures

Wire Rope Inspections:

- Inspection Criteria and Frequency

XII DEFINITIONS

Accessory Gear



A secondary part of the crane or crane component which contributes to the overall function of the crane which includes jibs, jib assemblies, outriggers, sheave assemblies, and counter weights.

Anti Two-Block Device

A warning or damage prevention feature which alerts the operator before the load block or ball assembly makes contact with the upper boom sheave assembly.

Below the Hook Lifting Device

Rigging used in conjunction with the crane to attach the load to the crane hook assembly which includes but is not limited to such items as wire rope slings, lifting beams, skookum blocks, shackles and web slings.

Certified Agent

The manufacturer, or a person who is currently registered as a professional civil, mechanical, or structural engineer by the state in which the Milton J. Wood project is located and is knowledgeable in the structure and use of the equipment.

Certification of Crane Operators (CCO)

The National Commission for the Certification of Crane Operators (CCO) is an independent not-for-profit corporation formed to establish and administer a nationwide program certification for operators. This organization establishes set standards for measuring the knowledge and proficiency for the safe operation of crane equipment.

Functional

A safety device shall be in use and operating while the crane is in use. Functional does not mean merely “capable of performing” for purposes of these safety requirements.

Jib

An extension attached to the boom point to provide added boom length for lifting specified loads.

On-Rubber Pick and Carry

A lift made in conjunction with the manufacturer’s load chart without the use of outriggers in which the load is lifted and moved under the power of the crane unit.

Rolling Outriggers

An accessory component that is attached to the outrigger assembly in lieu of outrigger pads which allow for pick and carry with the outriggers extended. Use of this equipment requires that the component and load chart is approved by the manufacturer or certified agent.

Qualified Person



A person, who by possession of a recognized degree or certificate of professional standing, or who, by extensive knowledge, training and experience, has successfully demonstrated the ability to solve problems relating to the subject matter and work.



Attachment II

DAILY INSPECTION LOG

Month _____ Year _____

Crane No. _____

INSTRUCTIONS:

1. Indicate in item (3 & 4) if reports were made (yes) or none necessary (no).
2. If report is made (yes) give subject number as listed on Form C 2.
3. Column (6) if for further identification of subject or remarks.

(1) DAY OF MONTH	(2) SIGNATURE OF OPERATOR	(3) PRE-TRIP CHECK		(4) POST-TRIP CHECK		(5) IF YES SUB. NO.	(6) REMARKS
		YES	NO	YES	NO		
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
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22							
23							
24							
25							
26							
27							
28							
29							
30							



Attachment IV

MONTHLY CRANE INSPECTION REPORT

Date _____

To: _____ (Superintendent)

From: _____ (Operator or Inspector)

This will verify that I have inspected Crane No. _____ located at _____

**All of the following have been inspected and are in proper working order unless checked.
 Note: A check mark indicates further inspection or maintenance is required.
 No check means OK!**

- 1. Limit Switches, stops and bumpers.
- 2. Leakage in lines, tanks, valves, pumps.
- 3. Hooks, chain, rope. Hooks with throat openings of 15% or more, or hook twists of 10 degrees or more, must be removed from service.
- 4. Deformed, cracked or corroded members.
- 5. Loose bolts and rivets.
- 6. Cracked or worn sheaves or drums, pins, bearings, shafts, gears, rollers, locking or clamping devices, hook roller brackets, removable outrigger attachments, lugs and welds.
- 7. Brake linings, pawls, ratchets and sprockets.
- 8. Contacts on controller, limit switches, pushbuttons.
- 9. Travel, Braking, Locking devices.
- 10. Tested anti-block system (where applicable).
- 11. List the indicators installed on this crane (such as load, boom angle, wind, two-block system _____ and any other:) _____
- 12. Date of last load test _____. Date of last calibration or adjustments on any two-block warning or prevention device _____.
- 13. Boom and jib for straight without any evidence of physical damage, such as cracking, bending, or any other deformation of welds.
- 14. Power plants operating properly.
- 15. No excessive wear on drive sprockets and/or chain stretch.
- 16. Counterweight is secure.
- 17. Identification number is permanently and legibly marked on jibs, blocks, equalizer beams, and all other accessories.

FOR SHOP, OVERHEAD AND GANTRY CRANES:

The type of Fire Extinguisher _____ Last date on tag _____

What is the rated load posted on each side of crane? _____

Can circuit-breaker be operated from floor or ground? _____

If overhead, is crane equipped with a dead-man control? _____

NOTE NCR PAPER - PUT WRAP-AROUND COVER BETWEEN DUPLICATE COPY & NEXT SET ORIGINAL - FORWARD TO SUPERINTENDENT 1ST WORKING DAY OF EACH MONTH

FORM C5



Attachment V

WIRE ROPE INSPECTION

INSPECTION FREQUENCY:

Shift Inspection: Before each shift.

Monthly Inspection: All wire ropes, including running ropes - Documented.

Annual Inspection: At least every 12 months, unless not feasible due to set-up. More detailed, including wire rope that is normally hidden during daily/monthly inspections, etc. - Documented.

DEFICIENCY CATEGORY:

Category I

- A. Significant distortion of the wire rope structure such as kinking, crushing, un-stranding, bird caging, signs of core failure, or steel core protrusion between the outer strands.
- B. Significant corrosion.
- C. Electric arc (from a source other than power lines) or heat damage.
- D. Improperly applied end connections.
- E. Significantly corroded, cracked, bent or worn end connections (such as from severe service).

If a Category I deficiency is identified, an immediate determination shall be made by a qualified person as to:

- Replacement of the wire rope, or
- If the deficiency is localized, the wire rope may be severed at the bad spot and may be continued to use.

Category II

Deficiencies in the category are:

Visible broken wires, as follows:

- A. In running wire ropes: six (6) randomly distributed broken wires in one rope lay or three (3) broken wires in one strand in one rope lay.
- B. In rotation resistant ropes: two (2) randomly distributed broken wires in six (6) rope diameters or four (4) randomly distributed broken wires in 30 rope diameters.
- C. In pendants or standing wire rope: More than two broken wires in one rope lay located in rope beyond end connections and/or one or more broken wire in a rope lay located at an end connection.

If a Category II deficiency is identified an immediate determination shall be made by a qualified person as to what action is required. Based on manufacturer recommendations, either remove or monitor the wire rope for continued deterioration.



The qualified person:

- Determines when to replace the wire rope (no more than 30 days after the deficiency is identified).
- Assesses the deficiency in light of the load and other conditions of use and determines it is safe for continued use.
- Establishes the parameters of use.

The qualified person's finding and procedures must be documented and all operators who conduct shift inspections must be notified.

Category III

Category III deficiencies are:

- Electrical contact to a power line.
- Core protrusion or other distortion indicating core failure in rotation resistant wire rope.
- Broken strand.

If a Category III deficiency is identified, operations involving use of the wire rope shall be prohibited until either:

- Wire rope is replaced (ALWAYS required with power line contact) or
- Deficiency is localized and problem is corrected.



Attachment VI

WORKING CLOSER THAN TABLE A APPROVAL FORM

Date: _____

Jobsite: _____

Why is it infeasible to stay outside the Table A Zone? _____

Why is it infeasible to deenergize and ground? _____

Power line owner – sets minimum approach distance: _____

Registered PE set minimum approach distance: _____

Variance Application: (Check One)

___ Assembly/Disassembly Operation.

___ Equipment Operation/Operator is able to see elevated warning line.

___ Equipment Operation/Operator is Unable to see elevated warning line.

Mandatory Requirements

- Planning meeting with employer and utility owner/operator (or PE) to determine the procedures to be followed to prevent electrical contact and electrocution. At a minimum the procedures must include:
 - If the power line is equipped with a device that automatically reenergizes the circuit in the event of a power line contact, before the work begins, the automatic reclosing feature of the circuit interrupting device must be made inoperative if the design of the device permits.
 - A dedicated spotter who is in continuous contact with the operator. The dedicated spotter must:
 - Be equipped with a visual aid to assist in identifying the minimum clearance distance.
 - Be positioned to effectively gauge the clearance distance.
 - If necessary, use equipment that enables the spotter to communicate directly with the operator.
 - Give timely information to the operator so that the clearance is maintained.
- An elevated warning line, or barricade (not attached to the crane) in view of the operator, equipped with flags or similar high-visibility markings.
- Insulating link/device installed at a point between the end of the load line or below the load.
- Nonconductive rigging if applicable.
- Device that automatically limits the range of motion if equipped.
- Non conductive tag line(s).



- Barricades – 10 feet from equipment to keep unauthorized personnel from entering the work area.
- Workers, other than the operator, are prohibited from touching the load line above the link/device and crane. Operators remotely operating the equipment from the ground must use either wireless controls that isolate the operator from the equipment or insulating mats that insulate the operator from the ground.
- Only essential personnel are permitted in the area of the crane or the load.
- The equipment must be properly grounded.
- Insulating line hose or cover-up must be installed by the utility owner/operator except where such devices are unavailable for the line voltages involved.
- The procedures must be immediately available on site.
- The equipment user and the utility owner/operator (or PE) must meet with the equipment operator and other workers that will be in the area of the equipment or the load to review the procedures that will be implemented.

Person Responsible for Implementation of Procedures: _____

Job Site Supervisor (if different from above): _____

Utility Owner/Operator: _____

PE (if applicable): _____



Attachment VII

Pre-Lift Checklist

Planners and reviewers use this checklist to confirm completeness of the lift plan. These items are included as a guide but should not be interpreted as being all-inclusive in the analysis and preparation of a Critical or Pre-engineered Lift. Sound engineering and planning is still the responsibility of the engineer or project manager associated with the lift.

Never vary from the approved Lift Plan without a full review and approval by the Corporate Safety Office.

Sub-surface and Foundation Issues

- What are the maximum loads imposed by the cranes on the soil/facility floor? Is the soil-bearing capacity adequate to safely support crane loads? What is the assumed load distribution through the timber mats?
- Has a soil adequacy of the area under the path of the tailing crane been determined?
- What pressures will be imposed on any underground structures (sewer lines, etc.)?

Transportation and Interim Storage Issues

- Has the lift director and the jobsite superintendent been notified of movement of the load to the lifting site (notification at the discretion of the lift director)? Are any permits required? Has load placement been discussed?
- Has the load transport route to the lift site been checked for overhead obstructions? Are there any bridges, culverts or pipe ways to cross? Are they structurally capable of safely supporting the transported loads?
- Where will the crane be assembled? What route will the crane take from the assembly site to the lift site?
- How will the load transport get to the lift site? How will the transport be removed once the load is lifted?

Crane Issues

- What is the minimum actual clearance between the load and the boom during the lift?
- Has the radius been double-checked by measuring in the field?
- Will the crane load change as the lift progresses?
- How many parts of line are needed? How was this determined?
- Will spreaders and other rigging hardware remain safely clear of the boom, the load, and other objects at all times during the lifting operation?
- If a tailing crane has to “walk,” is the path level properly compacted?
- What efforts have been made to identify obstructions in the lift path and swing path? How accurate are these efforts?
- Can the outriggers be deployed as per manufacturer’s load chart requirements?
- Can rigging personnel safely control and manipulate the load throughout the lifting path?



Pre-Lift Checklist (cont)

- Are the crane's operational safety alarms functioning properly? How, when, and were they tested?
- Have plans been developed to monitor the crane's stability during lift?
- Has a procedure been developed to monitor plumbness of load lines (in two directions)?
- Has a drawing showing the elevation of the crane during the lift as well as all clearances been developed (boom to load, and load to other obstructions)?
- Have all repairs or modifications to the crane been made in accordance with manufacturer's written instructions, and are they so certified?
- How will the crane's electronic safety alarms and interlocks be checked for operation and accuracy?
- Has the agreed nondestructive examination (NDE) of crane components been done and documented?
- Is the lift line new or has a piece of the lift line been pull-tested?
- Has a procedure to monitor tail swing of the crane during lifting operations been developed?
- Is the correct crane load chart for current lift conditions in the cab?
- Is there adequate headroom to ensure that the manufacturer's minimum allowable two-block distance is maintained for the configuration of the reeve used?

Load Weight & Center of Gravity Issues

- How was the weight determined when developing the lift plan? Has any margin been added to calculated weights?
- Has an accurate load weight determination been made before the lift to confirm calculated weight? How was this performed?
- Has the weight of any jibs, auxiliary boom heads, etc. been considered in the calculations?
- Has all the rigging hardware been included in the weight calculations?
- Who has determined the center of gravity? How was it determined? Is it marked on the load? Is it shown on the lift plan drawings?
- Is there anything inside the load that could shift during the lift?
- Has snow or ice accumulated on the load since the weight was determined?
- Is the surface area large enough to create unusual control problems in the wind?
- Has all hydrotest water been drained from the load (vessel) before lifting?
- If lifting a dressed device, has the insulation absorbed any water?
- If lift is of an existing item (being removed or demolished), have all anchor bolts and fasteners been removed?

Rigging Issues

- Has all rigging hardware been selected to work within the manufacturer's Safe Working Load?
- Does the lift require qualified riggers?
- Have sling angles flatter than 45 degrees been avoided, and have the slings or chains and shackles been chosen to allow for increased loads due to sling angles?
- Have softeners been used to protect the rigging where sharp corners could cause damage?



Pre-Lift Checklist (cont)

- Does the rigging provide positive control of the load to prevent slipping or shifting?
- Are shackles and hooks always used in such a manner as to avoid side bending in the hardware?
- Have qualified personnel designed and tested special rigging hardware in accordance with regulations?
- Is there a plan for removing lifting tackle from the load after it is erected?
- How will the shackle pins be removed after the lift is complete? Will a pin extractor be required, and if so, manual or hydraulic?
- What level of inspection have the shackles, hooks, slings, etc. been subjected to? Will a pull-test be conducted on the slings?
- Are the shackle pins and lifting eyes compatibly sized?
- How will side loading/bending of shackles and hooks be avoided?
- Have all rigging components such as shackles, hooks, and slings, been inspected for signs of damage or deterioration before use?
- Is the rigging arranged to have the crane hook directly over the load's center of gravity with the load hanging level?

Roles & Responsibility Issues

- Who is the Lift Director in charge of the lift? What are their qualifications? Who will give the signals to the operator?
- Has the Corporate Safety Office been involved in the lift planning process or lift plan review?
- Has a PE been involved in the lift planning process or lift plan review?
- Has the lift plan been reviewed with the crane operator, riggers, and others involved in the lifting operation? Has the plan been reviewed with supervisors and workers in adjacent areas?
- Has a chain of command to operate during the lift been established, and how are the involved people identified?
- Has a final pre-lift safety meeting been scheduled?
- Are there any language difficulties? Does everyone speak (fluently) the same language?

Operational Envelope Issues

- What are the limits on wind speed for making the lift? How and where will wind speed be measured?
- Is cold weather likely to affect the lift? Is it necessary to derate the crane or any part of the rigging equipment due to low temperatures?
- Is adequate lighting equipment available for use, if the lifting operation should extend beyond normal daylight hours?
- Are required personnel (operations, safety, other) available if the lift operation should extend beyond normal hours?



Pre-Lift Checklist (cont)

- Are there overhead power lines in the operating area? If so, have minimum clearance requirements been established and has a dedicated signal person been assigned to monitor boom, load and/or load line position relative to the power line?
- If operating near overhead power lines, are nonconductive taglines being used?

Emergency Procedural Issues

- Have emergency procedures been determined and communicated to all personnel involved in the lifting operation?
- If required, has confirmation of notification to plant Security and Fire Rescue been received?
- Has agreement been established on required actions if operational alarms occur during the lift?
- Has a review of operational activities planned/occurring during time of lift been performed?
- Has a review/agreement of safety/barricade/evacuation plans been done?
- Has a review/agreement of contingency plans in event of a site alarm or operational upset during lift been made?
- Have emergency plans been developed by, communicated to, and understood by operating personnel? Are the operating personnel clear regarding isolation of lines containing toxic or flammable materials? How are the valves identified? Does the lift plan reflect the philosophy that safety is the top priority?

Load Design Follow-up Issues

- Is the load fragile enough to require lifting from a “strong back” frame or from multiple attachment points to prevent load damage?
- Has the “strong back” frame been designed by a competent engineer, inspected, and load-tested?
- Has any required nondestructive testing been done to assess the quality of welds attaching lifting lugs, pad eyes, trunnions, etc.?
- Has anyone checked that the shackle pins will fit the holes provided in the lifting lugs?
- Are the dimensions of the lifting lugs/pad eyes consistent with the size of shackle proposed? Will the shackle be able to “turn” as the load goes from horizontal to vertical?
- Have the appropriate impact factors been used in designing the lifting lugs, shackles, etc.?
- Is there enough clearance between the load and the lifting lug/pad eye to get the nut on the shackle pin?
- What are the inspection requirements for the lifting attachments (lugs/pad eyes)? Who will do it?
- Has the load (tower) design been analyzed for localized buckling and bending shear stress during the lift operation in order to verify that allowances will not be *exceeded during the lift*?
- If trays or internals are to be installed before lifting, has the possibility of load shift been considered?
- Are all engineered lifting components (spreader bars, lift lugs, etc.) designed to ASME B30.20, Below-the-Hook Lifting Devices? (Show calculations).



Pre-Lift Checklist (cont)

- Are the lifting lugs designed about the weak axis using a force equal to a minimum of 5% of the force of the sling? (Show calculations).
- Who has designed the lifting lugs/trunnions? Has design been checked by a qualified rigger?

Peripheral Issues

- Are radios required? Who will provide them? Are they safe for use in operating facilities?
- Has a review/agreement of communications plan during lift (i.e., dedicated radio channels) been made?
- Is a trained Signal Person required?
- Has the operator and the signal person agreed upon the type of signals to be used?
- Has the anchor bolt pattern, if required, been checked to confirm the load can be landed properly?
- Will critical spare parts be available for the crane(s) during the lift? Are mechanics available?
- Has a drawing showing the barricade plan to be used during the lift been developed?
- Does the operator have the required certifications?
- Is a back-up operator available in case of emergency?
- Are crane maintenance personnel available during the lift?



Attachment VIII

PERSONNEL LIFT PLANNING AND AUTHORIZATION

This does not take the place of the Critical Lift Plan, but is an additional requirement.

1. Job Description

Jobsite: _____ Lift Point _____ Planned Lift Date: _____

Estimated Lift Height: _____ Lift Director: _____

2. Lift Evaluation

Evaluation of alternative methods (scaffolding, ladders, aerial lifts, etc.) finds that the use of a suspended personnel platform is regarded to be less hazardous than the alternative measures considered. (Reason why alternatives will not work or are more hazardous.)

3. Equipment, Inspection and Load Circulation

Testing Certificate Attached? <input type="checkbox"/> Yes <input type="checkbox"/> No	Anti Two Block Operational? <input type="checkbox"/> Yes <input type="checkbox"/> No
Locking Device (hook) Good? <input type="checkbox"/> Yes <input type="checkbox"/> No	Basket Meets Requirements? <input type="checkbox"/> Yes <input type="checkbox"/> No
Proposed Boom Angle? _____	(1) No of Persons X 250 lbs _____
Proposed Boom Length? _____	(2) Whip Line Ball Weight? _____
Proposed Lift Radius? _____	(3) Basket Weight? _____
Proposed Load? _____	(4) Load Block Weight? _____
(from load charts)	Calculated Working Load _____
Maximum Load X 50% _____	(1) + (2) + (3) + (4)
The Maximum Load must be more than the Calculated Working Load.	
Calculations Completed By: _____	Comments: _____

4. Personnel Lift Platform Pre-Lift Inspection Completed? Yes No

5. Anticipated Hazards (wind, weather, visibility, power lines): _____

6. Trial Lift, Pre-Lift Meeting and Final Inspection

A Pre-Lift Meeting, unoccupied lift test, final visual inspection of equipment, and occupied trial lift were conducted per the requirements of Milton J. Wood Procedures.

Conducted By: _____ Date Meeting Held: _____



Attachment IX

PRE-LIFT CHECKLIST FOR SUSPENDED PERSONNEL PLATFORMS

Platform Identification Number: _____ Date Inspected: _____

Markings

- _____ Platform weight & maximum load capacity posted on platform?
- _____ Suspension Systems

Structural

- _____ Load Supporting Welds/Bolts
- _____ Load Supporting Members
- _____ Guardrail system (top and mid rail, toe board) and enclosed construction.
- _____ Grab rail on the inside of guardrail system, around platform perimeter.
- _____ Access gates with restraining devices to prevent accidental opening.
- _____ Platform Flooring
- _____ Suspension Attachment Points
- _____ All rough edges exposed to contact with personnel are surface smooth.
- _____ Constructed with enough headroom to allow personnel to stand upright.

Attachments/Mechanisms

- _____ Pins/Ears/Bolt-ups/eyes (circle)
- _____ Wire Rope/Chains/Rigid Leg (circle)
- _____ Master Links

Special Purpose Items

(i.e. overhead protection, floatation, platform controls)

- List: _____ 1) _____
- _____ 2) _____
- _____ 3) _____

Crane Set Up

Crane Identification Number: _____

- _____ Crane has been leveled and outriggers are fully deployed.
- _____ Total weight of the load does not exceed 50% of rated capacity of the crane.
- _____ Two means of controlling decent of platform are available to prevent free fall. (Brakes and another automatic means)
- _____ Variable angled booms are equipped with boom angle indicators.
- _____ Telescoping booms have boom length clearly indicated.
- _____ Anti two-blocking device to prevent load block and boom tip contact.
- _____ Load line has device to regulate the lowering rate of speed to prevent free fall.
- _____ Wire rope bridle/rigging is connected to master link and not directly to the personnel platform.
- _____ Hook on overhaul ball is closed and locked.

Trial Lift Proof Testing

- _____ Trial lift with the unoccupied personnel platform loaded to anticipated weight.
- _____ Platform lifted to each location at which the personnel platform is to be hoisted.
- _____ Hoist ropes are free of kinks and multiple part line is not twisted around each other.
- _____ No slack in load rope around drums.
- _____ Visual inspection of platform and crane after trial lift test to check for defects.
- _____ Prior to hoisting any employees, platform was proof tested at 125% of platform rated capacity, and held in a suspended position for five minutes.



Attachment X

Pre-Lift Meeting

Jobsite: _____

Date: _____

TOPIC: _____
(i.e. Critical Lift Plan Review, Personnel Lift Plan Review, Lift Plan Review, etc.)

All lift plans must be reviewed in a pre-lift meeting. All personnel involved in the lift should participate in the meeting. At a minimum, attendees must include the lift director, assembly/disassembly director, equipment operator, signal person (if used for the lift), and any personnel to be hoisted.

Please sign below:

Employee (Print)

Signature

Employee No.

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____



Attachment XI

LIFT PLAN

1.0 General Information	
<input type="checkbox"/> Critical <input type="checkbox"/> Tandem <input type="checkbox"/> Pre Engineered Job Description: _____	
Load Description: _____	Value of Lift: \$ _____
Date: _____ Time of Lift: _____ Lifting Device Make: _____	
Lifting Device Model: _____ Lifting Device ID #: _____ Rated Capacity: _____	
<i>**Tandem Lifts require separate Lift Plan for each.</i>	
Is the lifting device "Annual Inspection" valid?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Is a current copy of Annual Inspection on site?	Yes <input type="checkbox"/> No <input type="checkbox"/>

2.0 LIFT DETAILS

Component	Information
Item(s) to Be Lifted:	
Value of Item to Be Lifted:	\$ _____
What is the travel route for the lifting equipment to the lift site?	_____
List major potential hazards (i.e. power lines).	_____

3.0 LIFT CONSIDERATIONS

Height of Lift (includes swing path)?	Ft.
Surface Area of Load? (For consideration for impact due to wind)	
Number of tag lines required to stabilize load?	
Is the crane set up level in all directions?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Number of Parts of Line adequate for load? (Confirm in operator's manual or load chart.)	Yes <input type="checkbox"/> No <input type="checkbox"/>
Length of wire rope for load travel requirements?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Center of Gravity of load OK? (Should be within and below rigging points.)	Yes <input type="checkbox"/> No <input type="checkbox"/>
Is the wire rope reeving balanced?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Will cribbing or Crane Mats be used?	Yes <input type="checkbox"/> No <input type="checkbox"/>
If "NO" to any of the above, review the condition and take corrective action.	
Action	Completed By
1.	
2.	
3.	



3.1 LIFT LAYOUT DIAGRAM
(Attach additional pages, as needed.)

Show crane set-up in relation to load, surrounding structures, rigging and lay-down location.
To be completed at the discretion of the Person in Charge (PIC) of the lift.



4.0 RIGGING DATA	
Component	Information
Rigging pre-use inspection complete?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Sling Material (Chain, Wire, Rope, Synthetic)?	
Sling Diameter?	
Sling Length?	
Sling Configuration (Choker, Basket, Straight)?	
Sling Capacity (in planned configuration)?	
Shackle Size (pin diameter)?	
Shackle Capacity?	
Spreader Beams (include ID Numbers)?	
Spreader Beam Capacity?	
Other Rigging Component's Capacity?	
Maximum Rigging Capacity as Configured?	
Does rigging capacity match or exceed planned loading? If no, obtain adequately sized rigging.	Yes <input type="checkbox"/> No <input type="checkbox"/>
COMMENTS:	

5.0 PROXIMITY TO POWER LINES & OTHER HAZARDS	
Check here <input type="checkbox"/> if this section is applicable to this lift;	
Component	Information
Distance to nearest power line in lift area from any part of lifting device or load?	
Can lift be completed without entering into any known exclusion zone?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
If no, is Working Closer than Table A Approval Form completed?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
Are there Fire or Explosive Hazards?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
Are their Underground Hazards?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>

6.0 GROUND STABILITY & TOPOGRAPHY	
Check here <input type="checkbox"/> if this section is applicable to this lift;	
Component	Information
Does the supporting structure have adequate capacity for crane and load?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Is the crane situated away from an excavation? (Horizontal clearance shall be greater than hole depth.)	Yes <input type="checkbox"/> No <input type="checkbox"/>
Is the crane sufficiently clear of any known underground structures?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Are the Ground Conditions level at the lift site?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Are Geological Ground Conditions stable at the lift site-particularly near bodies of water?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Is the lay-down area prepared and stable?	Yes <input type="checkbox"/> No <input type="checkbox"/>
If ground conditions are assessed to be unstable or on unconsolidated material, Geological Ground Conditions inspected and approved by: (Name of Official/Engineer)	<div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 30%; border-bottom: 1px solid black;"></div> <div style="width: 30%; border-bottom: 1px solid black;"></div> <div style="width: 30%; border-bottom: 1px solid black;"></div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Name Signature Date </div>



If answer is NO, initiate actions to Stabilize Area and Level the Area	
6.1 ACTIONS TO STABILIZE AREA	
Action	Completed By
1.	
2.	
6.2 ACTIONS TO LEVEL AREA	
Action	Completed By
1.	
2.	

7.0 LOCAL SECURITY CONTROL	
Will other personnel or equipment, other than lift team and lifting equipment, be in close proximity to lift?	Yes <input type="checkbox"/> No <input type="checkbox"/>
If answer is YES, initiate action to Barricade or Evacuate the Area	
7.1 ACTIONS TO BARRICADE OR EVACUATE THE AREA	
Action	Completed By
1.	
2.	

8.0 WEATHER & ENVIRONMENTAL CONCERNS					
Check here <input type="checkbox"/> if this section is applicable to this lift;					
Component	Information				
Weather Conditions:	Sun	Wind	Rain	Snow	Lightning
If a lift must be performed during periods of inclement weather, a Risk Assessment must be completed prior to executing the lift. If lightning is observed in the area, the lift must be cancelled until conditions clear.					
Temperature at Time of Lift:				Degrees C	
Check operator's manual for lowest temperature a lift may be executed. The crane's maximum capacity rating is derated 2% for every one degree below minus 20 degrees C, or to manufacturer's recommendations.					
Wind Speed at Time of Lift:				Km/h	
Check operator's manual for maximum wind speed a lift may be executed. Any lifts that must be performed in wind speeds that exceed 30 Km/h are deemed Critical and are subject to a Risk Assessment and/or to manufacturer's recommendations.					
Maximum Forecasted Wind Speed/Direction:				Km/h	
Source of Weather Information?					

9.0 LIFTING PERSONNEL	
Check here <input type="checkbox"/> if this section is applicable to this lift;	
Is this the best access mode to the work location? (No other option.)	Yes <input type="checkbox"/> No <input type="checkbox"/>
Has the basket or cage been designed and approved by a PE as per ANSI?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Does the basket or cage have a valid inspection certificate?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Is the capacity clearly marked on the basket or cage?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Is there a secondary means of support connected above the hook?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Are the lifting slings dedicated to personnel lifting only?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Do the personnel have the required PPE? (Fall arrest, other)	Yes <input type="checkbox"/> No <input type="checkbox"/>
Is there a fixed anchor support for each person?	Yes <input type="checkbox"/> No <input type="checkbox"/>



9.0 LIFTING PERSONNEL(cont)	
Has the Personnel Lift Authorization Form and the Personnel Lift Checklist been completed?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Does the applicable crane winch have the power-down capability to prevent free fall?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Was the anti-two-block noted as working in the Pre-Op inspection?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Has a competent person inspected all crane structural elements prior to the lift?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Has the crane operator been instructed to remain at the controls during the lift?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Is the operator aware that the crane shall not travel during the lift?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Has the "Emergency Rescue Plan" been completed and communicated to crew?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Has a trail lift been performed for the secondary & primary supports?	Yes <input type="checkbox"/> No <input type="checkbox"/>

10.0 LIFT COMPUTATION		
Component	Information	
Boom Length?		Ft
Jib Length?		Ft
Lowest Boom Angle?		Ft
Max. Load Radius (consider side and rear)?		Ft
Outrigger Footplate Size (OK? Yes <input type="checkbox"/> No <input type="checkbox"/>)		Ft
Counter Weight Configuration (OK? Yes <input type="checkbox"/> No <input type="checkbox"/>)		Lbs
Temperature De-rating (if applicable—check manual)?		Lbs
Wind Speed De-rating (if applicable—check manual)?		Lbs
Other		
Lift will be on <input type="checkbox"/> Boom <input type="checkbox"/> Jib <input type="checkbox"/>		
Lift will be: <input type="checkbox"/> over the side <input type="checkbox"/> over the end <input type="checkbox"/> on outriggers <input type="checkbox"/> on tires <input type="checkbox"/> on crawlers		
If the lifting device is used for lifting personnel, use only 50% of the rated capacity.		
Lifting Device Capacity as Configured	_____ Lbs at _____	Chart Load Radius
Max. Cargo and Container Weight (in/out of water)?		Lbs
Lifting Block and Hook Weight?		Lbs
Hoist Rope Weight (# parts X length X unit weight)?		Lbs
Rigging Weight (Slings, Shackles, Load Cell, Spreader Beams)?		Lbs
Effective jib and ball weight if not used for lift?		lbs
Other		
If dynamic loading is of concern due to travel with load, operating speeds, or boom movement, multiply the loads above by a factor of 1.25. Safely tie load to crane to prevent swing if traveling.		
Is there potential that the load is frozen, struck, caught on other structures or ground or under water? If yes, ensure load is free before attempting to move it.		
TOTAL LIFT WEIGHT		LBS
$\text{PERCENT OF CAPACITY} = \frac{\text{TOTAL LOAD WEIGHT}}{\text{LIFTING DEVICE CAPACITY}} \times 100 = \text{_____ \%}$ <p style="text-align: right; margin-right: 100px;">Percent of Capacity.</p>		



11.0 LIFT-TEAM PERSONNEL	
Component	Information
Number of people need to complete lift?	
Are the rigger(s)/spotter(s) trained, competent and qualified?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Method of communication between spotter/rigger and crane operator?	Radio <input type="checkbox"/> Hand Signals <input type="checkbox"/>
Method of communication between multiple crane operators in close proximity? Must communicate prior to each swing movement.	Radio <input type="checkbox"/> Hand Signals <input type="checkbox"/>

12.0 LIFT PLAN SIGN-OFF			
Crane Operator: I have been briefed of the contents of this lift plan and accept the duty of ensuring the lift is carried out to the agreed procedure, to the limits of my responsibilities. (If the lift continues through a shift change, the new operator shall review and sign above the original name.)			
	Name	Signature	Date
Lifting Rigger: I have been briefed of the contents of this lift plan and accept the duty of ensuring the lift is carried out to the agreed procedure, to the limits of my responsibilities.			
	Name	Signature	Date
Lifting Supervisor: I have been briefed of the contents of this lift plan and accept the duty of ensuring the lift is carried out to the agreed procedure.			
	Name	Signature	Date
Lift Planner: I confirm that I have planned this lift in accordance with Milton J. Wood procedures and accept the responsibilities of my position.			
	Name	Signature	Date

13.0 Emergency Rescue Plan:

Superintendent: _____ Project Manager: _____ Person(s) Assigned to Task: _____ Response/Rescue Method: _____ How: _____ _____ Equipment: _____ Communications Used: _____ Resources: _____
--

Attach a Risk Assessment and any other additional information to support the rescue plan.



EMERGENCY RESCUE/PLAN CHECKLIST				
ITEM	DESCRIPTION	REQUIRED	LOCATION OF EQUIP.	EQUIP. CHECKED
1.	WORKING AT HEIGHTS	Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>
2.	PERSONNEL TRAINED/APPOINTED	Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>
3.	RISK ASSESSMENT	Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>
4.	RESCUE PLAN COMPLETED AND UNDERSTOOD	Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>
5.	PERSONAL PROTECTIVE EQUIP	Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>
6.	FIRST AID SUPPLIES	Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>
7.	COMMUNICATION	Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>
8.	BREATHING APPARATUS	Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>
9.	LIFE GUARD 10 MIN OXYGEN PK	Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>
10.	RESUSCITATOR UNIT	Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>
11.	RELEVANT SAFE WORK PRACTICES	Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>
Other Equipment Available:				

CLOSE-OUT OF LIFT PLAN

I HERBY CLOSE THIS PLAN:

<input type="checkbox"/>	Confirm the immediate work area has been cleaned.
<input type="checkbox"/>	Confirm that all personnel working under the plan have signed off and left the work area.
<input type="checkbox"/>	Confirm there has been no damage to the environment from the work conducted.
<input type="checkbox"/>	If equipment cannot be returned to work, an "out of service" tag has been placed on the relevant piece of equipment.
<input type="checkbox"/>	Have visually inspected the work area to ensure the task is complete and the equipment is secured and ready for service.
<input type="checkbox"/>	Ensured a copy of plan has been submitted to the Corporate Safety Office.
<input type="checkbox"/>	Have notified the project manager and site representative of the job status.
SUPERVISOR: (PRINT)	
SIGNATURE:	
Lift Plan Number:	Date:
	Time:



Attachment XII

SAFE ASSEMBLY/DISASSEMBLY PROCEDURES

Assembly/Disassembly Director (A/D Director)

- Shall be both competent and qualified, or may be a competent person who is assisted by one or more qualified persons.
- Must understand the applicable assembly/disassembly procedures and must follow the manufacturer's instructions and prohibitions.
- Must review applicable A/D procedures immediately prior to the commencement of assembly/disassembly unless the A/D director understands the procedures and has applied them to the same type and configuration of equipment (including accessories).
- Must ensure crew members understand all of the following:
 - Their tasks.
 - Hazards associated with tasks.
 - Hazardous positions/locations they need to avoid.
- Implement procedures to minimize the risk of unintended movement and minimize the duration and extent of exposure under the boom if site constraints require one or more employees to be under the boom.

Assembly/Disassembly Crew Member

- Must inform the operator when he is moving to a location that is:
 - Out of the operator's sight and is,
 - Either in/on or under the equipment, or
 - Near the load or equipment where the crew member could be injured by movement of the equipment or load.
- Must understand the tasks, and the hazards associated with the tasks.
- Must understand the applicable assembly/disassembly procedures.

Communication:

The controlling entity shall inform the user of the equipment and the operator of hazards beneath the equipment set-up area (such as voids, tanks, utilities) if those hazards are identified in documents (such as site drawings, as-built drawings, and soil analyses) that are in the possession of the controlling entity (whether on or off-site) or the hazards are otherwise known to the controlling entity.

In the event there is no controlling entity for the project, then the employer with site authority, such as the GC, shall arrange for ground preparations to be made.

All assembly/disassembly operations will be under the direction of an assembly/disassembly director. A Job Hazard Analysis shall be prepared and reviewed with crew members prior to the commencement of any assembly/disassembly operations. The Job Hazard Analysis will be reviewed daily, whenever a crew member takes on a new task and when a new employee is added to the crew.



Crew members shall inform the operator when they will be out of the operator's view and either on, in or under the equipment or load. The operator shall not move any part of the equipment or load until the operator is informed in accordance with a pre-arranged system of communication that the crew member is in a safe position.

Employee Protection

Employees must not be under the boom, jib or other components when pins (or similar devices) are being removed. Exceptions to this will only be allowed through the development of a lift plan developed by the A/D director and approval by the Corporate Safety Office.

Rigging

Rated capacity limits for loads imposed on the equipment and/or equipment components (including rigging) shall not be exceeded for the equipment being assembled/disassembled.

Rigging for assembly/disassembly operations must be done by a qualified rigger.

Synthetic slings must be protected from abrasive, sharp or acute edges. Configurations shall not be used that could cause a reduction of the sling's rated capacity, such as distortion or localized compression. When synthetic slings are used, the manufacturer's instructions, limitations, specifications and recommendations must be followed. Labels must be attached and legible.

Outriggers/Stabilizers:

When outriggers/stabilizers are used:

- They must be fully extended or deployed as specified in the load chart.
- Outriggers must be set to remove the equipment weight from the wheels.
- Each outrigger or stabilizer must be fully visible to the operator or to a signal person during extension and setting operations.
- Outrigger or stabilizer blocking must:
 - be sufficient to sustain the loads and maintain stability.
 - Be located in a manner to protect the structural integrity of the equipment and/or prevent dangerous movement and collapse.

A/D Director Responsibility:

The A/D director must address all specific hazards associated with the operation such as:

- Ground Conditions: Must be adequate for safe assembly/disassembly operations.
- Blocking Material: Sufficient to sustain the loads and maintain stability.
- Location of Blocking: When used to support lattice booms or components, blocking must be placed to protect the structural integrity of the equipment and prevent dangerous movement and collapse.
- Verifying Assist Crane Loads: Must be verified before assembly/disassembly begins.
- Boom and Jib Pick Points: Must be suitable for preventing structural damage and facilitating safe handling of these components.
- Center of gravity must be identified or measures designed to prevent unintended dangerous movement must be used.



- Stability Upon Pin Removal: Boom sections, boom suspension systems and components must be rigged or supported to maintain stability.
- Reusable shipping pins, straps, links and similar equipment must be removed and either stowed/stored away so that they do not present a falling object hazard.
- Snagging: Suspension ropes and pendants must not be allowed to catch on the boom or jib connection pins or cotter pins (including keepers and locking pins).
- Struck by Counterweights: Caution must be taken to prevent unintended movement from inadequately supported counterweights and from hoisting counterweights.
- Boom Hoist Brake Failure: Boom hoist brake must be tested to determine if it is sufficient to prevent boom movement. If it is not sufficient, another method of preventing dangerous movement of the boom from a boom hoist brake failure must be used.
- Loss of Backward Stability: Must ensure backward stability before swinging the upperworks, travel and when attaching or removing equipment components.
- Wind Speed and Weather

The A/D director or another qualified person must perform a post assembly inspection in accordance with the Post Assembly Inspection Procedures.

Additional Requirements for Dismantling of Booms and Jibs:

- None of the pins in the pendants are to be removed (partly or completely) when the pendants are in tension.
- None of the pins (top or bottom) on boom sections located between the pendant attachment points and the crane/derrick body are to be removed (partly or completely) when the pendants are in tension.
- None of the pins (top or bottom) on boom sections located between the uppermost boom section and the crane/derrick body are to be removed (partly or completely) when the boom is being supported by the uppermost boom section resting on the ground or other support.
- None of the pins on boom sections located on the cantilevered portion of the boom being removed (the portion being removed ahead of the pendant attachment points) are to be removed (partly or completely) until the cantilevered section to be removed is fully supported.

Assembly/Disassembly:

- No part of the crane, line or load may be able to reach within 20 feet of a power line during set up. Any exception to this requirement would require a lift plan.
- Assembly/disassembly below power lines is prohibited, unless the line is de-energized and grounded



Attachment XIII

POST ASSEMBLY

Date:		Inspected By:	Equipment No.:
Inspection Criteria Used:		I certify that I have inspected this equipment post assembly and that it is configured in accordance with the applicable criteria. _____ Signature of Qualified Inspector	
<input type="checkbox"/>	Manufacturer's Criteria		
<input type="checkbox"/>	R. P. E. Criteria		
<input type="checkbox"/>	Qualified Person Criteria		

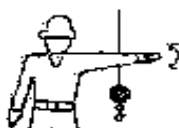


Attachment XIV

STANDARD HAND SIGNALS

OSHA is making this document, the regulatory text, available for informational purposes only. This action does not affect the effective date of the final rule on Cranes and Derricks in Construction, which will be 90 days after August 9, 2010, the date the final rule will be published in the *Federal Register*. Until the date of publication, the OSHA rule, including the preamble, can be found at <http://www.osha-slc.gov/dmcrules.htm>. After publication the rule can be found at the Federal Register at www.fdsys.gov.

Appendix A to Subpart CC of Part 1926—Standard Hand Signals.



STOP— With arm extended horizontally to the side, palm down, arm is swung back and forth.



EMERGENCY STOP— With both arms extended horizontally to the side, palms down, arms are swung back and forth.



HOIST— With upper arm extended to the side, forearm and index finger pointing straight up, hand and finger make small circles.



RAISE BOOM— With arm extended horizontally to the side, thumb points up with other fingers closed.



SWING— With arm extended horizontally, index finger points in direction that boom is to swing.



RETRACT TELESCOPING BOOM— With hands to the front at waist level, thumbs point at each other with other fingers closed.



RAISE THE BOOM AND LOWER THE LOAD— With arm extended horizontally to the side and thumb pointing up, fingers open and close while load movement is desired.



DOG EVERYTHING— Hands held together at waist level.



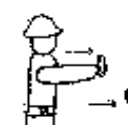
LOWER— With arm and index finger pointing down, hand and finger make small circles.



LOWER BOOM— With arm extended horizontally to the side, thumb points down with other fingers closed.



EXTEND TELESCOPING BOOM— With hands to the front at waist level, thumbs point outward with other fingers closed.



TRAVEL/TOWER TRAVEL— With all fingers pointing up, arm is extended horizontally out and back to make a pushing motion in the direction of travel.



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LOWER THE BOOM AND RAISE THE LOAD – With arm extended horizontally to the side and thumb pointing down, fingers open and close while load movement is desired.



MOVE SLOWLY – A hand is placed in front of the hand that is giving the action signal.



USE AUXILIARY HOIST (whipline) – With arm bent at elbow and forearm vertical, elbow is tapped with other hand. Then regular signal is used to indicate desired action.



CRAWLER CRANE TRAVEL, BOTH TRACKS – Rotate fists around each other in front of body; direction of rotation away from body indicates travel forward; rotation towards body indicates travel backward.



USE MAIN HOIST – A hand rests on top of the head. Then regular signal is given to indicate desired action.



CRAWLER CRANE TRAVEL, ONE TRACK – indicate track to be locked by raising fist on that side. Rotate other fist in front of body in direction that other track is to travel.



TROLLEY TRAVEL – With palm up, fingers closed and thumb pointing in direction of motion, hand is jerked horizontally in direction trolley is to travel.