



## Activity Hazards Analysis

Project Name: <b>Drexel University</b>	AHA No. <b>MD485B - Tower Assembly</b>	Date: <b>12/1/2009</b>	Scheduled:
Location: <b>Philadelphia, PA</b>	Contractor: <b>Madison</b>		Revised:
Required Personal Protective Equipment: <b>Fall protection, Hard Hats, Safety Glasses, Vest, Gloves</b>		Analysis by: <b>S. Elsing</b>	Date: <b>12/1/2009</b>
	Superintendent/Competent Person: <b>J. Fortenberry</b>	Reviewed by: <b>D. Bates J. Fortenberry</b>	Date: <b>12/1/2009</b>
Work Operation: <b>MD 485B Tower Assembly Procedures</b>		Approved by: <b>D. Bates J. Fortenberry</b>	Date: <b>12/1/2009</b>

Lift No.	Work Activity	Potential Hazards	Preventive or Corrective Measures	Inspection Requirements
	<p><b>Mobilization and setup of assist crane. GMK 6250 197' Main boom 97,000 LBS. Counterweight</b></p>	<p>Ground conditions for crane set up is proper compaction and there is room for setup, tractor-trailer access is appropriate for crane setup, struck by hazards, pinch points while setting counterweights and fitting luffing jib sections together, overexertion hazards while placing mats, slips and trips on trailer and crane decks, wind/weather restrictions, co-occupation of active worksite, work-zone intrusion, Maintenance of Public traffic and site traffic</p>	<p>Preplan crane set up area and visit site prior to setup day to verify, use taglines to avoid hand manipulation, use crane and jobsite equipment to limit manual exertion of mats and cribbing for crane, use ladders for trailer deck access, keep mud and dirt out of cleats of shoes and immediately clean up spills from refueling and preventative maintenance. Clear decks of equipment of snow, ice and mud, contractor to set-up barricades to keep non-essential personnel out of exclusion zone, Monitor the wind and adjust operations when wind prohibits operations.</p>	<p><b>Operator shall;</b> Keep equipment clean and free of slip/trip hazards. Use equipment to move materials in lieu of manual handling. All personnel stay away from pinch points, rigging integrity, and suspended loads. Monitor wind and weather restrictions</p> <p><b>Site supervision shall ensure;</b> Access roads for loads are appropriately compacted and have adequate space to move equipment. Ground conditions for assist crane to mobilize and setup as well and build out for crane attachments when necessary. Monitor wind and weather restrictions. Coordinate co-occupation work tasks to ensure other crafts are not in harm's way or create hazardous conditions for the tower erection.</p>

<p>1-4</p>	<p>1-3 Erection of Three (3) Double Tower Sections @ 21,700 LBS. ea.</p> <p>4. Erection of Single Tower Section @ 12,100 LBS. Unload truck and stand tower upright, erect tower on base section make pin connection.</p>	<p>Rigging failures, struck by load, pinch points, movement of equipment on site, under a suspended load, working from elevated work positions, assist crane hazards, ground conditions, and crane signal challenges, wind/weather restrictions.</p>	<p>Inspection of rigging prior to use for defects and proper capacity, ensure proper rigging practices and appropriate rigging protection, use of tag lines at all times when a greater safety hazard is not created, barricade and/or utilize road closures in area where crane erection is underway, ensure tractor-trailer access roads are of appropriate compaction and space for vehicle movement, ensure fall is used and inspected for all appropriate uses, ensure adequate space and ground conditions are prepared for assist crane, designation on ONE crane signal person for visual crane signals and radio signals are used when visual signal are limited., Monitor the wind and adjust operations when wind prohibits operations. Erection crew to implement daily huddle for work.</p>	<p><b>Crane erection supervisor</b> shall ensure; Rigging inspection and practices/ Fall protection is inspected and used during all fall potentials 6' and higher/ Erection plan is exactly followed and when deviations are required then job shall stop and new requirements effectively communicated with all personnel. Ensure working surfaces are kept free of slippery conditions.</p> <p><b>Site supervision</b> shall ensure; Access roads for loads are appropriately compacted and have adequate space to move equipment. Ground conditions for assist crane to mobilize and setup as well and build out for crane attachments when necessary. Coordinate co-occupation work tasks to ensure other crafts are not in harm's way or create hazardous conditions for the tower erection.</p>
	<p>Offload all jib, counter jib, wire, trolley and etc., onto ground Jib will be assembled on ground along with all components necessary to complete the upper tower crane, turntable and counter jib as time permits.</p>	<p>Work at heights, pinch points, manual rigging and movement of materials, climbing on lattice works of jib, slips and trips, weather and wind restrictions, pulling wire rope cable.</p>	<p>Same as previously mentioned in addition to the following; Ground work will require the use of ladders for elevated work position and tie-off when working higher than 6', careful consideration shall be given to tie off points that do not exceed rip and elongation distance requirements of 11.5 feet with personal fall protection, plywood or other suitable material will be placed under ladder feet when dirt conditions exist, work from platforms while assembly to turntable is taking place on tower top. Weather shall be monitored and work stopped when adverse conditions exist.</p>	<p><b>Crane erection supervisor</b> shall ensure; Rigging inspection and practices/ Fall protection is inspected and used during all fall potentials 6' and higher/ Erection plan is exactly followed and when deviations are required then job shall stop and new requirements effectively communicated with all personnel. Ensure working surfaces are kept free of slippery conditions.</p> <p><b>Site supervision</b> shall ensure; Access roads for loads are appropriately compacted and have adequate space to move equipment. Coordinate co-occupation work tasks to ensure other crafts are not in harm's way or create hazardous conditions for the tower erection.</p>

	<p>Unload all remaining tractor-trailers on site for assembly of tower upper works in preparation for final assembly.</p>	<p>Ground conditions for access road after numerous trucks have entered site already chewing it up, preassembly of attachments on ground, work from ladders, other hazards are common to same hazards previously mentioned</p>	<p>Same as previously mentioned in addition to the following;  Ground work will require the use of ladders for elevated work position and tie-off when working higher than 6', careful consideration shall be given to tie off points that do not exceed rip and elongation distance requirements of 11.5 feet with personal fall protection, plywood or other suitable material will be placed under ladder feet when soft conditions exist.</p>	<p><b>Crane erection supervisor</b> shall ensure;  Rigging inspection and practices/  Fall protection is inspected and used during all fall potentials 6' and higher/  Erection plan is exactly followed and when deviations are required then job shall stop and new requirements effectively communicated with all personnel. Ensure working surfaces are kept free of slippery conditions.</p> <p><b>Site supervision</b> shall ensure;  Access roads for loads are appropriately compacted and have adequate space to move equipment. Coordinate co-occupation work tasks to ensure other crafts are not in harm's way or create hazardous conditions for the tower erection.</p>
<p>5.</p>	<p>Install turntable &amp; cab on tower (along with power cord) @ 27,500 LBS</p>	<p>Rigging failures, suspended loads, fall exposures when setting onto turntable, dropping tools and materials, pinch points, manual manipulation of section to fit adjustment, wind/weather restrictions</p>	<p>Same as previously mentioned in addition to the following;  Rigging should be visually inspected prior to each lift, personnel shall be warned to evacuate area under suspended load, all tools and materials shall be tethered to prevent dropping, tools, pry-bars and alike to shall be used to manipulated load to fit, wind and weather shall be monitored and work stopped when adverse conditions exist.</p>	<p><b>Crane erection supervisor</b> shall ensure;  Rigging inspection and practices/  Fall protection is inspected and used during all fall potentials 6' and higher/  Erection plan is exactly followed and when deviations are required then job shall stop and new requirements effectively communicated with all personnel. Ensure working surfaces are kept free of slippery conditions.</p> <p><b>Site supervision</b> shall ensure;  Access roads for loads are appropriately compacted and have adequate space to move equipment. Coordinate co-occupation work tasks to ensure other crafts are not in harm's way or create hazardous conditions for the tower erection.</p>

<p>6 - 8</p>	<p>6. Install tower top @ 18,800 LBS.</p> <p>7. Install hand rails and catwalk, and install counter deck @ 18,200 LBS.</p> <p>8. Install hoist unit @ 18,900LBS.</p>	<p>Rigging failures, suspended loads, fall exposures when setting onto turntable, dropping tools and materials, pinch points, manual manipulation of section to fit adjustment, wind/weather restrictions, ground conditions for access road after numerous trucks have entered site already chewing it up, preassembly of attachments on ground, work from ladders, other hazards are common to same hazards previously mentioned, wind restrictions, slip and trip hazard due to grease on turntable</p>	<p>Same as previously mentioned in addition to the following; Rigging should be visually inspected prior to each lift, personnel shall be warned to evacuate area under suspended load, all tools and materials shall be tethered to prevent dropping, tools, pry-bars and alike to shall be used to manipulated load to fit, wind and weather shall be monitored and work stopped when adverse conditions exist.</p>	<p><b>Crane erection supervisor</b> shall ensure; Rigging inspection and practices/ Fall protection is inspected and used during all fall potentials 6' and higher/ Erection plan is exactly followed and when deviations are required then job shall stop and new requirements effectively communicated with all personnel. Ensure working surfaces are kept free of slippery conditions.</p> <p><b>Site supervision</b> shall ensure; Access roads for loads are appropriately compacted and have adequate space to move equipment. Coordinate co-occupation work tasks to ensure other crafts are not in harms way or create hazardous conditions for the tower erection.</p>
<p>9 - 10</p>	<p>9. Install inner jib @ 24,275 LBS.</p> <p>13. Install outer jib @ 13,370 LBS.</p> <p>Hold jib with assist crane until, inner and outer pendant bars are installed on jib, wire in trolley, and reeve hoist and trolley, and Technician will inspect Becket,</p>	<p>Work at heights, pinch points, manual rigging and movement of materials, climbing on lattice works of jib, slips and trips, weather and wind restrictions, pulling wire rope cable. Falling materials, manual material handling, dropping of tools and materials from elevated work positions.</p>	<p>Same as previously mentioned in addition to the following; Keep hands and all body parts out of pinch point areas, tie-off when working higher than 6', careful consideration shall be given to tie off points and maintain 100 % tie off.</p>	<p><b>Crane erection supervisor</b> shall ensure; Rigging inspection and practices/ Fall protection is inspected and used during all fall potentials 6' and higher/ Erection plan is exactly followed and when deviations are required then job shall stop and new requirements effectively communicated with all personnel. Ensure working surfaces are kept free of slippery conditions.</p> <p><b>Site supervision</b> shall ensure; Access roads for loads are appropriately compacted and have adequate space to move equipment. Coordinate co-occupation work tasks to ensure other crafts are not in harm's way or create hazardous conditions for the tower erection.</p>

<p><b>11 - 15</b></p>	<p><b>11-12</b> Install two (2) counterweights @ 15,471 LBS. each.</p> <p><b>13-15</b> Install three (3) counterweights @ 15,730 LBS. each.</p>	<p>Work at heights, work from ladders, ladder bases, pinch points, lifting and standing counterweights to stack, manual rigging and movement of materials, slips and trips, weather and wind restrictions. Rigging conditions and overall observance of operation.</p>	<p>Same as previously mentioned in addition to the following; Ground work will require the use of ladders for elevated work position and tie-off when working higher than 6', plywood or other suitable material will be placed under ladder feet when sand conditions exist, work from platforms where ever possible. Stand clear of counterweight when in upright positions, until secured.</p>	<p><b>Crane erection supervisor</b> shall ensure; Rigging inspection and practices/ Fall protection is inspected and used during all fall potentials 6' and higher/ Erection plan is exactly followed and when deviations are required then job shall stop and new requirements effectively communicated with all personnel. Ensure working surfaces are kept free of slippery conditions.</p> <p><b>Site supervision</b> shall ensure; Access roads for loads are appropriately compacted and have adequate space to move equipment. Coordinate co-occupation work tasks to ensure other crafts are not in harm's way or create hazardous conditions for the tower erection.</p>
	<p>Demobilize assist crane and depart for home portal.</p>	<p>Ground conditions for crane demobilization is proper compaction and there is room for setup, tractor-trailer access is appropriate for crane setup, co-occupation of area by other crafts, struck by hazards, pinch points while setting counterweights, overexertion hazards while removing mats, slips and trips on trailer and crane decks, wind/weather restrictions.</p>	<p>Preplan crane set up area and visit site prior to setup day to verify, use taglines to avoid hand manipulation, use crane and jobsite equipment to limit manual exertion of mats and cribbing for crane, use ladders for trailer deck access, keep mud and dirt out of cleats of shoes and immediately clean up spills from refueling and preventative maintenance. Barricade area where crane set-up is taking place, keep all construction site tasks affected by crane set-up out of area, Monitor the wind and adjust operations when wind prohibits operations.</p>	<p><b>Crane erection supervisor</b> shall ensure; Rigging inspection and practices/ Fall protection is inspected and used during all fall potentials 6' and higher/ Erection plan is exactly followed and when deviations are required then job shall stop and new requirements effectively communicated with all personnel. Ensure working surfaces are kept free of slippery conditions.</p> <p><b>Site supervision</b> shall ensure; Access roads for loads are appropriately compacted and have adequate space to move equipment. Coordinate co-occupation work tasks to ensure other crafts are not in harms way or create hazardous conditions for the tower erection.</p>



# Safety Acknowledgement SIGN IN SHEET

LOCATION: \_\_\_\_\_

DATE: \_\_\_\_\_

JOB/TASK: \_\_\_\_\_

PERSON CONDUCTING MEETING: \_\_\_\_\_

We, the undersigned erection/operation crew members, acknowledge the safety hazards associated with the task/job we are working and precautions necessary to complete the task/job safely. We further acknowledge that we understand the steps associated with the job/task and have had ample time to ask questions about any part or all of the steps in order to safely achieve the job/task assigned. We agree to participate under these provisions and further take full responsibility for our behavior and actions, as well as, the behaviors and actions of those working with me.

### SIGNATURES OF EMPLOYEES ATTENDING MEETING:

**Print**

**Signature**

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#### Training Requirements:

All assigned employees are required to complete this form before starting a work activity and review it with their Supervisor during their Daily Safety Huddle.