

Mast-Style Jib Crane

This guide can be used to prepare a bid specification for the incorporation of a Mast-Style Jib Crane into a competitive bid project or application.

***Each product specification is organized in three standard sections:**

SECTION 1 - GENERAL:

Includes product scope, references, performance requirements, applicable documents, quality assurances, product warranty information, and project conditions and handling practices.

SECTION 2 - PRODUCTS:

Includes a description of materials, products, and accessories to be incorporated into the project.

SECTION 3 – EXECUTION:

Includes provisions for product preparation, installation, field quality control, demonstrating and training, and protection.

***The specifier may need to edit this product specification to reflect the options and applications for a specific project. Notes to assist the specifier in editing this product specification are indicated in brackets. All notes and brackets should be deleted on the final draft.**

SECTION 1 – GENERAL

1.1 SCOPE

- A. Product:** Spanco Mast-Style Jib Cranes are floor supported and top stabilized with a steel beam mast connected to a 360-degree rotating steel beam boom, which covers a circular work area. Mast-Style Jib Cranes can be full cantilever or drop cantilever and manually operated or motorized.
- B. General Design Standards:** Spanco Cranes are designed in conformance with the following applicable standards:
 - 1. **Jib Cranes:** AISC Steel Construction Manual, OSHA 1910.179, ANSI B30.17, and CMAA 74.
- C. Standard Equipment Specifications:** List other specifications related to the product and application including options, accessories, and customizations [Mounting, Hoists, Electrical].
 - 1. Working Span: [Working span is determined by the amount of actual working area needed. The working distance, or hook distance, is approximately one-half the trolley length from the end of the I-beam and is the same distance from the top beam assembly.]
 - 2. Area of Rotation: [Freestanding and Mast-Style Jib Cranes offer 360-degree rotation.]
 - 3. Capacity: [The maximum weight of the application should not exceed the design weight. Load weights should be predetermined to avoid buying unnecessary capacity.]
 - 4. Height: [Under-boom height is considered the distance from the floor to the underside of the boom. The size of the hoist and the lifting distance should also be considered. The overall height is measured at the highest point on the crane after installation.]

5. Construction: Fabricated using ASTM A36 steel sections with finished ends and surfaces.

1.2 **REFERENCES**

List references referred to in this product specification. List by number and full title and delete non-applicable references.

- A. **American Institute of Steel Construction (AISC):** Manual of Steel Construction, Part 5, Specification for Structural Joints Using ASTM A325 or ASTM A490 Bolts
- B. **American National Standards Institute (ANSI):** ANSI B30.17 – Monorails and Underhung Cranes
- C. **American Society for Testing and Materials (ASTM) A36:** Carbon Structural Steel
- D. **American Society for Testing and Materials (ASTM) A325:** Structural Bolts, Steel, Heat Treated, 120/150 ksi Minimum Tensile Strength
- E. **American Society for Testing and Materials (ASTM) A490:** Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
- F. **American Society for Testing and Materials (ASTM) B221:** Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube
- G. **American Welding Society (AWS) D1.1:** Structural Welding Code
- H. **American Welding Society (AWS):** Certified Shop
- I. **Occupational Safety and Health Administration (OSHA) – Specification 1910.179:** Overhead and Gantry Cranes
- J. **CMAA Specification 74:** Traveling Bridge Cranes

1.3 **PERFORMANCE REQUIREMENTS**

- A. **Coverage:** Crane shall provide coverage of a circular area of size indicated on drawings and consist of rotating boom attached to steel mast, top and bottom bearing assemblies, and other accessories.
- B. **Modular, Pre-Engineered Design:** Crane system shall be designed for minimum effort manual rotation.
 1. Crane shall be designed, fabricated, and installed in accordance with ANSI B30.17 and OSHA 1910.179.
- C. **Deflection Guidelines:** Mast-Style Jib Crane (200 and 201 Series) models are designed with maximum deflection of approximately L/150.
- D. **Crane Operating Temperature:** 5 to 200 degrees F (-15 to 93 C)
- E. **Structural Design:** The crane's structural design is based on live load capacity plus 15 percent for hoist and trolley weight and 25 percent for impact. Contact Spanco, Inc. for assistance specifying cranes that will require seismic and other additional loads or cranes that will operate in high humidity or corrosive environments.
Crane shall be designed to withstand:
 1. Crane and hoist dead load.
 2. Live load capacity equal to net rated hook load.
 3. Inertia forces from crane and load movement.

1.4 **DOCUMENTS**

A. **Submittal Procedures**

1. Product data is included for crane and all accessories. Product data provides capacities, performance, standard operations, and applied forces to foundation.

2. Shop drawings, which outline crane configuration, dimensions, construction, and installation details.
3. Manufacturer's Warranty
4. Manufacturer's Installation Instructions
5. Manufacturer's Operation and Maintenance Manual

1.5 QUALITY ASSURANCE

- A. Standard cranes shall be designed, fabricated, and installed in accordance with our interpretation of ANSI B30.17, CMAA 74, and OSHA 1910.179. Spanco, Inc. assures the safety and quality of all systems when installed and maintained according to their Installation and Maintenance Manual.
- B. **Manufacturer's Qualifications:** An ISO 9001:2015 registered company with more than 40 years of experience successfully designing and manufacturing cranes and material handling solutions for numerous industries.
- C. **Installer's Qualification:** A company that is acceptable to the crane manufacturer and with five years of experience assembling and installing cranes for multiple applications. Installer should be able to:
 1. Perform welding using certified welders in accordance with AWS D1.1.
 2. Bolt connections in accordance with torque tightening procedures specified in AISC Manual, Part 5.
 3. Clearly label crane with maximum rated capacity with label visible from floor level and loading position.
 4. Perform OSHA Load Test Certification.

1.6 WARRANTY

- A. **Manufacturer's Warranty:** Included on manufacturer's standard form and outlines the manufacturer's agreement to repair or replace assemblies and components that fail in materials and/or execution within warranty period from date of substantial completion.
 1. Warranty covers defects in equipment material and workmanship of manual systems and equipment for ten (10) years or 20 thousand (20,000) hours, commencing on the date of shipment to the first retail purchaser. This warranty extends to non-wearable parts only, with the exception of the wheels supplied on manually operated workstation end trucks and hoist trolleys.
 2. Warranty covers two (2) years for paint and finishes for non-aluminum components.
 3. Warranty covers one (1) year for motorized systems and equipment.

1.7 CONDITIONS/DELIVERY, STORAGE, AND HANDLING

- A. **Project Conditions**
 1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimal results.
 2. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. **Delivery, Storage, and Handling**
 1. Store products in manufacturer's packaging until ready for installation.
 2. Store and dispose of solvent-based materials in accordance with requirements of local authorities.

SECTION 2 – PRODUCT

2.1 ACCEPTABLE MANUFACTURERS

A. Spanco, Inc.

Locations: Morgantown, PA and Las Vegas, NV; 800-869-2080; www.spanco.com

2.2 MAST-STYLE JIB CRANE

[Spanco Mast-Style Jib Cranes are available with standard capacities up to five tons and standard spans up to 20 feet.] Refer to the following chart for non-standard Jib Crane dimensions.

Product	Capacity	Maximum Span	Overall Height
200/201-Series Jib	2 ton	30'-0"	40'-0"
	5 ton	30'-0"	30'-0"

A. Models: The following are mast-style jib cranes manufactured by Spanco, Inc. [Specifier may need to choose an acceptable model based on the list below.]

1. Model 201 – Drop Cantilever as manufactured by Spanco, Inc.
2. Model 200 – Full Cantilever as manufactured by Spanco, Inc.

B. Construction: Fabricated from ASTM A36 steel sections with finished ends and surfaces.

C. Design Factors: Spanco Jib Cranes are designed with a factor of 15 percent of the rated capacity for hoist and trolley weight and 25 percent of the rated capacity for impact. 50 percent impact factor used for vacuum or magnet applications. The mast is designed to give maximum strength and minimum deflection to resist bending, buckling, and crushing. The bearings are designed for a 5,000-hour B-10 design lift. This design provides a margin to allow for variations in material properties, operating conditions, and design assumptions. No crane should ever be loaded beyond its rated capacity.

D. Service Factor: All Spanco Mast-Style Jib Cranes are designed for moderate usage (Class C Moderate Service) as defined by CMAA 74.2:

1. System or equipment is used where lifted loads average 50 percent of the rated capacity with five to ten lifts per hour, averaging 15 feet, not over 50 percent of the lifts at rated capacity.
2. Applications involving vacuums, magnets, and other high-impact lifters may be considered severe usage and require special design considerations. Please contact Spanco, Inc. for special design pricing.
3. Consult Spanco, Inc. for usage other than moderate and all instances of high-cycle rates or high-impact applications, such as high-speed air or electric hoists, vacuum lifters, or magnets.

E. Support Structure: Spanco Mast-Style Jib Cranes require top and bottom support of the mast to the building floor and overhead building steel. Mast-Style Jib Cranes are available in full cantilever or drop cantilever.

1. Full-cantilever design utilizes an I-beam or wide-flange beam for the boom and a wide-flange beam for the column. Full-cantilever styles utilize two types of bearing arrangements. For the top bearing assembly, a self-aligning spherical bearing is used. For the bottom assembly, a bronze bearing and bronze thrust washer is used. Both bearing assemblies are provided with grease fittings to aid rotation.
2. Drop cantilever design is identical to full-cantilever design with the addition of side-plate connections, which allow boom to be mounted at any specified height on mast.

2.3 SYSTEM OPTIONS

*The following options are available for Spanco Mast-Style Jib Cranes. [Select required options from the following, or contact Spanco, Inc. if other types of accessories are required.]

A. Installation Capabilities

1. Model 200 - Full Cantilever: Allows maximum use of headroom to provide the highest possible lifting distance.
2. Model 201 - Drop Cantilever: Allows boom to be mounted at various fixed heights and provides additional clearance for overhead obstructions.

B. Tagline Festoon System

1. Attached to boom for supporting electrical cable or compressed air hose supplying trolley hoist. Either S-hooks or wire rope trolleys can be used.
2. Includes system of wire rope tagline, (S-hooks or wire rope trolleys), brackets, and eyebolts for attachment to boom. System supports electrical cable and air hose supplying trolley hoist moving along boom.

C. Rotation Stops

1. Limit boom rotation.
2. Steel plate stops are welded to formed channels of top and bottom brackets.

D. Power Rotation**2.4 SYSTEM COMPONENTS****A. Mast**

1. Vertical standard steel I-beam or wide-flange beam perpendicular to boom and parallel to crane rotation axis.
 - a. Reinforced with stiffeners at critical stress points.
 - b. Includes steel plate with pivot pin for top and bottom ends of mast.
 - c. Includes plate welded to top of mast to be bolted to top flange of boom.
 - d. Box-in mast by welding steel plate to mast flanges to provide rigidity to withstand operator induced forces.

B. Boom

1. Horizontal standard steel I-beam designed for hoist trolley travelling on bottom flange.
 - a. Reinforced with cap channel as required for lateral stability.
 - b. Includes plate welded to inside end of boom to be bolted to outside flange of mast.
 - c. Includes plate and gusset welded to top inside end of boom to be bolted to outside flange of mast at specified height.
 - d. Equip boom with end stops to limit movement of trolley.

C. Top and Bottom Bearing Assemblies

1. Consist of adequately sized steel mounting plate with self-aligning, radial ball bearing in machined housing welded to mounting plate and field lubricated grease fitting. Includes bottom bearing assembly with bronze thrust washer.

2.5 SHOP FINISHING**A. Standard Paint Colors:**

1. All mast-style jib cranes are painted with Spanco Yellow Industrial Enamel.
2. Ford® Tractor Blue and Spanco Standard Gray Industrial Enamel available at no additional cost.
3. Systems can be painted any custom color for an additional cost.

B. Surface Preparation and Painting Procedures:

1. Spanco adheres to the standards of the Society for Protective Coatings (SSPC) for all product surface preparation.
2. Spanco Crane components are deburred and descaled using power tools equipped with sanding discs and wire wheels prior to painting.

3. Components are washed with high-pressure/high-temperature biodegradable degreaser solution.
4. All components are coated with quick drying, semi-gloss enamel, applied to a minimum dry-film thickness of two to three mils.
5. A finishing coat is applied with a hot airless electrostatic spray paint system.
6. Painted components are cured at air temperature.

SECTION 3 – EXECUTION

3.1 PREPARATION

- A. DO NOT** start installation until support structures are properly prepared.
- B. Inventory:**
 1. Check materials to ensure all parts are present.
- C. Motorized Power Rotation:**
 1. Check electrical supply, conduit, wiring, disconnect switch, and other electrical components.
- D. Foundation/Support Structure**
 1. Requires top and bottom support of the mast to building floor and overhead building steel.
 2. Building floor and overhead building steel must be adequate to support crane and its rated load.
 3. Consult with a qualified architect or engineer to determine structure's adequacy.

3.2 INSTALLATION

[NOTE: The following installation information is provided only as a reference tool. For complete installation and maintenance instructions, refer to manual 103-0032.]

- A. Units and accessories must be installed in accordance with manufacturer's instructions and shop drawings.**
- B. Do not modify crane components without manufacturer's approval.**
- C. Clearances for moving crane components:**
 1. Minimum vertical clearance: Three inches (76 mm) from any overhead obstruction.
 2. Minimum horizontal clearance: Two inches (51 mm) from any lateral obstruction.
- D. Mast**
 1. Before installation of any foundation, reinforcement, leveling plate, and anchor bolts, refer to the dimensions sheet included with the installation manual.
 2. Verify the exact height of the mast assembly. Verify that the jib mast will fit into the space provided, while maintaining the 3/8 inch space between top bearing housing and shaft shoulder of the upper bearing assembly (3/8 inch space is provided to accommodate ceiling sag due to snow or other loading conditions on the roof). The jib crane should be installed when snow and other loading conditions are not present.
 3. Clamp the top bearing assembly to the proposed support location. Level the housing in two directions. Use the bracket as a template to mark the location of the bolt holes. Remove the bearing housing and find the center of the bracket by scribing an "X" through the marked centers.
 4. Use a plumb bob to find the center location for the lower bearing assembly bracket. Bearing center tolerance is required to be within (+/-) 1/16 inch from the top to the bottom bracket.
 5. Place the bottom bearing assembly to the center location established in the step above. Level the housing in two directions. Mark mounting hole locations using the bracket as a template.

6. Drill mounting holes for the bottom bearing assembly using the bracket as a guide.
7. Relocate and clamp top bearing assembly and drill required holes using bracket as a guide.
8. Assemble the top and bottom bearing assembly on the mast and stand the mast upright. Slide the mast assembly into position and bolt the assemblies to the floor and to the upper support system.
9. Check the mast to verify that it is plumb with all four bolt holes. If the measurement is not consistent with the full length of the mast, adjust the bearing assemblies accordingly.
10. When mast is plumb, tighten the lock nuts.

E. Boom

1. Do not install the boom until the mast is installed properly and plumbed.
2. Raise boom to mounting location on mast and install as follows:
 - a. **For the 200 Series:**
 - i. Locate the boom to the mast and install using the bolts provided with the jib crane. Insert the top plate bolts and loosely tighten. Install the lower bolts to the mast and loosely tighten.
 - ii. Level the boom with the mast using a minimum six-foot level. Shims may be used at the lower bolts for leveling.
 - b. **For the 201 Series:**
 - i. Locate the boom to the mast and install using drop boom pin and the bolts provided with the jib crane. Insert the drop boom pin. Install the lower bolts to the mast and loosely tighten.
 - ii. Level the boom with the mast using a minimum six-foot level. Shims may be used at the lower bolts for leveling.
3. Tighten all bolts.
4. Re-check for plumb and level. Adjust as needed.
5. Apply grout if the jib crane requires it at the base plate.

3.3 FIELD QUALITY CONTROL

*Perform field quality control testing as recommended by manufacturer.

A. Inspection

1. Verify all bolts are tightened to torque values specified in manual and lock washers are fully compressed.
2. Before the unit is placed into service, it is important to review and follow procedures outlined in chapters 11 and 12 of ANSI B30.17 regarding inspection, testing, and maintenance.

B. Field Test

1. Ensure crane operates properly (movement is smooth and consistent).
2. Verify motorized operation and controls function properly.
3. Make adjustments as needed and correct inadequacies.

C. Acceptance Test

1. After the system has been installed, OSHA requires an acceptance test before operating and after any modifications. An authorized dealer or installer should perform acceptance tests.

D. Maintenance

1. To keep a jib crane in good operating order, engineers recommend establishing a schedule of inspection and lubrication. All parts should be inspected, all loose parts adjusted, and worn parts replaced at once.

2. During the first month after a new installation, a weekly inspection should be performed. All nuts, bolts, and screws should be checked for tightness. All end stops, cotter pins, and hoist trolleys should be checked for abnormal wear or breakage.
3. After the first month, a complete inspection of all fasteners and connections should be performed monthly. Heavier conditions of use will require more frequent inspections.
4. Operators should conduct a visual inspection of the system before each use.
5. All bearings are pre-lubricated at the factory. Bearings require lubrication based on crane usage. Spanco recommends that the bearings be lubricated at least once a year. Lubrication should be performed with lithium soap-based grease (NLGI No. 1 or No. 2).
6. Recommended lubrication schedule varies based on crane use and application. A crane that operates daily for multiple hours should be lubricated weekly. Operating a crane at "standard duty" requires lubrication once every two weeks. Operating a crane on "standby classification" requires lubrication once every six months. The interval of lubrication depends on the application.

E. Clean Surfaces

1. Touch up scratches and blemishes with matching paint from manufacturer.
2. Keep surfaces clean and clear of build-up and residue.

F. Protect Crane

1. Protect installed products until completion of project.
2. Touch up, repair, or replace damaged products before substantial completion.

G. Quality Standards

1. Spanco, Inc. is an ISO 9001:2015 Registered Corporation.
2. Spanco Cranes are manufactured to standards ensuring safety, reliability, and the highest quality.
3. Spanco products are manufactured in the United States of America at facilities located in Morgantown, Pennsylvania, and Las Vegas, Nevada.
4. Spanco certifies that all goods are in full compliance with the Buy American Clause of the American Recovery and Reinvestment Act (ARRA) of May 2009.