

Freestanding Jib Crane

This guide can be used to prepare a bid specification for the incorporation of a Freestanding 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 Freestanding Jib Cranes include 360-degree rotating boom and mast requiring adequate foundation support. Rotating collector assembly with service entrance and festoon service support are provided as indicated.
- 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 head assembly or vertical support member of the jib.]
 - 2. **Area of Rotation:** [Freestanding 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 circular area of size indicated on drawings and consist of:
 - 1. Freestanding mast that requires foundation support.
 - 2. Rotating boom: 360-degree rotation; boom will not drift when at rest.
- 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:** Freestanding Jib Crane (100, 101, and 102 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 FREESTANDING JIB CRANE

[Spanco Freestanding Jib Cranes are available with standard capacities up to 5 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
100-Series Jib	1 ton	50'-0"	40'-0"
	5 ton	35'-0"	30'-0"
	7.5 ton	35'-0"	25'-0"
	10 ton	30'-0"	20'-0"
	15 ton	20'-0"	20'-0"

A. Models: The following are Freestanding Jib Cranes manufactured by Spanco, Inc. [Specifier may need to choose an acceptable model based on the list below.]

1. Model No. 100: Base-Plate Mounted Crane manufactured by Spanco, Inc.
2. Model No. 101: Foundation Mounted Crane as manufactured by Spanco, Inc.
3. Model No. 102: Sleeve-Insert Mounted Crane 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 pipe mast is designed to give maximum strength and minimum deflection to resist bending, buckling, and crushing, as well as wear by the trunnion roller assembly. 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 Freestanding 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 Freestanding Jib Cranes are mounted to a permanent concrete foundation. This foundation anchors the crane and acts as a counterweight for the forces exerted by the crane under maximum loading conditions.

1. Base-plate mount: Hexagonal base plate reinforced with six knee braces equally spaced on the mast.
2. Foundation mount: Square steel plate welded to bottom of column.
3. Sleeve-insert mount: Square steel plate welded to bottom of sleeve.

F. Head Assembly: Designed to transfer boom load to mast and allow for rotation.

1. Construction: Standard plate, angles, and channels to ensure minimum deflection and maximum rigidity.
2. Plate: Reinforced using angles to limit compression and buckling stresses.
3. Lower trunnion roller assembly: Mounted on a channel, which transfers the load to the top of the box.
4. Head Assembly: Designed to inhibit dislodgment due to upward and forward motion. It allows bottom entry electrification inside the head and allows mounting above the boom for top entry electrification.

2.3 **SYSTEM OPTIONS**

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

A. Installation Capabilities

1. Base-plate mounted.
2. Foundation mounted.
3. Sleeve-insert mounted.

B. Air Swivels

1. Bottom Entry Air Swivel
 - a. Air swivel installed in weight bearing channel of head assembly to convey compressed air supply inside mast through mast pivot pin to air powered hoist on boom.
 - b. Swivel allows continuous 360-degree crane rotation.
2. Top Entry Air Swivel
 - a. Air swivel installed on top flange of boom to convey compressed air from overhead source to air-powered hoist on boom.
 - b. Swivel is fitted with pivot arm connected to source hose and allows continuous 360-degree rotation.

C. Air

1. Compressed air for air-powered hoists can be supplied with bottom entry air swivel or top entry air swivel.

D. Collectors

1. Electrical power can be provided for motorized cranes and hoists with either bottom entry collector or top entry collector.
 - a. Bottom entry collector: Electrical collector installed in weight bearing channel of head assembly to conduct electrical power from inside mast through mast pivot pin to motor operator on head assembly and electrically operated hoist on boom. Collector allows continuous 360-degree rotation.
 - b. Top entry collector: Electrical collector installed on top flange of boom to conduct electrical power from overhead electrical source to motor operator on head assembly and electrically operated hoist on boom. Collector is fitted with pivot arm connected to source conduit and allows continuous 360-degree rotation.

E. 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.

F. Rotation Stops

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

G. Power Rotation

H. Anchor Bolts

2.4 SYSTEM COMPONENTS

A. Mast

1. Stationary steel pipe perpendicular to boom.
2. Equip mast top with plate and pivot pin to receive head assembly.

B. Boom

1. Horizontal, standard I-beam bolted to head assembly and designed for hoist trolley travelling on bottom flange.
2. Reinforce with cap channel as required for lateral stability.
3. Equip booms with stops to limit movement of trolley.

C. Head Assembly

1. Utilizes a tapered roller bearing provided with grease fitting for proper lubrication.
2. Welded steel plate and channel fabrication fitted over mast, bolted to boom, and designed to transfer boom load to mast and allow for rotation.
3. Bearings are designed for 5,000-hour, B-10 design lift.
4. Allows for installation of head assembly prior to boom attachment and provides maximum hoist lift.
 - a. Top pivot bearing assembly: Designed to connect head assembly to mast and transfer load from boom. Weight bearing channel connects the sides of the head assembly and contains tapered roller bearings that allow for easy rotation.
 - b. Retaining clip: Inserted through mast pivot pin above weight bearing channel to prevent accidentally dislodging head assembly.
 - c. Trunnion roller assembly: Designed to rotate around mast and transmit moment force from boom to mast. Includes trunnion rollers with tapered bearings held in steel channel with bolts. A mast that is less than 18 inches in diameter will have two rollers, and larger masts will have four rollers. Assembly rotates around mast with full roller face contact. Roller surface is sufficiently large to prevent cutting into mast. Cranes with small rollers or cams requiring wear band on mast are not acceptable.

2.5 SHOP FINISHING

A. Standard Paint Colors:

1. All freestanding 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**
 1. Mount to a permanent concrete foundation to anchor crane and act as a counterweight for forces exerted by crane under maximum loading conditions.
 2. Install recommended concrete (3,000# P.S.I.) footing reinforcement and anchor bolts.
 3. Ensure accurate anchor bolt patterns are provided for foundation design.

3.2 INSTALLATION

[NOTE: The following installation information is provided only as a reference tool. For complete installation and maintenance instructions, refer to manual 103-0005.]

- A. Units and accessories should 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 inch (76 mm) from any overhead obstruction.
 2. Minimum horizontal clearances: Two inch (51 mm) from any lateral obstruction.
- D. Model 100 (Base-Plate Mounted)**
 - 1. Mast/Base Assembly**
 - a. Install one set of nuts on anchor bolts with top surface of nut approximately one inch above foundation. Place mast/base unit over anchor bolts resting on leveling nuts.
 - b. Bolt pads are tac welded to base plate for easy removal in case of slight misalignment of anchor bolt. Grind or hammer a tac area to remove bolt pad(s). Reset mast unit over anchor bolts and leveling nuts. Be sure to replace bolt pad(s) back into place before the second set of nuts. Bolt pads do not require welding once they are removed and replaced.
 - c. Install second set of nuts loosely and insert plumb line arm in pivot shaft located on top of mast. Select position on arm to hang plumb line that is two inches from edge of mast. Measure 60 inches down from top of mast and use that point to check plumb. Locate arm directly over one anchor bolt (or pairs when 12 bolts are used). Measure from plumb line to edge of mast. Measurement should be two inches. If not, adjust leveling nut. Rotate arm 180 degrees and check distance. If distance is more or less than two inches, adjust leveling nuts to the same distance on both sides of mast.
 - d. Repeat operation at each anchor bolt (60-degree increments). When mast is plumb, apply grouting compound under base plate, and tighten locking nuts.
 - 2. Box/Head Assembly**
 - a. Box/head assembly is mounted on main bearing of pivot shaft.
 - b. To level box assembly, adjust hex nuts to adjust the position of roller assembly to mast. When box is fairly level, place flat washer over pivot shaft protruding through head assembly of box, and secure with remaining snap ring.
 - 3. Boom Assembly**
 - a. Mount boom assembly to box securing at back plate and beam support angle.
 - b. Modify boom by adjusting the roller adjustment nut; lock into position with lock nuts.

E. Model 101 (Foundation Mounted)

1. Mast/Base Assembly

- a. Install one set of nuts on anchor bolts with top surface approximately one inch above foundation. Place mast/base unit over anchor bolts resting on leveling nuts.
- b. Install second set of nuts loosely and insert plumb line arm in pivot shaft located on top of mast. Select position on arm to hang plumb line that is two inches from edge of mast. Measure 60 inches down from top of mast and use that point to check plumb. Locate arm directly over one anchor bolt (or pairs when 12 bolts are used). Measure from plumb line to edge of mast. Measurement should be two inches. If not, adjust leveling nut. Rotate arm 180 degrees and check distance. If distance is more or less than two inches, adjust leveling nuts to the same distance on both sides of mast.
- c. Repeat operation at each anchor bolt (90-degree increments). When mast is plumb, apply grouting compound under base plate and tighten locking nuts.
- d. Install three braces from top of mast to ground at 120 degrees apart to prevent mast from shifting when concrete foundation is poured. After concrete has hardened proceed with jib assembly.

2. Box/ Head assembly

- a. Box/ head assembly is mounted on main bearing of pivot shaft.
- b. To level box assembly, adjust hex nuts to adjust the position of roller assembly to mast. When box is fairly level, place flat washer over pivot shaft protruding through head assembly of box, and secure with remaining snap ring.

2. Boom assembly

- a. Mount boom assembly to box securing at back plate and beam support angle.
- b. Modify boom by adjusting the roller adjustment nut; lock into position with lock nuts.

F. Model 102 (Sleeve-Insert Mounted)

1. Mast/Base assembly

- a. Install one set of nuts on anchor bolts with top surface approximately one inch above foundation. Place sleeve-insert base over anchor bolt resting on leveling nuts.
- b. Install second set of nuts loosely; plumb sleeve and tighten lock nuts; secure top of sleeve to ground with three braces at 120 degrees to prevent sleeve from shifting while second foundation is poured.
- c. After concrete has hardened, insert crane mast into sleeve and over sleeve aligning pin, making sure that aligning pin is fully engaged with hole in bottom mast plate.
- d. Insert plumb line arm in main pivot located on top of mast. Select position on arm to hang plumb line that is two inches from edge to mast. Measure down from top of mast 60 inches; use this point to check plumb.
- e. Insert steel wedges between sleeve and mast at 90-degree increments. Locate arm directly over one wedge and measure from plumb line to edge of mast. If more or less than two inches, adjust wedges, rotate arm 180 degrees, and check distance again. If more or less than two inches, adjust wedges for same measurement on each side of mast. Repeat operation at each wedge (90-degree increments).
- f. When mast is plumb, weld wedges into place and proceed with jib assembly.

2. Box/Head Assembly

- a. Box/head assembly is mounted on main bearing of pivot shaft.
- b. To level box assembly, adjust hex nuts to adjust the position of roller assembly to mast. When box is fairly level, place flat washer over pivot shaft protruding through head assembly of box and secure with remaining snap ring.

3. Boom Assembly

- a. Mount boom assembly to box securing at back plate and beam support angle.
- b. Modify boom by adjusting the roller adjustment nut; lock into position with lock nuts.

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.