

Workstation Jib Crane

This guide can be used to prepare a bid specification for the incorporation of a Workstation 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 Workstation Jib Cranes can be freestanding or wall cantilevered. [Freestanding Workstation Jib crane with stand alone mast requiring foundation support and a rotating boom that covers a circular work area around the mast.] [Wall Cantilever Workstation Jib Crane with horizontal boom cantilevered from vertical leg mast, which rotates to cover a semi-circular area.]
- 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 B30.11 as they apply to jib cranes.
- 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 beam, and is the same distance from the head assembly or vertical support member of the jib.]

2. Area of Rotation: [Freestanding Workstation Jib Cranes offer 360-degree rotation. Wall Cantilever Jib Cranes offer 200-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 B30.11 – Monorails and Under-hung 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) D1.1:** Certified Shop
- I. **Occupational Safety and Health Administration (OSHA) –** Specification 1910.179: Overhead and Gantry Cranes
- J. **American Recovery and Reinvestment Act (ARRA):** Buy American Clause of May 2009

1.3 PERFORMANCE REQUIREMENTS

- A. **Coverage:** Freestanding Workstation Jib Crane shall provide coverage of a circular area of size indicated on drawings and consist of:
 1. Freestanding mast that requires foundation support.
 2. Top pivot pin and bottom trunnion rollers.
 3. Rotating boom provides 360-degree rotation; boom will not drift when at rest.
- B. **Coverage:** Wall Cantilever Workstation Jib Crane shall provide coverage of a semi-circular area of size indicated on drawings and consist of:
 4. Wall mounted vertical leg mast.
 5. Horizontal boom cantilevered from mast for 200-degree rotation.
- C. **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 B30.11 and OSHA 1910.179.
- D. **Productivity Ratio:** Crane shall be designed to manually move load with maximum force of 1/100 load weight.

- E. Deflection Guidelines:** Wall Mounted Workstation Jib Crane models are designed with maximum deflection of L/225. Freestanding Workstation Jib Crane models designed with maximum deflection of L/150.
- F. Crane Operating Temperature:** 5 to 200 degrees F (-15 to 93 C)
- G. 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.
Edit the following to reflect project structural design requirements. 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 and impact factors
 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 ANSI B30.11, MH27.2, OSHA 1910.179, and IBC. Spanco, Inc assures the safety and quality of all systems when installed and maintained according to their Installation and Maintenance Manual. All standard Spanco Workstation Jib Cranes are designed to withstand the worst seismic condition in the U.S. or as defined by the IBC.
 1. Applications where cranes will be used in potentially hazardous environments or explosive environments require special consideration. As per the International Building Code, these special conditions must be disclosed prior to placing an order.
 2. Application where cranes will be used in essential facilities like fire departments, military buildings, or communications buildings, or at locations closer than 15km to known seismic sources require special consideration. As per the International Building Code, these special conditions must be disclosed prior to placing an order.
 3. Custom cranes (cranes modified over and above the standard dimensions or capacities shown within our standard Spanco literature) may need modification to conform to Seismic 4 International Building Code due to the customized and non-standard nature of these designs.
- B.** If different specifications are required, alternate specifications need to be requested before the order is placed. Crane modifications may be required at additional cost to conform to specifications other than IBC and ASNI.
- C. Manufacturer's Qualifications:** A company with more than 30 years of experience successfully designing and manufacturing cranes and material handling solutions for numerous industries

- D. 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. Bolt connections in accordance with torque tightening procedures specified in AISC Manual, Part 5.
 2. Clearly label crane with rated load capacity with label visible from floor level and loading position.
 3. 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 ten (10) years or twenty thousand (20,000) hours for manual crane products to cover defects in materials and execution.
 2. Warranty covers two (2) years or four thousand (4,000) hours for motorized tractor products.

1.7 CONDITIONS/ DELIVERY, STORAGE, HANDLING

A. Project Conditions

1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum 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.

604 Hemlock Road, Morgantown, PA 19543; 800-869-2080; www.spanco.com

2.2 WORKSTATION JIB CRANE

[Spanco Workstation Jib Cranes are available in capacities up to a thousand (1,000) pounds and with a standard span of 16 feet.]

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

1. **Model No. FR (Freestanding Workstation Jib)** as manufactured by Spanco, Inc.
 - a. Freestanding, base plate mounted, manually operated workstation jib crane with stationary mast and rotating boom. Equipped with pivot pin, trunnion roller assembly, enclosed track, hoist trolley, and other accessories.

- b. Construction: Fabricated from ASTM A36 steel sections with finished ends and surfaces.
- 2. **Model No. WC (Wall Cantilever Workstation Jib)** as manufactured by Spanco, Inc.
 - a. Wall mounted, manually operated rotating Workstation Jib Crane with horizontal cantilevered boom permanently jointed to vertical mast and provided with pivot mounting assemblies, enclosed track, hoist trolley and other accessories.
 - b. Construction: Fabricated from ASTM A36 steel sections with finished ends and surfaces.
- B. Design Factors**: Spanco Jib Cranes are designed to meet all specifications using a 25 percent factor of rated load for impact and 15 percent factor of rated load for hoist and trolley weight. The pope 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 5000-hour B-10 design lift.
- C. Service Factor**: All Spanco Workstation Jib Cranes are designed for moderate usage (Class C Normal/Industrial service) as defined:
 - 1. System or equipment is used moderately in a normal industrial environment.
 - 2. System or equipment is used where operational time is less than 50 percent of the work period and lifted load is greater than 50 percent of rated capacity.
 - 3. Applications involving vacuums, magnets, and other high impact lifters are considered severe usage and require special design considerations. Please contact Spanco, Inc. for special design pricing.
 - 4. 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.
- D. Support Structure**: Spanco Workstation Jib Cranes can be base plate mounted to an existing floor or poured foundation, or they can be mounted to an existing wall or column with structurally adequate support.
 - 1. Base plate mount: Square or hexagonal base plate secured by anchor bolts. Minimum six-inch reinforced concrete floor required; portable bases are available. (Foundation may be required; check with engineer for adequacy.)
 - 2. Wall mount: Wall or column mounted to structurally adequate support.

2.3 SYSTEM OPTIONS

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

A. Installation Capabilities

- 1. Model FR: Base plate mounted.
- 2. Model WC: Wall or Column mounted (cantilevered).

B. Air Swivels

- 1. 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 rotation.

C. Air

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

D. Collectors

- 1. Electrical power can be provided for motorized cranes and hoists with top entry collector.

- a. 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 rotation.

E. Rotation Stops

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

F. Counterweight Base: Portable base for enclosed track jib cranes. Available in three weights.

G. Vacuum Lift Platforms: Used to mount manufacturer's vacuum pumps on jib mast.

H. Vacuum Hose Trolley: Fits maximum three-inch diameter hose.

I. Special Balancer Trolleys: Air or manual for all manufacturers.

J. Festoon Flat Cable: 4 Conductor

K. Festoon Air Hose: Flat or round electrical cable (3/8 inch in diameter) used to supply lifting device and festoon along boom.

L. Telescoping Boom Sections

M. Anchor Bolts

2.4 **SYSTEM COMPONENTS**

A. Model FR: Freestanding Workstation Jib Crane

1. Mast

- a. Stationary steel pipe perpendicular to boom.
- b. Equip mast with top plate and base plate.

2. Top Plate

- a. Circular steel plate with pivot pin to receive boom.

3. Bottom Plate

- a. Square or hexagonal steel base plate welded to mast for anchoring crane to foundation.

4. Boom

- a. Open truss construction fabricated from rectangular steel tubes and enclosed steel track.
- b. L-shape configuration with horizontal boom and vertical leg to hold trunnion rollers.
- c. Trolley track enclosed, cold formed steel box track; track serves as bottom cord of horizontal boom and permits trolleys and festoon carriers to ride on lower inside flanges.
- d. Trunnion roller assembly designed to rotate around mast and transmit moment load from boom to mast. Assembly bolted to steel attachment angle welded to bottom leg of boom and consists of two rollers held in steel brackets with bolts.
- e. Pivot assembly attached to extended top cord of boom and fits over mast pivot pin.

5. Hoist Trolley

- a. Rigid-body trolley designed to move inside enclosed track and carry hoist and load.
- b. Constructed from a two-piece stamped steel body with two wheels on each side and tapered clevis positioning hoist hook at center of trolley so load weight is distributed evenly to trolley wheels.
- c. Four removable, self-centering wheels with sealed lifetime lubricated bears and tapered two degrees to match track profile.
- d. Drop Lugs limit trolley from dropping in event of wheel, axle, or load bar failure.

6. End Stops

- a. Molded composite, resilient bumper installed in track at boom end to prevent hoist trolley and festoon carriers from rolling out of track.

B. Model WC: Wall Cantilever Workstation Jib Crane:

1. Trolley Track

- a. Enclosed, cold formed box track that serves as bottom cord of horizontal boom and permits trolley and festoon carrier to move on lower inside flanges.

2. Top and Bottom Pivot Mounting Assemblies

- a. Designed to anchor boom/ mast to support structure, allow boom and mast rotation, and resist drift. Assembly includes steel bracket, bearings, and cotter pins.

3. Hoist Trolley

- a. Rigid-body trolley designed to ride inside enclosed track and carry hoist and load.
- b. Constructed from two-piece stamped steel body with two wheels on each side and tapered clevis positioning hoist hook at center of trolley to evenly distribute weight to trolley wheels.
- c. Includes four removable, self-centering wheels with sealed lifetime lubricated bears and tapered two degrees to match track profile.
- d. Drop lugs provided on both sides of trolley to limit dropping in the event of wheel, axles, or load bar failure.

4. End Stops

- a. Molded composite bumper installed in track at boom end to prevent hoist trolley and festoon carriers from rolling out of track.

2.5 SHOP FINISHING

A. Standard Paint Colors:

- 1. All freestanding and workstation jib cranes painted with one coat of Spanco Yellow.
- 2. Ford® Blue and grey enamel optional.

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. Painted components are cured at air temperature.

SECTION 3 – EXECUTION

2.1 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. Model FR: Base plate mounted to six-inch reinforced concrete floor or special foundation. Ensure accurate anchor bolt patterns are provided for foundation design. **Spanco recommends 3,000-PSI concrete foundation, reinforcement, and anchor bolts. Customer responsible for adequacy of floor or foundation.**
2. Model WC: Wall or column mounted to structurally adequate support. Verify accurate crane applied forces and anchor bolt patterns are provided for structural design.

2.2 INSTALLATION

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 inches (76 mm) from any overhead obstruction.
2. Minimum horizontal clearance: Two inches (51 mm) from any lateral obstruction.

D. Model FR: Freestanding Workstation Jib Crane

1. Mast

- a. Refer to installation manual to find dimensions for a specific model jib crane.
- b. Install one set of leveling nuts on the anchor bolts with the top surface approximately one inch above the foundation. Place the mast assembly over the anchor bolts resting on leveling nuts. Install the second set of nuts with plate washers and flat washers. Clamp the plumb fixture to mast cap plate and/or pivot pin.
- c. Select a position on the fixture arm to hang a plumb line. Measure 60 inches down from the top of the mast and use this point to check the two-inch dimension for mast plumb.
- d. Position fixture arm directly over one anchor bolt, and measure from the plumb line to the edge of the mast. If this measurement is not two inches, adjust the leveling nut directly below. Turn leveling nut up if greater than two inches, down if less than two inches.
- e. Rotate the fixture arm 180 degrees and recheck mast for plumb. Adjust the leveling nuts until you have the same distance on each side of the mast. Repeat this operation at each anchor bolt.
- f. When mast is plumb, tighten the locking nuts. Do not grout until installation of boom is complete.
- g. When installation of crane is complete and the operation is checked, float-grouting compound under base plate and recheck tightness of locking nuts.

1. Boom

- a. Do not install the boom until the mast is installed properly and plumbed.
- b. Place the bearing cone over the mast pivot pin.
- c. Assemble the trunnion roller assembly and attach to mast assembly.
- d. Lower the boom assembly over the mast pivot pin and onto the bearing.
- e. Place the washer over the mast pivot pin and insert the cotter pin.
- f. Check the boom for level and adjust trunnion roller assembly to ensure that boom is level in all positions. Roller must be adjusted to apply pressure to mast.

- g. To compensate for anticipated deflection it may be necessary to adjust boom with the tip raised a distance equal to half the expected deflection.

Each jib is designed for a maximum: **Boom Length (inches) ÷ 150 = Deflection (inches)**

3. Hoist Trolley and End-Stop

- a. Place end clamp, festoon trolley, and hoist trolley on boom track.
- b. Secure end stop bolts and rubber bumper.
- c. Install festoon cable on festoon trolleys at equal spacing as required.

4. Hoist

- a. Attach hoist to trolley.
- b. Use washer on outside of hoist trolley (both sides) before installing cotter pins to secure hoist-mounting pin. Replace cotter pin(s) if worn or broken.
- c. Bend cotter pin around mounting pin.
- d. Recheck for plumb and level. Adjust as needed.
- e. If the jib crane requires grout at the base plate, it can be grouted at this time.

E. Model WC: Wall Cantilever Workstation Jib Crane

1. Refer to installation manual to locate the dimensions of the specific jib crane to be installed.
2. Verify that the top and bottom bearing assembly is assembled correctly. Lift the crane into position using an overhead crane or other means. Place bottom wall bracket against supporting column in its proper location with a C-clamp or other supporting method. Drill the first lower hole and put the first bolt through. Level the lower bracket and then drill the second lower hole. Put the second bolt through and partially tighten bolts. Do not fully tighten bolts in case shims are needed later.
3. Allow crane to rest on lower bracket while still supporting the rest of the crane,
4. Level the crane vertically. Press downward on top of upper pin to ensure the upper bearing assembly is down as far as possible. Level the upper bracket and drill two bracket holes into support structure. Install and tighten two upper bolts. Do not fully tighten bolts in case shims are needed later.
5. Attach the hoist, supplied by others, to the hoist trolley. Use washers on hoist mounting pin to center hoist installed hoist trolley. Replace cotter pins if worn or broken.
6. Position the unloaded hoist and trolley at the extreme tip of boom. Install boom on a slight incline to compensate for anticipated deflection.
7. If lower washers (shims) are required to level the boom, leave upper bolts tightened, support crane, and install bottom washers (shims) before retightening bottom bolts. If upper washers (shims) are required to level the boom, leave lower bolts tightened, support crane, and install upper washers (shims). Retighten upper bolts. Be sure all four bolts are properly tightened.
8. Check to ensure both upper and lower bearing assemblies will pass the first inspection. Test jib by rotating back and forth to ensure there is no unusual rubbing or binding that could compromise the crane, bushings, or pin life. The crane should rotate freely.
9. Connect hoist to its source of power (air or electric).

2.3 FIELD QUALITY CONTROL

*Perform field quality control testing as recommended by manufacturer.

A. Inspection

1. Verify all bolts are tight and lock washers fully compressed.

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

- i. After the enclosed track crane system has been installed, OSHA requires an acceptance test before operating and also 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 regular schedule of inspection and lubrication. All parts should be inspected, all loose parts adjusted, and worn parts replaced at once.
2. Recommended lubrication schedule varies based on crane use/ application. A crane that operates daily for multiple should be lubricated weekly. Operating a crane at “standard duty” requires lubrication once every two or three weeks. Operating a crane on “standby classification” requires lubrication once every six months. The interval of lubrication depends on the application.
3. The points that require lubrication are the main pivoting bearing and trunnion roller bearing.

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 9001-2008 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.