

Headerless Workstation Monorail Crane

This guide can be used to prepare a bid specification for the incorporation of a Headerless Workstation Monorail 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 Headerless Workstation Monorail Cranes include freestanding support columns, track hangers, and monorail equipped with enclosed track, hoist trolley, and end stops.
- B. General Design Standards:** Spanco Cranes are designed in conformance with the following applicable standards:
 1. **Workstation Monorail Cranes:** AISC Steel Construction Manual, OSHA 1910.179, ANSI B30.11, AWS D1.1/D1.6, and MMA MH27.2.
- C. Standard Equipment Specifications:** List other specifications related to the product and application.
 1. Length: [Runway length is determined by length of a specific area requiring coverage. Runways are available in eight-foot or 12-foot lengths.]
 2. Capacity: [The maximum weight of the application should not exceed design weight. Load weights should be predetermined to avoid buying unnecessary capacity.]
 3. Height: [Keep trolley-clevis height as low as possible to attain minimal resistance (with practical consideration given to minimal headroom requirements). Height is measured from the floor to the trolley clevis from which the hoist is suspended.]
 4. Construction: Fabricated from 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 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. **MMA Specification MH27.2:** Enclosed Track Underhung Cranes and Monorail Systems

1.3 PERFORMANCE REQUIREMENTS

- A. **Coverage:** Crane shall provide coverage of rectangular area of size indicated on drawings and consist of:
 - 1. Support structure requiring only primary structural support without longitudinal or lateral bracing.
 - 2. Rigid monorail track.
- B. **Modular, Pre-engineered Design:** Crane system shall be capable of disassembly and relocation.
 - 1. Crane shall be designed, fabricated, and installed in accordance with ANSI B30.11 and OSHA 1910.179.
- C. **Productivity Ratio:** Crane shall be designed to move load manually with maximum force of approximately 1/100 load weight.
- D. **Deflection Guidelines:** All Headerless Workstation Monorail Crane models are designed with maximum deflection of approximately L/450.
- E. **Crane Operating Temperature:** 5 to 200 degrees F (-15 to 93 C)
- F. **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 operation, 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, 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 rated load 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.

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 HEADERLESS WORKSTATION MONORAIL CRANE

[Spanco Headerless Workstation Monorail Cranes are available in capacities ranging from 100 to 1,000 pounds. Standard overall monorail lengths are eight or 12 feet. No modifications are offered.]

- A. Models:** The following are headerless workstation monorail cranes manufactured by Spanco, Inc.
1. Headerless Workstation Monorail Cranes: Cranes with steel monorail supported on standard maximum support center of six feet four inches (6' 4") or 10 feet four inches (10' 4").
- B. Construction:** Fabricated from ASTM A36 steel sections with finished ends and surfaces.
- C. Design Factors:** Spanco Workstation Monorail 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. 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 Workstation Monorail Cranes are designed for moderate usage (Class C Normal/Industrial service) as defined:
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:** Support crane monorail with frames consisting of two columns and track hangers.
1. Columns: Square tube weldment with full bottom base plate equipped with gussets and top arm where the track hangers are through bolted.
 2. Hanger Assemblies: Includes each support frame with pair of hanger assemblies that provide a rigid connection for suspending runways. Assemblies to consist of track sleeve, minimum grade 5 bolts, lock washers, and hex nuts. Use of threaded rods in flush hanger assemblies not permitted.
- F. Monorail:** Fabricated from square steel tubes and enclosed steel track.
1. Track: Enclosed, cold formed, steel box track that serves as bottom cord of runway and permits hoist trolley to ride on lower inside flanges. Fabricate lower running flanges with flat surface for higher durability and wheel contact. Sloped flanges not permitted.
 2. Monorail Cantilevers: 10 inches (254 mm) of cantilever is allowed from a hanger location to the end of the monorail.
- G. Hoist Trolley:** Rigid-body trolley designed to ride inside enclosed track of monorail and to carry hoist and load. Articulating trolleys are not acceptable.
1. Construction: 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 evenly distributed to all four trolley wheels. Includes removable clevis pin (type and size determined by

manufacturer for specified capacity). Trolleys with non-removable clevis pins are not acceptable. Holes provided in body for mechanical connections.

2. **Wheels:** Removable, self-centering wheels with sealed lifetime lubricated bearings. Vertical wheels shall be flat to match track profile. Non-removable or non-tapered wheels are not acceptable. Polyamide wheel material provided by Spanco, Inc. Steel wheels are optional.
3. **Drop Lugs:** Included on both sides of trolley to limit trolley in the event of wheel, axle, or load bar failure.
4. Designed for hook attachment of hoist.

H. End Stops: Molded composite, resilient bumper installed in monorail to prevent hoist trolley from rolling out of track. Bolt stops without energy absorbing bumper are not acceptable.

2.3 **SYSTEM OPTIONS**

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

A. Application Options

1. No options are offered.

2.4 **SYSTEM COMPONENTS**

A. End Stop Bumper for Enclosed Track System

1. End stops are equipped with resilient rubber bumpers to increase impact resistance and are through bolted to the enclosed track.
2. Standard on all enclosed track monorail crane systems.

B. Hoist Trolley for Enclosed Track System

1. Fabricated from precision cut steel plate.
2. Equipped with large diameter polyamide wheels with anti-friction ball bearings to ensure smooth and easy movement (steel wheels optional).
3. Bronze wheels and rollers are available for "spark-resistant" applications.
4. Zinc chromate plated finish.

C. Hanger Assembly for Enclosed Track System

1. All headerless workstation monorail cranes are provided with flush-type hanger assemblies, which allow for adjustment in both lateral and longitudinal directions.
2. Hangers are of appropriate size and numbers for selected system.

D. Monorail for Enclosed Track System

1. Monorail is available for capacities ranging from 100 to 1,000 pounds.
2. Standard maximum support center of six-foot four-inches (6' 4") or 10-foot four-inches (10' 4").

2.5 **SHOP FINISHING**

A. Standard Paint Colors:

1. All structural supports are painted with Spanco Standard Gray Industrial Enamel.
2. All monorails are painted Spanco Yellow Industrial Enamel.
3. Ford® Tractor Blue Industrial Enamel is available at no additional cost.
4. 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.
 2. Anchor bolts for support columns are not included. Four 7/8-inch diameter holes are provided for anchor bolts.
- C. Foundation**
 1. Check concrete footings, slabs, or other foundations to ensure sufficient system support.
 2. 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 103-0045.]

- 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 clearances: Two inches (51 mm) from any lateral obstruction.
 3. Prior to applying proper torque to the bolts, ensure monorail is:
 - a. Level to within plus or minus 1/8-inch in 20 feet (3 mm in 6.1 m).
- D. Column Installation**
 1. Arrange installation area, position columns, and verify orientation. Bolt columns to floor as required. Torque fasteners to 108 foot-pounds.
 2. Follow the same procedure for subsequent sets of columns.
- E. Monorail and Track Hanger Sleeve Installation**
 1. Attach two set screws to temporarily hold the two brackets.
 2. Position the monorail up to the columns and bolt with the provided 5/8-inch or 3/4-inch diameter bolts, nuts, and lock washers. Use 108 foot-pounds for 5/8-inch diameter bolts, and 196 foot-pounds for 3/4-inch diameter bolts. Use 10-inch monorail overhangs on each end.
 3. After these bolts are tightened, tighten the track hanger sleeve set screws. The two center top set screws should be tightened slightly to push the tracks against the base of the sleeve. Tighten all top set screws, then tighten all side set screws for correct track alignment.
 4. OSHA regulations require a minimum clearance of two inches from end of monorail to face of support columns or other obstructions.
- F. Runway End Stop Installation**

1. Secure end stop assemblies, end stop bolts, and locknuts at both ends of monorail, except for end of festoon storage area, where applicable.

G. Hoist Trolley Installation

1. Remove one end stop from the end of the track. Install hoist trolley on monorail. Secure end stop bolt and rubber bumper to end of track.
2. To prevent personal injury or death, DO NOT operate crane without end stop through bolts securely in place.
3. After installation is complete, monorail should be leveled. Check tightness for all bolts and nuts.

H. Hoist Installation

1. Attach hoist to the hoist trolley. Use washers on hoist mounting pin to center hoist inside hoist trolley. Reinstall washers on outside of hoist trolley (both sides) before installing or reinstalling cotter pins to secure hoist-mounting pin. Replace cotter pin(s) if worn or broken. Bend cotter pin around mounting pin.
2. Do not operate hoist or crane if cotter pins are not in place and properly bent over on both sides of hoist trolley. Check regularly that cotter pins are in place and securing hoist on hoist trolley.

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.

B. Field Test

1. Ensure crane operates properly (movement is smooth and consistent).
2. Make adjustments as needed and correct inadequacies.

C. Acceptance Test

1. After the enclosed track crane 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. A system inspection should be performed 30 days after installation. 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. Check track for alignment and verify that end trucks travel smoothly through the entire track.
2. A complete inspection of all fasteners and connections should be performed annually or every two thousand (2,000) hours. Heavy conditions of use may require more frequent inspections.
3. Operators should visually inspect the system before each use to note any unusual or abnormal system operations.

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.