SECTION 412200 - HOISTS AND CRANES

1. GENERAL
   * + 1. REFERENCES

Edit references below to those which apply.

* + - * 1. AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.
        2. ANSI MH 27.1, Specifications for Underhung Cranes and Monorail Systems.
        3. ANSI B30.16 Safety Standard for Overhead Hoists (Underhung).
        4. ANSI B30.11 Safety Standards for Monorails and Underhung Cranes.
        5. ASME HST-4M, Performance Standard for Overhead Electric Wire Rope Hoists.
        6. ASME NOG-1, Rules for Construction of Overhead and Gantry Cranes.
        7. AWS D1.1, Code for Welding in Building Construction.
        8. Hoist Manufacturer’s Institute Standard Specification for Electric Wire Rope Hoists.
        9. ANSI/NFPA 70 National Electric Code, Article 610, Cranes and Hoists.
        10. OSHA 29 CFR 1910.179, Overhead and Gantry Cranes.
      1. SYSTEM DESCRIPTION
         1. Hoist and Crane System: The system specified consists of an overhead crane, with trolley mounted wire rope hoist, supported by a runway framework and the building structure, and meeting the requirements of the referenced specifications, standards, rules and codes.
      2. DESIGN REQUIREMENTS

Edit design requirements to suit.

* + - * 1. System Capacity: Will lift and move 10 tons of containers, materials, equipment and pallets within warehouse or maintenance areas.
        2. Crane, carrier, and hoist equipment shall be designed for Class C service.
        3. Crane shall be motor propelled, single girder with a minimum span of 31 feet.
        4. Bridge travel shall be single speed, a minimum of 75 feet per minute.
        5. Hoist shall be suspended from a motor driven trolley and have a minimum lifting speed of 15 feet per minute.
        6. Hoist, trolley, and crane shall be controlled by a pushbutton control pendant suspended 4’-0” above floor.
        7. Runway track shall be supported by and bolted directly to steel columns erected from concrete foundations.
        8. Distance between runway supports shall be 30’-10”.
        9. Overall length of runway shall be 75’-0”.
        10. Distance from floor to top of runway shall be a minimum of 15 feet.
      1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.
         5. Submittals Package: Submit the shop drawings, product data, and quality control submittals specified below at the same time as a package.
         6. Shop Drawings:

Show the construction details of the hoist and crane system and the crane support structure.

Show the electric wiring and control system.

Show installation details.

* + - * 1. Product Data:

Catalog sheets, specifications, and installation instructions.

Bill of materials.

Name, address, and telephone number of nearest fully equipped service organization.

* + - * 1. Quality Control Submittals:

Design data, including safety factor of materials.

Test report of hoist and crane system.

Certificate required under Quality Assurance.

* + - * 1. Contract Closeout Submittals:

Operation and maintenance data.

Warranty.

Test reports of the completed hoist and crane system.

* + - 1. QUALITY ASSURANCE

Edit number of hours in paragraph below to suit.

* + - * 1. Company Field Advisor: Secure the services of a Company Field Advisor for a minimum of 10 hours for the following:

Render advice regarding installation of the hoist and crane system.

Witness final system test and then certify with an affidavit that the hoist and crane system is installed in accordance with the contract requirements and is operating properly.

1. PRODUCTS
   * + 1. HOIST AND CRANE SYSTEMS
          1. Hoist: Electric wire rope hoist as manufactured by American Monorail, Spanmaster, or Robbins & Myers with all parts and accessories necessary to install on bridge crane and meeting the following requirements:

Check with project captain as to lifting capacity, lifting speed and travel speed of hoist.

Maximum lifting capacity of 10 tons.

Minimum lifting speed 15 feet per minute.

Trolleys: Trolley assemblies shall be articulating type. Attach load bars to yokes in such manner as to assume that all wheels are in contact with the operating flange at all times.

Yokes shall be ductile castings and fixture machined.

Motor driven trolley with travel speed of 35 feet per minute.

Festoon system for control cable.

Friction clutch assembly on hoist to prevent overloading.

Dual braking system.

Upper and lower limit switches.

Hook with safety latch. Hook shall be mounted to swivel on thrust bearing.

* + - * 1. Crane: Underhung, motor driven, single girder crane as manufactured by American Monorail, Robbins & Myers, or Spanmaster with track, suspension system and all parts necessary to meet the following requirements:

Rating of Service “Class C” as specified in ANSI MH 27.1.

Vertical impact load shall be 1/2 percent of the rated load for each fpm hoisting speed of the carrier.

Track and Fittings:

Ccheck to see that track hanger support spacing is shown on drawings.

Track size based on the load positioned on the track system to produce the most severe conditions of stress and deflection.

The total track deflection shall not exceed 1/450 of the span or 1-1/4 inch, whichever is the least.

Track sections shall be installed with bolted type splice plates to provide flush and level connections at the operating tread of the track. The maximum gap between the adjacent ends of the load carrying flange not to exceed 1/16 inch.

Rigid track support shall be accomplished by bolting the runway track to the supporting structure.

Track Suspension: All necessary clamps, hanger rods, bolts, and other fittings from which the track system is suspended shall be provided as a part of the overhead track system. Track hanger supports shall be spaced as shown on the Drawings.

Electrification:

Track electrification shall be accomplished by UL approved conductor bar rated 100A continuous. Insulation cover shall be rigid orange PVC, self-extinguishing, with a heat distortion point of 160 degrees F at 260 psi.

Conductors shall be complete with mounting clips, end caps, splices with covers, and power feeds.

Current collectors shall be sliding shoe type, spring loaded, and designed so that sparking and loss of contact shall be minimized.

Separate conductors shall be provided for each phase. More than one conductor in a single enclosure will not be permitted.

All controls shall be housed in a single NEMA 12 panel.

A fused, manual disconnect switch with a lockable handle mounted through the panel door shall be provided and wired into the incoming power circuit.

All motors equipped with magnetic contactors operated with ON-OFF push button station pendant suspended 4’-0” above the floor, from the hoist trolley unit.

All electrical equipment shall meet NEMA 1 requirements.

Edit circuit requirement below to suit.

Crane operation: 480 volt, 3 phase, 60 hertz.

Control circuits: Maximum 120 volts.

Interlocks (if applicable):

The interlock mechanism shall be manually operated, cross-connected, double locking pin type so designed that they will not operate until the crane is in proper alignment with the connecting crossover or spur rail.

Equip crane with a crane travel lockout limit switch to prevent bridge travel motion while in the latched position with the crossover or spur rail.

Single Girder Cranes: Single girder motor driven cranes with single spans of 40 feet or more, must have rigid outrigger beam mounted parallel to the crane girder running the entire span of the crane.

End Trucks: End trucks consisting of structural steel weldments bolted directly to the crane bridge member forming a rigid and square connection.

Safety lugs shall limit drop of end truck to not more than one inch in event of wheel yoke, axle or load bar failures. Place safety lugs on both sides of the rail so that if failure occurs the rail is centrally loaded about the vertical axis.

Coordinate the necessity of brakes with project captain.

Brakes:

Hoisting Brakes: In accordance with Hoist Manufacturers Institute specifications and ANSI B30.16 Safety Standards for Overhead Hoists (Underhung).

Brakes supplied for carrier and crane travel shall conform with ANSI B30.11 Safety Standards.

Miscellaneous:

Paint: Crane manufacturer’s standard paint system. Color shall be selected by the Director from the manufacturer’s standard color selection.

Letter the crane rated capacity on the bridge rail and on the control box.

Electrical Equipment: Comply with the provisions of ANSI/NFPA 70 National Electrical Code, Article 610, for wiring and equipment.

1. EXECUTION
   * + 1. INSTALLATION
          1. Install the Work in this Section in accordance with the manufacturer’s printed instructions, shop drawings, and directions of the Company Field Advisor.

END OF SECTION 412200