SECTION 14900

MONORAIL AND HOIST SYSTEMS

1. GENERAL
   1. SCOPE OF WORK
      1. Furnish all labor, materials, equipment and incidentals required to design, fabricate, install, test, finish paint and place in satisfactory operation monorail systems, monorail trolley, and hoist, as shown on the Drawings and as specified herein.
      2. The systems shall be complete with track, trolleys, hoists, hangers, clips, stops, fittings, bracing, supporting steel (other than main structural system), electrification and all appurtenances necessary to complete the installation. A source of 120 Volt, single phase electrical power will be furnished and installed to a disconnect switch adjacent to each system using an electrically operated hoist or trolley, under Division 16 and as shown on the Drawings. All other conduit and wire as required for a complete system shall be furnished and installed under this Section and in accordance with Division 16.
      3. Design of the monorail track has been provided by the Engineer and is shown on the Structural Drawings. Contractor shall coordinate with the monorail equipment manufacturer to determine design aspects of trolley and hoist should they differ from that as designed.
      4. Contractor shall confirm location of the monorail, trolley, and hoist to ensure that it lines up with the proposed pumps and motor centerline. Coordinate all related shop drawings potentially affecting location of the progressing cavity pumps inclusive of the piping shop drawings, pump and motor shop drawings, etc.
   2. MEASUREMENT AND PAYMENT
      1. No separate payment will be made for monorail and hoist systems. Include the cost for this work in the lump sum base bid.
   3. RELATED WORK
      1. Miscellaneous metal work is included in Section 05500.
      2. Field painting is included in Section 09901.
      3. Pre-Engineered Metal Building included in Section 13341.
      4. Except as otherwise specified herein, electrical work is included under Division 16.
   4. SUBMITTALS
      1. Submit to the Engineer, in accordance with Section 01300, shop drawings showing erection methods and details.
2. Provide Certified AutoCAD dimensional fabrication drawings.
3. Provide manufacturer’s cut sheets and catalogs for trolley, hoist, rail, and all items provided.
4. The total weight of the equipment as well as weights of individual components.
5. Provide wiring schematics.
   * 1. Copies of a certificate of compliance with OSHA, Part 1910, Subpart N, Section 1910.179 - Overhead and Gantry Cranes, shall be submitted at the time that shop drawings are submitted.
6. Design Responsibility
   * + - 1. Certificate of Design: Complete form at end of Section and submit to Engineer prior to manufacture of cranes.
         2. Support Data: Submit following with Certificate of Design:
7. Certification, signed by Texas-registered professional engineer, stating that all members, elements and connections are designed to withstand required loads and forces.
8. Codes and standards to which structural design conforms.
   * 1. Operating and Maintenance Data
9. Operating and maintenance instructions shall be furnished to the Engineer as provided in Section 01730.
10. A factory representative who has complete knowledge of proper operation and maintenance shall be provided for 1 day to instruct representatives of the Owner and Engineer on proper operation and maintenance. This work may be done in conjunction with the inspection of the installation and test run as provided under Paragraph 3.02 below.
    1. REFERENCE STANDARDS
       1. American Bearing Manufacturers Association (ABMA)
       2. American Society of Mechanical Engineers (ASME)
11. ASME B30.9-2018 – Slings
12. ASME B30.11-10, Monorails and Underhung Cranes -Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings.
13. ASME B30.17-2015 – Cranes and Monorails (With Underhung Trolley or Bridge)
14. ASME B30.26-2015 – Rigging Hardware
15. ASME B30.30-2019 – Ropes
    * 1. American Welding Society (AWS)
      2. Occupational Safety and Health Administration (OSHA)
      3. Monorail Manufacturers Association (MMA)
      4. American Institute of Steel Construction (AISC)
      5. Hoist Manufacturers Institute (HMI)
      6. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.
    1. QUALITY ASSURANCE
       1. All of the monorail track and carrier equipment on monorail track shall be products of a single, experienced, reputable and qualified manufacturer who is a member of the MMA. All products supplied shall be of USA manufacture.
       2. Carrier equipment for hoists on I beam track shall be provided by the hoist manufacturer.
       3. All of the hoisting equipment shall be the product of a single, experienced, reputable and qualified manufacturer who is a member of the Hoist Manufacturers Institute.
       4. It is the responsibility of the Contractor to guarantee that the monorail and hoisting equipment shall be completely operational in all locations. Contractor shall coordinate all crane loads with the Pre-Engineered Metal Building Manufacturer.
       5. The current issue of the Specifications for Underhung Cranes and Monorail Systems by the MMA and the standard specifications of the Hoist Manufacturers Institute shall be included as a part of this Section unless otherwise specified.
       6. All structural steel members of the handling system shall be designed in accordance with AISC current edition and any welded construction shall be in accordance with the standards of AWS and comply with Section 05500 as applicable. Structural design shall be performed by a qualified Professional Engineer registered in the State of Texas.
       7. Castings, forgings, stampings and other structural elements shall have a safety factor of 5.0.
       8. All equipment shall meet or exceed the requirements of OSHA.