

SECTION 13700

ALUMINUM FLOORING

PART 1 – GENERAL

1.1. DESCRIPTION

- A. This specification is for an aluminum flooring structure comprised of planks or panels, and beams to cover the lower wetwell area as shown on the Drawings.
- B. Furnish all labor, materials, and equipment to provide a complete, installed system of fixed and removable, custom fit, flat aluminum covers. The wetwell flooring system includes flooring planks or panels, structural supports, and attaching hardware.

1.2. SUBMITTALS

- A. A submittal shall be provided to the engineer prior to the beginning of fabrication. The submittal shall include:
 - 1. Complete structural calculations showing the governing stresses in all members and connections and detailed shop drawings. Preliminary drawings shall be stamped by cover manufacturer's PE.
 - 2. Manufacturer's standard guarantee.
 - 3. A letter of certification signed and sealed by a registered Colorado Professional Civil Engineer confirming that the aluminum flooring is in full compliance with the plans and specifications including any testing provisions included therein, and the 2006 International building Code requirements.
- B. OEM Manual: The manufacturer shall provide an OEM Manual that includes drawings, maintenance instructions, and removal and replacement instructions for the installed cover.

1.3. QUALIFICATIONS

- A. Manufacturer: Shall be a company specialized in providing aluminum flooring for wastewater treatment tanks/troughs. When requested by the Engineer, submit written evidence to show experience qualifications and adequacy of plant capability and facilities for performance of contract requirements.
- B. Erector: Regularly engaged in the erection of aluminum covers for wastewater treatment tanks.
- C. Welders: Qualified within the past two (2) years in accordance with AWS.
- D. Experience: The manufacturer must furnish adequate evidence of ongoing experience in the manufacture of similar structures.

1.4. PERFORMANCE CRITERIA

- A. Span: The clear span length of the floor shall be as noted on the Drawings.

- B. Width: The inside width of the floor shall be as noted on the Drawings.
- C. Distributed Design Live Load and Deflection: All structural components shall be designed to support the dead weight of the structure, plus a live load of sixty (60) pounds per square foot of surface. The maximum deflection of any component under this load shall not exceed $L/240$ of the span of that component. In no event shall the dead load deflection exceed the rise of any component in order to avoid surface ponding.
- D. Concentrated Live Load: The structural components shall be designed to support a 400-pound load on a six inch by six inch (6" x 6") area located anywhere on the surface of the structure without permanently deforming the tested area.
- E. Design Stresses: All allowable design stresses in structural aluminum shall be in accordance with the "Specifications for Aluminum Structures" for building-type structures by the Aluminum Association.
- F. Skid Resistance: The floor shall possess an integral non-skid surface and no exposed area of floor system wider than one inch (1") shall be without ribs/non-skid surface. The aluminum-decking surface of the structure shall be ribbed to provide an aggressively non-skid surface. The edges of adjacent deck slats shall double interlock so that the slats shall act together. The decking surface shall be manufactured from 6061-T6 alloy. The Manufacturer of the non-skid surface shall demonstrate in writing satisfactory performance for a minimum period of ten (10) years in the wastewater industry for the intended purpose. This surface shall not be achieved by the use of paint, adhesive tapes, sand blasting, or any other means other than an extruded process.
- G. Chemical Resistance: Panels shall be fabricated entirely of 6061-T6 corrosion resistant aluminum extrusions. Every panel to beam connection shall be chemical resistant, will not weaken or corrode, and will interlock. A mechanical and replaceable Santoprene seal shall isolate the cover perimeter from the concrete wall. No foam tape or caulk shall be allowed.
- H. Configuration: The aluminum floor shall be composed of panels and beams. All panels shall interlock with the adjoining beam. The weight of an individual panel shall not exceed one hundred fifty pounds (150lbs.). Each panel shall be easy to remove without disruption of adjacent panels, and the lifting force required shall not exceed the dead weight of the panel.

PART 2 – PRODUCTS

2.1 MANUFACTURERS:

- A. Hallsten Corporation.
- B. Ohio Gratings.
- C. or approved equal.

2.2. MATERIALS:

- A. Aluminum: All aluminum used in the fabrication of the cover shall be alloy 6061-T6. All plate shall be alloy 6061-T6. Material shall be new and of top quality.
- B. Welding Electrodes: Welding shall be with electrodes of an alloy which shall produce welds with strength and corrosion resistant characteristics compatible to the base metal.
- C. Fasteners: All fasteners between aluminum components shall be stainless steel or structural plastic. Aluminum shall be isolated from dissimilar materials by means of a stainless steel spacer or an elastomeric isolator. Beams shall be fastened to concrete using stainless steel drill-in-place anchor bolts.
- D. Steel Accessories: No carbon steel components shall be used.
- E. Seals: A mechanical and replaceable Santoprene seal shall isolate the cover perimeter from dissimilar materials such as concrete and steel. No foam tape or caulk shall be allowed for isolation of cover system.

PART 3 – EXECUTION

3.1. WORKMANSHIP

- A. The quality of workmanship shall be equal to the best general practice in modern structural fabrication shops. Workmanship, fabrication, and shop connections shall be in accordance with the latest edition of ANS/AWS D1.2 “Structural Welding Code – Aluminum.”

3.2. PREPARATION FOR WELDING

- A. All components to be welded shall be free of dirt, grease, and other contaminants and shall fit up properly for sound welding. Surfaces to be welded may not be cut with oxygen. Sawing, shearing, or machining may be used.

3.3. WELDING PROCEDURES

- A. All welding shall be with an inert gas shield arc process. Machine settings shall be developed with test welds of the same material, alloy, and geometry as the work pieces and samples tested destructively.

3.4. TESTING

- A. Loads: After installation the cover structure shall be tested for conformance with the deflection limits. A load of four hundred pounds (400 lbs.) shall be placed as directed by the Engineer, and the maximum deflection created by the load measured.

3.5. DELIVERY AND INSTALLATION

- A. Storage: Cover components shall be stored off the ground on level surface in such a manner as to prevent damage.
- B. Installation: Follow manufacturer's instructions.

END OF SECTION



DIVISION 14

CONVEYING SYSTEMS

SECTION 14320

MOTOR OPERATED HOISTS

PART 1 – GENERAL

1.1. DESCRIPTION

- A. This Section covers one (1) motor-operated chain hoist and manual operated trolley to be installed in the Lift Station Building with all appurtenances associated with hoist, trolley, and electrical power supply.

1.2. SUBMITTALS

- A. Shop Drawings.
 - 1. Submit complete Shop Drawings, reference Section 01340 - Shop Drawings, Samples, and Operation and Maintenance Manuals.
- B. Operation and Maintenance Manual.
 - 1. Supply an Operation and Maintenance Manual, reference Section 01340 - Shop Drawings, Samples, and Operation and Maintenance Manuals.

1.3. PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Store hoist, trolley, motor, controls, and all accessories in a weathertight warehouse or other comparable enclosure at maintained temperature of fifty degrees Fahrenheit (50° F.) minimum.

PART 2 – PRODUCTS

2.1. DESIGN REQUIREMENTS

- A. Design Hoist for conditions listed below:
 - 1. Type: Monorail mounted.
 - 2. Capacity: One (1) ton.
 - 3. Controls: Motorized Hoist.
 - 4. Festooning system for electric power supply.
 - 5. Details:
 - Unit: MCC Room Hoist
 - Lift Height: 40'
 - Pendant Drop: 8'
 - Trolley: Manual
 - Lift Speed: 16 fpm
- B. Hoist Motor.
 - 1. 1 Horsepower.
 - 2. 3-phase power.
 - 3. 1800 rpm.

- C. Accessories.
 - 1. Pendant Control.
 - 2. Chain Container.
 - 3. Provide for disengagement of locking device for constant duty use.

- D. Trolley performance.
 - 1. Design each trolley and hoist to operate on a monorail as specified and shown on Drawings.
 - 2. Contractor to provide end stops on monorail system.

- E. FRAME
 - 1. Shall be of lightweight aluminum and precision machined for accurate gear and bearing alignment.

- F. BEARINGS
 - 1. Shall be high quality anti-friction type of either needle or ball design throughout the hoist.

- G. BRAKES
 - 1. Hoist shall have two (2) types of brakes: One AC electrical motor brake spring set, electrically released, and one self-adjusting Weston type mechanical load brake located in the gear case. Either brake shall have the capability of holding rated load in event of failure of the other brake system.

- H. OVERLOAD DEVICE
 - 1. Shall be provided to prevent lifting excessive overloads. This load limiting (clutch) device shall be preset at factory to disengage the hoist motor from the gearing in event of excessive overload condition.

- I. MOTORS
 - 1. Shall be of high starting torque type designed specifically for hoist service with permanently lubricated ball bearings, rated for the service required. The motor enclosure is to be totally enclosed non-ventilated. TENV Motor is to have automatic reset temperature actuated switch (TAS) in motor windings to provide motor running overheat protection.

- J. GEARING
 - 1. Shall be a combination of helical and spur, precision cut and heat treated to ensure quiet, efficient operation. Gears shall be totally enclosed and run in a bath of oil to provide maximum lubrication and avoid environmental contamination.

- K. LOAD CHAIN
 - 1. Link load chain shall be accurately formed closely calibrated pocket wheel chain of high strength alloy steel, case hardened for long wear heavy duty service.

- L. LIMIT SWITCHES
 - 1. Automatic upper and lower limit switches that will prevent raising or lowering the load beyond a preset upper or lower limit will be furnished.

- M. SUSPENSION
1. Suspension may be a lug to receive a rigid mount push, hand geared, or motor driven trolley.
- N. LOAD HOOKS
1. Shall be of high strength forged steel and be capable of full 360 degree rotation. Load hook shall have bearing supported rotation. Each hook shall have spring loaded hook latches to prevent accidental slippage from lift points.
- O. CONTROLS
1. Shall be a centralized electrical system, easily accessible in one compartment. Control circuit voltage to the pushbutton station shall not exceed 120 volts.
- P. PUSHBUTTON STATION
1. Shall be of molded contour grip type and supported from hoist by strain relief cable to avoid damage from pull on control wires. Dependent on accessories, pushbutton station furnished will accommodate all motions. The enclosure is to be NEMA 4X watertight.
- Q. ELECTRICAL POWER
1. Shall be 230/460 volt, 60 hertz, three-phase.
- R. TROLLEYS
1. Push, hand geared trolleys shall have heavy section rolled steel side frames. The wheels shall be steel with contour treads and shall operate on either flat or tapered beam flanges. Movement of hand geared trolleys shall be accomplished by pulling on an endless hand chain. Spacer washers shall be provided for trolley adjustment to various beam sizes.
- S. Hoist, trolley, and festooning manufacturers.
1. Hoist and Trolley: Yale KELC, or equal.
 2. Festooning: INSUL-8, or equal.
- T. Monorail: Reference Section 05500 - Metal Fabrications.

PART 3 – EXECUTION

3.1. INSTALLATION

- A. Assemble, erect, and place in proper operating condition in full conformity with detailed drawings, specifications engineering data, instructions, and recommendations of the equipment manufacturer unless exceptions are noted by Engineer.

3.2 MANUFACTURER’S FIELD SERVICES

- A. Provide Manufacturer’s Field Service in accordance with Sections 01600-Materials & Equipment, 01640-Manufacturer’s Field Services, and 01650-System and Facility Startup.

END OF SECTION

SECTION 14330

MANUAL-OPERATED TROLLEY HOIST

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This Section covers the manual-operated trolley hoist to be installed on the Jib Crane in the Pump Room of the Lift Station.

1.2 SUBMITTALS

- A. Shop Drawings.
 - 1. Submit the information identified by the following Data Reference Symbols as specified in Section 01340 – Shop Drawings, Samples, and Operation and Maintenance Manuals.
 - a. Shop Drawings: C, D, E, H, I, and L.
 - b. Operation and Maintenance Manuals: C, D, E, F, H, I, L, M, and O.

1.3 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Store hoist, trolley, and all accessories in a weathertight warehouse or other comparable enclosure.

1.4 RELATED SECTIONS

- A. Section 14353 Jib Cranes - Jib Cranes

PART 2 – PRODUCTS

2.1. DESIGN REQUIREMENTS

- A. General.
 - 1. Hoist to lift the Pumps and valves from their permanent installations and transport to the overhead hatch opening for removal from or installation in the Lift Station.
 - 2. Hoist capacity:
 - a. One ton.
 - 3. Minimum clearance (from floor slab to bottom of hoist hook):
 - a. Twelve feet (12’).
 - 4. Hoist and trolley to be one (1) compact integral unit.
 - 5. Permanently lubricated ball or roller bearings.
- B. Trolley.
 - 1. Design each trolley to operate on a monorail as specified and shown on the Drawings.
 - 2. Trolley to be designed to allow disassembly for installation of trolley at any location along track.
 - 3. Unit shall be capable of operating on short-radius bends.

4. A gear mechanism shall be used as the method of lateral movement.
 - a. Mechanism shall be capable of holding complete unit in position when stopped.
5. Trolley to be equalized loading design.
6. Trolley wheels.
 - a. Single flange type.
 - b. Made from forged steel or cast iron.
 - 1) Ball tread for standard I-beams.
7. Cut spur-gear teeth in the flange of one pair of wheels in each geared trolley to engage the drive pinions.

C. Hoist and Lifting Tackle.

1. Chain hoist mechanism.
 - a. All chains to be heat treated alloy and zinc plated.
 - b. Electric welded links.
 - c. Provide with load chain guides.
 - d. Cast aluminum housing.
 - e. One (1) piece handwheel.
 - f. PFS: Lifting Dimension: Twelve feet (12').
Hand Chain Drop Dimension: Ten feet (10'-0").
2. Provide with load limiting device.
3. Provide with screw and disc friction type load brake.
 - a. System shall be capable of sustaining load at any vertical position.
 - b. Design each braking system to prevent acceleration of load during lowering operation.
 - c. Brakes and gearing totally-enclosed.
 - d. Minimum six (6) tooth holding pawl.
4. Forged steel hook with hook latch safety device.
 - a. Fracture resistant hook.
 - b. Hook to be capable of three hundred sixty degree (360°) rotation.
 - 1) Support hook on a ball or roller thrust bearing to permit easy turning.

2.2 Manufacturers.

- A. Yale Hoisting Equipment.
- B. Diff-Norton Coffing Hoists.
- C. Or equal.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Assemble, erect, and place in proper operating condition in full conformity with detailed drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer unless exceptions are noted by Engineer.

END OF SECTION

SECTION 14353

JIB CRANE

PART 1 – GENERAL

1.1. WORK INCLUDED

- A. This Section covers the Manufacturer designed, supplied, wall mounted jib crane system and all required appurtenances as indicated on the Drawings, as herein specified and as necessary for the proper and complete performance of this work.
- B. Sequencing of installation and other work shall be done by the Contractor.

1.2. SYSTEM DESCRIPTION

- A. This Section includes furnishing the following:
 - 1. One (1) wall mounted jib crane with one (1) ton maximum capacity.
- B. Install as shown on the drawings to allow the jib crane to facilitate lifting of the equipment.

1.3. SUBMITTALS

- A. General.
 - 1. In accordance with the procedures and requirements set forth in Section 01340-Shop Drawings, Samples, and Operation and Maintenance Manuals, Project Submittal Requirements, the Contractor shall obtain from the equipment manufacturer and submit the following:
 - a. Supply dimensional drawing for approval for crane and base.
 - b. Installation/mounting of crane is the responsibility of the contractor.
 - c. Provide recommended spare parts list at time of shipment from the manufacturer.
- B. Shop Drawings.
 - 1. All shop drawings shall be AutoCAD generated and fully to scale. Sketches or non-scaled drawings will not be accepted.
 - 2. Partial, incomplete, or illegible submissions will be returned to the Contractor without review for resubmission.
 - 3. Shop drawings shall include, but not be limited to:
 - a. Complete assembly, and dimensional drawings clearly marked.
 - b. Installation and start-up instructions will be supplied by the contractor.
 - c. List of recommended spare parts.
 - d. Contractor to submit design calculations to Engineer for review.
- C. Operations and Maintenance Manuals.
 - 1. The Contractor shall submit operation and maintenance manuals in accordance with the procedures and requirements set forth in Section 01340-Shop Drawings, Samples, and Operation and Maintenance Manuals.

1.4. QUALITY ASSURANCE

- A. Meet requirements of ANSI Specification B30.11 and OSHA Specification 1910.179.

1.5. WARRANTY

- A. Five year (5 yr.) manufacturer's warranty against defects in materials and workmanship.

1.6. RELATED SECTIONS

- A. Section 14330 - Manual Operated Trolley Hoists.

PART 2 – PRODUCTS

2.1. MANUFACTURER

- A. Manufacturer:
 - 1. Gobel Model WB100, or equal.

2.2. MATERIALS

- A. Jib Crane.
 - 1. General.
 - a. Design Factor: Designed with an ultimate design factor greater than 3:1 for all components including the lifting winch and base.
 - b. Lift Capacity: Jib crane shall have a lift capacity of two thousand pounds (2,000 lbs.).
 - c. Reach: Boom shall be twelve feet (12') long. Equip boom with end stops.
 - d. Rotation: Boom shall rotate two hundred degrees (200°). Provide boom travel stops to limits boom rotation.
 - e. Bearings: Bronze bushings and oil-impregnated bronze thrust washers. Equip bearings with grease fittings.
 - f. Nametag: Davit crane shall be labeled with a non-corrosive metal identification plate labeled or imprinted with the manufacturer's name, model number, serial number, capacity rating, and other essential information.
- B. Crane and Base Finish:
 - 1. Material: Crane boom, mast, and base shall be fabricated from steel meeting ASTM standards.
 - 2. Crane Finish: Manufacturer's standard enamel finish. Provide touchup paint supplied by equipment manufacturer.
- C. Anchor Bolts:
 - 1. Stainless Steel. Size, number, and embedment as required by equipment manufacturer.
- D. Finish:
 - 1. Manufacturer's standard shop finish.

PART 3 – EXECUTION

3.1. PAINTING TOUCH UP

- A. Use manufacturer-provided touch up paint for all nicks and scratches.

3.2. MANUFACTURER'S FIELD SERVICES

- A. Provide Manufacturer's Field Service in accordance with Sections 01600-Materials and Equipment, 01640-Manufacturer's Field Services, and 01650-System and Facility Startup.

3.3. USE DURING CONSTRUCTION

- A. Use of system is not permitted during construction.

3.4. TESTING

- A. Load test crane to one hundred twenty-five percent (125%) of rated capacity in field. Test to be performed by installer.
- B. Field Testing: After approved equipment is installed, it shall be given a running test where it shall demonstrate the ability to lift and continuously transport the rated capacity, through the lifting distance.

END OF SECTION

