

SECTION 44 46 30
MISCELLANEOUS MECHANICAL EQUIPMENT

EQUIPMENT NAMES AND COMPONENT NUMBER(S)

Component numbers are provided where applicable.

Portable Sump Pump.

Portable Davit Crane for Equipment. Portable Davit Crane for Personnel.

Manual High Lift Pallet Truck.

Portable Gantry Hoist.

High Pressure Hot Water Sprayer.

PMP-3213: UV Effluent Booster Pump 1.

PMP-3214: UV Effluent Booster Pump 2.

PART 1 GENERAL

1.01 SUMMARY

- A. This section contains miscellaneous mechanical equipment. In some cases the equipment is intended for use in multiple facilities. None of the equipment in this section includes specified component numbers.

1.02 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:

- a. Make, model, and weight of each equipment assembly.
- b. Complete catalog information, descriptive literature, specifications, and identification of materials of construction.
- c. Portable davit crane for personnel: Provide a list of the applicable OSHA standards for which the equipment is compliant.
- d. Detailed structural and mechanical drawings showing the equipment dimensions, size, and locations of connections and weights of associated equipment.
- e. Factory finish system.
- f. Motor data per Section 26 20 00, Low-Voltage AC Induction Motors.

B. Informational Submittals:

- 1. Special shipping, storage and protection, and handling instructions.
- 2. Manufacturer's printed installation instructions.

PART 2 PRODUCTS

2.01 PORTABLE SUMP PUMP

A. General:

1. Portable for use in draining basins and wet wells.
2. Quantity: Two.

B. Manufacturers and Products:

1. Pentair; Hydromatic SW50.
2. Or equal.

C. Physical Characteristics:

1. Materials of Construction:
 - a. Thermoplastic nonclog impeller sized for passing up to 3/4-inch solids.
 - b. 1-1/2-inch MNPT threaded pump discharge.
 - c. Pump Casing: Cast iron and thermoplastic.
 - d. Bearings: Bronze, oil or grease lubricated.
2. 50-foot long submersible power cable with standard 120-volt, three prong plug.
3. 30-foot long, Type 304 stainless steel, lift wire rope attached to pump.

D. Functional Characteristics:

1. Power Requirements:
 - a. Maximum Horsepower: 1/2 hp.
 - b. Voltage: 120 volt.
 - c. Phase: Single.
 - d. Frequency: 60-Hz.
2. Piggyback float switch that provides integral ON/OFF pump control when liquid level reaches a specified setpoint (adjustable).
3. Motor thermal overload detection by means of motor temperature sensor.
4. Motor leak detection by means of a motor moisture sensor.

E. Performance Characteristics:

1. Design Operating Point:
 - a. Flow Rate: 30 gpm.
 - b. Total Dynamic Head: 20 feet.

2.02 PORTABLE DAVIT CRANE FOR EQUIPMENT

A. General:

1. Designed for nonpersonnel load lifting.
2. Quantity of Crane: One.
3. Quantity of Winch, Wire Rope, and Wire Rope Accessories: Two of each, one for each crane.
4. Quantity of Type 1 Base: One.

B. Manufacturers and Products:

1. Crane and Winch:
 - a. Thern; First Mate, 5PF5-M1 Crane and Winch.
 - b. Or equal.
2. Type 1, Pedestal mount Socket Base:
 - a. Thern; Model 5BP5S.
 - b. Or equal.

C. Physical Characteristics:

1. Materials of Construction:
 - a. Crane: Powder-coated steel.
 - b. Winch: Zinc-plated steel.
 - c. Wire Rope, Eye Hook and Swaged Ball Fitting: Type 304 stainless steel.
 - d. Wire Rope Cable Spool and Bracket: Type 316 stainless steel.
 - e. Bases: Type 304 stainless steel.
2. Crane Boom: Telescoping type, equipped with spur gear hand-crank winch, adjustable to four different length positions and two different angle positions, minimum boom reach 24 inches, maximum boom reach 42 inches.
3. Wire Rope Assembly: 3/16-inch wire rope attached with stainless steel eye hook and swaged ball fitting, accessories to include cable spooler. Provide 60 feet of cable.
4. Type 1, Pedestal-mount Socket Base: Floor mounted flanged plate with integral Schedule 40 pipe sleeve and bottom drainage weep hole.

D. Functional Characteristics:

1. Crane Rotation: 360 degrees.
2. Winch: Hand-crank type for manual operation.
3. Crane and winch shall be portable.
4. Type 1, Pedestal-mount Socket Base: Permanently mounted sleeve base to receive portable crane mast.

E. Performance Characteristics:

1. Crane Capacity: 850 pounds maximum, 500 pounds minimum at maximum reach.
2. Winch Capacity: 850 pounds.

2.03 PORTABLE DAVIT CRANE FOR PERSONNEL

A. General:

1. Designed for confined space entry personnel retrieval applications.
2. Quantity of crane: Provide one portable crane assembly with accessories as defined herein.
3. Quantity of Lower Mast Extension: One.
4. Quantity of Wall Mounted Socket Bases: Eleven locations as shown on the Drawings.

B. Manufacturers and Products:

1. Crane Assembly:
 - a. Honeywell, Miller DuraHoist; SKU: DH-1.
 - b. Or equal.
2. Winch:
 - a. Honeywell, Miller ManHandler; SKU: 8442-Z7/65FT (Provided with crane SKU: DH-1).
 - b. Or equal.
3. Three-Piece Portable Base:
 - a. Honeywell, Miller; DH-24 (Provided with crane SKU: DH-1).
 - b. Or equal.
4. Lower Mast Extension:
 - a. Honeywell; SKU: DH-22/45.
 - b. Or equal.
5. Wall Mounted Socket Base:
 - a. Honeywell: DH-8SS
 - b. Or equal.

C. Physical Characteristics:

1. Materials of Construction:
 - a. Crane Assembly: Aluminum.
 - b. Winch: Galvanized steel.
 - c. Wire Rope: Galvanized steel.
 - d. Three-Piece Portable Base: Aluminum
 - e. Type 1, 2, and 3 Bases: Type 304 stainless steel.
2. Crane Adjustable Mast: Telescoping type, equipped with spur gear hand-crank winch, adjustable to different length and angle positions,

minimum boom length 12 inches or less, maximum boom length 29 inches or more.

3. Winch: 65 feet of wire rope, manual handle operation, and overload clutch, with mounting bracket and carrying bag.
4. Three-Piece Portable Base: Adjustable leveling screw feet, level indicator, 48-inch span between legs.
5. Lower Mast Extension: Length: 45 inches.
6. Type 1, Surface Mount Pedestal Base: Floor mounted base plate with integral pipe sleeve with bottom drainage.
7. Type 2, Embedded Socket Base: Flush mounted top flanged plate with integral pipe sleeve, four-headed anchor studs, and bottom drainage.
8. Type 3, Wall Mounted Socket Base: Side mounted flanged plate with integral Schedule 40 pipe sleeve and bottom drainage weep hole.

D. Functional Characteristics:

1. Crane shall be portable.
2. Crane Rotation: 360 degrees.
3. Winch: Hand-crank type for manual operation.
4. Three-Piece Portable Base: Portable base for set up over access openings.
5. Type 1, Type 2 and Type 3 Bases: Permanently mounted sleeve bases to receive portable crane mast.

E. Performance Characteristics:

1. Crane and Winch Capacity: 350 pounds.
2. Meet all applicable OSHA standards.

2.04 MANUAL HIGH LIFT PALLET TRUCK

A. General:

1. Quantity: One.
2. The high lift pallet truck will be utilized in two facilities (Facility 32 and Facility 80) to lift blower packages.

B. Manufacturers and Products:

1. WESCO Industrial Products, Inc., Telescoping Manual High Lift Truck; Model TSHL27-33.
2. Or equal.

C. Physical Characteristics:

1. Fork Dimensions: 27 inch (outside distance between forks), 43 inch (length).

2. Weight of Pallet Truck: 280 pounds (maximum).
3. Steering Wheels (two): 6-inch diameter, Mold-on Polyurethane.
4. Load Wheels (two): 3-inch diameter, Mold-on Polyurethane.

D. Functional Characteristics:

1. Manual operation.
2. Two stage hydraulic lift pump system providing slow lift and rapid lift functions.
3. Hand lever to set operating functions including:
 - a. Position 1: Rapid lift of forks.
 - b. Position 2: Slow lift of forks.
 - c. Position 3: Descending of forks.
4. 180-degree steering radius.

E. Performance Characteristics:

1. Lift Capacity: 3,300 pounds.
2. Lift Height: 31.5 inches.

2.05 PORTABLE GANTRY HOIST

A. Portable gantry hoist shall include an adjustable gantry, with casters, trolley, hand chain hoist, lifting frame height winch-hoist kits, and all other accessories required for a complete and operating system.

B. General:

1. Equipment and accessories provided shall be fabricated, assembled, erected, and placed in proper operating condition in full conformance recommendations of the equipment manufacturer.
2. Equipment shall be suitable for indoor or outdoor use.
3. Loading, impact allowances and allowable stresses shall be in accordance with the governing standards for the gantry.
4. Quantity: Two.
5. Both gantry hoists are intended for use in Facility 32, one on the lower level and one on the upper level.

C. Manufacturers and Products:

1. Spanco; A-Series.
2. Or equal.

D. Physical Characteristics:

1. Net Weight, without hoist and trolley: 240 pounds (maximum).
2. Gantry Dimensions:
 - a. Adjustable A-Frame:
 - 1) Overall Height Range: 6.5 feet to 9 feet.
 - 2) Tread Span: 4.33 feet.
 - 3) Caster Diameter: 8 inches.
 - b. Monorail:
 - 1) Overall Span: 8 feet.
 - 2) Maximum Clear Span: 6.75 feet (Adjustable).
 - 3) Beam Depth: 8 inches.
 - c. Hoist and Trolley:
 - 1) Headroom (maximum): 24 inches.
 - 2) Hoist Lift: 25 feet.
3. Trolley wheels shall be of the single flange type of rolled, forged, or cast steel with machined universal crowned or tapered treads.
 - a. Drive wheels shall have integrally cut spur gear teeth or machine cut gears pressed on hubs.
 - b. Trolley wheel axles shall be of the fixed type, made from high carbon steel machined and ground to size to receive the wheel bearings.
 - c. Wheel bearings shall be permanently shielded, lifetime-lubricated, anti-friction type, suitable for radial and end thrust loading.
4. Hoisting Assembly:
 - a. Hoisting assembly shall consist of the necessary gearing, guides, and sheaves, all built integrally with the trolley; a load chain equipped with a load hook, and hand chains.
 - b. Anti-friction bearings shall be used throughout, and the assembly shall have facilities for proper lubrication.
5. Gantry hoist hook shall be slow opening, nonfracturing, forged steel, and shall be provided with a safety latch.
 - a. The hook shall be mounted on anti-friction bearings to permit easy turning.
6. Materials and Construction:
 - a. Aluminum with adjustable height, span and tread, spring-loaded adjusting bolts and steel pin connections.
 - b. Monorail: Aluminum I-beam; socket connection to A-frame.
 - c. Casters: Four-position, swivel lock with polyurethane wheels.
 - d. Bearings: Anti-friction type; oil lubrication or lifetime grease packing.
 - e. Gearing: Spur or helical type; fully enclosed in oil tight housing equipped with load limiters for automatic overload protection.
 - f. Load Brake: Fully enclosed in oil tight housing.
 - g. Operating Chains: Welded steel link; zinc plated.
 - h. Load Chains: Heat-treated alloy steel; welded link, zinc plated.

- i. Lifting Hook: Forged steel; slow opening nonfracturing with safety latch.

E. Functional Characteristics:

- 1. Gantry Height: Fully adjustable in 6-inch intervals and shall be locked on each leg by a spring-loaded bolt.
- 2. Gantry monorail shall be designed to align with off-center loads to prevent lifting frame and trolley distortion.
- 3. Gantry shall be provided with four casters, each capable of rotating 360 degrees with a four-position swivel lock.
 - a. The lock on each caster shall prevent rolling and swiveling of the caster when engaged.
- 4. Gantry trolley and hoist shall be a hand-gear type, low headroom trolley hoist.
- 5. Gantry trolley frame shall be rigid and shall contain the hoist.

F. Performance Characteristics:

- 1. The portable gantry shall be designed with a safety factor of at least 1.5, and the monorail deflection under design load shall not exceed 1/360 of the span for the following criteria:
- 2. Capacity: 2 tons.
- 3. Maximum Chain Pull to Lift Max Load: 80 pounds.

2.06 HIGH PRESSURE HOT WATER SPRAYER

A. General: Portable high pressure hot water sprayer.

B. Manufacturer and Product:

- 1. Hotsy, Model 1065SS.
- 2. Or equal.

C. Physical Characteristics:

- 1. Provide 50 feet of hose with trigger gun and 48-inch long lance with grip and side handle.
- 2. Unit shall be mounted on air filled tires.

D. Functional Characteristics:

- 1. Unit shall be portable.
- 2. Fuel oil (fired burner).
- 3. Unleaded Gasoline (86 octane or higher) powered engine driven pump.

4. Integral pressure switch to limit maximum operating pressure and shut off pump and burner.
5. Unit shall be capable of feeding detergent.

E. Performance Characteristics:

1. Operating Pressure: 3,000 psi.
2. Flow Rate: 3.5 gpm.
3. Engine Displacement: 337 cc, minimum.
4. Burner capacity: 309,900 BTU/hr.
5. Burner rated and tuned for operation at 7,500 feet above sea level.

2.07 UV EFFLUENT BOOSTER PUMPS

A. General:

1. Pumps for ultraviolet (UV) disinfected and unchlorinated water recirculated to the UV vessels and distribution service to the odor control facility.
2. Quantity: Two, one duty and one standby.
3. Equipment names and component numbers:
 - a. PMP-3213: UV Effluent Booster Pump 1.
 - b. PMP-3214: UV Effluent Booster Pump 2.

B. Manufacturers and Products:

1. Goulds; e-SV, Model 33SV2.
2. Or equal.

C. Physical Characteristics:

1. Materials of Construction:
 - a. Wetted Metal Parts: Type 316/316L stainless steel.
 - b. Pump Casing: Cast iron.
 - c. Mechanical seal.
 - d. Flange connections: ASME B16.1 cast iron.
 - e. Pump body fitted with pressure gauge taps at suction and discharge.

D. Functional Characteristics:

1. Power Requirements:
 - a. Maximum Horsepower: 1-1/2 hp.
 - b. Voltage: 480 volts.
 - c. Phase: Three.
 - d. Frequency: 60-Hz.
2. Motor enclosure: Totally enclosed fan cooled (TEFC).

E. Performance Characteristics:

1. Design Operating Point:
 - a. Flow Rate: 25 gpm.
 - b. Total Dynamic Head: 50 feet.

2.08 ACCESSORIES

A. Physical Characteristics:

1. Lifting Lugs: Furnish suitably attached for equipment assemblies and components weighing over 50 pounds.
2. Equipment Identification Plates: Furnish 16-gauge Type 316 stainless steel identification plate securely mounted on each separate equipment component and control panel in a readily visible location. Plate shall bear 3/8-inch high die-stamped block type black enamel filled equipment identification tag number and letters indicated on the Drawings.
3. Anchor Bolts: Type 316 stainless steel, 1/2-inch minimum diameter, and as specified in Section 05 50 00, Metal Fabrications.

B. Functional Characteristics: None.

C. Performance Characteristics: None.

2.09 FACTORY FINISHING

- A. Submerged equipment shall be coated with the manufacturer's standard coating system for submerged service in a municipal wastewater treatment facility. Coating systems shall at a minimum consist of appropriate surface preparation, primer, and a surface coat. Surface preparation and coatings shall be installed in accordance with the coating manufacturer's instructions. Acrylic or alkyd type coatings are not allowed for the surface coat.

2.10 SOURCE QUALITY CONTROL

- A. Factory Inspections: Inspect equipment for required construction and intended function.
- B. Factory Tests and Adjustments: Test all equipment actually furnished.
- C. Factory test report of functional test.
- D. Functional Test: Perform manufacturer's standard test on equipment.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's printed instructions.
- B. Anchor Bolts: Accurately place using templates furnished by equipment manufacturer and as specified in Section 05 50 00, Metal Fabrications.

3.02 FIELD FINISHING

- A. Touchup damaged coating on equipment as recommended by equipment manufacturer.

3.03 FIELD TESTING AND FACILITY STARTUP

- A. Field Testing and Facility Startup shall be in accordance with the requirements of Section 01 91 14, Equipment Testing and Facility Startup.
- B. Facility startup specifies the order and prerequisites for the following tests of the equipment:
 - 1. Field functional testing.
 - 2. Software operational testing.
 - 3. Performance testing.
 - 4. Demonstration testing.
- C. All Field Testing and Facility Startup shall be performed using a qualified representative provided by the Manufacturer as specified in Section 01 91 14, Equipment Testing and Facility Startup, Section 01 43 33, Manufacturers' Field Services, and as elaborated upon in this section.

3.04 FIELD QUALITY CONTROL

- A. Functional Tests:
 - 1. Conduct on each pump, system, and subsystem as specified in Section 01 91 14, Process Equipment Testing and Facility Startup.
 - 2. Alignment:
 - a. Test complete assemblies for correct rotation, proper alignment and connection, and quiet operation.
 - b. Verify alignment of complete extended shaft assembly, including angularity of pump and motor shafts, meets requirements of shafting manufacturer.
 - c. Shafting manufacturer's authorized representative shall verify installation alignment and prepare and submit a report confirming compliance.

3. Flow Output: Measure using plant instrumentation and storage volumes.
 4. Operating Temperatures and Vibration: Monitor bearing areas on pump and motor for abnormally high temperatures or vibrations.
- B. Performance Test: Conduct on each pump as specified in Section 01 91 14, Equipment Testing and Facility Startup.
1. Test in accordance with Hydraulic Institute Standard 14.6, Rotodynamic Pumps for Hydraulic Performance Acceptance Tests.
 2. Perform under simulated operating conditions at full rated speed and at a reduced speed as approved by Contracting Officer.
 3. Test for a continuous 3-hour period without malfunction.
 4. Test Records and Report: Prepare and submit a complete test report along with the test records in accordance with Hydraulic Institute Standard 14.6.
 5. Use of plant instrumentation is allowed for tests. Provide additional instrumentation required to obtain required test data per the Hydraulic Institute.

3.05 MANUFACTURER'S SERVICES

- A. Manufacturer's Representative:
1. Manufacturer's Representative requirements apply only to the pumping equipment specified in this Section.
 2. Present at Site or classroom designated by Contracting Officer for minimum person-days listed below, travel time excluded:
 - a. 1 person-day for installation assistance and inspection.
 - b. 1 person-day for functional and performance testing and completion of Manufacturer's Certificate of Proper Installation.
 - c. 1/2 person-day for prestartup classroom or Site training.
 - d. 1/2 person-day for facility startup.
 - e. 1/2 person-day for post-startup training of Contracting Officer's personnel.
 - f. Training shall not commence until an accepted detailed lesson plan for each training activity has been reviewed by the Contracting Officer. Provide training session in accordance with Section 01 79 00, Demonstration and Training.
- B. Refer to Section 01 67 00, Product Requirements, for Certificate of Proper Installation, Certificate of Compliance, and other relevant requirements.
- C. Refer to Section 01 91 14, Equipment Testing and Facility Startup.

END OF SECTION