

**PART 1 GENERAL [DESIGN TEAM: THESE ARE MATERIAL LIFTS AND ARE NOT ALLOWED TO MOVE PEOPLE, ONLY MATERIALS.]**

1.1 SUMMARY

- A. This Section includes Vertical Reciprocating Conveyors (VRC).
- B. WAC 296-96 Part C1 - MINIMUM STANDARDS FOR NEW AND ALTERED WAC MATERIAL LIFTS.

1.2 DEFINITIONS

- A. Definitions in the latest version of ASME B20.1 apply to work of this Section. [DESIGN TEAM: These lifts are not under ASME A17.1 code, but ASME B20.1]
- B. Defective Work: Operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.
- C. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

1.3 QUALITY ASSURANCE

- A. Welding: Welding shall be performed in accordance with the requirements of AWS or CWB. Welders shall produce evidence of current certification by AWS or CWB.
- B. Requirements of Regulatory Agencies
  - 1. Installer shall obtain and pay for all necessary permits, and perform such tests as may be required for acceptance and approval of lifts by jurisdictional agencies.
  - 2. Installer shall notify the proper inspectors to witness required testing.

1.4 SUBMITTALS

- A. Refer to Section 14 20 00, Vertical Transportation, General.
- B. Product Data:
  - 1. Submit manufacturer's product data for each product and material.
  - 2. Indicate manufacturer, trade names, and model numbers, components, arrangement, optional and accessories being provided.
  - 3. Include applicable literature, catalog material or technical brochures.
  - 4. Include material and equipment specifications, sizes, types, dimensions, weights, rated capacities, and performance curves.

5. Include utility requirements for wiring, piping, and service connection data, motor sizes complete with electrical characteristics.

C. Shop Drawings:

1. Include plans, elevations, sections, and large-scale details indicating openings at each landing, machine room/equipment space layout, coordination with building structure, relationships with other construction, and locations of equipment.
2. Include cab and entrance drawings, including dimensions, finishes and details.
3. Include layout of operating fixtures.
4. Indicate maximum dynamic and static loads imposed on building structure at points of support and maximum and average power demands.
5. Power Confirmation Information: Include motor horsepower, code letter, starting current, full-load running current, and demand factor.

- D. Samples for Initial Selection: For finishes, including finished metals, materials with involving surface treatments, paint, and color selection.

E. Operating and Maintenance Manuals:

1. Description and sequence of operation of all equipment installed, including operating use for Building Personnel and tenants, as well as system troubleshooting manuals for technicians.
2. Maintenance instructions and procedures of all vertical transportation equipment installed, including parts lists, for each VRC system.
3. Lubrication charts indicating all lubricating points and type of lubricant recommended for all equipment.
4. Complete parts catalogs for all replaceable parts.

## 1.5 DELIVERY, STORAGE, AND HANDLING

A. General:

1. The protection of all equipment and exposed finishes is the responsibility of the VRC Contractor during delivery, handling, and installation until final acceptance of VRC equipment.
2. The VRC Contractor replaces damaged materials with new, at no additional cost for material and labor.

- B. Delivery and Storage: It is the responsibility of the VRC Contractor to properly store and protect all materials in space provided or designated by the Contractor against damage, stains, scratches, corrosion, weather, construction debris and environmental conditions.

- C. Hoisting: All required hoisting and movement of equipment is the responsibility of the VRC Contractor.

## 1.6 COORDINATION

- A. General: Refer to Section 14 20 00, Vertical Transportation, General.

- B. Coordinate installation of equipment with integral anchors, and other items that are embedded in concrete or masonry for equipment. Furnish templates, sleeves, escalator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.

- C. Coordinate sequence of installation with other work to avoid delaying the Work.

## 1.7 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair, restore, or replace VRC equipment that fails due to defective materials or poor workmanship within specified warranty period.
- B. Warranty Period: Twelve (12) months from date of Substantial Completion:
  - 1. The VRC Contractor guarantees that the materials and workmanship of the apparatus installed by them and any subcontractor, under this contract, is first class in every respect and that they will make good on any defects not due to ordinary wear and tear or improper use, which may develop within one year from the date of final acceptance of all equipment.
  - 2. Manufacturer's warranty to repair or replace defective products or their components in the event of defects within a specified period.
  - 3. Neither the final payment nor any provisions of the contract documents relieve the VRC Contractor of any obligation provided by law. They shall remedy any defects and pay all expenses for any damage to other work.
  - 4. The warranty as outlined above, for all devices, starts from the date of final acceptance of each device, by the Owner, of all work specified and intended under these contract documents.
  - 5. All other services as required by Section 14 20 00, Vertical Transportation, General.

## 1.8 MAINTENANCE

- A. General:
  - 1. All maintenance is performed according to the guidelines stated in manufacturer's Maintenance and Operations manuals.
  - 2. Maintenance records for each device, including lubrication logs, check charts, are provided in each control room.
- B. Construction Maintenance:
  - 1. Upon substantial completion of a device, after receiving sign-off from the governing authorities and acceptance from Consultant and/or Contractor, the device may be accepted for service before completion of the entire project.
  - 2. During the Construction Maintenance period, the necessary preventive maintenance is performed on a scheduled basis.
  - 3. Provide the necessary protection of the hoistway entrances and sills, hoistway fixtures, cab interiors and fixtures and car door sills.
  - 4. Replacement or repair of components, due to misuse by others, is the responsibility of the Contractor/Owner.
  - 5. Perform emergency callback service during normal working hours.
  - 6. Include 24-hour-per-day, 7-day-per-week emergency callback service with response time of sixty minutes or less.

**1.9 WARRANTY MAINTENANCE:**

- A. Upon final acceptance of each device, subsequent to receiving acceptance and sign-off from the governing authorities and final acceptance, each device is accepted for full operation.
- B. The warranty maintenance period begins for each device when all conditions in the above paragraph are met and will continue for a specified period.
  - 1. Warranty Maintenance Period may begin at different times for each VRC.
- C. The warranty maintenance program includes the following:
  - 1. Monthly examinations, including adjustments, cleaning, and lubrication of equipment.
  - 2. 24-hour Emergency Call back service is provided at no additional cost to Owner.
  - 3. Replacement of components as required, using only components produced by the original manufacturer.
  - 4. Each control room is equipped with a lockable storage cabinet to contain the necessary spare parts. See Specification 01 79 00 for spare parts list.

**PART 2 - PRODUCTS**

**2.1 GENERAL**

- A. Installer shall furnish and install lifts that shall comply with the following requirements: All lifts supplied under this contract shall be the product of a single manufacturer.
- B. Subject to compliance with the requirements of the Section, Lift Platform design shall be per Contract Drawings.

**2.2 MATERIALS**

- A. Except where product conformance to specific standards is indicated on the Contract Drawings and in ASME/ANSI A17.1, OEM's standard materials and equipment may be used in lift construction, subject to approval. Materials cited below are intended to establish the standard of quality for comparable materials used by the manufacturer.
- B. Structural Shapes, Plates, Sheets, and Tubing: ASTM A36 Steel.
- C. Sheet Steel: ASNI/ASTM A446, Grade B.
- D. Stainless Steel: ASTM A167, Type 316L
  - 1. Stainless steel with embossed texture to be rolled into exposed surface.
  - 2. Type 304 or 400-series, match specified color/finish in drawings.
  - 3. No. 4: Directional polish (satin finish). Graining directions as shown or, if shown, in longest dimension
  - 4. Textured: 5WL or 4LB as manufactured by Rigidized Metals or Windsor pattern 5-SM as manufactured by Rimex Metals or approved equal with .050-inch mean pattern depth with bright directional polish (satin finish).

5. Burnished: Non-directional, random abrasion pattern.

E. Aluminum: ASTM B211 or ASTM B221, Alloy 6061, T6.

F. Paint: Clean exposed metal parts and assemblies of oil, grease, scale, and other foreign matter and factory paint one shop coat of standard rust-resistant primer. After erection, provide one finish coat of industrial enamel paint. Galvanized metal need not be painted.

G. Prime Finish: Clean all metal surfaces receiving a baked enamel paint finish of oil, grease, and scale. Apply one coat of rust-resistant primer followed by a filler coat over uneven surfaces. Sand smooth and apply final coat of primer.

H. Baked Enamel Finish: Prime finish per above. Unless specified “prime finish” only, apply and bake three (3) additional coats of enamel in the selected solid color.

## 2.3 SUMMARY OF FEATURES [DESIGN TEAM: THE BLANK ITEMS ARE PROJECT SPECIFIC AND CAN BE CUSTOMIZED.]

A. Vertical Reciprocating Conveyor (VRC):

1. Quantity:
2. Location:
3. Capacity: 2,000 pounds.
4. Speed: 17 feet-per-minute (fpm)
5. Stops and Openings:
6. Gates:
  - a. Side:
  - b. Front:
7. Travel: Per architectural drawings
8. Platform Size:

## 2.4 OPERATION

A. General: Provide control system to perform the functions of motion and platform operation. The entire system is to be self-contained.

B. Provide a continuous pressure operation. Operation shall be by means of pressure type paddle switches in the car and at the landings, any one of which may be used to control the movement of the car as long as the switch is manually maintained in the activating position.

C. Power Source: Owner shall terminate high voltage operating power within 10’ of the location designated for installation of the VRC.

## 2.5 EQUIPMENT

- A. Support Columns: The VRC shall have a minimum of two (2) 6" wide, roll formed or wide flange support columns.
- B. Deflection Under Load: When loaded to rated capacity, no portion of the VRC shall exhibit permanent deformations.
- C. Hydraulic Power Unit:
  - 1. A pressure compensated flow control valve shall be included to provide for safe lowering of the load.
  - 2. A velocity sensing check valve is required to prevent uncontrolled carriage descent in case of a failure in the hydraulic pressure line.
  - 3. A pressure relief valve shall be provided to protect the hydraulic system from excessive pressure due to overloading or jam situations.
- H. Lifting Means:
  - 1. Raising and lowering of the carriage shall be provided by dual 2" ram direct-acting hydraulic cylinders. Sheaves, wire ropes, or chains are not to be incorporated in the lifting means.
  - 2. An adjustable mechanical stop and pressure switch act to limit the upward travel of the lift platform to a height flush and level with the upper floor. The pressure switch shall be designed and set to allow full build up of hydraulic pressure to secure the lift platform in place and prevent bounce during loading or unloading.
- I. Safety Enclosure: Guarding on all non-operating sides of the VRC shall be by safety enclosures a minimum of 8' high consisting of material which will reject a ball 1/2" in diameter. Shaft way enclosure.
- J. Floor Level Gates: Gates are required on all operating sides of the VRC at each level of operation.
  - 1. The gates shall be fire rated type.
  - 2. Each gate must be equipped with an electro-mechanical interlock to prevent opening of the gate unless the carriage is present, and to prevent operation of the VRC unless all gates are closed.
- K. Signs: "NO RIDER" signs shall be provided. Lettering shall be a minimum of 2" high for visibility.
- L. Approach Ramp: If a pit is not specified, the manufacturer shall supply or option a steel fabricated approach ramp to be installed within 1" of the VRC platform at the ground level.
- M. Motor:
  - 1. Motor horsepower shall be sized for the rated live load and specified speed.
  - 2. All motors are three phase and shall be designed for continuous duty at ambient temperatures from 32° to 102° Fahrenheit.

N. Control Stations:

1. Each operating floor level shall be equipped with a momentary contact push button control station with call, send, and mushroom style E-stop operators for manual control of lift operation.
2. An internally pre-wired main control panel shall be provided with step-down transformer and field wiring terminal block.
3. The motor/pump unit shall be pre-wired to the main control panel.
4. Provide quick-connect type cables and connectors for field connection of push button control stations and gate interlocks to the main control panel.

2.6 CONTROLLER

A. General:

1. The lift control equipment shall contain diagnostic capabilities as required for the ease of complete maintenance. The diagnostic system shall be an integral part of the controller and provide user-friendly interaction between the service person and the controls. All such systems shall be free from decaying circuits that must be periodically reprogrammed by the manufacturer.
2. Switch gear shall be mounted in cabinets and labeled terminal strips.
3. The Main controller shall be a non-proprietary programmable automation controller (PAC).

**PART 3 - EXECUTION**

3.1 EXAMINATION

- A. Prior to commencing with the installation of lift equipment, examine the following and verify that no irregularities exist that would affect the quality of execution of work specified.
1. Structural Supports and Plumbness.
  2. Pit depth.
  3. Overhead clearance.

3.2 INSTALLATION

- A. Install lift in accordance with the OEM's installation procedures and approved Shop Drawings. Install equipment so it may be easily removed for maintenance and repair. Install all equipment to afford maximum accessibility, safety, and continuity of operation.
- B. Verify that electrical wiring installation is in accordance with the OEM's submittal.
- C. Erect all items square, plumb, straight and accurately fitted with tight joints and intersections.

- D. Coordinate with the General Contractor to ensure that the installation of the lifts is not in conflict with the work performed of other trades.
- E. Provide protective coverings for finished surfaces.
- F. Upon completion, touch up and restore damaged or defaced factory finished surfaces. Touch up any marred finishes and replace as directed.
- G. Remove protective coverings and clean exposed surfaces after completion.
- H. Welding shall comply with AWS D1.1. Identify field welds with welder's identification stamp.

### 3.3 FIELD TESTING

- A. General: After installation, the Installer shall inspect and test each lift and related equipment to Owner's satisfaction that operation of every part of the equipment complies with this specification and with applicable requirements of ANSI A18.1 including sound level criteria specified herein. Lift will be inspected in accordance with the following:
  - 1. Installer shall notify Owner seven (7) days prior to each scheduled test Installer shall perform testing in the presence of the Owner's representative.
  - 2. Installer shall notify the appropriate local authorities having jurisdiction a minimum of seven (7) days in advance of final acceptance tests.
  - 3. Installer shall provide all instruments, materials, and labor required for tests specified herein.
- B. Acceptance Testing:
  - 1. Inspect and test the lift and related equipment to the Owner's satisfaction that operation of every part of equipment complies with applicable requirements of ASME/ANSI A18.1 and local codes.
  - 2. Speed Test: Make tests before and after full load tests. Determine actual speed of car in both directions of travel, both with full-specified rated load and no load in car. Tolerances for determining if car speeds meet the specified requirements are as follows:
    - a. Ascending and Descending Car Speed not more than 10 percent above or more than 10 percent below required speed.
    - b. Car Leveling Test: Determine accuracy of floor landing tests both before and after full load run tests. Minimum of 1/4 inch leveling must be maintained. Test accuracy of landing at all floors with full load and no load in car, in both directions of travel.
    - c. Electrical Tests: Ensure lift wiring system is free of short circuits and accidental grounds. Test ground resistance of lift structure, equipment, and raceways for continuity. Using meg ohm-meter, determine that insulation resistance of each circuit is more than one (1) meg ohm or higher as required by the cable manufacturer. Insulation resistance for motors shall be determined under actual conditions after installation.
  - 3. Acceptance: Lift acceptance will be based upon lifts meeting requirements of Contract Documents and upon evidence of passing specified acceptance tests and inspections. Final testing will be after lifts are connected to permanent power.
  - 4. Failures for any reasons shall be identified with cause(s) and corrective action taken.
- C. Re-Inspection: If any equipment is found to be damaged or defective, or if the performance of the lifts does not conform to the requirements of the contract specifications or the Safety Code, no approval or acceptance of



lifts shall be issued until all defects have been corrected. When the repairs and adjustments have been completed and the discrepancies corrected, the Owner and Owner's representative shall be notified and the lifts will be re-inspected. Rejected lifts shall not be used until they have been re-inspected and approved.

- D. The certificate of inspection for operational use will be issued to Port of Seattle by the enforcing inspection agency. The certificate shall be posted in the lift control room and in the car operating station.

#### 3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Port of Seattle's maintenance personnel to operate, adjust, and maintain lifts.
- B. Check operation of lifts with Port of Seattle's personnel present and before date of Completion. Determine that operation systems and devices are functioning properly.
- C. Check operation of lifts with Port of Seattle personnel present not more than one month before end of warranty period. Determine that operation systems and devices are functioning properly.

**END OF SECTION 14 46 00**