

**SECTION 14550
VERTICAL RECIPROCATING CONVEYOR**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Design, fabrication, and installation of one (1) vertical reciprocating conveyor (VRC) including drive unit, manual controls, gates, and enclosures as shown on project drawings and as specified herein.

1.02 RELATED SECTIONS

- A. Section 03300: Cast in place concrete.
- B. Sections of Division 16: Electrical as applicable.

1.03 REFERENCES

- A. ANSI – American National Standards Institute (ANSI/ASME B20.1).
- B. AWS – American Welding Society.
- C. NEMA – National Electrical Manufacturer’s Association.

1.04 SUBMITTALS

- A. Product Data: Submit latest edition of VRC data sheet and outline drawing with the proposal.
- B. Shop Drawings:
 - 1. Submit General Arrangement Drawing for approval within 2 weeks after receipt of an order, including plans, elevations, sections of the VRC, base plate and brace reaction values, and recommended pit dimensions if applicable.
 - 2. Submit VRC Specification Sheet for approval within two weeks of receipt of an order, including scope of work, operating and control voltages, lift speed, type of paint, and any special project notes.
- C. Closeout Submittals provided with equipment:
 - 1. Electrical Schematic Drawing including control panel layout.
 - 2. Installation Manual and Electrical Installation Guide.
 - 3. Owner’s Manual including operating instructions, maintenance schedule, service and troubleshooting guidelines.

1.05 QUALITY ASSURANCE

- A. Manufacturer must have a minimum of five (5) years experience in the manufacture of vertical reciprocating conveyors.
- B. All structural welding performed by manufacturer shall be in accordance with AWS D.1.1. structural welding code.
- C. Autoquip vertical reciprocating conveyors (VRC) are covered by ANSI/ASME B20.1 code.
- D. Installer shall have the approval of the manufacturer and have a minimum of five (5) years experience in the installation of vertical reciprocating conveyors.

1.06 WARRANTY

- A. The manufacturer shall warrant the VRC free of manufacturing defects beginning (30) days after shipment with the following minimums:
 - 1. All components – one (1) year parts.
 - 2. Labor is 90 days, one (1) year labor with PMP (Preventative Maintenance Program) in place.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Autoquip Model FL4M manufactured by Autoquip Corporation, 1058 West Industrial, Guthrie, Oklahoma 73044. Phone (405) 282-5200, Fax (405) 282-8105.

2.02 VRC MECHANICAL SPECIFICATION

- A. Capacity: The VRC shall be rated at a live load capacity of ____ lbs.
- B. Speed: The VRC shall have a lifting speed of 30 feet per minute when loaded to capacity.
- C. Vertical Travel: The VRC shall have a maximum lift height of ____ with a total of ____ operating levels with a distance between floors of ____.
- D. Lift Platform: The VRC platform shall be a minimum of ____ inches wide x ____ inches long x 84” load height with a steel deck plate and minimum 48” high welded handrails and kick plates on non-operating ends and safety chains with snap hooks on operating ends.
- E. Support Columns: The VRC shall have a minimum of four (4) 6” wide flange support columns.
- F. Deflection Under Load: When loaded to rated capacity, no portion of the VRC shall exhibit permanent deformations.
- G. Lifting Means: Raising and lowering of the carriage shall be provided by a chain over sprocket with common drive shaft connected to an efficient helical gear reducer assembly. The lifting chains shall be in a guidance assembly.

- H. Safety Cams: Safety cams shall be mounted on the platform and connected directly to the lifting chains. The cams shall prevent the platform from falling more than 6” if tension is lost in the chains.
- 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 2” in diameter.
- J. Floor Level Gates: Gates by Autoquip Corporation /or doors by others are required on all operating sides of the VRC at each level of operation.
 - 1. The gates/doors shall be (vertical acting) (Single swing) (BI-Swing) (slide) type.
 - 2. Each gate must be equipped with a combination gate status switch and 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 All other signage shall meet the minimum requirements set forth in the VRC application guidelines as referenced by ASME B 20.1.
- L. Approach Ramp: If a pit is not specified, the manufacturer shall supply a steel fabricated approach ramp to be installed within 1” of the VRC platform at the ground level.

2.03 VRC ELECTRICAL SPECIFICATION

- A. Electric 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.
 - 3. The motor shall not automatically restart when the overload device is reset.
 - 4. The motor shall be equipped with a heavy-duty, fast-acting, fail-safe industrial brake to ensure the brake will hold in case of power failure.
- B. Controls:
 - 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, NEMA 12 rated main control panel shall be provided with step-down transformer, reversing motor starter, overload relay, instantaneous current sensing jam relay, inrush bypass timer, field wiring terminal block, and positive acting brake contacts.
 - 3. Travel Limit Switch: The VRC shall be equipped with a floor level, upper level, and overtravel limit switch to control positioning of the VRC platform.
 - 4. Chain Tension Safety Device: Monitors each chain and shuts off motor while engaging brake in the event of a slack or broken chain.

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

2.04 FINISHES

- A. All carbon steel surfaces shall be coated with an industrial enamel finish – color Autoquip Blue (RAL 5000) or Customer specified.
- B. Prior to painting, all dirt, mill scale, oil, and grease shall be removed from carbon steel surfaces by a combination of brushing, wiping, and use of high pressure spray wash.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Prior to commencing installation of the VRC, the installer shall visually examine the conditions under which the VRC is to be installed and notify the architect in writing of conditions detrimental to the proper and timely completion of the work.

3.02 INSTALLATION

- A. Install the VRC, enclosures, and gates as indicated on the approved shop drawing.
- B. Comply with manufacturer's detailed installation instructions when installing the equipment.

3.03 FIELD QUALITY CONTROL

- A. Inspection: Upon completion of installation, the VRC shall be inspected to verify that it meets all requirements of Parts 1, 2, and 3 of this Section.
- B. Tests:
 1. Operating Load Test: The owner will provide a _____ pound test load and load the VRC at the ground level. The loaded VRC platform shall be conveyed to an upper floor level and returned to the ground level to assure proper operation. If the VRC conveyor cannot lift or lower the load, the VRC shall fail the test.
 2. Performance Test: This Test is to be performed in conjunction with Test 1 above. During the demonstration of the lifting and lowering test, the owner shall measure the time required to lift and lower the capacity load. The owner will average times for lifting and lowering the load and calculate the average lifting and lowering speed. If the VRC does not lift the load within 10% of the specified speed, or if the lowering speed exceeds the lifting speed by more than 10%, the VRC shall fail the test.
 3. Stationary Load Test: This Test is to be performed in conjunction with Test 1 above. The loaded VRC platform shall remain stationary at an upper level for a minimum of one (1) hour. After the one (1) hour period, the VRC will be inspected for deflection of the components or drift of the platform. If deformation or downward drift is evident, the VRC shall fail the test.

3.04 ADJUSTING AND CLEANUP

- A. Touch up all scratches, abrasions, and other defects in the pre-finished surfaces with the same material color as that used in the factory applied finish.
- B. Remove and dispose of all rubbish and debris caused by the work under this section.
- C. Verify that equipment is properly installed and guarded per ANSI/ASME B20.1.

END OF SECTION