VERTICAL RECIPROCATING CONVEYOR

PART 1: GENERAL

1.01: OVERVIEW

A. Design and manufacture of one (1) modular straddle type Vertical Reciprocating Conveyor (VRC) including mechanical drive unit, operator controls, safety gates and enclosures.

1.02: REFERENCES

A. ANSI – American National Standards Institute (ANSI B20.1)

B. ASME – American Society of Mechanical Engineers (ASME B20.1)

C. NEMA – National Electrical Manufacturer's Association

1.03: SUBMITTALS

A. Product Data: Submit latest edition of VRC datasheet and general drawings with the proposal.

B. Customer Drawings: Submit Customer Engineering Drawings for customer approval within two (2) weeks after receipt of an order to include plans, elevations, sections of the VRC.

C. Closeout Submittals provided with VRC Equipment:

1. Electrical Schematics Drawing including control panel layout.
2. Mechanical Installation Manual and Electrical Installation Guide.
3. Control Panel troubleshooting guide.
4. Owner's Manual including replacement parts list, operating instructions, maintenance schedule, and service and troubleshooting guidelines.

1.04: QUALITY ASSURANCE

A. Manufacturer must have a minimum of five (5) years experience in the manufacturing of vertical reciprocating conveyors.

B. Vertical Reciprocating Conveyors (VRC), when properly installed, must comply with ANSI/ASME B20.1 Safety Standards for Conveyors and Related Equipment.

1.05: WARRANTY

A. The manufacturer shall warrant the VRC against manufacturing defects from date of installation or 30 days after shipment, whichever is less, as outlined below:

1. Lift Structure – Lifetime.
2. Electric Motor and Cyclo-Drive Reducer – five (5) years.
3. Electrical Components – ninety (90) days.
4. Mechanical Components – one (1) year.

PART 2: PRODUCTS

2.01: VRC MECHANICAL SPECIFICATIONS

A. Load Capacity: The VRC shall be rated at a live load capacity of 2,500 lbs.

B. Operating Speed: The VRC shall have a vertical lifting speed of 19 - 21 feet per minute when loaded to maximum capacity.

C. Vertical Travel Height: The VRC shall have a vertical lifting height (finished floor to finished floor) of 159 inches with a total of 2 landings (including lowest level).

D. Lift Carriage: The VRC carriage shall be 72" wide x 72" deep x 72" load height (clear) with a steel deck plate and 72" high platform side panels on all non-operating ends and safety chains with snap hooks on all operating ends.

E. Mounting: The VRC shall be surface mounted.

F. Vertical Masts: The VRC shall have two (2) guide rails.

G. Deflection Under Load: No portion of the VRC shall exhibit permanent deflection when loaded to full capacity.

H. Lifting Means: The drive system shall be comprised of two (2) drums transmitting lifting forces through two (2) wire rope cables to the upper cross member of the carriage with leveling adjustments. The electrical drive motor shall be 100% duty cycle coupled with a Cyclo-Drive gear reducer with a shock load rating of 500%. Planetary or helical gear reducers are not allowed.

I. Safety Brakes and Devices: The Carriage shall be equipped with two (2) broken/slack cable brakes that prevent the carriage from descending if tension is lost on the cable. Slack cable switches are required to disable motor power in the event a cable becomes slack or broken.

J. Security Enclosures: Guarding on all sides of the VRC to extend the full height of the unit shall be security enclosures consisting of expanded metal which will reject a ½" diameter ball. Enclosures shall be welded securely to the guide rails.

K. Landing Gates: Gates are required on all operating sides of the VRC at each level of operation.

1. Each double-swing gate must be equipped with an electrical and mechanical locking device to prevent opening of the gate unless the carriage is present and to prevent operation unless all gates are closed.

L. Signage: Signs dictating "NO RIDERS" and maximum weight capacity shall be placed at every access point and visible from all operating ends of the carriage.

M. Approach Ramp: The manufacturer shall supply a steel fabricated 4" high approach ramp to be installed within ½" of the VRC carriage at the ground level.

N. Power Requirements: The VRC shall be manufactured to operate on 460 Volts / 3-Phase / 60 hertz.

O. Load Pattern: The pattern for loading and unloading the carriage at different levels must be a "Z" configuration (loading /unloading from opposite sides).

2.02: VRC ELECTRICAL SPECIFICATIONS

A. Electric Motor:

1. The motor shall have a minimum duty cycle of 100%.

2. The motor and Cyclo-Drive gear reducer must be able to withstand a shock load of at least 500%.

3. Motor horsepower shall be sized to handle the carriage weight in addition to the rated live load and specified speed.

4. Motor shall be designed for continuous duty at ambient temperatures of 32° to 102° Fahrenheit.

5. The motor shall <u>not</u> automatically restart when the overload device is reset.

6. The motor shall be equipped with a heavy-duty, long life, fast-acting fail-safe disc brake to ensure the brake will hold in case of power failure.

B. Controls:

1. Each operating floor shall be equipped with a light-present momentary contact push-button control station with full call, send and mushroom style E-stop switches for manual control of lift operation.

2. An internally pre-wired, NEMA 12 rated Intelitroll control panel shall be provided with appropriate transformer, overload relay, field wiring terminal block and breakers. The control panel shall be a UL 508A listed control panel.

3. Limit Switches: The VRC shall be equipped with a floor level switch at each level, upper level, and over travel limit switch to provide precise positioning of the carriage.

4. Slack Cable Safety Switches: Switches shall be provided to monitor slack cable situations and disable power to the motor while engaging carriage safety brakes in the event of a slack or broken cable.

5. Pre-Wired: The VRC shall be pre-wired at the factory and tested prior to shipping. Pre-wire shall consist of proper wiring of limit switches, slack cable switches, motor, interlocks and pushbutton stations to control panel.

6. The control voltage shall not exceed 24 volts.

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

2.03: FINISHES

A. All carbon steel surfaces shall have a powder cost finish. Color shall be Gray.

B. Prior to applying finish, all dirt, mill scale, oil and grease shall be removed from carbon steel surfaces by a combination of brushing, wiping and use of solvents.