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| Specification Section 32 31 00  TIGER SECURITY GATE SYSTEM – TYM-VSA OPERATOR, STRUCTURAL GATE AND LOCK (CHAIN LINK) | 1100-Heavy Duty | Tymetal-T-Orange |

1. GENERAL
   1. **SECTION INCLUDES:**
      1. The work in this section shall include furnishing all labor, materials, equipment and appliances necessary to complete all Fortress Structural Gate System(s) required for this project in strict accordance with this specification section and drawings. The gate and operator shall be specifically designed to complement each other as a system and be provided by a single manufacturer. Components (operator from one source and gate panel from another) assembled at the job site to form a system will not be approved.
   2. **REFERENCES:**
      1. Underwriters Laboratory Gate Operator Requirements (UL 325).
      2. ASTM F 2200 – Standard Specification for Automated Vehicular Gate Construction.
      3. ASTM F 1184 – Standard Specification for Industrial and Commercial Horizontal Slide Gates, Type II, Class 2. See 3.02 B.
      4. American Welding Society AWS D1.2 Structural Welding Code. See 1.03D-4.
      5. ASTM A 123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel.
   3. **SUBMITTAL:**
      1. Product Data:
         1. Provide manufacturer’s catalog cuts with printed specifications and installation instructions.
         2. Deliver two copies of operation and maintenance data covering the installed products. Manual to include parts list showing manufacturer’s names and part numbers for the gate operator.
      2. Shop Drawings:
         1. Supply shop drawings showing the relationship of operating systems with gate components, including details of all major components.
         2. Include complete details of gate construction, gate height and post spacing dimensions.
      3. Certification of Performance Criteria:
         1. Manufacturer of gate system shall provide certification stating the gate system includes the following material components that provide superior performance and longevity. Alternate designs built to minimum standards that do not include these additional structural features shall not be accepted.
            1. Gate track system shall be keyed to interlock into gate frame member (providing 200% additional strength when compared to weld only keyless systems). When interlocked with and welded to the "keyed" frame top member, gate track forms a composite structure.
            2. Gate shall have a minimum counterbalance length of 50% opening width which provides a 36% increase in lateral resistance (when compared to ASTM minimum of 40% counterbalance). If gate is ever to be automated, counterbalance section shall be filled with fabric or other specified material.
            3. To provide superior structural integrity, intermediate vertical members shall be used - with spacing between verticals to be less than 50% of the gate frame height.
            4. Entire gate frame (including counterbalance section) shall include 2 adjustable stainless or galvanized steel cables (minimum 3/16”) per bay to allow complete gate frame adjustment (maintaining strongest structural square and level orientation).
            5. Gate truck assemblies shall be tested for continuous duty and shall have precision ground and hardened components. Bearings shall be pre-lubricated and contain shock resistant outer races and captured seals.
            6. Gate truck assemblies shall be supported by a minimum 5/8” plated steel bolt with self aligning capability, rated to support a 2,000 # reaction load.
            7. Hanger brackets shall be hot dipped galvanized steel with a minimum 3/8” thickness that is also gusseted for additional strength.
            8. Gate top track and supporting hangar bracket assemblies shall be certified by a licensed professional engineer to withstand a 2,000 lb. vertical reaction load without exceeding allowable stresses.
      4. Certifications:
         1. Cantilever Slide Gate and Operator System manufacturer shall submit test results stating that the gate panel and operator have been tested as a system for 200,000 cycles. See 2.03C.
         2. Gate manufacturer shall certify gate is manufactured in compliance with ASTM F 2200, Standard Specification for Automated Vehicular Gate Construction and the operators are UL 325 listed.
         3. Gate operator shall be in compliance with UL 325 as evidenced by UL listing label attached to gate operator.
         4. Gate manufacturer shall provide independent certification as to the use of a documented Welding Procedure Specification and Procedure Qualification Record to insure conformance to the AWS D1.2 welding code. Upon request, Individual Certificates of Welder Qualification documenting successful completion of the requirements of the AWS D1.2 code shall also be provided.
         5. Manufacturer shall supply gate design performance certification as per section 1.03 C.
2. PRODUCTS:
   1. **Cantilever slide gate system MANUFACTURERS:**
      1. The cantilever sliding gate system shall be manufactured by Tymetal Corp., 678 Wilbur Ave., Greenwich, NY 12834 ‑ (800) 328 ‑ 4283.
      2. Approved substitution – All other systems must be submitted to the design team in accordance with substitution requirements as set forth in the general provisions of the specification manual for approval prior to the bid date. Products submitted after the bid date will not be approved.
      3. Gate system manufacturer shall have a minimum of $25 million in liability insurance.
   2. **SYSTEM DIMENSIONS:**
      1. Fortress Structural Cantilever Slide Gate System dimensions shall be as shown on the detail drawings.
         1. Structural Gate may be used for single clear openings up to 40’ wide.
   3. **SYSTEM FUNCTION:**
      1. Operation:
         1. System shall be designed so that gate movement from the closed position is impossible except by electric or mechanical means.
      2. Variable Speed-Rate of Travel:
         1. The TYM-VSA gate operator shall have the ability to achieve a maximum gate speed of 2.2 feet per second, and shall be equipped with soft‑start and soft‑stop function to prevent shock load to the gate panel and operator.
      3. Cycle Testing:
         1. The cantilever slide gate and operator system shall be cycle tested a minimum of 200,000 cycles. See 1.03D-1.
   4. **TYMETAL VEHICULAR SLIDE GATE OPERATOR TYM-VSA:**
      1. The slide gate operator as provided by Tymetal Corp. shall open and close cantilever, overhead, or track gates, to provide convenience and security. This model is adapted to function with most accessories including: radio controls, electro-mechanical locks, single and three button control stations, digital keypads, coded cards, sensing loops, telephone entry systems, and revenue control equipment. The operator utilizes 208/230 Volt AC single phase, or 208/230 Volt AC or 460 Volt AC three phase power. Motor box is 10 gauge galvanized steel with detention grade hinges and mogul lock.
      2. The gate operator shall be UL 325 compliant for Class III and IV.
      3. The gate operator includes an APeX Controller with integrated radio receiver, plug-in loop detector capability, surge protection, and easy to read labeling standard.
      4. Capacity:
         1. The gate operator shall be rated to operate a gate weighing up to 5,000 lbs.
      5. Motor Size:
         1. The electrical motor shall be 1 HP, [208/230VAC, Single Phase] or [208/230VAC, Three Phase] or [460 VAC, Three Phase] as produced by a nationally recognized manufacturer.
      6. AC Drive:
         1. The variable frequency drive unit shall allow for programmable speeds and programmable soft-start and soft-stop features.
      7. Overload Protection:
         1. Motor shall be protected against overload by either a thermal or a current sensing overload device.
      8. Gear (Box) Reducer:
         1. The self-enclosed gear-head gearbox shall be manufactured as a single unit, and shall consist of a hardened steel, machine cut worm and mating bronze gear running in oil bath. The gearbox shall perform the following functions:
            1. Adjustable Clutching Device.
            2. Manual disconnect by crank handle.
      9. Gear Box Heater
         1. Operator shall include internal gearbox heater and a heater strip for the control box.
      10. Drive – Chain:
          1. A #50 roller chain shall be utilized. All chain brackets and required attachment hardware shall be supplied.
      11. Manual Operation:
          1. A crank handle, located at ground level in the motor box, shall provide a two-step emergency procedure for manual operation:
             1. Unlock and open motor-box door.
             2. Fold out handle and crank gate opened or closed.
      12. Limits:
          1. The operator shall be equipped with an integral limit system, providing accurate settings to control the open and close positions of the gate, and shall not be affected by manual operation or motor removal.
      13. Control Circuit:
          1. U.L. listed operator shall have 5VDC control signal.
      14. Control wiring:
          1. The electrical contractor shall supply all exterior control wiring.
      15. Audio Alarm:
          1. This alarm shall have a dual function.
             1. The first function shall be as a warning prior to gate movement. When the motor control board recognizes a command, this alarm shall be activated three (3) seconds before the motor is energized and the gate begins to move. This shall be continuously activated while the gate is in motion.
      16. Main Power Disconnect Switch and Wiring Compartment:
          1. When this switch is in the OFF position, the main power shall be disconnected from the Variable Speed Drive, Motor Control Board and power transformer(s).
      17. Speed:
          1. The gate operator speed shall be fully programmable allowing a maximum speed of 2 feet per second.
      18. Transformer:
          1. Operators shall have an isolated low voltage (24VDC, 750mA) power supplied to provide power for external control devices (not including external gate lock).
      19. Auto Close Timer:
          1. The timer provides an automatic closure of the gate from the full open position, adjustable from 0 to 60 seconds.
      20. Master/Slave:
          1. Master/Slave or stand alone capable with programmable setting.
   5. **MOTOR HOUSING:**
      1. Water Resistant Motor Box:
         1. The motor box shall be constructed of 10-gauge sheet steel, hot-dip galvanized per ASTM A 123, gasketed and located at ground level for easy maintenance.
      2. Security Hinges and Tamper Resistant Security Screws:
         1. Security hinges and screws shall be furnished to secure operator enclosure components.
      3. Motor Box Lock:
         1. Motor box shall be locked with a detention grade dead bolt. Three (3) keys shall be provided per key code.
   6. **ACCESS CONTROL:**
      1. Entrapment Devices:
         1. Photoelectric through beams/photo eyes shall be installed to span the clear opening and gate path at the tail section.
      2. Optional accessories, contact, non-contact, and control devices:
         1. Control devices include pushbuttons, radio controls, keypads, card readers, key switches, telephone entry systems, and revenue control equipment.
         2. Contact and non-contact devices include photoelectric sensors, vehicle detectors, proximity sensors, and contact edges.

Accessories include flashing strobe lights, cycle counters, and intercom systems.

* 1. **STRUCTURAL SLIDING GATE PANEL:**
     1. Structural Gate Frame:
        1. The gate frame shall be fabricated from 6063-T6 aluminum alloy extrusions. The top member shall be a 3" x 5" aluminum structural channel/tube extrusion weighing not less than 3.0 lb/lf (4.4kg/m). To maintain structural integrity this frame member shall be "keyed" to interlock with the "keyed" track member. If fabricated as a single horizontal piece, the bottom member shall be a 2" x 5" aluminum structural tube weighing not less than 2.0 lb/lf. If fabricated in two horizontal pieces, the bottom member shall be a 5" aluminum structural channel weighing not less than 2.65 lb/lf, and the two horizontal pieces or sections shall be spliced in the field (the gate frame shall be fabricated in one or multiple sections depending on size requirements or project constraints).
        2. Vertical Members:
           1. The vertical members at the ends of the opening portion of the frame shall be "P" shaped in cross section with a nominal base dimension of no less than 2” x 2” (51mm x 51mm) and weighing not less than 1.6 lb/lf (2.3kg/m). The intermediate vertical members shall alternate between 2” x 2” (51mm x 51mm) and 1” x 2” (25mm x 51mm) in cross section weighing not less than 1.1 lb/lf (1.6kg/m) and 0.82 lb/lf (1.2kg/m) respectively.
           2. Intermediate 1” x 2” (25mm x 51mm) vertical members weighing not less than .82 lb/lf shall alternate between 2” x 2” major members.
     2. Splicing:
        1. A ¼" x 5" x 24" galvanized steel splice plate shall be used to secure the two bottom channel members together utilizing eight (8) plated carriage bolts with lock nuts. The top members will be spliced together using a ¼" x 2" x 24" aluminum splice plate secured with six (6) drive rivets on one side and welded to the top member on the other side. The track is overlapped onto the opposing section in an alternating fashion, interlocking with the top primary member.
     3. Gate Track:
        1. The gate shall have a separate semi-enclosed “keyed” track, extruded from 6005A-T61 or 6105‑T5 aluminum alloy, weighing not less than 2.9 lb/lf. Track members are to be located on each side of the top member. When interlocked and welded to the “keyed” top member, it forms a composite structure with the top of the gate frame. Welds are to be placed alternately along the top and side of the track at 9" centers with welds being a minimum of 2" long.
     4. All welds on the gate frame shall conform to Welding Procedure Specification and Procedure Qualification Record to insure conformance to the AWS D1.2 Structural Welding Code. All individual welders shall be certified to AWS D1.2 welding code. See 1.02 D.
     5. Gate Mounting:
        1. The gate frame is to be supported from the track by four (4) swivel type, self-aligning, 4‑wheeled, sealed lubricant, ball-bearing truck assemblies.
        2. The bottom of each support post shall have a bracket equipped with a pair of 3” (76mm) UHMW guide wheels Wheel cover protectors shall be included with bottom guides to comply with UL325.
        3. Gap protectors shall be provided and installed, compliant with ASTM F 2200.
     6. Diagonal Bracing:
        1. Diagonal "X" bracing of 3/16" or ¼” diameter stainless or galvanized steel cable shall be installed throughout the entire gate frame.
     7. The gate shall be completed by installation of approved filler as specified.
        1. Chain Link: 2” x 2” x 9 gauge aluminized steel chain link fabric shall extend the entire length of the gate (if operated gate, counterbalance must also have fabric to prevent reach through and comply with ASTM F 2200, see 1.03 C.1) Fabric shall be attached at each end of the gate frame by standard fence industry tension bars and tied at each 2” x 2” (51mm x 51mm) vertical member with standard fence industry ties. ASTM F 2200 requires attachment method that leaves no leading or bottom edge protrusions (cannot exceed 0.5 inch).
     8. Posts:
        1. Double sets of support posts shall be minimum 4" O.D. (102mm) round SS40 or 4” x 4” x 3/16” wall square steel tubing, grade 500. Gate posts shall be galvanized or coated and supported in concrete footings as specified by the design team.
     9. Finish:
        1. Gate to be mill finish aluminum or color coated with polyester powder as specified. If powder coated, the gate (including track member) and all accessories shall be pretreated chemically by sand blasting or other acceptable method to ensure proper coating adherence.
     10. Gate Lock:
         1. Gate system shall be furnished with a secure gate catcher. The catcher shall prevent the gate panel from being pried open while the gate is in the closed and locked position.
         2. Gate system shall be furnished with an electro-mechanical lock. Lock shall be supplied with status indication and with a six tumbler mechanical lock. All gates shall be keyed alike. Lock requires additional 115V power supplied by others.
  2. **WARRANTY:** 
     1. The cantilever slide gate and operator system shall be warranted by the manufacturer against manufacturing defects for a period of (3) three years from date of sale. The truck assembly shall be warranted against manufacturing defects by the manufacturer for a period of (5) five years from date of sale.

1. EXECUTION
   1. **Site INSPECTION:**
      1. Final grades and installation conditions shall be examined. Installation shall not begin until all unsatisfactory conditions are corrected.
   2. **INSTALLATION:**
      1. Equipment in this section shall be installed in strict accordance with the company’s printed instructions unless otherwise shown on the contract drawings.
      2. The gate and installation shall conform to ASTM F 1184 standards for aluminum cantilever slide gates, Type II, Class 2. See 1.02 C.
      3. The gate system is to comply with ASTM F 2200 and UL 325. See 1.02 B and 1.02 A.
      4. The installing contractor shall be responsible to ensure that appropriate external primary entrapment safety devices be installed for the specific site conditions to protect against all potential entrapment zones. Proper operation of these safety devices shall be verified and training as to the operation and maintenance of these devices for the users and owners shall be documented.
   3. **SYSTEM validation:**
      1. The complete system shall be adjusted to assure it is performing properly.
      2. The system shall be operated for a sufficient period of time to determine that the system is in proper working order.
      3. Test and Explain Safety Features:
         1. Each system feature and device is a separate component of the gate system.
         2. Read and follow all instructions for each component.
         3. Ensure that all instructions for mechanical components, safety devices and the gate operator are available for everyone who will be using the gate system.
         4. The warning signs shipped with the gate operator must be installed in prominent position on both sides of the gate.
      4. Ensure the owner is clear with regard to the safety points concerning the basic operational guidelines of the safety features of the gate operator system. These safety points are listed in the operator manual and must be read prior to system use.

**Note: Tymetal Corp. reserves the right to modify and/or make changes as deemed necessary without previous notice.**