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| Specification Section 32 31 00**TYM-VSA-TBF TELESCOPING BOX FRAME ROLLER GATE SYSTEM** | Boxframe_Roller_Gate | 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 TYM-VSA-TBF Telescoping Box Frame Roller Gate Systems with Variable Speed Operator required for this project in strict accordance with this specification section and drawings.
	2. REFERENCES:
		1. Underwriters Laboratory Gate Operator Requirements (UL 325).
			1. Automated / operated vehicular gates are not to be used for pedestrian traffic. Separate pedestrian gates must always be provided if pedestrian traffic is expected.
		2. ASTM F 2200 – Standard Specification for Automated Vehicular Gate Construction. See 3.01 C.
		3. American Welding Society AWS D1.2 Structural Welding Code. See 2.01 D.
		4. American Welding Society AWS D1.1 / D1.1M Structural Welding Code. See 2.01 D.
		5. ASTM A 123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel.
	3. SUBMITTALS:
		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. 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.
				2. Entire gate frames (inner frame and outer frame) shall include 2 adjustable stainless or galvanized steel cables (minimum 3/16”) per bay each side to allow complete gate frame adjustment (maintaining strongest structural square and level orientation).
				3. 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.
				4. 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.
				5. Top overhead track for inner gate shall be certified by a licensed professional engineer to withstand a 2,000 lb. vertical reaction load without exceeding allowable stresses.
		4. Certifications:
			1. Gate in compliance with ASTM F 2200, Standard Specification for Automated Vehicular Gate Construction per section 2.01 C.
			2. Gate operator shall be in compliance with UL 325 as evidenced by UL listing label attached to gate operator.
			3. The aluminum welders and welding process must be certified per section 2.01D.
			4. Manufacturer shall supply gate design performance certification as per section 1.03 C.
2. PRODUCTS:
	1. TELESCOPING BOX FRAME ROLLER GATE SYSTEM MANUFACTURER:
		1. The Telescoping Box Frame Roller Gate System (patent pending) shall be manufactured by Tymetal Corp., 678 Wilbur Avenue, 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 manufacturer shall certify gate is manufactured in compliance with ASTM F 2200, Standard Specification for Automated Vehicular Gate Construction. See 1.03 D.1.

## Gate manufacturer shall provide independent certification as to the use of a documented Welding Procedure Specification and Procedure Qualification Records to insure conformance to the AWS D1.2 (aluminum) and AWS D1.1 / D1.1M (steel) Structural Welding Codes. Upon request, Individual Certificates of Welder Qualification documenting successful completion of the requirements of the AWS D1.2 and AWS D1.1 / D1.1M codes shall also be provided.

* 1. SYSTEM DIMENSIONS:
		1. TYM-VSA-TBF Telescoping Box Frame Roller Gate System dimensions shall be as shown on the detail drawings.
	2. 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.
				1. The exterior / outer frame assembly shall be driven by the TYM-VSA operator and shall achieve a maximum speed of 1.1 feet per second.
				2. The interior / inner frame assembly shall achieve a maximum gate speed equivalent of twice the speed of the exterior / outer gate panel. The maximum speed of the interior panel is 2.2 feet per second. The interior panel shall be driven in unison with the exterior panel by the cable system.
	3. 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 2.2 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.
		21. Factory Inspection and Testing
			1. Manufacturer shall test each operator at factory to assure smooth, quiet operation.
			2. Manufacturer shall test all control inputs to ensure proper function.
	4. 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.
	5. 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.
			3. Accessories include flashing strobe lights, cycle counters, and intercom systems.
	6. GATE CONSTRUCTION DETAILS:
		1. Gate Frame:
			1. 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 C.
			2. The gate frames (inner and outer) shall be fabricated from 6063-T6 aluminum alloy extrusions. The primary members (top and bottom) shall be "P" shaped in cross section with no less than 2" on a side and weighing not less than 1.6 lb/lf. The vertical members at the ends of each panel section shall be 2"x2" in cross section weighing not less than 1.1 lb/ft. Intermediate vertical members shall alternate between 1"x2" and 1”x1” in cross section weighing not less than 0.82 lb/lf and 0.52 lb/lf, respectively. They shall be spaced at a distance not to exceed half the overall height of the box frame.
				1. The outer/exterior frame assembly shall be constructed in "box" form with the width of the frame measuring 24" from outside to outside. Two overhead tracks mounted inside the outer/exterior gate panel shall support the rear of the inner/interior frame assembly for telescoping.
				2. The inner/interior frame assembly shall be constructed in "box" form with the width to fit within the outer/exterior frame assembly. Between the inner/interior frames there shall be a continuous series of 1"x1" diagonal and horizontal bracing with the diagonals welded at approximately 45 degrees to the frames. This inner/interior frame assembly shall be supported from the track by two (2) swivel type, self-aligning, 4-wheeled, sealed lubricant, ball-bearing truck assemblies.
				3. The leading end of the inner/interior frame will be supported by a trolley assembly bolted to the front bottom of the frame assembly. The trolley assembly shall consist of a galvanized steel carriage to which two (2) wheel assemblies are secured. Each wheel shall be rated for a minimum load capacity of 2,000 lb.
			3. Box Frame trolley assemblies shall be bolted to the outer/exterior frame assembly at intervals as specified on the bid drawings. Each assembly shall consist of a galvanized steel carriage to which two (2) wheel assemblies are secured. Each wheel shall be rated for a minimum load capacity of 2,000 lb.
			4. Safety guides of 3/8” x 3” galvanized steel bar with attached guide wheels shall be provided at a maximum of 10’-0” on center along the entire gate length.
			5. Wheel assemblies shall be covered by a single 11 gauge galvanized steel cover at each location.
		2. Gate Track:
			1. The outer frame assembly and the front of the inner frame assembly shall roll on two parallel tracks, which are embedded in concrete so that the top of the track is level with the ground surface. The track shall consist of two (2) parallel W4 x 13 A36 steel beams (may be provided by others). The tracks shall be hot dipped galvanized and set so as to vary no more than 1/4" in width between tracks with the maximum width as shown in the bid drawings (i.e.: +/- 1/8" for each track).
		3. Diagonal Bracing:
			1. Diagonal "X" bracing of 3/16" or 1/4” diameter stainless or galvanized steel cable shall be installed throughout the gate to brace the gate panels and to provide a ready means for vertical adjustment.
		4. Gate Filler:
			1. 2” x 2” x 9 gauge aluminized steel chain link fabric shall extend the entire length of the gate. 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). The facility’s secure side of the gate frame will require a secondary gate filler that shall be secured at each end of the gate frame and tied at each vertical member. The secondary filler for the gate and adjoining fence shall extend to a minimum height of 48” above grade and shall be sized to prevent a 2¼” diameter sphere from passing through openings anywhere along the length of the gate frame.

## Catcher Post:

* + - 1. Catcher post, supplied by others, shall be minimum 4" O.D. (102mm) round SS40 or 4” x 4” x 3/16” wall square steel tubing, grade 500. Catcher post shall be galvanized or coated and supported in concrete footings as specified by the design team.
		1. Bollards (By Others):
			1. Three 6” diameter concrete filled bollards, supplied by others, shall be galvanized or coated and supported in concrete footings as specified by the design team.
		2. Finish:

### Gate to be mill finish aluminum or color coated with polyester powder as specified. If powder coated, the gate and all accessories shall be pretreated chemically by sand blasting or other acceptable method to ensure proper coating adherence. Gate post (to be supplied by others) shall be galvanized or coated as specified by the design team.

1. EXECUTION:
	1. INSTALLATION:
		1. Excavate and pour concrete grade beam and embed W4 beams per drawing detail. Assemble pre-fabricated gate sections on installed tracks, attach gate fabric and adjust as required.
		2. Equipment in this section shall be installed in strict accordance with the company’s printed instructions unless otherwise shown on the contract drawings.
		3. The gate system and installation shall also comply with ASTM F2200 and UL 325.
	2. 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. For operated gate systems - test and explain safety features:

### Each system feature and device is a separate component of the gate system.

### Read and follow all instructions for each component.

### Ensure that all instructions for mechanical components, safety devices and the gate operator are available for everyone who will be using the gate system.

### The warning signs shipped with the gate operator must be installed in prominent position on both sides of the gate.

### 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 gate 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.**