VT-6802 HDTR VERTICAL RESISTANCE BARRIER Specifications

GENERAL: The resistance barrier shall be Model VT-6802 HDTR, as manufactured by B&B Roadway, (888) 560-2060. The barrier shall be crash tested in accordance with the Manual for Assessing Safety Hardware (MASH) Test Level 2 (TL-2) and shall be capable of stopping a 5,000 lb vehicle traveling at 44 mph impacting the arm at 90 degrees.

APPLICATIONS: The barrier shall be designed for use as a penetration resistance barrier. The barrier shall be explicitly designed for traffic control on movable bridges, as required by AASHTO's current Standard Specifications for Movable Highway Bridges, and shall be suitable for similar applications such as railway crossings as well.

HOUSING: The operating mechanism and main control components shall be contained in a weatherproof housing. The housing shall be constructed of .375" (9.5 mm) carbon steel, hot dip galvanized after fabrication. Exterior surfaces shall be painted aluminum. All external fasteners shall be corrosion resistant. Arm shaft openings shall incorporate O-ring seals.

OPERATING MECHANISM: The barrier arm shall pivot in the vertical plane via a mechanical 4-bar linkage. The linkage shall utilize cranks keyed to the main arm shaft and transmission shaft and an adjustable connecting rod between a pair of self-aligning spherical rod ends. The connecting rod shall be 1.5" (38 mm) diameter AISI 4140 alloy steel. An auxiliary crank shall be used, paired with the transmission crank, to reduce the load on the transmission and to better balance and stabilize the load on the housing and mounting structure. The auxiliary crank shall be mounted in a grease lubricated ball bearing. The velocity of the arm shall follow a sinusoidal pattern to provide smooth operation. The arm shall begin and end its full motion path with zero velocity and accelerate smoothly to maximum velocity at mid-travel.

TRANSMISSION: The mechanism linkage shall be driven by a fully enclosed, double-enveloping worm gear, double reduction speed reducer. The transmission shall have a rated capacity of not less than 23,000 inch-pounds, continuous duty, with an occasional momentary peak load rating of not less than 69,000 inch-pounds. The output shaft shall be 2.5" (63 mm) in diameter. Gear ratio used shall produce an operation time of approximately 16 seconds. *[Option: Contact factory for other speed options.]*

TORQUE LIMITER: A heavy duty torque limiter shall be provided to limit torque transmitted to the operating mechanism in the event of excessive winds or a physical obstruction to the arm that could damage the mechanism during operation. The torque limiter shall be capable of being set anywhere within a range of 10,000 to 75,000 in-lbs torque. Each torque limiter shall be factory set for the load recommended by the manufacturer, based on installation requirements. Each torque limiter shall be adjusted and tested at the factory, under over-load condition, for a minimum of 5 minutes to verify the setting. The gate limit switch assembly shall be driven from the output side of the torque limiter so that slippage of the torque limiter will have no effect upon the limit switch settings.

MOTOR: The motor voltage and phase shall be as specified by the customer. The motor horsepower shall be as recommended by the barrier manufacturer to suit the installation. The motor shall be a C-face design and shall be mounted directly to the transmission. The motor shall be instantly reversing and overload protected.

LIMIT SWITCH: The barrier limit switch assembly shall be a self-contained unit. The standard assembly shall provide 8 independent SPDT control switches. *[Option: A 10 circuit or a 12 circuit limit switch assembly shall be provided when specified.]* Switches shall be rated for 15 amps, 480 VAC. Switches shall be controlled by individually adjustable cams. The limit switch assembly design shall permit adjustment of all cams with the barrier in any position. The limit switch assembly shall have a removable cover to help prevent accidental contact with switch terminals. Shaft, cams, bushings and housing pieces shall be of non-ferrous corrosion resistant materials.

BRAKING MECHANISM: The motor shall be equipped with a solenoid-release, automatic brake. The brake shall have a manual release lever to permit manual operation of the barrier during setup or emergencies.

ARM SHAFT: The main arm shaft shall be 3.5" (89 mm) diameter AISI 4140 high strength alloy steel with a minimum tensile strength of 140,000 psi. The shaft shall be mounted in heavy duty flange mount ball bearings assemblies.

DOORS: Front and rear access doors shall be mounted on strap hinges. Hinges shall be of the slip-off type and shall have stainless steel pins. A stop shall be mounted inside the door to secure the door from being raised off the hinges in

the closed position. Door latches, two per door, shall use a vise action to compress a neoprene bulb-type gasket to seal the door openings. *[Option: Door latches shall be stainless steel and shall be tamper-resistant.] [Option: A stainless steel strap shall extend across each door and fit over a heavy hasp to permit use of a padlock. Strap and hasp shall be designed to fit both standard style heavy-duty padlocks and high security shackleless ("hockey puck" style) padlocks. Padlocks shall be provided by others, keyed alike.]*

ARM MOUNTING TUBES: A pair of carbon steel rectangular tubes, hot dip galvanized after fabrication, painted aluminum, shall be rigidly affixed to the ends of the main arm shaft. The tubes shall be offset to locate the arm centerline at the height specified above the housing base. The tubes and a steel cross-member shall provide a sturdy mount for the arm and counterweights. The tubes shall have provision for easily adjusting the counterweight offset so the arm can be properly balanced in all positions.

COUNTERWEIGHTS: Lead counterweights shall be mounted at the rear of the side arm tubes to balance the arm. Counterweights shall be sectional and shall be balanced at the factory. The counterweights shall be coated with Amercoat 235 epoxy based paint.

ARM: The barrier arm design shall be a trussed tri-rail type fabricated from 3" OD aluminum tubing. Arm length shall be measured from the centerline of the barrier housing to the tip of the arm (maximum 60'). Stainless steel truss cables and a heavy duty spring type bumper rod shall be furnished with each arm to provide a stable and accurate landing position of the arm. Front and rear arm surfaces shall be covered with pre-striped alternating red and white high intensity reflective sheeting. Striping shall be 16" (406 mm) wide and vertical according to MUTCD. Remaining exposed surfaces shall be painted white.

ENERGY ABSORPTION CABLES: The barrier shall utilize 6x19 classification, 300 series stainless steel, annealed energy absorption cables to assist in diffusing the kinetic energy of an impacting vehicle. Cables shall be annealed in a coil not less than 42" diameter. Consult factory for barrier resistance capacity which shall necessarily depend on project specific conditions.

The tri-rail arm shall have (3) three ½" (13 mm) nominal diameter cables minimum, one inside each tube facing traffic and one between the tubes. The energy absorption cables shall be joined together by cable brackets in order to provide a net-like energy absorption system.

SIDE ARM LOCKS: At the housing, heavy duty side arm locks shall be mechanically linked to the operating mechanism to automatically engage and lock the side arm tubes into a rigid configuration when the arm is lowered, to assist in transferring the load into the housing in the event of an impact. This will minimize the chance of damage to the internal operating mechanism.

CABLE ANCHORAGE SYSTEM: The energy absorption cables shall be anchored at both ends of the span in the closed to traffic position. A "nearside" receiver shall be used at the housing or base end of the arm to capture the passive end locks and absorb loads during an impact. Details of the receiver shall be coordinated with the manufacturer to suit installation requirements.

ARM END LOCK: The energy absorption cables shall be anchored at the tip end of the arm in the closed to traffic position. A passive end lock mounted on the arm tip shall engage a rigidly mounted receiver on the "farside" of the roadway from the operator housing. End locks shall not require powered actuation for proper engagement.

MOUNTING: The barrier housing and receivers shall be fixed to a suitable foundation, as specified by the project engineer, using (8) eight 1" (25 mm) diameter anchor bolts for the barrier housing and (7) seven 1" (25 mm) diameter anchor bolts for the receivers. The barrier housing base shall provide 1.25" (32 mm) diameter mounting holes and the receiver bases shall have 1.25" (32 mm) diameter slotted mounting holes.

HANDCRANK: Both a handcrank and a drill crank shall be provided with each barrier to facilitate manual operation.

SAFETY SWITCHES, TERMINAL BLOCKS AND WIRING: A manual disconnect switch shall be provided, pre-wired at the factory to break the main motor leads, to protect personnel during service. A handcrank safety switch shall be provided to prevent automatic actuation of the barrier during manual operation. Additionally, safety switches shall be installed and set at the factory to break the control circuit when either access door is opened. Door safety switches shall have a pull-to-override feature for test operation and shall automatically reset when doors are closed. Control components and terminal blocks shall be mounted inside an electrical enclosure, which shall be mounted inside the operator housing, with roadway side access, except where customer requirements prevent this arrangement. Pressure-type, modular

terminal blocks shall be fully labeled and clearly coded to wiring diagrams. All control wiring shall be clearly coded to wiring diagrams and shall terminate at the terminal block. Connections to screw-type terminals shall have lugs. Conductors shall be XHHW #14 AWG stranded, minimum.

OPTION: ARM ENDLOCK ENGAGEMENT INDICATION LIMIT SWITCH: *[Option: The arm end lock shall be equipped with an extended range magnetic proximity switch and target to indicate correct engagement of the end lock. The switch shall be mounted on the arm end lock and send a confirmation signal only when the end lock is properly engaged. The mechanism shall be field adjustable and preset at the factory.]*

ACCESSORIES AND MODIFICATIONS: All common accessories and modifications shall be available. Custom modifications and accessories shall be available through coordination with manufacturer.

WARRANTY: A warranty shall cover the barrier and related equipment against defective material and components for 1 year from date of shipment from manufacturer. Manufacturer shall furnish replacement parts for a minimum of 10 years. Replacement parts for most components shall normally be available in 1 working day. Lamps, fuses and other components designed for a life less than 1 year shall be covered for the rated life of the component or the warranty period of the component manufacturer.

***PARTIAL LIST OF INCLUDED OPTIONS*:**

Stainless Housing
Anchor Bolts (provided by manufacturer)
Mounting Template
Alternate Door Latch Styles
Door Strap with Integral Heavy Duty Padlock Hasp
Stainless, Tamper-Resistant Door Latches
Arm Finishes, Striping Materials and Colors
Alternate Arm Designs
Arm Lights
Flasher
Reflective Button Delineator
Gong or Vibrating Bell

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