



**City Gate – Manual Swing Gate – Electro-hydraulic locking mechanism  
High impact vehicle barrier**

**ARCHITECTURAL SPECIFICATION**

**PART I – GENERAL**

**1.01 SECTION INCLUDES**

- A. The manufacturer shall be responsible for furnishing each vehicle barrier system and associated equipment as specified.
- B. The installer shall be responsible for furnishing installation materials, and providing installation, and field-testing of each anti-ramming vehicle barrier system including the associated equipment as specified.
- C. The Owner/Operator (End User) or facility architect will assume responsibility of providing traffic and safety engineering, including all necessary safety features to be used at each barrier site location, including, but not limited to: sidewalks for pedestrian traffic, sufficient roadway lighting, caution signage, traffic (stop) lights, audible warning alerts, visual warning alerts (such as flashing or strobe lights), secondary traffic control devices (such as gate arms), security guard control points, etc.
- D. The vehicle barrier system shall include a hinged swing gate, Hydraulic Power Unit (HPU), operator control panels, and accessories as specified.
- E. The design and materials of the vehicle barrier system shall be the same as those used in the crash test of the barrier, and approved by the Publicly Available Specification (PAS).
- F. The vehicle barrier system shall utilize a City Gate electro-hydraulic, hinged, swing gate barrier.
- G. The vehicle barrier system shall span across the entire roadway.
- H. The barrier shall be positioned across the roadway width for full protection coverage.
- I. Retaining walls, fixed City Gates or other devices shall be provided by the installer or facility architects on either side of the barrier, to prevent vehicles from going around the barrier.

**1.02 BARRIER RATING REQUIREMENTS**

- A. The crash rating for each anti-ramming vehicle barrier system is **PAS 68 certified**, as defined by the Publicly Available Specification (PAS).
- B. The vehicle barrier system performance shall be based on the Publicly Available Specification (PAS) publication PAS 68:2007 Specification for Vehicle Security Barriers dated January 2007. In which the impact conditions are:

<u>Crash Rating</u>	<u>Vehicle Weight</u>	<u>Impact Speed</u>
PAS 68	16,500 pounds (7500kg)	40 mph (64 km/h)

**1.03 QUALITY ASSURANCE**

- C. The manufacturer shall be a company specializing in the supply of vehicle barrier systems with a minimum of 10 years experience.
- D. The manufacturer shall provide a complete vehicle barrier system that has been fabricated, assembled and tested for proper operation prior to shipment.
- E. The manufacturer shall have performed an actual crash test on the type of vehicle barrier system being provided.

## 1.04 SUBMITTALS

- F. The manufacturer shall submit to the Buyer drawings on the vehicle barrier system.
  - 1. Detail drawings shall show the top assembly layout and overall dimensions of each major element of the barrier system equipment, including the vehicle barrier, HPU and operator control panels.
  - 2. Detail drawings shall show the foundation and anchoring requirements of the vehicle barrier system equipment.
  - 3. Detail drawings shall show the proposed layout of the barrier system equipment.
  - 4. A detail hydraulic schematic drawing shall be provided.
  - 5. A drawing shall be provided showing the size and number of hoses required to run between the vehicle barrier and HPU.
  - 6. A detailed electrical schematic including associated wiring shall be provided showing all electrically connected components, including the interface points for connection to equipment.
  - 7. The schematic drawings shall represent the entire vehicle barrier system, with all manufacturer-supplied equipment connected and integrated together as a system.
  - 8. Detail interconnect drawings shall show the minimum conduit size and number of wires required to run between each of the barrier system equipment.
- G. The manufacturer shall submit to the Buyer a crash test certification on the vehicle barrier system.
  - 1. A copy of the PAS crash rating letter, certifying the manufacturer's barrier shall be provided. As an alternate, the manufacturer may submit the current PAS website address listing the barrier system certified crash rating.
  - 2. A certificate of conformance that the vehicle barrier system delivered conforms to the crash rating, performance and the requirements of this specification.
- H. The Buyer will distribute vehicle barrier system submittal documentation and drawings to the Owner/Operator (End User), as necessary.

## 1.05 FINAL DOCUMENTATION

- A. After completion of field tests the manufacturer shall provide to the Buyer up-dated drawings, conforming to the "as-built" equipment provided.
- B. After completion of field tests the manufacturer shall provide to the Buyer parts and component documentation on the vehicle barrier system, conforming to the "as-built" equipment provided.
  - 1. A Parts List, or Bill of Material, shall be provided on all major parts and components used in the vehicle barrier system.
  - 2. A recommended Spare and Consumables Parts List shall be provided. Spare parts shall be those that can be field replaced. Consumables shall include items frequently required for maintenance and service, such as, but not limited to: lights, fuses, lubricants, hydraulic fluid, filter elements, etc. All items shall be provided with a part number, recommended quantity, and a brief description of the item.
- C. After completion of field tests the manufacturer shall submit to the Buyer an Operation and Maintenance (O&M) Manual. The O&M Manual shall include:
  - 1. A Preface section, with the manufacturer's name, model number and service contact information.
  - 2. A Safety Warnings and Cautions section applicable during operation, maintenance, service and/or repair.
  - 3. An overview and general description of the vehicle barrier system, including all equipment provided, and a summary of features or characteristics.
  - 4. A theory of operation, for both the hydraulic and electrical circuits.
  - 5. A Maintenance Instructions section, including as a minimum routine maintenance requirements, a chart of periodic maintenance activities and intervals, lubrication instructions and component adjustment.
  - 6. A Troubleshooting section, with probable cause and an itemized list of equipment checks.

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7. A Reference Information section, including abbreviations and acronyms, torque values and a list of applicable barrier drawings and documentation.
- D. After completion of field tests the installer shall submit to both the Buyer and manufacturer a vehicle barrier system Field Test Report.
  1. Upon completion and testing of the installed vehicle barrier system, a Test Report shall be submitted showing both the test data and results of any field tests, including the demonstration and compliance with the specified performance criteria of this specification.
  2. Each test report shall indicate the final position of component adjustments and set-points.
- E. The Buyer will distribute vehicle barrier system final documentation and drawings to the Owner/Operator (End User), as necessary.

#### **1.06 DELIVERY, STORAGE AND HANDLING**

- I. All equipment shall be prepared and protected by the manufacturer to be shipped by conventional shipping methods.
- J. The vehicle barrier system equipment shall be protected by suitable methods for the intended shipping and storage environments.
  1. Packaging, preservation, pallets and crating shall prevent mechanical damage to the equipment during both shipping and handling.
  2. Forklift provisions shall be provided for the lifting and handling of equipment.
  3. Shipping containers and crates shall be identified with the type of equipment.
  4. Shipping documents shall be provided with the contents of each container or crate.
- K. Equipment received on-site shall be placed in a storage area that is protected from the weather, humidity, excessive temperature variation, dust, dirt and/or other contaminants.
  1. Equipment shall be stored covered.
  2. Both equipment and structural materials shall be stored on pallets.
  3. Equipment shall not be stored directly on the ground, and shall be protected from standing water, and other conditions that might cause rust or corrosion.
  4. Equipment shall be stored in an area that is not subjected to potential damage by other construction activities.

#### **1.07 RELATED SECTIONS (For use in USA)**

- L. Section 2300 – Earthwork
- M. Section 2741 – Asphalt Paving
- N. Section 2751 – Cement Concrete Paving
- O. Section 16120 – Conductors and Cables
- P. Section 16123 – Control-Voltage Electrical Power Cables
- Q. Section 16130 – Raceways & Boxes

#### **1.08 WARRANTY**

- R. The manufacturer shall warranty its Products against defects in material and workmanship for a period of 1 year from the date of substantial completion, or 1½ years from the date of shipment.
- S. The warranty shall obligate the manufacturer to repair and/or replace any defective product, without charge to buyer, provided that, (a) Buyer gives the manufacturer written notice of any such claimed defect within such period of 1 year, (b) the Products, if installed, were installed by a professionally licensed and manufacturer-approved installer, and (c) the Products have not been altered or modified, subjected to improper storage, misuse, improper maintenance, negligence, improper installation, crash or accident, or used with parts not authorized by the manufacturer
- T. This warranty may exclude any on-site labor, travel costs to site and/or expenses if performing service or repair work on-site, even for valid warranty claims.

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- U. This warranty may exclude wear, scratches and/or other damage to finishes and painted surfaces due to use.
- V. This warranty may exclude damage that occurs due to abuse, misuse, natural disasters or catastrophes, including, but not limited to: damage in storage, excessive vehicle speed, excessive vehicle weight, temperature extremes, long-term flooding or lack of drainage, packed debris, snow or ice under the barrier, improper electrical power feed voltage or frequency.
- W. The manufacturer shall not be liable for any special, incidental or consequential damages which result from the use of the products by Buyer, Owner/Operator (End User) and/or any other party, and may limit the liability to the amounts paid by Buyer for the Product.
- X. The manufacturer shall not be liable for damage to the Product which results in the use of the barrier as a protective device (i.e. sustains a vehicle crash), due to damage caused by any other vehicle contact when the barrier is not in the full down position, and/or due to damage caused by snow plow operations.
- Y. If a warranty claim does not meet the warranty criteria, then the Buyer or Owner/Operator (End User) shall be responsible for reimbursing the manufacturer for service and/or repair costs.
- Z. An extended parts and labor warranty shall be made available through manufacturer's factory authorized and trained distributors.

## **PART II – PRODUCTS**

### **2.01 MANUFACTURER AND MODEL PROCUREMENT**

- A. The vehicle barrier system shall be a **City Gate** active electro-hydraulic, hinged swing gate barrier manufactured by:

**Ameristar Security Products**

1555 N. Mingo Rd

Tulsa, OK 74116

Phone: 866-467-2773

Fax: 918-879-5702

[www.ameristarsecurity.com](http://www.ameristarsecurity.com)

### **2.02 VEHICLE BARRIER PERFORMANCE AND PARAMETERS**

- B. The width of the barrier shall be no less than 13.12 feet (4 meters). When the standard barrier width is insufficient, the Buyer will specify the alternate barrier width to the manufacturer at the time of ordering.  
**Optional** – Barrier widths are available in increments of 100mm (4”), up to maximum of 5.5m (18’).
- C. Vehicle speed through the barrier shall be rated for speeds up to, but not exceeding 15 mph (24 km/h). The Owner/Operator (End User) shall be responsible for providing and posting speed limit signage to prevent barrier damage due to excessive vehicle speed.

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## 2.03 VEHICLE BARRIER CONSTRUCTION

- A. The vehicle barrier shall be provided with a swing gate. This is a USP where drop arm (pivot type), sliding or cantilever type beams are not acceptable.
- B. The swing gate shall provide protection in both directions; with one direction providing the high impact crash rating.
- C. When the gate is in the closed position, the barrier shall act as a formidable psychological deterrent due to the size of the gate.
- D. The vehicle barrier shall provide protection against motorcycle and pedestrian intrusion.
- E. The swing gate type shall permit integration with other security devices, such as rising or sliding gates for anti-personnel intrusion. Both vehicle anti-ramming and anti-personnel protection shall be capable of being provided in a very small (narrow) space.
- F. The vehicle barrier shall require specific right-hand or left-hand installation and is available in either left hand or right hand hinged versions
- G. The vehicle barrier configuration shall allow close placement of the barrier up to the property line, or a cross-road.
- H. The gate shall be semi-floating.
  - 1. The beam and mechanism shall permit the use of the barrier on roadways that are not perfectly level or flat.
  - 2. The barrier shall be capable of being installed and operated on cross-sloped roadways.
  - 3. The tolerances used for the gate mechanism shall accommodate the majority of common roadway grades.
  - 4. Large clearances shall be provided between the gates. and side columns to permit both longitudinal (forward/back) and lateral (side-to-side) movement.
  - 5. The mechanical configuration shall be difficult to seize or bind the gate.
  - 6. The gate. shall be replaceable after a low impact crash (attack) if the side columns are undamaged. Gate. Replacement, however, will be dependent on the magnitude, angle and point of impact of the crash and the extent of barrier damage.
- I. Welded structural side columns shall be provided to enclose the barrier mechanisms, and react crash loads when the gate is closed.
  - 1. The underground portion of the barrier side columns shall be spaced to the outboard side of the roadway, so as to not interfere with utilities typically running down the center of a roadway.
  - 2. The barrier shall be capable of being installed using excavation depth not exceeding 15-3/4 inches (400mm) deep.
  - 3. The above roadway structural side columns and beam actuator shall not exceed 60-1/2 inches (1530 mm) high.
- J. Side columns on each side of barrier shall:
  - 1. Be configured to permit easy application of architectural treatments by the Buyer, to look attractive, have architectural appeal and be consistent with other architectural theming in the area, especially perimeter fencing and walls.
  - 2. Allow a variety of different type of building or trim materials to be used, including, but not limited to: brick, rock work, wood, stucco, etc. around the side columns.
  - 3. Provide a natural gated community appearance when architectural treatments are provided by the Buyer.
  - 4. Provide a convenient place to mount Buyer-provided accessories, such as traffic lights, warning lights, caution signage, roadway lighting, and additional IR sensors for detecting the presence of vehicles and/or pedestrians.
- K. The majority of the roadway up to the barrier shall be capable of being made aesthetically pleasing by the Buyer, without an industrial or mechanical look.

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- L. The barrier configuration shall allow placement of up to 4 inches (101 mm) of decorative roadway up to the frame, and shall not require just a brushed concrete or an asphalt finish. Decorative pavers, cobble stone and other roadway treatments shall be capable of being used by the Buyer.
- M. No active parts, components and/or mechanism shall protrude beyond or underneath the bottom of the frame.
- N. Hydraulic pin shall be provided for the swing gate.
  1. The hydraulic pin (gate actuator) shall be located above grade and not down inside a hole or casing, to permit easy access for repair, and to prevent effects due to corrosion or deterioration due to flooding, or sitting submerged in water.
  2. The hydraulic pin shall be capable of being removed without requiring removal of the swing gate and/or supporting structure.
  3. The closing movement of the beam shall be manually operated.

#### 2.04 VEHICLE BARRIER OPERATION

- A. The gate shall be capable of being locked in the closed position using a hydraulic pin and key switch
- B. The gate shall be capable of being opened and closed manually
- C. The barrier shall be capable of at least 60 complete up/down cycles per hour.
- D. The barrier motion shall be instantly reversible in either direction.
- E. The barrier shall rise in approximately 3-5 seconds, when operating at normal ambient temperature conditions.
- F. The barrier shall be capable of being lowered in not more than 5 seconds, when operating at normal ambient temperature conditions.
- G. The barrier shall be capable of operating in a temperature range of 50°F to 120°F (10°C to 48°C), without heaters or heat exchangers. When the site ambient operating temperatures are not within the standard operating temperature range, the Buyer shall specify cold temperature and/or hot temperature operation. Refer to **Error! Reference source not found. Error! Reference source not found.** And O.
- H. The vehicle barrier system shall provide two methods of operation, for use during electrical power loss, or selected equipment failures:
  1. Provide stored hydraulic pressure utilizing a hydro-pneumatic accumulator, sized to allow no less than a 1-cycle operation, on a fully charged system.
  2. Provide an integrated, manual hand pump to permit raising and lowering of the barrier.

#### 2.05 HPU AND HYDRAULICS

- A. A Hydraulic Power Unit (HPU) shall be provided for supplying hydraulic fluid power to actuate the pin.
- B. The HPU shall be remotely located at a maximum distance of 50 feet from the City Gate. Any distance greater than 50 feet must be approved by the manufacturer.
- C. Hydraulic hoses (to be supplied by the installer) shall be:
  1. Rated to no less than 3000 PSIG (20.7mPa) by the hose manufacturer. The hose manufacturer's factor of safety shall be no less than 4:1 for this rating, with a burst pressure of at least 12,000 PSIG (82.8 map).
  2. Provided with protective wear sleeves at the City Gate. to protect the hydraulic hoses from abrasion and other mechanical damage.
  3. Configured using two different sizes, including connections at the City Gate. Hydraulic pin, to eliminate the possibility of inadvertently connecting the hoses backwards.
- D. Hydraulic connections shall utilize all O-ring seal connections and fittings. Pipe threads shall not be used at the City Gate. and/or HPU, in order to reduce the potential for hydraulic leaks.
- E. The HPU and hydraulic circuit shall use an environmentally friendly hydraulic fluid which does not degrade over time. A petroleum-based hydraulic fluid may be used at the request of the customer / installer.

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## 2.06 ELECTRICAL

- A. The City Gate system shall require single phase 230 volt AC electrical supply to power the hydraulic pump and electronic control board which control the gate locking pin. The mains supply should be fused at 13 amps.
- B. The site facility shall provide a main power disconnect, circuit protection (such as a circuit breaker or fusible disconnect) and utility electrical power feed wiring, for connection to the City Gate system HPU electrical enclosure, sump pumps, City Gate heaters, electric gate arms and/or other equipment as required to conform with national and local code requirements.
- C. All voltages required by electrical circuits other than the main electrical power feed, shall be provided by additional electrical circuit components, such as control transformers and DC power supplies.
- D. All electrical circuits shall be provided with overload and short circuit protection.
  - 1. The main incoming electrical power feed shall be provided with a circuit breaker.
  - 2. Each motor starter shall be provided with overload relays.
- E. Electrical controls shall be provided integral to the HPU, with self-contained wiring to all mounted components. Field wiring requirements shall be minimized.
- F. Electrical controls shall be contained inside an integral, sealed, NEMA rated (or IP 65 equivalent) enclosure for protection of electrical switchgear from moisture and weather conditions.
- G. Electrical controls such as circuit breakers, fuses, terminal blocks, power supply, motor starter, relays and PLC shall be DIN rail mounted for ease of replacement.
- H. The electrical enclosure shall have additional space inside for DIN rail mounted accessories, such as traffic light relays and vehicle loop detector modules.
- I. Electrical controls and monitoring shall be programmable, utilizing the ATG programmable B2 control board.
- J. The Buyer, in conjunction with the Owner/Operator (End User) requirements, will provide the manufacturer with a written sequence of operation that includes but not limited to:
  - 1. The City Gate system sequencing, vehicle loop detector functions, gate arm functions, traffic lights, annunciators and all other equipment directly controlled by the PLC. Note: Additional operating functionality (sequences, controls, periphery equipment, etc...) can be provided at with additional engineering, construction and integration costs.
  - 2. If the written sequence of operation is not provided by Buyer, then the manufacturer shall supply a control program for basic City Gate system operation only.
- K. All control and monitoring circuits, including signals, shall operate using low voltage, +24 VDC for safety, outside of the main electrical enclosure. To minimize the possibility of electrical noise, AC voltage signals shall not be used. This requirement is **not** applicable to the electric motor electrical power, sump pumps, City Gate heaters, electric gate arms and/or other equipment as required.
- L. All high voltage electrical switchgear shall be mounted inside the electrical enclosure (including, but not limited to: electrical power feed circuit breaker, motor starters, etc.).
- M. Electrical switchgear components shall be either UL and/or CE labelled.

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- N. When site ambient operating temperatures may be at or below **32°F** (0°C) a HPU heater, hose and City Gate heaters, and associated controls and circuitry are recommended.
- O. When site ambient operating temperatures may exceed **120°F** (48°C) an electrical enclosure cooling system and associated controls and circuitry are recommended.

**2.07 OPERATOR CONTROL PANELS**

- A. Operator control panels and associated control circuit shall be provided to interface between all Patriot locations, operator control panels and the HPU.
  - 1. The Main Operator Control Panel may be physically located at the site (such as a central security room) to allow operation of all City Gate.
  - 2. The Remote Operator Control Panels may be physically located in close proximity to each City Gate, (such as a guard booth).
  - 3. All operator control panels shall be mounted in an indoor, covered environment, and shall not be exposed to weather and environmental conditions.
  - 4. All operator control panels shall be mounted in such way that the operator always has visual (eye or camera) supervision on the City Gate, when operating the City Gate.
- B. The control circuit shall be part of the B2 Control circuit and associated equipment, integral with the HPU electrical enclosure.
  - 1. The control circuit functions and monitoring shall be programmed into the B2 Control circuit.
  - 2. The operator control panel switches and indicators shall interface with the B2 Control circuit.
  - 3. All operator control panel switches and indicators shall be pre-wired to wiring terminal strips. The terminal strips shall provide an interconnection side to allow connection of site field wiring.
- C. All operator control panel circuits, including signals, shall operate using low voltage, +24 VDC for safety.
- D. Operator control panel labelling may use text and graphic elements. A clear plastic overlay shall be provided to protect the panel surface and labelling from normal usage, and occasional panel cleaning.
- E. The operator control panels shall use electrical industry standard, industrial grade, electrical components. Switches and indicators shall be no less than the 0.89 inch (22.5 mm) switch industry standard size.
- F. Electrical switch and indicator components shall be either UL and/or CE labelled.
- G. Electrical switch and indicator components shall be mounted in a sealed, NEMA 12 (or IP 65 equivalent) enclosure, for protection against moisture and weather conditions, excluding the 19 inch (483 mm) panels.
- H. A Main Operator Control Panel shall be supplied for control and indication of all City Gate system functions. The Main Operator Control Panel shall have:
  - 1. A key lockable Activate switch (key switch),
  - 2. A set of pushbuttons for control, each set of City Gates
- I. One or more Remote Operator Control Panels shall be provided for control and indication of each Patriot within the overall Patriot system. Each Remote Operator Control Panel shall have:
  - 1. A key lockable Activate switch (key switch),
  - 2. A set of pushbuttons for control, to each set of City Gates

**2.08 FINISH**

- A. The manufactured galvanized framework shall be subjected to the PermaCoat® thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, as a minimum, a six-stage pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish. The base coat shall be a thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils (0.0508mm). The topcoat shall be a “no-mar” TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be Black. The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table below

<b>Table 2 – Coating Performance Requirements</b>
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<u>Quality Characteristics</u>	<u>ASTM Test Method</u>	<u>Performance Requirements</u>
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 3,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822 D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

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## **PART III – EXECUTION**

### **3.01 INSTALLATION, COMMISSIONING AND TESTING REQUIREMENTS**

- A. The City Gate system shall be installed, interconnected and integrated, commissioned and tested at the site collectively referred to as “installation”, by a third-party (independent) installer.
- B. The installer shall provide all installation materials for the City Gate system installation, including, but not limited to: underground conduit, piping, rebar, concrete, interconnection wire, interconnection hydraulic hoses, hydraulic fluid, lubricants, and other materials required for the installation of the City Gate system.
- C. The City Gate system installation shall be in accordance with the specifications and installation instructions provided by the City Gate system manufacturer.

### **3.02 INSTALLER REQUIREMENTS**

- B. The City Gate system installation shall be performed by a manufacturer-approved installer.
  - 1. Damage of City Gate system equipment during installation by non-authorized contractors, individuals and/or other entities will not be subject to the warranty provisions of the manufacturer.
  - 2. When required by the Buyer, the manufacturer shall supply a field supervisor during key milestones of the installation of the City Gate system.
- C. The Owner/Operator (End User) will assume responsibility of providing site drawings of the safe and proper placement of any site vehicle detector loops, including the proper operation of the loops with vehicle traffic, and between adjacent loops in close proximity of each other.
- D. The Owner/Operator (End User) and Buyer will assume responsibility of providing safety engineering, including City Gate system operational and safety criteria and the specific requirements for each vehicle detector loop.

### **3.03 INSTALLATION REQUIREMENTS**

- A. In accordance with the manufacturer’s drawings and instructions, the installer shall:
  - 1. Ensure that all City Gate system equipment to be installed is properly located at the site.
  - 2. Provide excavation and trenching for the City Gate system, including City Gate slabs and frames, conduits and accessories mounting pads.
  - 3. Prepare and provide concrete rebar for the City Gate foundation.
  - 4. Place and align the City Gate frames.
  - 5. Provide both hydraulic and electrical underground conduit runs for interconnecting hydraulic hoses and wiring between equipment locations, including any accessories.
  - 6. Provide City Gate drains and hook-ups to a facility-approved storm drain or sewer connection, to prevent water from accumulating inside the City Gate frames.
  - 7. Provide a properly sized, self-priming sump pump if no storm drains or sewer exist in close proximity of the City Gate location, or if a gravity drain cannot be utilized.
  - 8. Provide, pour and finish concrete for the City Gate foundations, including associated City Gate system equipment.
  - 9. Provide a suitable and matching roadway surface surrounding the City Gate after placement of the City Gate and allowing the foundation concrete to properly cure.
  - 10. Install and interconnect the HPU and associated hydraulics to the City Gate equipment provided with a weatherproof enclosure, if the HPU is not located inside a facility equipment room.
  - 11. Install, mount and wire the Main Operator Control Panel, and Remote Operator Control Panels, and interconnect to the City Gate equipment.

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12. Install, mount and wire accessory equipment and sensors, and interconnect to the City Gate equipment.
13. Hook-up and wire the facility electrical power feed to the HPU. The Buyer will provide a power feed circuit, including associated wiring and circuit protection (such as a circuit breaker or fusible disconnect) from the facility utilities.
14. Install and wire the roadway vehicle loop detector wiring (if required by the Buyer), and interconnect to the HPU.

### 3.04 COMMISSIONING REQUIREMENTS

- A. General Commission Requirement: The City Gate system shall be initially started and commissioned by a certified and manufacturer-authorized field service technician, in accordance with the manufacturer's drawings and instructions.
- B. Facility Electrical Power: All wiring terminations shall be checked before applying (turning on) electrical power to ensure correct connections. The facility electrical power feed shall be turned on, and the voltage at the HPU shall be checked.
- C. HPU Hydraulic Fluid Filling: The installer shall fill the HPU with hydraulic fluid, using the type and to the level specified by the manufacturer.
- D. HPU Start-up: The HPU shall be prepared for initial start-up by a factory-trained, manufacturer-authorized field service technician.
  1. Using the HPU, the hydraulic hoses shall be filled with hydraulic fluid prior to Patriot operation. The HPU reservoir level shall be replenished to the proper level prior to field testing and operation.
  2. The Pre-Operation checks shall be performed in accordance with the manufacturer's Operation and Maintenance manual.
- E. Initial Patriot Operation: The City Gate shall be cycled to lock and unlock the City Gate, to ensure proper, smooth operation and no evidence of leaks.
  1. Operational anomalies, failures, malfunctions and/or other equipment trouble shall be corrected and/or repaired for proper operation.
  2. Any adjustments required for the proper operation of the overall City Gate system shall be made specific to site conditions.
  3. The City Gate system shall be checked to ensure that all functions control, monitoring, indications of all integrated equipment is properly operating as a system.
  4. The City Gate system hydraulic circuits and connections shall be checked to ensure that they are leak-free, and corrective action shall be taken for any leaks found.
- F. Control System Programming Changes: Any Control System programming changes that deviate from the initially defined Buyer or manufacturer's default program shall be submitted to the manufacturer as a written request that defines the changes. The manufacturer reserves the right to charge additional fees, for any and all programming changes.

### 3.05 FIELD TESTING

- A. Upon completion of installation, a site field test shall be performed by the installer on the overall City Gate system, including the City Gate and each equipment piece. **Note**: During testing, allow the hydraulic system pressure to recover between operations of the Patriot, and between cycles.
  1. The Buyer shall be notified prior to the start of field testing, to allow for witness if desired.
  2. The City Gate system shall not be tested until the system is commissioned, and fully operational.
- B. The test shall include:
  1. Locking and unlocking the City Gate ,
  2. The use of all operator control panel functions and indicators.
  3. Operation of any installed equipment directly operated by the City Gate system, including accessories.

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- C. During testing, any Control System programming changes that deviate from the initially defined Buyer or manufacturer's default program shall be submitted to the manufacturer as a written request that defines the changes. The manufacturer reserves the right to charge additional fees, for any and all programming changes.
- D. The installer shall notify the Buyer and manufacturer of any equipment failures and/or malfunctions during field testing.
- E. The installer shall submit a Test Report with test data to the Buyer after completion of field testing.
- F. The Buyer will sign off the Test Report for final City Gate system buy-off and acceptance, and provide a copy to the installer, and to the manufacturer.

**3.06 FIELD TRAINING (OPTIONAL – Incurs Additional Costs and Fees)**

- A. The manufacturer shall provide an on-site field-training course for designated Owner/Operator (End User) supervisors, operators and service technicians. Optional field training shall:
  - 1. Be provided for no less than 4 hours of training during the normal working day.
  - 2. Commence after the City Gate system is functionally complete and operational, but prior to final acceptance tests.
  - 3. Cover all aspects of safely operating the City Gate system.
  - 4. Cover all of the items contained in the Operation and Maintenance (O&M) manual.
  - 5. Accommodate up to 5 Owner/Operator staff members. Additional staff members may be added for additional fees.

**3.07 ON-SITE MAINTENANCE AND SERVICE (OPTIONAL – Incurs Additional Costs and Fees)**

- A. The manufacturer shall have a network of factory-trained, field service technicians available to the Owner/Operator (End User) for technical support, maintenance, service and/or repair. Optional services to include:
  - 1. The complete maintenance, service, troubleshooting and/or repair of the City Gate system, in accordance with the manufacturer's drawings and instructions, and as needed.
  - 2. Specific work tasks authorized by the Owner/Operator (End User).
  - 3. "Emergency" on-call, service response for City Gate in non-operational status.

// End of Specification \\

***Ameristar Perimeter Security USA Inc. reserves the right to change this specification at any time without notice.***