**AMERISTAR® PERIMETER SECURITY USA INC.**

**Model 773H M30 Drop Arm Barrier**

**CONSTRUCTION SPECIFICATION - SECTION 11 12 43**

1. **- GENERAL**

**1.01 WORK INCLUDED**

The contractor shall provide all labor, materials and appurtenances necessary for the Installation of the impact tested M30 vehicle barrier system defined herein at (Specify Project/Site Name).

**1.02 RELATED WORK**

Section 31 \_\_ \_\_ - Earthwork

Section 03 \_\_ \_\_ - Concrete

Section 26 \_\_ \_\_ - Electrical

**1.03 SYSTEM DESCRIPTION**

**A.** The manufacturer shall supply a total vehicle barrier system of the Ameristar® model 773H M30 drop arm barrier. The 773H shall be tested and certified according to ASTM F2656-23. Opening lengths between those tested shall also be accepted as a certified system based on interpolation of full-scale crash tests of identical barriers per the ASTM standard. The system shall include all components (i.e., barrier, control system, operator panels, “as tested” mounting/foundation elements) required for installation.

**B.** High Security Drop Arm Configuration - Single drop arms individually operated: Each individual drop arm shall be able to be operated independently from any other component within the access control system. Each drop arm shall have its own controls and operate under one of the following configurations specified at time of order:

* + - 1. Single Direction Traffic flows in one direction only through the access control point (ACP) system.
			2. Bi-Directional Traffic flows in both directions through the same ACP.
			3. Twin Lane. Traffic flows in both directions through separate ACP lanes where the entry and exit lanes are segregated by a traffic island or similar delineating element.

**1.04 QUALITY ASSURANCE**

**A.** The manufacturer shall be a company specializing in the supply of vehicle barrier systems with a minimum of 10 years’ experience.

**B.** The manufacturer shall provide a vehicle barrier system that has been fabricated, assembled, and tested for proper operation prior to shipment.

**C.** The manufacturer shall have performed an actual full-scale ASTM F2656 crash test on the type of vehicle barrier system being provided.

**D.** Installer Qualifications: Manufacturer-approved and factory-authorized installer thoroughly familiar with the type of construction involved and materials/techniques specified for vehicle barrier systems.

**E.** Manufacturing Representative site support shall be an available option at the cost of the installer. Site support services to include commissioning, operator training, installation milestones, etc.

**1.05 REFERENCES**

* ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
* ASTM F2656-20– Standard Test Method for Vehicle Crash Testing of Perimeter Barriers

**1.06 SUBMITTAL**

**A.** Submit under provisions of Section 01 30 00 - Administrative Requirements.

1. Product Data: Manufacturer's data sheets on each product used, including:
	1. Preparation instructions and best practice recommendations.
	2. Storage and handling requirements and recommendations.
	3. Installation manuals.
	4. Operation and maintenance manuals
2. Shop Drawings:
	1. Show locations and details of vehicle barrier systems including each major element, and details of operation, hardware, and accessories.
	2. Indicate materials, dimensions, sizes, weights, and finishes of components.
	3. Include foundation drawings with operational clearances, and details of anchorage.
	4. Controls: Show locations and details for control components, switches and drive system. Indicate motor size, control schematic, electrical characteristics, drive arrangement, mounting, and grounding.
	5. Wiring Diagrams: Power and control wiring, communication features, and access control features.
	6. Differentiate between factory-installed and field-installed wiring and between components provided by manufacturer and those provided by other sections of the specification.

**B.** Manufacturer's Certificates:

1. Copy of ASTM crash rating letter certifying the barrier system.
2. If an opening width between those tested is required, provide a letter of conformance stating the performance of the barrier is based on interpolation of data from the actual full-scale crash tests of identical construction.
3. If an opening width is outside of those tested is required, provide a letter of conformance stating the expected performance of the specified opening using data from the actual full scale crash tests of tested barriers of same construction.

**C.** Closeout Submittals:

1. Provide As-Built Drawings showing the as-built conditions of all equipment provided.
2. Provide manufacturer's maintenance and service instructions that include recommendations for periodic maintenance and cleaning of all vehicle barrier system components including:
	1. Parts List, or Bill of Material on all major parts and components.
	2. Recommended Spare and Consumables Parts List. Spare parts shall be those that can be field replaced. Consumables include items required for maintenance and service, such as, lights, fuses, lubricants, bearings, etc. Provide all items with a part number, recommended quantity, and a brief description.

**1.07 DELIVERY, STORAGE, AND HANDLING**

**A.** Upon receipt, all materials shall be inspected to ensure that no damage occurred during shipping or handling

**B.** Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against **d**amage, weather, vandalism and theft.

**C.** Manufacturer is not responsible for any damages not documented during inspection.

**1.08 WARRANTY**

**A.** The complete vehicle barrier system shall be warranted within specified limitations, by the manufacturer for a period of 12 months from date of original shipment as recorded by the manufacturer.

**B.** Manufacturer’s full warranty statement available for download from manufacturer’s website.

**1.09 PRODUCT HANDLING AND STORAGE**

Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism, and theft.

**PART 2 – PRODUCTS**

**2.01 MANUFACTURER**

**A.** Acceptable Manufacturer: Ameristar Perimeter Security, 1555 N. Mingo Rd., Tulsa, OK 74116. PH 866-467-2773,

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

**B.** Substitutions not permitted without prior approval.

1. Substitutions must be approved 10 days prior to bid date to be considered “as equal” products.
2. Any product proposed as an alternate shall be crash tested in the specific length required for above specified project, engineered substitutions will not be allowed.

**2.02 MATERIALS**

**A.** Testing and Certification - 773H is tested and certified under ASTM F2656-23 Impact condition M30/P1 in 12-foot and M30/P2 in 24-foot nominal openings, all opening sizes between tested widths are certified based on interpolation of full-scale crash tests of identical construction per ASTM F2656-23.

1. Automatic barrier system will be hydraulically actuated and include a manual hand pump for power outage manual operation.
2. Height: 35 inches (889 mm) as measured from the roadway surface to the center line of the barrier arm mid span.
3. Width: available in widths from 12’ to 24’ openings.
4. Angle: Barrier arm shall achieve 85° when in the fully open position to accommodate larger vehicles.
5. Each barrier comes standard with foundation installation kits supplied by the manufacturer.
6. Standard finish is hot dip Galvanized and painted black for all steel components; mill finish aluminum arm with red/white reflective stripe. Custom colors are available with RAL color number.

**B.** Foundation

### The foundation consists of two separate concrete pours with rebar, installation stands and cast in place anchors for each stanchion.

### Soil Compaction of not less than 95% maximum dry density.

### Excavation Depth equal to 48” (X2)

### Foundation dimensions are 60” Long X 60” Wide X 48” Deep minimum for each stanchion.

### Concrete shall reach a minimum compressive strength of 4000 psi at 28 days.

1. Concrete and Rebar supplied by installer.

**C.** Performance

1. Unit shall consist of an electrically driven hydraulic pump that powers a push/pull hydraulic cylinder. The hydraulic pump/cylinder system shall be designed to push the barrier arm upward when the up command is given and pull the arm downward when a down command is given. Hydraulic systems that rely on gravity to lower the barrier shall not be acceptable.
2. A hand pump shall be furnished to allow the barricades to be raised manually in the event of a power failure.
3. A lockable weather resistant HPU (Hydraulic Pumping Unit) enclosure shall be mounted to the drive stanchion. An optional remote mount drive system shall be available. The design shall provide for easy access to the HPU for maintenance and emergency operation of the hydraulic system.
4. The hydraulic drive system shall be rated for continuous duty and not require the use of springs, shocks or counterweights for arm deployment.
5. Barricade shall be capable of being raised or lowered in 7-15 seconds under normal operating conditions and shall contain field adjustable speed controls with limitations determined by arm length.
6. If optional ECO button is pressed, all safety interlocks shall be overridden, and barrier will move to secure position and remain in the secure position.
7. Normal up/down buttons shall remain inoperable until the ECO has been reset at the remote-control master panel.

**D.** Electrical

1. 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 773 vehicle barrier system HPU electrical enclosure, and/or other equipment as required.
2. The electric motor shall be capable of producing a minimum 3 horsepower.
3. The motor shall be of high starting torque, continuous duty, and industrial type, protected by either a thermal or current sensing overload device.
4. The standard unit shall be 208-240 single phase 60hz AC voltage. Other power options are available.

**E.** System controls

1. The control circuit enclosure shall be mounted within the enclosure of the hydraulic pumping unit. The enclosure shall be of sufficient size and rating to accommodate accessory devices (by others). All accessory device wiring shall connect to the included terminal strips.
2. A door mounted PLC controller shall interface between the barrier control stations and the hydraulic power unit. The PLC shall be programmed to include all necessary inputs, outputs, timers and logic for barrier operation.
3. The control circuit inputs shall operate from a 24 volts DC. An internal power supply shall provide 24 volts DC for the control panel and customer dry contacts.
4. The barrier control system shall have plug in connections for up to 3 single channel loop detectors (in ground detection loops are by others) that can be programmed as vehicle safety (presence), access control (card reader or keypad activation) or free exit.
5. The barrier control system is designed to accept dry contact inputs from various types of access control and safety devices. (i.e. photo/IR beams, safety edges, magnetic locks, traffic signals, audible alarms, etc.)
6. The PLC control circuit shall have a minimum of 4 programmable Inputs and 4 programmable outputs to accommodate additional user defined components.

**F.** Traffic signals

1. Traffic signals shall be dual eight-inch signal housing with 8” LED red and green lights to alert vehicles when it is safe to pass under the vehicle barrier. The operating voltage shall be 24-volt DC.
2. The traffic lights shall be supplied with a 6-foot tall 3.5 inch OD plated mounting post.
3. The RED LED fixture shall be illuminated when the barrier arm is closed and remain illuminated while the barrier is in motion. Once the barrier arm has reached the fully open position and stopped movement, the green LED is illuminated and red LED goes dark(off).

**G.** Operator control panels – optional

1. Remote Control Master Panel
2. An optional remote control master panel can be supplied to control barricade operation. This panel shall have a key lockable main switch with "main power on" and "panel on" lights. Buttons to raise and lower each barricade shall be provided. “Up" and "Down" indicator lights shall be included for each barricade.
3. Optional Emergency Close Operate circuit (ECO) feature shall be operated from a larger push button designated as ECO.
4. The ECO shall be furnished with an active light and reset switch.
5. The remote-control master panel shall have a switch to arm or disarm the remote slave panel. An indicator light shall show if the slave panel is armed.
6. The remote-control master panel shall operate on 24 volts.
7. The remote-control master station shall be a standard 19-inch electronics rack type surface mount panel or desktop console type with all devices wired to a terminal strip on the back.
8. Remote Control Slave Panel
9. An optional remote-control slave panel can also be supplied to control barricade operation. This panel shall have a "panel on" light that is lit when enabled by a switch on the remote-control master panel. Buttons to raise or lower each barricade shall be provided. Barricade "up" and "down" indicator lights shall be included for each barricade.
10. Optional Emergency Close Operation (ECO) feature shall be operated from a larger push button designated as ECO. When the slave panel ECO is pushed, an ECO "active" lamp will light and operation of the barricade will not be possible until reset at the master panel.
11. The remote-control panel shall operate on 24 volts.
12. The remote-control station shall be a standard 19-inch electronics rack type surface mount panel or desktop console type with all devices wired to a terminal strip on the back.

**PART 3 – EXECUTION**

**3.01 PREPARATION**

**A.** Verify existing conditions before starting work. Do not proceed until unsatisfactory conditions are corrected in an acceptable manner.

**B**. Verify that foundation, applied finishes and adjacent construction are ready to receive vehicle barrier systems and are within tolerances acceptable to manufacturer.

**C.** Verify that required services and utilities are in correct location and are of correct capacities for specified products.

**D.** If preparation and condition is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

**E.** Prepare the grade and remove surface irregularities, if any, which may cause interference with the installation of vehicle barriers.

**3.02 INSTALLATION**

**A.** Install vehicle barrier systems in accordance with manufacturer's instructions and the authorities having jurisdiction over

the project.

**B.** Provide all related materials for the vehicle barrier system installation, including, but not limited to: underground conduit,

piping, interconnection wire, lubricants, and other materials required for the complete and functional installation of the

vehicle barrier system.

1. Coordinate with Excavation and Backfill specified in Section 31 20 00 - Earth Moving
2. Coordinate with Cast-In-Place concrete specified in Section 03 30 00 - Cast-in-Place Concrete.
3. Coordinate with Security Access and Surveillance connection specified in Section 28 13 63 - Access Control Vehicle Identification System.
4. Coordinate with Electrical services and connections specified in Division 16.
5. Coordinate with Paving specified in Section 32 10 00 - Bases, Ballasts, and Paving.

**C.** Ensure that all vehicle barrier system equipment to be installed is properly located at the site.

**D.** Place and align entire barrier system (including arm assembly) equipment prior to placement of cast-in-place concrete specified in Section 03 30 00 - Cast-in-Place Concrete.

**E**. Provide electrical underground conduit runs for interconnecting wiring between equipment locations, including any accessories.

**F.** Install and interconnect the hydraulic power unit (HPU) and associated wiring to the barrier equipment provided with a weatherproof enclosure.

**G**. Install, mount and terminate the Main Operator Control Panel, and Remote Operator Control Panels, and interconnect to the barrier equipment.

**H.** Install, mount and wire accessory equipment and sensors, and interconnect to the barrier equipment.

**I.** Terminate the facility electrical power feed to the HPU disconnect switch.

**J.** Install and terminate the roadway vehicle loop detector wiring if required, and interconnect to the HPU.

**3.03 FIELD TESTING AND COMMISSIONING**

**A.** General: Vehicle barrier system shall be initially started and commissioned by a certified manufacturer-authorized field

service technician. Perform tests in accordance with the manufacturer's instructions.

**B.** Facility Electrical Power: Verify all wiring terminations before turning on electrical power. Verify voltage from facility

electrical power feed.

**C.** Hydraulic Power Unit (HPU) Start-up: Prepare for initial start-up by a factory-trained, manufacturer-authorized field

service technician.

1. Pump/motor shall be jog started (but not run) to verify the correct direction of electric motor rotation.
2. Perform Pre-Operation checks in accordance with the manufacturer's Operation and Maintenance manual.

**D.** Initial Barrier Operation: Cycle vehicle barrier to raise and lower the barrier and ensure proper, smooth operation.

1. Correct and repair operational anomalies, failures, malfunctions and/or other equipment trouble for proper operation.
2. Make adjustments required for the proper operation of the overall vehicle barrier system specific to site conditions.
3. Verify all functions, control, monitoring, indications of all integrated equipment are properly operating as a system.
4. Verify electrical circuits and connections to ensure that they are tightly connected and correct any loose or compromised connections found.

**3.04 CLEANING**

**A**. Leave immediate work area neat at end of each workday.

**B**. Clean surfaces with mild household detergent and clean water, rinse well. Concrete should be removed from exposed surfaces.

**C.** Touch up scratched surfaces using materials recommended by manufacturer. Match touchup paint color to finish.

**3.05 FIELD TESTING**

**A.** Upon completion of installation and commissioning perform a site field test on each equipment piece and the overall

vehicle barrier system.

1. Notify the Architect 72 hours prior to the start of field-testing.
2. The vehicle barrier system shall not be tested until the system is commissioned, and operational.

**B.** Test shall include:

1. Raising and lowering the equipment, both electrically and manually, through their complete range of operation.
2. Verify the amount of time to raise and lower the gate arm.
3. Cycle each Drop arm using the specified duty cycle for not less than 30 minutes, to test for heat build-up in the electrical system.
4. Verify the use of all operator control panel functions and indicators.
5. Verify operation of any installed equipment directly operated by the vehicle barrier system, including accessories.

**C.** During testing, any PLC programming changes that deviate from the original specified or manufacturer's default

program shall be submitted to the manufacturer as a written change request that defines the changes for any programming changes.

**D.** Notify the Architect and manufacturer of any equipment failures and/or malfunctions during field-testing.

**E.** Submit a Test Report with test data verified by the manufacturer to the Architect after completion of field-testing.

**3.06 FIELD TRAINING**

**A.** Provide manufacturer's on-site field training for up to five designated Owner/Operator supervisors, operators and service technicians. Field training shall include:

1. No less than 8 hours of training during the normal working day.
2. Training shall commence after the vehicle barrier system is functionally complete and operational, but prior to final acceptance tests. Cover all aspects of safely operating the vehicle barrier system.
3. Cover all the items contained in the Operation and Maintenance manual.

**3.07 MAINTENANCE SERVICE**

**A.** Installer to furnish service and maintenance for vehicle barrier systems and components for the following period from Date of Substantial Completion. (choose one, two, or three years)

**B.** Include periodic examination, adjustment, and lubrication of vehicle barrier equipment. Repair or replace parts whenever required. Use parts produced by manufacturer of original equipment.

**C**. Provide emergency call back service for this maintenance period.

**D.** Perform maintenance work using competent and qualified personnel approved by manufacturer.

**3.08 PROTECTION**

**A.** Protect installed products until completion of project.

**B.** Touch-up, repair or replace damaged products before Substantial Completion.