SECTION 34 71 13.19 – ACTIVE

PART 1 – GENERAL

1. RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1. SUMMARY
2. Section Includes:
3. The manufacturer shall be responsible for furnishing each AVB system and associated equipment as specified.
4. The installer shall be responsible for furnishing installation materials, providing installation, and field‑testing of each AVB system including the associated equipment as specified.
5. The Owner/Operator (End User) or facility architect shall assume responsibility of providing traffic and safety engineering, including all necessary safety features to be used at each AVB 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., unless otherwise specified herein.
6. The AVB system shall include an integrated operator housing with Electric Power Unit (EPU), barrier control units inclusive of all parts and internal wiring, optional operator pushbutton or touchscreen control panels, and optional accessories as specified.
7. The design and materials of the AVB system shall be the same as those used in the crash test of the AVB system and certified by the Department of State (DOS).
8. The AVB system shall utilize Ameristar model M550 electro‑mechanical, vertical drop arm (lift) crash beam.

Related Requirements:

1. Section 033053 Miscellaneous Cast-in-Place Concrete
2. Section 055000 Metal Fabrications
3. Section 099000 Painting and Protective Coatings
4. Section 220000 Plumbing
5. Section 260500 Common Work Results for Electrical
6. Section 280500 Common Work Results for Electronic Safety and Security
7. Section 281300 Access Control
8. Section 310000 Earthwork
9. REFERENCES
10. Publications cited in the text of this specification are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.
11. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO HB-17 (2002; Errata 2003; Errata 2005, 17th Edition) Standard Specifications for Highway Bridges

1. AMERICAN WELDING SOCIETY (AWS)
2. AWS D1.1/D1.1M (2015; Errata 1 2015; Errata 2 2016) Structural Welding Code – Steel
3. ASTM INTERNATIONAL (ASTM)
4. ASTM A106/A106M (2014) Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service
5. ASTM D3034 (20115) Standard Specification for Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings
6. ASTM F2656/F2656M (2007) Standard Test Method for Crash Testing of Vehicle Security Barriers
7. ASTM F2656/F2656M (2015) Standard Test Method for Crash Testing of Vehicle Security Barriers
8. Department of Defense (DOD) USACE Protective Design Center (PDC)
   1. DOD Anti-Ram Vehicle Barrier List (June 2020)
9. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
10. NEMA 250 (2014) Enclosures for Electrical Equipment (1000 Volts Maximum).
11. American Concrete Institute Building Code Requirements for Structural Concrete (ACI 318) latest adopted edition
12. U.S. DEPARTMENT OF STATE (DOS)
13. U.S. DEPARTMENT OF STATE STANDARD (SD-STD) SD-STD-02.01(1985)

Specification for Vehicle Crash Testing of Perimeter Barriers and Gates

1. U.S. DEPARTMENT OF STATE STANDARD (SD-STD) SD-STD-02.01(2003; Rev A) Specification for Vehicle Crash Testing of Perimeter Barriers and Gates
2. U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)
3. Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), 2009 Edition, including Revisions No. 1 and No. 2, FHWA, dated May 2012.
4. U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
5. 29 CFR 1910 Occupational Safety and Health Standards
6. UNDERWRITERS LABORATORIES (UL)
7. UL 486A-486B (2013; Reprint Jan 2016) Wire Connectors
8. National Fire Protection Association (NFPA) 70
9. National Electric Code
10. SYSTEM DESCRIPTION
11. The Ameristar Perimeter Security M550, is an electro‑mechanically operated, vertical drop arm crash beam with two independent installation foundations. Each AVB system is designed to prevent unauthorized vehicular intrusion into facilities and provides positive control of normal traffic in either direction.

Automated solutions may be designed to maximize operating security to provide a personnel free, automatic system, to control vehicle access.

Each system is 100% factory tested and adjusted for normal installed operating conditions. The AVB system’s electric power unit and the electronic control unit are interconnected and run in varying operating modes. This ensures each component part of the M550 is functioning in accordance with the customer operating sequence and the quality assurance standards of Ameristar Perimeter Security.

Standard system documentation shall contain detailed, step-by-step, information pertaining to all aspects of installation, start up, troubleshooting, and preventative maintenance. Familiarity with AVB and access-control systems shall be required to properly install, operate, and maintain the systems.

1. SUBMITTALS
2. Shop Drawings:
3. Show locations and details of vehicle barrier systems including each major element, and details of operation, hardware, and accessories.
4. Indicate materials, dimensions, sizes, weights, and finishes of components.
5. Include foundation drawings with operational clearances, and details of anchorage.
6. Controls: Show locations and details for control components, switches and drive system. Indicate motor size, control schematic, electrical characteristics, drive arrangement, mounting, and grounding.
7. Wiring Diagrams: Power and control wiring, communication features, and access control features.
8. Differentiate between factory-installed and field-installed wiring and between components provided by manufacturer and those provided by other sections of the specification.

Product Data:

1. Preparation instructions and best practice recommendations
2. Storage and handling requirements and recommendations.
3. Installation manuals.
4. Owner’s manuals

Samples of custom available finishes for selection:

1. Submit one electronic sample. If physical samples are required, inquire with manufacturer availability and cost. If physical samples are to be furnished, one approved sample or set of samples will be retained by approving authority and one will be returned to Contractor.

Test Reports

1. Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements.
2. Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.
3. Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.
4. Investigation reports.
5. Daily logs and checklists.
6. Final acceptance test and operational test procedure.

Owner’s Manual:

1. General description and specifications.
2. Provide specific instructions, procedures, and illustrations for the following phases of operation for the installed AVB system model and features of each AVB system.
3. Safety Precautions and Hazards
4. List personnel hazards and equipment or product safety precautions for operating conditions. Provide recommended safeguards for each identified hazard.
5. Operator Prestart
6. Provide procedures required to install, set up, and prepare each AVB system for use.
7. Startup, Shutdown, and Post-Shutdown Procedures.
8. Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.
9. Normal Operations
10. Provide Control Diagrams with data to explain operation and control of AVB systems and specific equipment. Provide narrative description of Normal Operating Procedures.
11. Emergency Operations
12. Provide Emergency Procedures for AVB system equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment.
13. Provide guidance and procedures for manual emergency operation of the AVB system including required means and methods.
14. Operator Service Requirements
15. Provide instructions for services to be performed by the operator such as adjustment, inspection, and service.
16. Environmental Conditions
17. Provide a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or AVB system.
18. Describe conditions under which the AVB system equipment should not be allowed to operate.
19. Operating Log
20. Provide checklist forms, sample logs, and instructions for maintaining necessary operating record.
21. Preventive Maintenance
22. Provide the following information for preventive and scheduled maintenance to minimize repairs for the installed model and features of each AVB system.
23. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.
24. Troubleshooting Guides and Diagnostic Techniques:
25. Provide step-by-step procedures to promptly isolate the cause of typical malfunctions.
26. Describe checkout and what conditions are to be sought.
27. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.
28. Repair Procedures:
29. Provide instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.
30. Provide alignment and calibration procedures.
31. Wiring Diagrams and Control Diagrams
32. Provide point-to-point drawings of wiring and control circuits including factory-field interfaces.
33. Provide a complete and accurate depiction of the actual job specific wiring and control work.
34. On diagrams, number electrical and electronic wiring and the terminals for each type, identically to actual installation configuration and numbering.

Record Drawings:

1. Provide drawings showing final as-record conditions of the project. This paragraph covers record drawings complete, as a may be requirement of the contract, which are revised to be used for final record drawings showing as-record conditions.
2. The final CAD record drawings must consist of one set of the electronic transmit of CAD drawing files in the specified format (downsave to AutoCAD 2010) as well as single pdf of entire sheet set.
3. QUALITY ASSURANCE
4. The manufacturer shall be a company specializing in the supply of vehicle barrier systems with a minimum of 10 years’ experience.
5. The manufacturer shall design or provide a complete AVB system that has been fabricated, assembled, and tested for proper operation prior to shipment.
6. The manufacturer shall provide crash test certification from an accredited ASTM Test Facility, DOS Certification, or as permitted by Contract, an equivalent engineer certification on the design/type of AVB system being provided.
7. Installer Qualifications: Manufacturer-approved installer thoroughly familiar with the type of construction involved and materials/techniques specified for vehicle barrier systems.
8. Manufacturer 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.
9. WARRANTY
10. Each item of equipment is under warranty, by Supplier for a period of one (1) year, after Delivery to F.O.B. plant from failure of operation in ordinary use and against defects due to faulty material or workmanship.
11. Any defective equipment in the AVB system shall be returned to the factory, at Supplier's option, for repair or replacement.
12. Supplier assumes no responsibility for service at any consumer site. Supplier is in no event responsible for any labor costs under the warranty.
13. Subject to the above limitation, all service, parts, and replacements necessary to maintain the equipment as warranted shall be furnished by Supplier at no cost to consumer. Supplier shall not have any liability under these specifications from unauthorized repairs, improper installation, installation not performed by Supplier personnel.
14. The exclusive remedy for breach of any warranty by Supplier shall be the repair or replacement at supplier’s option, of any defects in the equipment. In no event shall the supplier be liable for consequential or special damages or any kind of damages to anyone.
15. Optional extended warranty periods shall be available.
16. DELIVERY, STORAGE, AND HANDLING
17. All equipment shall be prepared and protected as recommended by the manufacturer to be shipped by conventional shipping methods.
18. The vehicle barrier system equipment shall be protected by suitable methods for the intended shipping and storage environments.
19. As applicable, packaging, preservation, pallets and crating shall prevent mechanical damage to the equipment during both shipping and handling.
20. Forklift provisions shall be provided for the lifting and handling of equipment.
21. Shipping containers and crates shall be identified with the type of equipment.
22. Shipping documents shall be provided with the contents of each truckload, container, or crate.
23. Protect components placed in storage from the weather, humidity, and temperature variation, dirt and dust, or other contaminants.
24. Equipment stored outdoors shall be stored covered.
25. Both equipment and structural materials shall be stored on pallets.
26. 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.

Equipment shall be stored in an area that is not subjected to potential damage by other construction activities.

1. EXTRA MATERIALS
2. Submit spare parts data for each different item of material and equipment used, after approval of the detail drawings. Include in the data a complete list of parts and supplies, with current unit prices and source of supply.

Provide a manufacturer's standard recommended spare parts package, with current unit prices and source of supply complete with detailed manuals on parts replacement, with each barrier to facilitate one (1) year of normal operation, as applicable.

Give particular consideration to system components which are not readily available from local or commercial sources and which are critical to the operation of the system.

Part 2 – products

1. MANUFACTURER AND MODEL
2. The AVB system shall be an Ameristar model M550 manufactured by:

Ameristar Perimeter Security USA, Inc. 1555 N Mingo Rd.

Tulsa, OK 74116

Phone: 888-333-3422

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

1. Barrier PERFORMANCE
2. The AVB system performance shall be based on the Department of State (DOS) publication SD STD 02.01, (1985) or Revision A, dated March 2003 for Vehicle Crash Testing of Perimeter Barriers and Gates, based on crash tested clear opening length size, in which the impact conditions are:
3. Crash Rating: K12
4. Penetration Rating L3 ft (mm): ≤ 3 (915)
5. Vehicle Weight lb (kg): 15,000 (6804)
6. Impact Speed mph (kph): 50 (80)
7. Impact Energy: 1,253 ft-ksi / 1,699 kJ
8. Crash Tested Clear Opening Sizes:
9. 12 ft
   1. U.S. DEPARTMENT OF STATE STANDARD (SD-STD) SD-STD-02.01(1985)

Specification for Vehicle Crash Testing of Perimeter Barriers and Gates.

1. 18 ft
   1. U.S. DEPARTMENT OF STATE STANDARD (SD-STD) SD-STD-02.01(2003; Rev A) Specification for Vehicle Crash Testing of Perimeter Barriers and Gates.
2. All other sizes are Independent Professional Engineer Crash Certified (stamped and sealed).
3. All-electric operation is available up to 22 ft clear opening lengths.
4. MODEL M550:
5. The AVB system operation shall be electro-mechanical.
6. Cycle Time:
7. Normal Operation of 8-15 seconds depending on the beam clear opening size.
8. 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.
9. The vehicle barrier system shall provide a manual, counter-balance methods of operation, for use during electrical power loss without the aid of electrics.
10. The AVB system operation shall be lockable or secured with a pad lock.
11. Barrier CONSTRUCTION
12. Gate Arm:
13. Gate arm rectangular tubing shall be 6063-T52 aluminum, 6 inches x 9 inches and 5/16 inch wall thickness.
14. Gate arm shall house three (3) nylon, endless slings. The slings shall be 4 ply x 5 inches wide.
15. The gate arm shall be an above grade assembly that, in the SECURE or CLOSED position, shall present a visible obstacle to approaching vehicles. All beams shall include standard red and white with optional yellow and white alternating diagonal striping, MUTCD compliant, 3M™ Type Diamond Grade Conspicuity Marking or equal reflective stripes. Refer to shop drawings for exact dimensions and pattern.
16. Optional Powered or Solar LED Lights available.

Housing and Receiver:

1. The substructure wide flanges shall be ASTM A36 steel.

All A36 structural grade steel shall be 100% hot dip galvanized except for gate arm sleeve.

Height:

1. Secure height of 30in ± 1in above finished grade to center of arm.

Weight:

1. Varies dependent on barrier clear opening size.

Finish:

1. The topcoat shall be PPG 95-812 Series Type ‘Pitthane Ultra’ Gloss urethane enamels.
2. Color shall be tinted with PPG Type ‘Performacolor’ high performance coatings.

Housing Assembly finish to match selected color.

Color finishes (Optional):

1. Yellow
2. White
3. Black
4. Customer selected

Housing Assembly:

1. The housing assembly contains counter-weights, electric power unit (motor and gearbox), variable frequency drive, limit switches, and the barrier control unit.
2. electrIC POWER UNIT
3. Electric Power Unit (EPU) shall be provided for providing power to raise and lower the barrier.
4. The EPU shall be local internal to the barrier housing assembly.
5. The EPU operates the barrier in accordance with the operator’s input push button controls or an automated entrance and exit sequence utilizing applicable access control devices.

Variable Frequency Drive

1. The Variable Frequency Drive shall be Type Automation Direct GS2 Series.

Horsepower: Single Phase 1 Hp (60Hz) = 11.5 A @ 200-240 VAC

Manual Operation:

1. Manual operation by means of motor crank via hand or cordless drill or by means of manual lift via Counter-weight balance without aid of electrics or hydraulics shall be furnished to allow the beam arm to be raised manually in the event of a prolonged power interruption.
2. The Motor shall be Type SEW Eurodrive, Inc.

Horsepower: Three Phase 1 Hp (60Hz) = 2.9 A @ 230 VAC for arms 12 ft to 22 ft

1. Barrier Control Unit
2. A barrier control unit (BCU) and control circuit shall be provided to interface between all barrier push button control stations (master, remote, local, and / or maintenance) and the EPU.

The BCU shall contain all relays, timers, industrial programmable logic controllers (PLC), and other devices necessary for the barrier operation.

The BCU shall allow direct interface with auxiliary equipment such as card readers, remote switches, loop detectors, optical sensors, radar, independent non crash-rated traffic arms, and limit switches.

The BCU shall be mounted and wired in an enclosure. All device interconnect lines shall be terminate at terminal blocks.

The BCU is located inside the Housing Assembly and operates the barrier arm in accordance with the operator input.

The following is a brief description of the primary BCU components:

1. PLC:
2. The PLC shall be IDEC MicroSmart Type ‘FC6A-C24P1CE’.

14 digital inputs

10 relay outputs

120 VAC supply voltage

The PLC programming parameters shall be guarded by password protection.

Power Supply:

1. The power supply shall be Puls Type ‘CP5.241-S2’.
2. 100-240 VAC auto-select input voltage
3. 24-28 VDC, 4.3A, 120W output
4. Overcurrent, short circuit and overvoltage protection
5. DC OK- LED relay contact
6. UL 508, UL60950/IEC 60950 compliant
7. Input Current: 4 A Typ

Manual Motor Control Switch

1. The motor control switch shall be Cooper Industries Arrow Hart Type ‘AH7810GD’.
2. Two-position maintained contact switch.
3. 30 A / 600 VAC rating
4. Single Throw
5. 3-Pole
6. 3-Phase
7. NEMA 1 Enclosure

Surge Protective Device

1. The surge detector shall be Ditek Type ‘D50-120/2083Y’.
2. Industrial surge protectors are designed to provide protection to AC power systems in the most demanding environments.
3. The D50 Series incorporates individually fused components for maximum performance and protection.

50,000 Amp surge current rating ensures long service life.

Compact size enables close mounting to the protected panel, to minimize wire length and maximize performance.

Diagnostic LED indicates system power and SPD function.

Connection method: ½” NPT conduit.

Watertight fittings housing: NEMA 4X

Operating temperature: -40 °F to 140°F (-40 °C to 60°C)

Maximum humidity: 95% non-condensing

Dimensions: 3.5 in x 2.4 in x 3.5 in (L x W x D)

Weight: 1.2 lb. (.5kg)

Inductive Loop Detector

1. The detector shall be supplied to provide fully automatic tuning.
2. The detector shall be available in dual channel.
3. The loop detector shall be FEIG Electronic Type ‘VEK M2H’.
4. The loop detector output provides vehicle presence detection (VPD) to the system controller for the purpose of barrier safety devices which are intended to prevent the barrier securing inadvertently.
5. The barrier shall be prevented from being accidentally raised under an authorized vehicle in normal operation. Under normal operating conditions, the controller is programmed to respond to an active VPD by cancelling the SECURE pushbutton command, the command has to be initiated again after the loops clear.
6. Under emergency conditions, when an Emergency Close Operation ECO is initiated the controller is programmed to respond to an active VPD by either ignoring the VPD (secures the barrier without delay) or delaying the command to be completed once the VPD has cleared.
7. Isolation transformer between loop and detector electronics (surge protection).
8. Automatic calibration when switching on or changing the adjustment of holding time.
9. Direct DIN-rail (wiring on the housing) mounting.
10. Adjustment of unlimited holding time possible.
11. Front panel DIP-switch adjustments.
12. Rodway embedded or pre-formed inductive loop sensors, radar, other detection devices may be proposed as an option.
13. MASTER (MAIN) USER INTERFACE PANEL (UIP) Push Button Control STATION
14. This panel shall have a key lockable main switch with main power indicator light.
15. Push Buttons to Secure and Nonsecure each barrier shall be provided.
16. Barrier Secure and Nonsecure indicator lights shall be included for each barrier.
17. An Emergency Close Operation (ECO) function shall be operated from a push button larger than the normal controls and have a flip safety cover installed over the push button or toggle switch to prevent accidental deployment of barrier.
18. The main control panel ECO shall also be furnished with an ECO-active indicator light and reset key switch. An optional remote panel will not have ECO reset capabilities.
19. The main control panel shall have a key lockable switch to arm or disable the optional remote control panel.
20. An indicator light shall show if the remote control panel is enabled.
21. Optional UIP Control Stations may be provided as an option.
22. Electrical: 24VDC
23. Power indicator lights
24. Size: 16mm
25. Type: LED
26. Color: Blue
27. Keyed Switch
28. Power ON or OFF: 1-way, 2 position, maintained
29. ECO reset function: 1-way, 2 position, momentary
30. SECURE illuminated pushbutton
31. Size: 22 mm
32. Type: LED
33. Color: Red
34. Contact: Momentary
35. NONSECURE illuminated pushbutton.
36. Size: 22 mm
37. Type: LED
38. Color: Green
39. Contact: Momentary
40. ECO illuminated pushbutton
41. Size: 40 mm Mushroom
42. Mounting: 22 mm
43. Type: LED
44. Color: Red
45. Contact: Momentary
46. Pushbutton cover: Clear plastic, Rubber gasket, Pad lockable
47. Annunciator
48. Piezoelectric
49. Operating voltage: 4 – 28 VDC
50. Maximum current: 30 mA
51. Sound output level: 85 dB
52. Tone mode: Continuous
53. Screw lug terminals
54. Resonant frequency: 2,900 ± 500 Hz
55. Operating Temperature: -4 °F to 140°F (-20 °C to 60 °C)
56. Slanted Enclosure – standard size described below serves up to three (3) barriers
57. Dimensions: 5 in x 10 in x 10 in (H × W × D)
58. Slanted control surface for console or wall mount
59. 14 gauge carbon steel
60. Continuously welded seams
61. Oil resistant adhesive gasket
62. Continuous hinge with removable pin on long side
63. Standard Finish: RAL 7035 polyester powder coat
64. Keys
65. Owner directed key distribution.
66. Typed or marked to prevent unauthorized duplication.
67. Traffic Light
68. The housing assembly shall be McCain Type ‘A127’.
69. The following are features of the housing assembly:
70. Modular Design
71. Two section, vertical alignment
72. Polycarbonate:
73. Injection Molded
74. Ultraviolet and heat stabilized
75. Flame retardant
76. 10% fiberglass reinforcement
77. Permanently colored
78. Finishes: Colored resins integral to housing
79. Optional Aluminum:
80. Type 360
81. Reduced corrosion
82. Finishes: Powder Coated
83. Increased powder coat adhesion
84. Colors
85. Federal Yellow
86. Signal Green
87. Black
88. Optional custom colors
89. Construction: Reinforcement ribs and serrated ports provide strength and positive locking with other sections and mounting hardware.
90. Stainless steel door roll pins and eye bolt/wing nut assemblies for positive latching.
91. Integral lugs on the housing and doors with stainless steel roll pins provide effective door hinges.
92. Four (4) metal threaded inserts included for optional Visor attachment.
93. 8 in or 12 in diameter
94. Weathertight door seal with ethylene propylene diene monomer rubber gasket.
95. Housings have a cast boss for mounting a 5 or 6-position terminal block; one side of terminal block with fast-on terminals, the other side with screw terminals.
96. Mounting:
97. 2.0 in hole top and bottom
98. 1.5 in NPT fittings
99. Environmental
100. Operating Temperature: -35 °F to 165 °F (-37 °C to 74 °C)
101. Humidity: 0 to 90% non-condensing
102. The LED Traffic signal module shall be:
103. 8 in Leotek Type: ‘TSL-08R-LX-IL6-B1-P3’ Red and ‘TSL-08Y-LX-IL6-B1-P3’ Amber
104. 12 in Leotek Type: ‘TSL-12R-LX-IL6-B1-P3’ Red and ‘TSL-12Y-LX-IL6-B1-P3’ Amber
105. Electrical (Red Lens):
106. Operating voltage: 10-28 VDC
107. Power (8 in / 12 in): 2.4 W / 4.4 W
108. Dominant Wavelength: 626 nm
109. Intensity (8 in / 12 in): 165 cd / 365 cd
110. Electrical (Yellow Lens):
111. Operating voltage: 10-28 VDC
112. Power (8 in / 12 in): 4.3 W / 10 W
113. Dominant Wavelength: 589 nm
114. Intensity (8 in / 12 in): 410 cd / 910 cd
115. Electrical (Green Lens):
116. Operating voltage: 10-28 VDC
117. Power (8 in / 12 in): 3.4 W / 6.6 W
118. Dominant Wavelength: 500 nm
119. Intensity (8 in / 12 in): 215 cd / 475 cd
120. Environmental
121. Operating Temperature: -40 °F to 165 °F (-40 °C to 74 °C)
122. Excellent moisture and dust resistance
123. Additional Features:
124. Environmentally friendly
125. Significant energy efficiency
126. Wider viewing angle
127. Enhanced uniformity
128. Utilizes constant current source to maintain consistent light output
129. Engineered for superior thermal management
130. Maintains 70% of the initial light intensity after 100,000 hours of operation
131. Complies with FCC title 47, Subpart B section 15 for Radiated Emission
132. The Pedestal Base shall be Pelco Traffic Type ‘SP-1007-VA-P34’
133. Aluminum
134. Square Breakaway Base
135. Dimensions:
136. Outer diameter: 14.5 in max
137. The pedestal pole shall be Pelco Traffic Type ‘PB-5100-04-P34’
138. Spun Aluminum
139. Sch 40
140. Dimensions:
141. Outer diameter: 4 1/2 in
142. Wall Thickness: 0.237 in
143. Height: 4 ft
144. Standard Finish: P34 Flat Black
     1. Custom finishes available
145. The Pedestal Pole Top Slip Fitter shall be Pelco Traffic Type ‘SE-3106-P34’
146. Aluminum
147. Dimensions: Fits outer diameter: 4 1/2 in
148. Standard Finish: P34 Flat Black
149. Custom finishes available
150. Alternately, an option for a traffic light integral to the M550 integrated operator housing assembly is available as an option.
151. Saw-Cut Inductive Safety Loop
152. The following information applies for preformed, saw-cut loop installation where the roadway asphalt or concrete surface is existing or finished prior to safety loop installation.
153. The induction loop shall be BD Loops Series ‘SCXX-100’, where XX is the perimeter of the safety loop in feet and 100 is lead-in cable length in feet.
154. The entire loop including the lead-in fits within a 3/16” saw-cut groove preventing wasted time spent double saw-cutting or doubling blades to cut the home run lead-in.
155. Below are some features and benefits of the loop design:
156. Thicker 16-gauge loop wire, most other use thinner 18 gauge - More copper means increased tensile strength, and a tougher more durable loop.
157. LLDPE outer jacket same material as used in XLP. Tough abrasion resistance jacket will prevent failures caused by nicks and scratches.
158. Custom designed polyethylene wedge shaped jacket with wings. (built in backer-rod) Eliminates the need for a backer rod to hold loop to the bottom of saw-cut groove. No chance of air pockets and use 40% less sealant since bottom half of the groove is completely sealed.
159. Easy to follow instructions with template for dog-ear corner cut takes confusion out of the installation process.
160. Pre-phased at the factory saves time when installing two loops in series to one detector for a slide or vertical gate.
161. Loop wire jacket and lead-in jacket are the same size, no need to make a second saw-cut for lead-in run.
162. Soldered connections make solid connections that won’t corrode or break over time.
163. Every loop is tested 3 ways at the factory: meg-ohm meter, inductance meter, and with an actual loop detector.
164. Compact size and reduced weight saves on shipping cost and warehouse space.
165. Saw-Cut Safety Loop Sealant
166. The loop sealant shall be BD Loops Type ‘Loop Goop’.
167. Sealant polyurethane resin designed to encapsulate, protect and insulate inductance loops for door, gate, and parking applications.
168. Application does not require mixing or heating.
169. Permits vehicular traffic immediately after application with no need for lane closure.
170. Low viscosity sealant flows and encapsulates the wires and applying the sealant is easier on your hand when using a caulking gun.
171. Self-leveling sealant will flow and fill in low spots on its own.
172. Base material temperature at time of installation:
173. Must be between 14 °F and 104 °F (-10 °C and - 40 °C).
174. Direct Burial Inductive Safety Loop
175. The following information applies for pre-formed, direct burial loop installation where the safety loop is installed prior to roadway asphalt or concrete installation.
176. The induction loop shall be BD Loops Series ‘ELXX-100’ where XX is the perimeter of the safety loop in feet and 100 is lead-in cable length in feet.
177. Used for direct burial installations under concrete, asphalt, pavers, or in gravel roads.
178. The induction loop shall not have an air pocket resulting in fewer phantom detections caused by ground vibration.
179. The loop wire shall have arrows indicating the direction of current and lead-in is red/black allowing easy understanding of phasing.
180. Offset the direct burial loop from the rebar pattern (if applicable).
181. The lead-in shall be installed through conduit and glue the joint with a proper PVC solvent cement.
182. The lead-in shall be installed in conduit underneath the rebar (if applicable) in a concrete pour.
183. Photoelectric Sensor
184. The photoelectric sensor shall be EMX Type ‘IRB-MON’ which provides a universal solution for entrapment protection.
185. Optional powder coated steel hood and liquid tight strain relief connectors shall be provided.
186. One photo-eye covers the entire spectrum of possible requirements for monitored and non-monitored photo eyes, simplifying inventory management and product training.
187. The IRB-MON is an external entrapment protection device type B1, non-contact sensor for use with automatic gates and doors.
188. The device is UL325-2016 compliant and suitable for use with both operators that require monitored entrapment protection and those that do not require monitored operation.
189. The long range and thru-beam features combined with the installer mode switch settings provide a flexible solution to all external entrapment protection needs.
190. Lens-less design minimizes fogging and false triggering caused by small objects and provides for easy alignment.
191. The following are specifications and features:
192. Max Operating Range: 115 Ft. (35m)
193. Detection Angle: 24°
194. Sensitivity Adjustment: Potentiometer
195. Power Indicator: Green Led
196. Detect Indicator: Green Led
197. Relay Output Operation: Light On/Dark On Selection
198. Relay Output: Form C Contacts (No, Com, NC)
199. Power Protection: Thermal Fuse
200. Operating Temperature: -40°F to 170°F (-40°C to 77°C)
201. Environmental: Nema 4x
202. Weight: Tx - 0.35 Lbs, Rx 0.35 Lbs
203. Connections: Tx-2 Terminal, Rx-5 Terminal

part 3 ­ ­­– Execution

1. EXAMINATION
2. Verify existing conditions before starting work. Do not proceed until unsatisfactory conditions are corrected in an acceptable manner.
3. Verify foundation, applied finishes, and adjacent construction are ready to receive vehicle barrier systems and are within tolerances acceptable to manufacturer.
4. Verify required services and utilities are in correct location and are of correct capacities for specified products.
5. If preparation and condition is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
6. installation schedule
7. Before beginning any site work, provide a schedule of all installation and testing activities. The project activities in the proposed schedule shall be arranged in chronological order. All installation and testing activities, specifically those requiring access control point or vehicle barrier outages, shall be coordinated with the Contracting Officer. No site work shall be done without an approved schedule by the Contracting Officer.
8. INSTALLATION
9. The AVB system shall be installed, interconnected, integrated, commissioned and tested at the site, collectively referred to as “installation”, by a third party (independent) installer authorized by Ameristar.
10. Reinforcing (Optional)
11. Rebar is not required to meet crash rating requirements. However, the crash certification is only valid if the concrete maintains a solid mass. Ameristar recommends contractor/ installer to provide rebar to maintain concrete foundation corm in accordance with AHJ and/or local applicable codes.
12. Reinforcing steel shall be ASTM A615, Grade 60.
13. All concrete and rebar work shall be per ACI 318, latest edition.
14. Follow all applicable building codes when installing reinforcement.
15. Concrete shall be normal weight with minimum 28-day compressive strength of 4,000 psi.
16. Truncate rebar where there is interference with M550 foundation frame.
17. Refer to shop drawings for exact dimensions and layout.
18. Dimensions
19. Housing and Receiver Foundations:
    1. Certified crash rating foundation size: Two (2) Minimum 8 ft x 4 ft x 3 ft (L x W x D) each.
    2. Approximate volume of concrete required: Two (2) each 3.56 yd³ (2.72m³)
    3. The AVB system installation shall be in accordance with Ameristar Perimeter Security instructions.
    4. The installer shall provide all installation materials for the AVB system installation, including, but not limited to: underground conduit, piping, rebar (if applicable), concrete, interconnection power and controls conductors, and other materials required for the installation of the vehicle barrier system.
20. Wiring:
21. Furnish and install all cables and conduits for all wiring interconnecting contractor furnished, and as indicated on the drawings.

1. Grounding:
2. Provide adequate grounding system for the following: Traffic Signal supports, Traffic Gate Arm, AVB frames, AVB control enclosure and additional options or accessories.
3. Test installed ground rods as specified in IEEE 142.
4. Enclosure Penetrations:
5. Enclosure penetrations shall be from the bottom unless the system design requires penetrations from other directions.
6. Penetrations of interior enclosures involving transitions of conduit from interior to exterior, and penetrations on exterior enclosures shall be sealed with rubber silicone sealant to preclude the entry of water.
7. The conduit riser shall terminate in a hot-dipped galvanized metal cable terminator. The terminator shall be filled with an approved sealant as recommended by the cable manufacturer and in a manner that does not damage the cable.
8. Ensure that all AVB system equipment to be installed is properly located at the site.
9. Provide excavation and trenching for the AVB system, including slabs, conduits and accessories, and mounting pads.
10. All AVB equipment shall be integrated, including system accessories, for a complete operation, ready to operate by the owner.
11. Install, mount, and wire the Master (Main) Operator Control Panel, and/or other specified Control Stations, and interconnect to the barrier equipment.
12. Install, mount, and wire accessory equipment and sensors, and interconnect to the AVB system equipment.
13. Hook up and wire the facility electrical power feed to the EPU. The Contractor 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 owner), and interconnect to the EPU.
15. NAMEPLATES
16. Nameplate data shall be permanently attached to each AVB system. The data shall be legibly marked on corrosion-resistant metal plates and shall consist of at least the following:
17. Manufacturer's name
18. Model number
19. Serial number
20. Date of manufacture
21. field testing
22. The AVB system(s) shall be initially started and commissioned by a manufacturer approved field service technician in the presence of the Customer and the designated Site Construction Manager.
23. The test shall demonstrate that all AVB unit(s) are operating / installed properly.
24. ONE (1) day per AVB system location for equipment operational commissioning & quality assurance. Test shall require a up to eight (8) hour session.
25. The test shall include:
26. Raising and lowering the AVB system, both electrically and manually, through their complete range of operation.
27. The verification of the amount of time to raise and lower the AVB system.
28. No less than five (5) operations of the ECO function.
29. The use of all operator control panel functions and indicators.
30. Operation of any installed equipment directly operated by the AVB system, including accessories.
31. The installer shall submit a Test Report with test data to the owner after completion of field testing.
    1. The owner/customer shall sign off the Test Report for final AVB system handoff and acceptance, and provide a copy to the installer, and to Ameristar.
32. field training
33. Provide manufacturer’s onsite field training course for designated Owner/Operator (End User) supervisors, operators and service technicians.
34. Field training shall:
35. Be provided for no less than four (4) hours of training during the normal working day and accommodate up to ten (10) Owner/Operator staff members.
36. Commence after the AVB system is functionally complete and operational, but prior to final acceptance tests.
37. Cover all aspects of safely operating the AVB system.
38. Cover all of the items contained in the Operation and Maintenance manual.
39. Adjusting and cleaning procedures shall be provided in the manufacturer user manual.
40. commissioning
41. General:
42. The AVB system pre-operation checks shall be performed in accordance with the manufacturer’s Operation and Maintenance manual.
43. The AVB system shall be initially started‑up and commissioned by a manufacturer authorized field service technician, in accordance with the manufacturer’s drawings and instructions.
44. All wiring terminations shall be checked before energizing electrical power to ensure correct connections.
45. The facility electrical power feed shall be energized, and the voltage at the EPU shall be checked.
46. Each AVB system shall be cycled to raise to Secure and lower to Nonsecure, to ensure proper, smooth operation.
47. Operational anomalies, failures, malfunctions and/or other equipment trouble shall be corrected and/or repaired for proper operation.
48. Any adjustments required for the proper operation of the overall AVB system shall be made specific to site conditions.
49. The AVB system shall be checked to ensure that all functions, control, monitoring, indications of all integrated equipment is properly operating as a system.
50. Any PLC programming changes that deviate from the original defined owner sequence of operations or Ameristar’s default program, shall be submitted to Ameristar as a written change request that defines the changes, subject to change order.

END OF SECTION