

SECTION 11 12 00
PARKING CONTROL EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Automatic barrier gates.
2. Vehicle detectors.
3. Traffic controllers.
4. Access Control.
5. Crash Rated Vehicle Barriers and components.
6. Parking facility management software.
7. Access control units.

B. Related Work for Coordination:

1. Refer to Section 32 31 19 Decorative Metal Fences and Gates for control of all vehicle entry gates, vehicle detection and access control units associated with site vehicle access gates and other components controlled through vehicle detectors, access control components and Owner's security requirements. Coordinate the Work of this Section with that of Section 32 31 19 Decorative Metal Fences and Gates to operate all related components and permit site access and egress in compliance with the Functional Narrative included in this Section.
2. [Refer to Section 34 71 13 Active Vehicle Barriers for all wedge plate barrier systems. Coordinate the Work of this Section with that of Section 34 71 13 Active Vehicle Barriers to allow site access control points and systems integrated with all Owner security systems to operate all related components and permit site access and egress in compliance with the Functional Narrative included in this Section.]
3. Functional Narrative: Valid access control credentials presented shall open vehicle barrier gates at the respective location, open the vehicle gates at the respective location and lower the active vehicle barriers at the respective location to allow unobstructed site entry. Unobstructed vehicle exit from the site shall be permitted to all vehicles existing the secure site.

1.2 ACTION SUBMITTALS

- A. Product Data: Technical data including Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for parking control equipment.
- B. Shop Drawings: Submit plans, elevations, sections and attachment details.

1. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 2. Include diagrams for power, signal, and control wiring.
 3. Vehicle Detectors: Layout and method of placement of vehicle loop detector system.
- C. Samples: Submit samples for each exposed product and for each color and texture specified, 6 inches (150 mm) square in size.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Submit data for Installer.
- B. Field quality control reports.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit data for parking control equipment to include in emergency, operation, and maintenance manuals.
- B. Software and Firmware Operational Documentation:
 1. Software operating and upgrade manuals.
 2. Program Software Backup: On USB media and approved online or cloud solution.
 3. Device address list.
 4. Printout of software application and graphic screens.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and are packaged with protective covering for storage and identified with labels describing contents.
 1. Gate Arms: Two breakaway gate arms for each gate installed, complete with accessory components.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative having minimum 5 years documented experience who is trained and approved by manufacturer.
- B. Sole Source Responsibility: Obtain parking control equipment from single source from single manufacturer.
- C. Preinstallation Conference: Conduct conference at project site.
 1. Inspect and discuss electrical roughing in, equipment bases, and preparatory work.
 2. Verify equipment operation is consistent with system description.
 3. Review sequence of operation for each type of parking control equipment.

4. Review coordination of interlocked equipment specified.
5. Review required testing, inspecting, and certifying procedures.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Parking Control System: For the following types of parking management:
 1. Limited Security Access Parking: Limited parking, with preconfigured access control card.
- B. Electrical Components and Devices: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 AUTOMATIC BARRIER GATES.

- A. Provide parking control device consisting of operator and controller housed in a weathertight, tamper resistant cabinet enclosure with gate arm. Device shall be activated by a signal from access or revenue control device. Fabricate unit with gate arm height in down position of not more than 35 inches (889 mm) above pavement.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Amano Cincinnati, Inc.
 - b. ASPS Access Security & Parking Systems Inc.
 - c. Automatic Systems.
 - d. CAME Americas Automation LLC.
 - e. Canadian Parking Equipment Ltd./American Parking Equipment Inc.
 - f. Delta Scientific Corporation.
 - g. DoorKing, Inc.
 - h. Engineered Parking Systems, Inc.
 - i. Falcon Eye Global Security, LLC.
 - j. Magnetic Automation Corporation.
 - k. Parking Systems, Inc.
 2. Standards: Barrier gate operators that are listed and labeled according to UL 325 by a qualified testing agency.
- B. Controller: Factory sealed, solid state, plug in type, with galvanized steel box for wiring connections. Communicating type.
 1. Communicating Type:
 - a. Real time communication of lane counts, status messages, and execute commands.
 - b. Monitor illegal entries and exits, tailgates, tickets, monthlies, and backouts.
 - c. Status messages for gate up too long, backouts, ticket in chute, and gate-arm rebound.

- d. Communication commands for resetting loops, turning "Full" signs on/off, raising and lowering gate arm, and disabling card readers automatic vehicle identification.
2. Physical Characteristics:
 - a. On-off power supply switch.
 - b. Automatic-manual switch.
 - c. Differential counter.
 - d. Communication port.
 - e. Internal resettable counters.
 - f. Thermal overload protection with manual reset.
 - g. Plug-in connectors for vehicle loop detectors.
 - h. Thermostatically controlled heater with on/off/auto switch.
 - i. Thermostatically controlled fan with on/off/auto switch.
 - j. Switch to test motor and limit switches.
 - k. Emergency manual disconnect.
 - l. Battery backup.
 - m. Four, 115-V ac grounded power receptacle.
 3. Operational Characteristics:
 - a. Able to store successive inputs and sequentially processing each one.
 - b. Automatic instant reversing obstacle detector mechanism that stops downward motion of gate arm if arm contacts or nears an object and that immediately returns arm to upward position. Include a zero to 60 second, variable time reset device.
 - c. Directional arming logic.
 - d. Broken gate arm monitoring.
 - e. Programmable timer.
 - f. Diagnostic mode for onsite testing, with LEDs for inputs and outputs.
 - g. Automatic and continuous testing of inputs and outputs.
 - h. Reversible arm capability for right or left handed operation.
- C. Cabinets: Fabricated from sheet metal with seams welded and ground smooth; approximately 15 inches square by 40 inches tall (381 mm square by 1016 mm tall). Provide single, gasketed access door for each cabinet with flush mounted locks. Furnish two keys for each lock, all locks keyed alike. Fabricate cabinet with internal reinforcing and four mounting holes accessible only from inside cabinet.
1. Steel Sheet: Not less than 0.097 inch (2.5 mm) thick, galvanized steel sheet.
 - a. Finish cabinet, interior and exterior, with white baked enamel or powder coat finish.
- D. Straight Gate Arm: Fiberglass.
1. Traffic-Side Face: Reflective painted finish and red diagonal stripes.
 2. Length: Indicated on Drawings.
 3. Mounting Flange: Provide with breakaway feature to ensure a clean break if arm is struck by vehicle.

- E. Operator: UL labeled and listed, Class IV. 1/2 hp; V, 60-Hz, single phase, instant reversing, continuous duty motor for operating gate arm. Transmit power to gate arm drive shaft through the speed reducer to harmonic acting crank and connecting rod. Fabricate crank, rod, and drive shaft of galvanized solid bar steel. Provide an operable cam for adjusting arm travel.
 - 1. Opening Time: Six seconds.
 - 2. Inherently adjustable, torque limiting clutch for safety.

- F. Characteristics:
 - 1. Audible alarm that activates as part of a safety device system.
 - 2. Additional obstruction detector; noncontact infrared.
 - 3. Gate arm warning safety signs on both sides of unit to limit traffic to vehicular traffic.
 - 4. Low voltage yellow warning lights that illuminate when gate is in down position.
 - 5. Low voltage light on cabinet top that flashes or changes from red to green when barrier gate is operating.
 - 6. LED integrated into gate arm for increased visibility.
 - 7. Manually operated crank for emergency operation.
 - 8. Authorities having jurisdiction's emergency access by confirmed means to be included in the Base Scope of Work.

2.3 CRASH RATED VEHICLE BARRIERS

- A. Provide crash rated vehicle barriers with dual arms at all locations indicated on the Drawings. Vehicle barrier controls shall be integrated to and coordinated with adjacent vehicle gates, access controls, vehicle detection and other components.

- B. Basis of Design: Provide HySecurity vehicle barrier model StrongArm™ M50 with Smart Touch Controller, High Security Anti-Ram Gate by High Security. Subject to compliance with requirements, alternate products shall be submitted under the requirements for Substitution Request as outlined in the Project Manual

- C. Standards:
 - 1. Barrier gate shall be crash rated and certified to ASTM F2656-07.
 - 2. Barrier gate operators that are listed and labeled according to UL 325 by a qualified testing agency.

- D. Operation shall be by means of dual acting hydraulic cylinder acting directly on the drop arm to move the arm through 90 degrees vertical. Operation to the fully open and fully closed position shall be continuously monitored by an absolute position sensing device that accurately reads the position of the cylinder and arm. The system shall function normally without need for springs or weights to counterbalance the arm. Gears, sprockets, belts or pulleys shall not be incorporated in the operator. Arresting of vehicles shall be accomplished by polymeric straps suspended in the arm. All models include a variable speed motor drive and two brake valves to gradually stop and hold the arm without applying a shock load to the arm or barrier assembly. Barrier shall hydraulically lock in the closed position.

- E. Dual Arm Design Straight Gate Arms: Basis of Design Strong Arm Crash for Strong Arm M50. Crash certified to ASTM F2656-07 M50-P2 to stop a 15,000 lb Truck travelling at 50 mph with penetration of less than 1.2 meters.
- F. The vehicle barrier shall be certified by a third party licensed engineer to be capable of withstanding a direct impact from a vehicle to the M50 level specified in ASTM F2656 for 12 ft (3,657 mm) and 24 ft (7,315 mm) lengths. The vehicle barrier shall have successfully passed testing at an accredited test facility to ASTM F2656 as validation of the engineering certification.
- G. Minimum Safety Features:
 - 1. Lower barrier arm at a height of 18 inches from grade to prevent smaller vehicles from penetrating under the main barrier arm.
 - 2. The barrier arm shall contain LED warning lights to enhance night visibility.
 - 3. The barrier shall include a red – amber stoplight to display status to vehicles.
 - 4. A photoelectric eye capable of detecting a person or vehicle in the path of the barrier to prevent closure of the barrier arm when an obstruction is present. This feature shall not be active during Emergency Fast Close.
 - 5. Shield to prevent entrapment of bystanders between arm and catch post.
- H. Schedule of barrier arm lengths and speed capacities:
 - 1. StrongArm M50 12-14 ft clear opening: Travel time not to exceed six seconds from fully closed to fully open position. Maximum clear opening shall be 14 ft..
 - 2. StrongArm M50 16-18 ft clear opening: Travel time not to exceed seven seconds from fully closed to fully open position. Maximum clear opening shall be 18 ft ..
 - 3. StrongArm M50 20-24 ft clear opening: Travel time not to exceed eight seconds from fully closed to fully open position. Maximum clear opening shall be 24 ft ..
 - 4. All units shall contain, as standard equipment, a provision for Emergency Fast Close operation that shall move the barrier from fully open to the fully closed position in 1.5 seconds less than the normal travel time to open.
- I. Minimum standard mechanical components:
 - 1. Chassis: shall be 3/8" (9 mm) steel plate, welded, and edges ground smooth.
 - 2. Cover: shall be 14 gauge (2 mm) galvanized sheet steel, with a security lock to limit access.
 - 3. Main shaft: shall be 3" (76 mm) diameter, high strength steel alloy.
 - 4. Heavy duty sealed 1-15/16" (49 mm) bearings, with cast iron pillow blocks.
 - 5. Resilient physical stop limiting open and close travel and to cushion stop at each end of travel.
 - 6. Hydraulic hose: Shall be 3/8" (9 mm) wire braid reinforced, rated to 3,050 psi (21.0 MPa).
 - 7. Hydraulic valves: Shall be individually replaceable cartridge type, in an integrated hydraulic manifold.
 - 8. Hydraulic fluid: High performance type with a viscosity index greater than 375 and temperature range -40° F to 158° F (-40° C to 70° C). (optional biodegradable fluid requires a heater at temperatures below -10° F (-24° C))

9. A zero to 2,000 psi (13.7 MPa) pressure gauge, mounted on the manifold for diagnostics, shall be a standard component.
10. The hydraulic fluid reservoir shall be formed from a single piece of metal, non-welded, and shall be powder painted on the inside and the outside, to prevent fluid contamination.
11. Manual operation: in the event of a power outage the use of a "pull to release" bypass valve shall unlock the operator and allow the arm to be operated by a hand pump.
12. Arm: Aluminum oval shape for optimal strength, wind resistance and corrosion protection
13. Arm striping: shall be highly reflective alternating red and white vertical stripes, 16" (406 mm) intervals measured horizontally per MUTCD standards.
14. Finish: hot dipped galvanize coating per ASTM A123 G85.
15. Red LED lights shall be integrated into the barrier arm.

J. Minimum standard electrical components:

1. Pump motor: 2 hp, 3450 RPM, 56C, TEFC, three phase. (Note, the VFD converts single phase input power to drive a three phase motor)
2. All components shall have overload protection.
3. Variable frequency drive to enable variable displacement pump operation.
4. Controls: Smart Touch Controller Board containing:
 - a. Built in warning buzzer for Emergency Fast Close and in the event of Alerts, Faults, or Errors;
 - b. Built in timer to close;
 - c. 32 character OLED display for reporting of functions and codes;
 - d. Multiple programmable output relay options;
 - e. Anti-tailgate mode;
 - f. Built-in power surge/lightning strike protection;
 - g. Menu configuration, event logging and system diagnostics easily accessible with a PC and HySecurity's free Smart Touch Analyze and Retrieve Tool;
 - h. RS-232 port for connection to laptop or other computer peripheral and RS-485 connection for network interface.
 - i. Dual gate communication connection for bi-parting, sally port, or sequenced gates.
 - j. Electromechanical and solid state relays.
 - k. Radio option outputs.
 - l. 21 inputs for site specific configurations.
5. Control circuit: 24 VDC.
6. Transformer: 75 VA, non-jumpered taps, for all common voltages.
7. Sockets for up to four HySecurity HY-5A plug-in vehicle detectors.
8. Open and close limits shall be via encoder, providing continuous position sensing of arm position and the stop positions shall be adjustable from the controller with an LCD display. Provide card reader, key switch, pushbuttons, free egress vehicle detectors, vehicle obstruction loop detectors, reset loop, seven day timers or

various emergency vehicle open devices as dictated by local code. Coordinate all access control and other components with all gates as specified in Section **32 31 21**

2.4 CRASH RATED VEHICLE BARRIERS

- A. Provide crash rated vehicle barriers with dual arms at all locations indicated on the Drawings. Vehicle barrier controls shall be integrated to and coordinated with adjacent vehicle gates, access controls, vehicle detection and other components.
- B. Basis of Design: Provide HySecurity vehicle barrier model StrongArm™ M30 with Smart Touch Controller, High Security Anti-Ram Gate by High Security. Subject to compliance with requirements, alternate products shall be submitted under the requirements for Substitution Request as outlined in the Project Manual.
- C. Standards:
 - 1. Barrier gate shall be crash rated and certified to ASTM F2656-07.
 - 2. Barrier gate operators that are listed and labeled according to UL 325 by a qualified testing agency.
- D. Operation shall be by means of dual acting hydraulic cylinder acting directly on the drop arm to move the arm through 90 degrees vertical. Operation to the fully open and fully closed position shall be continuously monitored by an absolute position sensing device that accurately reads the position of the cylinder and arm. The system shall function normally without need for springs or weights to counterbalance the arm. Gears, sprockets, belts or pulleys shall not be incorporated in the operator. Arresting of vehicles shall be accomplished by polymeric straps suspended in the arm. All models include a variable speed motor drive and two brake valves to gradually stop and hold the arm without applying a shock load to the arm or barrier assembly. Barrier shall hydraulically lock in the closed position.
- E. Dual Arm Design Straight Gate Arms: Basis of Design Strong Arm Crash for Strong Arm M30. Crash certified to ASTM F2656-07 M30-P1 to stop a 15,000 lb Truck travelling at 30 mph with penetration of less than 1.2 feet.
- F. The vehicle barrier shall be certified by a third party licensed engineer to be capable of withstanding a direct impact from a vehicle to the M30 level specified in ASTM F2656 for 12 ft (3,657 mm) and 24 ft (7,315 mm) lengths. The vehicle barrier shall have successfully passed testing at an accredited test facility to ASTM F2656 as validation of the engineering certification.
- G. Minimum Safety Features:
 - 1. Lower barrier arm at a height of 18 inches from grade to prevent smaller vehicles from penetrating under the main barrier arm.
 - 2. The barrier arm shall contain LED warning lights to enhance night visibility.
 - 3. The barrier shall include a red – amber stoplight to display status to vehicles.
 - 4. A photoelectric eye capable of detecting a person or vehicle in the path of the barrier to prevent closure of the barrier arm when an obstruction is present. This feature shall not be active during Emergency Fast Close.

5. Shield to prevent entrapment of bystanders between arm and catch post.
- H. Minimum standard mechanical components:
1. Chassis: steel plate, welded, and edges ground smooth.
 2. Cover: shall be 14 gauge (2 mm) galvanized sheet steel, with a security lock to limit access.
 3. Main shaft: shall be 3" (76 mm) diameter, high strength steel alloy.
 4. Heavy duty sealed 1-15/16" (49 mm) bearings, with cast iron pillow blocks.
 5. Resilient physical stop limiting open and close travel and to cushion stop at each end of travel.
 6. Hydraulic valves: Shall be individually replaceable cartridge type, in an integrated hydraulic manifold.
 7. Hydraulic fluid: High performance type with a viscosity index greater than 375 and temperature range -40° F to 158° F (-40° C to 70° C). (optional biodegradable fluid requires a heater at temperatures below -10° F (-24° C))
 8. A zero to 2,000 psi (13.7 MPa) pressure gauge, mounted on the manifold for diagnostics, shall be a standard component.
 9. The hydraulic fluid reservoir shall be formed from a single piece of metal, non-welded, and shall be powder painted on the inside and the outside, to prevent fluid contamination.
 10. Manual operation: in the event of a power outage the use of a "pull to release" bypass valve shall unlock the operator and allow the arm to be operated by a hand pump.
 11. Arm: Aluminum oval shape for optimal strength, wind resistance and corrosion protection
 12. Arm striping: shall be highly reflective alternating red and white vertical stripes, 16" (406 mm) intervals measured horizontally per MUTCD standards.
 13. Finish: hot dipped galvanize coating per ASTM A123 G85.
 14. Red LED lights shall be integrated into the barrier arm.
- I. Minimum standard electrical components:
1. Pump motor: 2 hp
 2. All components shall have overload protection.
 3. Variable frequency drive to enable variable displacement pump operation.
 4. Controls: Smart Touch Controller Board containing:
 - a. Built in warning buzzer for Emergency Fast Close and in the event of Alerts, Faults, or Errors;
 - b. Built in timer to close;
 - c. 32 character OLED display for reporting of functions and codes;
 - d. Multiple programmable output relay options;
 - e. Anti-tailgate mode;
 - f. Built-in power surge/lightning strike protection;
 - g. Menu configuration, event logging and system diagnostics easily accessible with a PC and HySecurity's free Smart Touch Analyze and Retrieve Tool;

- h. RS-232 port for connection to laptop or other computer peripheral and RS-485 connection for network interface.
 - i. Dual gate communication connection for bi-parting, sally port, or sequenced gates.
 - j. Electromechanical and solid state relays.
 - k. Radio option outputs.
 - l. 21 inputs for site specific configurations.
 - 5. Control circuit: 24 VDC.
 - 6. Transformer: 75 VA, non-jumpered taps, for all common voltages.
 - 7. Sockets for up to four plug-in vehicle detectors.
 - 8. Open and close limits shall be via encoder, providing continuous position sensing of arm position and the stop positions shall be adjustable from the controller with an LCD display.
- J. Provide card reader, key switch, pushbuttons, free egress vehicle detectors, vehicle obstruction loop detectors, reset loop, seven day timers or various emergency vehicle open devices as dictated by local code. Coordinate all access control and other components with all gates as specified in Section 32 31 21 Decorative Metal Security Fences and Gates.
- K. Provide Flashing lights or rotating beacon with configurable audible alert.
- L. Additional Components:
- 1. Heater with thermostat control for cold or damp climates or for use with biodegradable hydraulic oil.
 - 2. Relay to provide minimum eight additional programmable user relay outputs.
 - 3. Communications package: Internet Protocol (RJ-45 copper or SFP fiber), managed switch and web based interface to operator via HyNet™ Gateway.
 - 4. ExtremeCycle hydraulic side cover with cooling fan and thermostat.
 - 5. Magnetic Lock
 - 6. Biodegradable, non-toxic hydraulic fluid.
 - 7. UPS AC battery backup.
- M. Factory Testing
- 1. Fully assemble and test, at the factory, each barrier to assure smooth operation, sequencing and electrical connection integrity.
 - 2. Inspect and test all hydraulics are leak free.
 - 3. Maintain records of material and process traceability for all critical structural elements.
 - 4. Check all mechanical connections for tightness and alignment. Check all welds for completeness and continuity.
 - 5. Inspect finishes for completeness. Touch up imperfections prior to shipment.
 - 6. Check all hydraulic hoses and electrical wires to assure that chafing cannot occur during shipping or operation.

2.5 VEHICLE DETECTORS

- A. Provide detection devices that sense presence or transit of vehicles and emit signals activating gate arm operators.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Amano Cincinnati, Inc.
 - b. ASPS Access Security & Parking Systems Inc.
 - c. Delta Scientific Corporation.
 - d. Engineered Parking Systems, Inc.
 - e. Magnetic Automation Corporation.
 - f. Parking Systems, Inc.
- B. Vehicle Loop Detector System: Self tuning electronic presence detector with adjustable detection patterns, adjustable sensitivity and frequency settings, and panel indicator light. Include automatic closing timer with adjustable time delay before closing designed to hold gate arm open until traffic clears. Provide number of loops consisting of multiple strands of wire, number of turns, loop size, and method of placement at location indicated on Drawings, as recommended in writing by detection system manufacturer for installation.
1. Factory Formed Loop: Wire, preformed in size indicated.
 2. Operation:
 - a. Recognize vehicles within 6 inches (152 mm) of each other on standard-sized loop.
 - b. Recognize vehicle direction by detecting vehicle moving from one loop to another.
 - c. Generate reverse count if vehicle backs up after generating directional count in forward direction.
 - d. Continuous diagnostic monitoring and memory for intermittently operating and failed loops.
 - e. Crosstalk test between adjacent loops.
- C. Active Infrared Vehicle Detector: Retroreflective type presence detector with adjustable detection zone pattern and sensitivity, designed to detect the presence or transit of vehicle in gate arm pathway by interrupting infrared beam in zone pattern and to emit signal activating gate arm operator. Include automatic closing timer with adjustable time delay before closing and vehicle presence detector designed to hold gate arm open until traffic clears.

2.6 TRAFFIC CONTROLLERS

- A. Provide directional enforcement system that allows passage of vehicle in only one direction.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Ameristar Booth & Building Structures.
 - b. Delta Scientific Corporation.

- c. DoorKing, Inc.
 - d. Engineered Parking Systems, Inc.
 - e. Falcon Eye Global Security, LLC.
- B. Penetrating Type: System consisting of multiple raised teeth that allow vehicular traffic in one direction and that puncture tires of vehicular traffic in the other direction. Fabricate system from steel plate contained in welded steel frame.
1. Mounting: Recessed.
 2. Operation: Manual, with each tooth controlled by torsion spring.
 3. Latch Down: Allow disarming for two way traffic flow. Furnish one tool for latch down operation.
 4. Illuminated Warning Signs: Double faced warning signs consisting of LED lamps with photo cell control and keyed on/off override switches, contained in welded steel bodies with baked enamel or powder coat finish and fiberglass sign faces.
 - a. Post Mounting: Provide surface mounted base sleeves and posts.
 - b. Sign Copy: "Wrong Way, Stop, Severe Tire Damage." and "Warning, Do Not Back Up, Tire Damage."
 5. Speed Bumps: Compression molded rubber compound for speed reduction to 5 mph (8 km/h) or less.

2.7 PARKING FACILITY MANAGEMENT SOFTWARE

- A. Software that is compatible with security access control system and that provides automatic facility monitoring, supervision, and remote control of parking control equipment from one or more locations.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Amano Cincinnati, Inc.
 - b. ASPS Access Security & Parking Systems Inc.
 - c. Canadian Parking Equipment Ltd./American Parking Equipment Inc.
 - d. WPS North America Inc.
- B. Operation:
1. Collect data for activity reporting.
 2. Collect data for access and space control.
 3. Event management.
 4. Validation solutions.
 5. License plate recognition systems.
 6. Programmable parking control equipment.

2.8 ACCESS CONTROL UNITS

- A. Provide access control unit that activates barrier gates.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Amano Cincinnati, Inc.
 - b. ASPS Access Security & Parking Systems Inc.
 - c. Canadian Parking Equipment Ltd./American Parking Equipment Inc.
 - d. DoorKing, Inc.
 - e. Engineered Parking Systems, Inc.
 - f. Falcon Eye Global Security, LLC.
 - g. Nortek Security & Control.
 - h. Parking Systems, Inc.
- B. Unit Housings: Fabricated from welded aluminum sheet with weatherproof front access panel equipped with flush-mounted lock and two keys. Provide face lighted unit fully visible at night; one housing for each pedestal height for dual height pedestals.
1. Finish: Baked enamel or powder coat finish system.
- C. Card Reader Controlled Unit: Functions when authorized card is presented.
1. System: Programmable, multiple code capability permitting validation or voiding of individual cards.
 - a. Permit four different access time periods.
 2. Reader Type: Proximity.
 - a. Proximity reader for proximity cards.
 3. Operation: Online communication to remote security access control system computer.
 4. Characteristics: Timed antipassback.
 5. Mounting: With dual height pedestals for passenger vehicles and trucks in enclosed cabinet locations as indicated on Drawings.
 6. Cards: Provide 30.
 - a. Imprint cards with Insert special printing requirements such as company logo or emblem.
- D. Access control mounting pedestal: Single and dual height gooseneck pedestals as indicated to accommodate card readers, intercoms and other parking control equipment components mounted as indicated and meeting the following:
1. Single head design where indicated supports use of parking control equipment access control and presentation of valid identification for passenger cars within a 12 inch reach to vehicle window at 42 inch height above finished paving.
 2. Double-head design supports use of parking control equipment access control and presentation of valid identification for passenger cars, delivery vans, buses, semi-trucks, and construction equipment within a 12 inch reach to vehicle window at 42 inch and 58 inch heights above finished paving.
 3. Material: Carbon steel tube 2 inch by 2 inch by 0.125 minimum thickness with ¼ inch thick steel baseplate and 0,074 inch thick cover plate.
 - a. Optional shapes may be considered with written approval by the Architect and Owner prior to submittal.
 4. Finish: Polyester powder coat
 - a. Color as selected by Architect from the manufacturer's full line.

5. Warranty: 1 full year from the date of Substantial Completion.
 6. Manufacturers:
 - a. Manufacturer of specified parking control equipment.
 - b. Pedestal PRO LLC
 - c. Engineered Parking Systems.
 - d. All Security Equipment.
 - e. ADI Global.
 - f. Other manufacturers acceptable to the Architect and Owner.
- E. Radio Controlled System: Digital access control system consisting of code-compatible universal coaxial receiver, one per barrier gate, remote antenna with coaxial cable and mounting brackets, and one permanently mounted transmitter(s) per receiver designed to operate barrier gates. Provide programmable transmitter with multiple code capability permitting validation or voiding of no fewer than 1000 codes per channel configured for the following functions:
1. Transmitters: Triple button operated.
 - a. Triple button operated with open, close, and stop functions.
 - 1) Provide transmitters featuring two independent channel settings controlling separate receivers for operating more than one barrier gate from each transmitter.

2.9 FUNCTIONAL NARRATIVE FOR SITE SECURITY

- A. Functional Operational Narrative: Upon vehicle detection together with valid security credentials presented, the following shall occur:
1. Vehicle Entry to Site: Valid access control credentials presented shall open vehicle barrier gates at the respective location, open the vehicle gates at the respective location and lower the active vehicle barriers at the respective location to allow unobstructed site entry.
 2. Vehicle Exit from Site: Upon detection of a vehicle in the exit lane within one half car length of the exit gate, open vehicle barrier gates at the respective location, open the vehicle gates at the respective location and lower the active vehicle barriers at the respective location to allow unobstructed exit.
 3. Should the Owner's security protocol require the presentation of valid security identification, vehicle exit from each lane shall be adjusted to require valid security identification for exit from the site.
- B. Compliance with functional narrative
1. Upon the completion of the Work, energize the access control circuits to confirm activation of all obstructions to site access and confirm simultaneous operation of the following systems for both site entry and site egress.
 - a. Scope of Work as specified in Section 32 31 19 for control of vehicle gates, vehicle detection and access control units. Test and confirm compliance with the functional narrative for site entry and egress.
 - b. Scope of Work as specified in Section 34 71 13 Active Vehicle Barriers for all wedge plate barrier systems. Test and confirm compliance with the functional narrative for site entry and egress.

- c. Test and confirm all integrated Owner security systems and components for intended operation and unobstructed site entry and egress when valid credentials are presented.
2. Repair all systems as necessary to meet the functional narrative resulting in a fully operational and coordinated system for site access and egress.

2.10 ANCHORAGES

- A. Anchor Bolts: Stainless steel.
 1. Stainless steel, Type 304.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances, including equipment bases; accurate placement, pattern, and orientation of anchor bolts; critical dimensions; and conditions affecting performance of the work.
- B. Examine roughing in for electrical and communication systems to verify actual locations of connections before parking control equipment installation.
- C. Proceed with installation after correcting unsatisfactory conditions.

3.2 PREPARATION

- A. Excavation for Traffic Controllers: Saw cut existing pavement for recessed traffic controllers and hand excavate recesses to dimensions and depths and at locations as required by traffic controller manufacturer's written instructions and as indicated on Drawings.

3.3 INSTALLATION

- A. Coordinate all automatic barrier gates, vehicle detection and access control system with Section 32 31 19 Decorative Metal Fences and Gates, and Section 34 71 13 Active Vehicle Barriers for all wedge plate barrier systems to meet the functional narrative of this Section and all Owner security system requirements.
- B. Install parking control equipment as required for complete and integrated installation.
 1. Rough in electrical connections.

3.4 INSTALLATION OF AUTOMATIC BARRIER GATES

- A. Anchor cabinets to concrete bases with anchor bolts or expansion anchors, and mount barrier gate arms.
 1. Install barrier gates according to UL 325.

3.5 INSTALLATION OF CRASH RATED VEHICLE BARRIERS

- A. Install all barriers, components, controllers and detectors according to the Manufacturer's written instructions.
- B. Coordinate all access control and Owner's security devices to function as intended. Configure all entry and exit site access points in accordance with the Functional Narrative indicated in Section **32 31 19**

3.6 INSTALLATION OF VEHICLE DETECTORS

- A. Bury and seal wire loop at locations indicated on Drawings according to manufacturer's written instructions. Connect to parking control equipment operated by detector.

3.7 INSTALLATION OF TRAFFIC CONTROLLERS

- A. Anchor controllers to recessed concrete bases with anchor bolts or expansion anchors.

3.8 INSTALLATION OF ENTRY TERMINALS

- A. Attach cabinets to concrete bases with anchor bolts or expansion anchors.
 - 1. Connect equipment to remote computer.
 - 2. Load ticket dispenser with supply of tickets.

3.9 INSTALLATION OF EXIT TERMINALS

- A. Attach cabinets to concrete bases with anchor bolts or expansion anchors.
 - 1. Connect equipment to remote computer.
 - 2. Load ticket dispenser with supply of tickets.

3.10 INSTALLATION OF PAY STATIONS

- A. Attach cabinets to concrete bases with anchor bolts or expansion anchors.
 - 1. Connect equipment to remote computer.
 - 2. Load ticket dispenser with supply of tickets.

3.11 INSTALLATION OF CARD READER PEDESTALS

- A. Pad or In-ground mount with mounting bolts as indicated.

3.12 INSTALLATION OF ELECTRICAL

- A. Connect wiring according to Section 26 05 19.
- B. Ground equipment according to Section 26 05 26.

3.13 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform the following tests and inspections with the assistance of a factory authorized service representative:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA ATS. Certify compliance with test parameters.
 - 2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Parking control equipment will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.
- F. Test and repair all systems as necessary to meet the functional narrative resulting in a fully operational and coordinated system for site access and egress.

3.14 ADJUSTING

- A. Adjust parking control equipment to function smoothly and lubricate as recommended by manufacturer.
- B. Confirm that locks engage accurately and securely without forcing or binding.
- C. After completing installation of exposed, factory finished parking control equipment, inspect exposed finishes and repair damaged finishes.

3.15 PROTECTION

- A. Remove barrier gate arms during the construction period to prevent damage and install them immediately before Substantial Completion.

3.16 MAINTENANCE SERVICE

- A. Maintenance Service Description: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by manufacturer's authorized service representative. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper parking control equipment operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

3.17 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.
- B. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.
 - 1. Upgrade Notice: At least 30 days to allow Owner to schedule and access the system and to upgrade computer equipment if necessary.

3.18 DEMONSTRATION

- A. Engage a factory authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain parking control equipment.

END OF SECTION