SECTION 111200 - PARKING CONTROL EQUIPMENT

Revise this Section by deleting and inserting text to meet Project-specific requirements.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Automatic barrier gates.

Vehicle detectors.

Traffic controllers.

Entry terminals.

Exit terminals.

Pay stations.

Fee computers.

Miscellaneous parking control equipment.

Parking facility management software.

Access control units.

* + - * 1. Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 055000 "Metal Fabrications" for pipe bollards to protect parking control equipment.

Section 133423.16 "Fabricated Control Booths" for cashiers'/parking attendants' booths.

Section 281300 "Card Access Control Systems" for integrating parking control equipment with building access control.

* + - 1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" paragraph below if Work of this Section is extensive or complex enough to justify a preinstallation conference.

* + - * 1. Preinstallation Conference: Conduct conference at Project site.

Retain subparagraphs below if additional requirements are necessary; include information about conference.

Inspect and discuss electrical roughing-in, equipment bases, and other preparatory work specified elsewhere.

Verify that equipment operation is consistent with system description.

Review sequence of operation for each type of parking control equipment.

Review coordination of interlocked equipment specified in this Section and elsewhere.

Review required testing, inspecting, and certifying procedures.

If needed, insert list of conference participants.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for parking control equipment.

Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties.

* + - * 1. Shop Drawings: For parking control equipment.

Include plans, elevations, sections and attachment details.

Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

Retain first subparagraph below if equipment includes wiring.

Include diagrams for power, signal, and control wiring.

Retain "Vehicle Detectors" subparagraph below for vehicle loop detector systems.

Vehicle Detectors: Layout and method of placement of vehicle loop detector system.

Retain "Samples" paragraph below for single-stage Samples, with a subordinate list if applicable. Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs for two-stage Samples.

* + - * 1. Samples: For each exposed product and for each color and texture specified, 6 inches square in size.

Coordinate "Qualification Data" paragraph below with qualification requirements in "Quality Assurance" Article.

* + - * 1. Qualification Data: For Installer.

Retain "Field quality-control reports" paragraph below if Contractor is responsible for field quality-control testing and inspecting.

* + - * 1. Field quality-control reports.
			1. CLOSEOUT SUBMITTALS
				1. Operation and Maintenance Data: For parking control equipment to include in emergency, operation, and maintenance manuals.

Retain "Software and Firmware Operational Documentation" paragraph below for PC-based control systems.

* + - * 1. Software and Firmware Operational Documentation:

Software operating and upgrade manuals.

Program Software Backup: On USB media and approved online or cloud solution.

Device address list.

Printout of software application and graphic screens.

* + - 1. MAINTENANCE MATERIAL SUBMITTALS
				1. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Gate Arms: Two breakaway gate arms for each gate installed, complete with accessory components.

* + - 1. QUALITY ASSURANCE
				1. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
1. PRODUCTS
	* + 1. SYSTEM DESCRIPTION

Revise this article to suit Project or delete for simple facilities.

* + - * 1. Parking Control System: For the following types of parking management:

Transient Parking: Hourly rated parking, with fee paid while [entering] [exiting].

Monthly Parking: Monthly rated parking, with fee paid by the month and access gained by access control card.

Flat-Rate Parking: Unlimited-duration parking, with free gate entry and fixed-fee amount paid while exiting.

Flat-Rate or Hourly Parking: Fee paid at central pay station after parking.

Special-Event Parking: Duration-of-event parking, with fee paid while entering with gates up or down.

Limited Date and Time Parking: Limited-duration parking, with predetermined fee access control card.

Merchant Validated Parking: Fee set, reduced, or waived by merchant validation, with free gate entry and fee paid while exiting.

Valet Parking: Assisted parking, with fee paid while entering or exiting.

Hotel Guest Parking: Unlimited access for duration of stay, with access gained by access control card.

* + - * 1. Electrical Components and Devices: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

Retain this article if a single source is required.

* + - 1. SOURCE LIMITATIONS

Revise paragraph below if not all parking control equipment is from a single source from a single manufacturer.

* + - * 1. Obtain parking control equipment from single source from single manufacturer.
			1. AUTOMATIC BARRIER GATES <Insert drawing designation>

Use manufacturers' catalogs or product data to insert series, type, model, and designations of other characteristics.

Copy this article and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. General: 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 above pavement.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Amano Cincinnati, Inc.

Automatic Systems.

Falcon Eye Global Security, LLC.

Approved equivalent.

Compliance with standards in "Standards" subparagraph below is required by the International Building Code. Not all manufacturers currently demonstrate compliance and, therefore, must have their products tested, listed, and labeled at an additional cost to comply. Verify which manufacturers have tested barrier gate operators and can demonstrate compliance.

Standards: Barrier gate operators that are listed and labeled according to UL 325 by a qualified testing agency.

* + - * 1. Controller: Factory-sealed, solid-state, plug-in type, with galvanized-steel box for wiring connections. **[Noncommunicating] [Communicating]** type.

Retain "Noncommunicating Type" or "Communicating Type" subparagraph below to coordinate with option retained in "Controller" paragraph above.

Noncommunicating Type:

Capable of logic for one- and two-way lanes.

Separate momentary contacts for transient patrons, monthly patrons, vehicle entries, and vehicle exits.

Communicating Type:

Real-time communication of lane counts, status messages, and execute commands.

Monitor illegal entries and exits, tailgates, tickets, monthlies, and backouts.

Status messages for gate up too long, backouts, ticket in chute, and gate-arm rebound.

Communication commands for resetting loops, turning "Full" signs on/off, raising and lowering gate arm, and disabling **[ticket dispensers] [card readers] [barcode imagers] [license plate recognition] [automatic vehicle identification]**.

Not all characteristics in "Physical Characteristics" and "Operational Characteristics" subparagraphs below are standard by all manufacturers or may only be available on certain models. Verify, with manufacturers, availability of characteristics and retain as required.

Physical Characteristics:

On-off power supply switch.

Automatic-manual switch.

Differential counter.

Communication port.

Internal **[resettable] [non-resettable]** counters.

Thermal-overload protection with manual reset.

Plug-in connectors for **[two] [three]** vehicle loop detectors.

Thermostatically controlled heater with on/off/auto switch.

Thermostatically controlled fan with on/off/auto switch.

Switch to test motor and limit switches.

Emergency manual disconnect.

Battery backup.

**[Single] [Two] [Four]**, 115-V ac grounded power receptacle.

Operational Characteristics:

Able to store successive inputs and sequentially processing each one.

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.

Directional arming logic.

Broken gate-arm monitoring.

Programmable**[ automatic]** timer.

Diagnostic mode for on-site testing**[, with LEDs for inputs and outputs]**.

Automatic and continuous testing of inputs and outputs.

Reversible arm capability for right- or left-handed operation.

* + - * 1. Cabinets: Fabricated from sheet metal with seams welded and ground smooth; approximately 15 inches square by 40 inches tall. Provide single, gasketed access door for each cabinet with flush-mounted locks. Furnish two keys for each lock. Fabricate cabinet with internal reinforcing and four mounting holes accessible only from inside cabinet.

Retain "Steel Sheet," "Aluminum Sheet," or "Stainless-Steel Sheet" subparagraph below. Revise material thicknesses to suit product if required. UL 325 requires steel sheet metal thickness to exceed 0.026 inch if uncoated, 0.029 inch if galvanized, or 0.036 inch if nonferrous; UL 325 includes requirements for finishes. Most manufacturers also offer custom colors.

Steel Sheet: Not less than 0.097-inch (12 ga) - thick, galvanized- steel sheet.

Finish cabinet, interior and exterior, with manufacturer's standard **[white] [yellow]** baked-enamel or powder-coat finish.

Aluminum Sheet: Not less than 0.125-inch (8 ga) - thick, aluminum sheet.

Finish cabinet, interior and exterior, with manufacturer's standard **[white] [yellow]** baked-enamel or powder-coat finish.

Stainless-Steel Sheet: Not less than 0.109-inch (12 ga) - thick, stainless-steel sheet.

Finish cabinet exterior with No. 4 finish.

Retain "Straight Gate Arm," "Folding Gate Arm," "Straight Gate Arm with Counterbalance," or "Wishbone-Style Gate Arm" paragraph below. Typical parking garage gate arms are 10 or 12 feet long; however, gate-arms exceeding 20 feet in length are available. Folding gate arms are used for applications with restricted ceiling heights. Straight gate arms with counterbalance and wishbone-style gate arms are typically used for wider entrances, such as for outdoor parking and industrial areas.

The material and size of the gate arm may depend on the length required. Verify, with manufacturer, available materials and sizes for gate-arm lengths exceeding 12 feet. If retaining last option in "Straight Gate Arm," "Folding Gate Arm," "Straight Gate Arm with Counterbalance," or "Wishbone-Style Gate Arm" paragraph below, verify availability with manufacturer; not all models are available with breakaway feature.

* + - * 1. Straight Gate Arm: **[1-by-4-inch nominal- size pine or redwood] [0.097-inch (12 ga) - thick steel] [Fiberglass, PVC, or polycarbonate] [Aluminum]**.

Traffic-Side Face: **[Reflective painted finish and black diagonal stripes] [Reflective painted finish and red diagonal stripes] [Reflective painted finish and black and yellow diagonal stripes] [Manufacturer's standard finish and striping]**.

Length: **[10 feet] [12 feet] [As indicated on Drawings]**.

Retain "Mounting Flange" subparagraph below if required.

Mounting Flange: Provide with breakaway feature to ensure a clean break if arm is struck by vehicle.

* + - * 1. Folding Gate Arm: Two pieces of 1-by-4-inch nominal- size pine or redwood joined together with metal side brackets.

Traffic-Side Face: **[Reflective painted finish and black diagonal stripes] [Reflective painted finish and red diagonal stripes] [Reflective painted finish and black and yellow diagonal stripes] [Manufacturer's standard finish and striping]**.

Length: **[10 feet] [12 feet] [As indicated on Drawings]**.

Retain "Mounting Flange" subparagraph below if required.

Mounting Flange: Provide with breakaway feature to ensure a clean break if arm is struck by vehicle.

* + - * 1. Straight Gate Arm with Counterbalance: 1-by-6-inch nominal- size pine or redwood with steel counterweights.

Traffic-Side Face: **[Reflective painted finish and black diagonal stripes] [Reflective painted finish and red diagonal stripes] [Reflective painted finish and black and yellow diagonal stripes] [Manufacturer's standard finish and striping]**.

Length: **[16 feet] [As indicated on Drawings]**.

Retain "Mounting Flange" subparagraph below if required.

Mounting Flange: Provide with breakaway feature to ensure a clean break if arm is struck by vehicle.

* + - * 1. Wishbone-Style Gate Arm: **[1-by-4-inch nominal- size pine or redwood] [0.097-inch (12 ga) - thick steel]** formed into wishbone configuration, with steel counterweights.

Traffic-Side Face: **[Reflective painted finish and black diagonal stripes] [Reflective painted finish and red diagonal stripes] [Reflective painted finish and black and yellow diagonal stripes] [Manufacturer's standard finish and striping]**.

Length: **[14 feet] [As indicated on Drawings]**.

Retain "Mounting Flange" subparagraph below if required.

Mounting Flange: Provide with breakaway feature to ensure a clean break if arm is struck by vehicle.

Retain one of first four options in "Operator" paragraph below. Class I is for residential use; Class II, for commercial/general access; Class III, for industrial/limited access; and Class IV, for restricted access.

* + - * 1. Operator: UL labeled and listed, **[Class II] [Class III] [Class IV]. [1/3] [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.

Opening time in "Opening Time" subparagraph below depends on length and weight of barrier arm and on barrier-arm options.

Opening Time: Three seconds.

Inherently adjustable, torque limiting clutch for safety.

Not all characteristics in "Characteristics" paragraph below are standard by all manufacturers or may only be available on certain models. Verify, with manufacturers, availability of characteristics and retain as required.

* + - * 1. Characteristics:

Retain one or both of first two subparagraphs below to comply with UL 325 requirements for safety devices, or insert another type.

Audible alarm that activates as part of a safety device system.

Additional obstruction detector; noncontact **[infrared] [photoelectric] [radio-frequency barrier]**.

First six subparagraphs below are additional safety features.

Gate-arm warning safety signs on both sides of unit to limit traffic to vehicular traffic.

Low-voltage **[yellow] [red]** warning lights that illuminate when gate is in down position.

Low-voltage light on cabinet top that flashes or changes from red to green when barrier gate is operating.

LED integrated into gate-arm for increased visibility.

Manually operated crank for emergency operation.

Authorities having jurisdiction's emergency access by **<Insert type>**.

Retaining option in first subparagraph below increases security and discourages vandalism.

Gate-arm tip support**[ with electromagnetic lock]**.

Gate-arm skirt bottom**[ and top]**.

* + - 1. VEHICLE DETECTORS **<Insert drawing designation>**

Use manufacturers' catalogs or product data to insert series, type, model, and designations of other characteristics.

Copy this article and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

Examples below are common; verify availability with manufacturers.

* + - * 1. General: Provide detection devices that sense presence or transit of vehicles and emit signals activating gate-arm operators.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Amano Cincinnati, Inc.

Delta Scientific Corporation.

Engineered Parking Systems, Inc.

Approved equivalent.

Retain "Vehicle Loop Detector System" and "Active Infrared Vehicle Detector" paragraphs below if system requires both loop and presence detectors.

* + - * 1. 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**[, timer cut-off switch,]** 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 **[pave-over] [saw-cut]** installation.

Retain "Field-Assembled Loop" or "Factory-Formed Loop" subparagraph below.

Field-Assembled Loop: Wire, in size indicated for field assembly.

Factory-Formed Loop: Wire, preformed in size indicated.

Operation:

Recognize vehicles within 6 inches of each other on standard-sized loop.

Recognize vehicle direction by detecting vehicle moving from one loop to another.

Generate reverse count if vehicle backs up after generating directional count in forward direction.

Continuous diagnostic monitoring **[and memory ]**for intermittently operating and failed loops.

Crosstalk test between adjacent loops.

Retroreflective type in "Active Infrared Vehicle Detector" paragraph below is suitable for up to 25 feet; emitter/receiver type, for up to 100 feet. Revise below if passive infrared detectors or another type are required to suit Project.

* + - * 1. Active Infrared Vehicle Detector: **[Retroreflective] [Emitter/receiver]**-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**[, timer cut-off switch,]** and vehicle presence detector designed to hold gate arm open until traffic clears.
			1. TRAFFIC CONTROLLERS **<Insert drawing designation>**

Use manufacturers' catalogs or product data to insert series, type, model, and designations of other characteristics.

Copy this article and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. General: Provide directional enforcement system that allows passage of vehicle in only one direction.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Delta Scientific Corporation.

Engineered Parking Systems, Inc.

Falcon Eye Global Security, LLC.

Approved equivalent.

* + - * 1. 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.

Mounting: **[Surface] [Recessed]**.

Operation: **[Manual, with each tooth controlled by torsion spring] [Electromechanical] [Hydraulic]**.

Retain "Latch Down," "Illuminated Warning Signs," and "Speed Bumps" subparagraphs below if required. Illuminated warning signs are recommended for use with all traffic controllers. Speed bumps are recommended for use with recessed traffic controllers.

Latch Down: Allow disarming for two-way traffic flow. Furnish one tool(s) for latch-down operation.

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**[, with flood lamp]**.

Retain "Post Mounting" subparagraph below if required.

Post Mounting: Provide **[in-ground] [surface-mounted]** base sleeves and posts.

Sign Copy: **["Wrong Way, Stop, Severe Tire Damage."] ["Warning, Do Not Back Up, Tire Damage."]**

Speed Bumps: **[Composite plastic] [Compression molded rubber compound]** for speed reduction to 5 mph or less.

* + - * 1. Nonpenetrating Type: System consisting of steel curb that allows traffic in only one direction. Fabricate system from steel plate contained in welded steel frame.

Mounting: **[Surface] [Recessed]**.

Operation: **[Manual] [Electromechanical] [Hydraulic]**.

* + - 1. ENTRY TERMINALS **<Insert drawing designation>**

Use manufacturers' catalogs or product data to insert series, type, model, and designations of other characteristics.

Copy this article and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

Retain this article for paid controlled parking.

* + - * 1. General: Provide entry terminals with mechanisms, components, and controllers housed in cabinet enclosures.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Amano Cincinnati, Inc](http://www.specagent.com/Lookup?uid=123457132928).

Engineered Parking Systems, Inc.

Falcon Eye Global Security, LLC.

Approved equivalent.

Not all characteristics in "Physical Characteristics" and "Operational Characteristics" subparagraphs below are standard by all manufacturers or may only be available on certain models. Verify, with manufacturers, availability of characteristics and retain as required.

* + - * 1. Physical Characteristics:

Digital display, touchscreen, or LCD.

Time and date display.

Time Indicator: 24-hour cycle with **[A.M. and P.M.] [military-time]** clock mechanism.

Voice annunciation.

Tickets: **[Standard paper] [Magnetic stripe] [Barcode]**.

Removable ticket tray with capacity of 5000 fan-folded tickets.

Battery backup for clock and RAM memory.

Communication port.

Thermostatically controlled heater with on/off/auto switch.

Thermostatically controlled fan with on/off/auto switch.

Ticket printing and dispensing mechanism.

Credit card activation slot, credit card reader**[ with smart card reader]**, and "Insert Ticket/Card" message.

Access card reader.

Multiple ticket option for valet parking.

Intercom.

Pinhole camera.

Barcode imager scanner.

Proximity access reader.

Automatic vehicle identification reader.

License plate recognition.

* + - * 1. Operational Characteristics:

Operation: [Standalone] [Online communication to remote computer].

Activation by [button with "Push for Ticket" message] [vehicle detector] [credit card in/out] [license plate recognition] [automatic vehicle identification] [proximity] [scanned electronic or hardcopy media] [access card].

Retain one or both of first two subparagraphs below to coordinate with the type of activation retained above.

On activation by button, unit automatically records entry time**[, license plate,]** and date on ticket,**[ sounds buzzer,]** dispenses ticket, and raises barrier gate.

On activation by means other than button, credentials are recorded and signal is automatically sent to raise barrier gate.

Credit card pay on entry.

Automatic ticket validation.

Programmable ticket numbering.

Programmable facility code.

Programmable display.

Programmable timer for closing barrier gate.

Built-in-service diagnostics.

Low-ticket alarm.

Out-of-ticket alarm.

Ticket jam detection.

Test ticket printing.

Back-out ticket function.

Cancel transaction function.

* + - * 1. Cabinets: Fabricated from sheet metal with seams welded and ground smooth, approximately 15 inches square by 40 inches tall; consisting of base and top components. Provide single, gasketed access door for each base component 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. Fabricate top component so it can be unlocked and opened for ticket loading and maintenance. Include flush-mounted lock in rear of top, keyed the same as base component lock.

Retain "Steel Sheet," "Aluminum Sheet," or "Stainless-Steel Sheet" subparagraph below. Revise material thicknesses to suit product if required.

Steel Sheet: Not less than 0.097-inch (12 ga) - thick**[, galvanized-]** steel sheet.

Finish cabinet, interior and exterior, with manufacturer's standard **[white] [yellow]** baked-enamel or powder-coat finish.

Aluminum Sheet: Not less than 0.125-inch (8 ga) - thick, aluminum sheet.

Finish cabinet, interior and exterior, with manufacturer's standard **[white] [yellow]** baked-enamel or powder-coat finish.

Stainless-Steel Sheet: Not less than 0.109-inch (12 ga) - thick, stainless-steel sheet.

Finish cabinet exterior with No. 4 finish.

* + - * 1. Ticket-Dispensing Mechanisms: Removable assembly, with **[self-sharpening ticket cutter] [or] [ticket burster]** and plug-in controller.

If needed, insert requirements for coin and token controllers.

* + - 1. EXIT TERMINALS **<Insert drawing designation>**

Use manufacturers' catalogs or product data to insert series, type, model, and designations of other characteristics.

Copy this article and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. General: Provide exit terminals with controllers and components housed in cabinet enclosures.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Amano Cincinnati, Inc.

Engineered Parking Systems, Inc.

Parking Systems, Inc.

Approved equivalent.

Not all characteristics in "Physical Characteristics" and "Operational Characteristics" subparagraphs below are standard by all manufacturers or may only be available on certain models. Verify, with manufacturers, availability of characteristics and retain as required.

* + - * 1. Physical Characteristics:

Digital display, touchscreen, or LCD.

Time and date display.

Voice annunciation.

Battery backup for clock and RAM memory.

Communication port.

Thermostatically controlled heater with on/off/auto switch.

Thermostatically controlled fan with on/off/auto switch.

Credit card activation slot, credit card reader**[ with smart card reader]**, and "Insert Ticket/Card" message.

Access card reader.

Ticket reader.

Receipt printer.

Intercom.

Pinhole camera.

Barcode imager scanner.

Proximity access reader.

Automatic vehicle identification reader.

License plate recognition.

* + - * 1. Operational Characteristics:

**[Standalone] [Online communication to remote computer]**.

Activation by **[ticket insertion] [vehicle detector] [credit card in/out] [license plate recognition] [automatic vehicle identification] [proximity] [scanned electronic or hardcopy media] [access card]**.

Activation results in the following:

Valid Prepaid Exit: Signal is automatically sent to raise barrier gate.

Pay at Exit: Parking fee is calculated and displayed for payment.

Invalid Exit: Activation is rejected and "Pay Cashier First" or "Return to Cashier" message is displayed.

Programmable lost ticket function.

Display fee.

Accept payment by **[credit card] [debit card] [smart card] [prepaid value card] [scanned media] [and] [merchant ticket]**.

Accept discounted coupons.

Print receipts on demand.

Programmable facility code.

Programmable grace period.

Programmable display.

Programmable timer for closing barrier gate.

Reports for events and exception events.

Programmable merchant validations.

Built-in service diagnostics.

Cancel transaction function.

* + - * 1. Cabinets: Fabricated from sheet metal with seams welded and ground smooth; approximately 15 inches square by 40 inches 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.

Retain "Steel Sheet," "Aluminum Sheet," or "Stainless-Steel Sheet" subparagraph below. Revise material thicknesses to suit product if required.

Steel Sheet: Not less than 0.097-inch (12 ga) - thick**[, galvanized-]** steel sheet.

Finish cabinet, interior and exterior, with manufacturer's standard **[white] [yellow] <Insert color>** baked-enamel or powder-coat finish.

Aluminum Sheet: Not less than 0.125-inch (8 ga) - thick, aluminum sheet.

Finish cabinet, interior and exterior, with manufacturer's standard **[white] [yellow] <Insert color>** baked-enamel or powder-coat finish.

Stainless-Steel Sheet: Not less than 0.109-inch (12 ga) - thick, stainless-steel sheet.

Finish cabinet exterior with No. 4 finish.

* + - 1. PAY STATIONS **<Insert drawing designation>**

Usually retain this article or "Fee Computers" Article, but not both.

Use manufacturers' catalogs or product data to insert series, type, model, and designations of other characteristics.

Copy this article and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

Central pay stations are also called "pay-on-foot stations." If retaining first option in "General" paragraph below, also usually retain "Exit Terminals" Article. If retaining second or third option below, also retain last option.

* + - * 1. General: Provide self-contained, cashiering **[central] [entry] [exit]** pay stations designed for self-service operation; with mechanisms, components,**[ controllers,]** and fee computers housed in a combined enclosure.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Amano Cincinnati, Inc.

Engineered Parking Systems, Inc.

Parking Systems, Inc.

Approved equivalent.

Not all characteristics in "Physical Characteristics" and "Operational Characteristics" subparagraphs below are standard by all manufacturers or may only be available on certain models. Verify, with manufacturers, availability of characteristics and retain as required.

* + - * 1. Physical Characteristics:

Digital display, touchscreen, or LCD.

Time and date display.

Voice annunciation.

Battery backup for clock and RAM memory.

Thermostatically controlled heater with on/off/auto switch.

Thermostatically controlled fan with on/off/auto switch.

Ticket printing and dispensing mechanism.

Credit card activation slot, credit card reader**[ with smart card reader]**, and "Insert Ticket/Card" message.

Bill acceptor.

Access card reader.

Ticket reader.

Printer.

Intercom.

Pinhole camera.

Barcode imager scanner.

Proximity access reader.

Automatic vehicle identification reader.

License plate recognition.

* + - * 1. Operational Characteristics:

**[Standalone] [Online communication to remote computer]**.

Activation by **[ticket insertion] [vehicle detector] [credit card in/out] [license plate recognition] [automatic vehicle identification] [proximity] [scanned electronic or hardcopy media] [access card]**.

Activation results in the following:

Retain "Valid Prepayment" subparagraph below for entry and exit pay stations only.

Valid Prepayment: Signal is automatically sent to raise barrier gate.

Payment Prompt: Parking fee is calculated and displayed for payment.

Compute multiple parking fees based on recorded entry times.

Compute multiple taxes by percentage and fixed amount.

Programmable lost ticket function.

Display fee.

Accept payment by cash and **[credit card] [debit card] [scanned media] [smart card] [prepaid value card] [and] [merchant ticket]**.

Accept discounted coupons.

Compute change.

Print receipts on demand.

Print validation on ticket.

Print audit trail.

Programmable for up to six fee structures.

Test mode to verify accuracy of fee structure program.

Programmable time.

Programmable facility code.

Programmable grace period.

Programmable display.

Programmable timer for closing barrier gate.

Programmable merchant validations.

Built-in service diagnostics.

Print cash audit, revenue, operational, and statistical reports on demand.

Duress alarm output for emergencies.

Cancel transaction function.

* + - * 1. Cabinets: Fabricated from cold-rolled steel sheet with seams welded and ground smooth, approximately 36 inches wide by 18 inches deep by 60 inches tall. Provide single, gasketed access door 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.

Finish cabinet, interior and exterior, with manufacturer's standard **[white] [yellow]** baked-enamel or powder-coat finish.

* + - 1. FEE COMPUTERS **<Insert drawing designation>**

Usually retain this article or "Pay Stations" Article, but not both.

Use manufacturers' catalogs or product data to insert series, type, model, and designations of other characteristics.

Copy this article and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. General: Provide modular**[ PC-based]** system. Register permanent record of each transaction in computer's memory.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Amano Cincinnati, Inc.

Engineered Parking Systems, Inc.

Falcon Eye Global Security, LLC.

Parking Systems, Inc.

Approved equivalent.

Not all characteristics in "Physical Characteristics" and "Operational Characteristics" subparagraphs below are standard by all manufacturers or may only be available on certain models. Verify, with manufacturers, availability of characteristics and retain as required.

* + - * 1. Physical Characteristics:

Touchscreen display.

Battery backup for clock and RAM memory.

Communication port.

[Cash drawer] [Two cash drawers].

Standard ticket reader.

Magnetic stripe ticket reader.

Barcode ticket reader.

Credit card reader[ with smart card reader].

Access card reader.

Proximity access reader.

Automatic Vehicle Identification reader.

License plate recognition.

[Keyed] [Keyless-membrane] keypad.

Detachable printer.

* + - * 1. Operational Characteristics:

Compute multiple parking fees based on entry times on ticket from ticket dispenser.

Compute multiple taxes by percentage and fixed amount.

Programmable lost ticket function.

Display fee on remote fee display device.

Credit card in/out.

Accept payment by cash and **[credit card] [debit card] [smart card] [prepaid value card] [and] [merchant ticket]**.

Accept discounted coupons.

Control independent cash drawer.

Compute change.

Print receipts.

Print validation on ticket.

Print audit trail.

Reload value cards.

Interface to automatic barrier gate.

Programmable with up to six fee structures.

Programmable time.

Programmable keys.

Programmable for special events validations.

Programmable for automatic activation for limited date and time validations.

Programmable merchant validations.

Programmable valet parking.

Programmable hotel guest parking.

Three levels of security including cashier, supervisor, and master.

Recall last transaction.

Test mode to verify accuracy of fee structure program.

Built-in service diagnostics.

View cash audit, revenue, operational, and statistical reports on screen or print on demand.

Duress alarm output for emergencies.

* + - * 1. Cash Drawer: Fabricated with a removable tray and drawer, with five compartments for paper currency and five compartments for coins.
				2. Remote Fee Display: Single-faced signs designed for use with fee computer, consisting of 1-inch- tall, digital displays or LCDs contained in welded steel bodies with baked-enamel or powder-coat finish.

Messages: Amount due, "Thank You," "Closed," and time in A.M./P.M. format.

Mounting: **[Front of cashier's booth] [42-inch- high pedestal]**.

* + - 1. MISCELLANEOUS PARKING CONTROL EQUIPMENT

Use manufacturers' catalogs or product data to insert series, type, model, and designations of other characteristics.

Copy paragraphs below and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. "Lot Full" Signs **<Insert drawing designation>**: Single-faced signs consisting of illumination source contained in welded steel bodies with extended hood and baked-enamel finish. Sign copy shall be 4 inches tall.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

ASPS Access Security & Parking Systems Inc.

Engineered Parking Systems, Inc.

Approved equivalent.

Type: **[Flashing] [Nonflashing]**.

Operation: **[Manual by push button] [Automatic by barrier gate controller]**.

Illumination: **[Traffic signal lamps and colored] [LED bulb and clear]** acrylic sign face.

Mounting: **[Top of barrier gate cabinet] [42-inch- high pedestal]**.

Insert other parking control equipment to suit Project, such as vehicle identification systems and license plate inventory systems.

* + - 1. PARKING FACILITY MANAGEMENT SOFTWARE
				1. General: Manufacturer's standard 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.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=783) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Amano Cincinnati, Inc](http://www.specagent.com/Lookup?uid=123457133024).

[ASPS Access Security & Parking Systems Inc](http://www.specagent.com/Lookup?uid=123457133035).

Approved equivalent.

Not all items in "Operation" subparagraph below are standard by all manufacturers or may only be available with certain software. Verify, with manufacturers, availability of items and retain as required.

* + - * 1. Operation:

Collect data for revenue and activity reporting.

Collect data for access and space control.

Notification services.

On-line prepaid parking.

Event management.

Validation solutions.

License plate recognition systems.

Pay-by-phone.

Loyalty programs.

Track tickets.

Programmable parking control equipment.

* + - 1. ACCESS CONTROL UNITS **<Insert drawing designation>**

Use manufacturers' catalogs or product data to insert series, type, model, and designations of other characteristics.

Copy this article and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

Retain this article for limited-access controlled parking, such as reserved parking areas for employees.

Examples in this article are commonly used for parking control. Revise examples to suit product or insert another type of access control to suit Project.

* + - * 1. General: Provide access control unit that activates barrier gates.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Amano Cincinnati, Inc.

Engineered Parking Systems, Inc.

Falcon Eye Global Security, LLC.

Approved equivalent.

Retain "Unit Housing" paragraph below if retaining card and digital keypad readers. Delete if retaining only radio-controlled system.

* + - * 1. Unit Housing: Fabricate from **[welded cold-rolled steel or aluminum sheet] [plastic]** with weatherproof front access panel equipped with flush-mounted lock and two keys. Provide face-lighted unit fully visible at night.

Retain "Steel Finish" subparagraph below with first option in "Unit Housing" paragraph above.

Steel Finish: Manufacturer's standard baked-enamel or powder-coat finish system.

* + - * 1. Card Reader Controlled Unit: Functions only when authorized card is presented.

First option in "System" subparagraph below is not programmable, costs less initially, and is generally available with fewer functions and less flexibility than second option.

System: **[Magnetically coded, single-code system activated by coded card] [Programmable, multiple-code capability permitting validation or voiding of individual cards]**.

Permit four different access time periods.

Reader Type: **[Swipe] [Insertion] [Proximity]**.

Retain one of first three subparagraphs below to coordinate with option retained in "Reader Type" paragraph above.

Swipe reader for **[magnetic-stripe] [barcode] [Wiegand]** cards.

Insertion reader for **[magnetic-stripe] [barcode] [Wiegand]** cards.

Proximity reader for proximity cards.

Operation: **[Standalone] [Online communication to remote parking control system computer] [Online communication to remote security-access control system computer]**.

First option in "Characteristics" subparagraph below prevents card from being used a second time for a set period of time or until after card is used to exit. Second option limits time allowed for entry of correct card.

Characteristics: **[Timed antipassback] [Limited-time usage] [Capable of monitoring and auditing barrier gate activity] [Digital display or LCD] [Programmable by PDA (personal digital assistant) by infrared interface]**.

Mounting: **[With pedestal] [Wall] [In enclosed cabinet] [As indicated on Drawings]**.

Cards: Provide **<Insert number>**.

Retain subparagraph below if required. Imprinting is not available for proximity cards from some manufacturers; verify availability.

Imprint cards with **<Insert special printing requirements such as company logo or emblem>**.

* + - * 1. Digital Keypad Controlled Unit: Functions only when authorized code is entered on **[keyed] [keyless-membrane]** keypad.

Retain one of two "System" subparagraphs below. Digital keypad entry in first subparagraph is programmable, costs less initially, and is generally available with fewer functions and less flexibility than digital keypad entry in second subparagraph.

System: **[Multiple-code capability] [Programmable, multiple-code capability]**.

Retain one of two subparagraphs below to coordinate with option selected in "System" paragraph above.

Multiple-code capability of no fewer than **[five] [100] [500]** possible individual codes.

Programmable, multiple-code capability permitting validation or voiding of no fewer than **[100] [2500] [10,000]** possible individual codes, consisting of one to six digits**[, and permitting four different access time periods]**.

Operation: **[Standalone] [Online communication to remote parking control system computer] [Online communication to remote security-access control system computer]**.

First option in "Characteristics" subparagraph below prevents code from being used a second time for a set period of time or until after code is used to exit. Second option limits time allowed for entry of correct code and discourages unauthorized individuals from repeatedly entering possible codes.

Characteristics: **[Timed antipassback] [Limited-time usage] [Capable of monitoring and auditing barrier gate activity]**.

Mounting: **[With pedestal] [Wall] [As indicated on Drawings]**.

* + - * 1. Radio-Controlled System: Digital access control system consisting of code-compatible universal coaxial receiver**[, one per barrier gate] [, where indicated on Drawings]**, remote antenna with coaxial cable and mounting brackets, and **[one permanently mounted] [four portable]** 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] [10,000]** codes per channel configured for the following functions:

Transmitters: **[Single-button] [Triple-button]** operated.

Retain one of first two subparagraphs below to coordinate with option retained in "Transmitters" paragraph above.

Single-button operated with **[open] [open and close]** functions.

Triple-button operated with open, close, and stop functions.

Retain subparagraph below with one of last two subparagraphs above if required to suit Project.

Provide transmitters featuring **[two] [three] [four]** independent channel settings controlling separate receivers for operating more than one barrier gate from each transmitter.

* + - 1. ANCHORAGES
				1. Anchor Bolts: Stainless steel.

Retain one of two subparagraphs below to coordinate with option selected in "Anchor Bolts" paragraph above.

Hot-dip galvanized according to ASTM A153 and ASTM F2329.

Stainless steel, **[Type 304] [Type 316] [Type 304 or 316 as indicated]**.

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, including equipment bases; accurate placement, pattern, and orientation of anchor bolts; critical dimensions; and other conditions affecting performance of the Work.
				2. Examine roughing-in for electrical and communication systems to verify actual locations of connections before parking control equipment installation.
				3. Proceed with installation only after unsatisfactory conditions have been corrected.
			2. PREPARATION

Retain this article for recessed traffic controllers installed in existing pavement.

* + - * 1. 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.

Delete the paragraph below in no separate electrical work contract.

* + - * 1. Coordination: Coordinate locations of electrical, data, and communication connections with the Electrical Work Contract.
			1. INSTALLATION, GENERAL
				1. Install parking control equipment as required for complete and integrated installation.

Rough-in electrical connections.

Delete the paragraph below in no separate electrical work contract.

Electrical, data, and communication connections to be performed by the Electrical Work Contract.

* + - 1. INSTALLATION OF AUTOMATIC BARRIER GATES
				1. Anchor cabinets to concrete bases with anchor bolts or expansion anchors, and mount barrier gate arms.

Install barrier gates according to UL 325.

* + - 1. INSTALLATION OF VEHICLE DETECTORS
				1. **[Cut grooves in pavement and bury] [Bury]** and seal wire loop at locations indicated on Drawings according to manufacturer's written instructions. Connect to parking control equipment operated by detector.
			2. INSTALLATION OF TRAFFIC CONTROLLERS
				1. Anchor controllers to **[recessed concrete bases] [driveway surfaces]** with anchor bolts or expansion anchors.
			3. INSTALLATION OF ENTRY TERMINALS
				1. Attach cabinets to concrete bases with anchor bolts or expansion anchors.

Delete first subparagraph below if equipment listed above is standalone.

Connect equipment to remote computer.

Load ticket dispenser with supply of tickets.

* + - 1. INSTALLATION OF EXIT TERMINALS
				1. Attach cabinets to concrete bases with anchor bolts or expansion anchors.

Delete first subparagraph below if equipment listed above is standalone.

Connect equipment to remote computer.

Load ticket dispenser with supply of tickets.

* + - 1. INSTALLATION OF PAY STATIONS
				1. Attach cabinets to concrete bases with anchor bolts or expansion anchors.

Delete first subparagraph below if equipment listed above is standalone.

Connect equipment to remote computer.

Load ticket dispenser with supply of tickets.

* + - 1. INSTALLATION OF FEE COMPUTERS
				1. Install computers at locations indicated, including connecting to peripheral equipment and remote computers.
			2. INSTALLATION OF CARD READER PEDESTALS
				1. **[Pad] [In-ground]** mount with mounting bolts.
			3. INSTALLATION OF ELECTRICAL
				1. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
				2. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
			4. FIELD QUALITY CONTROL
				1. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

Perform each visual and mechanical inspection and electrical test stated in NETA ATS. Certify compliance with test parameters.

Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

* + - * 1. Parking control equipment will be considered defective if it does not pass tests and inspections.
				2. Prepare test and inspection reports.
			1. ADJUSTING
				1. Adjust parking control equipment to function smoothly and lubricate as recommended by manufacturer.
				2. Confirm that locks engage accurately and securely without forcing or binding.
				3. After completing installation of exposed, factory-finished parking control equipment, inspect exposed finishes and repair damaged finishes.
			2. PROTECTION
				1. Remove barrier gate arms during the construction period to prevent damage and install them immediately before Substantial Completion.
			3. DEMONSTRATION
				1. Engage a Company Field Advisor to train Facilities maintenance personnel to adjust, operate, and maintain parking control equipment.
			4. PARKING CONTROL EQUIPMENT SCHEDULE

Retain this article if a complicated combination of products in this Section is required on Project and parking control equipment is not shown or a schedule is not included on Drawings.

* + - * 1. Provide parking control equipment for each lane as follows:

Lane **<Insert designation>: <Insert list of equipment>**.

END OF SECTION 111200