

SECTION 111200 - PARKING CONTROL EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Automatic barrier gates.
2. Ticket dispensers.
3. Exit terminals.
4. Parking facility management software.

B. Related Sections include the following:

1. Division 26 Sections for electrical wiring for, connections to, and grounding of parking control equipment.

1.2 SYSTEM DESCRIPTION

A. Parking control system shall be used for the following parking situations:

1. Transient Parking: Hourly rated parking, with fee paid while exiting.
2. Card Authorized Parking: Parking entry gained by access control card.
3. Restricted Parking: Tickets are provided to customers to be used when exiting.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Detail equipment assemblies and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.

1. Wiring Diagrams: Power, signal, and control wiring.

C. Qualification Data: For Installer.

D. Operation and Maintenance Data: For parking control equipment to include in emergency, operation, and maintenance manuals.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

- B. Source Limitations: Obtain parking control equipment through one source from a single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.5 COORDINATION

- A. Coordinate installation of anchorages for parking control equipment. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- B. Electrical System Roughing-in: Coordinate layout and installation of parking control equipment with connections to power supplies and, if applicable, perimeter security system and security access control system.

1.6 EXTRA MATERIALS

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

PART 2 - PRODUCTS

2.1 AUTOMATIC BARRIER GATES

- A. To be installed at entrances and exits of all closed lots.
 - 1. FEDERAL APD Parking Barrier Gate Model G-90 CD Series™ or pre-approved equal.
- B. General: Provide UL-approved parking control device consisting of operator and controller housed in cabinet enclosure with gate arm. Device shall be provided with all necessary control logic for activation by a signal from vehicle detector, card reader, exit verifier, ticket dispenser, or remote switch. Fabricate unit with gate arm height in down position of not more than 35 inches to prevent even small vehicles from passing under gate arm.
 - 1. Controller: Factory-sealed, solid-state, plug-in type, with galvanized steel box for wiring connections. Equip unit with the following features:
 - a. Capable of storing successive inputs and sequentially processing each one.
 - b. Automatic instant-reversing mechanism that stops downward motion of gate arm if arm strikes an object and that immediately returns arm to upward position. Include a 0- to 60-second variable-time reset device.
 - c. On-off power supply switch.

- d. Automatic-manual switch.
 - e. Thermal-overload protection with manual reset.
 - f. Plug-in connectors for vehicle loop detectors.
 - g. Thermostatically controlled heater with on-off-auto switch.
 - h. Diagnostic mode for on-site testing.
 - i. Automatic and continuous testing of inputs and outputs.
 - j. Switch to test motor and limit switches or raise gate arm manually.
 - k. Single, 115-V ac grounded power receptacle.
- C. Cabinets: Fabricated from metal sheet 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. Fabricate cabinet with internal reinforcing and four mounting holes accessible only from inside cabinet.
1. Material: 0.125-inch- thick aluminum sheet.
 - a. Finish cabinet, interior and exterior, with manufacturer's standard baked-enamel finish over primer.
- D. Straight Gate Arm: 1-by-4-inch nominal- size pine or redwood, with painted finish and black diagonal stripes on traffic-side face. Provide mounting flange with breakaway feature to ensure clean break if arm is struck by vehicle.
- E. Operator: 1/3 hp; 115 VAC, single-phase, instant-reversing, continuous-duty motor for operating gate arm. Transmit power to gate-arm drive shaft through 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.

2.2 VEHICLE DETECTORS

A. Vehicle Loop Detector System

1. Inductive loops should be 2 ½ X 6 feet and have three turns.
2. Loop leads are generally limited to 100 feet in length, and must be twisted a minimum of ten turns per foot.
3. Loop leads shall not share conduit with any other power or signal conductors.
4. Loop wire shall be 14 – 16 AGW, TFFN or THHN type insulation, single conductor stranded wire. Loop shall be constructed from a single continuous conductor without splicing.

2.3 TICKET DISPENSERS

A. To be installed at entrances to Transient Parking lots.

1. FEDERAL APD Ticket Spitter® Model TD249 or pre-approved equal.

B. General: Provide ticket dispenser units, consisting of ticket printing and issuing mechanisms, ticket magazines, and controllers housed in cabinet enclosures. Include the following features:

1. Activation button with "Push for Ticket" message or loop detector operation.
 2. Time and date display.
 3. Removable ticket tray with capacity for 5000 fan-folded tickets.
 4. Operation: Stand-alone.
 5. Battery backup for clock and RAM memory.
 6. Thermostatically controlled heater with on/off/auto switch.
- C. Cabinets: Fabricated from metal sheet 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. 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.
1. Material: 0.125-inch- thick aluminum sheet.
 - a. Finish cabinet, interior and exterior, with manufacturer's standard baked-enamel finish over primer.
- D. Ticket-Dispensing Mechanisms: Removable assembly, with self-sharpening ticket cutter and plug-in controller.
1. Units shall be activated by vehicle loop detector or push-button operation. On activation, unit automatically records entry time and date on ticket, sounds buzzer, and dispenses ticket.
 2. Time Indicator: 24-hour cycle with A.M. and P.M. clock mechanism.
 3. Tickets: 2" by 4" magnetic-stripe type.

2.4 ACCESS CONTROL UNITS

- A. Installed at entrance to Card Authorized Parking lots.
1. FEDERAL APD Passport Plus® Card Reader or pre-approved equal.
- B. Card Reader Access Unit: Access control system that activates barrier gates and functions only when authorized card is presented. Fabricate housing from welded cold-rolled steel sheet with weatherproof front access panel equipped with flush-mounted lock and two keys. Finish units with manufacturer's standard baked-enamel coating system. Provide face-lighted unit fully visible at night.
1. System: Programmable, multiple-code capability permitting validating or voiding of individual cards.
 2. Reader: Insertion type for magnetic-stripe cards.
 3. Operation: Stand-alone.

2.5 FEE COMPUTERS

- A. Installed at exit booth from Transient Parking lots.

1. SST Auditor Power Pad TM Fee Computer or pre-approved equal.
- B. Fee Computer System: Provide modular PC-based system consisting of fee computer terminal, cash drawer, magnetic-stripe ticket reader, and printer. Register permanent record of each transaction in computer's memory. Provide the following features:
1. Battery backup for clock and RAM memory.
 2. RS-422 communication port.
- C. System Performance: Capable of the following:
1. Compute parking fees based on entry times on ticket from ticket dispenser.
 2. Program lost ticket function.
 3. Control independent cash drawer.
 4. Compute change.
 5. Print receipts.
 6. Print validation on ticket.
 7. Print audit trail.
 8. Interface to automatic barrier gate.
 9. Program fee structures.
 10. Program time.
 11. Program keys.
 12. Built-in service diagnostics.
 13. View cash audit, revenue, operational, and statistical reports on screen or print on demand.
 14. Duress alarm output for emergencies.
- D. Cash Drawer: Fabricated with a removable tray and drawer, with five compartments for paper currency and five compartments for coin currency.

2.6 EXIT TERMINALS

- A. Installed at exit from Restricted Parking lots to accept tickets. Tickets for these lots are produced and distributed by M.S.U Department of Police and Public Safety.
1. SST® Exit Verifier Model ML 3000 or pre-approved equal.
- B. General: Provide exit terminals consisting of magnetic-stripe ticket readers, LCD displays, and printers housed in metal cabinet. Provide "Please Insert Ticket" sign on side of cabinet visible to driver. Include the following features:
- C. System Performance: Capable of the following:
1. Activated by vehicle loop detector.
 2. Program display.
 3. Program timer for closing barrier gate.
 4. Built-in service diagnostics.
- D. Operation: Inserting exit ticket into exit ticket reader results in the following actions:

1. Valid Exit Ticket: Exit ticket reader captures ticket and automatically sends signal to raise barrier gate.
 2. Invalid Exit Ticket: Exit ticket reader rejects ticket and displays programmed message.
- E. Cabinets: Fabricated from metal sheet 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.
1. Material: 0.125-inch- thick aluminum sheet.
 - a. Finish cabinet, interior and exterior, with manufacturer's standard baked-enamel finish over primer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, critical dimensions, and other conditions affecting performance.
- B. Examine roughing-in for electrical systems to verify actual locations of connections before parking control equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

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.
- B. Concrete Bases for Traffic Controllers: Place cast-in-place concrete, made of not less than 3000-psi compressive strength (28 days), dimensioned and reinforced according to traffic controller manufacturer's written instructions and as indicated on Drawings.

3.3 INSTALLATION

- A. Automatic Barrier Gates: Anchor cabinets to concrete bases with anchor bolts or expansion anchors and mount barrier-gate arms.
- B. Vehicle Loop Detectors: Cut grooves in pavement and bury and seal wire loop at locations indicated on Drawings according to manufacturer's written instructions. Connect to parking control equipment operated by detector.
- C. Ticket Dispensers and Exit Terminals: Attach cabinets to concrete bases with anchor bolts or expansion anchors.

- D. Fee Computers: Install computers at locations indicated, including connecting to peripheral equipment.
- E. Ground equipment according to Division 16 Section "Grounding and Bonding."
- F. Connect wiring according to Division 16 Section "Conductors and Cables."

3.4 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
 - 1. Each electrical test and visual and mechanical inspection shall be stated in NETA ATS, Section 7.15 and compliance with test parameters shall be certified.
 - 2. Operational Test: After electrical circuitry has been energized, units shall be started to confirm proper motor rotation and unit operation.
 - 3. Controls and safeties shall be tested and adjusted. Report any damaged and malfunctioning controls and equipment.
- B. Remove and replace parking control equipment where test results indicate that it does not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.5 ADJUSTING AND CLEANING

- A. Adjust parking control equipment to operate smoothly, easily, and properly. Confirm that locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware, gate operators, and other moving parts.
- C. After completing installation of exposed, factory-finished parking control equipment, inspect exposed finishes and repair damaged finishes.
- D. Remove barrier-gate arms during the construction period to prevent damage, and install them immediately before Substantial Completion.

END OF SECTION 111200