

SECTION 11150 - PARKING CONTROL EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Automatic barrier gates.
2. Vehicle detectors.
3. Ticket dispensers.
4. Card/tag access control units.
5. Fee computers.
6. Ticket acceptors.
7. Central operating server
8. Satellite servers
9. Revenue management software tools

- B. Overall Requirements

1. System hardware and software shall be fully integrated and supported by system provider.
2. All revenue management software and hardware shall be supported through system life, ten-year minimum.
3. All transaction decisions shall occur and remain resident in the central processor memory for true on-line, real-time operation. Degraded mode operation is not acceptable.
4. All time dependant functions shall utilize the single central system clock.

1.3 SYSTEM DESCRIPTION

- A. Parking control system shall be used for monthly, transient flat-rate and special-event parking.

1. Transient Parking: Duration of stay rated parking, with fee paid while exiting or at a pay station prior to exiting.
2. Monthly Parking: Monthly rated parking, with fee paid by the month and entry gained by access control card.
3. Flat-Rate Parking: Unlimited-duration parking, with free gate entry and fixed fee amount paid while exiting.
4. Special-Event Parking: Duration-of-event parking, with fee paid while entering with gates down.

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1.4 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Provide parking control equipment that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 degree F (67 degree C), ambient; 180 degree F (100 degree C), material surfaces.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Qualification Data: For Installer.
- C. Operation and Maintenance Data: For parking control equipment to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
 - 1. Maintenance Proximity: Not more than three hours' normal travel time from Installer's place of business to Project site.
- 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.
- D. Pre-installation Conference: Conduct conference at Project site. Provide approved timeline and periodic updates as required by the Parking Authority.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that match product 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 gate installed, complete with accessory components.

PART 2 - PRODUCTS

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2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Parking Control Equipment:
 - a. Secom International
 - b. Approved equivalent

2.2 MATERIALS

- A. Stainless-Steel Sheet: 304, QQ-S-766, MIL-S-5-59, ASTM A240. Thickness 16, 18, 20 gauge.
- B. Anchorages: Anchor bolts, hot-dip galvanized according to ASTM A 153/A 153M.

2.3 AUTOMATIC BARRIER GATES

- A. General: Provide UL-or equal approved parking control device consisting of operator and controller housed in 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 40 inches to prevent even small vehicles from passing under gate arm.
 - 1. Controller: Equip unit with the following features:
 - a. Obstacle detection that stops downward motion of gate arm if obstacle in path of gate arm. Once obstacle clears gate moves slowly to down position. Must not depend on contact of arm with object.
 - b. On-off power supply switch.
 - c. Automatic-manual switch.
 - d. Directional arming logic.
 - e. Galvanically isolated two-wire multi-drop serial communication over single pair of wires. RS232 communication is acceptable only if DES encrypted.
 - f. Broken gate-arm monitoring. (can be noted as gate-down-auto-use)
 - g. Thermal-overload protection with manual reset.
 - h. Plug-in connectors for two vehicle loop detectors.
 - i. Operable without heater to minus 50 degrees Celsius.
 - j. Diagnostic mode for on-site testing, with LEDs for inputs and outputs.
 - k. Automatic and continuous testing of inputs and outputs.
 - l. Switch to test motor and limit switches or raise gate arm manually.
 - m. Double, 115-V ac grounded power receptacle.
 - n. Solid state position sensors (mechanical switches not acceptable) to control arm movement and indicate up or down position.
- B. Reporting.
 - 1. Gates shall be on-line to central controller to report in real-time, the following exception conditions:
 - a. Gate off line/powering off, online

- b. Gate manually raised or manually lowered
 - c. Gate manually raised and a car crossed over the loop detector,
 - d. No Car detected (when a card was used)
 - e. Gate opened remotely via a command from the controller
 - f. Communication failure.
2. A summary of all above activities shall print hourly and be available on-demand.

C. Control:

1. The gate shall be able to be opened remotely with an authorized card for either:
 - a. A single use only, after which the gate will lower automatically when a car crosses over the closing loop);
 - b. Remotely opened permanently, until a remote close command is issued;
2. The gate shall have the ability to be user-programmed to automatically open in the event the controller receives a "fire" alarm.
3. The gate shall have the ability to be user-defined to automatically raise and lower at the start and stop, respectively, of a user-defined time zone. (Gate to close at the end of said time zone only after a car crosses over the closing loop detector).

D. Card Access: Gates shall have the ability to be fully integrated with card readers and/or to be vended by one or more separate devices, and:

1. Deny access to a card:
 - a. That is foreign or not linked into the system;
 - b. Whose status is void;
 - c. Outside cards' assigned Time Zone;
 - d. Whose Area Group is not assigned to that device;
 - e. In a Passback condition;
 - f. Whose Paid Status is unpaid;
 - g. Non-home garage card outside its non-home garage time zone, where multiple garage accesses are possible;
 - h. Whose start/stop time/date has expired;
 - i. That has violated the nesting requirement;
 - j. At an exit reader when its debit balance is insufficient to cover the current charges;
 - k. At an entry device when its debit balance less than a user-definable grace amount;
 - l. At an entry device when a card assigned to a group (sometimes called a House Account) whose occupancy limit has been reached;
2. Provide for:
 - a. Suspension of time zone, area group, nesting, and passback processing, inside a user-defined time zone, on an individual device basis;
 - b. Incrementing or decrementing occupancy counters for each device;
 - c. Disabling of readers when the limit for an occupancy counter has been reached;
3. Record the events of each device:
 - a. On the fixed disk drive for hourly and cumulative lane monitoring reports;
 - b. For on-demand review;
 - c. For hourly reporting of lane monitoring and lot count activity.
4. Assign, in real-time, a non-resettable sequence number for each successful card use for audit purposes;
5. Allow a user-defined Attendant card to be impervious to passback and car presence detection.

E. Controller must be continuously online and include:

1. Real-time, online communication of lane counts, status messages, and execute commands;
 2. Monitor illegal entries and exits, tailgates, tickets, monthlies, and back-outs;
 3. Status messages for gate up too long, back-outs, ticket in throat, and gate-arm rebound.
 4. Communication commands for resetting loops, turning FULL signs on/off, raising and lowering gate arm, and disabling ticket dispensers, card readers, and ticket acceptors.
- F. Cabinets: Replaceable shell, fabricated from stainless steel sheet with seam welded and ground smooth; approximately 17 inches square by 41 inches tall. Provide double door design with separate attendant and maintenance hinged, non-removable doors with flush-mounted locks on attendant door and internal catch on maintenance door. Furnish two keys for each lock. Fabricate structure with internal reinforcing and four mounting holes accessible only from inside cabinet.
1. Material: Stainless steel 304, AMS 5640, QQ-S-766, MIL-S-5059, ASTM A240.
 - a. Shell thickness: 20 gauge
 - b. Structure thickness: 13 gauge
 - c. Brush stainless finish on cabinet exterior with option for manufacturer's standard polyester blend powder coat, yoke white 2-3 mil thickness.
- G. Straight Gate Arm: Thickness: $\frac{3}{4}$ " Material: Pine Length: 12-foot. Finish: Washable semi-gloss white enamel Ultra base 276 4B, Labeled with a black & white "Not a walkway" safety sticker. Provide mounting flange with breakaway feature to ensure clean break if arm is struck by vehicle.
- H. Folding Gate Arm: Two pieces of 1-by-4-inch nominal size pine joined together with metal side brackets; 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.
1. Length: 12 feet
- I. Mechanism: Direct drive 1/3 hp, 60 Hz, 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 non-ferrous materials.

2.4 VEHICLE DETECTORS

- A. Vehicle Loop Detector System: Provide self-tuning electronic detector with adjustable detection patterns, adjustable sensitivity and frequency settings, and panel indicator light designed to detect presence or transit of a vehicle over an embedded loop of wire and to emit signal activating gate-arm operator. Vehicle loop detector 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 shown on Drawings, as recommended in writing by detection system manufacturer for function indicated.
1. Field-Assembled Loop: Wire, in size indicated for field assembly, and sealant; style for saw-cut installation.
 2. Factory-Formed Loop: Wire, preformed in size indicated; style for saw-cut installation.
 3. System Performance: Capable of the following:

- a. Recognize two vehicles within 6 inches 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 for intermittently operating and failed loops.
- e. Crosstalk test between adjacent loops.

- B. Vehicle Presence Detector: Provide active acoustic sensor type 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.

2.5 TICKET DISPENSERS

- A. General: Ticket Dispensers shall issue pre-encoded barcode tickets and shall print time, date, device number, sequence number, and system-generated six digit identification number on ticket. The ticket dispenser shall:
1. Have an activation button with "Push for Ticket" message;
 2. Time and date display. (optional)
 3. Removable ticket tray with capacity of 4000 fan-folded tickets connectable with an additional supply of fanfold tickets to avoid interruption;
 4. Built in proximity-style card reader;
 5. Built-in intercom.
 6. Be of a three-door design with both attendant and maintenance hinged, non-removable doors.
- B. Operation: On-line communication to remote computer
1. On-line, real-time to controller to insure elapsed time from time ticket issued to time processed at an on line cashiering terminal is exact. This is to eliminate discrepancies and eliminate continuous grace period;
 2. Galvanically isolated two-wire multi-drop serial communication over single pair of wires; RS232 communication not acceptable unless DES encrypted;
 3. Cancellation of not taken or back-out tickets;
 4. Be able to operate without a heater to temperatures of minus 50 degrees Celsius;
 5. Be able to issue a ticket via push button when vehicle presence is detected over loop and gate is in normally down position;
 6. Print time and date issued off-line in the event the communication loop is interrupted;
- C. Functionality. Ticket dispensers shall:
1. Print a unique six digit identification number on the ticket to be used in the event the barcode cannot be read;
 2. Be user-definable for applying a validation to a ticket and be able to distinguish between concurrent rates and rate structures for specific areas or purposes;
 3. Be capable of issuing Prepay Event Tickets with an authorized prepay attendant card;
 4. Be capable of issuing non-prepay tickets concurrently during prepay mode;
 5. Detect when a ticket is issued but not taken, and void the ticket as such so that it will be rejected at a cashiering device;
 6. Detect when a ticket is taken but the car does not cross over the closing loop (a back out ticket) and void the ticket as such so that it will be rejected at a cashiering device;

7. Have a display counter to set time and date when operating off line;
8. Have a resettable display counter to indicate number of tickets issued, number of bar codes retried, number of bar codes read;
9. Assign, in real-time, a non-resettable sequence number for each successful ticket issuance for audit purposes;
10. Be capable of incrementing or decrementing occupancy counters;
11. Be capable of disabling the ticket issue function when occupancy counter limits are reached (and enable the ticket issue function when the occupancy drops below the limit);
12. If integrated with a card reader, the unit shall be capable of disabling the card reader when occupancy counter limits are reached (and enable the card reader when the occupancy drops below the limit);
13. Be capable of activating a "lot full" sign when occupancy counter limits are reached (and deactivating the lot full sign when the occupancy drops below the limit);
14. Print the word "Manual" along with the time and date on all tickets issued manually. Internally, they shall be noted as manually issued tickets and shall not be processed via the bar code;
15. Print the word "Local" along with the time and date on all tickets issued off-line. Internally, they shall be noted as locally issued tickets and shall not be processed via the bar code;
16. Read the preprinted bar coded ticket with 99.8% or greater accuracy;
17. Not permit any duplicated ticket usage.

D. Ticket Dispenser Reporting.

1. When integrated with a card reader, all card reader reporting functions shall be functional and applicable;
2. The ticket dispensers shall report the following with respect to tickets:
 - a. Ticket Jam
 - b. Ticket in Throat
 - c. Low Ticket
 - d. No Tickets
 - e. Bar Code not read
 - f. Manual Ticket Issued
 - g. Ticket Not Taken
 - h. Back Out Ticket
 - i. Device Malfunction

E. Cabinets: Fabricated from stainless steel sheet with seam welded and ground smooth, approximately 14 inches wide by 29 inches long by 44 inches tall; consisting of base and top components.

1. Provide single, gasketed access door for each base component with flush-mounted locks. Furnish two keys for each lock.
2. Fabricate cabinet with internal reinforcing and four mounting holes accessible only from inside structure.
3. Fabricate top component to be unlocked and opened for ticket loading and maintenance. Include flush-mounted lock in top, keyed the same as base component lock.
4. Swing away head ("top" component) to minimize damage if vehicle contacts dispenser. Held in place with nylon mounting bolts;
5. Material: 16 – 20 gauge stainless steel 304 sheet.
6. Cabinet exterior to be brushed stainless finish or optionally, polyester blend powder coat yoke white, 2-3 mils thick.

- F. Ticket-Dispensing Mechanisms: Removable assembly, with self-sharpening ticket cutter and plug-in controller.
1. Units shall be activated by vehicle loop detector and accept push-button operation or access control card key. On activation, unit automatically records entry time and date on ticket and dispenses ticket.
 2. Tickets: Pre-printed bar-code 2-1/2" x 6"
 - a. Optional 12" tickets for advertiser coupons with eight perforations;
 - b. Optional 12" ticket for valet operation with two bar codes and up to five perforations.

2.6 ACCESS CONTROL CARDS AND TAGS

- A. Card Reader Access Unit: Access control system that activates barrier gates and functions only when authorized card is presented.
1. System: Two-stage proximity access.
 2. Permit 16 different weekly access time zones with capability to expand to 32 zones;
 3. Permit 32 different access groups with capability to expand to 64 groups;
 4. Operation: On-line communication to central server.
 5. Features: True antipassback.
 6. Reader:
 - a. The card reader shall read the encoded data from the access card and/or transponder and transmit the data back to the central server, giving an audible and visual indication of a properly read card.
 - b. The card reader shall be no larger than 6.0" x 1.7" x 0.75" (15.2 X 4.3 X 1.91 cm).
 - c. The card reader shall have a typical read range of 4" to 5.5"
 - d. The card reader shall be a single piece unit;
 - e. The card reader shall be fully weatherized, and shall have an operating temperature of -22 to 150 degrees Fahrenheit (-30 to 65 degrees Celsius), and an operating humidity of 5-95% noncondensing.
 - f. The card reader shall be made from polycarbonate material, and shall be charcoal gray.
 - g. The card reader shall transmit at a 125 kHz frequency.
 - h. The voltage requirements of the card reader shall be 4.75 to 16 VDC.
 - i. The current requirements of the card reader shall be current (DC) Voltage Average Peak 5 VDC 50 mA 70 mA 12 VDC 60 mA 140 mA
 7. Mounting: Pedestal or ticket dispenser
- B. Cards: The access cards shall:
1. Be "Passive" (non-battery operated) proximity technology;
 2. No larger than 3.375" x 2.125", with a maximum thickness of 0.070";
 3. Have an operating temperature of -50 to 160 degrees Fahrenheit (-45 to 70 degrees Celsius), and shall have an operating relative humidity of 5-95% non-condensing;
 4. Have an extremely consistent read range, and not be affected by body shielding or variable environmental conditions;
 5. Be, as an option, custom printed.

2.7 FEE COMPUTERS

- A. The following devices shall be able to calculate charges:

1. Exit Cash Registers
 2. Central Cash Registers
 3. Pay On Foot (POF) devices
 4. Pay In Lane (PIL) devices
 5. Pay On Exit (POE) devices
 6. Validators configured as registers
 7. Ticket acceptors
- B. General: All fee calculating devices shall be connected real time to the central controller to ensure correct system/elapsed time.
1. Rates shall be governed only by the central controller to ensure consistency, eliminate redundancy, and to effect changes immediately at all devices.
 2. Only personnel signed on to the system with a card of sufficient security level shall be able to access and/or alter rates.
 3. All modifications to rates shall be logged at the time of the event, and shall be written to the hard drive and available for subsequent review.
 4. The event log shall include the time of the event, the change(s) "from" and "to", the card number of the person signed on to the system, and the device from which the change(s) were made.
 5. Assign, in real-time, a non-resettable sequence number for each transaction processed for audit purposes;
- C. Fee Calculation Methods. Fees shall be able to be calculated based on the following methods, or a combination thereof, simultaneously.
1. Elapsed time
 2. Specific Time of Day
 3. 24 hour anniversary of entry
 4. A rate day based on a start/stop time of day
 5. First day rates and subsequent day rates
 6. Special Events
 7. Flat Rate
 8. Entry time and/or exit time criteria
 9. Fee calculations for access cards as required by owner
 10. Nesting requirement or lack thereof.
- D. Rates: The rates programs shall provide for eight different rate schedules capable of all running concurrently and automatically applied without cashier action or decision.
1. The rates programs shall provide for:
 - a. Day rates
 - b. Early bird rates
 - c. Evening rates
 - d. Night rates
 - e. Weekend rates
 - f. Holiday rates
 - g. Rates based on the day of the week
 - h. Rates that allow maximums for multi-day stays
 - i. Provide for prepaying charges to a dollar amount or to a time of day
 2. The rates programs shall provide for user definitions that include the ability to define:
 - a. The validation type
 - b. The validation name (to be printed on receipts and/or tickets)

- c. A validation to be charged back to an account
 - d. A validation to be charged back to a merchant account at a different amount than the difference between the validated charges and the non-validated charges
 - e. And process a lost ticket transaction
 - f. And compute taxes by percent and fixed amount
 - 3. The rates programs shall provide for validations that include the ability to:
 - a. Apply or disallow a validation based on entry and/or exit time
 - b. Charge-back validated charges to a Merchant Account
 - c. Control the mix-ability of validations
 - d. Control the number of multiples of validations
 - e. Post payments and partial validations to the ticket without penalty or loss of funds to ticket holder
 - f. Apply or disallow validations based on elapsed time
 - 4. The rates programs shall provide for validation types that include:
 - a. 100 % Free
 - b. Free days
 - c. Free billing increments
 - d. Money off
 - e. Time off
 - f. Limit daily maximum
 - g. Flat Rate
 - h. One time surcharge
 - i. Daily surcharge
 - j. Apply alternate rate schedule
 - 5. The rates programs shall provide for the following user definable grace periods:
 - a. Turnaround – to permit a driver to quickly exit if choosing not to park
 - b. Continuous – to allow for possible rush hour time spent in exit queue
 - c. Delayed – to permit parker to pay at central location, return to vehicle and proceed to exit lane
 - d. Exit
 - 6. The rates programs shall provide for the ability to validate an unknown tickets at a register and at an on-line validator;
 - 7. The rates programs shall provide for the ability to assign a validation to an unknown ticket at an Pay on Foot device.
 - 8. The rate programs shall provide for free exits during user defined times when there may be no cashiers on duty.
- E. Fee Computer: Single integrated unit, non-open architecture, consisting of fee computer terminal including bar-code ticket reader, keyboard, LCD display, printer, credit card reader, and cashier drawer. Register permanent record of each transaction in the central server memory. Provide the following features:
- 1. Rates calculated by server to ensure consistency.
 - 2. Galvanically isolated two-wire multi-drop serial communication over single pair of wires. RS232 communication not acceptable unless DES encrypted.
 - 3. Material: Stainless steel sheet 304, AMS 5640, QQ-S-766, MIL-S-5059, ASTM A240.
 - a. Thickness: 16 – 20 gauge
 - b. Grained stainless finish on exterior.
 - 4. Display shall be readable in direct sunlight
 - 5. System Performance: Capable of the following:
 - a. Compute taxes by percent and fixed amount
 - b. Display fee on remote fee display device

- c. Accept payment by cash, check, credit card, debit card and merchant validation
 - d. Control cash drawer
 - e. Display calculated change due
 - f. Print receipts
 - g. Print validation on ticket
 - h. Print audit trail on ticket
 - i. Physically retain ticket through transaction completion to avoid ticket swapping
 - j. Interface to automatic barrier gate
 - k. Three levels of security, including cashier, supervisor, and master
 - l. Built-in service diagnostics.
 - m. Blind cashier sign-off. Provide no ability for cashier to view totals
 - n. Accept machine readable system generated coupons
- F. Cash Drawer: Fabricated with a removable tray and drawer, with five compartments for paper currency and five compartments for coin currency.
- G. Remote Fee Display: Single-faced signs designed for use with fee computer, consisting of:
- 1. A minimum of 2.7 inch tall, five-digit read-out;
 - 2. Florescent orange color against black color for enhanced visibility.
 - 3. Characters are formed by rotating disks that show a colored or black side under the influence of a magnetic stator whose field is controlled by a high speed current pulse;
 - 4. Each element contains magnetic memory and retains its status indefinitely when power is removed.
 - 5. No lamps, mechanical linkages or bearings.
 - 6. Mounting: Front of cashier booth or pedestal mount.

2.8 TICKET ACCEPTORS

- A. General: Provide ticket acceptors consisting of bar code ticket readers, LCD displays, and dot-matrix printer housed in metal cabinet. Provide "Please Insert Ticket" sign on side of cabinet visible to driver. Include the following features:
- 1. Operation: On-line communication to remote computer.
 - 2. All transaction data held in central computer
 - 3. Heater with on/off/auto switch.
 - 4. Galvanically isolated two-wire multi-drop serial communication over single pair of wires. RS232 communication not acceptable unless DES encrypted.
- B. System Performance: Capable of the following:
- 1. Using time and date data from the server clock
 - 2. Using ticket data stored at central server
 - 3. Calculate and display amount owed on unpaid or insufficiently paid ticket based on current exit time and system rate schedules;
 - 4. Permit collection of fees by a roving cashier using a specially assigned cashier card to vend the gate and log the amount collected, the overdue amount, to a virtual register assigned to the card;
 - 5. Sign-off of cashier card at admin terminal to generate the cashier activity summary (cashier dump) for reconciling funds;
 - 6. Activated by vehicle loop detector;
 - 7. Accept exit grace period programmed at central server;
 - 8. Reports for events and exception events;

9. Built-in service diagnostics.

C. Operation: Inserting exit ticket into exit ticket reader results in the following actions:

1. Valid Exit Ticket: Exit ticket acceptor captures ticket and automatically sends signal to raise barrier gate;
2. Invalid Exit Ticket: Exit ticket acceptor displays PLEASE SEE ATTENDANT message and sends alarm signal to the system server;
3. Exit Ticket with Elapsed Grace Time: Exit ticket acceptor displays amount owed and sends alarm signal to the system for roving cashier dispatch;
4. Accept tickets and permit free exit during unattended hours, calculate, and report these uncollected revenue amounts

D. Cabinets: Fabricated from stainless steel sheet with seam welded and ground smooth, approximately 14 inches wide by 29 inches long by 44 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. 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 top, keyed the same as base component lock.

1. Material: 16 – 20 gauge stainless-steel 304 sheet.
 - a. Cabinet exterior to be brushed stainless finish or optionally, polyester blend powder coat yoke white, 2-3 mils thick.
2. Swing away head (“top” component) to minimize damage if vehicle contacts dispenser. Held in place with nylon mounting bolts;
3. Shall be of a three-door design with both attendant and maintenance hinged, non-removable doors

2.9 MISCELLANEOUS PARKING CONTROL EQUIPMENT

A. Lot "FULL" Signs: 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.

1. Type: Nonflashing.
2. Operation: Automatic by system server
3. Illumination: Incandescent lamps with plexiglass sign face.
4. Mounting: Top of entry barrier-gate cabinet

2.10 PARKING FACILITY MANAGEMENT SOFTWARE

A. General. Signing on to Server shall be accomplished only by personnel with an authorized card, the scope of the functions and capabilities of which shall be determined by the security level of the card used to sign on with.

1. Cards can be linked, and defined only by personnel signed on to the system with a sign on card assigned to the administrator security level. Internally, no two cards shall have the same number.
2. The system shall be able to utilize insertion cards, proximity cards, AVI tags, or a combination thereof with no difference in processing.
3. Insertion cards shall not be magnetic nor affected by magnetic fields.

- B. Linking. The system shall contain “cold start sign on” cards that are internally hard-coded in the system software so they cannot be inadvertently de-linked, rendered ineffective, or otherwise removed from the system.
1. All other cards or credentials shall be linked only with a single, unique number;
 2. The system shall not allow two cards to be simultaneously linked with the same number.
 3. The administrator shall be able to disable or remove a card from the system without having the physical card.
 4. In the event a card is lost, the administrator shall be able to link a new card as the same number as the lost card. Such action shall destroy neither the static information contained in the card file (name, address, paid status, etc.) nor the historical data used to review past activity for that card.
 5. When card “A” is linked with the same number as card “B”, card “B” shall be rendered useless and will be considered as “foreign” if an attempt is made to use it.
 6. The system shall prevent linking an already linked card as a different number without first delinking the known card to prevent inadvertent mistakes.
 7. System shall automatically broadcast the linking activity information to all satellite sites to eliminate having to link the card on each remote system.
- C. Programming
1. The administrator shall be able to define non-cold start cards capable of signing on, including assigning a sign-on cypher code.
 2. The administrator shall have the ability to assign security levels to sign-on cards to:
 - a. Restrict functions by commands (link, deactivate, remote open, etc.),
 - b. To restrict access to specific files (card file, terminal devices, house accounts, etc.),
 - c. To restrict the ability to view and/or update specific fields within a record (home address, debit balance, bank card number, etc.).
 3. The administrator shall be able to define employee cards for use by:
 - a. Attendants
 - b. Cashiers
 - c. Roving Cashiers
 - d. Prepay attendants
 - e. Employees exempt from monthly payment
 4. The administrator shall be able to define cards with respect to
 - a. Time zone
 - b. Area group
 - c. Home garage/lot
 - d. Defined group or house account
 - e. Payment status
 - f. Payment amount
 - g. Expiration time and date
 - h. Credit or debit balance
 - i. Department
 - j. Suite
 - k. Requirements to nest
 - l. Card feature (time zone violator, credit, debit, limit by house account, etc.).
- D. Reporting. Operation of this parking facility shall be to the highest standards of fiscal accountability. Accordingly, the following requirements will identify the role the revenue control system shall provide in achieving the necessary accountability.
1. Software accountability: The software that operates the key revenue control elements including, but not limited to, the fee calculating registers and the revenue reporting

- computer(s) shall be unalterable in the field by any person, including any person who may have access through a phone line.
2. The entire system shall be completely impervious to any software virus
 3. The system shall report hourly, on hard copy, and on the system hard drive, which software release is running in the field. The manufacturer shall certify that any change in the software will be accompanied by a change in the release version number of the software.
 4. The manufacturer (supplier) shall certify that there are no means by which its employees (or others) can change any data on the system except through the normal, auditable, methods of:
 - a. Signing on (using card and cipher) with the proper level of authorization
 - b. Using the system as a user and causing a printed record and an electronic record on the system disc log.
- E. Protection of critical data.
1. The Software: The system software shall reside in EPROM.
 - a. There shall be no ability to load software into the system from the fixed disc, the removable disc, a phone line or any other means.
 - b. This lack of ability shall be absolute. The process of performing such function shall not exist. It is not sufficient to turn them off.
 - c. There shall be no "back door" access to the software.
 2. The Memory: The main memory of the system is volatile. No critical data shall be supported in this memory even if battery is backed up. This includes transaction numbers, etc. All critical data shall reside on the system's fixed disc. This data falls into three categories:
 - a. Category A refers to site data. The site data shall include:
 - 1) The name and address of the location.
 - 2) The date the disc was formatted and loaded with this data in the manufacturers factory.
 - 3) The serial number of the system.
 - 4) There shall be no ability to load or change this data in the field or tamper with it in anyway.
 - b. Category B refers to financial data collected by the system. There shall be no ability to change this data in the field except as a result of legitimate customer transactions.
 - 1) Such changes shall be controlled by the operational software warranted by the manufacturer as complying with this requirement.
 - 2) There shall be no ability to reload this data nor to reformat this portion of the disc in the field.
 - 3) It shall not be possible to dynamically allocate this space, but shall at all times be located in a known fixed area.
 - 4) Such control shall be "hard coded" into the system and shall not be able to be modified in the field.
 - c. Category C refers to the system parameters (rates etc.) customer files and other data. The owner shall be able to change this information as needed under the normal security procedures built into the system.
- F. Reporting unusual events: Unusual events shall be printed as they occur (on continuous fan fold paper) and, along with all other events, logged as they occur to the electronic log where they shall be available for review, either on-demand and immediate, or at some point in the future. It

shall not be possible to disable or alter this information in any way. Events classified as unusual shall include but not be limited to:

1. Every transaction at the register where the ticket was not read and processed by the system as a normal valid ticket, such as a manually or locally issued ticket
2. Every ticket that was issued as a back-out ticket, not taken, or manual.
3. Every time the gate is opened manually.
4. Every time a car drives through a gate where the arm is open or missing.
5. Every time a gate is opened remotely. In this case the card number and name of the employee shall also be recorded.
6. Every transaction cancelled by the cashier. The system shall allow a search of such events and show the event, the ticket number, the cashier, the register and details of the ticket (time/date of issue etc) as well as the next transaction at that register.
7. Every attempt by a monthly customer to use a card out of sequence (in passback). The system shall concurrently report and record details of the previous time the card was used.

G. Reporting Functionality: The system shall

1. Be able to create and generate reports of static information:
2. Run the report(s) on demand,
3. Start the report(s) automatically by day and/or time
4. Using up to three selection criteria on any data element.
5. Print any data elements,
6. Clear or change any data element of records selected

H. PC-based Data Management Computers: The system shall hand-off an ASCII text string of all transaction data for general analysis using standard Windows-based applications such as MS Excel, Access, FoxPro and Word.

I. General System Capabilities: Manufacturer's standard software shall be compatible with the existing security access control system and provide automatic facility monitoring, supervision, and remote control of parking control equipment from one or more locations. The system shall:

1. Perform rates calculation with up to 16 rate schedules
2. Have a database of card user data including, but not limited to the following fields:
 - a. Last name, first name, middle name
 - b. Title
 - c. Department
 - d. Company name
 - e. E-mail address
 - f. Address, city, state, zip
 - g. Office phone and extension
 - h. Automobile #1 make, color, license and state
 - i. Automobile #2 make, color, license and state
 - j. Suite
 - k. Employee number
 - l. House account, uses, charges
 - m. Debit card number, balance today, month-to-date, year-to-date
 - n. Debit card time balance today, month-to-date, year-to-date
 - o. Opening balance
 - p. Bank credit card number and expiration date
 - q. Used today parking
 - r. This month payment status

- s. Next month payment status
 - t. Parking time zone
 - u. Parking area group
 - v. Cash or credit violator
 - w. Security time zone
 - x. Security area group
 - y. Elevator group/floor
 - z. Parking feature set
 - aa. Security feature set
 - bb. Last use time, date and location
 - cc. Last entry time date and location
 - dd. Last exit time, date and location
 - ee. Original entry time, date and location
 - ff. Nesting card
 - gg. Remarks
3. Automatically report an access control card's last use on passback event
 4. Maintain a 25-year non-clearable daily system summary of all financial transactions.
 5. With the ability to review historical activity of a minimum of three million events.
 6. Review all activity on demand by multiple search keys
 7. Review one activity or a range of past card activities
 8. Recover printout data printer off, paper out or malfunction
 9. List device malfunctions for diagnostics, and preventative maintenance,
 10. Review by day, month, and year and by day, employee, terminal, merchant
 11. Review card violator revenue collection for limit and time zone
 12. Review by both occupancy and time restrictions with the ability to calculate outside limits reports and collection of fees
- J. General Future Capabilities: The City of Camden expects a minimum of seven years (preferably ten) system life from this software hardware and lane equipment acquisition. Although not required at this time, the system must be able to perform the following revenue management functions that may be needed with this ascribed time:
1. Read and fully integrate license plate information with a high accuracy rate:
 - a. Capture, optically read and store the license plate number on entry and exit within the same amount of time it takes to read an access control card or to vend a ticket, or 1.5 seconds, which ever is less
 - 1) Upon contract card presentation on entry or exit, the verification with stored license plate data shall occur within the above timeframe to vend the gate
 - 2) Upon visitor ticket vend license plate data shall be assigned to the ticket taken upon entry and matched to ticket presented upon exit for transaction completion.
 - b. Report automatically and on demand:
 - 1) All outstanding tickets with associated license plates and length of stay information
 - 2) All contract card in the garage with associated license plates and length of stay information
 - c. Search and find specific license plate by full plate or possible wild card numbers
 - d. Ability to prevent unauthorized vehicles, regardless of validity of card, from entering a secure garage or area.
 2. Nest tickets where visitors are compelled to use lesser desirable areas of parking facility by the incentive of a lower rate that will be automatically calculated when the transient

parker follows the rules of arriving and leaving the area within the user-definable allotted time.

3. Assign and track a select group of two or more contract card holders to a carpool reward system to track and report the number of days the card holders carpooled for the month.
4. Permit alternate traffic and lane configurations to include:
 - a. Central Cashiering of transient tickets
 - b. Pay-on-foot stations

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.
 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to 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 INSTALLATION

- A. Automatic Barrier Gates: Anchor units 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, Central Pay Stations and Exit Terminals: Attach cabinets to concrete bases with anchor bolts or expansion anchors and connect to central computer.
 1. Connect equipment to remote computer.
 2. Load ticket dispenser with supply of tickets.
- D. Fee Computers: Install computers at locations indicated, including connecting to remote computers.
- E. Ground equipment according to Division 16 Section "Grounding and Bonding."
- F. Connect wiring according to Division 16 Section "Conductors and Cables."

3.3 FIELD QUALITY CONTROL

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- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.
- B. 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 unit operation.
 - 3. Controls and safeties shall be tested and adjusted. Report any damaged and malfunctioning controls and equipment.
- C. Remove and replace parking control equipment where test results indicate that it does not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.4 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 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.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain parking control equipment.
- B. Provide timeline and schedule for cashier training, supervisor training and management advanced audit training.

3.6 PARKING CONTROL EQUIPMENT SCHEDULE

- A. Provide parking control equipment for each lane as follows:
 - 1. Lane **<Insert designation>**: **<Insert list of equipment.>**

END OF SECTION 11150