Revised 04/14/16

SPECIFICATIONS - DETAILED PROVISIONS
Section 17310 - Site Access System

C O N T E N T S

SECTION 17310
SITE ACCESS SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

Contractor shall furnish, and install the site access system and all appurtenant materials and equipment. Site access system shall be suitable for the services listed, complete and operable in accordance with the requirements of the Contract Documents and in conformance with the manufacturer's recommendations.

1.02 PROJECT SPECIFIC REQUIREMENTS

Contractor shall furnish and install the site access system as shown on the Drawings, as specified in Section 17310.1, Detailed Site Access System, and as specified herein.

Section 17310.1 shall be utilized in conjunction with this Specification. Gate operator location, type, and appurtenances shall be as specified in Section 17310.1, and as shown on the Drawings.

1.03 RELATED SECTIONS

A. The Contract Documents are a single integrated document, and as such all Specification Sections apply. It is the responsibility of the Contractor and its subcontractors to review all Sections and ensure a complete and coordinated project.

B. Related Specification Sections include, but are not limited to, the following:

1. Division 2 – Fencing
2. Division 3 – Concrete
3. Division 5 – Metals
4. Division 16 – Electrical

1.04 STANDARDS AND CODES

All equipment and materials, including installation of same, shall meet or exceed the applicable requirements of the following standards and codes (latest edition):

A. Underwriters Laboratories (UL)

1. UL325: Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems.

2. UL991: Standard for Testing of Safety-Related Controls Employing Solid-State Devices.

B. National Fire Protection Association

1. NFPA 70 - National Electrical Code (NEC)

1.05 SUBMITTALS

A. Shop Drawings

Contractor shall prepare and submit complete and organized information, drawings, and technical data for all equipment and components. All drawings shall be legible and reduced to a maximum size of 11" x 17" for inclusion within the submittal. Shop drawings shall include, but not be limited to, the following:

1. Manufacturer product literature, specifications, features and accessories, materials of construction, and data in sufficient detail to demonstrate compliance with Specification requirements. Manufacturer's literature and data shall be marked to clearly delineate all applicable information and crossing out all inapplicable information.

2. Detailed drawings for each gate operator showing layout and dimensions of gate, gate operator, connections to gate, gate operator support foundation, vehicle sensor system, gate operator entry system, and conduit/wiring for gate operator and accessories. Drawings shall clearly show the precise location of each vehicle detector loop and lead-in cable, loop dimensions, number of detector loop cable turns, slot width and depth, and placement of cable within the slot.

3. Written confirmation that each proposed operator unit is adequate for the specified gate (size, weight, and required pull force).

4. Manufacturer requirements for gate operator support foundation(s), including minimum dimensions, concrete strength, and reinforcing steel. Manufacturer requirements for gate operator frame anchorage, including anchor bolt locations, size, and embedment depth.

5. Complete wiring connection diagram for each gate operator and accessories.

6. Gate operator safety literature and required warning signs. Warning signs shall be in compliance with requirements of UL325.

7. Copy of proposed equipment warranty, as specified in Part 1.07 herein.

B. Operation and Maintenance Manual

Contractor shall submit a detailed Operation and Maintenance (O&M) Manual for all equipment and components specified herein and incorporated into the Work. The O&M Manual shall be provided in accordance with the requirements of the District's General Conditions, Section 01430, and as specified herein.

The O&M Manual shall include, but not be limited to, the following:

1. Equipment Performance Data and Drawings

   a. Detailed Bill of Materials for all equipment, components, and appurtenances, listing: manufacturer's name, quantity, description, and model/part number.

   b. Manufacturer's product literature, specifications, performance capabilities, features and accessories, materials of construction, and illustrations.

   c. Manufacturer’s data and drawings showing dimensions, physical configurations, installation and mounting details, and wiring schematics.

   d. Control diagrams and wiring interconnect diagrams for all equipment, associated field devices, and controls.

2. Equipment Installation Requirements

   a. Complete, detailed installation instructions for all equipment, components, and appurtenances.

3. Equipment Operation Data

   a. Complete and detailed instructions for adjusting all equipment settings, including: input power, motor current settings, torque settings, status and alarm signals, etc.

   b. Complete and detailed user manuals and operating instructions, including setup parameters for all controllers.

   c. Printed list of all final setup parameters for each controller, including factory settings and any field modifications to factory settings.

4. Equipment Service and Maintenance Data

   a. Maintenance data shall include all information and instructions required by District's personnel to keep equipment adjusted and calibrated so that it functions properly under the full range of operating conditions.

   b. Explanation with illustrations as necessary for each maintenance task.

   c. Recommended schedule of maintenance tasks.

   d. Troubleshooting instructions.

   e. List of maintenance tools and equipment.

   f. Recommended spare parts list.

   g. Names, addresses and phone numbers of all manufacturers and manufacturer's local service representatives.

5. Manufacturer Warranties

1.06 QUALITY ASSURANCE

A. All equipment furnished shall be of current design and manufacture that has been utilized in similar applications and environments.

B. Automatic gate operators shall be as manufactured by LiftMaster, DoorKing, or equal.

1.07 WARRANTY

Gate operators shall be warranted by the manufacturer for a period of two (2) years from date of acceptance by the District against defects in materials or workmanship. Defective part(s) shall be repaired or replaced at no charge, at the manufacturer's option. The warranty shall be in printed form and shall be included in the Operation and Maintenance Manual.

PART 2 - PRODUCTS

2.01 AUTOMATIC SLIDE GATE OPERATOR

A. General

1. Contractor shall furnish and install automatic vehicular slide gate operators as specified in Part 1.02 (herein) and as shown on the Drawings. Each vehicular slide gate operator shall be provided complete with all drive and electrical components. Gate operators shall be heavy-duty industrial slide type openers, Model SL585 as manufactured by LiftMaster, or equal.

2. Vehicular slide gate operator unit shall automatically open and close V-track (roller) gates to provide convenience and security. Operator unit shall function with standard features, options, and accessories including, but not limited to: inherent primary and secondary entrapment protection devices; connection of contact or non-contact entrapment protection devices, radio controls, single and three button control stations, digital keypads, coded cards, vehicle detector loops, telephone entry systems, and revenue control equipment.

3. Unless specified otherwise, each gate operator unit shall operate on 115 VAC, single phase, 60 Hz power.

4. Unless specified otherwise, the gate operator shall be controlled by a card reader system. Card readers shall be provided by the Security System Subcontractor.

B. Design Criteria

1. Operator unit shall be sized as required for the specified V-track rolling gate and site conditions. Operator unit shall be completely assembled, pre-wired, and tested in the factory.

2. Contractor and operator unit manufacturer shall coordinate with gate manufacturer to insure that the selected operator and accessories will be suitable for the proposed gate. Operator unit shall open/close the gate at a rate not greater than 11 inches per second. Operator unit shall provide a minimum pull force of 75 pounds.

3. Operator unit supplier shall provide all required operator accessories and appurtenances, including vehicle sensing loops, entry system, and entrapment protection sensors, to ensure compatibility between accessories and operator and to provide sole source responsibility.

C. Mechanical Features and Components

Standard mechanical features and components shall include as a minimum:

1. Weather-resistant galvannealed steel cabinet with automotive type powder coat finish.

2. Lockable access panel for manual disconnect and adjustable limit switches.

3. Heavy duty worm gear operator with oil bath lubrication.

4. 1-inch diameter (minimum) solid steel output drive shaft with heavy-duty ball bearings.

5. Roller chain and drive sprocket with chain guide(s) and gate attachment brackets.

6. Disconnect/release for manual operation of gate.

D. Electrical Features and Components

Standard electrical features and components shall include as a minimum:

1 High-starting torque, continuous duty 1/2 HP (minimum) motor, 115 VAC, 60 Hz, single phase with thermal overload protection.

2. Solid state controller with adjustable timers, LED indicators, and self-diagnostics.

3. Adjustable motor current sensing to detect obstructions, with separate adjustments for opening and closing directions.

4. Adjustable motor RPM sensing to detect obstructions, with separate adjustments for open and closing directions.

5. Allow connection of external devices such as access control systems.

6. Integral detector loop inputs compatible with exit, shadow, and interrupt loops.

7. Controller housed in separate control box.

8. Power input "On/Off" switch.

9. Built-in 120 VAC duplex power receptacle for accessories.

10. Transformer for low voltage power. Fuse protected 24 VAC and 24 VDC secondary power shall be available on a terminal strip to power accessory devices.

11. Adjustable precision snap-action type limit switches to control gate position.

12. Contacts for opening, closing, and reversing accessories, as well as contact and non-contact obstruction sensing devices. In addition, a dry contact for the gate in a closed position shall be provided for remote indication. The dry contact shall be rated for 5A at 120 VAC and shall be pre-wired to a terminal strip.

E. Entrapment Protection Devices

Each gate operator shall be provided with inherent entrapment protection devices which comply with Class III of UL Standard 325. Unless specified otherwise, the primary entrapment protection device shall be adjustable motor RPM sensing and the secondary entrapment protection device shall be adjustable motor current sensing.

2.02 AUTOMATIC SWING GATE OPERATOR

A. General

1. Contractor shall furnish and install automatic vehicular swing gate operators as specified in Part 1.02 (herein) and as shown on the Drawings. Each vehicular swing gate operator shall be provided complete with all drive and electrical components. Gate operators shall be heavy-duty industrial swing type openers, Model SW490 as manufactured by LiftMaster, or equal.

2. Vehicular swing gate operator unit shall automatically open and close swing gates to provide convenience and security. Operator unit shall function with standard features, options, and accessories including, but not limited to: inherent primary and secondary entrapment protection devices; connection of contact or non-contact entrapment protection devices, radio controls, single and three button control stations, digital keypads, coded cards, vehicle detector loops, telephone entry systems, and revenue control equipment. Unit shall operate on 115 VAC, single phase, 60 Hz power.

3. Unless specified otherwise, the gate operator shall be controlled by a card reader system. Card readers shall be provided by the Security System Subcontractor.

B. Design Criteria

1. Operator unit shall be sized as required for the specified swing gate and site conditions. Operator unit shall be completely assembled, pre-wired, and tested in the factory.

2. Contractor and operator unit manufacturer shall coordinate with gate manufacturer to insure that the selected operator and accessories will be suitable for the proposed gate. Operator unit shall open/close the gate at a rate not greater than 7 degrees per second. Operator unit shall provide a minimum pull force of 75 pounds.

3. Operator unit supplier shall provide all required operator accessories and appurtenances, including vehicle sensing loops, entry system, and entrapment protection sensors, to ensure compatibility between accessories and operator and to provide sole source responsibility.

C. Mechanical Features and Components

Standard mechanical features and components shall include as a minimum:

1. Weather-resistant galvannealed steel cabinet with automotive type powder coat finish.

2. Lockable access panel for manual disconnect and adjustable limit switches.

3. Cold rolled solid steel output drive shaft with heavy-duty ball bearings.

4. Gate operator arms and gate attachment brackets.

5. Disconnect/release for manual operation of gate.

D. Electrical Features and Components

Standard electrical features and components shall include as a minimum:

1 High-starting torque, continuous duty 0.5 HP (minimum) motor for single leaf gate, or two (2) 0.5 HP (minimum) motors for double leaf gates, 115 VAC, 60 Hz, single phase with thermal overload protection.

2. Solid state controller with adjustable timers, LED indicators, and self-diagnostics.

3. Adjustable motor current sensing to detect obstructions, with separate adjustments for opening and closing directions.

4. Adjustable motor RPM sensing to detect obstructions, with separate adjustments for open and closing directions.

5. Allow connection of external devices such as access control systems.

6. Integral detector loop inputs compatible with exit, shadow, and interrupt loops.

7. Controller housed in separate control box.

8. Power input "On/Off" switch.

9. Built-in 120 VAC duplex power receptacle for accessories.

10. Transformer for low voltage power. Fuse protected 24 VAC and 24 VDC secondary power shall be available on a terminal strip to power accessory devices.

11. Adjustable precision snap-action type limit switches to control gate position.

12. Contacts for opening, closing, and reversing accessories, as well as contact and non-contact obstruction sensing devices. In addition, a dry contact for the gate in a closed position shall be provided for remote indication. The dry contact shall be rated for 5A at 120 VAC and shall be pre-wired to a terminal strip.

E. Entrapment Protection Devices

Each gate operator shall be provided with inherent entrapment protection devices which comply with Class III of UL Standard 325. Unless specified otherwise, the primary entrapment protection device shall be adjustable motor RPM sensing and the secondary entrapment protection device shall be adjustable motor current sensing.

2.03 ACCESSORIES

A. Card Readers (By Others)

1. Contractor shall provide card readers as specified in Part 1.02 (herein) and as shown on the Drawings. Each card reader shall be pedestal mounted for operation of an automatic gate operator at each entry point as shown on the Drawings. Card readers shall be suitable for outdoor exposure.

2. Card readers shall be furnished by the Security System Subcontractor. Card readers shall be suitable to read existing magnetic cards for District personnel. Card reader access control system shall be connected to a microwave radio communication system to permit card reader recognition from District's central computer system.

B. Vehicle Sensor System

Unless specified otherwise, each gate operator shall be provided with a vehicle sensor system. Each vehicle sensor system shall consist of in-ground vehicle detectors loops for entrance and exit, lead-in cables, appurtenances, and gate operator integral control inputs for detector loops.

1. Detector loop cable shall be #14 AWG (minimum), stranded copper, single conductor, with cross-linked polyethylene insulation and suitable for direct burial. Loop size and number of turns shall be as determined by the gate operator manufacturer for vehicles ranging in size from small automobiles to large high bed trucks. A sufficient turns shall be provided to ensure the loop functions properly with the gate operator detector loop controls. The detector loop cable shall be continuous (no splices).

2. Lead-in cable shall be #16 AWG, stranded tinned copper, twisted pair, with aluminum/polyester shield, tinned copper drain, and polyethylene insulation. Lead-in cable shall be twisted four times per foot, minimum.

C. Photoelectric Entrapment Protection Sensors

1. Where specified, non-contact photoelectric sensors for entrapment protection shall be provided.

2. Photoelectric sensors shall include separate transmitter and receiver units, mounting arms, wiring, and appurtenances. Sensors shall prevent gate closure on obstructions (pedestrians and vehicles) within its path.

D. Card Reader Pedestals

1. Where specified, one (1) or two (2) tiered free standing pedestals shall be provided for card readers. Card reader pedestal location(s) shall be as shown on the Drawings.

2. Pedestals shall be constructed of 2" x 4" rectangular steel tubing with an 8" square base plate with integral conduit stub-up hole centered in steel tubing to conceal conductors. A steel base plate cover shall be provided to conceal anchor bolts. Each pedestal arm shall be provided with a stainless steel open sided housing for a mounting card reader, as specified herein. Each card reader housing shall be provided with solid back plate sized to accommodate the proposed card reader, and solid top and sides to shield the card reader from direct sunlight exposure.

3. The single tiered pedestal arm and lower arm of the two (2) tiered pedestal shall be a suitable height for a standard pickup truck. The upper arm of the two (2) tiered pedestal shall be a suitable height for a large service truck.

4. Contractor shall coordinate pedestal design, fabrication, and construction with Security System Subcontractor. Prior to pedestal fabrication, Contractor shall confirm card reader housing heights with District. Pedestal shall be provided with a factory baked on powder coating. Color shall be as selected by District. Pedestal and card reader housings shall be as manufactured by Engineered Parking Systems, or equal.

E. Building Emergency Access Boxes

1. Where specified, provide an emergency access box located outside of the building, as shown on the Drawings.

2. The emergency access box shall be wall mounted directly adjacent to the designated building door. The emergency access box shall be Knox Box Series 3200, Hinged Door Model as manufactured by the Knox Company (no substitutes).

3. Manufacturer information and location for the emergency access box (Knox Box) shall be submitted by the Contractor to the City or County Fire Department (as applicable) for approval.

F. Site Emergency Access Switches

1. Where specified, provide a site emergency access switch located outside of the automatic gate, as shown on the Drawings.

2. The emergency access switch shall be directly wired to the gate operator to automatically open and close the gate. In addition, the switch shall be wired to the security control panel provided by the Security System Subcontractor to indicate alarm/status. The emergency access switch shall be Knox Key Switch 3500 Series, Model 3502 as manufactured by the Knox Company (no substitutes).

3. Manufacturer information and location for the emergency access switch (Knox Key Switch) shall be submitted by the Contractor to the City or County Fire Department (as applicable) for approval.

PART 3 – EXECUTION

3.01 FACTORY INSPECTION AND TESTING

A. Manufacturer shall inspect and test each automatic gate operator at the factory to assure smooth, quiet operation.

B. Manufacturer shall test all gate operator control inputs and safety features to ensure proper function.

3.02 INSTALLATION

Contractor shall install the site access system, including gate operators and accessories in accordance with manufacturer's written installation instructions and approved shop drawings, UL Standards, and as indicated on the Drawings and specified herein. Contractor shall connect all necessary electrical power and control wiring, including furnishing of all necessary materials in addition to that provided with the specified equipment. Wiring materials and installation shall be in accordance with the requirements of Section 16050 and as shown on the Drawings.

A. Contractor shall provide a NEMA 4X stainless steel junction box directly adjacent to gate operator for supply power and remote communication conduits, as shown on the Drawings. Provide PVC coated flexible conduit between junction box and gate operator.

B. Contractor shall install entrance and exit vehicle sensor system detector loops for each gate operator. Unless specified otherwise, detector loops shall be placed in slots saw cut into the pavement. Detector loop location and dimensions shall be in accordance with the manufacturer's approved shop drawings. Slot width and depth shall be as determined by the gate operator manufacturer. Detector loop cable shall be placed into the slots and filled with epoxy in accordance with the manufacturer's written instructions.

Transition from detector loop cable to lead-in cable shall be in a precast concrete handhole located directly adjacent to the driveway. Lead-in cable shall be installed in PVC-RGS conduit from the handhole to the gate operator foundation. Conduit shall be stubbed up through the foundation, directly beneath the gate operator and aligned with the operator terminal box.

C. Contractor shall install a 3/4" diameter x 10' long copper clad ground rod extending through the gate operator support foundation for operator unit grounding. The operator cabinet enclosure shall be bonded to the ground rod with a #6 AWG bare copper conductor.

D. Contractor shall install photoelectric sensors (where specified) per manufacturer's written instructions.

E. Contractor shall install all warning signs securely with stainless steel fasteners and within view of both sides of the gate, as required by the manufacturer and UL 325.

F. Contractor shall coordinate locations of card reader mounting pedestals with District. The final location of each card reader mounting pedestal shall be confirmed in the field with the District’s Inspector.

G. Prior to equipment operation, Contractor shall provide initial lubrication of all mechanical components, check all belts/chains and other moving parts for alignment and tolerances in accordance with the manufacturer's written instructions.

3.03 STARTUP AND TESTING

A. Contractor shall arrange for a qualified representative of the manufacturer to inspect the installation and perform start-up of the equipment and demonstrate required performance to the satisfaction of the District.

B. Manufacturer's representative shall adjust the gate operator and accessories in accordance with the equipment installation manual and shall test the adjustments to verify correct settings for the installation. Each entrapment protection provision shall be tested separately and independently with the other entrapment protection provisions defeated.

3.04 INSTRUCTION

After the equipment has been installed, adjusted, tested, and placed in satisfactory operating condition, the equipment manufacturer shall provide instruction of District personnel in the use and maintenance of the equipment. Contractor shall give the District formal written notice of the proposed instruction period at least two weeks prior to commencement of the instruction period. Scheduled training shall be at a time acceptable to the District and the manufacturer. During this instruction period, the manufacturer shall address details of operation, routine maintenance, repair, and special equipment features. Manufacturer shall thoroughly address all items in the equipment operation and maintenance manual. Unless specified otherwise, one (1) hour of instruction shall be provided.

END OF SECTION 17310