NOTICE TO ALL BIDDERS

ADDENDUM NO. 2

TO

TUCSON AIRPORT AUTHORITY

TUCSON INTERNATIONAL AIRPORT

10119007 CBP RELOCATION

February 06, 2020

In accordance with the Bid Documents, Bidders on the above-referenced project are hereby notified that the following Addendum, dated February 06, 2020 shall be made a part of the Bid Documents. The Bidder shall acknowledge receipt of this addendum on the Bid Form.

GENERAL

1. Revised Bid Form dated February 05, 2020. Including the following modifications;

   I. Specifications and Contract Documents

      1. The bidding period has been extended to Wednesday, February 19, 2020, at 2:00 p.m. Sealed Bids will be received until 2:00 Local Tucson Time, February 19, 2020, at the TAA Administrative Offices, 7250 S. Tucson Boulevard, Suite 300, Tucson International Terminal, Third Floor, Tucson, Arizona 85756.

      2. Bidders are hereby notified that the attached BID FORM - REVISED 2.5.20 (pages 23, 24, and 25 of the NOTICE OF INVITATION TO BID) shall REPLACE the original BID FORM (pages 23, 24, and 25 of the NOTICE OF INVITATION TO BID) and shall be submitted with the Bid in lieu of the original BID FORM.

      3. The last day for questions has changed. The last day for questions is now Tuesday, February 11, 2020.

      4. The FINAL ADDENDUM date has changed. The FINAL ADDENDUM will be issued on Thursday, February 13, 2020.

PLACE: TUCSON AIRPORT AUTHORITY  
7250 South Tucson Boulevard, Suite 300  
Tucson, Arizona 85756

DATE/TIME: 2:00 p.m. Local Tucson Time February 19, 2020

BID OF:  
(Hereinafter called the "Bidder")

DOING BUSINESS AS:  
Corporation  Partnership  Individual

TO: Tucson Airport Authority ("TAA" or "Owner")

PROJECT: 10119007 CBP Relocation – BID 2020

I (We), the undersigned, propose to provide all construction and services required by the Bid Documents or reasonably inferable therefrom to produce the results intended, whether completed or partially completed, and including all other administration, supervision, labor, materials, equipment, supplies, incidentals, facilities, requirements, and services to be provided by Contractor to fulfill Contractor’s obligations under the Contract Documents, hereinafter called the “Work.”

I (We) further declare that we have carefully read and examined all Bid Documents and all portions of the Contract Documents, including the Drawings and Specifications, and that we have made personal examination of the property, and that we have a full understanding of the exact scope of the Work.

I (We) further declare that in case of a joint bid each party thereto certifies, as to his/her own organization, that this Bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid with any other Bidder or with any competitor. The Bid as stated herein includes the cost of insurance and bonds as required by the Contract Documents. I (We) agree to provide the bonds and insurance required under the Contract Documents.

I (We) further declare that we have not in the preparation or submission of this Bid, or with regard to any act of performance under the Contract Documents, entered into any contract, combination, conspiracy or other act in restraint of trade or commerce which is unlawful under the laws of the State of Arizona.

I (We) further acknowledge receipt of the following Addenda:

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In submitting this Bid, I (we) agree to the following:
1. To execute the Construction Services Agreement for the Work for the price stated below, in the form submitted in the Bid Documents, as that form is supplemented and amended by the Contract Documents, within fourteen (14) Calendar Days of receipt of notification of acceptance of this Bid.

2. To accomplish the Work in strict accordance with the Contract Documents and all applicable laws, statutes, ordinances, codes and regulations, and to submit herewith the attached Non-Collusion Affidavit.

3. To commence Work on or before the date specified in the "Notice to Proceed," and to complete the Work within the time set forth in the Contract Documents.

4. To complete the Work for the price(s) shown below:

**BASE BID:**

__________________________________________ ($___________)

In words In numbers

**Additive Alternate No. 1 (Entry Canopy Re-Roof)**

__________________________________________ ($___________)

In words In numbers

**Allowance #1: Interior and Exterior Building Signage (Lump Sum Allowance includes the sum to cover the costs of design, engineering, procurement, manufacturing, delivery, and installation of the interior and exterior building signage)**

Twenty Thousand Dollars ($20,000.00)

In Words In Numbers

**Allowance #2: Decorative Window Film (Lump Sum Allowance includes the sum to cover the costs of design, engineering, procurement, manufacturing, delivery, and installation of the decorative window film)**

Two Thousand Five Hundred Dollars ($2,500.00)

In Words In Numbers

**TOTAL AGGREGATE BID (BASE BID PLUS ALTERNATE NO. 1, PLUS ALLOWANCE #1, PLUS ALLOWANCE #2)**

__________________________________________ ($___________)

In words In numbers

Enclosed is a Bid Bond as required in the Instructions to Bidders consisting of a _____________ in the amount of _____________________________ dollars ($____________________) which is not less than ten percent (10%) of the Total Aggregate Bid.

In accordance with the terms and conditions set forth in the Instruction to Bidders, the undersigned Bidder understands and agrees that the Bid Bond can be forfeited to TAA in the event the Bidder fails to deliver the
Bid Form 25 10119007 CBP Relocation – BID 2020

required bonds and insurance and otherwise fails to execute the Construction Services Agreement for the Project within fourteen (14) Calendar Days of receipt of notification of TAA’s acceptance of this Bid. The undersigned Bidder represents to TAA the Bidder's Representations set forth in Section II of the Instructions to Bidders.

Bidder encloses with his/her/its Bid, the following documents: (1) Bid Form; (2) Schedule of Values; (3) Bid Bond; (4) Noncollusion Affidavit; (5) Interest List Form; (6) Contractor’s Qualification Statement, (7) Statement of Proposed DBE Utilization, and (8) a written explanation setting forth the basis for an exemption from licensing requirements, if claimed. ANY EXCEPTIONS TO THE ABOVE LIST MUST BE IDENTIFIED IN WRITING: ______________________________________________________________________________________________________________________________________________________________________________________________________________________

(Official Name of Bidder)

Signature: ____________________________

By: ____________________________ (If Bidder is a corporation)

Title: ____________________________

Bidder’s Telephone Number: ____________________________

Bidder’s Email Address: ____________________________

Bidder’s Business Address: ____________________________

________________________________________

STATE OF ARIZONA )

County of Pima ) ss.

SUBSCRIBED AND SWORN TO before me this ______ day of ________, by ___________________ in his/her capacity as ____________________________

Notary Public:

My commission expires:

________________________________________
CLARIFICATIONS

QUESTIONS:

Question #1
Per Addendum #1, Item 2.6 states that a TAA Interest Form must be enclosed for the GC and the Subcontractors on bid day. Is this correct? Please advise. Can we submit the Subcontractor Interest Forms after the bid?
Response: GC and all proposed subcontractors must complete the TAA Interest Form as stipulated in the Bid Instructions and included with bid.

Question #2
The plans show the TAA Project # as: 10219007 and Addendum #1 shows: 10119007. Which number is correct?
Response: Clarification: Bid number is 10119007 and should be the number referenced in all bid materials. Drawings will maintain the 10219007 number.

Question #3
Are the vending machines OFOI or is the contractor responsible for supplying and installing them?
Response: Vending machines are OFOI. Note added to Keynote #20.

Question #4
The bid form calls for an Alternate for ‘Entry Canopy Re-roof” Are there any more details or specs provided for this alternate?
Response: Drawing A4.1 has been revised to show the information as it pertains to the re-roof. No added specifications are provided.

Question #5
The electric gate operator which can be found in spec section 02 8290 – 1, Lift Master BG770 has been discontinued and is no longer available. Please provide allowance or alternate.
Response: Spec section revised to updated model number per Lift Master - BG790.

Question #6
The Access Control Reader ‘HID 6171 AKT0000’ located in spec section 28 1300 - 8 is discontinued and no longer available. Please provide a valid reader part number.
Response: See attached revised spec pages.

Question #7
Will customer be providing an access control computer?
Response: Yes.

Question #8
Are security device to integrate into access control system or be stand alone?
Response: See attached spec 283200.

Question #9
No complete access control hardware, strike, electronic lock, maglock, etc. on any door hardware schedule or hardware schedule. Who will be installing hardware?
Response: See attached revised spec page.
Question #10
In section 26-2300, item 1.2 B, Video surveillance system shall integrate with existing monitoring and control system. What is the existing system, and does it have camera licenses and room for new cameras? Also, where is the system located and how will we connect new cameras into the existing system?
Response: See attached revised spec page.

Question #11
In section 26-2300 page 8, item 2.8 and 2.9, IP video system: Are we installing a new video recording head end system, and workstations? Please provide recording specs and storage requirements.
Response: See attached revised spec page.

Question #12
Will any special work hours be required?
Response: Hours will be as required to complete project in the specified timeframe. Contractor to adequately staff project to complete in specified timeframe.

Question #13
On sheet A1.1, items are identified by keynotes, but no indication if they are to be included in the scope of work. Are items #26 Lockers, #27 storage racks and #36 mirrors by GC or OFOI?
Response: The lockers and mirrors are to be CFCI. The storage racks will be OFOI. Keynotes will be updated.

Question #14
There is no keynote for “detention grade” installation instructions. Please provide.
Response: Unclear question. Numerous items are listed as detention grade and must be installed per drawings and specifications.

Question #15
Please provide details for “new 6’ high fencing separating parking areas” on sheet AS1.1.
Response: Notation added to sheet AS1.1 to cover the fencing installation.

Question #16
Drawings state lockers OFCI and previous addendum #2 response to question #13 states lockers and storage racks OFOI. Please clarify.
Response: Keynote updated. Lockers are existing to be relocated from existing CBP facility. They will be OFOI.

Question #17
Will there be an additional site visit for the sub-contractors?
Response: No scheduled sub-contractor site visit will be provided. Contractors and sub-contractors can visit the public areas on the exterior of the building without escort.

Question #18
Please provide deck height for first floor.
Response: Per existing drawings existing first floor elevation is 86’-6” and second floor elevation is 96’-6”. NOTE: All existing dimensions and conditions to be field verified by selected contractor.

Question #19
Is there any scope of work for existing floor trenches? i.e. raceway removal/infill
Response: Information added to sheets DA1.1 and A1.1 to cover the removal and infill of existing floor trenches/raceways.
SPECIFICATIONS

ITEM NO. 1 SPEC SECTION
A. Delete Spec Section 02 8290 and substitute new spec section per Bid Addendum – 02, dated February 06, 2020

ITEM NO. 2 SPEC SECTION
A. Delete Pages 1 and 8 of Spec Section 26 2300 and substitute new spec pages per Bid Addendum – 02, dated February 06, 2020

ITEM NO. 3 SPEC SECTION
A. Delete Pages 5 and 8 of Spec Section 28 1300 and substitute new spec pages per Bid Addendum – 02, dated February 06, 2020

ITEM NO. 4 SPEC SECTION
A. Added Spec Section 28 3200 per Bid Addendum – 02, dated February 06, 2020

DRAWINGS

ITEM NO. 1 DRAWING AS1.1 – ARCHITECTURAL SITE PLAN
A. Delete sheet AS1.1 and substitute new sheet per Bid Addendum – 02, dated February 06, 2020

ITEM NO. 2 DRAWING DA1.1 – FLOOR PLANS - DEMOLITION
A. Delete sheet DA1.1 and substitute new sheet per Bid Addendum – 02, dated February 06, 2020

ITEM NO. 3 DRAWING A1.1 – FLOOR PLANS
A. Delete sheet A1.1 and substitute new sheet per Bid Addendum – 02, dated February 06, 2020

ITEM NO. 4 DRAWING A4.1 – ROOF PLAN
A. Delete sheet A4.1 and substitute new sheet per Bid Addendum – 02, dated February 06, 2020

ITEM NO. 5 DRAWING A9.1 – DOOR AND FRAME SCHEDULE
A. Delete sheet A9.1 and substitute new sheet per Bid Addendum – 02, dated February 06, 2020

ITEM NO. 6 DRAWING A9.2 – DOOR OPERATION DIAGRAM
A. Delete sheet A9.2 and substitute new sheet per Bid Addendum – 02, dated February 06, 2020

ITEM NO. 7 DRAWING E1.1 – POWER PLANS
A. Delete sheet E1.1 and substitute new sheet per Bid Addendum – 02, dated February 06, 2020

ITEM NO. 8 DRAWING E1.2 – FIRST LEVEL AND BASEMENT HVAC POWER PLANS
A. Delete sheet E1.2 and substitute new sheet per Bid Addendum – 02, dated February 06, 2020

ITEM NO. 9 DRAWING E1.3 – ROOF LEVEL HVAC POWER PLAN
A. Delete sheet E1.3 and substitute new sheet per Bid Addendum – 02, dated February 06, 2020

ITEM NO. 10 DRAWING E2.1 – SPECIAL SYSTEMS PLANS
A. Delete sheet E2.1 and substitute new sheet per Bid Addendum – 02, dated February 06, 2020
ITEM NO. 11  DRAWING E2.3 – ACCESS CONTROL PLANS  
A. Delete sheet E2.3 and substitute new sheet per Bid Addendum – 02, dated February 06, 2020

ITEM NO. 12  DRAWING E6.0 – ELECTRICAL PANEL SCHEDULES  
A. Delete sheet E6.0 and substitute new sheet per Bid Addendum – 02, dated February 06, 2020

END OF Bid ADD-02
DN

NEW 12' GATE ARM - KEY ACTIVATED ACCESS

NEW SURFACE MOUNTED TIGER TEETH

6' FENCE SEPARATING PARKING AREAS - FENCE CONSTRUCTION TO BE CHAINLINK WITH 2" OPENINGS, POSTS AT 6' O.C. CAST IN 12" DIA. x 36" DEEP CONCRETE FOOTERS PROVIDE ALL NECESSARY HANGERS AND CHAINLINK SUPPORTS FOR A FULL INSTALLATION

18' - 0" NEW PARKING SPACES W/ STRIPING TO MATCH

20' - 0" 8' - 0" 8' - 0"

20' - 0" 45 DEG. STRIPING FOR NEW ADA PARKING SPACE

NEW ADA PARKING SYMBOL

EXISTING PARKING AREA FOR CBP STAFF PERSONAL VEHICLE PARKING

EXISTING PARKING SPACES FOR CBP GOVERNMENT VEHICLE PARKING AREA

9'-0" PERMANENT AOA FENCING THIS PORTION TO REMAIN AT CONCLUSION OF CONSTRUCTION

35' - 0" 66'-6" ~15'-0"

EXISTING PARKING TO REMAIN EXISTING CROSSWALK STRIPING EXISTING CROSSWALK STRIPING EXISTING CROSSWALK STRIPING ACCESSIBLE ROUTE

7'-0" TEMP. CONSTRUCTION AOA FENCING 10' - 0" 18' - 6" 2' - 0" OVERHANG 5' - 0" 8' - 6"

NEW CROSSWALK STRIPING 10' - 0" 7'-0" TEMP. CONSTRUCTION AOA FENCING

CONTRACTOR PARKING AREA TO BE PROVIDED IN THIS AREA

FENCE DETAILS FROM TAA AIRPORT STANDARDS FOR REFERENCE ONLY TO ASSIST WITH BIDDING. FULL STANDARDS AVAILABLE FROM TAA UPON REQUEST

NOTE: THESE DETAILS APPLY TO THE AOA FENCING ONLY BOTH PERMANENT AND TEMPORARY
SECTION 02 8290

ELECTRIC GATE OPERATORS

PART 1 - GENERAL

1.1 SUMMARY

A. Electric Gate Operators:
   1. Heavy-duty industrial barrier gate operators (LiftMaster Model BG790).

1.2 RELATED SECTIONS

A. Section 03 3000 – Cast-in-Place Concrete: Concrete mounting pads.
B. Section 26 0500 – Common Work Results for Electrical.

1.3 REFERENCES

A. National Electrical Manufacturers Association (NEMA): NEMA ICS 6 - Industrial Control and Systems: Enclosures.
1.4 SUBMITTALS

A. Product Data: Equipment list, system description, electrical wiring diagrams for installation, and manufacturer’s data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

B. Shop Drawings: Submit shop drawings showing layout, profiles, and product components, including anchorage, edge conditions, and accessories.
   1. Operation, installation, and maintenance manuals including wiring diagrams.
   2. Risers, layouts, and special wiring diagrams showing any changes to standard drawings.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle materials and products in strict compliance with manufacturer’s instructions and industry standards.

B. Store products indoors in manufacturer’s original containers and packaging, with labels clearly identifying product name and manufacturer. Protect from damage.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: ISO 9001 Certified Manufacturer.

B. Installer Qualifications: Installation performed by factory authorized contractor specifically trained in gate operation systems of the type found within this section.
   1. Provide documentation of maintenance and repair service availability for emergency conditions.
   2. Provide quarterly maintenance for one year following Substantial Completion of the Project.
2.1 MANUFACTURERS

A. Acceptable Manufacturer: LiftMaster; 845 Larch Avenue; Elmhurst, IL 60126-1196. ASD. Toll-Free: 800.282.6225. Email: specs@LiftMaster.com. Web: LiftMaster.com.

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 GATE OPERATORS

1. Compliance: ETL Listed. Compliant to the UL 325, UL 991 and CSA C22.2 No. 247 standards.
   a. This model is intended for use in Class I, II, III and IV vehicular barrier gate applications.

2. Warranty: 2 years.


4. Gate Arms: 12-foot (7315 mm) wishbone arm with black and white stripes and 2 counterweights.

   a. Accessory Electrical Power Requirements: One, 115V AC.
   b. Accessory Electrical Power Requirements: One, 24V AC.

   a. Accessory Electrical Power Requirements: One, 24V AC.


8. Motor: 1/2 HP, continuous duty.


12. Control Inputs: Control inputs allow the connection of optional external devices like loop detectors, photo eyes, telephone entry systems, access control systems and radio receivers.
13. Limit Settings: Driven limit cams are fully adjustable.


   a. SAMS Limit Switch Modification: Compatible with sequenced access management systems, as a single or pair; compatible with systems with a GL control board.

   b. Timer-to-Close: Programmable module can be set from 1 second to 17 minutes. The unit will automatically close when programmed time has expired.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

   A. Inspect and prepare substrates using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions.

   B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer’s recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.

   C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer’s recommended installation tolerances and conditions.

3.2 INSTALLATION

   A. Install in accordance with manufacturer’s instructions. Test for proper operation and adjust until satisfactory results are obtained.

3.3 PROTECTION

   A. Protect installed products until completion of project.

   B. Touch-up, repair or replace damaged products before Substantial Completion.

   END OF SECTION
SECTION 26 2300 – VIDEO SURVEILLANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes a video surveillance system consisting of cameras and data transmission wiring.

B. Video surveillance system shall be integrated with existing TAA monitoring and control system which is network based with existing TAA Software.

1.3 DEFINITIONS

A. AGC: Automatic gain control.

B. BNC: Bayonet Neill-Concelman - type of connector.

C. CCD: Charge-coupled device.

D. FTP: File transfer protocol.

E. IP: Internet protocol.

F. LAN: Local area network.

G. MPEG: Moving picture experts group.

H. NTSC: National Television System Committee.

I. PTZ: Pan-tilt-zoom

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C. Mounting Brackets for Fixed Cameras: Type matched to items supported and mounting conditions. Include manual pan-and-tilt adjustment.

2.8 IP VIDEO SYSTEMS

A. MFR: Pelco

B. Description:

1. System shall provide high-quality delivery and processing of IP-based video, audio, and control data using standard Ethernet-based networks.
2. System shall have seamless integration of all video surveillance and control functions.
3. Graphical user interface software shall manage all IP-based video matrix switching and camera control functions, two-way audio communication, alarm monitoring and control, and recording and archive/retrieval management. IP system shall also be capable of integrating into larger system environments.
4. System design shall include all necessary compression software for high-performance, dual-stream, MPEG-2/MPEG-4 video. Unit shall provide connections for all video cameras, camera PTZ control data, bidirectional audio, discreet sensor inputs, and control system outputs.
5. All camera signals shall be compressed, encoded, and delivered onto the network for processing and control by the IP video-management software.
6. Camera system units shall be ruggedly built and designed for extreme adverse environments, complying with NEMA Type environmental standards.
7. Encoder/decoder combinations shall place video, audio, and data network stream that can be managed from multiple workstations on the user's LAN or WAN.
8. All system interconnect cables, workstation PCs, PTZ joysticks, and network intermediate devices shall be provided for full performance of specified system.
9. **Video recording is existing for TAA cameras at TAA MDF room and existing for CBP cameras at Denver CBPHQ**

2.9 CONTROL STATIONS

A. Description: Heavy-duty, freestanding, modular, metal furniture units arranged to house electronic equipment. Coordinate component arrangement and wiring with components and wiring of other systems.

B. Equipment Mounting: Standard 19-inch (483-mm) rack complying with CEA 310-E.
1. Store in temperature- and humidity-controlled environment in original manufacturer's sealed containers. Maintain ambient temperature between 50 and 85 deg F, and not more than 80 percent relative humidity, noncondensing.

2. Open each container; verify contents against packing list; and file copy of packing list, complete with container identification, for inclusion in operation and maintenance data.

3. Mark packing list with the same designations assigned to materials and equipment for recording in the system labeling schedules that are generated by software specified in "Cable and Asset Management Software" Article.

4. Save original manufacturer's containers and packing materials and deliver as directed under provisions covering extra materials.

1.10 PROJECT CONDITIONS

A. Environmental Conditions: System shall be capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:

1. Control Station: Rated for continuous operation in ambient conditions of 60 to 85 deg F and a relative humidity of 20 to 80 percent, noncondensing.

2. Indoor, Controlled Environment: NEMA 250, Type 1 enclosure. System components, except the central-station control unit, installed in air-conditioned indoor environments shall be rated for continuous operation in ambient conditions of 36 to 122 deg F dry bulb and 20 to 90 percent relative humidity, noncondensing.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Altronix AL600ULMB power supplies

B. Ademco, Radionics, Caddx, or DMP controller

C. HID 921PTNNEK001V keypad cardreader

D. Sentrol SR 2505A-L magnetic switch

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2. Electrical characteristics of controllers shall match the signal and power requirements of door hardware.

2.4 CONTROLLERS

A. Controllers: Intelligent peripheral control unit, complying with UL 294, that stores time, date, valid codes, access levels, and similar data downloaded from the central station or workstation for controlling its operation.

B. Subject to compliance with requirements in this article, manufacturers may use multipurpose controllers.

C. Battery Backup: Sealed, lead acid; sized to provide run time during a power outage of 90 minutes, complying with UL 924.

D. Alarm Annunciation Controller:

1. The controller shall automatically restore communication within 10 seconds after an interruption with the field device network, with dc line supervision on each of its alarm inputs.

   a. Inputs: Monitor dry contacts for changes of state that reflect alarm conditions. Provides at least eight alarm inputs, which are suitable for wiring as normally open or normally closed contacts for alarm conditions.

   b. Alarm-Line Supervision:

      1) Supervise the alarm lines by monitoring each circuit for changes or disturbances in the signal, and for conditions as described in UL 1076 for line security equipment y monitoring for abnormal open, grounded, or shorted conditions using dc change measurements. System shall initiate an alarm in response to an abnormal current, which is a dc change of [5] [10] percent or more for longer than 500 ms.

      2) Transmit alarm-line-supervision alarm to the central station during the next interrogation cycle after the abnormal current condition.

   c. Outputs: Managed by central-station software.


2.5 CARD READERS, CREDENTIAL CARDS, AND KEYPADS

A. Manufacturer and Model: HID 921PTNNEK001V
SECTION 283200 - INTRUSION DETECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes intrusion detection with communication links to perform monitoring, alarm, and control functions.

1.2 DEFINITIONS

A. Control Unit: System component that monitors inputs and controls outputs through various circuits.

B. Master Control Unit: System component that accepts inputs from other control units and may also perform control-unit functions. The unit has limited capacity for the number of protected zones and is installed at an unattended location or at a location where it is not the attendant's primary function to monitor the security system.

C. Standard-Intruder Movement: Any movement, such as walking, running, crawling, rolling, or jumping, of a "standard intruder" in a protected zone.

1.3 ACTION SUBMITTALS

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

B. Shop Drawings: Detail assemblies of standard components that are custom assembled for specific application on this Project.
   1. Site and Floor Plans: Indicate final outlet and device locations, routing of raceways, and cables inside the building.
   2. Master Control-Unit Console Layout: Show required artwork and device identification.
   3. Device Address List: Coordinate with final system programming.
   4. System Wiring Diagrams: Include system diagrams unique to Project. Show connections for all devices, components, and auxiliary equipment. Include diagrams for equipment and for system with all terminals and interconnections identified.
   5. Details of surge-protection devices and their installation.

C. Design Data: Include method of operation and supervision of each component and each type of circuit. Show sequence of operations for manually and automatically initiated system or equipment inputs. Description must cover this specific Project; manufacturer's standard descriptions for generic systems are unacceptable.
1.4 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

B. Product Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Intrusion Detection Devices: Furnish quantity equal to five percent of the number of units of each type installed, but no fewer than one of each type.

2. Fuses: Three of each kind and size.

3. Tool Kit: Provide two sets of tools for use with security fasteners, each packaged in a compartmented kit configured for easy handling and storage.

4. Security Fasteners: Furnish no fewer than 1 box for every 50 boxes or fraction thereof, of each type and size of security fastener installed.

1.7 PROJECT CONDITIONS

A. Environmental Conditions: Capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:

1. Altitude: Sea level to 2600 feet.

2. Master Control Unit: Rated for continuous operation in an ambient of 60 to 85 deg F and a relative humidity of 20 to 80 percent, noncondensing.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer and Installer agree to repair or replace components of intrusion detection devices and equipment that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.
PART 2 - PRODUCTS

2.1 FUNCTIONAL DESCRIPTION OF SYSTEM

A. Description: Hard wired, modular, microprocessor-based controls, intrusion sensors and detection devices, and communication links to perform monitoring, alarm, and control functions.

B. Supervision: System components shall be continuously monitored for normal, alarm, supervisory, and trouble conditions. Indicate deviations from normal conditions at any location in system. Indication includes identification of device or circuit in which deviation has occurred and whether deviation is an alarm or malfunction.

1. Alarm Signal: Display at master control unit and actuate audible and visual alarm devices.
2. Trouble Condition Signal: Distinct from other signals, indicating that system is not fully functional. Trouble signal shall indicate system problems such as battery failure, open or shorted transmission line conductors, or control-unit failure.
3. Supervisory Condition Signal: Distinct from other signals, indicating an abnormal condition as specified for the particular device or control unit.

C. System Control: Master control unit shall directly monitor intrusion detection units and connecting wiring.

D. System shall automatically reboot program without error or loss of status or alarm data after any system disturbance.

E. Operator Commands:

1. Help with System Operation: Display all commands available to operator. Help command, followed by a specific command, shall produce a short explanation of the purpose, use, and system reaction to that command.
2. Acknowledge Alarm: To indicate that alarm message has been observed by operator.
3. Place Protected Zone in Access: Disable all intrusion-alarm circuits of a specific protected zone. Tamper circuits may not be disabled by operator.
4. Place Protected Zone in Secure: Activate all intrusion-alarm circuits of a protected zone.
5. Protected Zone Test: Initiate operational test of a specific protected zone.
7. Print reports.

F. Timed Control at Master Control Unit: Allow automatically timed "secure" and "access" functions of selected protected zones.

G. Printed Record of Events: Print a record of alarm, supervisory, and trouble events on system printer. Sort and report by protected zone, device, and function. When master control unit receives a signal, print a report of alarm, supervisory, or trouble condition. Report type of signal (alarm, supervisory, or trouble), protected zone description, date, and time of occurrence. Differentiate alarm signals from other indications. When system is reset, report reset event with the same information concerning device, location, date, and time. Commands shall initiate the
reporting of a list of current alarm, supervisory, and trouble conditions in system or a log of past events.

H. Response Time: Two seconds between actuation of any alarm and its indication at master control unit.

I. Circuit Supervision: Supervise all signal and data transmission lines, links with other systems, and sensors from master control unit. Indicate circuit and detection device faults with both protected zone and trouble signals, sound a distinctive audible tone, and illuminate an LED. Maximum permissible elapsed time between occurrence of a trouble condition and indication at master control unit is 20 seconds. Initiate an alarm in response to opening, closing, shorting, or grounding of a signal or data transmission line.

J. Programmed Secure-Access Control: System shall be programmable to automatically change status of various combinations of protected zones between secure and access conditions at scheduled times. Status changes may be preset for repetitive, daily, and weekly; specially scheduled operations may be preset up to a year in advance. Manual secure-access control stations shall override programmed settings.

K. Manual Secure-Access Control: Coded entries at manual stations shall change status of associated protected zone between secure and access conditions.

2.2 SYSTEM COMPONENT REQUIREMENTS

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

B. Control Units, Devices, and Communications with Monitoring Station: Listed and labeled by a qualified testing agency for compliance with SIA CP-01.

C. FM Global Compliance: FM-Approved and -labeled intrusion detection devices and equipment.

D. Comply with NFPA 70.

E. Surge Protection: Protect components from voltage surges originating external to equipment housing and entering through power, communication, signal, control, or sensing leads. Include surge protection for external wiring of each conductor entry connection to components.


2. Minimum Protection for Communication, Signal, Control, and Low-Voltage Power Lines: Listed and labeled by a qualified testing agency for compliance with NFPA 731.

F. Intrusion Detection Units: Listed and labeled by a qualified testing agency for compliance with UL 639.
G. **Interference Protection:** Components shall be unaffected by radiated RFI and electrical induction of 15 V/m over a frequency range of 10 to 10,000 MHz and conducted interference signals up to 0.25-V rms injected into power supply lines at 10 to 10,000 MHz.

H. **Tamper Protection:** Tamper switches on detection devices, control units, annunciators, pull boxes, junction boxes, cabinets, and other system components shall initiate a tamper-alarm signal when unit is opened or partially disassembled and when entering conductors are cut or disconnected. Master control-unit alarm display shall identify tamper alarms and indicate locations.

I. **Self-Testing Devices:** Automatically test themselves periodically, but not less than once per hour, to verify normal device functioning and alarm initiation capability. Devices transmit test failure to master control unit.

J. **Antimasking Devices:** Automatically check operation continuously or at intervals of a minute or less, and use signal-processing logic to detect blocking, masking, jamming, tampering, or other operational dysfunction. Devices transmit detection of operational dysfunction to master control unit as an alarm signal.

2.3 **ENCLOSURES**

A. **Interior Sensors:** Enclosures that protect against dust, falling dirt, and dripping noncorrosive liquids.

B. **Interior Electronics:** NEMA 250, Type 12.

C. **Screw Covers:** Where enclosures are readily accessible, secure with security fasteners of type appropriate for enclosure.

2.4 **SECURE AND ACCESS DEVICES**

A. **Keypad and Display Module:** Arranged for entering and executing commands for system-status changes and for displaying system-status and command-related data.

B. **Key-Operated Switch:** Change protected zone between secure and access conditions.

2.5 **DOOR AND WINDOW SWITCHES**

A. **Description:** Balanced-magnetic switch, complying with UL 634, installed on frame with integral overcurrent device to limit current to 80 percent of switch capacity. Bias magnet and minimum of two encapsulated reed switches shall resist compromise from introduction of foreign magnetic fields.

B. **Flush-Mounted Switches:** Unobtrusive and flush with surface of door and window frame.
2.6 PIR SENSORS

A. Listed and labeled by a qualified testing agency for compliance with SIA PIR-01.

B. Description: Sensors detect intrusion by monitoring infrared wavelengths emitted from a human body within their protected zone and by being insensitive to general thermal variations.

1. Wall-Mounted Unit Maximum Detection Range: 125 percent of indicated distance for individual units and not less than 50 feet
2. Ceiling-Mounted Unit Spot-Detection Pattern: Full 360-degree conical.
3. Ceiling-Mounted Unit Pattern Size: 84-inch diameter at floor level for units mounted 96 inches above floor; 18-foot diameter at floor level for units mounted 25 feet above floor.

C. Device Performance:

1. Sensitivity: Adjustable pattern coverage to detect a change in temperature of 2 deg F or less, and standard-intruder movement within sensor's detection patterns at any speed between 0.3 to 7.5 fps across two adjacent segments of detector's field of view.
2. Test Indicator: LED test indicator that is not visible during normal operation. When visible, indicator shall light when sensor detects an intruder. Locate test enabling switch under sensor housing cover.

2.7 ACOUSTIC-TYPE, GLASS-BREAK SENSORS

A. Listed and labeled by a qualified testing agency for compliance with SIA GB-01.

B. Device Performance: Detect unique, airborne acoustic energy spectrum caused by breaking glass.

1. Sensor Element: Microprocessor-based, digital device to detect breakage of plate, laminate, tempered, and wired glass while rejecting common causes of false alarms. Detection pattern shall be at least a 20-foot range.
2. Hookup Cable: Factory installed, not less than 72 inches.
3. Activation Indicator: LED on sensor housing that lights when responding to vibrations, remaining on until manually reset at sensor control unit or at master control unit.
4. Control Unit: Integral with sensor housing or in a separate assembly, locally adjustable by control under housing cover.
5. Glass-Break Simulator: A device to induce frequencies into protected glass pane that simulate breaking glass without causing damage to glass.

2.8 MASTER CONTROL UNIT

A. Honeywell, Bosh, Caddx, or DMP

B. Description: Supervise sensors and detection subsystems and their connecting communication links, status control (secure or access) of sensors and detector subsystems, activation of alarms and supervisory and trouble signals, and other indicated functions.
1. System software and programs shall be held in flash electrically erasable programmable read-only memory (EEPROM), retaining the information through failure of primary and secondary power supplies.
2. Include a real-time clock for time annotation of events on the event recorder and printer.
3. Control circuits for operation of mechanical equipment in response to an alarm.

C. Construction: Wall mounted, modular, with separate and independent alarm and supervisory system modules. Alarm-initiating protected zone boards shall be plug-in cards. Arrangements that require removal of field wiring for module replacement are unacceptable.

D. Comply with UL 2050

E. Console Controls and Displays: Arranged for interface between human operator at master control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.
   1. Annunciator and Display: LCD, three line(s) of 80 characters, minimum.
   2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.
   3. Control-Unit Network: Automatic communication of alarm, status changes, commands, and other communications required for system operation. Communication shall return to normal after partial or total network interruption such as power loss or transient event. Total or partial signaling network failures shall identify the failure and record the failure at the annunciator display and at the system printer.
   4. Field Device Network: Communicate between the control unit and field devices of the system. Communications shall consist of alarm, network status, and status and control of field-mounted processors. Each field-mounted device shall be interrogated during each interrogation cycle.
   5. Operator Controls: Manual switches and push-to-test buttons that do not require a key to operate. Prevent resetting of alarm, supervisory, or trouble signals while alarm or trouble condition persists. Include the following:
      a. Acknowledge alarm.
      b. Silence alarm.
      c. System reset.
      d. LED test.
   6. Timing Unit: Solid state, programmable, 365 days.
   7. Confirmation: Relays, contactors, and other control devices shall have auxiliary contacts that provide confirmation signals to system for their on or off status. Software shall interpret such signals, display equipment status, and initiate failure signals.
   8. Alarm Indication: Audible signal sounds and an LED lights at master control unit identifying the protected zone originating the alarm. Annunciator panel displays a common alarm light and sounds an audible tone.
   9. Alarm Indication: Audible signal sounds and a plain-language identification of the protected zone originating the alarm appears on LCD display at master control unit. Annunciator panel displays a common alarm light and sounds an audible tone.
  10. Alarm activation sounds a siren.
F. Protected Zones: Quantity of alarm and supervisory zones as indicated, with capacity for expanding number of protected zones by a minimum of 25 percent.

G. Power Supply Circuits: Master control units shall provide power for remote power-consuming detection devices. Circuit capacity shall be adequate for at least a 25 percent increase in load.

H. Cabinet: Lockable, steel enclosure arranged so operations required for testing, normal operation, and maintenance are performed from front of enclosure. If more than a single cabinet is required to form a complete control unit, provide exactly matching modular enclosures. Accommodate all components and allow ample gutter space for field wiring. Identify each enclosure by an engraved, laminated, phenolic-resin nameplate. Lettering on enclosure nameplate shall not be less than 1 inch high. Identify, with permanent labels, individual components and modules within cabinets.

I. Transmission to Monitoring Station: A communications device to automatically transmit alarm, supervisory, and trouble signals to the monitoring station, operating over a standard voice grade telephone leased line. Comply with UL 1635.

J. Printout of Events: On receipt of signal, print alarm, supervisory, and trouble events. Identify zone, device, and function. Include type of signal (alarm, supervisory, or trouble) and date and time of occurrence. Differentiate alarm signals from all other printed indications. Also print system reset event, including same information for device, location, date, and time. Commands initiate the printing of a list of existing alarm, supervisory, and trouble conditions in the system and a historical log of events.

2.9 AUDIBLE AND VISUAL ALARM DEVICES

A. Siren: 30-W speaker with siren driver, rated to produce a minimum sound output of 103 dB at 10 feet from master control unit.

B. Strobe: Xenon light complying with UL 1638, with a clear polycarbonate lens.
   1. Light Output: 115 cd, minimum.
   2. Flash Rate: 60 per minute.

2.10 SECURITY FASTENERS

A. Operable only by tools produced for use on specific type of fastener by fastener manufacturer or other licensed fabricator. Drive system type, head style, material, and protective coating as required for assembly, installation, and strength.

B. Drive System Types: Pinned Torx
PART 3 - EXECUTION

3.1 SYSTEM INSTALLATION

A. Comply with UL 681 and NFPA 731.

B. Install wall-mounted equipment, with tops of cabinets not more than 72 inches above the finished floor.

C. Security Fasteners: Where accessible to inmates, install intrusion detection components using security fasteners with head style appropriate for fabrication requirements, strength, and finish of adjacent materials except that a maximum of two different sets of tools shall be required to operate security fasteners for Project. Provide stainless-steel security fasteners in stainless-steel materials.

3.2 WIRING INSTALLATION

A. Wiring Method: Install wiring in metal raceways according to Section 270528 "Pathways for Communications Systems." Conceal raceway except in unfinished spaces and as indicated. Minimum conduit size shall be 1/2 inch, Control and data transmission wiring shall not share conduit with other building wiring systems.

B. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points. Use lacing bars and distribution spools. Separate power-limited and non-power-limited conductors as recommended in writing by manufacturer. Install conductors parallel with or at right angles to sides and back of enclosure. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with intrusion system to terminal blocks. Mark each terminal according to system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.

C. Wires and Cables:

1. Conductors: Size as recommended in writing by system manufacturer unless otherwise indicated.

2. 120-V Power Wiring: Install according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables" unless otherwise indicated.

D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

E. Install power supplies and other auxiliary components for detection devices at control units unless otherwise indicated or required by manufacturer. Do not install such items near devices they serve.
3.3 GROUNDING

A. Ground the master control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to master control unit.

B. Ground system components and conductor and cable shields to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.

C. Signal Ground Terminal: Locate at main equipment rack or cabinet. Isolate from power system and equipment grounding. Provide 5 -ohm ground. Measure, record, and report ground resistance.

3.4 FIELD QUALITY CONTROL

A. Pretesting: After installation, align, adjust, and balance system and perform complete pretesting to determine compliance of system with requirements in the Contract Documents. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new ones and retest until satisfactory performance and conditions are achieved. Prepare forms for systematic recording of acceptance test results.

1. Report of Pretesting: After pretesting is complete, provide a letter certifying that installation is complete and fully operable; include names and titles of witnesses to preliminary tests.

B. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections: Comply with provisions in NFPA 731, Ch. 9, "Testing and Inspections."

1. Inspection: Verify that units and controls are properly labeled and interconnecting wires and terminals are identified.

D. Documentation: Comply with provisions in NFPA 731, Ch. 4, "Documentation."

E. Tag all equipment, stations, and other components for which tests have been satisfactorily completed.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain the intrusion detection system. Comply with documentation provisions in NFPA 731, Ch. 4, "Documentation and User Training."

END OF SECTION 283100