

Exhibit 1-B
Additional Requested Elements

B.1 ARE #1 - Protection of Power Circuits for Fire Alarm and CCTV

~~A.1.1~~B.1.1 ~~Related Documents~~

ARE #1s shall ~~follow~~be completed in accordance with the ~~requirements of the~~ Contract Requirements.

~~A.1.2~~B.1.2 ~~Summary~~Scope of Work

The Contractor shall complete all additional Work necessary to resolve the power surges causing outages with the existing FFSS and CCTV systems at the EJMT. The Contractor shall design and construct a way of eliminating this issue consisting of ~~General scope of work includes:~~

~~The site has had issues with power surges causing outages with the FFSS and CCTV systems. P~~power conditioners or another technical solution ~~is needed~~ to ensure better resiliency and reliability for power to the systems. All new equipment must be compatible with the existing equipment. It is recommended to provide a Programmable Logic Controller (PLC), manufactured by Stormin Protection Products, Inc., or approved equal, as well as replacement and upgrades to the existing Uninterruptible Power Supplies associated with the Fire Alarm and CCTV systems, including all workstations and power to all control equipment. See Fixed Fire Suppression System As-Builts in Reference Documents for information on existing systems.

~~A.1.3~~ ~~Definitions~~

~~A. FFSS - Fixed Fire Suppression System~~

~~B. CCTV - Closed Circuit Television~~

B.1.3 Applicable Standards

A. 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.

B. Comply with NFPA 70.

C. Comply with NFPA 72.

~~A.1.4~~B.1.4 ~~Action~~Submittals

Submittals shall be prepared, Reviewed, and submitted in accordance with the requirements set forth in Book 2, Section 3. The Contractor shall submit the following items for ARE #1 to CDOT:

A. Bill of Materials: A listing shall include all panels, racks, instruments, components, and devices provided under this section.

B. Product Data: Drawings and descriptive (catalog) data and brochures of each item of equipment including technical data sheets for all equipment and components.

~~B.C.~~ ARE #1 SCADA Integration Plan and Report: Shall follow the requirements of Book 2 Section 14.

~~A.1.5~~ B.1.5 Shop Drawings

Shop Drawings shall be prepared, Reviewed, and submitted in accordance with the Contract Requirements. The Contractor shall submit the following items for ARE #1 to CDOT:

A. Detail equipment assemblies, method of field assembly, components, and location and size of each field connection.

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

~~A.1.6~~ Quality Assurance

~~A. Installer Qualifications: Minimum 5 years of experience in the design and installation of fire alarm and CCTV systems. Factory trained by Edwards Systems Technology and Aviligon in the design and installation of the associated systems.~~

~~1. Maintenance Proximity: Not more than two (2) hours' normal travel time from Installer's place of business to Project site.~~

~~B. 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.~~

~~C. Comply with NFPA 70.~~

~~D. Comply with NFPA 72.~~

~~A.1.7~~ B.1.6 Training Demonstration

The Contractor shall provide training to CDOT maintenance personnel on the ARE #1 Work elements by an Eexperienced system designer or installer to train Owner's maintenance personnel. The Owner's training shall consist of two (2), four (4) hour trainings with Owner's CDOT's Maintenance and O operations pPersonnel at the EJMT or an alternate location Approved by CDOT. The Ttraining dates tshall be coordinated with CDOT Maintenance and Operations Staff to occur after tTesting and Ccommissioning of the systems is completed.

A.1.8B.1.7 Operation and Maintenance Manuals

The Contractor shall provide two (2) hard copy sets and one (1) digital copy of operation and maintenance manuals and supporting documents. Include final as-built wiring interconnect diagrams, product data sheets, installation manuals, recommended spare parts list, and routine inspection, testing and maintenance procedures in the submittal.

B.1.8 Deliverables

At a minimum, the Contractor shall submit the following to CDOT for Review, Approval, or Acceptance:

Table AB.1 ARE #1 Deliverables by the Contractor

<u>Deliverable</u>	<u>Review, Acceptance, or Approval</u>	<u>Schedule</u>
<u>Submittals and Shop Drawings</u>	<u>Review</u>	<u>Prior to Construction</u>
<u>ARE #1 - SCADA Integration Plan</u>	<u>Approval</u>	<u>Within 90 days prior to integration</u>
<u>ARE #1 - SCADA Integration Report</u>	<u>Acceptance</u>	<u>Within 30 days after integration</u>
<u>Training materials</u>	<u>Review</u>	<u>At training sessions</u>
<u>Operation and Maintenance Manuals</u>	<u>Review</u>	<u>Prior to Substantial Project Completion</u>
<u>Training materials</u>	<u>Review</u>	<u>At training sessions</u>
		<u>Project</u>

A.2B.2 ARE #2 - Label Manholes and Walls for Ease of Maintenance Access with Signage

B.2.1 Related Documents

ARE #2 shall be completed in accordance with the Contract Requirements.

B.2.2 ~~Reserved~~ Summary Scope of Work

The Contractor shall perform all additional Work necessary to Label the manholes and walls within the EJMT with signage for ease of CDOT maintenance access with signage. The Contractor shall locate all manholes along both tunnels and prepare 100 - 6"x6" signs that meet the CDOT Standard Specifications for aluminum backing and retroreflective sheeting to identify the location of each manhole. Signage shall in be in accordance with the CDOT Standard Specifications for aluminum backing and retroreflective sheeting. These signs wouldshall be anchored to the existing wall panels immediately adjacent to the manholes. Any remaining signs not installed in the tunnels wouldshall be givenprovided to CDOT for use maintenance-as sparesreplacements.

B.2.3 Deliverables

Reserved.

A.3.B.3 ARE #3 - Update Fire Alarm System Custom Label Programming

A.3.1B.3.1 Related Documents

~~AREs #3 shall follow the requirements of the Contract. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Book 1, Book 3, Controls and Instrumentation and System Commissioning apply to this section.~~

B.3.2 Applicable Standards

A. Comply with NFPA 72.

~~—Applicable Standards~~

~~—Comply with NFPA 72.~~

A.3.2B.3.3 Summary Scope of Work

~~The Contractor shall perform all additional Work necessary to General scope of work includes:~~

~~Provide programming to update the existing zone and device descriptions in the **fixed fire suppression** FFSS control equipment and graphical workstations to align with the current tunnel zone naming conventions, ~~to be provided~~ used by CDOT. All graphical maps and descriptions in the workstations are to be updated by the Contractor. Upon completion of the programming, the Contractor shall perform field verification testing of each zone and all associated devices by simulating alarm conditions through the LIOS linear heat detection system and operation of all valves, switches, ~~ete~~ and supporting infrastructure, for each deluge zone.~~

A.3.3 Definitions

~~A. CDOT - Colorado Department of Transportation~~

~~B. LIOS - Manufacturer name, LIOS Technologies~~

A.3.4B.3.4 Action Submittals

~~Submittals shall be prepared, Reviewed, and submitted in accordance with the requirements set forth in Book 2, Section 3. The Contractor shall submit the following items for ARE #3 to CDOT:~~

A. Custom Point Description List: Provide a list showing the new custom descriptions with associated address prior to programming.

B. Testing Plan and Schedule: Provide a schedule and method of testing the system after programming is complete.

C. Provide electronic copy of fire alarm system program.

D. Provide electronic and hard copy of fire alarm system points list.

~~A.3.5~~ **B.3.5 Shop Drawings**

Shop Drawings shall be prepared, Reviewed, and submitted in accordance with the Contract Requirements. The Contractor shall submit the following items for ARE #3 to CDOT:

A. Provide drawings showing the correlation of the zones with the custom labels.

~~A.3.6~~ **Quality Assurance**

~~A. Installer Qualifications: Minimum 5 years of experience in the programming of Edwards System Technology fire alarm systems. Factory trained by Edwards Systems Technology.~~

~~B. Comply with NFPA 72.~~

~~A.3.7~~ **B.3.6 Demonstration Training**

The Contractor shall provide training to CDOT maintenance personnel on the ARE #3 Work elements by an experienced system designer or installer. The training shall include demonstrating the programming changes during testing with CDOT's maintenance and operations personnel at the EJMT or an alternate location Approved by CDOT. The training dates shall be coordinated with CDOT.

B.3.7 Deliverables

At a minimum, the Contractor shall submit the following to CDOT for Review, Approval, or Acceptance:

~~Demonstrate program changes during testing to CDOT personnel.~~

Table AB.3 ARE #3 Deliverables by the Contractor

<u>Deliverable</u>	<u>Review, Acceptance, or Approval</u>	<u>Schedule</u>
<u>Submittals and Shop Drawings</u>	<u>Review</u>	<u>Prior to Construction</u>
<u>Custom Point Description List</u>	<u>Review</u>	<u>Prior to Construction</u>
<u>Testing Plan and Schedule</u>	<u>Review</u>	<u>30 Days prior to testing</u>

<u>Deliverable</u>	<u>Review, Acceptance, or Approval</u>	<u>Schedule</u>
<u>Electronic Copy of Fire Alarm Programing</u>	<u>Review</u>	<u>Prior to SubstantialProject Completion</u>
<u>Electronic Copy of Fire Alarm Points List</u>	<u>Review</u>	<u>Prior to SubstantialProject Completion</u>
<u>Training documents</u>	<u>Review</u>	<u>At training session</u>

~~A.3.8 — Operation and Maintenance Manuals~~

~~Provide electronic copy of fire alarm system program. Provide electronic and hard copy of fire alarm system points list.~~

A.4B.4 ARE #4 - Electric System Analog to Digital Conversion

B.4.1 Related Documents

ARE #4 shall follow the requirements of the Contract.

B.4.2 Applicable Standards

A. International Electrical Testing Association:

1. NETA ATS - Acceptance Testing Specifications

B. National Fire Protection Association:

1. NFPA 502 - Standard for Road Tunnels, Bridges, and Other Limited Access Highways
2. NFPA 70 - National Electric Code

~~A.4.1 — Related Documents~~

~~AREs shall follow the requirements of the Contract. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Book 1, Book 3, Controls and Instrumentation and System Commissioning apply to this section.~~

~~A.4.2B.4.3 SummarScope of Worky~~

~~The Contractor shall perform all additional Work necessary to General scope of work includes but is not limited to:~~

~~c~~Converting the remaining electrical system analog monitoring and controls to digital on both west and east electrical 24.9kV, 2400V and 480V systems. Parts of the electric systems have been converted to or installed as digital on past CDOT projects. ~~This project~~ The Contractor will complete the system conversion to be fully digital and capable of being monitored and controlled ~~from by the TCDOT unnel Operators operations and~~

maintenance staff in the EJMT Control Room. The new digital system shall be fully integrated and compatible with the existing digital hardware, software, and firmware. The existing hardware, software and firmware shall be upgraded as required. The existing Power Control Board (PCB) is located in the East Ventilation Building EJMT Control Room. At Project Completion, the PCB shall no longer be required and ~~not~~ used and shall be removed by the Contractor. ~~Existing Power Control Board is shown in Reference Documents. The~~ Contractor shall repair the area building elements impacted by this Work to match existing room finishes. The existing PCB is shown in Reference Documents.

The additional Work shall include the following elements and any associated infrastructure required for the Work to perform as intended:

Specific scope of work includes but is not limited to:

- 1) Create a new communications tie between East and West Switchboards through the SCADA system. Existing CDOT fiber is available for interconnection. Contractor shall submit a fiber allocation request to CDOT.
- 2) The SCADA system shall display/monitor status of breakers and give Open / Close commands.
- 3) Assign I.P. addresses to the PXG900 Gateway and test system functionality of breakers.
- 4) Check position signals on all breakers and Open / Close command to spare breakers.
- 5) West Electric Room - Convert remaining (8) eight 480V circuit breakers in 3000Amp Switchgear from DIGITrip 5520 to model equal to DIGITrip 1150 units capable of digital control and monitoring.
- 6) East Electric Room - Install an EATON PXG900 Gateway device.
- 7) East Electric Room - Convert (~~2146~~) sixteen-twenty-one 480V circuit breakers in 300Amp Switchgear from Eaton DIGITrip 5520 to model equal to DIGITrip 1150 units capable of digital control and monitoring.
- 8) East and West Electric Room - Remove retired-in-place MP3000 motor protection relays and all associated wiring and equipment. Provide and install new doors / front covers.
- 9) East and West Portal - Replace analog counters / timers on south tunnel fans with digital electronic timers to record motor run times. New timers shall be connected to existing SCADA system. Provide SCADA system upgrades as required.
- 10) West Electric Room - Existing 2400V Switchgear consist of (5) five breakers with Siemens Siprotec 4 relays. Breakers consist of (2) two mains, tie and (2) two feeder. Contractor shall integrate digital control and monitoring functions of each breaker into the SCADA system. Provide SCADA system upgrades as required. Remove existing analog controls.
- 11) East Electric Room - Existing 2400V Switchgear consist of (5) five breakers with Siemens Siprotec 4 relays. Breakers consist of (2) two mains, tie and (2) two feeder. Contractor shall integrate digital control and monitoring functions of each

- breaker into the SCADA system. Provide SCADA system upgrades as required. Remove existing analog controls.
- 12) Remove existing Power Control Board (PCB) and reconfiguration of remaining functions.
- i. Manual Traffic Counts - existing Wavetronix System. Data is recorded digitally then converted to analog. Function to be removed from PCB. Contractor to provide and install a CAT 6 cable from the Wavetronix Control Panel in East Electric Room to PLC and integrate traffic count data into East Control Room operator's station. Coordinate with CDOT.
 - ii. East/West existing Generator Controls - Function to be removed when the two existing 500kW generators are removed.
 - iii. East/West Plaza DC Lighting Resets - Contractor shall integrate function into PLC / SCADA system. Existing wiring shall be modified / rerouted to PLC. Coordinate with CDOT Maintenance & Operations.
 - iv. East/West 25kV System Incoming Power Gauges - This is duplicate information. Digital information is already on the PLC / SCADA system. Analog equipment to be removed with PCB.
 - v. East/West Supply/Exhaust fan amperage gauges - This is duplicate information. Digital information is already on the PLC / SCADA system. Analog equipment to be removed with PCB. Contractor shall program the SCADA system to be display motor information on a separate screen/page at Operator's Monitor.
- 13) Contractor shall provide and install a complete, fully functional new operator's SCADA workstation in east control room. Workstation shall be capable of running all SCADA programs as directed by CDOT Maintenance & Operations. Workstation shall include at minimum: CPU, keyboard, mouse, (4) Four 4K LED HD Monitors (32" min), adjustable monitor mounting brackets, UPS unit and adjustable height workstation desk. Equipment shall be compatible with existing CDOT hardware and software systems.

~~A.4.3 — Definition~~

- ~~A. CDOT - Colorado Department of Transportation~~
- ~~B. EJMT - Eisenhower Johnson Memorial Tunnel~~

~~A.4.4 — References~~Applicable Standards

~~A. International Electrical Testing Association:~~

- ~~1. NETA ATS - Acceptance Testing Specifications~~

~~B. A. National Fire Protection Association:~~

- ~~1. NFPA 502 - Standard for Road Tunnels, Bridges, and Other Limited Access Highways~~

~~2.1. NEPA 70 National Electric Code~~

~~A.4.5B.4.4~~ **Action Submittals**

Submittals shall be prepared, Reviewed, and submitted in accordance with the requirements set forth in Book 2, Section 3. The Contractor shall submit the following items for ARE #4 to CDOT:

- A. Bill of Materials: A listing shall include all panels, racks, instruments, components, and devices provided under this section.
- B. Product Data: Drawings and descriptive (catalog) data and brochures of each item of equipment including technical data sheets for all equipment and components.
- B.C. Digital Monitoring and Control System SCADA Integration Plan and Report shall follow the requirements of Book 2 Section 14.

~~A.4.6B.4.5~~ **Shop Drawings**

Shop Drawings shall be prepared, Reviewed, and submitted in accordance with the Contract Requirements. The Contractor shall submit the following items for ARE #4 to CDOT:

- A. Detail equipment assemblies, method of field assembly, components, and location and size of each field connection.
- B. Wiring Diagrams: Power, signal, and control wiring

~~Deliverables by the Contractor~~

Deliverable	Review, Acceptance, or Approval	Schedule
Digital Monitoring and Control System – Submittals and Shop Drawings	Acceptance	Per Design Schedule
Digital Monitoring and Control System – SCADA Integration Report	Approval	Within 90 days prior to integration
Digital Monitoring and Control System - Field Quality Control and System Start Up	Approval	Per Construction Schedule
Digital Monitoring and Control System – Commissioning and Training	Approval	Per Construction Schedule

~~A.4.7 Quality Assurance~~

~~A. Installer Qualifications: Minimum of 10 years experience with control systems installation and integration of similar complexity.~~

~~1. Maintenance Proximity: Not more than two (2) hours' normal travel time from Installer's place of business to Project site.~~

~~B. 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.~~

~~C. Comply with NFPA 70.~~

~~B.1.4B.4.6 Demonstration Training~~

~~Experienced Integrator to train Owner's maintenance personnel. Owner's training shall consist of two (2), four (4) hour trainings with Owner's Maintenance & Operations Personnel. The Contractor shall provide training to CDOT maintenance personnel on the ARE #4 Work elements by an experienced integrator. The training shall consist of two (2), four (4) hour trainings with CDOT's maintenance and operations personnel at the EJMT or an alternate location Approved by CDOT. The training dates shall be coordinated with CDOT.~~

~~A.4.8B.4.7 Operation and Maintenance Manuals~~

~~The Contractor shall provide two (2) hard copy sets and one (1) electronic digital copy of the operation and maintenance documents. Include final as-built wiring interconnect diagrams, control logic, parameters, settings, I/O points, IP Addresses and schedules. This includes Software Overview, Maintenance, Troubleshooting, and Operation.~~

Table AB.4 ARE #4 Deliverables by the Contractor

<u>Deliverable</u>	<u>Review, Acceptance, or Approval</u>	<u>Schedule</u>
Digital Monitoring and Control System—Submittals and Shop Drawings	<u>Review</u>	<u>Prior to Construction</u>
<u>Digital Monitoring and Control System - SCADA Integration Plan</u>	<u>Approval</u>	<u>Within 90 days prior to integration</u>
<u>Digital Monitoring and Control System - SCADA Integration Report</u>	<u>Acceptance</u>	<u>Within 30 days after integration</u>
<u>Digital Monitoring and Control System - Field Quality Control and System Start Up Plan</u>	<u>Approval</u>	<u>Per Construction Schedule</u>

<u>Deliverable</u>	<u>Review, Acceptance, or Approval</u>	<u>Schedule</u>
<u>Digital Monitoring and Control System - Commissioning and Training Plan</u>	<u>Approval</u>	<u>Per Construction Schedule</u>
<u>Training documents</u>	<u>Review</u>	<u>At training session</u>
<u>Operation and Maintenance Manuals</u>	<u>Review</u>	<u>Prior to Substantial Project Completion</u>