



Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

September 4, 2026

SUBJECT: FAI Route 57 (I-57) & FAP Route 330 (IL 17)
Project NHFP-BR-NHPP-BSGY(427)
Section (46-3)R,HBK-1 & [(46-3)HB-5]HB-1
Kankakee County
Contract No. 66863
Item No. 1, September 18, 2026 Letting
Addendum C

NOTICE TO PROSPECTIVE BIDDERS:

Attached is an addendum to the plans or proposal. This addendum involves revised and/or added material.

1. Revised the Schedule of Prices.
2. Revised pages iv and vii of the Table of Contents to the Special Provisions.
3. Revised pages 77, 95, 101-106, and 111-112 of the Special Provisions.
4. Added pages 319-338 to the Special Provisions
5. Revised sheets 6, 7, 10, 23, 30, 31, 40, 42, 51, 61, 68-70, 141, 143, 540, 541, 543, 546, 557, 562, 572, 686, 687, 697, 716, 723, 742-745, 747, 778, 787, 804, 861, 878, 882, and 911 of the Plans.

Prime contractors must utilize the enclosed material when preparing their bid and must include any changes to the Schedule of Prices in their bid.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Jack A. Elston'.

Jack A. Elston, P.E.
Bureau Chief, Design and Environment

LIGHTING ASSEMBLY (SPECIAL).....	71
TEMPORARY LIGHTING SYSTEM.....	72
REMOVE AND RE-ERECT EXISTING LIGHTING UNIT	73
LOCATION OF UNDERGROUND STATE MAINTAINED FACILITIES	74
AS-BUILT DOCUMENTATION	74
SERVICE INSTALLATION (TRAFFIC SIGNALS)	74
UNDERGROUND CONDUIT, PVC.....	77
TRAFFIC SIGNAL BACKPLATE, LOUVERED, FORMED PLASTIC, SPECIAL.....	77
LOOP DETECTOR TESTING	78
MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION.....	79
FIBER OPTIC CABLE IN CONDUIT	80
PEDESTRIAN SIGNAL HEAD AND SIGNAL HEAD, POLYCARBONATE, LED, 1 FACE, MAST ARM OR BRACKET MOUNTED, 3-SECTION OR 5-SECTION OR PEDESTRIAN SIGNAL HEADS	80
PEDESTRIAN PUSH-BUTTON	80
REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT	81
REMOVE EXISTING JUNCTION BOX.....	81
REMOVE EXISTING DOUBLE HANDHOLE.....	81
TEMPORARY TRAFFIC SIGNAL INSTALLATION (SPECIAL)	82
FULL-ACTUATED CONTROLLER AND TYPE V CABINET, SPECIAL.....	87
FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL.....	89
COMBINATION LIGHTING CONTROLLER.....	91
ACCESSIBLE PEDESTRIAN SIGNALS.....	92
MODIFY EXISTING CONTROLLER AND CABINET.....	95
OPTIMIZE TRAFFIC SIGNAL SYSTEM.....	96
PERMANENT TRAFFIC SIGNAL TIMING	99
TEMPORARY TRAFFIC SIGNAL TIMING	100
CLOSED-CIRCUIT TELEVISION DOME CAMERA, HD	106
SYSTEM IMPLEMENTATION, EQUIPMENT INTEGRATION AND SUPPORT	111
CAT 5 ETHERNET CABLE	112
EMERGENCY VEHICLE PRIORITY SYSTEM.....	113

Revised September 4, 2026

SWPPP.....286

TRAINING SPECIAL PROVISIONS (BDE)298

IDOT TRAINING PROGRAM GRADUATE ON-THE-JOB TRAINING SPECIAL PROVISION.300

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES303

DRIVEWAY AT EASTRIDGE DRIVE319

LOCATION OF UNDERGROUND STATE MAINTAINED FACILITIES319

TRAFFIC SIGNAL BATTERY BACKUP SYSTEM319

WIDE AREA VIDEO DETECTION SYSTEM COMPLETE329

RAILROAD TRACK335

UNDERGROUND CONDUIT, PVC

This work shall consist of furnishing and installing a conduit of the type and size specified, in accordance with Section 810 of the Standard Specifications except as described herein.

When PVC Conduit is required to be spliced to steel conduit sections, a heavy wall set screw connector with a PVC female adapter shall be installed and sealed by duct seal and plastic tape.

A ¼ inch (6 mm) polypropylene pull rope shall be installed in all conduit runs exceeding 20 feet. A minimum of 3 feet of rope shall be provided at each end of a conduit run.

This work shall be considered as included in the contract unit price per FOOT for UNDERGROUND CONDUIT, PVC of the size and type specified.

TRAFFIC SIGNAL BACKPLATE, LOUVERED, FORMED PLASTIC, SPECIAL

Description. This item consists of furnishing and installing a LOUVERED, FORMED PLASTIC TRAFFIC SIGNAL BACKPLATE as specified herein and all hardware accessories required to install on all proposed signal heads as described in Article 882 and 883.

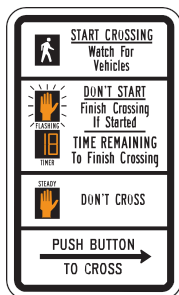
The vacuum formed ABS plastic backplate shall have a nominal ½ inch deep back flange on all inside and outside edges. The backplate shall be louvered and provide openings (louvers) to all wind to penetrate and reduce wind loading. The louver openings shall cover a minimum of 20 percent of the surface area of the backplate. The entire front and side surface of the backplate including louver shall be manufactured so that it is imprinted with fluorescent yellow sheeting. The sheeting shall be Type AZ or Type ZZ sheeting according to Article 1091.03 and applied to the preferred orientation for the maximum angularity according to the manufacture's recommendation.

Basis of Payment. This item shall be paid for at the contract unit price each for TRAFFIC SIGNAL BACKPLATE, LOUVERED, FORMED PLASTIC, SPECIAL.

Revised September 4, 2026

Contractor shall remove any existing pedestrian isolation boards, field wire terminals, and any wires to the board when easily accessible. If the pedestrian isolation board has been installed from the factory on the back panel of the cabinet, contractor is to disconnect the power to the isolation board and any wires while leaving the board mounted. This work shall be included in the cost of Accessible Pedestrian Signals and will not be paid for separately.

Signage. A sign shall be located immediately above the pedestrian push button and parallel to the crosswalk controlled by the push button. The sign shall conform to the following standard MUTCD design: R10-3e.



R10-3E

Tactile Arrow. A tactile arrow, pointing in the direction of travel controlled by a pushbutton, shall be provided on the pushbutton.

Vibrotactile Feature. The push button shall pulse when depressed and shall vibrate continuously throughout the WALK interval.

Basis of Payment. This work will be paid for at the contract unit price per each for ACCESSIBLE PEDESTRIAN SIGNALS and shall include furnishing, installation, mounting hardware including extension brackets if required, and programming of the push button.

MODIFY EXISTING CONTROLLER AND CABINET

In addition to the requirements of Sections 885, 886, 888, and 895 of the Standard Specifications, this pay item shall include modifying the existing controller cabinets at IL 17 & Eastgate Industrial Pkwy for installation of the new **Econolite** fully actuated controller, new **Econolite** fiber optic transceiver which are paid for separately. This pay item shall also include a new 16 channel Malfunction Management Unit (MMU), that will not be paid for separately. This pay item shall include installing and programming the new controllers with the existing timing program running at the intersections. This pay item shall also include programming the new MMU to provide proper operation of the traffic signals at the above intersections. This pay item shall also include all work and material required to interface the proposed fiber optic interconnect to the fiber optic transceivers and to provide proper operation of the traffic signals and closed-loop system. This item requires that a factory representative capable of ensuring that the controller and transceiver are operating to the satisfaction of the Engineer shall be present at the turn on of the controller and shall remain until the intersection is operating to the satisfaction of the Engineer. New cabinet drawings may be needed as directed by the Engineer.

Revised September 4, 2026

This page left blank intentionally.

Revised September 4, 2026

This page left blank intentionally.

Revised September 4, 2026

This page left blank intentionally.

Revised September 4, 2026

This page left blank intentionally.

Revised September 4, 2026

This page left blank intentionally.

Revised September 4, 2026

CLOSED-CIRCUIT TELEVISION DOME CAMERA, HD

Description. This work shall consist of furnishing and installing an integrated Closed-Circuit Television (CCTV) Dome Camera Assembly, camera bracket, and all other items required for installation and operation. This assembly shall contain all components identified in the Materials Section and shall be configured as indicated on the plan sheets.

Materials.

The CCTV camera shall be an **Axis Model Q6086-E, or equivalent**, Dome Camera Assembly for integration into the existing District 3 ITS system.

The Contractor shall provide all materials required to install the proposed camera equipment on the proposed traffic signal mast arm pole and lighting mast arm as shown on the plan sheets.

The Contractor shall submit catalog cut sheets to the Department for all items (mounting brackets, hardware, etc.) that will be utilized for review prior to commencing work.

The Contractor shall furnish and install new camera brackets at all locations. The existing CAT 5 ethernet cable shall be terminated in the bracket terminal block (use IDC connector and pre-formed RJ-45 connector that is furnished with the camera bracket) in accordance with the manufacturer's instructions.

The Department will program the cameras prior to installation.

The camera shall meet or exceed the following specifications:

CAMERA

VIDEO:	60 Hz (NTSC), 50 Hz (PAL)
IMAGE SENSOR:	1/2.8" progressive scan CMOS
LENS:	4.44–142.6 mm, F1.6–4.41 Horizontal angle of view: 62.8°–2.23° Vertical angle of view: 36.8°–1.3° Autofocus, auto-iris
DAY AND NIGHT:	Automatically removable infrared-cut filter
MINIMUM ILLUMINATION:	Color: 0.3 lux at 30 IRE F1.6 B/W: 0.03 lux at 30 IRE F1.6 Color: 0.5 lux at 50 IRE F1.6 B/W: 0.04 lux at 50 IRE F1.6
SHUTTER TIME: NTSC:	1/33000 s to 1/3 s with 50 Hz 1/33000 s to 1/4 s with 60 Hz

Revised September 4, 2026

Basis of Payment. Payment will be made at the contract unit price for each CLOSED-CIRCUIT TELEVISION DOME CAMERA, HD including all equipment, material, testing, documentation, and labor detailed in the contract documents for this bid item.

SYSTEM IMPLEMENTATION, EQUIPMENT INTEGRATION AND SUPPORT

The Contractor shall install the CCTV cameras at the locations indicated on the plans.

The CCTV cameras along with all related components shall be subject to a 30 day burn-in period. During the "burn-in" period, all components shall perform continuously, without any interruption of operation, for a period of thirty days. In the event that there are operational problems during the burn-in period, the burn-in period shall reset back to day one.

After the successful completion of the burn-in period, the system will have completed final acceptance.

The Department will program the cameras and integrate them into the existing ITS system.

The Contractor shall be responsible for installing the proposed CCTV cameras in accordance with the plans, specifications, and manufacturers recommended practices.

This work will not be paid for separately but shall be included in the contract bid price.

Revised September 4, 2026

CAT 5 ETHERNET CABLE

This work shall be in accordance with Sections 873, 1076, and 1088 of the Standard Specifications except as modified herein.

This work shall consist of furnishing and installing an outdoor rated CAT5E cable in conduits, handholes, and poles.

The cable shall be rated for outdoor use and conform to the following specifications:

- Outdoor CMX Rated Jacket (climate/oil resistant jacket)
- UV Resistant Outer Jacket Material (PVC-UV, UV Stabilized)
- Outer Jacket Ripcord
- Designed for Outdoor Above- Ground or Conduit Duct applications
- Cat5E rated to 350MHz (great for 10/100 or even 1000mbps Gigabit Ethernet)
- Meets TIA/EIA 568b.2 Standard
- Shielded Twist Pair
- 4 Pairs, 8 Conductors
- 24AWG, Solid Core Copper
- UL 444 ANSI TIA/EIA-568.2 ISO/IEC 11801

Revised September 4, 2026

DRIVEWAY AT EASTRIDGE DRIVE

The Contractor shall stage the construction of the car wash exit driveway at Station 13+81 LT on Eastridge Drive, and the surrounding area so that the exit remains open except for a maximum 14 consecutive calendar days closure to complete the driveway work. The closure shall be coordinated with the Engineer in advance of the work, and a minimum 7- day notice provided to the property owner before the closure. This work will be paid for at the contract unit price per each TEMPORARY ACCESS (COMMERCIAL ENTRANCE).

LOCATION OF UNDERGROUND STATE MAINTAINED FACILITIES

The Contractor shall be responsible for locating all existing IDOT electrical facilities prior to performing any work at his/her own expense if required. The Contractor shall also be liable for any damage to facilities resulting from inaccurate locating. The Contractor may obtain, on request, plans of existing electrical facilities from the Department.

The Contractor shall also be responsible for locating and providing protection for facilities during all phases of construction. If at any time, the facilities are damaged, the Contractor shall immediately notify the Department and make all necessary arrangements for repair to the satisfaction of the Engineer. This work shall be included in the contract bid price and no additional compensation will be allowed.

TRAFFIC SIGNAL BATTERY BACKUP SYSTEM

The following models of Battery Backup Systems are approved for use on this contract:

- Alpha Technologies Novus XFM HP 1100 (with standard IDOT cabinet or Alpha Technologies Side Mount 6 Integrated BBS Cabinet), Equipped with Ethernet SNMP Interface and Enhanced Capability Battery Monitoring System (AlphaGuard Plus)

The Contractor shall be responsible for providing Battery Backup Systems that are sized appropriately for the intersection load. The total system load shall not exceed the manufacturer's specifications.

The Battery Backup System shall be equipped with a deluxe pleated air filter and plexiglass covers to prevent accidental contact to terminal strips and connections carrying line voltage.

Added September 4, 2026

The battery backup systems for the existing traffic signal cabinets shall be installed as shown on the plan detail sheets and as follows:

- A separate circuit breaker shall be installed in the battery backup system cabinet (or in the traffic signal cabinet). The circuit breaker shall be rated equivalent to the main power circuit breaker rating in the existing traffic signal cabinet. The Contractor shall install #6 wiring from the test circuit breaker to the line voltage in the traffic signal cabinet. The circuit breaker shall be used to shut off the incoming utility power to test the battery backup system.
- The cabinet light, ventilation fans, heater strips, and service receptacle shall be wired to a separate circuit that will not be powered by the battery backup system
- A hole of sufficient size for the cables will be drilled into the side of the cabinet to accommodate the battery backup system cables and harnesses from the BBS cabinet. The hole shall be free of sharp edges and equipped with a plastic or rubber grommet.
- The fail-safe automatic by-pass switch and blue indicator light shall be installed in the battery backup cabinet (or in the existing traffic signal cabinet).

GENERAL REQUIREMENTS: The Battery Back-up System (BBS) shall include, but not be limited to the following: inverter/charger, power transfer relay, batteries, battery cabinet, a separate failsafe automatic bypass switch and all necessary hardware and interconnect wiring. The BBS shall provide reliable emergency power to a traffic signal in the event of a power failure or interruption. The transfer from utility power to battery power and vice versa shall not interfere with the normal operation of traffic controller, conflict monitor/malfunction management unit or any other peripheral devices within the traffic controller assembly.

The BBS shall provide power for full run-time operation for an "LED-only" intersection (all colors red, yellow, and green) or flashing mode operation for an intersection using Red LED's. As the battery reserve capacity reaches 50%, the intersection shall automatically be placed in all-red flash. The BBS shall allow the controller to automatically resume normal operation after the power has been restored. The BBS shall log an alarm in the controller for each time it is activated.

All 48-volt Battery Backup Systems shall include four batteries and all 36-volt Battery Backup Systems shall include six batteries.

The BBS shall be designed for outdoor applications, and shall meet the environmental requirements of, "NEMA Standards Publication No. TS 2 – Traffic Controller Assemblies," or applicable successor NEMA specifications, except as modified herein.

Added September 4, 2026

The BBS shall conform to the following specifications:

1.1 OPERATION

- 1.1 The BBS shall be online and provide voltage regulation and power conditioning when utilizing utility power.
- 1.2 The BBS shall provide a minimum two (2) hours of full run-time operation and four (4) hours all-red flash operation for an "LED-only" intersection (minimum 1000W/1000VA active output capacity, with 80% minimum inverter efficiency).
- 1.3 The maximum transfer time from loss of utility power to switchover to battery backed inverter power shall be 150 milliseconds.
- 1.4 The BBS shall provide the user with 4-sets of normally open (NO) and normally closed (NC) single-pole double-throw (SPDT) relay contact closures, available on a panel mounted terminal block, rated at a minimum 120V/1A, and labeled so as to identify each contact. For typical configuration, see the plan detail sheet.
- 1.5 A first set of NO and NC contact closures shall be energized whenever the unit switches to battery power. Contact shall be labeled or marked "On Batt."
- 1.6 The second set of NO and NC contact closures shall be energized whenever the battery approaches approximately 40% of remaining useful capacity. Contact shall be labeled or marked "Low Batt."
- 1.7 The third set of NO and NC contact closures shall be energized two hours after the unit switches to battery power. Contact shall be labeled or marked "Timer."
- 1.8 The fourth set of NO and NC contact closures shall be energized in the event of inverter/charger failure, battery failure or complete battery discharge. Contact shall be labeled or marked "BBS Fail or Status."
- 1.9 A surge suppression unit shall be provided for the output power if available as an option by the BBS manufacturer.
- 1.10 Operating temperature for both the inverter/power transfer relay and failsafe automatic bypass switch shall be -37°C to +74°C.
- 1.11 The Power Transfer Relay shall be rated at 240VAC/30AMPS minimum and failsafe automatic bypass switch shall be rated at 240VAC/20 amps, minimum.

Added September 4, 2026

- 1.12 The fail-safe automatic bypass switch shall be wired to provide power to the BBS when the switch is set to bypass.
- 1.13 The BBS shall use a temperature-compensated battery charging system. The charging system shall compensate over a range of 2.5 – 4.0 mV/°C per cell.
- 1.14 The temperature sensor shall be external to the inverter/charger unit. The temperature sensor shall come with 2 meters (6'6") of wire.
- 1.15 Batteries shall not be recharged when battery temperature exceeds 50°C ±3°C.
- 1.16 BBS shall bypass the utility line power whenever the utility line voltage is outside of the following voltage range: 100VAC to 130VAC (±2VAC).
- 1.17 When utilizing battery power, the BBS output voltage shall be between 110 VAC and 125 VAC, pure sine wave output, ±3% THD, 60Hz ±3Hz.
- 1.18 BBS shall be compatible with Illinois DOT's traffic controller assemblies utilizing NEMA TS 1 or NEMA TS 2 controllers and cabinet components for full time operation.
- 1.19 When the utility line power has been restored at above 105 VAC ±2 VAC for more than 30 seconds, the BBS shall dropout of battery backup mode and return to utility line mode.
- 1.20 When the utility line power has been restored at below 125VAC ±2 VAC for more than 30 seconds, the BBS shall dropout of battery backup mode and return to utility line mode.
- 1.21 BBS shall be equipped to prevent a malfunction feedback to the cabinet or from feeding back to the utility service.
- 1.22 In the event of inverter/charger failure, battery failure or complete battery discharge, the power transfer relay shall revert to the NC state, where utility line power is reconnected to the cabinet. The BBS shall always revert back to utility line power and shall be designed to revert back to utility line power in the event of a BBS fault condition.
- 1.23 Recharge time for the battery, from "protective low-cutoff" to 80% or more of full battery charge capacity, shall not exceed twenty (20) hours.

Added September 4, 2026

- 1.24 When the intersection is in battery operation, the BBS shall bypass all internal cabinet lights, ventilation fans, heater strips, and service receptacles.
- 1.25 The fail-safe automatic bypass switch shall be wired to provide power to the BBS when the switch is set to bypass.
- 1.26 A blue LED indicator light shall be mounted on the front of the traffic signal cabinet or on the side of the BBS cabinet facing traffic and shall turn on to indicate when the cabinet power has been disrupted and the BBS is in operation. The light shall be a minimum 1" diameter, be viewable from the driving lanes, and shall be large enough and visible enough to be seen from 200 ft. away.
- 1.27 All 36 volt and 48 volt systems shall include an external component that monitors battery charging to ensure that every battery in the string is fully charged. The device shall compensate for the effects of adding a new battery to an existing battery system by ensuring that the charge voltage is spread equally across all batteries. All cables, harnesses, cards, and other components that are required to provide the functionality described above shall be included in the unit bid price for the battery backup system. The following products are currently approved for use within District 3: Alpha Technologies: AlphaGuard with Charge Management Technology Module and Approved Equivalent
- 1.28 The BBS shall be equipped with an integrated safety switch that will interrupt inverter output power in the event of a cabinet knockdown. The safety switch may be either internal to the inverter/charger or externally mounted inside of the BBS cabinet. The safety switch shall be designed to interrupt output power in the event that the charger/inverter is tilted more than twenty degrees on any axis. The switch shall be mechanically latching to ensure that power is not automatically restored to the BBS until the charger/inverter has been "reset". The switch shall also be resettable and reusable unless it has been physically damaged.
- 1.29 The BBS shall be equipped with an Ethernet port and network management card.

2.0 MOUNTING AND CONFIGURATION

2.1 GENERAL

2.2 Inverter/Charger Unit shall be rack or shelf mounted.

2.3 (Reserved).

Added September 4, 2026

- 2.4 All interconnect wiring provided between Power Transfer Relay, Bypass Switch and Cabinet Terminal Service Block shall be no greater than two (2) meters (6'6") of #10 AWG wire.
- 2.5 Relay contact wiring provided for each set of NO/NC relay contact closure terminals shall be #18 AWG wire.
- 2.6 All necessary hardware for mounting (shelf angles, rack, etc.) shall be included in the bid price of the BBS. The swing-trays shall be screwed to the Type IV or Type V NEMA cabinets using continuous stainless steel or aluminum piano hinge. All bolts/fasteners and washers shall be ½" diameter galvanized or stainless steel.

3.0 EXTERNAL BATTERY CABINET WITH BLUE LIGHT INDICATOR

- 3.1 The external cabinet shall be a rated NEMA Type 3R Cabinet.
- 3.2 Inverter/Charger and Power Transfer Relay shall be installed inside the external battery cabinet and the failsafe automatic bypass switch shall be installed inside the existing traffic signal cabinet or proposed battery backup cabinet.
- 3.3 Batteries shall be housed in the external cabinet which shall be NEMA Standard rated cabinet mounted to the side of the Type IV or Type V Cabinet (see plan sheets for details). This external battery cabinet shall conform to the IDOT Standard Specifications for traffic signal cabinets for the construction and finish of the cabinet.
- 3.4 The external battery cabinet shall mount to the Type IV or Type V NEMA Cabinet with a minimum of four (4) bolts to the satisfaction of the Engineer.
- 3.5 The dimensions of the external battery cabinet shall be 25" (L) x 16" (W) x 41" (H) and installed in accordance with the plan sheet cabinet detail and this specification.
- 3.6 The cabinet shall include heater mats for each battery shelf and/or battery. If the BBS charger/inverter does not have facilities to accommodate heater mat connections, thermostatically controlled heater mats shall be provided with the system. The heater mat thermostat shall be a separate thermostat (from the ventilation fan thermostat) and be adjustable from 0°F to 32°F for heater mat turn-on.

Added September 4, 2026

- 3.7 A warning sticker shall be placed on the outside of the cabinet indicating that there is an Uninterruptible Power Supply inside the cabinet.
- 3.8 The external battery cabinet shall be ventilated through the use of louvered vents (2), filters, and one thermostatically controlled fan as per NEMA TS 2 Specifications. The cabinet shall include a cleanable or replaceable cabinet filter.
- 3.9 External battery cabinet fan shall be AC operated from the same line output of the bypass Switch that supplies power to the Type IV or Type V Cabinet.
- 3.10 The BBS with external battery cabinet shall come with all bolts, conduits and bushings, gaskets, shelves, and hardware needed for mounting. The external battery cabinet shall have a hinged door opening to the entire cabinet. The cabinet shall include a bottom constructed from the same material as the cabinet.
- 3.11 The external cabinet shall be equipped with a power receptacle to accommodate the inverter/charger. The receptacle shall be wired to the line output of the manual bypass switch.

4.0 MAINTENANCE, DISPLAYS, CONTROLS AND DIAGNOSTICS

- 4.1 The BBS shall include a display and /or meter to indicate current battery charge status and conditions.
- 4.2 The BBS shall have lightning surge protection compliant with IEEE/ANSI C.62.41.
- 4.3 The BBS shall be equipped with an integral system to prevent battery from destructive discharge and overcharge.
- 4.4 The BBS and batteries shall be easily replaced with all needed hardware and shall not require any special tools for installation.
- 4.5 The BBS shall be equipped with a RS-232 port.
- 4.6 The BBS shall include a resettable front-panel event counter display to indicate the number of times the BBS was activated and a front-panel hour meter to display the total number of hours the unit has operated on battery power.

Added September 4, 2026

4.7 Manufacturer shall include two (2) sets of equipment lists, operation and maintenance manuals, and board-level schematic and wiring diagrams of the BBS, and the battery data sheets. Manufacturer shall include any software needed to monitor, diagnose, and operate the BBS. The manufacturer shall include any required cables to connect to a laptop computer.

4.8 The BBS shall include a data cable for the serial connection to the RS232 port and diagnostic software if it is available as an option with the unit (only two cables required for project).

4.9 One copy of the owner/maintenance manuals shall be provided with the BBS.

4.1 BATTERY SYSTEM

4.2 Individual batteries shall be 12V type and shall be easily replaced and commercially available off the shelf.

4.3 The batteries shall be premium gel type with a 5-year full replacement warranty.

4.4 Batteries used for BBS shall consist of a minimum of four (4) to eight (8) batteries with a cumulative minimum rated capacity of 280 amp-hours.

4.5 Batteries shall be deep cycle, completely sealed, silver alloy VRLA (Valve Regulated Lead Acid) requiring no maintenance with maximum run time.

4.6 Batteries shall be certified by the manufacturer to operate over a temperature range of – 40°C to +71°C.

4.7 The batteries shall be provided with appropriate interconnect wiring and corrosion resistant mounting trays and/or brackets appropriate for the cabinet into which they will be installed.

4.8 Batteries shall indicate maximum recharge data and recharging cycles.

4.9 Battery interconnect wiring shall be via modular harness. Batteries shall be shipped with positive and negative terminals pre-wired with red and black cabling that terminates into a typical power-pole style connector. Harness shall be equipped with mating power-pole style connectors for batteries and a single, insulated plug-in style connection to inverter/charger unit. Harness shall allow batteries to be quickly and easily connected in any order and shall be keyed and wired to ensure proper polarity and circuit configuration.

Added September 4, 2026

4.10 Battery terminals shall be covered and insulated so as to prevent accidental shorting.

6.0 QUALITY ASSURANCE

6.1 BBS shall be manufactured in accordance with a manufacturer quality assurance (QA) program. The QA program shall include two types of quality assurance: (1) Design quality assurance and (2) Production quality assurance. The production quality assurance shall include statistically controlled routine tests to ensure minimum performance levels of BBS units built to meet this specification and a documented process of how problems are to be resolved.

6.2 QA process and test results documentation shall be kept on file for a minimum period of seven years.

6.3 Battery Backup System designs not satisfying design qualification testing and the production quality assurance testing performance requirements described below shall not be labeled, advertised, or sold as conforming to this specification.

7.0 DESIGN QUALIFICATION TESTING

7.1 The manufacturer, or an independent testing lab hired by the manufacturer, shall perform design Qualification Testing on new BBS designs, and when a major design change has been implemented on an existing design. A major design change is defined as a design change (electrical or physical) which changes any of the performance characteristics of the system, or results in a different circuit configuration.

7.2 Burn In. The sample systems shall be energized for a minimum of 5 hours, with full load of 700 watts, at temperatures of +74°C and -37°C., excluding batteries, before performing any design qualification testing.

7.3 Any failure of the BBS, which renders the unit non-compliant with the specification after burn-in, shall be cause for rejection.

7.4 For Operational Testing, all specifications may be measured including, but not limited to:

7.5 Run time while in battery backup mode, at full load.

7.6 Proper operation of all relay contact closures ("On-Batt", "Low-Batt", "Timer" and "BBS-Fail").

Added September 4, 2026

- 7.7 Inverter output voltage, frequency, harmonic distortion, and efficiency, when in battery backup mode.
- 7.8 All utility mode – battery backup mode transfer voltage levels. See Section 1 Operation.
- 7.9 Power transfer time from loss of utility power to switchover to battery backed inverter power.
- 7.10 Backfeed voltage to utility when in battery backup mode.
- 7.11 IEEE/ANSI C.62.41 compliance.
- 7.12 Battery charging time.
- 7.13 Event counter and runtime meter accuracy.

8.0 PRODUCTION QUALITY CONTROL TESTING

- 8.1 Production Quality Control tests shall consist of all of the above listed tests and shall be performed on each new system prior to shipment. Failure to meet requirements of any of these tests shall be cause for rejection. The manufacturer shall retain test results for seven years.
- 8.2 Each BBS shall be given a minimum 100-hour burn-in period to catch any premature failures.
- 8.3 Each system shall be visually inspected for any exterior physical damage or assembly anomalies. Any defects shall be cause for rejection.

9.0 WARRANTY

- 9.1 Manufacturers shall provide a minimum two (2) year factory-repair warranty for parts and labor on the BBS from date of acceptance by the State. Batteries shall be warranted for full replacement for five (5) years from date of purchase. The warranty shall be included in the total bid price of the BBS.
- 9.2 The Contractor shall furnish a warranty certificate for each Battery Backup System that includes the equipment description and details, serial numbers, effective dates, and the details of the warranty regarding materials and labor. The warranty period shall begin on the date of final inspection, and the warranty certificate shall reflect this date.

Added September 4, 2026

Basis of Payment: The above work will be paid for at the contract unit price Each for TRAFFIC SIGNAL BATTERY BACKUP SYSTEM shall be payment in full for all labor, materials, and equipment required to provide, install, and test the battery backup system described above, complete.

WIDE AREA VIDEO DETECTION SYSTEM COMPLETE

Description. This work consists of furnishing and installing a wide area video detection system at locations designated herein.

- Intersection of N Fairmont Avenue and IL 17
- Intersection of Eastridge Drive and IL 17

Equipment. The following video detection systems are approved for use on this contract:

- Autoscope (Complete Camera System) (latest version)

The contractor shall not mix video detection systems and controllers from different vendors. The video detection system, controller, and cabinet must all be supplied by the same vendor.

The video vehicle detection system shall include the following:

- Four Cameras
- All necessary electrical cable
- CAT 5 Ethernet Cable
- Electrical Junction Boxes
- Electrical and Communications Surge Suppression
- Necessary hardware, software and programming
- Necessary camera brackets that are required for installation and configuration.

All cameras shall be installed on existing traffic signal mast arms using five foot extension brackets.

General. This work shall be in accordance with sections 873, 1076, and 1088 of the Standard Specifications adopted January 1, 2022 and as modified herein.

The CAT 5 Ethernet cable (CAT5E) shall be furnished and installed in existing conduits, handholes and poles

The cable shall be rated for outdoor use and conform to the following specifications.

- Outdoor CMX Rated Jacket (climate / oil resistant jacket)
- UV Resistant outer Jacket material (PVC – UV, UV Stabilized)
- Outer Jacket Ripcord
- Designed for Outdoor Above – Ground of Conduit Duct applications
- CAT5E Rated to 350MHz (great for 10 / 100 or even 1000mbps Gigabit Ethernet)
- Meets TIA / EIA 568b.2 Standard

Added September 4, 2026

- Shielded Twist Pair
- 4 Pairs, 8 Conductors
- 24AWG, Solid Core Copper
- UL 444 ANSI TIA / EIA-568.2 ISO / IEC 11801
- RoHS Compliant
- Water Blocking Gel

The cost of the cable shall be included in the cost of this pay item.

Construction Requirements. Construction requirements shall include the following.

1. One 12" – 15" color LCD video monitor and 4 camera video selectors (if required to switch camera videos) shall be included for each installation to allow for the setup and monitoring of the video detection system.
2. All vehicle video detection systems shall be equipped with the latest software of firmware revisions.
3. All video detection cameras shall be installed on the mast arms (centered over the detection area, the Contractor shall determine exact location at time of construction) at a 25 ft. minimum mounting height. All camera brackets shall be constructed of aluminum.
4. The video vehicle system shall be configured and installed to NEMA TS2 Standards (use of the SDLC port and BIU).
 - Installation conforming to NEMA TS1 standards will not be allowed.

Video Vehicle Detection System. The minimum requirements for a video vehicle detection system are listed below.

1. **General.**

This specification sets forth the minimum requirements for a system that monitors vehicles on a roadway via processing of video images and provides detector outputs to a traffic controller or similar device.

- 1) **System Hardware.** The system shall consist of 4 video cameras and an automatic control unit (ACU). The ACU shall process all detected calls and shall be equipped with the latest firmware revisions.
- 2) **System Software.** The system shall be able to detect either approaching or receding vehicles in multiple traffic lanes. A minimum of 24 detection zones shall be user – definable per camera. The user shall be able to modify and delete previously defined detection zones. The software shall provide remote access operation and shall be the latest revision.

Added September 4, 2026

2. Functional Capabilities.

- 1) Real-Time Detection.
- 2) The ACU shall be capable of simultaneously process information from up to four digital video sources. The video shall be digitized and analyzed at a rate of 30 times per second.
- 3) The system shall be able to detect the presence of vehicles in a minimum of 96 detection zones within the combined field view of the image sensors.

3. Vehicle Detection

- 1) Detection Zone Placement. The video detection system shall provide flexible detection zone placement anywhere and at any orientation within the combined field of view of the image sensors. In addition, the detector zones shall have the capability of implementing logical functions including
- 2) Optimal Detection. The video detection system shall reliably detect vehicle presence when the image sensor is mounted 30 ft. or higher above the roadway. When the image sensor is adjacent to the desired coverage area and the length of the detection area or field of view (FOV) is not greater and ten times the mounting height of the image sensor. The image sensor shall not be required to be mounted directly over the roadway. A single image sensor placed at the proper mounting height with the proper lens shall be able to monitor six to eight traffic lanes simultaneously.
- 3) Detection Performance. Overall performance of the detection system shall be comparable to inductive loops. Using standard image sensor or optics and in the absence of occlusion, the system shall be able to detect vehicle presence with 98% accuracy under normal conditions (days & night) and 096% accuracy under adverse conditions (fog, rain, snow). The AVC shall output a constant call for each enabled detector output channel is a loss of video signal occurs in any camera.

The ACU shall be capable of processing a minimum of twenty detector zones placed anywhere in the field of view of the camera.

4. ACU Hardware

- 1) ACU Mounting. The ACU shall be shelf or rack mountable. Nominal outside dimensions excluding connectors shall not exceed 7¼" x 19" x 10½" (H x W x D).
- 2) ACU Environmental. The ACU shall be designed to operate reliably in the adverse environment found in the typical roadside traffic cabinet. It shall meet the environmental requirements set forth by the NEMA (National Electrical Manufacturers Association) TS1 And TS2 Standards as well as the environmental requirements for Type 170 and Type 179 controllers. The minimum operating temperature range shall be from -35 to +74 degrees C at 0% to 95% relative humidity, non-condensing.

Added September 4, 2026

5. **ACU Electrical**

- 1) The ACU shall be modular in design and provide processing capability equivalent to the Intel Pentium microprocessor. The bus connections used to interconnect the modules of the ACU shall be gold – plated DIN connectors.
- 2) The ACU shall be powered by 89 - 135 VAC, 60 Hz, single phase, and draw 0.25 amps, or by 190 - 270 VAC, 50 Hz, single phase and draw 0.12 amps. If a rack mountable ACU is supplied, it shall be capable of operating from 10 to 28 VDC. The power supply shall automatically adapt to the input power level. Surge ratings shall be as set forth in the NEMA TS1 and TS2 specifications.
- 3) Serial communications to a remote computer equipped with remote monitoring software shall be through a RJ-45 Ethernet port.
- 4) The ACU shall be equipped with a NEMA TS2 RS-485 SDLC interface for communicating input and output information. Front panel LEDs shall provide status information when communications are open.
- 5) The ACU and/or camera hookup panel shall be equipped with four RJ-45 connector based/terminal block connections for cameras so that signals from four image sensors can be processed in real-time.
- 6) The ACU shall be equipped with USB ports, WiFi, and Ethernet ports to provide communications to a computer running the configuration and remote access software.
- 7) The ACU and/or camera hookup panels used for a rack mountable ACU shall be equipped with a video output port.
- 8) The ACU shall be equipped with viewable front panel detection LED indications.

6. **Camera**

- 1) The video detection system shall use high resolution, color, cameras as the video source for real-time vehicle detection. As a minimum, each image sensor shall provide the following capabilities:
 - a) MPEG-4 and H.264 video compression and transport
 - b) Support video streaming that is viewable through a standard web browser with an adjustable frame rate of 5/15/30 fps
 - c) Images shall be produced with a CCD sensing element with horizontal resolution of at least 720 lines and vertical resolution of at least 480 lines.

Added September 4, 2026

- d) Useable video and resolvable features in the video image shall be produced when those features have luminance levels as low as 0.1 lux at night.
 - e) Useable video and resolvable features in the video image shall be produced when those features have luminance levels as high as 10,000 lux during the day.
 - f) Automatic gain, automatic iris, and absolute black reference controls shall be furnished.
 - g) An optical filter and appropriate electronic circuitry shall be included in the image sensor to suppress "blooming" effects at night.
- 2) The image sensor shall be equipped with an integrated zoom lens with zoom and focus capabilities that can be changed using either configuration computer software or hand- held controller. The machine vision processor (MVP) may be enclosed within the camera.
- 3) The image sensor and lens assembly shall be housed in an environmental enclosure that provides the following capabilities:
- a) The enclosure shall be waterproof and dust-tight to NEMA-4 specifications. The camera shall be IP-67 rated.
 - b) The enclosure shall allow the image sensor to operate satisfactorily over an ambient temperature range from -34C to +74C while exposed to precipitation as well as direct sunlight.
 - c) The enclosure shall allow the image sensor horizon to be rotated in the field during installation.
 - d) A heater shall be at the front of the enclosure to prevent the formation of ice and condensation in cold weather, as well as to assure proper operation of the lens' iris mechanism. The heater shall not interfere with the operation of the image sensor electronics, and it shall not cause interference with the video signal.
 - e) The enclosure shall be light-colored and shall include a sun shield to minimize solar heating. The front edge of the sunshield shall protrude beyond the front edge of the environmental enclosure and shall include provision to divert water flow to the sides of the sunshield. The amount of overhang of the sun shield shall be adjustable to prevent direct sunlight from entering the lens or hitting the faceplate.
 - f) The total weight of the image sensor in the environmental enclosure with sunshield shall be less than 2.7 kg (6 pounds).

Added September 4, 2026

- g) When operating in the environmental enclosure with power and video signal cables connected, the image sensor shall meet FCC class B requirements for electromagnetic interference emissions.
- 4) The video output of the image sensor shall be isolated from earth ground. All video connections from the image sensor to the video interface panel shall also be isolated from earth ground.
- 5) The video output, communication, and power to the image sensor shall include transient protection to prevent damage to the sensor due to transient voltages occurring on the cable leading from the image sensor to other field locations.
- 6) A stainless-steel junction box shall be available as an option with each image sensor for installation on the structure used for image sensor mounting. The junction box shall contain a terminal block for terminating power to the image sensor and connection points for cables from the image sensor and from the ACU.

7. Software

- 1) The system shall include the remote access software that is used to setup and configure the video detection system. The software shall be of the latest revision.
- 2) All necessary cable, adapters, and other equipment shall be included with the system.

8. Installation and Training

- 1) The supplier of the video detection system shall supervise the installation and testing of the video and video vehicle detection equipment. A factory certified representative from the supplier shall be on-site during installation.

9. Warranty, Maintenance, and Support

- 1) The video detection system shall be warranted by its supplier for a minimum of Five years from date of the IDOT-D3 acceptance. This warranty shall cover all material defects and shall also provide all parts and labor as well as unlimited technical support.
- 2) Ongoing software support by the supplier shall include updates of the ACU and supervisor software. These updates shall be provided free of charge during the warranty period.
- 3) The supplier shall maintain a program for technical support and software updates following expiration of the warranty period. This program shall be made available to the contracting agency in the form of a separate agreement for continuing support.

Added September 4, 2026

Basis of Payment. This work will not be paid for separately but shall be included in the contract unit price each for WIDE AREA VIDEO DETECTION SYSTEM COMPLETE which price shall be payment in full for all labor, equipment, CAT5 Ethernet cable, and materials required to furnish, install, and test the video vehicle detection system described above, complete.

RAILROAD TRACK

This work shall consist of providing the labor and materials for the assembly of the track components including rail, crossties, inner guard rail, and other track materials.

Materials.

- (a) Rail. Rail shall be AREMA 115RE. Rail shall be new or relay rail. Relay rail shall be Class I or Class II as outlined in the current edition of the AREMA Manual's Recommended Rail Grading Classification. Rail section shall be subject to the approval of Engineer and shall be consistent throughout the project unless shown otherwise on plan. No rail less than 39 feet in length shall be supplied except with permission from Engineer.
- (b) Crossties. All crossties shall be new treated hardwood timber meeting AREMA specifications on material, design and inspection for 7" IG ties. All crossties shall be end-plated. Contractor will provide Engineer with a certificate of preservative treatment prior to tie shipment from supplier. Contractor will notify Engineer as to the source of the ties and the loading dates in sufficient time to permit inspection of the ties prior to shipment. Minimum crosstie size will be 7"x 9" x 8'6".
- (c) Other Track Materials and Devices:
 - a. Joint Bars – New or relay to match rail section and drilling.
 - b. Compromise Joints – New, cast to the design of the adjoining rail sections.
 - c. Bolts, Nuts and Lock Washers – New and of the appropriate size for the bolt hole of the rail and bar and sufficient length for a full nut, lock washer and 1 ½ threads exposed after tightening, but not exceeding 1" of thread exposure.
 - d. Tie Plates – New or relay of an approved design (min. size 7"x10.5") for the weight of rail used. Joint plates, relay of sufficient length to accommodate joint bars and still expose spike holes in plate on both sides of bar. Double shouldered tie plates required on curves over 8°.
 - e. Spikes – New, 5/8" x 6".
 - f. Anchors – New, one piece to match the rail section with a consistent design throughout project.
 - g. Gage Rods – New, non-insulated single clamp.
 - h. Inner Guard Rail – Inner Guard Rail shall be the same material as Rail, above.

Track Laying.

- (a) Track laying shall be performed by foreman and laborers experienced in railroad track construction. No track materials shall be placed on the sub-ballast or base ballast until written approval has been obtained from the Engineer.
- (b) Crossties shall be uniformly spaced at 19 ½" centers, 4'3" from end the tie to track centerline and at right angles to track centerline. Crosstie distribution shall precede rail laying. When handling or spacing ties, care shall be taken not to damage them with picks or hammers. Pulling ties into position with picks or shovels will not be permitted. Tie tongs shall be used for this purpose.

Added September 4, 2026

(c) The pulling of spikes, once driven, shall be avoided whenever possible. When spikes are pulled, the holes shall be immediately plugged with creosoted tie plugs of the proper size to completely and tightly fill the hole.

(d) The bottom of the rail, the tie plate and the bearing surface of the tie shall be cleaned before the rail is laid.

(e) Two tie plates shall be centered on each crosstie prior to the time the rail is laid. The plates must be placed so that the shoulder is against the outside base of the rail for the entire length of the shoulder (can't inward).

(f) Rails shall be so laid that the joints on one side will not vary more than 18 inches in either direction perpendicular from the mid-point of the opposite rail. Rails shall be laid one at a time and the rail ends must be brought squarely together and bolted prior to spiking.

(g) For tracks exceeding 1,000 feet in length and rail temperatures below 85° F, a 1/8" rail shim will be used to gap rail and removed after bolt tightening.

(h) Rails shall be cut square and clean by means of rail saws. Holes for complete bolting of cut rails shall be drilled by an approved type of rail drill. Under no circumstance shall new holes be drilled between two holes already drilled. Cutting rails or drilling holes by means of acetylene or electric torch will not be permitted.

(i) The appropriate number of bolts shall be applied according to the rail joint bars used. The nuts of all bolts shall alternate uniformly inside and outside of each joint. All track bolts shall be installed when the rail is laid and nuts turned up snug, after which all bolts shall be tightened three times; first after track has been brought to approximately true alignment; second, after it has been given the first raise of rock ballast; and finally, immediately before the completion and acceptance of the work. Each bolt shall be equipped with a spring washer of the size required to fit the diameter of the bolts used. For the final tightening a wrench not under 36 inches and not over 42 inches in length shall be used by men of average strength.

(j) The righthand rail going in the direction of the tract stationing or the outside rail on curves shall first be spiked in position in its proper relation to the ties. The opposite rail shall then be spiked to true gage by using a tested and approved track gage. The track shall be gaged at every third tie, according to the following:

<u>Degree of Curve</u>	<u>Gage</u>
8° and under	4'-8 1/2"
Over 8°	4'-9"

(k) Two spikes, one on the gage side, and one on the field side of the base of rail, shall be used to fasten each rail to the tie on tangents and curves except within the limits of curves over 8° where two spikes will be used on the gage side and one spike will be used on the field side. Spikes shall be staggered so that the outside spikes shall be on the same side of the tie and the inside spikes on the opposite side, except where extra spikes are used in curves over 8°.

Added September 4, 2026

(l) Rail shall not be struck with maul or heavy tool when spiking, gaging or aligning. Spikes shall be started vertically and square. They shall be driven straight with full bearing against the base of the rail. Straightening with maul of spikes started crooked will not be permitted. Spikes started crooked shall be pulled, the holes plugged, and spikes re-driven. No spikes shall be within 2" of the end of a joint bar or in a joint bar hole/slot.

(m) Crossties will be boxed anchored on every fourth tie as practical unless traffic or profile conditions warrant otherwise. The number of anchors needed equals the number of ties needed. Anchors shall not be more than 3/8" from the tie. Adjustment of anchors will not be made by striking.

(n) Gage rods will be installed on ten-foot centers for curves over 10°.

(o) Guard Rails should not be higher than the running rails and not lower than 2 inches below the running rail surface. Guard rail shall consist of two rails, spiked to every tie and spliced with fully bolted joints and constrained from longitudinal movement as necessary. The distance between head of running rail and head of guard rail shall be set to allow for mechanized tamping of the track. Tie plates may be used with Guard Rails when deemed advisable, but they may not contact the plates of the running rails. Guard Rails shall extend at least 50 feet beyond both ends of the bridge. The ends should run to the center of the track and be beveled and bent down or otherwise protected against direct impact. A filler block or plate shall be provided at the meeting of the converging rails.

Surfacing, alignment and dress:

(a) This work shall consist of placing ballast, bringing the track to final grade and alignment, and dressing/shaping the ballast.

(b) Contractor shall make his/her own arrangements to unload and distribute the ballast materials for surfacing using an approved method.

(c) Upon receipt of approval of track laying from the Engineer the uniform distribution of ballast for surfacing may begin.

(d) Turnouts shall be protected from damage and from over-ballasting during distribution.

(e) The track structure shall be raised and ballasted to final grade with a series of intermediate lifts and one final lift. No lift shall exceed 4 inches and Contractor shall make his own estimate as to how many of these lifts are needed to reach final grade. Regardless of how many lifts are made, the final lift shall not exceed 2 inches and shall primarily be smoothing lift.

(f) Prior to the first lift the track shall be brought to approximate alignment. The final lift shall result in true alignment, profile and cross-level as shown on the Plans. The final lift shall be accomplished by the use of grade stakes, spot boards, track levels and/or automatic tamping equipment capable of controlled lifting, lining and cross-leveling of the track.

Added September 4, 2026

(g) For each lift, the track shall be raised and ballast distributed under the full length of the tie. Satisfactory compaction shall be obtained by the operation of mechanical tampers. Tamping shall begin at the ends of each tie and progress to a point 15 inches inside base of rail. When using jacks, the jacks shall be spaced close enough to prevent bending of the rails or undue stressing of the joints. Both rails shall be raised at the same time as uniformly as possible. Each lift shall be given a good running surface.

(h) After the track has the required final surface and line, the ballast shall be dressed to conform to the section shown on the drawing. Ballast shall be shaped to the required section and using a ballast regulator equipped with rotary broom or other equally satisfactory means. All excess ballast shall be removed and deficiencies of ballast corrected.

Basis of Payment. Rail shall be paid for at the contract unit price per track foot for RAILROAD TRACK. Track laying, crossties, inner guard rails, and all other track materials and devices shall be included in the cost of RAILROAD TRACK and shall not be paid for separately.

Added September 4, 2026