



Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

November 2, 2005

SUBJECT: FAP Route 804
Project ACHS-804(185)
Section 25R, TS
Champaign County
Contract No. 70476
Item No. 40, November 18, 2005 Letting
Addendum A

NOTICE TO PROSPECTIVE BIDDERS:

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

1. Revised sheet 2 of the Plans.
2. Added sheet 16A to the Plans.
3. Revised the Table of Contents to the Special Provisions.
4. Revised pages 3, 10 – 17 & 50 – 51 to the Special Provisions.
5. Added pages 69 – 70 to the Special Provisions.

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

Bidders using computer-generated bids are cautioned to reflect any and all Schedule of Prices changes, if involved, into their computer programs.

Very truly yours,

Michael L. Hine
Engineer of Design
and Environment

A handwritten signature in black ink, appearing to read 'Ted B. Walschleger' followed by a small 'P.E.' monogram.

By: Ted B. Walschleger, P. E.
Engineer of Project Management

cc: J. E. Crowe, Region 3, District 5; Roger Driskell; Estimates; Design & Environment File

TBW:MS:jc

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This work will be paid for at the contract unit price per foot (meter) for PAVEMENT MARKING REMOVAL and no additional compensation will be allowed.

ANTI-BACKUP FEATURE

The anti-backup feature for controller programming required in Article 1073.01(c) of the Standard Specifications for Traffic Control Items shall have the following added to the definition shown in Article 1073.01(a):

The components used to accomplish this feature shall be located outside the controller and labeled for identification.

Any costs incurred by compliance with this special provision shall be considered as included in the applicable pay items.

CONDUIT IN TRENCH

The 1¼” conduit from the hole in the pavement to the junction box or handhole as shown on Standard 888001 shall be paid for at the contract unit price per FOOT for CONDUIT IN TRENCH of the type and size specified and no additional compensation will be allowed.

DAMAGE TO EQUIPMENT

Any equipment damaged by the Contractor in his operations shall be replaced by him at his own expense, and no additional compensations will be allowed.

DETECTOR AMPLIFIERS

The induction loop detector amplifiers furnished under this contract shall be rack type amplifiers. Independent units in individual housings will not be permitted.

DETECTOR LOOPS

Detector loops shall be installed in accordance with Section 886 of the Standard Specifications for Traffic Control Items and Standard 886001 with the exception that the wiring from the curb to

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Compliance with this special provision shall be considered as included in the contract unit cost EACH for TRAFFIC SIGNAL POST of the size and type specified and no additional compensation will be allowed.

TRAFFIC SIGNAL EQUIPMENT

The traffic signal equipment furnished for this contract shall be Eagle Brand in accordance with the proprietary letter between the State of Illinois and the City of Champaign dated July 14, 1986.

UNINTERRUPTIBLE POWER SUPPLY FOR TRAFFIC SIGNALS UTILIZING LIGHT EMITTING DIODES (LED) TRAFFIC SIGNAL MODULES:

The uninterruptible power supply (UPS) shall include, but not be limited to the following: inverter/charger, power transfer relay, batteries, a separate manually operated non-electronic bypass switch and all necessary hardware and interconnect wiring (UPS Block Diagram Standard). The UPS 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 visa 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 UPS 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.

The UPS 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.

1.0 OPERATION

1.1

The UPS shall be line interactive and provide voltage regulation and power conditioning when utilizing utility power.

1.1.1

The UPS shall provide a minimum two (2) hours or a minimum six (6) hours of full run-time operation for LED signal modules load at 25 °C (77 °F) (minimum 700W/1000VA active output capacity, with 80% minimum inverter efficiency). The two UPS, differing in the minimum duration of full run-time operation, shall be designated as UPS STANDARD and UPS EXTENDED respectively.

1.2

The maximum transfer time from loss of utility power to switchover to battery backed inverter power shall be 65 milliseconds.

1.3

The UPS 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 (Manual Bypass Switch and Relay Contacts Standard).

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1.3.1

The 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."

1.3.2

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."

1.3.3

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."

1.3.4

The fourth set of NO and NC contact closures shall be energized in the event of inverter/charger failure. Contact shall be labeled or marked "UPS Fail."

1.4

Operating temperature for both the inverter/power transfer relay and manual bypass switch shall be -37 °C to +74 °C (-35 °F to 165 °F).

1.5

Both the Power Transfer Relay and Manual Bypass Switch shall be rated at 240VAC/30 amps, minimum.

1.6

The UPS shall use a temperature-compensated battery charging system. The charging system shall compensate over a range of 2.5 – 4.0 mV/ °C or (1.4 – 2.2 mV/°F) per cell.

1.6.1

The temperature sensor shall be external to the inverter/charger unit. The temperature sensor shall come with 2 meters (6.5 ft) of wire.

1.7

Batteries shall not be recharged when battery temperature exceeds 50 °C ± 3 °C (122°F ± 5°F).

1.8

UPS shall bypass the utility line power whenever the utility line voltage is outside of the following voltage range: 100VAC to 130VAC (± 2VAC).

1.9

When utilizing battery power, the UPS output voltage shall be between 110 VAC and 125 VAC, pure sine wave output, ± 3% THD, 60Hz ± 3Hz.

1.10

UPS 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.

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1.11

When the utility line power has been restored at above 105 VAC ± 2 VAC for more than 30 seconds, the UPS shall dropout of battery backup mode and return to utility line mode.

1.12

When the utility line power has been restored at below 125VAC ± 2 VAC for more than 30 seconds, the UPS shall dropout of battery backup mode and return to utility line mode.

1.13

UPS shall be equipped to prevent a malfunction feedback to the cabinet or from feeding back to the utility service.

1.14

In the event of inverter/charger failure, the power transfer relay shall revert to the NC state, where utility line power is reconnected to the cabinet.

1.15

Recharge time for the battery, from “protective low-cutoff” to 80% or more of full battery charge capacity, shall not exceed twenty (20) hours.

2.0 MOUNTING/ CONFIGURATION

2.1 GENERAL

2.1.1

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

2.1.2

(Reserved)

2.1.3

All interconnect wiring provided between Power Transfer Relay, Bypass Switch and Cabinet Terminal Service Block shall be no less than 2 meters (6.5 ft) of #10 AWG wire.

2.1.4

Relay contact wiring provided for each set of NO/NC relay contact closure terminals shall be 2 meters (6'6”) of #18 AWG wire.

2.1.5

To ensure interchangeability between all UPS manufacturers, UPS Power Transfer Relay and Manual Bypass Switch shall be interconnected with Type IV or Type V NEMA cabinets according to the Department standards.

2.1.6

(Reserved)

2.2 (Reserved)

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2.3 BATTERY CABINET

2.3.1

Inverter/Charger, Power Transfer Relay and manually operated Bypass Switch shall fit inside a typical fully equipped Type IV or Type V NEMA Cabinet that houses one NEMA TS 1 or NEMA TS 2 controller.

2.3.2

Batteries shall be housed in a NEMA Standard TS 2 rated cabinet, self supported and mounted on the concrete foundation according to the Department standards. The cabinet shall be mounted on the left side of the cabinet as facing the door. The external battery cabinet shall be mounted against and bolted to the controller cabinet per a method that meets the approval of the manufacturer. This external battery cabinet shall conform to the IDOT Standard Specifications for the construction and finish of the cabinet.

2.3.3

Batteries shall be mounted on individual shelves for the cabinet housing four (4) batteries and two (2) batteries per shelf for the cabinet housing eight (8) batteries.

2.3.4

Four shelves shall be provided. Each shelf shall support a load of 30 kg (66 lb) minimum for single battery or 60 kg (132 lb) minimum for dual batteries.

2.3.5 (Reserved)

2.3.6

Cabinets housing four (4) batteries shall have nominal outside dimensions of width 356 mm (14 in.), depth 229 mm (9 in.) and height within 1143 mm to 1397 mm (45 in. to 55 in.). Cabinets housing eight (8) batteries shall have nominal outside dimensions of width 711 mm (28 in.) depth 229 mm (9 in.), and height within 1143 mm to 1397 mm (45 in. to 55 in.). Clearance between shelves shall be a minimum of 254 mm (10 in.).

2.3.7

The battery cabinet shall be ventilated through the use of louvered vents, filter, and one thermostatically controlled fan as per NEMA TS 2 specifications.

2.3.8

The battery cabinet fan shall be AC operated from the same line output of the Manual Bypass Switch that supplies power to the Type IV or Type V Cabinet.

2.3.9

The battery cabinet shall have a door opening to the entire cabinet. The door shall be attached to the cabinet through the use of a continuous stainless steel or aluminum piano hinge. The cabinet shall be provided with a main door lock which shall operate with a traffic industry conventional No. 2 key. Provisions for padlocking the door shall be provided.

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2.3.10

The UPS with battery cabinet shall come with all bolts, conduits and bushings, gaskets, shelves, and hardware needed for mounting.

3.0 MAINTENANCE, DISPLAYS, CONTROLS AND DIAGNOSTICS

3.1

The UPS shall include a display and /or meter to indicate current battery charge status and conditions.

3.2

The UPS shall have lightning surge protection compliant with IEEE/ANSI C.62.41.

3.3

The UPS shall be equipped with an integral system to prevent battery from destructive discharge and overcharge.

3.4

The UPS and batteries shall be easily replaced with all needed hardware and shall not require any special tools for installation.

3.5

The UPS shall include a resettable front-panel event counter display to indicate the number of times the UPS was activated and a front-panel hour meter to display the total number of hours the unit has operated on battery power.

3.6

Manufacturer shall include two (2) sets of equipment lists, operation and maintenance manuals, and board-level schematic and wiring diagrams of the UPS, and the battery data sheets.

4.0 BATTERY SYSTEM

4.1

Individual batteries shall be 12V type, 65 amp-hour minimum capacity at 20 hours, and shall be easily replaced and commercially available off the shelf.

4.2

Batteries used for UPS shall consist of 4 to 8 batteries with a cumulative minimum rated capacity of 240 amp-hours.

4.3

Batteries shall be deep cycle, completely sealed, prismatic lead-calcium based AGM/VRLA (Absorbed Glass Mat/ Valve Regulated Lead Acid) requiring no maintenance.

4.4

Batteries shall be certified by the manufacturer to operate over a temperature range of – 25 C to +71 C (-13°F to 160°F).

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4.5

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.

4.6

Batteries shall indicate maximum recharge data and recharging cycles.

4.7

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.

4.8

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

5.0 QUALITY ASSURANCE

5.1

Each UPS 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 UPS units built to meet this specification and a documented process of how problems are to be resolved.

5.2

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

5.3

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.

5.4 DESIGN QUALIFICATION TESTING

5.4.1

The manufacturer, or an independent testing lab hired by the manufacturer, shall perform design Qualification Testing on new UPS 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.

5.4.2

A single unit for each design shall be submitted for Design Qualification Testing.

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5.4.2.1

Test units shall be submitted to the Traffic Operations Lab, 1605 Titan Drive, Rantoul, IL 61866, after the manufacturer's testing is complete.

5.4.2.2

Manufacturer's testing data shall be submitted with test units for IDOT's verification of Design Qualification Testing data.

5.4.3 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 (+165°F and -35°F), excluding batteries, before performing any design qualification testing.

5.4.4

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

5.4.5

For Design Qualification Testing, all specifications will be measured including, but not limited to:

5.4.5.1

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

5.4.5.2

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

5.4.5.3

Inverter output voltage, frequency, harmonic distortion, and efficiency, when in battery backup mode.

5.4.5.4

All utility mode – battery backup mode transfer voltage levels. See UPS Spec 1.8, 1.11 and 1.12.

5.4.5.5

Power transfer time from loss of utility power to switchover to battery backed inverter power.

5.4.5.6

Backfeed voltage to utility when in battery backup mode.

5.4.5.7

IEEE/ANSI C.62.41 compliance.

5.4.5.8

Battery charging time.

5.4.5.9

Event counter and runtime meter accuracy.

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5.5 PRODUCTION QUALITY CONTROL TESTING

5.5.1

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.

5.5.2

Each UPS shall be given a minimum 100-hour burn-in period to catch any premature failures.

5.5.3

Each system shall be visually inspected for any exterior physical damage or assembly anomalies. Any defects shall be cause for rejection.

5.6 IDOT QUALITY ASSURANCE TESTING

5.6.1

The IDOT will perform random sample testing on all shipments, consistent with ANSI/ASQC Z1.4-1993 Sampling Procedures and Tables for Inspection by Attributes.

5.6.2

Sample testing will normally be completed within 90 days after delivery to the Traffic Operations Laboratory, barring deficiencies in the shipment, which would reset the clock.

5.6.3

All parameters of the specification may be tested on the shipment sample.

5.6.4

The number of units tested (sample size) shall be determined by the quantity in the shipment. The sample size and acceptance or rejection of the shipment shall conform to ANSI/ASQC Z1.4.

6.0 WARRANTY

Manufacturers shall provide a two (2) year factory-repair warranty for parts and labor on the UPS from date of acceptance by the State. Batteries shall be warranted for full replacement for two (2) years from date of purchase. The warranty shall be included in the total bid price of the UPS.

RELOCATE EXISTING EMERGENCY VEHICLE PRIORITY SYSTEM, COMPLETE

This work shall consist of the removal of the existing light detector amplifier from the existing controller cabinet and the removal of the light detector units and confirmation beacons from the existing mast arms and the relocation of this equipment to their respective locations in the proposed controller cabinet and the proposed mast arms as shown in the plans.

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PRECAST CONCRETE PRODUCTS (BDE)

Effective: July 1, 1999

Revised: November 1, 2004

Product Approval. Precast concrete products shall be produced according to the Department's current Policy Memorandum, "Quality Control/Quality Assurance Program for Precast Concrete Products". The Policy Memorandum applies to precast concrete products listed under the Products Key of the "Approved List of Certified Precast Concrete Producers".

Precast Concrete Box Culverts. Add the following sentence to the end of the fourth paragraph of Article 540.06:

"After installation, the interior and exterior joint gap between precast concrete box culvert sections shall not exceed 38 mm (1 1/2 in.)."

Portland Cement Replacement. For precast concrete products using Class PC concrete or other mixtures, portland cement replacement with fly ash or ground granulated blast-furnace (GGBF) slag shall be governed by the AASHTO or ASTM standard specification referenced in the Standard Specifications.

For all other precast concrete products using Class PC concrete or other mixtures, portland cement replacement with fly ash or GGBF slag shall be approved by the Engineer. Class F fly ash shall not exceed 15 percent by mass (weight) of the total portland cement and Class F fly ash. Class C fly ash shall not exceed 20 percent by mass (weight) of the total portland cement and Class C fly ash. GGBF slag shall not exceed 25 percent by mass (weight) of the total portland cement and GGBF slag.

Concrete mix designs, for precast concrete products, shall not consist of portland cement, fly ash and GGBF slag.

Ready-Mixed Concrete. Delete the last paragraph of Article 1020.11(a) of the Standard Specifications.

Shipping. When a precast concrete product has attained the specified strength, the earliest the product may be loaded, shipped, and used is on the fifth calendar day. The first calendar day shall be the date casting was completed.

Acceptance. Products which have been lot or piece inspected and approved by the Department prior to July 1, 1999, will be accepted for use on this contract.

RAILROAD PROTECTIVE LIABILITY INSURANCE

The contractor will be required to carry Railroad Protective Liability and Property Damage Liability Insurance in accordance with Article 107.11 of the Standard Specifications. The limits of liability shall be in accordance with Article 107.11 of the Standard Specification unless otherwise noted. A separate policy is required for each railroad indicated below unless otherwise noted.

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Special CN/IC Requirements as follows:

1. Exclusion Asbestos (CG T4 78 02 90) must be removed.
2. War Liability Exclusion (CG 00 64 12 02) must be removed.
3. Cap on Losses from Certified Acts of Terrorism (CG 21 70 11 02) must be removed.

NAMED INSURED & ADDRESS	NUMBER AND SPEED OF PASSENGER TRAINS	NUMBER & SPEED OF FREIGHT TRAINS
Illinois Central Railroad Company Mr. John Henriksen Manager Engineering Services 17641 South Ashland Avenue Homewood, Illinois 60430-1345	4/Day @79 MPH MAX	25/Day @ 60 MPH

Dot/AAR No. 313 648 V Mile Post-130.2

Division-MIDWEST

Sub Division-CHAMPAIGN

FOR FREIGHT/PASSENGER INFORMATION CONTACT:

Illinois Central Railroad Company
Mr. Hardy Taylor, Field Engineer

Phone: 217-238-2443

FOR INSURANCE INFORMATION CONTACT:

Illinois Central Railroad Company
Mr. John Henriksen, Manager Engineering Services

Phone: (708) 332-3557

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FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL

This work shall consist of furnishing and installing a full-actuated controller in a controller cabinet in accordance with Section 857 of the Standard Specifications, the details in the plans, and the following additions or exceptions.

The cabinet furnished under this contract shall have a detector test panel installed properly wired to the back-panel and located on the interior of the service door. It shall be possible to register an input call by means of momentary action switches, or comparable means, for any available phase. The call will be serviced as an actual call from a field detector. Each switch shall be properly identified per phase.

The controller shall be the EAGLE EPAC M52 TS-2, Type 2 Controller with Port 3 FSK Modem, model number EPAC3608M52. The Type IV controller cabinet shall be the EAGLE Size P base mounted cabinet, model number EL 712. The controller cabinet shall be constructed of unpainted aluminum.

The controller cabinet shall contain an EDI MMU-16E or approved equivalent TS-2 malfunction management unit, a TS-1 panel and terminal facilities, TS-1 load switches, and a TS-1 flasher and flasher relays.

The controller cabinet shall contain two TS-2 cabinet detector racks for the video detection system and the emergency vehicle priority system. The racks shall be the EAGLE CDR100 and the EAGLE AAD12047P001. Each cabinet detector rack shall be furnished with an EAGLE BIU200 bus interface unit. The controller cabinet shall contain an EAGLE CPS102 cabinet power supply for the cabinet detector racks.

The controller cabinet shall contain separate ground and neutral buses. The neutral bus shall be electrically isolated from ground. The controller cabinet shall be bonded to the equipment grounding conductor in accordance with the NEC and the NESC.

The controller cabinet shall contain an HS-P-SP-120-30-RJ surge protector manufactured by Innovative Technology.

The controller cabinet shall contain one 10A, 120V, single pole circuit breaker for the control equipment, one 40A, 120V, single pole circuit breaker for the signal load, and one 15A, 120V, single pole circuit breaker for the internally illuminated street name signs.

The City of Champaign will furnish and install a contactor and a photocell inside the controller cabinet to control the internally illuminated street name signs.

The controller cabinet shall contain an engraved laminated plastic nameplate with the following message: "CAUTION - TRAFFIC SIGNAL MAST ARM POLES HAVE TWO SOURCES OF POWER. LUMINAIRES ON TRAFFIC SIGNAL MAST ARM POLES ARE FED FROM THE LIGHTING CONTROLLER CABINET." The nameplate shall be red with white letters, and the letters shall be ¼" high. The nameplate shall be mounted with corrosion-resistant screws in a prominent location inside the controller cabinet.

Added 11/02/2005

FAP Route 804 (US Rte 45)
Project ACHS-0804(185)
Section 25R,TS
Champaign County
Contract No. 70476

This work will be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL, which price shall be considered payment in full for all labor, equipment, and material necessary to complete the work as specified.

Added 11/02/2005