



Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

March 3, 2005

SUBJECT: FAP Route 305
Project ACNHF-0305(035)
Section 1313.1B
Cook County
Contract No. 62878
Item No. 87, March 11, 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 page iii of the Table of Contents.
2. Added pages 172 – 207 to the Special Provisions.
3. Revised page 160 of the Special Provisions.
4. Revised entire schedule of prices.
5. Revised sheets 2, 4-11, 15, 17-19, 21, 32, 42, 46, 70, 71, 84, 120-122, 124-126, 192 and 193 of the plans.
6. Added sheet 115C and 167A to the plans.

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' with a small 'P.E.' to the right.

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

cc: Diane O'Keefe; Roger Driskell; R. E. Anderson; Jim White; Design & Environment File

TK/sar/62878LetterA

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REVISED 3/3/05

Delete all references to "Type 1A barricades" and "wing barricades" throughout Section 702 of the Standard Specifications.

STEEL COST ADJUSTMENT (BDE)

Effective: April 2, 2004

Revised: July 1, 2004

Description. At the bidder's option, a steel cost adjustment will be made to provide additional compensation to the Contractor or a credit to the Department for fluctuations in steel prices. The bidder must indicate on the attached form whether or not steel cost adjustments will be part of this contract. This attached form shall be submitted with the bid. Failure to submit the form shall make this contract exempt of steel cost adjustments.

Types of Steel Products. An adjustment will be made for fluctuations in the cost of steel used in the manufacture of the following items:

- Metal Piling (excluding temporary sheet piling)
- Structural Steel
- Reinforcing Steel

Other steel materials such as dowel bars, tie bars, mesh reinforcement, guardrail, steel traffic signal and light poles, towers and mast arms, metal railings (excluding wire fence), frames and grates, and other miscellaneous items will be subject to a steel cost adjustment when the pay item they are used in has a contract value of \$10,000 or greater.

Documentation. Sufficient documentation shall be furnished to the Engineer to verify the following:

- (a) Evidence that increased or decreased steel costs have been passed on to the Contractor.
- (b) The dates and quantity of steel, in kg (lb), shipped from the mill to the fabricator.
- (c) The quantity of steel, in kg (lb), incorporated into the various items of work covered by this special provision. The Department reserves the right to verify submitted quantities.

Method of Adjustment. Steel cost adjustments will be computed as follows:

$$SCA = Q \times D$$

Revised 3/3/05

ELECTRIC SERVICE INSTALLATION

Effective: January 1, 2002

Description. This item shall consist of all material and labor required to extend, connect or modify the electric services, as indicated or specified, which is over and above the work performed by the utility. Unless otherwise indicated, the cost for the utility work, if any, will be reimbursed to the Contractor separately under ELECTRIC SERVICE CONNECTION. This item may apply to the work at more than one service location and each will be paid separately.

Materials. Materials shall be according to the following Articles of Section 1000 - Materials

Item	Article/Section
(a) Electric Service Installation – Lighting	1086.01

CONSTRUCTION REQUIREMENTS

General. The Contractor shall ascertain the work being provided by the electric utility and shall provide all additional material and work required to complete the electric service work in complete compliance with the requirements of the utility.

No additional compensation will be allowed for work required for the electric service, even though not explicitly shown on the Drawings or specified herein

Method Of Measurement. Electric Service Installation shall be counted, each.

Basis Of Payment. This work will be paid for at the contract unit price each for **ELECTRIC SERVICE INSTALLATION** which shall be payment in full for the work specified herein.

UNIT DUCT

Effective: October 1, 2002

Revise the second paragraph of Article 816.03(b) to read:

“The unit duct shall be installed at a minimum depth of 760 mm (30-inches) unless otherwise directed by the Engineer.”

Added 3/3/05

Revise Article 1066.01 to read:

"1066.01 Unit Duct. The unit duct shall be an assembly of insulated conductors which are factory pre-installed in a coilable nonmetallic conduit. The polyethylene duct shall be extruded directly over the cable at the factory in long continuous lengths. The unit duct shall be according to NEC Article 354 and be UL Listed."

Revise Article 1088.01(c) to read:

"(c) Coilable Nonmetallic Conduit.

Polyethylene Duct. The duct shall be a plastic duct which is intended for underground use and can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties of performance.

The duct shall be made of high density polyethylene which shall meet the requirements of ASTM D 2447, for schedule 40. The duct shall be composed of black high density polyethylene meeting the requirements of ASTM D 3350, Class C, Grade P33. The wall thickness shall be in accordance with Table 2 for ASTM D 2447.

Duct dimensions shall conform to the following table:

Nom. Duct Diameter		Nom. Outside Diameter		Min. Wall Thickness	
mm	in	mm	in	mm	in
27	1	33.4	1.315	3.4	0.133
35	1.25	42.2	1.660	3.6	0.140
41	1.5	48.3	1.900	3.7	0.145
53	2.0	60.3	2.375	3.9	0.154

Performance Tests. Polyethylene Duct testing procedures and test results shall meet the requirements of ASTM D 3485. Certified copies of the test report shall be submitted to the Engineer prior to the installation of the duct. Duct crush test results shall meet or exceed the following requirements:

Duct Diameter		Min. force required to deform sample 50%	
mm	in	N	lbs
27	1	5337	1200
35	1.25	4937	1110
41	1.5	4559	1025
53	2.0	3780	850

Added 3/3/05

GROUND ROD

Effective: January 1, 2002

Description. This item shall consist of furnishing, installing and connecting ground rods for the grounding of service neutral conductors and for supplementing the equipment grounding system via connection at poles or other equipment throughout the system. All materials and work shall be in accordance with Article 250 of the NEC.

Materials. Materials shall be according to the following Articles of Section 1000 - Materials

Item	Article/Section
(a) Ground Rod.....	1087.01(b)
(b) Copper Ground Wire.....	1087.01(a)
(c) Access Well.....	1087.01(c)

CONSTRUCTION REQUIREMENTS

General. All connections to ground rods, structural steel or fencing shall be made with exothermic welds. Where such connections are made to insulated conductors, the connection shall be wrapped with at least 4 layers of electrical tape extended 152.4 mm (six inches) onto the conductor insulation.

Ground rods shall be driven so that the tops of the rod are 609.6 mm (24 inches) below finished grade. Where indicated, ground wells shall be included to permit access to the rod connections.

Where indicated, ground rods shall be installed through concrete foundations.

Where ground conditions, such as rock, preclude the installation of the ground rod, the ground rod may be deleted with the approval of the Engineer.

Where a ground field of "made" electrodes is provided, such as at control cabinets, the exact locations of the rods shall be documented by dimensioned drawings as part of the Record Drawings.

Ground rod connection shall be made by exothermic welds. Ground wire for connection to foundation steel or as otherwise indicated shall be stranded uncoated bare copper in accordance the applicable requirements of ASTM Designation B-3 and ASTM Designation B-8 and shall be included in this item. Unless otherwise indicated, the wire shall not be less than No. 2 AWG.

Where connections are made to epoxy coated reinforcing steel, the epoxy coating shall be sufficiently removed to facilitate the exothermic weld.

Added 3/3/05

Method Of Measurement. Ground rods shall be counted, each. Ground wires and connection of ground rods at poles shall be included in this pay item.

Basis Of Payment. This item shall be paid at the contract unit price each for **GROUND ROD**, of the diameter and length indicated which shall be payment in full for the material and work described herein.

UNDERGROUND RACEWAYS

Effective: January 1, 2002

Revise Article 810.03 of the Standard Specifications to read:

“Installation. All underground conduit shall have a minimum depth of 700 mm (30-inches) below the finished grade.”

Add the following to Article 810.03 of the Standard Specifications:

“All metal conduit installed underground shall be Rigid Metal Conduit unless otherwise indicated on the plans.”

EXPOSED RACEWAYS

Effective: March 1, 2003

Add the following to Article 811.03(a)(3) of the Standard Specifications:

“Where PVC coated conduit is utilized, all conduit fittings, couplings and clamps shall be PVC coated. All other mounting hardware and appurtenances shall be stainless steel.”

Add the following to Article 811.03(b) of the Standard Specifications:

“The personnel installing the PVC coated conduit must be trained and certified by the PVC coated conduit Manufacturer or Manufacturer’s representative to install PVC coated conduit. Documentation demonstrating this requirement must be submitted for review and approval.”

“All conduit fittings, couplings and clamps shall be PVC coated. All other mounting hardware and appurtenances shall be stainless steel.”

Added 3/3/05

Revise Article 1088.01(a) of the Standard Specifications to read:

"Couplings and fittings shall meet ANSI Standard C80.5 and U.L. Standard 6. Elbows and nipples shall conform to the specifications for conduit. All fittings and couplings for rigid conduit shall be of the threaded type."

Revise Article 1088.01(a)(1) of the Standard Specifications to read:

"Rigid Steel Conduit. Rigid steel conduit shall be galvanized and manufactured according to UL Standard 6 and ANSI Standard C 80.1."

Revise Article 1088.01(a)(3) of the Standard Specifications to read:

"a. PVC Coated Steel Conduit. The PVC coated rigid metal conduit shall be UL Listed (UL 6). The PVC coating must have been investigated by UL as providing the primary corrosion protection for the rigid metal conduit. Ferrous fittings for general service locations shall be UL Listed with PVC as the primary corrosion protection. Hazardous location fittings, prior to plastic coating shall be UL listed.

b. The PVC coating shall have the following characteristics:

Hardness:	85+ Shore A Durometer
Dielectric Strength:	400V/mil @ 60 Hz
Aging: Temperature	1,000 Hours Atlas Weatherometer The PVC compound shall conform at 0 °F. to Federal Specifications PL-406b, Method 2051, Amendment 1 of 25 September 1952 (ASTM D 746)
Elongation:	200%

c. The exterior and interior galvanized conduit surface shall be chemically treated to enhance PVC coating adhesion and shall also be coated with a primer before the PVC coating to ensure a bond between the zinc substrate and the PVC coating. The bond strength created shall be greater than the tensile strength of the plastic coating.

d. The nominal thickness of the PVC coating shall be 1 mm (40 mils). The PVC exterior and urethane interior coatings applied to the conduit shall afford sufficient flexibility to permit field bending without cracking or flaking at temperatures above -1°C (30°F).

Added 3/3/05

- e. An interior urethane coating shall be uniformly and consistently applied to the interior of all conduit and fittings. This internal coating shall be a nominal 2 mil thickness. The interior coating shall be applied in a manner so there are no runs, drips, or pinholes at any point. The coating shall not peel, flake, or chip off after a cut is made in the conduit or a scratch is made in the coating.
- f. The PVC conduit shall pass the following tests:

Exterior PVC Bond test RN1:

Two parallel cuts 13 mm (1/2 inch) apart and 40 mm (1 1/2 inches) in length shall be made with a sharp knife along the longitudinal axis. A third cut shall be made perpendicular to and crossing the longitudinal cuts at one end. The knife shall then be worked under the PVC coating for 13 mm (1/2 inch) to free the coating from the metal.

Using pliers, the freed PVC tab shall be pulled with a force applied vertically and away from the conduit. The PVC tab shall tear rather than cause any additional PVC coating to separate from the substrate.

Boil Test:

Acceptable conduit coating bonds (exterior and interior) shall be confirmed if there is no disbondment after a minimum average of 200 hours in boiling water or exposure to steam vapor at one atmosphere. The RN1 Bond Test and the Standard Method for Measuring Adhesion by Tape Test shall be utilized.

Exterior Adhesion. In accordance with ASTM D870, a 6" length of conduit test specimen shall be placed in boiling water. The specimen shall be periodically removed, cooled to ambient temperature and immediately tested according to the bond test (RN1). When the PVC coating separates from the substrate, the boil time to failure in hours shall be recorded.

Interior Adhesion. In accordance with ASTM D3359, a 6" conduit test specimen shall be cut in half longitudinally and placed in boiling water or directly above boiling water with the urethane surface facing down. The specimen shall be periodically removed, cooled to ambient temperature and tested in accordance with the Standard Method of Adhesion by Tape Test (ASTM D3359). When the coating disbonds, the time to failure in hours shall be recorded.

Added 3/3/05

Heat/Humidity Test:

Acceptable conduit coating bonds shall be confirmed by a minimum average of 30 days in the Heat and Humidity Test. The RN1 Bond Test and the Standard Method for Measuring Adhesion by Tape Test shall be utilized.

Exterior Adhesion. In accordance with ASTM D1151, D1735, D2247 and D4585, conduit specimens shall be placed in a heat and humidity environment where the temperature is maintained at 150°F (66°C) and 95% relative humidity. The specimens shall be periodically removed and a bond test (RN1) performed. When the PVC coating separates from the substrate, the exposure time to failure in days shall be recorded.

Interior Adhesion. In accordance with ASTM D3359, conduit specimens shall be placed in a heat and humidity environment where the temperature is maintained at 150°F (66°C) and 95% relative humidity. When the coating disbonds, the time to failure in hours shall be recorded.

Add the following to Article 1088.01(a)(4) of the Standard Specifications:

"All liquid tight flexible metal conduit fittings shall have an insulated throat to prevent abrasion of the conductors."

Revise Article 811.05 of the Standard Specifications to read:

"811.05 Basis of Payment. This work will be paid for at the contract unit price per meter (foot) for **CONDUIT ATTACHED TO STRUCTURE**, of the diameter specified, **RIGID GALVANIZED STEEL** or **CONDUIT ATTACHED TO STRUCTURE**, of the diameter specified, **RIGID GALVANIZED STEEL, PVC COATED.**"

TRENCH AND BACKFILL FOR ELECTRICAL WORK

Effective: January 1, 2002

Revise the first sentence of Article 815.03(a) of the Standard Specifications to read:

"Trench. Trenches shall have a minimum depth of 760 mm (30 in.) or as otherwise indicated on the plans, and shall not exceed 300 mm (12 in.) in width without prior approval of the Engineer."

Added 3/3/05

Revise Article 1066.05 of the Standard Specifications to read:

“Underground Cable Marking Tape. The tape shall be 150 mm (6 in.) wide; consisting of 0.2 mm (8 mil) polyethylene according to ASTM D882, and ASTM D2103.

The tape shall be red with black lettering or red with silver lettering reading “CAUTION – ELECTRICAL LINE BURIED BELOW”.

The tape shall have reinforced metallic detection capabilities consisting of a woven reinforced polyethylene tape with a metallic core or backing.”

WIRE AND CABLE

Effective: January 1, 2002

Revise the second sentence of the first paragraph of Article 1066.02(a) to read:

“The cable shall be rated at a minimum of 90°C dry and 75°C wet and shall be suitable for installation in wet and dry locations, and shall be resistant to oils and chemicals.”

Revise the second paragraph of Article 1066.02(b) to read:

“Uncoated conductors shall be according to ASTM B3, ICEA S-95-658/NEMA WC70, and UL Standard 44. Coated conductors shall be according to ASTM B 33, ASTM B 8, ICEA S-95-658/NEMA WC70 and UL Standard 44.”

Revise the third paragraph of Article 1066.02(b) to read:

“All conductors shall be stranded. Stranding meeting ASTM B 8, ICEA S-95-658/NEMA WC70 and UL Standard 44. Uncoated conductors meeting ASTM B 3, ICEA S-95-658/NEMA WC70 and UL Standard 44.”

Revise the first sentence of Article 1066.03(a)(1) to read:

“General. Cable insulation designated as XLP shall incorporate cross-linked polyethylene (XLP) insulation as specified and shall meet or exceed the requirements of ICEA S-95-658, NEMA WC70, U.L. Standard 44.”

Added 3/3/05

Add the following to Article 1066.03(a)(1) of the Standard Specifications:

“The cable shall be rated 600 volts and shall be UL Listed Type RHH/RHW/USE.”

Revise the Aerial Electric Cable Properties table of Article 1066.03(a)(3) to read:

Aerial Electric Cable Properties

Phase Conductor		Messenger wire			
Size AWG	Stranding	Average Insulation Thickness		Minimum Size AWG	Stranding
		mm	mils		
6	7	1.1	(45)	6	6/1
4	7	1.1	(45)	4	6/1
2	7	1.1	(45)	2	6/1
1/0	19	1.5	(60)	1/0	6/1
2/0	19	1.5	(60)	2/0	6/1
3/0	19	1.5	(60)	3/0	6/1
4/0	19	1.5	(60)	4/0	6/1

Revise the first paragraph of Article 1066.03(b) to read:

“EPR Insulation. Cable insulation shall incorporate ethylene propylene rubber (EPR) as specified and the insulation shall meet or exceed the requirements of ICEA S-95-658, NEMA Standard Publication No. WC70, and U.L. Standard 44, as applicable.”

Add the following to Article 1066.03(b) of the Standard Specifications:

“Cable sized No. 2 AWG and smaller shall be U.L. listed Type RHH/RHW and may be Type RHH/RHW/USE. Cable sized larger than No. 2 AWG shall be U.L. listed Type RHH/RHW/USE.”

Revise Article 1066.04 to read:

“Aerial Cable Assembly. The aerial cable shall be an assembly of insulated aluminum conductors according to Section 1066.02 and 1066.03. Unless otherwise indicated, the cable assembly shall be composed of three insulated conductors and a steel reinforced bare aluminum conductor (ACSR) to be used as the ground conductor. Unless otherwise indicated, the code word designation of this cable assembly is “Palomino”. The steel reinforced aluminum conductor shall conform to ASTM B-232. The cable shall be assembled according to ANSI/ICEA S-76-474.”

Added 3/3/05

Revise the second paragraph of Article 1066.05 to read:

“The tape shall have reinforced metallic detection capabilities consisting of a woven reinforced polyethylene tape with a metallic core or backing.”

Revise Article 1066.08 to read:

“Electrical Tape. Electrical tape shall be all weather vinyl plastic tape resistant to abrasion, puncture, flame, oil, acids, alkalies, and weathering, conforming to Federal Specification MIL-I-24391, ASTM D1000 and shall be listed under UL 510 Standard. Thickness shall not be less than 0.215 mm (8.5 mils) and width shall not be less than 20 mm (3/4-inch).”

LUMINAIRE

Effective: August 1, 2004

Add the following to first paragraph of Article 1067(a)(3) of the Standard Specifications:

“The reflector shall not be altered by paint or other opaque coatings which would cover or coat the reflecting surface. Control of the light distribution by any method other than the reflecting material and the aforementioned clear protective coating that will alter the reflective properties of the reflecting surface is unacceptable”

Add the following to Article 1067(a)(5)a. of the Standard Specifications:

“The ballast shall be a High Pressure Sodium, high power factor, constant wattage auto-regulator, lead type (CWA) for operation on a nominal 240 volt system.”

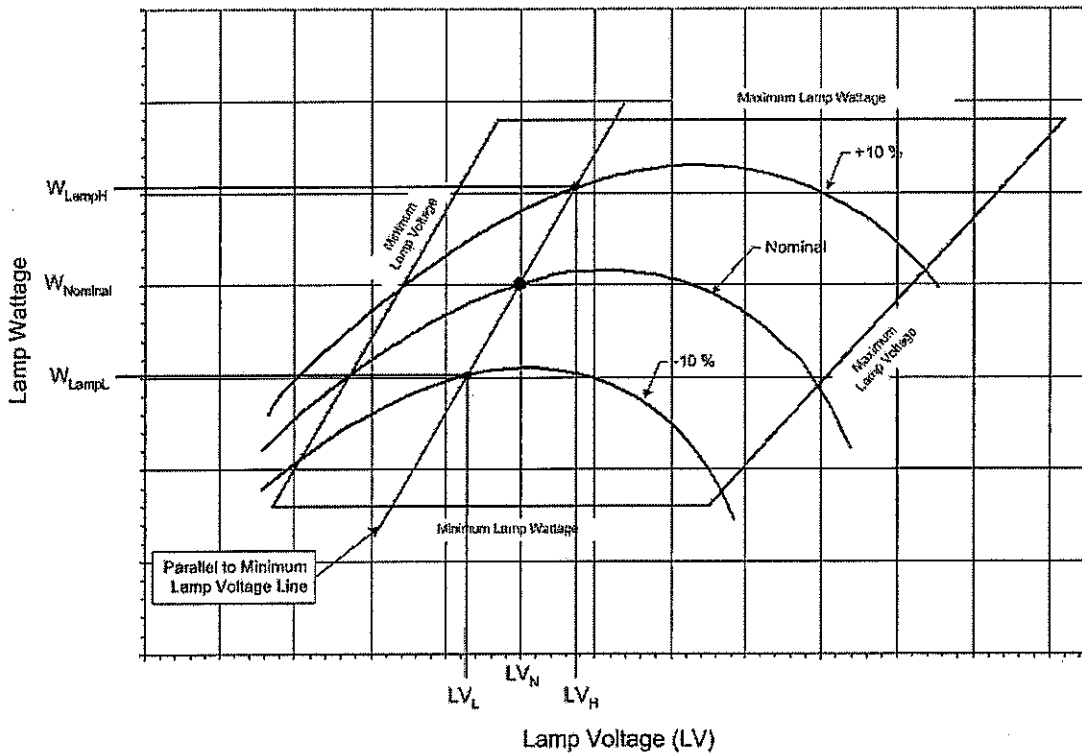
Revise the second sentence of the second paragraph of Article 1067(a)(5)c. of the Standard Specifications:

“The ballast shall be designed to ANSI Standards and shall be designed and rated for operation on a nominal 240 volt system. The ballast shall provide positive lamp ignition at the input voltage of 216 volts. It shall operate the lamp over a range of input voltages from 216 to 264 volts without damage to the ballast. It shall provide lamp operation within lamp specifications for rated lamp life at input design voltage range. Operating characteristics shall produce output regulation not exceeding the following values:

Added 3/3/05

Nominal Ballast Wattage	Maximum Ballast Regulation
750	25%
400	26%
310	26%
250	26%
150	24%
70	18%

For this measure, regulation shall be defined as the ratio of the lamp watt difference between the upper and lower operating curves to the nominal lamp watts; with the lamp watt difference taken within the ANSI trapezoid at the nominal lamp operating voltage point parallel to the minimum lamp volt line:



$$\text{Ballast Regulation} = \frac{W_{LampH} - W_{LampL}}{W_{LampN}} \times 100$$

where:

W_{LampH} = lamp watts at +10% line voltage when Lamp voltage = LV_H

W_{LampL} = lamp watts at -10% line voltage when lamp voltage = LV_L

W_{LampN} = lamp watts at nominal lamp operating voltage = LV_N

Added 3/3/05

Wattage	Nominal Lamp Voltage, LV _N	LV _L	LV _H
750	120v	115v	125v
400	100v	95v	105v
310	100v	95v	105v
250	100v	95v	105v
150	55v	50v	60v
70	52v	47v	57v

Revise the third sentence of the second paragraph of Article 1067(a)(5)c. of the Standard Specifications to read:

“Ballast losses, based on cold bench tests, shall not exceed the following values:

Nominal Ballast Wattage	Maximum Ballast Losses
750	14.0%
400	17.0%
310	19.0%
250	19.0%
150	26.0%
70	34.0%

Ballast losses shall be calculated based on input watts and lamp watts at nominal system voltage as indicated in the following equation:

$$\text{Ballast Losses} = \frac{W_{\text{Line}} - W_{\text{Lamp}}}{W_{\text{Lamp}}} \times 100$$

where:

W_{line} = line watts at nominal system voltage

W_{lamp} = lamp watts at nominal system voltage

Add the following to Article 1067(a)(5)c. of the Standard Specifications:

“Ballast output to lamp. At nominal system voltage and nominal lamp voltage, the ballast shall deliver lamp wattage with the variation specified in the following table. Example: *For a 400w luminaire, the ballast shall deliver 400 watts ±2.5% at a lamp voltage of 100v for the nominal system voltage of 240v which is the range of 390w to 410w.*”

Added 3/3/05

Nominal Ballast Wattage	Output to lamp variation
750	± 2.0%
400	± 2.5%
310	± 2.5%
250	± 4.0%
150	± 4.0%
70	± 4.0%

Add the following to Article 1067(a)(5)c. of the Standard Specifications:

"Ballast output over lamp life. Over the life of the lamp the ballast shall produce average output wattage of the nominal lamp rating as specified in the following table. Lamp wattage readings shall be taken at 5-volt increments throughout the ballast trapezoid. Reading shall begin at the lamp voltage (L_v) specified in the table and continue at 5 volt increments until the right side of the trapezoid is reached. The lamp wattage values shall then be averaged and shall be within the specified value of the nominal ballast rating. Submittal documents shall include a tabulation of the lamp wattage vs. lamp voltage readings. Example: *For a 400w luminaire, the averaged lamp wattage reading shall not exceed the range of ±3% which is 388 to 412 watts*"

Nominal Ballast Wattage	LV Readings begin at	Maximum Wattage Variation
750	110v	± 3%
400	90v	± 3%
310	90v	± 3%
250	90v	± 4%
150	50v	± 4%
70	45v	± 5%

Revise the first paragraph of Article 1067(a)(7) of the Standard Specifications to read:

"Independent testing of luminaires shall be required whenever the quantity of luminaires of a given wattage and distribution, as indicated on the plans, is 50 or more. For each luminaire type to be so tested, one luminaire plus one luminaire for each 50 luminaires shall be tested. Example: *A plan quantity of 75 luminaires would dictate that 2 to be tested; 135 luminaires would dictate that three be tested.*"

Add the following to Article 1067(a)(7) of the Standard Specifications:

"The Contractor shall be responsible for all costs associated with the specified testing, including but not limited to shipping, travel and lodging costs as well as the costs of the tests themselves, all as part of the bid unit price for this item. Travel, lodging and other associated costs for travel by the Engineer shall be direct-billed to or shall be pre-paid by the Contractor, requiring no direct reimbursement to the Engineer or the independent witness, as applicable"

Added 3/3/05

Revise Article 1067(a)(7)a. of the Standard Specifications to read:

“Engineer Factory Selection for Independent Lab: The Contractor may select this option if the luminaire manufacturing facility is within the state of Illinois. The Contractor shall propose an independent test laboratory for approval by the Engineer. The selected luminaires shall be marked by the Engineer and shipped to the independent laboratory for tests.”

Revise Article 1067(a)(7)b. of the Standard Specifications to read:

“Engineer Witness of Independent Lab Test: The Contractor may select this option if the independent testing laboratory is within the state of Illinois. The Engineer shall select, from the project luminaires at the manufacturer’s facility or at the Contractor’s storage facility, luminaires for testing by the independent laboratory.”

Add the following to Article 1067(a)(7)c. of the Standard Specifications:

“The independent witness shall as a minimum meet the following requirements:

- ▶ Have been involved with roadway lighting design for at least 15 years.
- ▶ Not have been the employee of a luminaire or ballast manufacturer within the last 5 years.
- ▶ Not associated in any way (plan preparation, construction or supply) with the particular project being tested.
- ▶ Be a member of IESNA in good standing.
- ▶ Provide a list of professional references.

This list is not an all inclusive list and the Engineer will make the final determination as to the acceptability of the proposed independent witness.”

Add the following to Article 1067(a)(7) of the Standard Specifications:

“d. Engineer Factory Selection and Witness of Manufacturer Testing: The Contractor may select this option if the luminaire manufacturing facility is within the state of Illinois. At the Manufacturer’s facility, the Engineer shall select the luminaires to be tested and shall be present during the testing process. The Contractor shall schedule travel by the Engineer to and from the Manufacturer’s laboratory to witness the performance of the required tests.”

Revise the sixth paragraph of Article 1067(c)(1)a. of the Standard Specifications to read:

“The beam of maximum candlepower for luminaires specified or shown to have a ‘medium’ distribution shall be at 70 degrees from the horizontal \pm 2.5 degrees. Submittal information shall identify the angle.”

Added 3/3/05

Revise Article 1067.02(a)(1) of the Standard Specifications to read:

"The lamps shall be of the clear type and shall have a color of 2050° to 2100° Kelvin."

Added 3/3/05

Add the following table(s) to Article 1067 of the Standard Specifications:

IDOT DISTRICT 1 LUMINAIRE PERFORMANCE TABLE

Palatine Rd. Center Median Lighting
 Light poles with dual davit arms

GIVEN CONDITIONS		
ROADWAY DATA	Pavement Width	52 (ft)
	Single Lane Width	12 (ft)
	Median Width	4 (ft)
	Number of Lanes	4
	I.E.S. Surface Classification	R3
	Q-Zero Value	.07
	Cross section	2 lanes-median-2 lanes
LIGHT POLE DATA	Mounting Height (pole mounted on center median on Palatine Rd.)	50 (ft)
	Mast Arm Length (dual arms)	6 (ft)
	Pole Set-Back From Edge of Pavement	0 (ft)
LUMINAIRE DATA	Lamp Type	HPS
	Lamp Lumens	37,000
	I.E.S. Vertical Distribution	Medium
	I.E.S. Control Of Distribution	Cutoff
	I.E.S. Lateral Distribution	Type III
	Total Light Loss Factor	.07
LAYOUT DATA	Spacing	235 (ft)
	Configuration	Median Only, Symmetric
	Luminaire Overhang over edge of pavement	4 (ft)

NOTE: Variations from the above specified I.E.S. distribution pattern may be requested and acceptance of variations will be subject to review by the Engineer based on how well the performance requirements are met.

PERFORMANCE REQUIREMENTS

NOTE: These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above.

ILLUMINATION	Ave. Horizontal Illumination, E_{AVE}	12.0 Lux
	Uniformity Ratio, E_{AVE}/E_{MIN}	0.3 (Max)
LUMINANCE	Average Luminance, L_{AVE}	0.8 Cd/m ²
	Uniformity Ratio, L_{AVE}/L_{MIN}	3.0 (Max)
	Uniformity Ratio, L_{MAX}/L_{MIN}	5.0 (Max)
	Veiling Luminance Ratio, L_V/L_{AVE}	0.3 (Max)

Added 3/3/05

IDOT DISTRICT 1 LUMINAIRE PERFORMANCE TABLE

Palatine Rd. Ramp Lighting
 Light poles with single davit arms

GIVEN CONDITIONS		
ROADWAY DATA	Pavement Width	24 (ft)
	Single Lane Width	12 (ft)
	Number of Lanes	2
	I.E.S. Surface Classification	R3
	Q-Zero Value	.07
	Cross section	2 lanes
LIGHT POLE DATA	Mounting Height	30 (ft)
	Mast Arm Length	6 (ft)
	Pole Set-Back From Edge of Pavement	4 (ft)
LUMINAIRE DATA	Lamp Type	HPS
	Lamp Lumens	27,500
	I.E.S. Vertical Distribution	Medium
	I.E.S. Control Of Distribution	Cutoff
	I.E.S. Lateral Distribution	Type III
	Total Light Loss Factor	.07
LAYOUT DATA	Spacing	165 (ft)
	Configuration	Single Side
	Luminaire Overhang over edge of pavement	2 (ft)

NOTE: Variations from the above specified I.E.S. distribution pattern may be requested and acceptance of variations will be subject to review by the Engineer based on how well the performance requirements are met.

PERFORMANCE REQUIREMENTS		
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NOTE: These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above.

ILLUMINATION	Ave. Horizontal Illumination, E_{AVE}	12.0 Lux
	Uniformity Ratio, E_{AVE}/E_{MIN}	0.3 (Max)
LUMINANCE	Average Luminance, L_{AVE}	0.8 Cd/m ²
	Uniformity Ratio, L_{AVE}/L_{MIN}	3.0 (Max)
	Uniformity Ratio, L_{MAX}/L_{MIN}	5.0 (Max)
	Veiling Luminance Ratio, L_V/L_{AVE}	0.3 (Max)

Added 3/3/05

LAMPS

Effective: January 1, 2002

Revise Article 1067.02(a)(1) of the Standard Specifications to read:

"The lamps shall be of the clear type and shall have a color of 2050° to 2100° Kelvin."

LIGHT POLES

Effective: March 1, 2003

Revise the fifth sentence of Article 1069.01(b)(2)d of the Standard Specifications to read:

"A 9.525 mm (3/8 in.) – 16 tapped hole shall be provided in the frame for attaching a mechanical grounding connector."

Revise the third sentence of Article 1069.01(c)(2)b5 of the Standard Specifications to read:

"A 9.525 mm (3/8 in.) – 16 tapped hole shall be provided in the frame for attaching a mechanical grounding connector."

STAINLESS STEEL JUNCTION BOX

Effective: January 1, 2002

Revise the second sentence of the seventh paragraph of Article 1088.04 of the Standard Specifications to read:

"The gasket shall be extruded directly onto the junction box cover."

UNDERPASS LUMINAIRE, HPS, STAINLESS STEEL HOUSING

Effective: April 1, 2004

1. **Description.** This item shall consist of furnishing, testing as required, and installing a luminaire suitable for roadway underpasses as specified herein.

Added 3/3/05

2. General.

- 2.1 The luminaire shall be optically sealed, mechanically strong and easy to maintain.
- 2.2 All wiring within the fixture shall have a minimum temperature rating of 125° C. In addition, the unit shall be designed to allow for a maximum supply wire rating of 90° C.
- 2.3 All hardware of the housing, reflector, and ballast assembly shall be captive
- 2.4 The luminaire shall be UL Listed for Wet Locations.
- 2.5 The underpass luminaire shall be suitable for lighting a roadway underpass at approximate mounting height of 16 feet from a position suspended directly above the roadway.
- 2.6 The luminaire shall be certified by the U.L. testing laboratory to meet the IP66 criteria of the International Electrotechnical Commission Standard 529.

3. Housing.

- 3.1 The housing shall be stainless steel and be made of 16 gauge minimum thickness stainless steel, Type 304, #2B finish.
- 3.2 Since the installed location of the luminaires has severe space limitations that prohibit servicing the luminaire from the top or side of the fixture, the luminaire must be serviceable from the bottom of the housing when in the installed position. Both ballast and optical compartments must be serviceable from the bottom of the fixture. Fixtures which open from the top or sides are not acceptable.
- 3.3 The housing shall have a maximum width of 14"
- 3.4 All internal and external hardware, unless specifically specified otherwise, shall be made of stainless steel.
- 3.5 Stainless Steel Housing
 - 3.5.1 The stainless steel housing, and lens frame shall be made of 16 gauge minimum thickness stainless steel, Type 304 #2B.
 - 3.5.2 All housing and frame components shall be cut within with a laser with a positioning accuracy of +/- .004" for assembly accuracy and machine welded to minimize irregularities in the weld joint.
 - 3.5.3 All seams in the housing enclosure shall be welded by continuous welding. Stainless steel weld wire shall be used for all welds. A sample weld shall be submitted for review and approval.

Added 3/3/05

- 3.5.4 The luminaire lens shall be flush, within 3.1 mm (0.122"), of the lens frame.
- 3.5.5 The lens frame shall be flat and the frame and luminaire housing shall not have any protruding flanges.
- 3.5.6 The lens frame assembly shall consist of a one-piece 16 gauge 304 stainless steel external frame with the lens facing toward the housing and a 16 gauge 304 stainless internal frame with the legs facing away from the housing. The internal frame shall have seam welded corners for added strength. The two panels will sandwich the glass lens and be fastened together with the use of no less than 10 #10 stainless steel fasteners.
- 3.5.7 The ballast door frame shall consist of a one-piece 16 gauge 304 stainless steel external door with the legs facing toward the housing and an 18 gauge 304 stainless steel internal door with the legs facing away from the housing. The two elements will be welded together.
- 3.5.8 The lens frame and the door frame shall each be secured through the use of two stainless steel draw latches secured to the fixture housing.
- 3.5.9 When in open position, it shall be possible to un-hinge and remove the lens frame for maintenance. The lens frame hinge shall be stainless steel and designed so that there must be a conscious action of the maintenance personnel to remove the lens frame. The frame hinging method shall not be designed so that bumping the frame accidentally could allow the frame to fall to the roadway surface. The removal method must be accomplished without the use of tools or hardware. The hinge pin shall be a minimum of 6.35 mm (0.250") in diameter. The pin shall be spring loaded and retractable with a safety catch to hold the pin in the retracted position for ease of maintenance.
- 3.5.10 The ballast and all electrical equipment shall be mounted to a removable aluminum chassis with a minimum thickness of 3.175 mm (0.125") The chassis shall be held in place with captive stainless steel hardware that can be removed without the use of tools. The hardware shall include a bracket that can be loosened and shifted to allow the chassis to pivot away from fastened position for removal. The chassis shall include a heavy-duty 3 pole terminal block to accommodate #6 conductors and a KTK 5 amp fuse with HPC fuse holder or approved equal. Quick-connect power distribution terminal blocks shall be a molded thermoset plastic, rated 70A, 600V and have 3 poles, each with (4) .250 quick connect terminals. Operating temperature rating to be 1500C. Input wire size shall accommodate #2 - #14 AWG. Torque rating shall be 45 in/lb. Maximum. Agency approvals shall be UL E62622; CSA LR15364.

Added 3/3/05

- 3.5.11 Ballast compartment surfaces shall be deburred and free of sharp edges, points or corners that may come in contact with installers or service personnel.
- 3.5.12 The housing shall be divided into two compartments, one for the ballast and one for the optical assembly. The optical chamber shall be sealed from the environment and separated from the ballast compartment with a welded and sealed stainless steel divider. The wire portal between compartments shall be sealed so as to prevent air exchange through the portal. There shall be an internally mounted breather mechanism to allow internal and external air pressure to equalize without permitting dust or water into the unit.

4. Gasketing:

- 4.1 The junction between the lens frame and the ballast housing door and the housing shall be sealed with a one-piece vulcanized or molded high temperature solid silicone rubber gasket with the equivalent of a 60 Shore A durometer rating. The gasket between the lens frame and the luminaire housing shall be securely attached by mechanical means, such a retaining lip to prevent the movement of the gasket. The gasket may not be secured by adhesive means exclusively. The lens and ballast housing doors shall be designed and constructed so they seal to the gasket on a flat surface. The frame shall not seal to the gasket using the edge of leg on a doorframe. The lens shall be sealed inside of the lens frame with the use of a one-piece solid silicone rubber gasket with ribbed flanges and a rating of 60 Shore A Durometer .
- 4.2 The junction between conduit connections to the luminaire and the lens frame junction to the housing shall withstand entry of water when subjected to a water jet pressure of 207 kPa (30 lbs. Per sq. inch), tested under laboratory conditions. Submittal information shall include data relative to gasket thickness and density and the means of securing it in place.

5. Mounting Brackets

- 5.1 The brackets shall be properly sized to accommodate the weight of the luminaire with calculations or other suitable reference documentation submitted to support the material choice.
- 5.2 The luminaire shall have an opening in the housing for installation (by others) of a 25.4 mm (1 inch) diameter flexible conduit. The location of the opening will be determined by the Engineer during the shop drawing review.

Added 3/3/05

6. Lamp Socket:

- 6.1 The lamp socket shall be a 4KV pulse rated mogul type, porcelain glazed enclosed, and be provided with grips, or other suitable means to hold the lamp against vibration. The rating of the socket shall exceed the lamp starting voltage, or starting pulse voltage rating.
- 6.2 If the lamp socket is of the sealed removable type, proper alignment of the socket shall be provided and molded into the socket assembly and indicated in a contrasting color.
- 6.3 If the lamp socket is adjustable, the factory setting must be indicated legibly in the luminaire housing.
- 6.4 The lamp shall be held in place with the socket and wire cage so that the centerline of the lamp is aligned no more than ¼" from the alignment of the focal point of the reflector.
- 6.5 The lamp shall be held in place from vibration with a fabricated wire cage which securely holds the lamp to prevent loosening from the socket or damage due to vibration of the structure the luminaire is attached to. The wire holder shall not come in direct contact with the glass of the lamp, but shall be insulated by a glass fiber insulation means rated for 450°C and UL E86619 listed to prevent deterioration on the lamp. The wire holder shall be designed with a torsion arm that allows for the removal of the lamp without the removal of the wire harness.

7. ANSI Identification Decal:

A decal, complying to ANSI standard C136-15 for luminaire wattage and distribution type, shall be factory attached permanently to the luminaire. The information contained in the decal shall enable a viewer, from the ground level, to identify the lamp wattage and type of luminaire distribution.

8. Optical Assembly:

8.1 Lens and Lens Frame. The lens shall be made of crystal clear, impact and heat resistant tempered glass a minimum of 6.35 mm (0.25") thick. The lens shall be held in such a manner as to allow for its expansion and contraction, due to temperature variation. The lens shall be a flat glass design.

8.2 Reflector:

8.2.1 The main reflector shall be made from a pre-anodized aluminum sheet of such grade quality that the reflecting surface shall have a smooth, specular finish and the reflecting surface shall have a dense protective coating of oxide not less than 0.012 mg/mm² (7.5 mg/in²), applied by the anodic oxidation process.

Added 3/3/05

- 8.2.2 The reflector surfaces parallel to the direction of the main beam plane shall be constructed of specular 0.51 mm (0.020") mm thick pre-anodized lighting grade hammertone textured aluminum.
- 8.2.3 The reflector shall be attached with no fewer than three machine screws or bolts. It shall not be possible to misalign the reflector in either the vertical or horizontal planes.
- 8.2.4 The reflector shall be secured with a stainless steel aircraft cable during maintenance operations.
- 8.2.5 If the reflector has multiple light distribution positions, each position must have positive stop/mounting with the original factory distribution identified.
- 8.2.6 The luminaire shall be photometrically efficient. Luminaire efficiency, defined by the I.E.S. as "the ratio of luminous flux (lumens) emitted by a luminaire to that emitted by the lamp or lamps used within", shall not be less than 67%. Submittal information shall include published efficiency data.
- 8.2.7 The reflector, the refractor or lens, and the entire optical assembly shall not develop any discoloration over the normal life span of the luminaire.
- 8.2.8 The reflector shall not be altered by paint or other opaque coatings which would cover or coat the reflecting surface. Control of the light distribution by any method other than the reflecting material and the aforementioned clear protective coating that will alter the reflective properties of the reflecting surface is unacceptable

9. Ballast:

- 9.1 The ballast shall be a High Pressure Sodium, high power factor, lead type, Isolated Regulator Ballast (CWI) or a Constant Wattage Auto-regulator (CWA), for operation on a nominal 240 volt system.
- 9.2 The ballast shall be designed to furnish proper electrical characteristics for starting and operating a high pressure sodium vapor lamp of the specified rating at ambient temperatures of -29 degrees to +40 degrees C. The ballast windings shall be adequately impregnated and treated for protection against the entrance of moisture, insulated with Class H insulation, and able to withstand the NEMA standard dielectric test.
- 9.3 The ballast shall include an electronic starting assembly. The starter assembly shall be comprised of solid state devices capable of withstanding ambient temperatures of 85 degrees C. The starter shall provide timed pulsing with sufficient follow-through current to completely ionize and start all lamps. Minimum amplitude of the pulse shall be 2,500 volts, with a width of one (1) microsecond at

Added 3/3/05

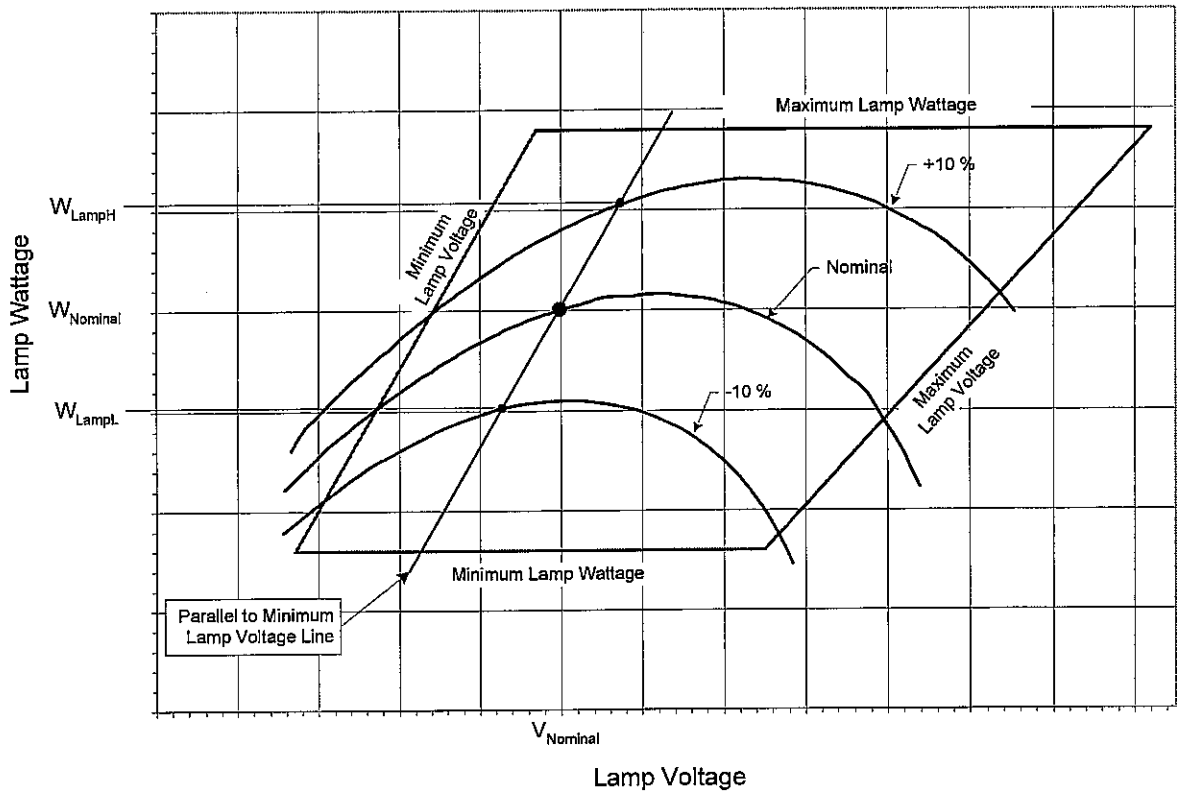
2,250 volts, and shall be applied within 20 electrical degrees of the peak of the open circuit voltage wave with a repetition rate as recommended by the lamp manufacturer for the 60 cycle wave. The lamp peak pulse current shall be a minimum of 0.2 amperes. Proper ignition shall be provided over a range of input voltage from 216 to 264 volts. The starter component shall be field replaceable and completely interchangeable with no adjustment necessary for proper operation. The starter component shall have push-on type electrical terminations to provide good electrical and mechanical integrity and ease of replacement. Terminal configuration shall preclude improper insertion of plug-in components. The starter circuit board shall be treated in an approved manner to provide a water and contaminant-resistant coating.

- 9.4 The ballast shall have an overall power factor of at least 0.9 when operated under rated lamp load.
- 9.5 The ballast shall withstand a 2,500 volt dielectric test between the core and windings without damage to the insulation.
- 9.6 The ballast shall not subject the lamp to a crest factor exceeding 1.8 and shall operate the lamp without affecting adversely the lamp life and performance.
- 9.7 The ballast shall be designed to ANSI Standards and shall be designed and rated for operation on a nominal 240 volt system. The ballast shall provide positive lamp ignition at the input voltage of 216 volts. It shall operate the lamp over a range of input voltages from 216 to 264 volts without damage to the ballast. It shall provide lamp operation within lamp specifications for rated lamp life at input design voltage range. Operating characteristics shall produce output regulation not exceeding the following values:

Nominal Ballast Wattage	Maximum Ballast Regulation
750	25%
400	25%
310	26%
250	22%
150	22%
70	17%

For this measure, regulation shall be defined as the ratio of the lamp watt difference between the upper and lower operating curves to the nominal lamp watts; with the lamp watt difference taken within the ANSI trapezoid at the nominal lamp operating voltage point parallel to the minimum lamp volt line:

Added 3/3/05



$$\text{Ballast Regulation} = \frac{W_{LampH} - W_{LampL}}{W_{LampN}} \times 100$$

where:

W_{LampH} = lamp watts at +10% line voltage (264v)

W_{LampL} = lamp watts at - 10% line voltage (216v)

W_{lampN} = lamp watts at 240v"

9.8 Ballast losses, based on cold bench tests, shall not exceed the following values:

Nominal Ballast Wattage	Maximum Ballast Losses
750	16.0%
400	16.0%
310	19.0%
250	17.5%
150	26.0%
70	34.0%

Added 3/3/05

Ballast losses shall be calculated based on input watts and lamp watts at nominal system voltage as indicated in the following equation:

$$\text{Ballast Losses} = \frac{W_{Line} - W_{Lamp}}{W_{Lamp}} \times 100$$

where:

W_{line} = line watts at 240v

W_{lamp} = lamp watts at 240v

- 9.9 Ballast output to lamp. At nominal system voltage and a lamp voltage of 52v, the ballast shall deliver a lamp wattage within $\pm 4\%$ of the nominal lamp wattage. For a 70w luminaire, the ballast shall deliver 70 watts $\pm 4\%$ at a lamp voltage of 52v for the nominal system voltage of 240v.
- 9.10 Ballast output over lamp life. Over the life of the lamp the ballast shall produce an average of the nominal lamp rating $\pm 5\%$. Lamp wattage readings shall be taken at 5-volt increments throughout the ballast trapezoid. The lamp wattage values shall then be averaged within the trapezoid and shall be within $\pm 5\%$ of the nominal ballast rating. Submittal documents shall include a tabulation of the lamp wattage vs. lamp voltage readings.
- 9.11 The ballast shall be integral to the luminaire. The ballast components shall be mounted on a removable door or on a removable mounting pad. The ballast tray or mounting door shall be manufactured with dissimilar metal conflicts kept to a minimum.
- 9.12 Ballast wiring and lamp socket wiring shall be connected by means of keyed plugs. Upon unplugging the ballast wiring the entire ballast assembly shall be removable for maintenance. The plugs shall not be interchangeable to avoid improper connection of the assemblies.
- 9.13 The mounting adjustments and wiring terminals shall be readily accessible. The removable door or pad shall be secure when fastened in place and all individual components shall be secure upon the removable element. Upon ballast assembly removal, each component shall be readily removable for replacement.
- 9.14 The luminaire shall be completely wired. All wiring connections within the luminaire shall be made with insulated compression connectors or insulated terminal blocks. An insulated terminal block shall be provided to terminate the incoming supply wires. The terminal block shall be rated for 600 volts and shall accommodate wire sizes from #10 to #6 AWG. The use of "wire nuts" is unacceptable. A ground terminal shall be provided for the connection of a ground wire.
- 9.15 Ballast and lamp Leads shall not be smaller than #16 AWG conductors rated at a minimum temperature rating of 90° C.

Added 3/3/05

- 9.16 All wires shall be coded by tagging and/or color coding for proper identification. A complete legible permanently attached wiring diagram (no smaller than 3" x 4" with a min. font size of 8 pts.) coordinated with the wire identifications shall be displayed at the convenient location on the interior of the luminaire. The wiring diagram shall be oriented so that it is right side up and readable when the luminaire is in the installed position.
- 9.17 The ballast shall not be excessively noisy. Noticeable noisy ballasts, as determined by the Engineer, shall be replaced at no additional cost to the State.
- 9.18 The ballast shall provide lamp operation within lamp specifications for the rated lamp life at the input design voltage range. It shall have a 6 month operation capability with a cycling lamp.
- 9.19 Submittal information shall include manufacturer's literature and data to confirm compliance with all specified requirements including an ANSI Standard Ballast Characteristic Graph (Trapezoid) diagram, with all items clearly identified.

10. Photometric Performance:

- 10.1 The luminaire photometric performance shall produce results equal to or better than those listed in the included Luminaire Performance Table. Submittal information shall include computer calculations based on the controlling given conditions which demonstrate achievement of all listed performance requirements. The computer calculations shall be done according to I.E.S. recommendations and the submitted calculations shall include point-by-point illuminance, luminance and veiling luminance as well as listings of all indicated averages and ratios as applicable. Acceptable programs to perform the calculations are: Micro-Site-Lite, Lumen Micro, and AGI32. The program used to perform the calculations shall be identified on the submittal. The submittal data shall also include all photometric calculations files (for either Micro-Site-Lite, Lumen Micro or AGI32) with the proposed photometric data on a CD ROM. The performance requirements shall define the minimum number of decimal places used in the calculations. Rounding of calculations shall not be allowed.
- 10.2 In addition to computer printouts of photometric performance, submittal information shall include: Descriptive literature; an Isofootcandle chart of horizontal lux (footcandles); Utilization curve; Isocandela diagram; Luminaire classification per ANSI designation; Candlepower values at every 2.5 degree intervals; Candlepower tables are to be provided on 3.5" diskette or CD ROM in the IES format as specified in IES publication LM-63.

Added 3/3/05

IDOT DISTRICT 1 LUMINAIRE PERFORMANCE TABLE #1
5 Lane Cross Section

GIVEN CONDITIONS		
ROADWAY DATA	Pavement Width	18.3 m (60 ft)
	Number of Lanes	5
	I.E.S. Surface Classification	R3
	Q-Zero Value	.07
LIGHT POLE DATA	Mounting Height	4.8 m (16 ft)
	Mast Arm Length	0 m (0 ft)
	Pole Set-Back From Edge of Pavement	0.6 m (2 ft)
LUMINAIRE DATA	Lamp Type	HPS
	Lamp Lumens	6,300
	I.E.S. Vertical Distribution	Medium
	I.E.S. Control Of Distribution	Cutoff
	I.E.S. Lateral Distribution	n/a
	Total Light Loss Factor	0.60
LAYOUT DATA	Spacing	9.1 m (30 ft)
	Configuration	Opposite Side
	Luminaire Overhang over edge of pavement	-0.6 m (-2 ft)

NOTE: Variations from the above specified I.E.S. distribution pattern may be requested and acceptance of variations will be subject to review by the Engineer based on how well the performance requirements are met.

PERFORMANCE REQUIREMENTS		
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NOTE: These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above.

ILLUMINATION	Ave. Horizontal Illumination, E_{AVE}	18 Lux (Min)	26 Lux (Max)
	Uniformity Ratio, E_{AVE}/E_{MIN}	3:1 (Max)	
LUMINANCE	Average Luminance, L_{AVE}	1.2 Cd/m ² (Min)	1.8 Cd/m ² (Max)
	Uniformity Ratio, L_{AVE}/L_{MIN}	3:1 (Max)	
	Uniformity Ratio, L_{MAX}/L_{MIN}	5:1 (Max)	
	Veiling Luminance Ratio, L_V/L_{AVE}	0.30:1 (Max)	

Added 3/3/05

11. Independent Testing:

- 11.1 Independent testing of luminaires shall be required whenever the quantity of luminaires of a given wattage and distribution, as indicated on the plans, is 50 or more. For each luminaire type to be so tested, one luminaire plus one luminaire for each 50 luminaires shall be tested. Example: *A plan quantity of 75 luminaires would dictate that 2 to be tested; 135 luminaires would dictate that three be tested.*
- 11.2 The Contractor shall be responsible for all costs associated with the specified testing, including but not limited to shipping, travel and lodging costs as well as the costs of the tests themselves, all as part of the bid unit price for this item. Travel, lodging and other associated costs for travel by the Engineer shall be direct-billed to or shall be pre-paid by the Contractor, requiring no direct reimbursement to the Engineer or the independent witness, as applicable.
- 11.3 Commitment to test. The Vendor shall select one of the following options for the required testing with the Engineer's approval:
- a. Engineer Factory Selection for Independent Lab: The Contractor may select this option if the luminaire manufacturing facility is within the state of Illinois. The Contractor shall propose an independent test laboratory for approval by the Engineer. The selected luminaires shall be marked by the Engineer and shipped to the independent laboratory for tests.
 - b. Engineer Witness of Independent Lab Test: The Contractor may select this option if the independent testing laboratory is within the state of Illinois. The Engineer shall select, from the project luminaires at the manufacturer's facility or at the Contractor's storage facility, luminaires for testing by the independent laboratory.
 - c. Independent Witness of Manufacturer Testing: The independent witness shall select from the project luminaires at the manufacturer's facility or at the Contractor's storage facility, the luminaires for testing. The Contractor shall propose a qualified independent agent, familiar with the luminaire requirements and test procedures, for approval by the Engineer, to witness the required tests as performed by the luminaire manufacturer. The independent witness shall:
 - ▶ Have been involved with roadway lighting design for at least 15 years.
 - ▶ Not have been the employee of a luminaire or ballast manufacturer within the last 5 years.
 - ▶ Be a member of IESNA in good standing.
 - ▶ Provide a list of professional references.

Added 3/3/05

- d. Engineer Factory Selection and Witness of Manufacturer Testing: The Contractor may select this option if the manufacturing facility is within the state of Illinois. At the manufacturer's facility, the Engineer shall select the luminaires to be tested and shall be present during the testing process. The Contractor shall schedule travel by the Engineer to and from the Manufacturer's laboratory to witness the performance of the required tests.

In all cases, the selection of luminaires shall be a random selection from the entire completed lot of luminaires required for the contract. Selections from partial lots will not be allowed. The selection of the testing option shall be presented with the information submitted for approval. The proposed independent laboratory or independent witness shall be included with that information. The selection of the testing option shall be presented with the information submitted for approval. The proposed independent laboratory or independent witness shall be included with that information.

- 11.4 The testing performed shall include photometric, electrical, heat and water jet testing.
- 11.5 Photometric testing shall be in accordance with IES recommendations except that the selected luminaire(s) shall be tested as manufactured without any disassembly or modification and, as a minimum shall yield an isofootcandle chart, with max candela point and half candela trace indicated, an isocandela diagram, maximum plane and cone plots of candela, a candlepower table (house and street side), a coefficient of utilization chart, a luminous flux distribution table, and complete calculations based on specified requirements and tests.
- 11.6 Electrical testing shall conform to NEMA and ANSI standards and as a minimum, shall yield a complete check of wiring connections, a ballast dielectric test, total ballast losses in watts and percent of input, a lamp volt-watt trace, regulation data, a starter test, lamp current crest factor, power factor (minimum over the design range of input voltage at nominal lamp voltage) and, a table of ballast characteristics showing input amperes, watts and power factor, output volts, amperes, watts and lamp crest factor as well as ballast losses over the range of values required to produce the lamp volt-watt trace. Ballast test data shall also be provided in an electronic format acceptable to the Engineer to demonstrate compliance with sections 9.7, 9.8, 9.9 and 9.10.
- 11.7 Heat Testing. Heat testing shall be conducted to ensure that the luminaire complies with UL 1572. An ambient temperature of 40 degrees centigrade (104 degrees F) shall be used for the test.

11.8 Water spray test. The luminaires must pass the following water spray test.:

A spray apparatus consisting of four spray nozzles set at an angle of 30 degrees from the vertical plane space 30 inches apart on a 2 inch pipe, each delivering 12 gallons of water per minute at a minimum of 100 psi at each nozzle in a 90 degree cone. A water pressure gauge shall be installed at the first nozzle.

Added 3/3/05

The luminaires shall be mounted in a ceiling configuration and with each nozzle set a distance of 18 inches below the fixture in the vertical plane and 18 inches away in the horizontal plane from the fixture lens, apply spray for a duration of 3 minutes at a minimum of 100 psi. When opened, the fixture shall not show any signs of leakage.

The above test shall be repeated in the opposite horizontal plane from the fixture lens with no signs of leakage.

The summary report and the test results shall be certified by the independent test laboratory or the independent witness, as applicable, and shall be sent by certified mail directly to the Engineer. A copy of this material shall be sent to the Contractor and luminaire manufacturer at the same time.

- 11.9 Should any of the tested luminaires of a given distribution type and wattage fail to satisfy the specifications and perform according to approved submittal information, the luminaire of that distribution type and wattage shall be unacceptable and be replaced by alternate equipment meeting the specifications with the submittal and testing process repeated in their entirety; or corrections made to achieve required performance. In the case of corrections, the Vendor shall advise the Engineer of corrections made and shall request a repeat of the specified testing and, if the corrections are deemed reasonable by the Engineer, the testing process shall be repeated. The number of luminaires to be tested shall be the same quantity as originally tested. Luminaires which are not modified or corrected shall not be re-tested without prior approval from the Engineer.

Coordination shall be the Vendor's responsibility. Failure to coordinate arrangements and notice shall not be grounds for additional compensation or extension of time.

Submittal information shall include a statement of intent to provide the testing as well as a request for approval of the chosen laboratory.

12. Installation.

- 12.1 Underpass luminaires shall be either attached to structures (such as piers, etc.) or suspended from structures (such as bridge decks) as indicated or implied by the configuration on the Plans. Mounting, including all hardware and apparent items, shall be included as part of this item.
- 12.2 Unless otherwise indicated, suspended underpass luminaires shall be installed one-inch above the lowest underpass beam and shall be mounted using vibration dampening assemblies. All mounting hardware shall be corrosion resistant and shall be stainless steel unless otherwise indicated.
- 12.3 The Engineer reserves the right to select the final light distribution pattern, luminaire aiming angle and change it as deemed necessary to produce the proper pavement luminance.

Added 3/3/05

12.4 Surface mounted luminaires, all luminaires not mounted on suspension rods, shall have one-inch thick stainless steel spacers installed between the luminaire and the deck or wall.

13. Guarantee.

The Vendor shall provide a written guarantee for materials, and workmanship for a period of 6 months after final acceptable of the lighting system.

14. Documentation.

All instruction sheets required to be furnished by the manufacturer for materials and supplies and for operation of the equipment shall be delivered to the Engineer.

The manufacturer shall have been incorporated for at least five years and shall have at least five years in the design and manufacturing of roadway underpass lighting. The manufacturer shall provide evidence of financial strength to finance the production of the project by submitting the name of at least three projects completed in the previous calendar year of greater than \$250,000 each. All steel used in the project shall be certified to be provided domestically, and all fixture components used shall be manufactured domestically.

15. Method Of Measurement. Luminaires shall be counted, each.

16. Basis Of Payment. This item shall be paid at the contract unit price each for **UNDERPASS LUMINAIRE**, of the wattage specified, **HIGH PRESSURE SODIUM VAPOR, STAINLESS STEEL HOUSING** which shall be payment in full for the material and work described herein.

LUMINAIRE SAFETY CABLE ASSEMBLY

Effective: April 1, 2003

Description: This item shall consist of providing a luminaire safety cable assembly as specified herein and as indicated in the plans.

Materials. Materials shall be according to the following:

Wire Rope. Cables (wire rope) shall be manufactured from Type 304 or Type 316 stainless steel having a maximum carbon content of 0.08 % and shall be a stranded assembly. Cables shall be 3.18 mm (0.125") diameter, 7x19 Class strand core and shall have no strand joints or strand splices.

Cables shall be manufactured and listed for compliance with Federal Specification RR-W-410 and Mil-DTL-83420.

Added 3/3/05

Cable terminals shall be stainless steel compatible with the cable and as recommended by the cable manufacturer. Terminations and clips shall be the same stainless steel grade as the wire rope they are connected to.

U-Bolts. U-Bolts and associated nuts, lock washers, and mounting plates shall be manufactured from Type 304 or Type 316 stainless steel.

CONSTRUCTION REQUIREMENTS

General. The safety cable assembly shall be installed as indicated in the plan details. One end of the cable assembly shall have a loop fabricated from a stainless steel compression sleeve. The other end of the cable assembly shall be connected with stainless steel wire rope clips as indicated. Slack shall be kept to a minimum to prevent the luminaire from creeping off the end of the mast arm.

Basis of Payment: This work shall be paid for at the contract price each for **LUMINAIRE SAFETY CABLE ASSEMBLY**, which shall be payment for the work as described herein and as indicated in the plans.

SLIPFORM PARAPET

Effective February 25, 2005

The following shall replace Article 503.17(e)(1) of the Standard Specifications.

(1) Slipforming. At the option of the Contractor, concrete parapets may be constructed by slipforming in lieu of the conventional forming methods. The slipform machine shall have automatic horizontal and vertical grade control and be approved by the Engineer.

The concrete mix design may combine two or more coarse aggregate sizes, consisting of CA-7, CA-11, CA-13, CA-14, and CA-16, provided a CA-7 or CA-11 is included in the blend in a proportion approved by the Engineer.

The slipform machine speed shall not exceed 1.2 m (4 feet) per minute. Any section of parapet placed with the slipform machine moving in excess of the maximum allowed speed will be rejected. The contractor shall schedule concrete delivery to maintain a uniform delivery rate of concrete into the slipform machine. If delivery of concrete into the slipforming machine is interrupted by more than 10 minutes, the portion of the wall within the limits of the slipform machine will be rejected.

If the Contractor elects to slipform, the parapet cross-sectional area and reinforcement bar clearances may be revised according to the detail for Concrete Parapet Slipforming Option.

Added 3/305

For parapets adjacent to the watertable, the Contractor shall use the alternate reinforcement as shown in the detail for Concrete Parapet Slipforming Option at no additional cost to the Department. For parapets at other locations or for median barriers on bridge decks, the Contractor may propose alternate reinforcement and stiffening details subject to the approval of the Engineer.

The use of cast-in-place anchorage devices for attaching appurtenances and/or railings to the parapets will not be allowed in conjunction with slipforming of parapets. Alternates means for making these attachments shall be as detailed on the plans or as approved by the Engineer.

All reinforcement bar intersections within the parapet cross section shall be 100 percent tied to maintain rigidity during concrete placement. At pre-planned sawcut joints in the parapet, Glass Fiber Reinforced Polymer (GFRP) reinforcement shall be used to maintain the rigidity of the reinforcement cage across the proposed joints (See Detail for Concrete Parapet Slipforming Option).

Glass Fiber Reinforced Polymer (GFRP) reinforcement shall be subject to approval by the Engineer. Other non-ferrous reinforcement may be proposed for use but shall be subject to approval by the Engineer.

For projects with plan details specifying parapet joints spaced greater than 6 meters (20 feet) apart, additional sawcut joints, spaced between 3 meters (10 feet) and 6 meters (20 feet), shall be placed as directed by the Engineer. The horizontal reinforcement extending through the proposed joints shall be precut to provide a minimum of 100 mm (4 inch) gap, centered over the joint, between rebar ends. The ends of the reinforcement shall be repaired according to Article 508.05.

After the slipform machine has been set to proper grade and prior to concrete placement, the clearance between the slipform machine inside faces and reinforcement bars shall be checked during a dry run by the Contractor in the presence of the Engineer. The dry run shall not begin until the entire reinforcing cage has been tied and the Engineer has verified and approved the placement and tying of the reinforcing bars. Any reinforcement bars found to be out of place by more than 13 mm ($\frac{1}{2}$ in.), or any dimensions between bars differing from the plans by more than 13 mm ($\frac{1}{2}$ in.) shall be re-tied to the plan dimensions.

During the dry run and in the presence of the Engineer, the Contractor shall check the clearance of the reinforcement bars from the inside faces of the slipform mold. In all locations, the Contractor shall ensure the reinforcement bars have the minimum cover distance shown on the plans. This dry run check shall be made for the full distance that is anticipated to be placed in the subsequent pour. Reinforcement bars found to have less than the minimum clearance shall be adjusted and the dry run will be performed again, at least in any locations that have been readjusted.

Added 3/3/05

The aluminum cracker plates as detailed in the plans shall be securely tied in place and shall be coated or otherwise treated to minimize their potential reaction with wet concrete. In lieu of chamfer strips at horizontal and vertical edges, radii may be used. Prior to slipforming, the Contractor shall verify proper operation of the vibrators using a mechanical measuring device subject to approval by the Engineer.

The top portion of the joint shall be sawcut as shown in Detail for Concrete Parapet Slipforming Option. Sawing of the joints shall commence as soon as the concrete has hardened sufficiently to permit sawing without excessive raveling. All joints shall be sawed to the full thickness before uncontrolled shrinkage cracking takes place but no later than 8 hours after concrete placement. The sawcut shall be approximately 10 mm (3/8 in.) wide and shall be performed with a power circular concrete saw. The joints shall be sealed with an approved polysulfide sealant, conforming to Article 1050.03, to a minimum depth of 12 mm (1/2 in.), with surface preparation and installation according to the manufacturer's written instructions. Cork, hemp or other compressible material may be used as a backer. The sawcut will not require chamfered edges.

Ends of the parapet shall be formed and the forms securely braced. Parapets at light standards, shall be formed for a minimum distance of 1.2 m (4 ft) on each side of the exception.

For acceptance and rejection purposes a parapet section shall be defined as the length of parapet between adjacent vertical parapet joints.

The maximum variance of actual to proposed longitudinal alignment shall not exceed ± 20 mm (3/4 in.) with no more than 6 mm in 3 m (1/4 in. in 10 ft). Notwithstanding this tolerance, abrupt variance in actual alignment of 13 mm in 3 m (1/2 in. in 10 ft) will be cause for rejection of the parapet section.

In addition, all surfaces shall be checked with a 3 m (10 ft) straight edge furnished and used by the Contractor as the concrete is extruded from the slipform mold. Continued variations in the barrier surface exceeding 6 mm in 3 m (1/4 in. in 10 ft) will not be permitted and remedial action shall immediately be taken to correct the problem.

The use of equipment or methods which result in dimensions outside the tolerance limits shall be discontinued. Parapet sections having dimensions outside the tolerance limits will be rejected.

Any visible indication that less than specified cover of concrete over the reinforcing bars has been obtained, or any cracking or tearing of the plastic concrete, or any location showing diagonal or horizontal cracking will be cause for rejection of the parapet section in which they are found.

Added 3/3/05

The vertical surfaces at the base of the barrier within 75 mm (3 inches) of the deck surface shall be trowelled true after passage of the slipform machine. Any deformations or bulges remaining after the initial set shall be removed by grinding after the concrete has hardened. Hand finishing of minor sporadic surface defects may be allowed at the discretion of the Engineer. Otherwise the parapets shall receive a normal finish as specified in Article 503.16(a) as directed by the Engineer.

Slipformed parapets shall be cured according to either Article 1020.13(a)(3) or Article 1020.13(a)(5). For either method, a soaker hose shall be placed on the top surface of the parapet, and the curing material kept wet with a continuous supply of water for the entire curing period. The cotton mats or burlap covering shall be held in place with brackets or other method approved by the Engineer.

A maximum of three random 100 mm (4 in.) diameter cores per 30 m (100 feet) of parapet shall be taken as directed by the Engineer, but no less than three random cores shall be taken for each parapet pour. Separate parapets poured on the same date shall be considered separate pours. Random cores will not be measured for payment.

The Engineer will mark additional locations for cores where, in the sole opinion of the Engineer, the quality of the slipformed parapet is suspect.

Any cores showing voids of any size adjacent to the reinforcement bars, or showing voids not adjacent to reinforcement bars of 160 square millimeters (1/4 square inch) in area or more, or showing signs of segregation, or showing signs of cracking shall be considered failures and the parapet section from which it was taken will be rejected.

Rejected parapet sections shall be removed and replaced for the full depth cross-section of the parapet. The minimum length of parapet removed and replaced shall be 1 m (3 feet). Additional cores may be required to determine the longitudinal extent of removal and replacement if it can not be determined and agreed upon by other means (i.e. visual, sounding, non-destructive testing, etc.).

Any parapet section with more than one half of its length rejected or with remaining segments less than 3m (10 feet) in length shall be removed and replaced in its entirety.

If reinforcement bars are damaged during the removal and replacement, additional removal and replacement shall be done, as necessary, to ensure minimum splice length of replacement bars. Any damage to epoxy coating of bars shall be repaired according to Article 508.05.

All core holes will be filled with a non-shrink grout meeting the requirements of Section 1024.

Added 3/3/05

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Route
 FAP 305

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
XX003011	REM EX LIGHTING CONTR	EACH	1.000				
XX004308	LIQ TIG FLX M CON 1	FOOT	40.000				
XX005916	TEMP CONC BAR, F & I	FOOT	873.000				
X0301199	ANCHOR BOLTS	EACH	100.000				
X0322080	BUS SHELTER REM RELOC	EACH	2.000				
X0322141	REM TEMP WOOD POLE	EACH	4.000				
X0322208	TEMP STORM SEWER PLUG	EACH	3.000				
X0322256	TEMP INFO SIGNING	SQ FT	100.000				
X0323426	SED CONT DR ST INL CL	EACH	476.000				
X0323558	BR JT SYS EXPAN 1-5/8	FOOT	63.000				
X0323574	MAINTAIN LIGHTING SYS	CAL MO	6.000				
X0323651	REM & REIN EX LT UNIT	EACH	1.000				
X0323670	PREFORM DETECT LOOP	FOOT	734.000				
X0323830	DRAINAGE SCUPPR DS-11	EACH	8.000				
X0323973	SED CONT SILT FENCE	FOOT	587.000				

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X0323974	SED CONT SILT FN MAIN	FOOT	587.000				
X0696000	BRIDGE DRAINAGE SYS	L SUM	1.000				
X0712400	TEMP PAVEMENT	SQ YD	2,561.000				
X3550300	BIT BC SUPER 6	SQ YD	351.000				
X3550500	BIT BC SUPER 8	SQ YD	78.000				
X4021000	TEMP ACCESS-PRIV ENT	EACH	12.000				
X4022000	TEMP ACCESS-COM ENT	EACH	7.000				
X4066414	BC SC SUPER "C" N50	TON	48.000				
X4066426	BC SC SUPER "D" N70	TON	41.000				
X4066548	P BCSC SUPER "F" N90	TON	581.000				
X4066618	BCBC SUP IL-19.0 N90	TON	1,971.000				
X4067100	P LB MM SU IL4.75 N50	TON	35.000				
X6060500	CORRUGATED MED REM	SQ FT	629.000				
X7015000	CHANGEABLE MESSAGE SN	CAL MO	36.000				
X8050010	SERV INSTALL GRND MT	EACH	1.000				

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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
X8110110	CON ATS 1 GALVS PVC	FOOT	475.000				
X8110121	CON ATS 3 GALVS PVC	FOOT	10.000				
X8110125	CON ATS 4 GALVS PVC	FOOT	30.000				
X8160375	UD 3#4 #6G EPRRH1.50	FOOT	4,220.000				
X8250110	LTG CT RCD C-TY SCADA	EACH	1.000				
X8730027	ELCBL C GROUND 6 1C	FOOT	982.000				
X8730250	ELCBL C 20 3C TW SH	FOOT	1,072.000				
X8800020	SH LED 1F 3S MAM	EACH	6.000				
X8800035	SH LED 1F 3S BM	EACH	4.000				
X8800038	SH LED 1F 4S MAM	EACH	4.000				
X8808120	OPSH LED 1F 3S MAM	EACH	2.000				
X8809020	CSH 2F 4SOP 3S LED BM	EACH	4.000				
X8810610	PED SH LED 1F BM	EACH	4.000				
X8810620	PED SH LED 2F BM	EACH	4.000				
Z0001050	AGG SUBGRADE 12	SQ YD	13,057.000				

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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
Z0002600	BAR SPLICERS	EACH	106.000				
Z0076600	TRAINEES	HOUR	500.000		0.800		400.000
20100110	TREE REMOV 6-15	UNIT	44.000				
20101100	TREE TRUNK PROTECTION	EACH	9.000				
20200100	EARTH EXCAVATION	CU YD	7,574.000				
20201200	REM & DISP UNS MATL	CU YD	1,126.000				
20700220	POROUS GRAN EMBANK	CU YD	4.200				
20700420	POROUS GRAN EMB SUBGR	CU YD	100.000				
20800150	TRENCH BACKFILL	CU YD	4,616.000				
21101615	TOPSOIL F & P 4	SQ YD	6,751.000				
25000400	NITROGEN FERT NUTR	POUND	126.000				
25000500	PHOSPHORUS FERT NUTR	POUND	126.000				
25000600	POTASSIUM FERT NUTR	POUND	126.000				
25200110	SODDING SALT TOLERANT	SQ YD	6,751.000				
28000510	INLET FILTERS	EACH	68.000				

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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
40600100	BIT MATLS PR CT	GALLON	3.000				
42000501	PCC PVT 10 JOINTED	SQ YD	10,980.000				
42001400	BR APPROACH PAVT SPL	SQ YD	347.000				
42300200	PCC DRIVEWAY PAVT 6	SQ YD	27.000				
42300400	PCC DRIVEWAY PAVT 8	SQ YD	391.000				
42400200	PC CONC SIDEWALK 5	SQ FT	9,107.000				
44000100	PAVEMENT REM	SQ YD	13,357.000				
44000200	DRIVE PAVEMENT REM	SQ YD	916.000				
44000500	COMB CURB GUTTER REM	FOOT	6,154.000				
44000600	SIDEWALK REM	SQ FT	4,326.000				
44000700	APPROACH SLAB REM	SQ YD	1,003.000				
44003100	MEDIAN REMOVAL	SQ FT	9,461.000				
44003500	MEDIAN REM & REPL SPL	SQ FT	2,521.000				
44201765	CL D PATCH T2 10	SQ YD	72.000				
44201769	CL D PATCH T3 10	SQ YD	16.000				

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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
44201771	CL D PATCH T4 10	SQ YD	126.000				
48202400	BIT SHLD SUPER 6	SQ YD	185.000				
50100100	REM EXIST STRUCT	EACH	1.000				
50200100	STRUCTURE EXCAVATION	CU YD	5,652.800				
50300160	NEOPRENE EXPAN JT 4	FOOT	64.000				
50300225	CONC STRUCT	CU YD	1,022.700				
50300255	CONC SUP-STR	CU YD	717.500				
50300260	BR DECK GROOVING	SQ YD	2,118.000				
50300300	PROTECTIVE COAT	SQ YD	2,720.000				
50300440	ERECT ELAS BRG ASY T1	EACH	20.000				
50300450	ERECT ELAS BRG ASY T2	EACH	10.000				
50500305	ERECT STRUCT STEEL	L SUM	1.000				
50500505	STUD SHEAR CONNECTORS	EACH	10,320.000				
50800205	REINF BARS, EPOXY CTD	POUND	308,910.000				
51205200	TEMP SHT PILING	SQ FT	2,359.000				

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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
51500100	NAME PLATES	EACH	1.000				
550A0050	STORM SEW CL A 1 12	FOOT	738.000				
550A0070	STORM SEW CL A 1 15	FOOT	158.000				
550A0090	STORM SEW CL A 1 18	FOOT	90.000				
550A0340	STORM SEW CL A 2 12	FOOT	19.000				
550A0380	STORM SEW CL A 2 18	FOOT	426.000				
550A0410	STORM SEW CL A 2 24	FOOT	264.000				
550A0430	STORM SEW CL A 2 30	FOOT	292.000				
550A0450	STORM SEW CL A 2 36	FOOT	528.000				
550A0480	STORM SEW CL A 2 48	FOOT	109.000				
55100400	STORM SEWER REM 10	FOOT	461.000				
55100500	STORM SEWER REM 12	FOOT	135.000				
55101400	STORM SEWER REM 30	FOOT	136.000				
55101600	STORM SEWER REM 36	FOOT	768.000				
58700200	BRIDGE SEAT SEALER	SQ FT	288.000				

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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
59100100	GEOCOMPOSITE WALL DR	SQ YD	157.000				
60100905	PIPE DRAINS 4	FOOT	23.000				
60102005	PIPE DRAINS 12 SPL	FOOT	88.000				
60107700	PIPE UNDERDRAINS 6	FOOT	137.000				
60109580	P UNDR FOR STRUCT 4	FOOT	202.000				
60201340	CB TA 4 DIA T24F&G	EACH	18.000				
60205040	CB TA 5 DIA T24F&G	EACH	15.000				
60208240	CB TC T24F&G	EACH	11.000				
60221500	MAN TA 5 DIA T5F CL	EACH	3.000				
60224039	MAN TA 6 DIA T24F&G	EACH	2.000				
60250200	CB ADJUST	EACH	14.000				
60255500	MAN ADJUST	EACH	8.000				
60256940	MAN ADJ NEW T24F&G	EACH	1.000				
60500040	REMOV MANHOLES	EACH	5.000				
60500050	REMOV CATCH BAS	EACH	17.000				

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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
60500060	REMOV INLETS	EACH	5.000				
60500105	FILL MANHOLES	EACH	2.000				
60500205	FILL CATCH BAS	EACH	2.000				
60600605	CONC CURB TB	FOOT	168.000				
60603800	COMB CC&G TB6.12	FOOT	168.000				
60605000	COMB CC&G TB6.24	FOOT	4,410.000				
60619600	CONC MED TSB6.12	SQ FT	18,833.000				
60624600	CORRUGATED MED	SQ FT	629.000				
63000000	SPBGR TY A	FOOT	3,113.000				
63100045	TRAF BAR TERM T2	EACH	2.000				
63100070	TRAF BAR TERM T5	EACH	2.000				
63100085	TRAF BAR TERM T6	EACH	2.000				
63100167	TR BAR TRM T1 SPL TAN	EACH	2.000				
67000400	ENGR FIELD OFFICE A	CAL MO	12.000				
67100100	MOBILIZATION	L SUM	1.000				

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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
70101800	TRAF CONT & PROT SPL	L SUM	1,000				
70102550	TR CONT-PROT TEMP DET	EACH	1,000				
70103815	TR CONT SURVEILLANCE	CAL DA	195,000				
70300100	SHORT-TERM PAVT MKING	FOOT	3,089,000				
70300220	TEMP PVT MK LINE 4	FOOT	7,980,000				
70300510	PAVT MARK TAPE T3 L&S	SQ FT	146,000				
70300520	PAVT MARK TAPE T3 4	FOOT	28,720,000				
70300540	PAVT MARK TAPE T3 6	FOOT	1,924,000				
70300560	PAVT MARK TAPE T3 12	FOOT	123,000				
70300570	PAVT MARK TAPE T3 24	FOOT	449,000				
70301000	WORK ZONE PAVT MK REM	SQ FT	1,030,000				
70400100	TEMP CONC BARRIER	FOOT	536,000				
72000100	SIGN PANEL T1	SQ FT	232,000				
72000200	SIGN PANEL T2	SQ FT	30,000				
72800100	TELES STL SIN SUPPORT	FOOT	480,000				

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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
78000100	THPL PVT MK LTR & SYM	SQ FT	73.000				
78000200	THPL PVT MK LINE 4	FOOT	8,004.000				
78000400	THPL PVT MK LINE 6	FOOT	239.000				
78000600	THPL PVT MK LINE 12	FOOT	190.000				
78008200	POLYUREA PM T1 LTR-SY	SQ FT	146.000				
78008210	POLYUREA PM T1 LN 4	FOOT	3,327.000				
78008230	POLYUREA PM T1 LN 6	FOOT	1,357.000				
78008240	POLYUREA PM T1 LN 8	FOOT	410.000				
78008250	POLYUREA PM T1 LN 12	FOOT	264.000				
78008270	POLYUREA PM T1 LN 24	FOOT	209.000				
78100100	RAISED REFL PAVT MKR	EACH	131.000				
78100105	RAISED REF PVT MKR BR	EACH	22.000				
78200100	MONODIR PRIS BAR REFL	EACH	32.000				
78200405	GUARDRAIL MARKERS	EACH	39.000				
78201000	TERMINAL MARKER - DA	EACH	2.000				

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PPS NBR - 1-71448-0100
County Name - COOK--
Code - 31 - -
District - 1 - -
Section Number - 1313.1 B

Project Number
ACNHF-0305/035/000

Route
FAP 305

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
78300100	PAVT MARKING REMOVAL	SQ FT	1,372.000				
80400100	ELECT SERV INSTALL	EACH	1.000				
80400200	ELECT UTIL SERV CONN	L SUM	1.000				
80700140	GROUND ROD 5/8 X 10	EACH	21.000				
80800500	TEMP WP60 CL4	EACH	4.000				
81000600	CON T 2 GALVS	FOOT	508.000				
81000700	CON T 2 1/2 GALVS	FOOT	122.000				
81000800	CON T 3 GALVS	FOOT	385.000				
81001000	CON T 4 GALVS	FOOT	309.000				
81018500	CON P 2 GALVS	FOOT	127.000				
81018600	CON P 2 1/2 GALVS	FOOT	56.000				
81018700	CON P 3 GALVS	FOOT	894.000				
81018900	CON P 4 GALVS	FOOT	427.000				
81200270	CON EMB STR 4 PVC	FOOT	255.000				
81300220	JUN BX SS AS 6X6X4	EACH	8.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES

CONTRACT NUMBER - 62878

State Job # - C-91-064-05
PPS NBR - 1-71448-0100
County Name - COOK--
Code - 31 - -
District - 1 - -
Section Number - 1313.1 B

Project Number
ACNHF-0305/035/000

Route
FAP 305

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
81300530	JUN BX SS AS 12X10X6	EACH	6.000				
81300730	JUN BX SS AS 16X14X6	EACH	2.000				
81302620	JUN BX NM ES 21X11X6	EACH	4.000				
81400100	HANDHOLE	EACH	7.000				
81400300	DBL HANDHOLE	EACH	3.000				
81500200	TR & BKFIL F ELECT WK	FOOT	4,080.000				
81700110	EC C EPR RHW 1C 10	FOOT	1,650.000				
81700375	EC C EPR RHW 3C #4#6G	FOOT	50.000				
81701385	EC C EPR USE 3-1C 350	FOOT	80.000				
81800320	A CBL 3-1C4 MESS WIRE	FOOT	270.000				
82102250	LUM SV HOR MT 250W	EACH	5.000				
82102310	LUM SV HOR MT 310W	EACH	20.000				
82107100	UNDERPAS LUM 70W HPS	EACH	8.000				
83000200	LT P A 30MH 6DA	EACH	5.000				
83050775	LT P A 47.5MH 10DA	EACH	8.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
 SCHEDULE OF PRICES

CONTRACT NUMBER - 62878

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 ACNHF-0305/035/000

Route
 FAP 305

State Job # - C-91-064-05
 PPS NBR - 1-71448-0100
 County Name - COOK--
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 Section Number - 1313.1 B

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
83050915	LT P A 47.5MH 2-6DA	EACH	2.000				
83600200	LIGHT POLE FDN 24D	FOOT	180.000				
83600215	LIGHT POLE FDN 24D OS	FOOT	46.000				
83800105	BKWY DEV TR B 11.5BC	EACH	5.000				
83800205	BKWY DEV TR B 15BC	EACH	6.000				
84200500	REM EX LT UNIT SALV	EACH	3.000				
84200700	LIGHTING FDN REMOV	EACH	1.000				
85700200	FAC T4 CAB	EACH	1.000				
87301215	ELCBL C SIGNAL 14 2C	FOOT	1,842.000				
87301225	ELCBL C SIGNAL 14 3C	FOOT	4,071.000				
87301245	ELCBL C SIGNAL 14 5C	FOOT	3,760.000				
87301255	ELCBL C SIGNAL 14 7C	FOOT	2,533.000				
87301305	ELCBL C LEAD 14 1PR	FOOT	2,156.000				
87301805	ELCBL C SERV 6 2C	FOOT	56.000				
87502440	TS POST GALVS 10	EACH	2.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
 SCHEDULE OF PRICES
 CONTRACT
 NUMBER - 62878

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 County Name - COOK--
 Code - 31 - -
 District - 1 - -
 Section Number - 1313.1 B

Project Number
 ACNHF-0305/035/000

Route
 FAP 305

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
87502480	TS POST GALVS 14	EACH	3.000				
87700300	S MAA & P 52	EACH	1.000				
87700310	S MAA & P 54	EACH	1.000				
87702890	STL COMB MAA&P 32	EACH	1.000				
87702920	STL COMB MAA&P 38	EACH	1.000				
87702985	STL COMB MAA&P 52	EACH	2.000				
87800100	CONC FDN TY A	FOOT	20.000				
87800200	CONC FDN TY D	FOOT	4.000				
87800415	CONC FDN TY E 36D	FOOT	90.000				
88024130	OPSH 1F 3S MAM	EACH	2.000				
88024210	OPSH 1F 4S BM	EACH	2.000				
88024220	OPSH 1F 4S MAM	EACH	2.000				
88025150	CSH 2F 4SOP 3S BM	EACH	2.000				
88200100	TS BACKPLATE	EACH	14.000				
88500100	INDUCTIVE LOOP DETECT	EACH	8.000				

CONTRACT NUMBER

62878

THIS IS THE TOTAL BID \$ _____

NOTES:

1. Each PAY ITEM should have a UNIT PRICE and a TOTAL PRICE.
2. The UNIT PRICE shall govern if no TOTAL PRICE is shown or if there is a discrepancy between the product of the UNIT PRICE multiplied by the QUANTITY.
3. If a UNIT PRICE is omitted, the TOTAL PRICE will be divided by the QUANTITY in order to establish a UNIT PRICE.
4. A bid may be declared UNACCEPTABLE if neither a unit price nor a total price is shown.