



Congestion-Relief Plan

MEMORANDUM

To: DISTRIBUTION LIST
From: Paul D. Kovacs, P.E., Chief Engineer *PDK*
Subject: Construction Bulletin No. 08-01
Date: October 6, 2008

Attached is a copy of the **Construction Bulletin No. 08-01: Roadway Lighting Cable.**

Copies of this Construction Bulletin should be provided to all of your active Design Section Engineers and Construction Managers.

The Construction Bulletin will be posted on Proliance.

PDK: kjk

Attachment

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Congestion-Relief Plan

MEMORANDUM

October 6, 2008

Construction Bulletin No. 08-01

Subject: ROADWAY LIGHTING CABLE

The Tollway would like to change the insulation used on circuit conductors for roadway lighting from various types of 600 volt insulation specified on contracts currently under construction to 2400 volt XLP insulation which is 110 mils thick. The ground conductor should be 600 volt XLP insulation.

The change is for #8 through #2 circuit conductors only. Service conductors, #10 pole wire and #10 conductors for underpass lighting will not change.

Any project following the 2001 Tollway Standards (Green Book) that has 5 KV circuit conductors specified should not need to be changed since the Contractor should already be supplying the 2400 volt rated cable that replaced the 5 KV rated cable. Construction Managers (CMs) should verify that 2400 volt cable is being supplied on projects where 5 KV cables were specified. (Contract I-06-8978 is an example of a contract that has 5KV cable specified)


Projects that have 600 volt cables specified for roadway lighting conductors may have one of three types of cables specified.

1. 600 volt composite insulation. EPR insulation with a chlorosulfanated polyethylene jacket.
2. 600 volt EPR insulation with no jacket. (EPR-TYPE RHW)
3. 600 volt XLP insulation (60 mils) (XLP-TYPE USE)

On all projects that include roadway lighting the CM is requested to review the status of the roadway lighting cable. On any project where the roadway lighting cable has not been released for fabrication the CM shall request the Contractor to investigate if the roadway lighting circuit conductors can be changed to 2400 volt cable and the cost impact of such a change. The 2400 volt cable shall conform to the attached Special Provisions.

If the cable can be switched at no increase in cost to the Tollway the CM shall proceed with changing the circuit conductors to 2400 volt cable. If the change results in an increase in cost to the Tollway the change shall be referred to the Tollway Project Manager for direction.

Also attached is a list of Pay Items for the 2400 volt cables and unit duct.


Paul D. Kovacs, P.E.
Chief Engineer

10/09/08
Date

WIRE AND CABLE

This Special Provision supersedes Tollway Supplemental Specification Section 1066 issued January 1, 2007 and revised June 1, 2008, and amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2007 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 1066 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2007 shall be modified as follows:

Revise the last sentence in Article 1066.01 to read:

The unit duct shall be according to NEC Article 354.

Replace the first paragraph of Article 1066.02(a) with the following paragraph:

The cable shall be the voltage rating and Type identified on the plans. Any cable used for a service entrance shall have a Type USE-2 rating.

Delete the last paragraph of Article 1066.02(a) and replace with the following paragraphs:

The color code for wire and cable used to make up 480 volt, single phase, two wire roadway lighting circuits shall be two yellow for circuit A, two orange for circuit B, and one green for the ground. Wiring for sign luminaires shall be pairs of yellow or orange wires tagged with a luminaire identifier matching the identifier marked on the ballast.

Wire and cables normally unavailable from manufacturers in colors, shall be striped by the manufacturer. If the manufacturer is unable to stripe the cable the black cables shall be color code-banded with colored adhesive strips or tape where exposed in light pole bases, handholes, junction boxes, pull boxes, control panels and consoles.

Replace Article 1066.02(b) with the following:

(b) Copper Conductors. Conductors shall be uncoated or coated copper.

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.

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

Replace Article 1066.03(a)(1) with the following:

(1) General. Cable insulation designated as XLP shall incorporate cross-linked polyethylene (XLP) insulation as specified. Cable rated 2400 volt shall meet or exceed the requirements of ICEA S-96-659 and UL Standard 1072. Average insulation thickness of 2400 volt rated cables shall be 110 mils. 600 volt rated cable shall meet or exceed the requirements of ICEA S-95-658, NEMA WC70, and UL Standard 44. 600 volt rated cable shall be UL Listed Type RHH/RHW-2/USE-2. Minimum insulation thickness of 600 volt rated cable shall not at any point be less than the average insulation's thickness listed in the following table.

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

Aerial Electric Cable Properties

Size AWG	Phase Conductor			Messenger wire	
	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:

(b) 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 UL Standard 44, as applicable.

Replace Article 1066.04 with the following:

1066.04 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.

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.

Replace Article 1066.08 with the following:

1066.08. Electrical Tape. Electrical tape shall be all weather vinyl plastic tape resistant to abrasion, puncture, flame, oil, acids, alkalis, 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 8.5 mils (0.215 mm) and width shall not be less than 3/4-inch (20 mm).

Replace Article 1066.09 with the following:

1066.09 Wire and Cable for Roadway Lighting.

- (a) Wire and cable used to make up 480 volt, single phase, two wire roadway lighting circuits shall be insulated with XLP insulation. Power wires shall be rated 2400 volt, Type MV-90. Ground wire shall be rated 600 volt, type RHH/RHW-2/USE-2. With the approval of the Tollway cable insulated with composite EPR insulation may be used if the specified XLP cable is not available.
- (b) Pole wire, wiring to underpass luminaires and wiring to sign luminaires shall be sized No.10, rated 600 volt, type RHH/RHW-2/USE-2, and have copper conductors, stranded in conformance with ASTM B-8. Wire shall be insulated with XLP insulation over the conductor with a minimum average thickness as indicated in the table in Article 1066.03(a)(2).

The color code for pole wire and wiring for underpass lighting shall be two yellow for circuit A, two orange for circuit B, and green for the ground.

UNIT DUCT

This Special Provision supersedes Tollway Supplemental Specification Section 816 issued January 1, 2007 and amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2007 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 816 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2007 shall be modified as follows:

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

Unit duct installed in trench shall have a minimum depth of 39 inches below the finished grade unless otherwise indicated on the plans. Unit duct installed by plowing shall have a minimum depth of 33 inches below the finished grade unless otherwise indicated on the plans.

Add the following paragraph to Article 816.03:

Before final wire and cable connections are made, the Contractor shall demonstrate that all conductors within the coilable nonmetallic conduit or duct are free to move.

Revise Article 816.05 to read:

816.05 Basis of Payment. This work will be paid at the contract unit price per foot installed for UNIT DUCT or UNIT DUCT, PLOWED IN, of the number, size and type of conductors, and the size and type of duct specified.

Special Provision	Approved Pay Item	Designation	Unit of Measure
*	JS816041	UNIT DUCT, WITH 2-1/C NO. 2, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816042	UNIT DUCT, WITH 2-1/C NO. 4, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816043	UNIT DUCT, WITH 2-1/C NO. 6, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816044	UNIT DUCT, WITH 2-1/C NO. 8, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816045	UNIT DUCT, WITH 4-1/C NO. 2, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816046	UNIT DUCT, WITH 4-1/C NO. 4, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816047	UNIT DUCT, WITH 4-1/C NO. 6, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816048	UNIT DUCT, WITH 4-1/C NO. 8, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816061	UNIT DUCT, PLOWED IN, WITH 2-1/C NO. 2, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816062	UNIT DUCT, PLOWED IN, WITH 2-1/C NO. 4, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816063	UNIT DUCT, PLOWED IN, WITH 2-1/C NO. 6, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816064	UNIT DUCT, PLOWED IN, WITH 2-1/C NO. 8, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816065	UNIT DUCT, PLOWED IN, WITH 4-1/C NO. 2, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816066	UNIT DUCT, PLOWED IN, WITH 4-1/C NO. 4, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816067	UNIT DUCT, PLOWED IN, WITH 4-1/C NO. 6, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS816068	UNIT DUCT, PLOWED IN, WITH 4-1/C NO. 8, 2400V (XLP-TYPE MV90) AND 1/C NO. 8 GROUND, 600V (XLP-TYPE USE), 2" DIA. CNC	FOOT
*	JS817002	ELECTRIC CABLE IN CONDUIT, 2400V (XLP-TYPE MV90) 1/C NO. 8	FOOT
*	JS817003	ELECTRIC CABLE IN CONDUIT, 2400V (XLP-TYPE MV90) 1/C NO. 6	FOOT
*	JS817004	ELECTRIC CABLE IN CONDUIT, 2400V (XLP-TYPE MV90) 1/C NO. 4	FOOT
*	JS817005	ELECTRIC CABLE IN CONDUIT, 2400V (XLP-TYPE MV90) 1/C NO. 2	FOOT