Print Form | Submit by Email

McHenry County
Division of Transportation

16111 Nelson Road
Woodstock, IL 60098

Request for Authorization to Bid

IDOT Contractor Number: _____
Letting Date: _____

TYPE OR USE BLACK INK

SPECIAL NOTICE

Companies wishing to bid **MUST** request Authorization to Bid.

TO EXPEDITE THIS REQUEST, PLEASE PRINT LEGIBLY AND FOLLOW THE INSTRUCTIONS ON PAGE TWO.

Part A:

Companies that wish to bid on McHenry County Division of Transportation (MCDOT) projects, as the prime contractor, **must** submit a **Request for Authorization to Bid** form to MCDOT, filling in Part A. MCDOT will email an **Authorization to Bid** letter to the company within three (3) working days.

We request **Authorization to Bid** on the following projects.
Please list our Company on the **For Bid List** for the following projects (check all that apply):

☐ _____ ☐ _____ ☐ _____ ☐ _____
☐ _____ ☐ _____ ☐ _____ ☐ _____
☐ _____ ☐ _____ ☐ _____ ☐ _____

MCDOT will review the request and issue an **Authorization to Bid** only on the projects checked and listed in Part A.

Part B:

Companies downloading plans and/or specifications that wish to be placed on the **Not for Bid List**, **must** submit a **Request for Authorization to Bid** form to MCDOT, filling in Part B.

Please list our Company on the **Not For Bid List** for the following items (check all that apply):

☐ _____ ☐ _____ ☐ _____ ☐ _____
☐ _____ ☐ _____ ☐ _____ ☐ _____
☐ _____ ☐ _____ ☐ _____ ☐ _____

Part C:

Company Name: _____
Contact Person: _____
Company Address (*): _____
For United Parcel Delivery

_____ City _____ State _____ Zip Code

Post Office Box No. (*): _____ Box No. _____ For First Class Delivery

_____ City _____ State _____ Zip Code

E-Mail: _____
Phone No.: _____ Fax No.: _____

(*) Complete street address and post office box information are required.

E-mail to: MCDOTBidDocs@mchenrycountyil.gov or Fax to: MCDOT at (815) 334-4989, Attn: MCDOT Bid Docs

(Rev 11/14)

Instructions

1. Using a computer or **Black Ink (PLEASE PRINT)** complete the MCDOT Request for Authorization to Bid form (Page 1).

2. To be placed on the **For Bid List** and request **Authorization to Bid** on specific MCDOT projects, check and include the section number(s) (☒ XX-XXXXX-XX-XX) in Part A, that apply.

3. To be placed on the **Not For Bid List**, check and include the section number(s) (☒ XX-XXXXX-XX-XX) in Part B, that apply.

4. Fill in all information in Part C.

5. **E-mail** the completed Request for Authorization to Bid form (Page 1) along with a copy of your current IDOT prequalification **Certificate of Eligibility** and **Affidavit of Availability** to MCDOTBidDocs@mchenrycountyil.gov or Fax the completed Request for Authorization to Bid form (Page 1) along with a copy of your current IDOT prequalification **Certificate of Eligibility** and **Affidavit of Availability** to MCDOT at (815) 334-4989, attention MCDOT Bid Docs. Certificate not required for materials letting.

6. Requests for **Authorization to Bid** will not be processed after 4:00 p.m., three (3) calendar days preceding the published letting date as specified on form BLR 12200, Notice to Bidders, in the various project specifications.

Companies that have not received an Authorization to Bid letter within three (3) working days of submitting their request should contact MCDOT at (815) 334-4960 to check on their status.

ELECTRONIC PLANS & SPECIFICATIONS

HOW TO OBTAIN ELECTRONIC PLANS & SPECIFICATIONS?: Project plans and/or specifications may be downloaded from MCDOT's website at https://www.mchenrycountyil.gov/county-government/departments-j-z/transportation/doing-business. A CD containing the plans and specifications for the project(s) may be purchased from MCDOT at a cost of $20. Contact MCDOT at (815) 334-4960 to request a CD. Hard copies of the plans and/or specifications will be available by request for a fee. **Three (3) days advance notice is required for both requests**.

ADDENDA: Companies downloading plans and/or specifications from the internet are responsible for checking the McHenry County Division of Transportation web site (https://www.mchenrycountyil.gov/county-government/departments-j-z/transportation/doing-business) for any project ADDENDA. Companies that sign up for the electronic notification will be alerted to addenda when they are published. **It is each Company's responsibility to download any addenda and include them with their proposal(s).**

WHO CAN BID?: Bids will be accepted from only those companies that request and receive written **Authorization to Bid** letter from MCDOT.

WHAT IS AUTHORIZATION TO BID?: A Company that wishes to bid on a MCDOT project, as the prime contractor, **must** submit a **Request for Authorization to Bid** form, filling in Part A and select which project(s) they wish to bid on, to MCDOT along with a copy of their IDOT prequalification **Certificate of Eligibility** and **Affidavit of Availability**. Certificate not required for Materials Lettings. MCDOT will review the request and issue an **Authorization to Bid** letter indicating which projects the Company is authorized to bid on. If a Company is not authorized to bid on a project, the **Authorization to Bid** letter will indicate the reason for denial.

WHAT MUST BE INCLUDED IN THE BID PROPOSAL: Companies do not need to return the entire bid package when submitting a bid proposal. The following documents must be included in the bid proposal:

FOR CONTRACT PROPOSAL:

- Local Public Agency Formal Contract Proposal (BLR 12200)
- Schedule of Prices (BLR 12200a) **(Note: Written bid will not be accepted and will be subject to rejection of bid.)**
- Local Agency Proposal Bid Bond (BLR 12230)
- Apprenticeship or Training Program Certification (BLR 12325) [If included in the bid package]
- Affidavit of Illinois Business Office (BLR 12326)
- Affidavit of Availability (BC 57)

FOR MATERIAL PROPOSAL:

- Local Public Agency Material Proposal or Deliver & Install Proposal (BLR 12240)
- Material Proposal Schedule of Prices (BLR 12241)

All proposal documents, including the Proposal Guaranty Checks or Proposal Bid Bonds, should be stapled together to prevent loss.

MCDOT does not accept electronic bids. Signed and sealed paper copy proposals **must** be submitted.

MCDOT recommends that Companies deliver their proposals in person to insure they arrive at 16111 Nelson Road, Woodstock, Illinois 60098, prior to the time specified on form BLR 12200, under Notice to Bidders. **Any bid(s) received after the time specified on form BLR 12200 will not be accepted.**

For Assistance Contact MCDOT at 815-334-4960

Illinois Department of Transportation

Local Public Agency
Formal Contract Proposal

COVER SHEET

Proposal Submitted By:

Contractor's Name

Contractor's Address | City | State | Zip Code

STATE OF ILLINOIS

Local Public Agency	County	Section Number
McHenry County Division of Transportation	McHenry	22-00000-01-GM

Route(s) (Street/Road Name)	Type of Funds
Various County Highways	Non-MFT

☐ Proposal Only ☒ Proposal and Plans ☐ Proposal only, plans are separate

Submitted/Approved
For Local Public Agency:

For a County and Road District Project

Submitted/Approved

Highway Commissioner Signature | Date

Submitted/~~Approved~~

County Engineer/Superintendent of Highways | Date

Jos. R Kozalski Jr. | 08·11·21

County Engineer
On behalf of IDOT pursuant to Agreement of Understanding dated March 4, 2005

For a Municipal Project

Submitted/Approved/Passed

Signature | Date

Official Title

Department of Transportation

Released for bid based on limited review

Regional Engineer Signature | Date

Jos. R Kozalski Jr | 08·11·21

Note: All proposal documents, including Proposal Guaranty Checks or Proposal Bid Bonds, should be stapled together to prevent loss when bids are processed.

Local Public Agency	County	Section Number	Route(s) (Street/Road Name)
McHenry County Division of Tran	McHenry	22-00000-01-GM	Various County Highways

NOTICE TO BIDDERS

Sealed proposals for the project described below will be received at the office of McHenry County Division of Transportation (Name of Office)

16111 Nelson Road Woodstock, IL 60098 (Address) until 10:00 AM (Time) on 09/08/21 (Date).

Sealed proposals will be opened and read publicly at the office of McHenry County Division of Transportation (Name of Office)

16111 Nelson Road Woodstock, IL 60098 (Address) at 10:00 AM (Time) on 09/08/21 (Date).

DESCRIPTION OF WORK

Location	Project Length
Various County Highways	N/A

Proposed Improvement

2022 to 2023 Traffic Signal and Highway Lighting Maintenance. Continuous maintenance and repair services of traffic signals, highway lighting, flashing beacons, and related equipment under the maintenance jurisdiction of the McHenry County Division of Transportation.

1. Plans and proposal forms will be available in the office of

Proposal forms available online at: https://www.mchenrycountyil.gov/county-government/departments-j-z/transportation/doing-business

2. ☒ Prequalification

   If checked, the 2 apparent as read low bidders must file within 24 hours after the letting an "Affidavit of Availability" (Form BC 57) in triplicate, showing all uncompleted contracts awarded to them and all low bids pending award for Federal, State, County, Municipal and private work. One original shall be filed with the Awarding Authority and two originals with the IDOT District Office.

3. The Awarding Authority reserves the right to waive technicalities and to reject any or all proposals as provided in BLRS Special Provision for Bidding Requirements and Conditions for Contract Proposals.

4. The following BLR Forms shall be returned by the bidder to the Awarding Authority:
   a. Local Public Agency Formal Contract Proposal (BLR 12200)
   b. Schedule of Prices (BLR 12201)
   c. Proposal Bid Bond (BLR 12230) (if applicable)
   d. Apprenticeship or Training Program Certification (BLR 12325) (do not use for project with Federal funds.)
   e. Affidavit of Illinois Business Office (BLR 12326) (do not use for project with Federal funds)

5. The quantities appearing in the bid schedule are approximate and are prepared for the comparison of bids. Payment to the Contractor will be made only for the actual quantities of work performed and accepted or materials furnished according to the contract. The scheduled quantities of work to be done and materials to be furnished may be increased, decreased or omitted as hereinafter provided.

6. Submission of a bid shall be conclusive assurance and warranty the bidder has examined the plans and understands all requirements for the performance of work. The bidder will be responsible for all errors in the proposal resulting from failure or neglect to conduct an in depth examination. The Awarding Authority will, in no case, be responsible for any costs, expenses, losses or changes in anticipated profits resulting from such failure or neglect of the bidder.

7. The bidder shall take no advantage of any error or omission in the proposal and advertised contract.

8. If a special envelope is supplied by the Awarding Authority, each proposal should be submitted in that envelope furnished by the Awarding Agency and the blank spaces on the envelope shall be filled in correctly to clearly indicate its contents. When an envelope other than the special one furnished by the Awarding Authority is used, it shall be marked to clearly indicate its contents. When sent by mail, the sealed proposal shall be addressed to the Awarding Authority at the address and in care of the official in whose office the bids are to be received. All proposals shall be filed prior to the time and at the place specified in the Notice to Bidders. Proposals received after the time specified will be returned to the bidder unopened.

9. Permission will be given to a bidder to withdraw a proposal if the bidder makes the request in writing or in person before the time for opening proposals.

Local Public Agency	County	Section Number	Route(s) (Street/Road Name)
McHenry County Division of Tran	McHenry	22-00000-01-GM	Various County Highways

PROPOSAL

1. Proposal of _____
Contractor's Name

_____
Contractor's Address

2. The plans for the proposed work are those prepared by McHenry County Division of Transportation and approved by the Department of Transportation on August 10, 2021.

3. The specifications referred to herein are those prepared by the Department of Transportation and designated as "Standard Specifications for Road and Bridge Construction" and the " Supplemental Specifications and Recurring Special Provisions" thereto, adopted and in effect on the date of invitation for bids.

4. The undersigned agrees to accept, as part of the contract, the applicable Special Provisions indicated on the "Check Sheet for Recurring Special Provisions" contained in this proposal.

5. The undersigned agrees to complete the work within _____ working days or by _____ unless additional time is granted in accordance with the specifications.

6. The successful bidder at the time of execution of the contract will be required to deposit a contract bond for the full amount of the award. When a contract bond is not required, the proposal guaranty check will be held in lieu thereof. If this proposal is accepted and the undersigned fails to execute a contract and contract bond as required, it is hereby agreed that the Bid Bond of check shall be forfeited to the Awarding Authority.

7. Each pay item should have a unit price and a total price. If no total price is shown or if there is a discrepancy between the products of the unit price multiplied by the quantity, the unit price shall govern. If a unit price is omitted, the total price will be divided by the quantity in order to establish a unit price. A bid may be declared unacceptable if neither a unit price nor a total price is shown.

8. The undersigned submits herewith the schedule of prices on BLR 12201 covering the work to be performed under this contract.

9. The undersigned further agrees that if awarded the contract for the sections contained in the combinations on BLR 12201, the work shall be in accordance with the requirements of each individual proposal for the multiple bid specified in the Schedule for Multiple Bids below.

10. A proposal guaranty in the proper amount, as specified in BLRS Special Provision for Bidding Requirements and Conditions for Contract Proposals, will be required. Bid Bonds will be allowed as a proposal guaranty. Accompanying this proposal is either a bid bond, if allowed, on Department form BLR 12230 or a proposal guaranty check, complying with the specifications, made payable to: Glenda L. Miller Treasurer of McHenry County.
The amount of the check is _____ (_____).

Attach Cashier's Check or Certified Check Here

In the event that one proposal guaranty check is intended to cover two or more bid proposals, the amount must be equal to the sum of the proposal guaranties which would be required for each individual bid proposal. If the proposal guaranty check is placed in another bid proposal, state below where it may be found.

The proposal guaranty check will be found in the bid proposal for: Section Number _____.

Local Public Agency	County	Section Number	Route(s) (Street/Road Name)
McHenry County Division of Tran	McHenry	22-00000-01-GM	Various County Highways

CONTRACTOR CERTIFICATIONS

The certifications hereinafter made by the bidder are each a material representation of fact upon which reliance is placed should the Department enter into the contract with the bidder.

1. **Debt Delinquency.** The bidder or contractor or subcontractor, respectively, certifies that it is not delinquent in the payment of any tax administered by the Department of Revenue unless the individual or other entity is contesting, in accordance with the procedure established by the appropriate Revenue Act, its liability for the tax or the amount of the tax. Making a false statement voids the contract and allows the Department to recover all amounts paid to the individual or entity under the contract in a civil action.

2. **Bid-Rigging or Bid Rotating**. The bidder or contractor or subcontractor, respectively, certifies that it is not barred from contracting with the Department by reason of a violation of either 720 ILCS 5/33E-3 or 720 ILCS 5/33E-4.

   A violation of section 33E-3 would be represented by a conviction of the crime of bid-rigging which, in addition to Class 3 felony sentencing, provides that any person convicted of this offense, or any similar offense of any state or the United States which contains the same elements as this offense shall be barred for 5 years from the date of conviction from contracting with any unit of State or local government. No corporation shall be barred from contracting with any unit of State or local government as a result of a conviction under this Section of any employee or agent of such corporation if the employee so convicted is no longer employed by the corporation: (1) it has been finally adjudicated not guilty or (2) if it demonstrates to the governmental entity with which it seeks to contract that entity finds that the commission of the offense was neither authorized, requested, commanded, nor performed by a director, officer or a high managerial agent on behalf of the corporation.

   A violation of Section 33E-4 would be represented by a conviction of the crime of bid-rotating which, in addition to Class 2 felony sentencing, provides that any person convicted of this offense or any similar offense of any state or the United States which contains the same elements as this offense shall be permanently barred from contracting with any unit of State of Local government. No corporation shall be barred from contracting with any unit of State or Local government as a result of a conviction under this Section of any employee or agent of such corporation if the employee so convicted is no longer employed by the corporation and: (1) it has been finally adjudicated not guilty or (2) if it demonstrates to the governmental entity with which it seeks to contract and that entity finds that the commission of the offense was neither authorized, requested, commanded, nor performed by a director, officer or a high managerial agent on behalf of the corporation.

3. **Bribery.** The bidder or contractor or subcontractor, respectively, certifies that, it has not been convicted of bribery or attempting to bribe an officer or employee of the State of Illinois or any unit of local government, nor has the firm made an admission of guilt of such conduct which is a matter or record, nor has an official, agent, or employee of the firm committed bribery or attempted bribery on behalf of the firm and pursuant to the direction or authorization of a responsible official of the firm.

4. **Interim Suspension or Suspension.** The bidder or contractor or subcontractor, respectively, certifies that it is not currently under a suspension as defined in Subpart I of Title 44 Subtitle A Chapter III Part 6 of the Illinois Administrative code. Furthermore, if suspended prior to completion of this work, the contract or contracts executed for the completion of this work may be canceled.

Local Public Agency	County	Section Number	Route(s) (Street/Road Name)
McHenry County Division of Tran	McHenry	22-00000-01-GM	Various County Highways

SIGNATURES

(If an individual)

Signature of Bidder | Date

Business Address

City | State | Zip Code

(If a partnership)

Firm Name

Signature | Date

Title

Business Address

City | State | Zip Code

Insert the Names and Addresses of all Partners

(If a corporation)

Corporate Name

Signature | Date

Title

Business Address

City | State | Zip Code

Insert Names of Officers

President

Attest:

Secretary

Secretary

Treasurer

Illinois Department of Transportation

Schedule of Prices

Contractor's Name

Contractor's Address | City | State | Zip Code

Local Public Agency: McHenry County Division of Transportation | County: McHenry | Section Number: 22-00000-01-GM

Route(s) (Street/Road Name): Various County Highways

Schedule for Multiple Bids

Combination Letter	Section Included in Combinations	Total

Schedule for Single Bid

(For complete information covering these items, see plans and specifications.)

Item Number	Items	Unit	Quantity	Unit Price	Total
A-1	Traffic Signal Location	EA (MO)	984		
A-2	Temp Traffic Signal Location	EA (MO)	72		
A-3	Flashing Beacon, Overhead Mt	EA (MO)	48		
A-4	Flashing Beacon, Post Mount	EA (MO)	1,080		
B-1	Street Light Location	EA (MO)	16,920		
E-1	Fully Act Cont & Ty IV Cab	EA	1		
E-2	Fully Act Cont & Ty V Cab	EA	1		
E-3	Fully Act Cont & Ty IV Cab, 65"	EA	1		
E-4	Full Actuated Controller	EA	1		
E-5	Master Controller	EA	1		
E-6	Inductive Loop Sealant	FT	150		
E-7	Detector Loop Type I	FT	300		
E-8	Service Install, Grd Mt Metered	EA	2		
E-9	Concrete Foundation, Type A	FT	12		
E-10	Concrete Foundation, Type C	FT	12		
E-11	Concrete Handhole	EA	2		
E-12	Concrete Heavy Duty Handhole	EA	2		
E-13	Concrete Double Handhole	EA	2		
E-14	Video Det System, Single App	EA	4		
				Bidder's Total Proposal	

1. Each pay item should have a unit price and a total price.
2. If no total price is shown or if there is a discrepancy between the product of the unit price multiplied by the quantity, the unit price shall govern.
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 or total price is shown.

INTENTIONALLY

BLANK

Illinois Department of Transportation

Local Public Agency
Proposal Bid Bond

Local Public Agency	County	Section Number
McHenry County Division of Transportation	McHenry	22-00000-01-GM

WE, _____ as PRINCIPAL, and

_____ as SURETY, are held jointly, severally and firmly bound unto the above Local Public Agency (hereafter referred to as "LPA") in the penal sum of 5% of the total bid price, or for the amount specified in the proposal documents in effect on the date of invitation for bids, whichever is the lesser sum. We bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly pay to the LPA this sum under the conditions of this instrument.

WHEREAS THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH that, the said PRINCIPAL is submitting a written proposal to the LPA acting through its awarding authority for the construction of the work designated as the above section.

THEREFORE if the proposal is accepted and a contract awarded to the PRINCIPAL by the LPA for the above designated section and the PRINCIPAL shall within fifteen (15) days after award enter into a formal contract, furnish surety guaranteeing the faithful performance of the work, and furnish evidence of the required insurance coverage, all as provided in the "Standard Specifications for Road and Bridge Construction" and applicable Supplemental Specifications, then this obligation shall become void; otherwise it shall remain in full force and effect.

IN THE EVENT the LPA determines the PRINCIPAL has failed to enter into a formal contract in compliance with any requirements set forth in the preceding paragraph, then the LPA acting through its awarding authority shall immediately be entitled to recover the full penal sum set out above, together with all court costs, all attorney fees, and any other expense of recovery.

IN TESTIMONY WHEREOF, the said PRINCIPAL and the said SURETY have caused this instrument to be signed by their respective officers this _____ (Day) of _____ (Month and Year)

Principal

Company Name		Company Name	
Signature	Date	Signature	Date
By:		By:	
Title		Title	

(If Principal is a joint venture of two or more contractors, the company names, and authorized signatures of each contractor must be affixed.)

Surety

Name of Surety	Signature of Attorney-in-Fact	Date
	By:	

STATE OF IL

COUNTY OF

I _____, a Notary Public in and for said county do hereby certify that

_____

(Insert names of individuals signing on behalf of PRINCIPAL & SURETY)

who are each personally known to me to be the same persons whose names are subscribed to the foregoing instrument on behalf of PRINCIPAL and SURETY, appeared before me this day in person and acknowledged respectively, that they signed and delivered said instruments as their free and voluntary act for the uses and purposes therein set forth.

Given under my hand and notarial seal this _____ (Day) day of _____ (Month and Year).

Notary Public Signature

(SEAL)

Date commission expires _____

Local Public Agency	County	Section Number
McHenry County Division of Transportation	McHenry	22-00000-01-GM

ELECTRONIC BID BOND

☐ **Electronic bid bond is allowed (box must be checked by LPA if electronic bid bond is allowed)**

The Principal may submit an electronic bid bond, in lieu of completing the above section of the Proposal Bid Bond Form. By providing an electronic bid bond ID code and signing below, the Principal is ensuring the identified electronic bid bond has been executed and the Principal and Surety are firmly bound unto the LPA under the conditions of the bid bond as shown above. (If PRINCIPAL is a joint venture of two or more contractors, an electronic bid bond ID code, company/Bidder name title and date must be affixed for each contractor in the venture.)

Electronic Bid Bond ID Code

Company/Bidder Name

Signature

Date

Title

Illinois Department of Transportation

Apprenticeship and Training Program Certification

Local Public Agency	County	Street Name/Road Name	Section Number
McHenry County Division of Trans	McHenry		22-00000-01-GM

All contractors are required to complete the following certification

☒ For this contract proposal or for all bidding groups in this deliver and install proposal.

☐ For the following deliver and install bidding groups in this material proposal.

Illinois Department of Transportation policy, adopted in accordance with the provisions of the Illinois Highway Code, requires this contract to be awarded to the lowest responsive and responsible bidder. The award decision is subject to approval by the Department. In addition to all other responsibility factors, this contract or deliver and install proposal requires all bidders and all bidder's subcontractors to disclose participation in apprenticeship or training programs that are (1) approved by and registered with the United States Department of Labor's Bureau of Apprenticeship and Training, and (2) applicable to the work of the above indicated proposals or groups. Therefore, all bidders are required to complete the following certification:

1. Except as provided in paragraph 4 below, the undersigned bidder certifies that it is a participant, either as an individual or as part of a group program, in an approved apprenticeship or training program applicable to each type of work or craft that the bidder will perform with its own employees.

2. The undersigned bidder further certifies, for work to be performed by subcontract, that each of its subcontractors either (A) is, at the time of such bid, participating in an approved, applicable apprenticeship or training program; or (B) will, prior to commencement of performance of work pursuant to this contract, establish participation in an approved apprenticeship or training program applicable to the work of the subcontract.

3. The undersigned bidder, by inclusion in the list in the space below, certifies the official name of each program sponsor holding the Certificate of Registration for all of the types of work or crafts in which the bidder is a participant and that will be performed with the bidder's employees. Types of work or craft that will be subcontracted shall be included and listed as subcontract work. The list shall also indicate any type of work or craft job category for which there is no applicable apprenticeship or training program available.

4. Except for any work identified above, if any bidder or subcontractor shall perform all or part of the work of the contract or deliver and install proposal solely by individual owners, partners or members and not by employees to whom the payment of prevailing rates of wages would be required, check the following box, and identify the owner/operator workforces and positions of ownership. ☐

The requirements of this certification and disclosure are a material part of the contract, and the contractor shall require this certification provision to be included in all approved subcontracts. The bidder is responsible for making a complete report and shall make certain that each type of work or craft job category that will be utilized on the project is accounted for and listed. The Department at any time before or afterward may require the production of a copy of each applicable Certificate of Registration issued by the United States Department of Labor evidencing such participation by the contractor and any or all of its subcontractors. In order to fulfill the participation requirement, it shall not be necessary that any applicable program sponsor be currently taking or that it will take applications for apprenticeship, training or employment during the performance of the work of this contract or deliver and install proposal.

Bidder	Signature	Date

Title

Address	City	State	Zip Code

INTENTIONALLY

BLANK

Illinois Department of Transportation

Affidavit of Illinois Business Office

Local Public Agency	County	Street Name/Road Name	Section Number
McHenry County Division of Trans	McHenry		22-00000-01-GM

I, _____ of _____, _____,
Name of Affiant — City of Affiant — State of Affiant
being first duly sworn upon oath, state as follows:

1. That I am the _____ of _____.
Officer or Position — Bidder

2. That I have personal knowledge of the facts herein stated.

3. That, if selected under the proposal described above, _____, will maintain a business office in the
Bidder
State of Illinois, which will be located in _____ County, Illinois.
County

4. That this business office will serve as the primary place of employment for any persons employed in the construction contemplated by this proposal.

5. That this Affidavit is given as a requirement of state law as provided in Section 30-22(8) of the Illinois Procurement Code.

Signature | Date

Print Name of Affiant

Notary Public

State of IL

County _____

Signed (or subscribed or attested) before me on _____ by
(date)

_____, authorized agent(s) of
(name/s of person/s)

_____.
Bidder

Signature of Notary Public

(SEAL)

My commission expires _____

INTENTIONALLY

BLANK

Illinois Department of Transportation

Substance Abuse Prevention Program Certification

Contract Number	District	Letting Date
		09/08/21

Route	County
Various	McHenry

Project Number	Job Number

Section Number: 22-00000-01-GM

The Substance Abuse Prevention on Public Works Act, Public Act 95-0635, prohibits the use of drugs and alcohol, as defined in the Act, by employees of the Contractor and by employees of all approved Subcontractors while performing work on a public works project. The Contractor/Subcontractor herewith certifies that it has a superseding collective bargaining agreement or makes the public filing of its written substance abuse prevention program for the prevention of substance abuse among its employees who are not covered by a collective bargaining agreement dealing with the subject as mandated by the Act.

A. The undersigned representative of the Contractor/Subcontractor certifies that the contracting entity has signed collective bargaining agreements that are in effect for all of its employees, and that deal with the subject matter of Public Act 95-0635.

Contractor/Subcontractor

Name of Authorized Representative (type or print)

Title of Authorized Representative (type or print)

Signature of Authorized Representative	Date

B. The undersigned representative of the Contractor/Subcontractor certifies that the contracting entity has in place for all of its employees not covered by a collective bargaining agreement that deals with the subject of the Act, the attached substance abuse prevention program that meets or exceeds the requirements of Public Act 95-0635.

Contractor/Subcontractor

Name of Authorized Representative (type or print)

Title of Authorized Representative (type or print)

Signature of Authorized Representative	Date

INTENTIONALLY

BLANK

Illinois Department of Transportation

Affidavit of Availability

For the Letting of 09/08/21

Bureau of Construction
2300 South Dirksen Parkway/Room 322
Springfield, IL 62764

Instructions: Complete this form by either typing or using black ink. "Authorization to Bid" will not be issued unless both sides of this form are completed in detail. Use additional forms as needed to list all work.

Part I. Work Under Contract

List below all work you have under contract as either a prime contractor or a subcontractor. It is required to include all pending low bids not yet awarded or rejected. In a joint venture, list only that portion of the work which is the responsibility of your company. The uncompleted dollar value is to be based upon the most recent engineer's or owners estimate, and must include work subcontracted to others. If no work is contracted, show NONE.

	1	2	3	4	Awards Pending	Accumulated Totals
Contract Number						
Contract With						
Estimated Completion Date						
Total Contract Price						
Uncompleted Dollar Value if Firm is the Prime Contractor						
Uncompleted Dollar Value if Firm is the Subcontractor						
					Total Value of All Work	

Part II. Awards Pending and Uncompleted Work to be done with your own forces.

List below the uncompleted dollar value of work for each contract and awards pending to be completed with your own forces. All work subcontracted to others will be listed on the reverse of this form. In a joint venture, list only that portion of the work to be done by your company. If no work is contracted, show NONE.

Earthwork						
Portland Cement Concrete Paving						
HMA Plant Mix						
HMA Paving						
Clean & Seal Cracks/Joints						
Aggregate Bases, Surfaces						
Highway, R.R., Waterway Struc.						
Drainage						
Electrical						
Cover and Seal Coats						
Concrete Construction						
Landscaping						
Fencing						
Guardrail						
Painting						
Signing						
Cold Milling, Planning, Rotomilling						
Demolition						
Pavement Markings (Paint)						
Other Construction (List)						
Totals						

Disclosure of this information is REQUIRED to accomplish the statutory purpose as outlined in the "Illinois Procurement Code." Failure to comply will result in non-issuance of an "Authorization To Bid." This form has been approved by the State Forms Management Center.

Part III. Work Subcontracted to Others.

For each contract described in Part I, list all the work you have subcontracted to others.

	1	2	3	4	Awards Pending
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					

Total Uncompleted						

Notary

I, being duly sworn, do hereby declare this affidavit is a true and correct statement relating to ALL uncompleted contracts of the undersigned for Federal, State, County, City and private work, including ALL subcontract work, ALL pending low bids not yet awarded or rejected and ALL estimated completion dates.

Officer or Director

Title

Signature

Date

Company

Address

City

State

Zip Code

Subscribed and sworn to before me

this _____ day of _____, _____

_____

(Signature of Notary Public)

My commission expires _____

(Notary Seal)

☐ Add pages for additional contracts

Illinois Department of Transportation

Affidavit of Availability

For the Letting of 09/08/21

Bureau of Construction
2300 South Dirksen Parkway/Room 322
Springfield, IL 62764

Instructions: Complete this form by either typing or using black ink. "Authorization to Bid" will not be issued unless both sides of this form are completed in detail. Use additional forms as needed to list all work.

Part I. Work Under Contract

List below all work you have under contract as either a prime contractor or a subcontractor. It is required to include all pending low bids not yet awarded or rejected. In a joint venture, list only that portion of the work which is the responsibility of your company. The uncompleted dollar value is to be based upon the most recent engineer's or owners estimate, and must include work subcontracted to others. If no work is contracted, show NONE.

	1	2	3	4	Awards Pending	Accumulated Totals
Contract Number						
Contract With						
Estimated Completion Date						
Total Contract Price						
Uncompleted Dollar Value if Firm is the Prime Contractor						
Uncompleted Dollar Value if Firm is the Subcontractor						
					Total Value of All Work	

Part II. Awards Pending and Uncompleted Work to be done with your own forces.

List below the uncompleted dollar value of work for each contract and awards pending to be completed with your own forces. All work subcontracted to others will be listed on the reverse of this form. In a joint venture, list only that portion of the work to be done by your company. If no work is contracted, show NONE.

Earthwork						
Portland Cement Concrete Paving						
HMA Plant Mix						
HMA Paving						
Clean & Seal Cracks/Joints						
Aggregate Bases, Surfaces						
Highway, R.R., Waterway Struc.						
Drainage						
Electrical						
Cover and Seal Coats						
Concrete Construction						
Landscaping						
Fencing						
Guardrail						
Painting						
Signing						
Cold Milling, Planning, Rotomilling						
Demolition						
Pavement Markings (Paint)						
Other Construction (List)						
Totals						

Disclosure of this information is REQUIRED to accomplish the statutory purpose as outlined in the "Illinois Procurement Code." Failure to comply will result in non-issuance of an "Authorization To Bid." This form has been approved by the State Forms Management Center.

Part III. Work Subcontracted to Others.

For each contract described in Part I, list all the work you have subcontracted to others.

	2	3	4	Awards Pending	1
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					

Total Uncompleted					

Notary

I, being duly sworn, do hereby declare this affidavit is a true and correct statement relating to ALL uncompleted contracts of the undersigned for Federal, State, County, City and private work, including ALL subcontract work, ALL pending low bids not yet awarded or rejected and ALL estimated completion dates.

Officer or Director

Title

Signature

Date

Company

Address

City

State

Zip Code

Subscribed and sworn to before me

this _____ day of _____ , _____

_____

(Signature of Notary Public)

My commission expires _____

(Notary Seal)

☐ Add pages for additional contracts

Illinois Department of Transportation

Affidavit of Availability

For the Letting of 09/08/21

Bureau of Construction
2300 South Dirksen Parkway/Room 322
Springfield, IL 62764

Instructions: Complete this form by either typing or using black ink. "Authorization to Bid" will not be issued unless both sides of this form are completed in detail. Use additional forms as needed to list all work.

Part I. Work Under Contract

List below all work you have under contract as either a prime contractor or a subcontractor. It is required to include all pending low bids not yet awarded or rejected. In a joint venture, list only that portion of the work which is the responsibility of your company. The uncompleted dollar value is to be based upon the most recent engineer's or owners estimate, and must include work subcontracted to others. If no work is contracted, show NONE.

	1	2	3	4	Awards Pending	Accumulated Totals
Contract Number						
Contract With						
Estimated Completion Date						
Total Contract Price						
Uncompleted Dollar Value if Firm is the Prime Contractor						
Uncompleted Dollar Value if Firm is the Subcontractor						
					Total Value of All Work	

Part II. Awards Pending and Uncompleted Work to be done with your own forces.

List below the uncompleted dollar value of work for each contract and awards pending to be completed with your own forces. All work subcontracted to others will be listed on the reverse of this form. In a joint venture, list only that portion of the work to be done by your company. If no work is contracted, show NONE.

Earthwork						
Portland Cement Concrete Paving						
HMA Plant Mix						
HMA Paving						
Clean & Seal Cracks/Joints						
Aggregate Bases, Surfaces						
Highway, R.R., Waterway Struc.						
Drainage						
Electrical						
Cover and Seal Coats						
Concrete Construction						
Landscaping						
Fencing						
Guardrail						
Painting						
Signing						
Cold Milling, Planning, Rotomilling						
Demolition						
Pavement Markings (Paint)						
Other Construction (List)						
Totals						

Disclosure of this information is REQUIRED to accomplish the statutory purpose as outlined in the "Illinois Procurement Code." Failure to comply will result in non-issuance of an "Authorization To Bid." This form has been approved by the State Forms Management Center.

Part III. Work Subcontracted to Others.

For each contract described in Part I, list all the work you have subcontracted to others.

	1	2	3	4	Awards Pending
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					

Total Uncompleted					

Notary

I, being duly sworn, do hereby declare this affidavit is a true and correct statement relating to ALL uncompleted contracts of the undersigned for Federal, State, County, City and private work, including ALL subcontract work, ALL pending low bids not yet awarded or rejected and ALL estimated completion dates.

Officer or Director

Title

Signature

Date

Company

Address

City

State

Zip Code

Subscribed and sworn to before me

this _____ day of _____ , _____

_____

(Signature of Notary Public)

My commission expires _____

(Notary Seal)

☐ Add pages for additional contracts

Illinois Department of Transportation

Affidavit of Availability

For the Letting of 09/08/21

Bureau of Construction
2300 South Dirksen Parkway/Room 322
Springfield, IL 62764

Instructions: Complete this form by either typing or using black ink. "Authorization to Bid" will not be issued unless both sides of this form are completed in detail. Use additional forms as needed to list all work.

Part I. Work Under Contract

List below all work you have under contract as either a prime contractor or a subcontractor. It is required to include all pending low bids not yet awarded or rejected. In a joint venture, list only that portion of the work which is the responsibility of your company. The uncompleted dollar value is to be based upon the most recent engineer's or owners estimate, and must include work subcontracted to others. If no work is contracted, show NONE.

	1	2	3	4	Awards Pending	Accumulated Totals
Contract Number						
Contract With						
Estimated Completion Date						
Total Contract Price						
Uncompleted Dollar Value if Firm is the Prime Contractor						
Uncompleted Dollar Value if Firm is the Subcontractor						
					Total Value of All Work	

Part II. Awards Pending and Uncompleted Work to be done with your own forces.

List below the uncompleted dollar value of work for each contract and awards pending to be completed with your own forces. All work subcontracted to others will be listed on the reverse of this form. In a joint venture, list only that portion of the work to be done by your company. If no work is contracted, show NONE.

Earthwork						
Portland Cement Concrete Paving						
HMA Plant Mix						
HMA Paving						
Clean & Seal Cracks/Joints						
Aggregate Bases, Surfaces						
Highway, R.R., Waterway Struc.						
Drainage						
Electrical						
Cover and Seal Coats						
Concrete Construction						
Landscaping						
Fencing						
Guardrail						
Painting						
Signing						
Cold Milling, Planning, Rotomilling						
Demolition						
Pavement Markings (Paint)						
Other Construction (List)						
Totals						

Disclosure of this information is REQUIRED to accomplish the statutory purpose as outlined in the "Illinois Procurement Code." Failure to comply will result in non-issuance of an "Authorization To Bid." This form has been approved by the State Forms Management Center.

Part III. Work Subcontracted to Others.

For each contract described in Part I, list all the work you have subcontracted to others.

	1	2	3	4	Awards Pending
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					

Total Uncompleted						

Notary

I, being duly sworn, do hereby declare this affidavit is a true and correct statement relating to ALL uncompleted contracts of the undersigned for Federal, State, County, City and private work, including ALL subcontract work, ALL pending low bids not yet awarded or rejected and ALL estimated completion dates.

Officer or Director

Title

Signature

Date

Company

Address

City

State

Zip Code

Subscribed and sworn to before me

this _____ day of _____ , _____

_____

(Signature of Notary Public)

My commission expires _____

(Notary Seal)

☐ Add pages for additional contracts

Illinois Department of Transportation

Affidavit of Availability

For the Letting of 09/08/21

Bureau of Construction
2300 South Dirksen Parkway/Room 322
Springfield, IL 62764

Instructions: Complete this form by either typing or using black ink. "Authorization to Bid" will not be issued unless both sides of this form are completed in detail. Use additional forms as needed to list all work.

Part I. Work Under Contract

List below all work you have under contract as either a prime contractor or a subcontractor. It is required to include all pending low bids not yet awarded or rejected. In a joint venture, list only that portion of the work which is the responsibility of your company. The uncompleted dollar value is to be based upon the most recent engineer's or owners estimate, and must include work subcontracted to others. If no work is contracted, show NONE.

	1	2	3	4	Awards Pending	Accumulated Totals
Contract Number						
Contract With						
Estimated Completion Date						
Total Contract Price						
Uncompleted Dollar Value if Firm is the Prime Contractor						
Uncompleted Dollar Value if Firm is the Subcontractor						
					Total Value of All Work	

Part II. Awards Pending and Uncompleted Work to be done with your own forces.

List below the uncompleted dollar value of work for each contract and awards pending to be completed with your own forces. All work subcontracted to others will be listed on the reverse of this form. In a joint venture, list only that portion of the work to be done by your company. If no work is contracted, show NONE.

Earthwork						
Portland Cement Concrete Paving						
HMA Plant Mix						
HMA Paving						
Clean & Seal Cracks/Joints						
Aggregate Bases, Surfaces						
Highway, R.R., Waterway Struc.						
Drainage						
Electrical						
Cover and Seal Coats						
Concrete Construction						
Landscaping						
Fencing						
Guardrail						
Painting						
Signing						
Cold Milling, Planning, Rotomilling						
Demolition						
Pavement Markings (Paint)						
Other Construction (List)						
Totals						

Disclosure of this information is REQUIRED to accomplish the statutory purpose as outlined in the "Illinois Procurement Code." Failure to comply will result in non-issuance of an "Authorization To Bid." This form has been approved by the State Forms Management Center.

Part III. Work Subcontracted to Others.

For each contract described in Part I, list all the work you have subcontracted to others.

	1	2	3	4	Awards Pending
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Subcontractor					
Type of Work					
Subcontract Price					
Amount Uncompleted					
Total Uncompleted					

Notary

I, being duly sworn, do hereby declare this affidavit is a true and correct statement relating to ALL uncompleted contracts of the undersigned for Federal, State, County, City and private work, including ALL subcontract work, ALL pending low bids not yet awarded or rejected and ALL estimated completion dates.

Officer or Director

Title

Signature

Date

Company

Address

City

State

Zip Code

Subscribed and sworn to before me

this _____ day of _____ , _____

_____

(Signature of Notary Public)

My commission expires _____

(Notary Seal)

Illinois Department of Transportation

Check Sheet for Recurring Special Provisions

Local Public Agency	County	Section Number
McHenry County Division of Transportation	McHenry	22-00000-01-GM

The Following Recurring Special Provisions Indicated By An "X" Are Applicable To This Contract And Are Included By Reference:

Recurring Special Provisions

Check Sheet #			Page No.
1	☐	Additional State Requirements for Federal-Aid Construction Contracts	97
2	☐	Subletting of Contracts (Federal-Aid Contracts)	100
3	☐	EEO	101
4	☐	Specific EEO Responsibilities Non Federal-Aid Contracts	111
5	☐	Required Provisions - State Contracts	116
6	☐	Asbestos Bearing Pad Removal	122
7	☐	Asbestos Waterproofing Membrane and Asbestos HMA Surface Removal	123
8	☐	Temporary Stream Crossings and In-Stream Work Pads	124
9	☐	Construction Layout Stakes Except for Bridges	125
10	☐	Construction Layout Stakes	128
11	☐	Use of Geotextile Fabric for Railroad Crossing	131
12	☐	Subsealing of Concrete Pavements	133
13	☐	Hot-Mix Asphalt Surface Correction	137
14	☐	Pavement and Shoulder Resurfacing	139
15	☐	Patching with Hot-Mix Asphalt Overlay Removal	140
16	☐	Polymer Concrete	142
17	☐	PVC Pipeliner	144
18	☐	Bicycle Racks	145
19	☐	Temporary Portable Bridge Traffic Signals	147
20		**Reserved**	149
21	☒	Nighttime Inspection of Roadway Lighting	150
22	☐	English Substitution of Metric Bolts	151
23	☐	Calcium Chloride Accelerator for Portland Cement Concrete	152
24	☐	Quality Control of Concrete Mixtures at the Plant	153
25	☐	Quality Control/Quality Assurance of Concrete Mixtures	161
26	☐	Digital Terrain Modeling for Earthwork Calculations	177
27		**Reserved**	179
28	☐	Preventive Maintenance - Bituminous Surface Treatment (A-1)	180
29		**Reserved**	186
30		**Reserved**	187
31		**Reserved**	188
32	☐	Temporary Raised Pavement Markers	189
33	☐	Restoring Bridge Approach Pavements Using High-Density Foam	190
34	☐	Portland Cement Concrete Inlay or Overlay	193
35	☐	Portland Cement Concrete Partial Depth Hot-Mix Asphalt Patching	197
36	☐	Longitudinal Joint and Crack Patching	200
37	☐	Concrete Mix Design - Department Provided	202

Local Public Agency	County	Section Number
McHenry County Division of Transportation	McHenry	22-00000-01-GM

The Following Local Roads And Streets Recurring Special Provisions Indicated By An "X" Are Applicable To This Contract And Are Included By Reference:

Local Roads And Streets Recurring Special Provisions

Check Sheet #			Page No.
LRS 1		**Reserved**	204
LRS 2	☐	Furnished Excavation	205
LRS 3	☒	Work Zone Traffic Control Surveillance	206
LRS 4	☒	Flaggers in Work Zones	207
LRS 5	☐	Contract Claims	208
LRS 6	☒	Bidding Requirements and Conditions for Contract Proposals	209
LRS 7	☐	Bidding Requirements and Conditions for Material Proposals	215
LRS 8		**Reserved**	221
LRS 9	☐	Bituminous Surface Treatments	222
LRS 10		**Reserved**	223
LRS 11	☒	Employment Practices	224
LRS 12	☒	Wages of Employees on Public Works	226
LRS 13	☒	Selection of Labor	228
LRS 14	☐	Paving Brick and Concrete Paver Pavements and Sidewalks	229
LRS 15	☐	Partial Payments	232
LRS 16	☒	Protests on Local Lettings	233
LRS 17	☒	Substance Abuse Prevention Program	234
LRS 18	☐	Multigrade Cold Mix Asphalt	235

CHECK SHEET #21

State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
NIGHTTIME INSPECTION OF ROADWAY LIGHTING

Effective: May 1, 1996

The Contractor shall provide traffic control and protection for the nighttime inspection of the roadway lighting as shown in the contract. Any fixtures found not to be aimed to provide optimum lighting on the roadway during the nighttime inspection shall be re-aimed to optimum during the inspection. Any work necessary for re-aiming will not be paid for separately but, shall be included in the cost of the highway lighting bid items.

INTENTIONALLY

BLANK

CHECK SHEET #LRS3

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION
FOR
WORK ZONE TRAFFIC CONTROL SURVEILLANCE

Effective: January 1, 1999
Revised: January 1, 2018

Revise Article 701.10 of the Standard Specifications to read:

"The Contractor shall conduct inspections of the worksite at a frequency that will allow for the timely replacement of any traffic control device that has become displaced, worn, or damaged. A sufficient quantity of replacement devices, based on vulnerability to damage, shall be readily available to meet this requirement."

Delete Article 701.20(g) of the Standard Specifications.

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION FOR FLAGGERS IN WORK ZONES

Effective: January 1, 1999
Revised: January 1, 2007

Revise the last paragraph of Article 701.13 of the Standard Specifications to read:

"Flaggers are required only when workers are present."

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION
FOR
BIDDING REQUIREMENTS AND CONDITIONS FOR CONTRACT PROPOSALS

Effective: January 1, 2002
Revised: January 1, 2015

Replace Article 102.01 of the Standard Specifications with the following:

"Prequalification of Bidders. When prequalification is required and the Awarding Authority for contract construction work is the County Board of a County, the Council, the City Council, or the President and Board of Trustees of a city, village, or town, each prospective bidder, in evidence of competence, shall furnish the Awarding Authority as a prerequisite to the release of proposal forms by the Awarding Authority, a certified or photostatic copy of a "Certificate of Eligibility" issued by the Department of Transportation, according to the Department's "Prequalification Manual".

The two low bidders must file, within 24 hours after the letting, a sworn affidavit in triplicate, showing all uncompleted contracts awarded to them and all low bids pending award for Federal, State, County, Municipal and private work, using the blank form made available for this affidavit. One copy shall be filed with the Awarding Authority and two copies with IDOT's District office.

Issuance of Proposal Forms. The Awarding Authority reserves the right to refuse to issue a proposal form for bidding purposes for any of the following reasons:

(a) Lack of competency and adequate machinery, plant, and other equipment, as revealed by the financial statement and experience questionnaires required in the prequalification procedures.

(b) Uncompleted work which, in the judgment of the Awarding Authority, might hinder or prevent the prompt completion of additional work awarded.

(c) False information provided on a bidder's "Affidavit of Availability".

(d) Failure to pay, or satisfactorily settle, all bills due for labor and material on former contracts in force at the time of issuance of proposal forms.

(e) Failure to comply with any prequalification regulations of the Department.

(f) Default under previous contracts.

(g) Unsatisfactory performance record as shown by past work for the Awarding Authority, judged from the standpoint of workmanship and progress.

(h) When the Contractor is suspended from eligibility to bid at a public letting where the contract is awarded by, or requires approval of, the Department.

(i) When any agent, servant, or employee of the prospective bidder currently serves as a member, employee, or agent of a governmental body that is financially involved in the proposal work.

(j) When any agent, servant, or employee of the perspective bidder has participated in the preparation of plans or specifications for the proposed work.

Interpretation of Quantities in the Bid Schedule. The quantities appearing in the bid schedule are approximate and are prepared for the comparison of bids. Payment to the Contractor will be made only for the actual quantities of work performed and accepted or materials furnished according to the contract. The scheduled quantities of work to be done and materials to be furnished may be increased, decreased, or omitted as hereinafter provided.

Examination of Plans, Specifications, Special Provisions, and Site of Work. The bidder shall, before submitting a bid, carefully examine the provisions of the contract. The bidder shall inspect in detail the site of the proposed work, investigate and become familiar with all the local conditions affecting the contract and fully acquaint themselves with the detailed requirements of construction. Submission of a bid shall be a conclusive assurance and warranty the bidder has made these examinations and the bidder understands all requirements for the performance of the work. If his/her bid is accepted, the bidder shall be responsible for all errors in the proposal resulting from his/her failure or neglect to comply with these instructions. The Awarding Authority will, in no case, be responsible for any costs, expenses, losses, or change in anticipated profits resulting from such failure or neglect of the bidder to make these examinations.

The bidder shall take no advantage of any error or omission in the proposal and advertised contract. Any prospective bidder who desires an explanation or interpretation of the plans, specification, or any of the contract documents, shall request such in writing from the Awarding Authority, in sufficient time to allow a written reply by the Awarding Authority that can reach all prospective bidders before the submission of their bids. Any reply given a prospective bidder concerning any of the contract documents, plans, and specifications will be furnished to all prospective bidders in the form determined by the Awarding Authority including, but not limited to, an addendum, if the information is deemed by the Awarding Authority to be necessary in submitting bids or if the Awarding Authority concludes the information would aid competition. Oral explanations, interpretations, or instructions given before the submission of bids unless at a prebid conference will not be binding on the Awarding Authority.

Preparation of the Proposal. Bidders shall submit their proposals on the form furnished by the Awarding Authority. The proposal shall be executed properly, and bids shall be made for all items indicated in the proposal form, except when alternate bids are asked, a bid on more than one alternate for each item is not required, unless otherwise provided. The bidder shall indicate in figures, a unit price for each of the separate items called for in the proposal form; the bidder shall show the products of the respective quantities and unit prices in the column provided for that purpose, and the gross sum shown in the place indicated in the proposal form shall be the

summation of said products. All writing shall be with ink or typewriter, except the signature of the bidder which shall be written in ink.

If the proposal is made by an individual, that individual's name and business address shall be shown. If made by a firm or partnership, the name and business address of each member of the firm or partnership shall be shown. If made by a corporation, the proposal shall show the names, titles, and business addresses of the president, corporate secretary and treasurer. The proposal shall be signed by president or someone with authority to execute contracts and attested by the corporate secretary or someone with authority to execute or attest to the execution of contracts.

When prequalification is required, the proposal form shall be submitted by an authorized bidder in the same name and style as shown on the "Contractor's Statement of Experience and Financial Condition" used for prequalification.

Rejection of Proposals. The Awarding Authority reserves the right to reject any proposal for any of the conditions in "Issuance of Proposal Forms" or for any of the following reasons:

(a) More than one proposal for the same work from an individual, firm, partnership, or corporation under the same name or different names.

(b) Evidence of collusion among bidders.

(c) Unbalanced proposals in which the bid prices for some items are, in the judgment of the Awarding Authority, out of proportion to the bid prices for other items.

(d) If the proposal does not contain a unit price for each pay item listed, except in the case of authorized alternate pay items or lump sum pay items.

(e) If the proposal form is other than that furnished by the Awarding Authority; or if the form is altered or any part thereof is detached.

(f) If there are omissions, erasures, alterations, unauthorized additions, conditional or alternate bids, or irregularities of any kind which may tend to make the proposal incomplete, indefinite or ambiguous as to its meaning.

(g) If the bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award.

(h) If the proposal is not accompanied by the proper proposal guaranty.

(i) If the proposal is prepared with other than ink or typewriter, or otherwise fails to meet the requirements of the above "Preparation of Proposal" section.

Proposal Guaranty. Each proposal shall be accompanied by a bid bond on the Department form contained in the proposal, executed by a corporate surety company satisfactory to the Awarding Authority, by a bank cashier's check or a properly certified check for not less than five percent of the amount bid, or for the amount specified in the following schedule:

CHECK SHEET #LRS6

Amount Bid		Proposal Guaranty
Up to	$5,000	$150
>$5,000	$10,000	$300
>$10,000	$50,000	$1,000
>$50,000	$100,000	$3,000
>$100,000	$150,000	$5,000
>$150,000	$250,000	$7,500
>$250,000	$500,000	$12,500
>$500,000	$1,000,000	$25,000
>$1,000,000	$1,500,000	$50,000
>$1,500,000	$2,000,000	$75,000
>$2,000,000	$3,000,000	$100,000
>$3,000,000	$5,000,000	$150,000
>$5,000,000	$7,500,000	$250,000
>$7,500,000	$10,000,000	$400,000
>$10,000,000	$15,000,000	$500,000
>$15,000,000	$20,000,000	$600,000
>$20,000,000	$25,000,000	$700,000
>$25,000,000	$30,000,000	$800,000
>$30,000,000	$35,000,000	$900,000
Over	$35,000,000	$1,000,000

In the event that one proposal guaranty check is intended to cover two or more proposals, the amount must equal to the sum of the proposal guaranties which would be required for each individual proposal.

Bank cashier's checks or properly certified checks accompanying proposals shall be made payable to the County Treasurer, when a County is the Awarding Authority; or the City, Village, or Town Treasurer, when a city, village, or town is the Awarding Authority.

The proposal guaranty checks of all, except the two lowest responsible, will be returned promptly after the proposals have been checked, tabulated, and the relation of the proposals established. Proposal guaranty checks of the two lowest bidders will be returned as soon as the contract and contract bond of the successful bidder have been properly executed and approved. Bid bonds will not be returned.

After a period of three working days has elapsed after the date of opening proposals, the Awarding Authority may permit the two lowest bidders to substitute for the bank cashier's checks or certified checks submitted with their proposals as proposal guaranties, bid bonds on the Department forms executed by corporate surety companies satisfactory to the Awarding Authority.

Delivery of Proposals. If a special envelope is supplied by the Awarding Authority, each proposal should be submitted in that envelope furnished by the Awarding Authority and the blank spaces on the envelope shall be filled in correctly to clearly indicate its contents. When an envelope other than the special one furnished by the Awarding Authority is used, it shall be marked to clearly indicate its contents. When sent by mail, the sealed proposal shall be addressed to the Awarding Authority at the address and in care of the official in whose office the bids are to be received. All proposals shall be filed prior to the time and at the place specified in the Notice to

Bidders. Proposals received after the time specified will be returned to the bidder unopened.

Withdrawal of Proposals. Permission will be given a bidder to withdraw a proposal if the bidder makes the request in writing or in person before the time for opening proposals.

Public Opening of Proposals. Proposals will be opened and read publicly at the time and place specified in the Notice to Bidders. Bidders, their authorized agents, and other interested parties are invited to be present.

Consideration of Proposals. After the proposals are opened and read, they will be compared on the basis of the summation of the products of the quantities shown in the bid schedule by the unit bid prices. In awarding contracts, the Awarding Authority will, in addition to considering the amounts stated in the proposals, take into consideration the responsibility of the various bidders as determined from a study of the data required under "Prequalification of Bidders", and from other investigations which it may elect to make.

The right is reserved to reject any or all proposals, to waive technicalities, or to advertise for new proposals, if in the judgment of the Awarding Authority, the best interests of the Awarding Authority will be promoted thereby.

Award of Contract. The award of contract will be made within 45 calendar days after the opening of proposals to the lowest responsible and qualified bidder whose proposal complies with all the requirements prescribed. The successful bidder will be notified by letter of intent that his/her bid has been accepted, and subject to the following conditions, the bidder will be the Contractor.

An approved contract executed by the Awarding Authority is required before the Awarding Authority is bound. An award may be cancelled any time by the Awarding Authority prior to execution in order to protect the public interest and integrity of the bidding process or for any other reason if, in the judgment of the Awarding Authority, the best interests of the Awarding Authority will be promoted thereby.

If a contract is not awarded within 45 days after the opening of proposals, bidders may file a written request with the Awarding Authority for the withdrawal of their bid, and the Awarding Authority will permit such withdrawal.

Requirement of Contract Bond. If the Awarding Authority requires a Contract Bond, the Contractor or Supplier shall furnish the Awarding Authority a performance and payment bond with good and sufficient sureties in the full amount of the contract as the penal sum. The surety shall be acceptable to the Awarding Authority, shall waive notice of any changes and extensions of time, and shall submit its bond on the form furnished by the Awarding Authority.

Execution of Contract. The contract shall be executed by the successful bidder and returned, together with the Contract Bond, within 15 days after the contract has been mailed to the bidder.

If the bidder to whom the award is made is a corporation organized under the laws of a State other than Illinois, the bidder shall furnish the Awarding Authority a

copy of the corporation's Certificate of Authority to do business in the State of Illinois with the return of the executed contract and bond. Failure to furnish such evidence of a Certificate of Authority within the time required will be considered as just cause for the annulment of the award and the forfeiture of the proposal guaranty to the Awarding Authority, not as a penalty, but in payment of liquidated damages sustained as a result of such failure.

Failure to Execute Contract. If the contract is not executed by the Awarding Authority within 15 days following receipt from the bidder of the properly executed contracts and bonds, the bidder shall have the right to withdraw his/her bid without penalty.

Failure of the successful bidder to execute the contract and file acceptable bonds within 15 days after the contract has been mailed to the bidder shall be just cause for the cancellation of the award and the forfeiture of the proposal guaranty which shall become the property of the Awarding Authority, not as penalty, but in liquidation of damages sustained. Award may then be made to the next lowest responsible bidder, or the work may be readvertised and constructed under contract, or otherwise, as the Awarding Authority may decide."

CHECK SHEET #LRS11

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION
FOR
EMPLOYMENT PRACTICES

Effective: January 1, 1999

In addition to all other labor requirements set forth in this proposal and in the Standard Specifications for Road and Bridge Construction, adopted by the Department of Transportation, during the performance of this contract, the Contractor for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

Selection of Labor. The Contractor shall comply with all Illinois statutes pertaining to the selection of labor.

Equal Employment Opportunity. During the performance of this contract, the Contractor agrees as follows:

(a) That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, ancestry, age, marital status, physical or mental handicap or unfavorable discharge from military service, and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.

(b) That, if it hires additional employees in order to perform this contract or any portion hereof, it will determine the availability of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not underutilized.

(c) That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, national origin, ancestry, age, marital status, physical or mental handicap or unfavorable discharge from military service.

That it will send to each labor organization or representative of workers with which it has or is bound by collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the Contractor's obligations under the Illinois Human Rights Act and the Department's Rules and Regulations. If any such labor organization or representative fails or refuses to cooperate with the Contractor in its efforts to comply with so such Act and Rules and Regulations, the Contractor will promptly so notify the Illinois Department of Human Rights and the contracting agency and will recruit employees from other sources when necessary to fulfill its obligations thereunder.

(e) That it will submit reports as required by the Department of Human Rights Rules and Regulations, furnish all relevant information as may from time to time be requested by the Department or the contracting agency, and in all respects comply with the Illinois Human Rights Act and the Department's Rules and Regulations.

(f) That it will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency Illinois Department of Human Rights for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Department's Rules and Regulations.

(g) That it will include verbatim or by reference the provisions of this clause in every subcontract so that such provisions will be binding upon every such subcontractor. In the same manner as with other provisions of this contract, the Contractor will be liable for compliance with applicable provisions of this clause by all its subcontractors; and further it will promptly notify the contracting agency and the Illinois Department of Human Rights in the event any subcontractor fails or refuses to comply therewith. In addition, the Contractor will not utilize any subcontractor declared by the subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations.

CHECK SHEET #LRS12

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION
FOR
WAGES OF EMPLOYEES ON PUBLIC WORKS

Effective: January 1, 1999
Revised: January 1, 2015

1. Prevailing Wages. All wages paid by the Contractor and each subcontractor shall be in compliance with The Prevailing Wage Act (820 ILCS 130), as amended, except where a prevailing wage violates a federal law, order, or ruling, the rate conforming to the federal law, order, or ruling shall govern. The Illinois Department of Labor publishes the prevailing wage rates on its website. If the Illinois Department of Labor revises the prevailing wage rates, the revised prevailing wage rates on the Illinois Department of Labor's website shall apply to this contract and the Contractor will not be allowed additional compensation on account of said revisions. The Contractor shall review the wage rates applicable to the work of the contract at regular intervals in order to ensure the timely payment of current wage rates. The Contractor agrees that no additional notice is required. The Contractor shall be responsible to notify each subcontractor of the wage rates set forth in this contract and any revisions thereto.

2. Payroll Records. The Contractor and each subcontractor shall make and keep, for a period of not less than five years from the date of the last payment on a contract or subcontract, records of all laborers, mechanics, and other workers employed by them on the project; the records shall include information required by 820 ILCS 130/5 for each worker. Upon seven business days' notice, the Contractor and each subcontractor shall make available for inspection and copying at a location within this State during reasonable hours, the payroll records to the public body in charge of the project, its officers and agents, the Director of Labor and his deputies and agents, and to federal, State, or local law enforcement agencies and prosecutors.

3. Submission of Payroll Records. The Contractor and each subcontractor shall, no later than the 15th day of each calendar month, file a certified payroll for the immediately preceding month with the public body in charge of the project, except that the full social security number and home address shall not be included on weekly transmittals. Instead the payrolls shall include an identification number for each employee (e.g., the last four digits of the employee's social security number). The certified payroll shall consist of a complete copy of the payroll records, except starting and ending times of work each day may be omitted.

   The certified payroll shall be accompanied by a statement signed by the Contractor or subcontractor or an officer, employee, or agent of the Contractor or subcontractor which avers that: (i) he or she has examined the certified payroll records required to be submitted by the Act and such records are true and accurate; (ii) the hourly rate paid to each worker is not less than the general

prevailing rate of hourly wages required; and (iii) the Contractor or subcontractor is aware that filing a certified payroll that he or she knows to be false is a Class A misdemeanor.

4. Employee Interviews. The Contractor and each subcontractor shall permit his/her employees to be interviewed on the job, during working hours, by compliance investigators of the Department or the Department of Labor.

CHECK SHEET #LRS13

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION
FOR
SELECTION OF LABOR

Effective: January 1, 1999
Revised: January 1, 2012

The Contractor shall comply with all Illinois statutes pertaining to the selection of labor.

Employment of Illinois Workers During Periods of Excessive Unemployment. Whenever there is a period of excessive unemployment in Illinois, which is defined herein as any month immediately following two consecutive calendar months during which the level of unemployment in the State of Illinois has exceeded five percent as measured by the United States Bureau of Labor Statistics in its monthly publication of employment and unemployment figures, the Contractor shall employ at least 90 percent Illinois laborers. "Illinois laborer" means any person who has resided in Illinois for at least 30 days and intends to become or remain an Illinois resident.

Other laborers may be used when Illinois laborers as defined herein are not available, or are incapable of performing the particular type of work involved, if so certified by the Contractor and approved by the Engineer. The Contractor may place no more than three of his regularly employed non-resident executive and technical experts, who do not qualify as Illinois laborers, to do work encompassed by this Contract during a period of excessive unemployment.

This provision applies to all labor, whether skilled, semi-skilled or unskilled, whether manual or non-manual.

INTENTIONALLY

BLANK

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION FOR PROTESTS ON LOCAL LETTINGS

Effective: January 1, 2007
Revised: January 1, 2013

Except for apprenticeship and training certification issues, all protests shall be handled according to Sections 6.390 through 6.440 of Title 44 Subtitle A Chapter III Part 6 of the Illinois Administrative Code. For the purpose of a protest under this special provision, a representative of the awarding local authority executing the contract will perform the functions of the Chief Procurement Officer (CPO) and the State Purchasing Officer (SPO).

CHECK SHEET #LRS17

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION
FOR
SUBSTANCE ABUSE PREVENTION PROGRAM

Effective: January 1, 2008
Revised: January 1, 2014

In addition to all other labor requirements set forth in this proposal and in the Standard Specification for Road and Bridge Construction, adopted by the Department, during the performance of this contract, the Contractor for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

Substance Abuse Prevention Program. Before the Contractor and any subcontractor commences work, the Contractor and any subcontractor shall have in place a written Substance Abuse Prevention Program for the prevention of substance abuse among its employees which meets or exceeds the requirements in 820 ILCS 265 or shall have a collective bargaining agreement in effect dealing with the subject matter of 820 ILCS 265.

The Contractor and any subcontractor shall file with the public body engaged in the construction of the public works: a copy of the Substance Abuse Prevention Program along with a cover letter certifying that their program meets the requirements of the Act, or a letter certifying that the Contractor or a subcontractor has a collective bargaining agreement in effect dealing with the subject matter of this Act.

Illinois Department of Transportation

Special Provisions

Local Public Agency	County	Section Number
McHenry County Division of Transportation	McHenry	22-00000-01-GM

The following Special Provision supplement the "Standard Specifications for Road and Bridge Construction", adopted January 1, 2016, the latest edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways", and the "Manual of Test Procedures of Materials" in effect on the date of invitation of bids, and the Supplemental Specification and Recurring Special Provisions indicated on the Check Sheet included here in which apply to and govern the construction of the above named section, and in case of conflict with any parts, or parts of said Specifications, the said Special Provisions shall take precedence and shall govern.

INTENTIONALLY

BLANK

TABLE OF CONTENTS
(Specifications and Special Provisions)

PAGE

ARTICLE 1 – DESCRIPTION OF WORK 3

ARTICLE 2 – COMPENTENCY OF BIDDERS AND ADDITIONAL BIDDERS INFORMATION 3

2.1 Examination of Plans, Specifications, Special Provisions, and Site of Work 3
2.2 Advertisement, Bidding, Award and Execution of Contract 3
2.3 Initial Transfer of Facilities 4
2.4 Cooperation with Utilities 4
2.5 Legal Regulations and Responsibility to Public 5
2.6 Protection and Restoration of Property 5
2.7 Protection of Streams, Lakes, Reservoirs, Natural Areas, Wetlands, Prairie Areas, Savannahs, and Endangered and Threatened Species 5
2.8 Certification of Uncontaminated Soils 6
2.9 Insurance 7

ARTICLE 3 – GENERAL PROVISIONS AND SPECIFICATIONS 7
3.1 Applicable Specifications and Standards 7
3.2 Definition of Terms 8
3.3 Control of Work 10
3.4 Prosecution of Work by the Contractor 10
a. Work Force 11
b. Emergency Travel Time 12
c. Work Priority 12
d. Communication Equipment 12
e. Contractor's Representatives 12
f. Pavement Closures 12
g. Traffic Control 12
h. Contractor's Facilities 13
i. Extra Work 13
j. Equipment and Materials 13
k. Testing Instruments 14
l. Contractor's Equipment 14
m. Work by Others 14
n. Emergency Temporary Repairs 14
o. Equipment Location and Access Responsibility 14
p. Repair Records 15
q. Utility Service Coordination 15
r. Cable Maintenance 15
s. Equipment Labels 16
t. Malfunction Investigation 16
u. Adequate Parts Inventory (Spare Components) 16
v. Locks 16
w. Restoration of Work Area 16
x. Construction Safety and Health Standards 16
y. Meetings 16
z. Mobilization 17
3.5 New Installations, Increased or Decreased Quantities 17
3.6 Maintenance Schedules 17
3.7 Disruption of Service – Liquidated Damages 18

3.8 Extra Work 18
3.9 Equipment Knockdowns and Damage 20
3.10 Reimbursement from Third Party for Repairs or Damages 20
a. Damages by Traffic, Vandalism and Other Miscellaneous Causes 20
b. Damages by Construction Forces 20
c. Equipment Damages by County Personnel Working Within the County Right-of-Way 20
d. Record Keeping Requirements for Third Party Damages 20
3.11 Method of Billing 21
3.12 Damaged Parts, Materials, and Equipment 21
3.13 Reports and Forms 21
1. Unsatisfactory Service Report 21
2. Condition Report 22
3. Inspection Report 22
4. Dispatch Report 22
5. Work Order 22
6. Weekly Traffic Signal Maintenance Report 22
7. Yearly Call-Out Report 22
3.14 Duration of Contract 23

ARTICLE 4 – SPECIAL PROVISIONS 23
4.1 Traffic Signal System 23
Item A: Traffic Signal Routine Maintenance 24
Repair Timetable 33
Listing of Traffic Signal Routine Maintenance Pay Items 34
Item B-1: Street Lighting Routine Maintenance 36
Item E: Equipment 38
Listing of Equipment (E) Pay Items 38

McHenry County Division of Transportation Signal Location List 48

Schedule of Routine Maintenance Pay Items 51

McHenry County Division of Transportation Traffic Signal Specifications 54

Traffic Control Plan 150

Appendix A: LED Signal Heads, Warranty Dates 151

Appendix B: UPS Maintenance Forms 152

Note: Highway Standards follow the Specifications and Special Provisions portions of this Proposal.

ARTICLE 1 – DESCRIPTION OF WORK

This Contract is for the maintenance of traffic signals, interconnect, flashing beacons, cameras, street lighting, and their appurtenances under the maintenance jurisdiction of the McHenry County Division of Transportation.

The Contractor for specified unit prices listed under the Schedule of Prices shall:

(1) Furnish labor and provide materials to maintain the respective installations and systems;

(2) Make permanent repairs to damaged equipment,

(3) Clean, repair, perform preventive maintenance, and overhaul specified equipment at stated intervals of time,

(4) Provide the necessary transportation for workers,

(5) Provide continuous maintenance and repair service on a 24-hour basis, 7 days a week, including holidays, to correct any malfunction of equipment or perform any temporary/emergency repairs to missing, defective, damaged, obstructed, obscured, or displaced equipment resulting from any cause whatsoever in the shortest possible time,

(6) Locate and mark underground facilities when requested, and

(7) Perform all activities required and described herein.

ARTICLE 2 – COMPENTENCY OF BIDDERS AND ADDITIONAL BIDDERS INFORMATION

Each bidder shall be pre-qualified to comply with all the requirements of Article 102.01 of the Illinois Department of Transportation Standard Specifications for Road & Bridge Construction. All patrol electricians and field personnel working on traffic signal equipment shall be certified by the International Municipal Signal Association (IMSA) as Traffic Signal Level II Technicians. Each bidder shall have a minimum of one (1) employee certified by the International Municipal Signal Association (IMSA) as a Level III Traffic Signal Technician.

2.1 EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS, AND SITE OF WORK

The prospective bidder shall before submitting Their bid, carefully examine the Contract proposal, plans, specifications, special provisions, Contract, and Contract bond. The Contractor shall inspect in detail all of the locations to be maintained under this Contract and familiarize Himself with all of the local conditions affecting the Contract and the detailed requirements of maintenance. The Contractor shall be responsible for any pre-existing maintenance deficiencies that may exist at the time this contract is awarded and his bid shall reflect these deficiencies. If this bid is accepted, the Contractor will be responsible for all errors in his proposal resulting from his failure or neglect to comply with these instructions. The McHenry County Division of Transportation (MCDOT) will, in no case, be responsible for any change in anticipated profits resulting from such failure or neglect.

2.2 ADVERTISMENT, BIDDING, AWARD AND EXECUTION OF CONTRACT

Authorization to Bid: All Contractors shall submit a “Request for Authorization to Bid” to MCDOT and receive an approved “Authorization to Bid” response, prior to submitting a proposal for this project.

Prequalification of Bidders: According to the requirements of check sheet LRS 6, Special Provision for Bidding Requirements and Conditions for Contract Proposals, included on the Check Sheet for Recurring Special Provisions included herein, a valid (unexpired) “Certificate of Eligibility” issued by

IDOT detailing the Contractor's prequalification for the classes of work included on this project shall be provided to MCDOT as a prerequisite to MCDOT issuing an "Authorization to Bid".

Bid Proposals: Contractors submitting proposals without first securing an "Authorization to Bid" will be considered Not Responsible and their bid will not be opened, read or otherwise considered. The unopened proposal will be returned to the Contractor.

Award and execution of Contract shall be in accordance with Section 102 of the Standard Specifications and the following special provision: Insurance certificates shall be received by the McHenry County Division of Transportation (MCDOT) within five (5) calendar days after the Contract has been mailed to the bidder. Contract performance and payment bond shall be received by MCDOT within ten (10) calendar days after the Contract has been mailed to the bidder. The Contract shall be executed by the successful bidder and returned to MCDOT within fifteen (15) calendar days after the Contract has been mailed to the bidder.

2.3 INITIAL TRANSFER OF FACILITIES

The equipment maintained under this contract will be transferred from the previous county maintainer to the Contractor en masse at 12:00 A.M. December 1, 2021. The Contractor will not conduct maintenance transfer inspections for individual intersections that are under county maintenance on the effective date of this Contract.

Beginning October 1, 2021, the Contractor may conduct inspections of the facilities included in the Contract. All inspections will be allowed only from the right-of-way at street level and without obstructing traffic flow. In no case shall the Contractor be granted access to county cabinets, handholes, or other maintained facilities.

No later than November 1, 2021, the Contractor may provide the Engineer with a list of deficient items requested to be addressed. The Engineer has the sole discretion of which items, if any, identified by the Contractor as "deficient" are to be repaired or replaced.

2.4 COOPERATION WITH UTILITIES

The Contractor shall coordinate with applicable utilities according to Article 105.07 of the "Standard Specifications" and the following:

The Contractor shall comply with all the requirements of the Illinois Underground Utility Facilities Damage Prevention Act (JULIE Law) and other applicable laws and regulations. The Contractor shall be aware of the location of all utilities and structures in the project area. The Contractor shall conduct construction operations to avoid damage to the above-mentioned utilities or structures.

Should any damage to utilities occur, due to the Contractor's negligence, the Contractor shall be responsible for making all repairs, in a manner acceptable to the Engineer. All costs associated with making the repairs shall be the responsibility of the Contractor.

The Contractor shall be aware of the locations of vehicle detector loops cut into the pavement. Any vehicle detector loop damaged by the Contractor's negligence shall be repaired by the Contractor in a manner acceptable to the Engineer. All costs associated with making the repairs shall be the responsibility of the Contractor.

When utility relocations are required, the Contractor shall coordinate with all affected utility owners and notify them of the proposed construction schedule for the authorized work. The Contractor shall coordinate construction operations with the utility owners so that relocation of utility lines and

structures may proceed in an orderly manner. Notification shall be in writing with copies transmitted to the Engineer.

2.5 LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

The Contractor shall observe and comply with the Legal Regulations and Public Responsibilities according to Section 107 of the "Standard Specifications" and the following:

Construction Safety and Health Standards: It is a condition of this contract and shall be made a condition of each subcontract entered into pursuant to this contract that the contractor and any Subcontractor shall not require any laborer or mechanic employed in performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous to their health or safety, as determined under Federal Construction Safety and Health Standards.

Keeping Roads Open to Traffic: All roads shall remain open to traffic. The Contractor may close one (through traffic) lane because of construction only between the hours of 9:00 AM and 3:00 PM. The Contractor shall maintain one-way traffic during these restricted hours on two lane highways with the use of signs and flaggers as shown on the Traffic Control Standard. On multi-lane highways the Contractor shall maintain at least one (through traffic) lane in each direction with the use of signs, barricades, and arrow boards as shown on the Traffic Control Standards. All lanes of traffic will be maintained between 3:00 PM and 9:00 AM and when no construction activities are being carried out.

The restricted lane closure time may be adjusted by the Resident Engineer. The Contractor shall provide a start and end time and a procedure plan 48 hours prior to the lane(s) to be closed. The Resident Engineer will notify the Contractor 24 hours in advance with the decision.

If the Contractor fails to provide notification or disregards the decision by the Resident Engineer the Traffic Control Deficiency Charge will be applied as stated in the Special Provisions for Traffic Control and Protection.

2.6 PROTECTION AND RESTORATION OF PROPERTY

The Contractor shall protect and restore property according to Article 107.20 of the "Standard Specifications" and the following:

Trees and Shrubs: Extra care shall be exercised when operating equipment around trees or shrubs. Injured branches or roots shall be pruned in a manner satisfactory to the Engineer and shall be painted where the cut was made. Roots exposed during excavating operations shall be neatly pruned and covered with topsoil. This work shall be done as soon as possible and shall be considered as included in the contract, and no additional compensation will be allowed.

Phosphorus Fertilizer Nutrient shall not be used on McHenry County Highways.

2.7 PROTECTION OF STREAMS, LAKES, RESERVOIRS, NATURAL AREAS, WETLANDS, PRAIRIE AREAS, SAVANNAHS, AND ENDANGERED AND THREATENED SPECIES

Concrete Washout Facility

The Contractor shall take sufficient precautions to prevent pollution of streams, lakes, reservoirs, and wetlands with fuels, oils, bitumens, calcium chloride, or other harmful materials according to Article 107.23 of the "Standard Specifications".

To prevent pollution by residual concrete and/or the byproduct of washing out the concrete trucks,

concrete washout facilities shall be constructed and maintained on any project which includes cast-in-place concrete items. The concrete washout shall be constructed, maintained, and removed according to this special provision. Concrete washout facilities shall be required on all projects regardless of the need for NPDES permitting. On projects requiring NPDES permitting, concrete washout facilities shall also be addressed in the Storm Water Pollution Prevention Plan.

The Contractor may elect to use a prefabricated portable concrete washout structure. The Contractor shall submit a plan for the concrete washout facility, to the Engineer for approval, a minimum of ten calendar days before the first concrete pour. The working concrete washout facility shall be in place before any delivery of concrete to the site. The Contractor shall ensure that all concrete washout activities are limited to the designated area.

The concrete washout facility shall be located no closer than 50 feet from any environmentally sensitive areas, such as water bodies, wetlands, and/or other areas indicated on the plans. Adequate signage shall be placed at the washout facility and elsewhere as necessary to clearly indicate the location of the concrete washout facility to the operators of concrete trucks.

The concrete washout facility shall be adequately sized to fully contain the concrete washout needs of the project. The contents of the concrete washout facility shall not exceed 75% of the facility capacity. Once the 75% capacity is reached, concrete placement shall be discontinued until the facility is cleaned out. Hardened concrete shall be removed and properly disposed of outside the right-of-way. Slurry shall be allowed to evaporate or shall be removed and properly disposed of outside the right-of-way. The Contractor shall immediately replace damaged basin liners or other washout facility components to prevent leakage of concrete waste from the washout facility. Concrete washout facilities shall be inspected by the Contractor after each use. Any and all spills shall be reported to the Engineer and cleaned up immediately. The Contractor shall remove the concrete washout facility when it is no longer needed.

This work will not be paid for separately but shall be included in the cost of the concrete work items included in the contract.

2.8 Certification of Uncontaminated Soil

The contractor shall dispose of all surplus, unstable, and unsuitable materials and organic waste according to Article 202.03 of the Standard Specifications.

In addition, when the Contractor proposes to dispose of surplus excavated material off of the right-of-way to a Clean Construction or Demolition Debris (CCDD) fill operation or an uncontaminated soil fill operation, the Contractor shall conduct testing of surplus excavated material as required by the operator of the fill facility to confirm that the soil is uncontaminated.

The surplus excavated material must be certified to be uncontaminated soil according to Public Act 96-1416. The Contractor shall be responsible for securing these certifications which must be documented on the forms provided by the IEPA (LPC-663 or LPC-662 as appropriate).

The cost of all testing and certifications required to determine clean construction materials will be paid for according to Article 109.04. The Engineer reserves the right to choose the Consultant used by the Contractor for all testing and certifications required.

Should testing result in the determination that the excavated material is contaminate with petroleum hydrocarbon materials or other potentially hazardous substances, the contractor shall remove and dispose of the contaminated soil according to Section 669 of the Standard Specifications. Payment for removal and disposal of contaminated soil will be paid for according to Article 109.04.

2.9 Insurance.

The Contractor shall have the appropriate insurance according to Article 107.27 of the *Standard Specifications*.

In addition, the Contractor shall also have the following insurance limits required by Commonwealth Edison when working on County owned traffic signals, highway lighting, etc. that is within a ComEd utility easement.

Note: ComEd easement terms include, among other things, the following requirements:

- ✓ *Term of agreement typically perpetual*
- ✓ *Planting of trees in right-of-way is not allowed*
- ✓ *Insurance requirements include:*
  - *1) Workers' Compensation Insurance with statutory limits,*
  - *2) Employers' Liability Insurance with limits not less than One Million d dollars ($1,000,000.00) each accident/occurrence*
  - *3) Commercial General Liability (CGL) Policy or Policies covering all contractors, subcontractors and all their subcontractors with limits not less than Four Million dollars ($4,000,000.00) per occurrence covering liability for bodily injury and property damage arising from premises, operations, independent contractors, personal injury/advertising injury, blanket contractual liability and products/completed operations for not less than three (3) years from the date the work is accepted.*
  - *4) Automobile Liability in an amount of not less than one million dollars ($1,000,000) per accident for bodily injury and property damage, covering all owned, Leased, rented or non-owned vehicles, which shall include automobile contractual liability coverage.*
  - *Insurance requirements are subject to change.*
- ✓ *General & Environmental Indemnities*
- ✓ *Termination right reserved by ComEd*

ARTICLE 3 – GENERAL PROVISIONS AND SPECIFICATIONS

3.1 APPLICABLE SPECIFICATIONS AND STANDARDS

The latest issue of the following standards at the bid date including subsequent additions or revisions shall apply to the work covered by this Contract. In case of conflict with any part or parts of the standards listed below the Special Provisions contained herein shall take precedence and shall govern:

Illinois Department of Transportation Standards & Specifications

- ❖ Standard Specifications for Road and Bridge Construction, Latest Edition
- ❖ Supplemental Specifications and Recurring Specifications
- ❖ Design Manual Section 3-600 on Highway Lighting
- ❖ Highway Standards
- ❖ Manual on Uniform Traffic Control Devices, IDOT Supplement
- ❖ Road, Bridge and Other Related Laws of Illinois
- ❖ Safety Code
- ❖ Work Site Protection Manual
- ❖ Traffic Control Plans for Daylight Traffic Operation
- ❖ District 1 Standard Specifications for Integrated Closed-Loop Traffic Signal

Monitoring System

National Standards and Specifications

- An Informal Guide for Roadway Lighting, published by American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., N.W., Washington, D.C. 20001
- Insulated Cable Engineers Assn. and Underwriters Laboratories publications when applicable for cable and other materials
- National Electrical Manufacturers Associations (NEMA) Standards
- American National Standards Institute, where applicable, for lamps, ballasts, and other accessories
- American Society for Testing and Materials (ASTM) Standards for materials
- All applicable manuals and policies of the Federal Highway Administration (FHWA)
- American National Standard Practice for Roadway Lighting, Published by Illuminating Society of North America, 120 Wall St., 17th Floor, New York, NY, Phone: (212) 248-5000
- National Electrical Code, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, approved by the American National Standards Institute, Publication #ANSI/C2, published by IEEE, 345 E. 47th Street, New York, NY 10017
- National Electrical Code, NFPA - SF70-96, as published by National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
- Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals AASHTO Publication
- Institute of Traffic Engineers Technical Report No. 1 (A Standard for Adjustable Face Vehicular Traffic Control Heads)
- Emergency Response Guidebook by U.S. Dept. of Transportation, latest version, for further assistance call National Response Center (NRC) 1-800-424-8802
- Hazardous Materials Regulations, Hazardous Materials Transportation Uniform Safety Act of 1990, Hazardous Materials Regulations and Motor Carrier Safety Regulating by U.S. Department of Transportation
- OSHA, all applicable regulations
- RUS, all applicable regulations
- IMSA Standards & Manuals
- Manual on Uniform Traffic Control Devices, FHWA

McHenry County Division of Transportation Standards and Specifications

- Traffic Signal Specifications (enclosed within these specifications)
- Traffic Control and Protection Special Provisions

3.2 DEFINITION OF TERMS

a. Contract Period
The period from December 1 to November 30, of any calendar year, and as stated in Article 3, Section 13.

b. Engineer
The Traffic Engineer for the McHenry County Division of Transportation or his/her designee.

c. Emergency
A condition, which is a hazard to the public or is designated by the Engineer to be a hazard or potential hazard of such severity that life and property are endangered. All emergency conditions require IMMEDIATE CORRECTIVE ACTION.

d. Equipment Damage
Any piece of equipment owned or maintained by the McHenry County Division of Transportation that is no longer capable of functioning as originally designed, or as since modified, or any piece of equipment that has deteriorated sufficiently in the opinion of the Engineer so that failure is imminent.

e. Extra Work
Any work upon an existing system or existing installation not specified in this contract as Routine Maintenance or as a Specialty Item. Provisions for Extra Work are covered in Article 3.8 of this Contract.

f. Immediate Corrective Action
When Immediate Corrective Action is required, the Contractor shall proceed to the site of the emergency by the fastest means available and, with no delay, perform all such work as may be necessary and appropriate to: 1) Ensure the safety of the public at the site of the emergency, and 2) restore to operation all of the equipment as specified under Article 4 - Special Provisions.

g. Maintenance Schedule
A schedule prepared by the Engineer, or prepared by the Contractor at the direction and approval of the Engineer, showing starting and completion dates of work items to be performed on the various installations or systems.

h. Manual on Traffic Control
The State of Illinois "Manual on Uniform Traffic Control Devices for Streets and Highways."

i. Routine Maintenance
Servicing the various installations, systems and equipment and performing all work necessary to keep them in proper working order, appropriate appearance, and in serviceable condition at all times. Any required equipment repairs of an unforeseen nature coming to the attention of the Contractor shall also be included under the Routine Maintenance definition. The Routine Maintenance work is more fully described under Article 4 - Special Provisions.

j. Standard Specifications
The Illinois Department of Transportation's "Standard Specifications for Road and Bridge Construction."

k. Week
A period of seven (7) calendar days. Any multiple of this term shall mean a corresponding multiple of seven (7) calendar days.

l. Working Day/Business Day
Any day the Offices of the Department are open for normal business.

m. End of Life
The point at which equipment is no longer serviceable, repairs are not possible, and the equipment must be replaced. The Engineer shall have sole discretion to make this determination.

n. Equipment Repair
Servicing and/or restoration of any equipment to normal operating condition and appearance as necessitated by equipment wear-out, failure, damage, or loss.

3.3 CONTROL OF WORK

The Engineer will be responsible for the control of work in conformance with Section 105 of the Standard Specifications and Contract Special Provisions.

a. The Contractor shall respond promptly in restoring, replacing, repairing, and re-aligning equipment covered in this Contract when notified by any source.

b. The Engineer may furnish the Contractor with the names of representatives of the Department who may be available to confer with or to advise the Contractor in administrative and technical matters.

c. The Engineer, or his representative, may make periodic and/or frequent inspections of the respective systems and installations to determine if all maintenance operations are being performed by the Contractor promptly and satisfactorily, and in the manner specified in this Contract.

d. The Engineer may prepare MAINTENANCE SCHEDULES for the prosecution of work on the various items of Routine Maintenance, Specialty Items, and/or Extra Work, which are to be completed at regularly stated intervals. Refer to Article 3.6 of this Contract for specific requirements.

e. The Engineer may require that the Contractor prepare and submit written progress reports for Routine Maintenance, Specialty Items, and/or Extra Work. When required, these reports shall include (but not be limited to) one or more of the following: 1) completed or uncompleted status of work items 2) specific troubleshooting procedures and when they were performed 3) any temporary repair actions taken 4) explanation of any delays experienced by the Contractor 5) expected completion dates for each work item, based on the Engineer's approval. Written reports may be required on a regular and/or periodic basis throughout the duration of the Contract.

3.4 PROSECUTION OF WORK BY THE CONTRACTOR

The purpose of this Contract is (1) to assure that all components of the traffic signal systems and installations operate essentially as originally installed, or as subsequently modified and (2) for preventive maintenance, to guard against and prevent equipment failures due to mechanical or electrical defects. The proper functioning of the traffic signal systems and installations is essential to maintain the smooth, expeditious, and safe movement of people and goods. It is imperative that all of the traffic signal equipment be serviceable and in good operating condition so as to insure maximum working efficiency and prevent unnecessary failures. When equipment failures do occur, due to unforeseen events, knockdowns, or from any cause whatsoever, TIME IS OF THE ESSENCE in arriving at the scene and taking corrective measures. To insure this continuous and uninterrupted operation of equipment, service calls and emergency calls shall be answered promptly, and extraordinary effort shall be exerted by the Contractor to render this service. Following is an Index to the issues covered under this section.

The items listed below shall be considered incidental to the Routine Maintenance portion of

the Contract and will not be paid for separately unless explicitly stated otherwise in the Contract.

a. Work Force
b. Emergency Travel Time
c. Work Priority
d. Communication Equipment
e. Contractor's Representatives
f. Pavement Closures
g. Traffic Control
h. Contractor's Shops
i. Extra Work
j. Equipment and Materials
k. Testing Instruments
l. Contractor's Equipment
m. Work by Others
n. Emergency Temporary Repairs
o. Equipment Location and Access Responsibility
p. Repair Records
q. Utility Service Coordination
r. Cable Maintenance
s. Equipment Labels
t. Malfunction Investigation
u. Adequate Parts Inventory
v. Locks
w. Restoration of Work Area
x. Construction Safety and Health Standards
y. Meetings
z. Mobilization

a. Work Force

The Contractor shall at all times provide a force of qualified personnel sufficient, in the opinion of the Engineer, to perform the Routine work and specialized operations required and described herein. The force of qualified personnel shall be sufficient to simultaneously perform both Routine Maintenance and Emergency repairs, including Extra Work items.

It is the intent of this Contract that McHenry County Division of Transportation service shall take precedence over other work for third parties. The Engineer may grant the Contractor authorization to postpone MCDOT work to address emergency situations, but the shortage of work force shall otherwise be insufficient grounds for the Contractor's failure to perform routine or other non-routine work within the prescribed time constraints.

The Contractor's workforce shall possess the skills and knowledge necessary to perform all work in the proper manner. The workforce shall include personnel having certain special expertise, including, but not limited to the following:

- Materials Management
- General Electrical Power
- Building Wiring (Indoor Electrician)
- Various Types of Mechanical Work
- Roadway Electrical (Outdoor Lineman)
- Telemetry/Telecommunications
- Traffic Signal Closed Loop Monitoring System

- ❖ Fiber Optic Cable Installation and Repairs
- ❖ Hardware/Software Troubleshooting
- ❖ Office Administration

The Contractor shall have in full time employment at least one (1) technician or electrician holding a current IMSA (International Municipal Signal Association) Traffic Signal Level 3 Bench Certification. All patrolmen and field personnel working on traffic signal equipment shall be certified by IMSA as Traffic Signal Level II Electricians.

b. Emergency Travel Time

The Contractor's Representative designated to respond to emergency calls shall be stationed so that their travel time to arrive at any designated point of trouble shall not exceed one hour during normal weather and under normal traffic conditions.

c. Work Priority

Priority in the performance of Routine Maintenance and Extra Work, shall be at the discretion of the Contractor unless specifically directed otherwise by the Engineer.

d. Communication Equipment

The Contractor shall furnish the transportation for his employees and equipment used in the performance of this Contract. All personnel shall be equipped with cellular phones with internet/email access and cameras for taking pictures for expediting and maintaining 24-hour communications with the Contractor's headquarters. A listing of cellular telephone numbers shall be prepared and furnished to the Agency one (1) week prior to the beginning of the Contract.

The Contractor shall maintain a high-speed Internet connection and a dial-up phone connection on a personal computer(s), with email capability, accessible to dispatching personnel 24-hours per day, 7-days per week, including holidays. The requirements for alarm monitoring, dispatching, and system monitoring are described elsewhere in the Contract.

e. Contractor's Representatives

The Contractor and subcontractors, if any, shall each designate in writing at least one responsible representative of their organizations to whom instructions may be given by the Engineer. This list shall include the name, home address, and home telephone number of these representatives. Replacements on a temporary basis that might be needed shall be provided to the Engineer as necessary. The representatives designated are to be available at all times under all circumstances.

f. Pavement Closures

The Contractor shall keep at least one lane of two-lane roadways and one through lane in each direction on multi-lane highways, open to traffic unless otherwise directed by the Engineer. These restrictions shall not apply when and for the time necessary to clear from the roadway damaged equipment, debris, or other objects which constitute a hazard.

g. Traffic Control

Traffic Control shall be in accordance with the applicable sections of the Standard Specifications, the Supplemental Specifications, the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways," and any special details and Highway Standards contained in the Contract, and the Special Provisions contained herein.

h. Contractor's Facilities

The Contractor shall have and maintain adequate facilities for the timely completion of the work under this Contract. These facilities shall be available at all times and shall include a central base of operations (Headquarters).

The Contractor shall provide one phone number and one fax number to the Engineer that is staffed 24-hours per day, 7-days per week, including holidays. This phone number shall serve as the primary point of contact for the County and other agencies to report maintenance and emergency issues. Personnel answering the phone and receiving the faxes shall have the ability to dispatch sufficient number of qualified personnel capable of responding in accordance with the REPAIR TIMETABLE included in this Contract.

The Contractor shall maintain storage facilities and/or shops within the County in order to store spare equipment (either Contractor owned equipment or McHenry County owned equipment) and in order to minimize time involved in repairing items covered under this Contract.

The Contractor shall maintain, equip and staff a facility for the testing, repairing and overhauling of all traffic signal control equipment to be maintained under this Contract.

The repair facility staff shall include at minimum one full time employee dedicated to the repair and testing of traffic signal equipment. This employee shall be capable of conducting the required MMU/CMU testing and performing cabinet and controller troubleshooting onsite at the repair facility.

The Engineer shall have the authority to visit the Contractor's facilities at any time.

All storage and repair facilities shall be operational and available for inspection at any time.

i. Extra Work

The Contractor shall perform Extra Work, as authorized under Article 3.8 of this Contract, when directed by the Engineer.

j. Equipment and Materials

All equipment, materials, miscellaneous items and component parts are to be furnished by the Contractor at his expense, unless otherwise specified by the Engineer, and shall be the best grade of their respective kinds for the purpose.

It is the Contractor’s responsibility to ensure that all equipment, materials, and parts comply with the applicable standards and special provisions herein, and/or have been explicitly approved by the Engineer for use in the system, otherwise no payment for equipment, materials, and parts shall be made.

When required by these Specifications, or when called for by the Engineer, full information concerning the materials or articles, which the Contractor intends to incorporate into the work, shall be provided for approval (this may include such submittals as the manufacturer's catalog information).

The Contractor shall prepare the equipment and materials in his shop so that the Engineer can easily inspect them for approval for use in the system.

Extra Work directed by the Engineer shall be completed with all new materials and

parts, unless otherwise specified by the Engineer.

k. Testing Instruments

The Contractor shall provide all necessary testing instruments and related troubleshooting equipment. That portion of instrumentation for use in the performance of this Contract shall be calibrated by an approved testing laboratory once each year. The Contractor shall maintain all current certificates of calibration and shall provide this information when requested by the Engineer. This equipment shall include but not be limited to the following: Inductive Loop Analyzer, amp probe, ohm meter, volt meter, watt meter, preemption system emitter/tester, conflict monitor testers, malfunction monitoring unit tester, fiber optic testers, UPS Inverter testing equipment, etc.

l. Contractor's Equipment

The Contractor shall provide at all times sufficient equipment in the opinion of the Engineer to perform the routine work and specialized operations required and described herein. This equipment shall be dedicated to the work under this Contract and is in addition to the equipment required for any other work being performed by the Contractor.

The Contractor shall furnish the transportation for his employees and equipment used in the performance of this Contract. All vehicles used by the Contractor shall comply with all applicable laws and shall carry such lights and safety appurtenances as may be prescribed by the McHenry County Division of Transportation.

m. Work by Others

The Contractor shall report to the Engineer, by the fastest means of communication, (1) any unauthorized work being performed by others affecting the system, (2) any other work in progress which may come to his attention and which may endanger any installation of the system, and (3) any emergency and/or temporary repairs.

n. Emergency Temporary Repairs

The Contractor shall make emergency temporary repairs and permanent repairs to the installations. Unless specifically authorized by the Engineer, permanent repairs shall be started not later that the second working day following emergency temporary repairs, and shall be continued insofar as possible without interruption, until completion. The contractor shall assemble all equipment and parts necessary for making permanent repairs within one (1) working day following notification of damage.

o. Equipment Location and Access Responsibility

The Contractor shall respond to all requests to locate County maintained facilities included under this Contract. The Contractor shall locate and mark underground cables or any other components of the system according to the JULIE requirements to prevent damage and facilitate work by others. For routine facility locate requests or emergency locate requests, the Contractor shall locate and mark the appropriate equipment within the required timeframe specified under JULIE law. After marking the facilities in accordance with the JULIE location request, the Contractor shall digitally photograph the excavation site for documentation purposes, showing the markings, flags, and adjacent landmarks or reference points. The photographs shall be kept on file by the Contractor for a minimum of 180 days and shall be furnished to the Engineer upon request.

Locate requests that are received outside of normal MCDOT operation hours shall be handled directly by the Contractor. If locate requests are for facilities in which the

Contractor does not currently have maintenance, the Contractor shall immediately forward the request to the electrical contractor that currently has maintenance. If the maintaining contractor cannot be contacted, the Contractor must act on the locate request within the required timeframe specified under JULIE law and shall notify the Engineer within one business day. Locates of facilities that are not currently maintained by the County will be paid for as Extra Work according to the applicable sections of this Contract.

The Contractor shall have the capability to receive JULIE ticket requests for locates by three communications modes: phone, fax, and email. The Contractor shall respond with an "ALL CLEAR" message directly to the requesting excavator when JULIE tickets are determined to be clear of McHenry County Division of Transportation facilities, in accordance with JULIE law.

McHenry County Division of Transportation currently uses Diglet, Utility Location Management Software (https://app.diglet.xyz/index.html). This software is a management portal for JULIE tickets. The Contractor shall be responsible for using this software for locating all JULIE tickets. This is a web-based software.

The Contractor shall attend joint meetings as requested by the excavator, or as required by the Engineer.

The Contractor is also required to provide access to equipment for other contractors and consultants who have approved contracts to work on the systems as directed by the Engineer.

The Contractor shall provide personnel to open cabinets and facilities for inspection and review of equipment.

Allowing access to equipment shall be considered incidental to the pay items for Routine Maintenance.

p. Repair Records

The Contractor shall maintain Records for each respective system's equipment as described and/or directed by the Engineer, under the terms and conditions of the Contract. This work shall include keeping records of repairs and services to all serial-numbered pieces of equipment and making them available for review by the Engineer at all times.

q. Utility Service Coordination

The Contractor shall keep incoming power service in proper condition at all times and shall cooperate with the appropriate utility company in this matter. The Contractor shall maintain interconnection lines owned by the County and shall cooperate with any utility company leasing interconnection lines to the County. In addition, the Contractor shall perform such work at line terminals as may be required.

r. Cable Maintenance

All cable, raceways, and handholes within County Right of Way or between various parts of County equipment and County maintained facilities as defined herein shall be maintained by the Contractor. All parts of an existing cable system and appurtenances which become inoperative and/or designated for abandonment by the Engineer, shall be removed by the Contractor, as directed, to the satisfaction of the Engineer.

s. Equipment Labels

The Contractor shall label all circuit breakers, fuse boxes, and disconnect switches, indicating the associated equipment. All labels shall be maintained in readable condition at all times and replaced as required.

t. Malfunction Investigation

When directed by the Engineer, the Contractor shall provide additional special patrols, inspections, and tests to confirm proper system equipment operation and/or collect information to isolate the cause of repetitious or intermittent system malfunctions. The times and locations shall be specified by the Engineer.

u. Adequate Parts Inventory (Spare Components)

The Contractor shall be responsible for providing an adequate number of spare components and equipment, and shall have them available for emergency, routine service and for overhauling replacement. At any time during the duration of this Contract, the current spare components inventory shall be provided to the Engineer upon request.

In the event the Contractor fails to have equivalent spare equipment, the Engineer may deduct from the monthly billing, as liquidated damages, the amount of $300.00 per day or part of a day past the repair limit.

v. Locks

The Contractor shall be responsible for keeping all equipment locks in proper working order at all times. Whenever the Engineer deems it necessary to change, replace, remove or add locks, the contractor shall assume the full cost for such changes. Whenever any locks are changed or added, 10 keys shall be furnished to the Engineer.

All master control cabinets shall be locked unless otherwise indicated by the Engineer.

w. Restoration of Work Area

Restoration of the traffic signal work area shall be included in the cost of the related pay item such as foundation, conduit, handhole, trench and backfill, etc. and no extra compensation shall be allowed. For purposes of this contract, the traffic signal work area includes areas surrounding and adjacent to traffic signal equipment, street lighting, interconnect facilities, communications facilities, communications cabinets, PTZ cameras and poles, as well as all related conduits, handholes, and service locations. All roadway surfaces such as shoulders, medians, sidewalks, pavement, etc. shall be restored to match the previously existing conditions. All damage to mowed lawns shall be replaced with an approved sod, and all damage to un-mowed fields shall be seeded, in accordance with Standard Specifications Sections 252 and 250, respectively.

x. Construction Safety and Health Standards

It is a condition of this contract and shall be made a condition of each subcontract entered into pursuant to this contract that the Contract and any Subcontractor shall not require any laborer or mechanic employed in performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to their health or safety, as determined under OSHA.

y. Meetings

The Contractor is responsible for attending monthly meetings at a time and location determined by the Engineer. The meeting is to be attended by the Contractor

project manager and additional maintenance and construction personnel, if needed. Invoiced and work schedules shall be submitted and discussed at these meetings. All costs associated with these meeting shall be incidental to the Contract.

z. Mobilization
Revise Article 671.02 of the Standard Specifications to read "Basis of Payment: This work shall not be paid for separately but shall be included in the various items of work."

3.5 NEW INSTALLATIONS, INCREASED OR DECREASED QUANTITIES

Whenever the quantity of any item of work, as listed in the Schedule of Prices, is increased or decreased due to additions or deletions of items in the installations or systems, payment will be made on the basis of the actual work performed.

The Engineer shall notify the Contractor in writing when changes are made in any installations or systems, which will increase or decrease the quantities in the Schedule of Prices. This notification shall give the following information:

(1) A description of the equipment, unit or item to be added or removed,
(2) The location of the equipment, unit, or item,
(3) The revised totals of the respective item as shown in the Schedule of Prices,
(4) Effective date of the change.

In case of installation of new equipment to be added to this Contract, the Engineer shall inform the Contractor of the scheduled date and time of equipment activation. The Contractor shall make such inspection as necessary at the time of activation to ascertain that the equipment is in proper working order. In addition, at no extra cost to the County, the Contractor shall notify the Engineer in writing any information regarding failure of parts, guarantee periods, failure due to faulty construction, and knockdowns.

3.6 MAINTENANCE SCHEDULES

This section supplements Section 108 of the Standard Specifications.

a. The Engineer may present MAINTENANCE SCHEDULES to the Contractor or may require the Contractor to present proposed schedules to him. Where schedules are required, the Contractor shall submit schedules a minimum of two weeks before work is to begin.

b. The Contractor shall complete all work items contained in MAINTENANCE SCHEDULES within the time period specified. Failure to complete the work items as specified, and within the designated time period, is sufficient cause for the County to collect liquidated damages as defined herein.

c. The Contractor may request changes in a MAINTENANCE SCHEDULE by submitting proposed changes in writing to the Engineer at least five (5) working days prior to the scheduled starting date of any item(s). Any such changes will become effective only upon the written approval of the Engineer.

d. The Contractor shall forward a MAINTENANCE SCHEDULE Completion Report to the Engineer at the completion of a Work Item, or prior to the end of the Contract, whichever occurs first.

3.7 DISRUPTION OF SERVICE - LIQUIDATED DAMAGES

The Contractor is obligated to assure that the various items of equipment in the installations and systems perform properly; whereas, maintenance operations to the respective installations and systems prescribed by this Contract must not be interrupted; whereas, MAINTENANCE SCHEDULES and completion dates are specified for various items of work and are deemed of paramount importance in the maintenance functions; whereas, failure to perform all functions in the manner specified and within any time limit specified may seriously jeopardize the welfare of the general public, the Contractor agrees that should the Contractor refuse or fail to prosecute the work, or any separable part thereof, promptly and in the manner specified in this Contract with such diligence as will insure its satisfactory completion, the Engineer in his discretion may take one or more of the following actions:

> (1) Withhold payment of any monthly or final remittance for any installation or system until all work has been performed to the satisfaction of the Engineer; (2) Deduct a proportionate amount of money for work not performed on any installation or system, from any monthly or final remittance due the Contractor, with the amount of money deducted to be determined by the Engineer; (3) By written notice to the Contractor, terminate his right to proceed with the work or such part of the work that has been delayed, in which event the County may take over the work, prosecute the same to completion, by Contract or otherwise, and the Contractor and his sureties shall be liable to the County for any excess expenditures occasioned by the County; (4) Assess liquidated damages if any work covered by MAINTENANCE SCHEDULES, or any ROUTINE or other work which has a time limit specified, shall remain uncompleted after the expiration of such time limit, or after any authorized extension of such stipulated time. The Contractor expressly agrees to pay the McHenry County Division of Transportation the sum of Five Hundred Dollars ($500.00) for each and every Calendar Day, or part of a day, for each and every item of such work remaining uncompleted. Such monies shall be paid by the Contractor as liquidated damages to partially cover losses and expenses to the County, and not as a penalty.

The McHenry County Division of Transportation shall recover said liquidated damages by deducting the amount thereof from any monies due or that may become due the Contractor, and if said monies are insufficient to cover said damages, then the Contractor or the Surety shall pay such amount due, provided, in any of the above instances, the right of the Contractor to proceed with the work was not deterred by the County, other Contractors employed by the County, or unforeseen causes beyond the control and without the fault or negligence of the Contractor. The Contractor shall as soon as practicable notify the Engineer in writing of the cause of such delay, if any, and request of the Engineer in writing such additional time or relief as he may deem necessary.

3.8 EXTRA WORK

The Engineer may authorize the Contractor to perform Extra Work and furnish the necessary materials and parts, provided that changes are not of such magnitude as to constitute a substantial or material variation in the original Contract. However, the County reserves the right to advertise for competitive bids to effect changes on any system or installation. Specialty Work Items may be authorized in conjunction with Extra Work. Authorization for Extra Work shall be given by the Engineer in writing.

The completion time for Extra Work shall be 30 calendar days, unless specifically agreed to otherwise by the Engineer. If the Contractor is certain that he cannot fulfill the above requirement when he is resubmitting his quotation for Extra Work, the quotation should contain a proposed

schedule for start and finish of the work at issue. Failure to complete the work within the required time will constitute disruption of service and appropriate liquidated damages will be assessed in accordance with Article 3.7 of this Contract.

a. Extra work shall not include replacing or making temporary and permanent repairs to all equipment, which is damaged by traffic, construction forces, of County personnel. Included are knockdowns of traffic signal heads and posts, mast arm assemblies, cabinets or any other piece of equipment. Repairs of such damage shall be paid to the Contractor under Article 3.9 – Equipment Knockdowns and Damage.

b. The repair of equipment damaged from any cause whatsoever other than that due to traffic, construction forces working under other County contracts, permits, or County personnel, shall not be paid for as Extra Work. Such work will be considered Routine Maintenance.

c. Extra work does not include the repair or replacement of equipment damaged by the fault or negligence of the Contractor.

d. Extra Work includes the replacement of failed inductive detector loops, providing the failure was not caused by negligence on the part of the Contractor. Failed inductive detector loops shall be replaced as directed by the Engineer.

   Under routine conditions, the Contractor shall have thirty (30) calendar days, after notification by the County, to complete the installation of a specified inductive detector loop. This time frame shall apply to both new and replacement detector loop installations.

   Certain inductive detector loop installations may be designated by the Engineer as priority items if, in the opinion of the Engineer, they diminish public safety or level of service. For all such specially designated detector loop installations, the Contractor shall have ten (10) calendar days, after notification by the County, to complete the installation of the specified inductive detector loop. Failure to complete routine or priority detector loop installations within the required time will constitute disruption of service and appropriate liquidated damages will be assessed in accordance with Article 2.7 of this Contract.

e. Extra Work directed by the Engineer shall be completed with all new materials and parts, unless otherwise specified by the Engineer.

f. The County reserves the right to furnish any or all of the materials or parts for Extra Work, in which case no charges for items so furnished shall be made to the County.

g. The County reserves the right to reject any claims for Extra Work which were not approved by the Engineer before the work was started, for other than knockdowns or emergency repairs.

h. Extra work for items not listed on the Schedule of Prices will be paid for: (1) either at a lump sum price or at a unit price agreed upon by the Contractor and the County, or (2) upon a force account basis as calculated in accordance with Article 109.04 of the Standard Specifications, with the exception that no additional payments will be made for fabrication, engineering, transportation, materials ordering, or any other labor or equipment costs.

3.9 EQUIPMENT KNOCKDOWNS AND DAMAGE

Equipment Knockdowns and Damage are defined as equipment hit, knocked down, damaged due to traffic including mast arm assemblies, signal heads and posts, cabinets, street lighting poles and control cabinets, flasher posts and heads, and/or any other equipment owned and maintained by the County. Equipment damage may occur from typical roadway traffic, utility vehicles, construction vehicles, mowers, etc. This is not for materials and services under Routine Maintenance.

Repairs due to equipment knockdowns shall be paid to the Contractor on a Force Account Basis in accordance with Article 109.04 (b) of the Standard Specifications.

The completion time for Equipment Knockdowns shall be 30 calendar days, unless specifically agreed to otherwise by the Engineer. Failure to complete the work within the required time will constitute disruption of service and appropriate liquidated damages will be assessed in accordance with Article 3.7 of this Contract

3.10 REIMBURSEMENT FROM THIRD PARTY FOR REPAIRS OR DAMAGES

a. **Damages by Traffic, Vandalism and Other Miscellaneous Causes**

The County reserves the right to make recovery from third party or parties for damage to any part of the installations or systems caused by vehicular traffic, vandalism, or construction forces working within the County Right-of-Way requiring a highway permit, including all incidents of equipment damage for which the County pays the Contractor to replace the damaged equipment. No part of such recovery or recoveries shall inure to the benefit of the Contractor. For each incident resulting in damage to electrical facilities, the Contractor shall furnish to the Engineer an individual statement itemizing the location and nature of damages, costs of labor, equipment and materials, the date of damage, and the date repairs were completed.

b. **Damages by Construction Forces**

The Specifications for each project describe in detail the responsibility for equipment damaged by construction forces working under contract with the County. For cases when the Electrical Maintenance Contractor is directed to perform repairs on damaged equipment, the Contractor will be paid either directly by the Construction Contractor (upon approval by the Engineer) or by the use of Extra Work provided for under Article 3.8 of this Contract.

c. **Equipment Damages by County Personnel Working Within the County Right-of-Way**

Damage to equipment and/or cable caused by County personnel in the performance of their assigned duties shall be paid for by the County as Extra Work, as provided for Under Article 3.8 of this Contract. The Contractor shall request an inspection by the Engineer of the damaged equipment and/or cable at the site of the damage prior to making permanent repairs.

d. **Record Keeping Requirements for Third Party Damages**

The Contractor shall prepare Dispatch Reports for all equipment damages, whether notified or discovered by the Contractor. The Contractor shall prepare Work Order Reports for each incident of damage to be repaired or replaced, for all Emergency, Temporary, or Permanent Repairs made to the installations or systems. Dispatch Reports, Work Order Reports, and pictures of the damage shall be completed and forwarded to the Engineer within 48 hours of occurrence or discovery.

3.11 METHOD OF BILLING

Billing for the cost of Routine Maintenance operations shown on invoices shall be for full monthly periods only and shall not be prorated for shorter periods. Work performed on installations completed and activated on or before the fifteenth of the month shall be billed to cover the entire month; however, work performed on installations completed and activated after the fifteenth of the month shall not be billed on the current invoice, and payment shall begin the following month. Equipment that has been deactivated, eliminated or which the Department has relinquished maintenance responsibility after the fifteenth of the month, shall be billed for the full month, however, equipment that has been deactivated or eliminated on or before the fifteenth shall not be billed for that month. The Engineer shall notify the Contractor, in writing, whenever changes are made to the Schedule of Routine Maintenance Pay Items.

Between the 15th day and before the 30th day of each month, the Engineer shall provide the Contractor, in writing, a list of Routine Maintenance pay items and quantities for the current month's pay items. This list shall reflect the total dollar amount of each pay item, as well as the overall total dollar amount for the current month's Routine Maintenance. The Contractor shall review this list to confirm that recent signal activations, maintenance transfers, equipment additions, etc. are properly indicated. If necessary, the Engineer shall resubmit a corrected list to the Contractor. The Contractor shall then submit to the Engineer an invoice for the dollar value shown on the list. See Page 49 for the list of Routine Maintenance Pay Items.

At the end of the Contract, The Engineer shall withhold the final month routine maintenance billing until all work, determined by the Engineer to be the responsibility of the Contractor, is completed by the Contractor to the Engineer's satisfaction.

Separate invoices shall be submitted no later than thirty (30) calendar days after the completion of the work for Extra Work and for Specialty Work. Each invoice shall show the date of authorization and location of the work. Partial project billing will not be accepted unless previously authorized by the Engineer.

3.12 DAMAGED PARTS, MATERIALS, AND EQUIPMENT

Surplus or damaged parts, materials, or other equipment deemed salvageable by the Engineer shall be stored in the Contractor's warehouse or yard and designated as property of the County until disposed of or repaired under the direction of the Engineer. The Engineer may require inside, protected storage of specified equipment.

Used parts may not be installed to repair the various systems and installations unless specifically permitted by the Routine Maintenance Special Provisions or when otherwise directed by the Engineer.

3.13 REPORTS AND FORMS

The following reports, in addition to the other reports or forms listed under ARTICLE 4 - SPECIAL PROVISIONS, or elsewhere in the Contract, shall be submitted when required, reports should be in excel spreadsheet format:

1. **Unsatisfactory Service Report**

When, in the opinion of the Engineer, any maintenance operation is not being properly performed to the satisfaction of the Engineer, the Engineer may submit an Unsatisfactory Service Report. The Contractor shall take necessary action in the most practical manner possible to correct the items listed in the report. A copy of the report showing the action taken and the date of such action shall be submitted to the Engineer.

2. Condition Report

The Contractor shall submit to the Engineer, when requested, a Condition Report showing the history of any item in the system. This report shall contain the following information or such other information as required by the Engineer: (1) The general condition of the item, including the results of tests, (2) The record of any breakdown of the item, and of remedial action taken, and (3) The Contractor's recommendations for corrective measures necessary to insure the proper performance of the item.

3. Inspection Report

When the Contractor finds any item of equipment not functioning properly, he shall submit to the Engineer an Inspection Report. This report shall contain a detailed description of the particular malfunction and the Contractor's detailed recommendations for corrective measures necessary to eliminate the condition.

4. Dispatch Report

Whenever defective, non-operative, or damaged equipment is reported to the Contractor by telephone, fax, or e-mail, a sequentially numbered Dispatch Report shall be initiated. Copies of said reports shall be provided to the Engineer weekly. The Copy of the Dispatch Report shall show, in addition to the description of the defect, the Work Order Number, which is initiated to correct the reported defect. This provision does not require a Work Order to be generated for every Dispatch Report. However, the Engineer reserves the right to require Work Orders for specific maintenance activities.

5. Work Order

Copies of all Work Order(s) issued to correct the defect(s) indicated on a Dispatch Report shall be maintained with the associated Dispatch Report. The copy of the Work Order(s) shall indicate the exact location of the component at fault and whether it is being bypassed, removed, replaced, or repaired temporarily or permanently. The Engineer reserves the right to require copies of all Work Orders related to a specific Radio Room Report. When requested by the Engineer, copies of Work Orders shall be provided within seven (7) days from the date of the request.

6. Weekly Traffic Signal Maintenance Report

The Contractor shall prepare and submit to the Engineer a maintenance report on a weekly basis detailing the status of all open, authorized, or recently completed maintenance and repair work on MCDOT facilities. This report shall include location, item description, date and time notified, caller, reference number (Dispatch ticket number), date competed, and status/remarks. The report shall cover 7 consecutive days Monday through Sunday and shall be sent to the Engineer on Monday. All maintenance items at County-maintained traffic signals, flashers, and highway lighting shall appear on the report. For tracking purposes, maintenance items shall remain on the report, and subsequent reports, until the item is completed, and the completion date is entered.

7. Yearly Call-Out Report

When directed by the Engineer, the Contractor shall generate a yearly call-out report. The call-out report shall contain the date, time, and reason for each and

every call-out (calls to Dispatch Center only by MCDOT or by local law enforcement agencies) to perform maintenance on MCDOT's traffic signals and highway lighting.

3.14 DURATION OF CONTRACT

This Contract shall be in full force from 12:01 AM December 1, 2021 to 12:00 midnight November 30, 2023 following the date of execution and acceptance of the Contract, subject, however, to the right of the McHenry County Division of Transportation to cancel and terminate the same at any time with or without cause, or for reasons which it believes to be in the public interest by giving thirty (30) days notice in writing to the Contractor.

In the event of such cancellation, the Contractor shall be entitled to receive payment for services and work performed and materials or equipment furnished under the terms of the Contract prior to the effective date of such cancellation, but shall not be entitled to receive any damages on account of such cancellation or any further payment whatsoever. The Department may take possession of the work and all materials, tools, and appliances thereon and thereat, for any reason which the Engineer deems to be in the public interest, and his decision shall be final.

The McHenry County Division of Transportation has the sole discretion to renew this contract for two (2) additional 1-year terms.

- The first renewal would extend the Contract for one additional term/year from 12:01 AM December 1, 2023 to 12:00 midnight November 30, 2024, the same terms and conditions as the original Contract.
- The second renewal would extend the Contract for one final term/year from 12:01 AM December 1, 2024 to 12:00 midnight November 30, 2025, the same terms and conditions as the original Contract.

The County shall notify the Contractor in writing of its intention to renew the contract prior to October 1 of the current contract calendar year for each of the renewal terms/years.

ARTICLE 4 - SPECIAL PROVISIONS

4.1 TRAFFIC SIGNAL SYSTEM

The Traffic Signal System consists of electronically operated traffic control devices maintained by the McHenry County Division or Transportation including flashing beacon installations, traffic signal installations, closed-loop traffic signal systems, highway lighting systems, and UPS (Uninterruptible Power Supply) systems.

Installations include, but are not limited to master and local controllers, time base coordinators, coordination units, intersection monitors/modules, modems, transceivers, detectors (induction loop, microwave, video, thermal imaging, radar detection, pedestrian-activated, or optical), controller cabinets, LED signal heads (vehicle and pedestrian), internally illuminated and fiber optic signs, pan/tilt/zoom cameras, video monitors, communication cabinets, UPS (Uninterruptible Power Supply) systems, traffic signal posts, mast arm assemblies and poles, electric cable (standard multi conductor, shielded multi conductor, co-axial, and fiber optic), conduit, communication lines, concrete foundations, handholes, junction boxes, utility service installations, ground rods, and other appurtenances owned and/or maintained by the McHenry County Division of Transportation.

In all cases where the signal head is bracket mounted to a combination mast arm assembly and pole

with a lighting unit, the foundation and mast arm assembly and pole shall be maintained under Traffic Signal System A-1, TRAFFIC SIGNAL LOCATION, and the luminaire shall be maintained under the Traffic Signal System Item B-1, STREET LIGHT LOCATION, where both the traffic signal installation and street lighting are maintained by the McHenry County Division of Transportation. At locations where the McHenry County Division of Transportation maintains the traffic signal installation and a municipality (others) maintains the street lighting system, the foundation, mast arm assembly and pole shall be maintained under Traffic Signal System Item A,-1, TRAFFIC SIGNAL LOCATION and the lighting arm, luminaire and related wiring shall be maintained by the municipality (others). In this case the McHenry County Division of Transportation's Electrical Maintenance Contractor shall coordinate all repair work with the municipality (others).

In all cases where the signal head is bracket mounted or span wire mounted to a wood pole with a lighting unit, the wood pole shall be maintained under Traffic Signal System A-2, TEMPORARY TRAFFIC SIGNAL LOCATION, and the luminaire shall be maintained under the Traffic Signal System Item B-1, STREET LIGHT LOCATION, where both the traffic signal installation and street lighting are maintained by the McHenry County Division of Transportation. At locations where the McHenry County Division of Transportation maintains the temporary traffic signal installation and a municipality (others) maintains the street lighting system, the wood pole shall be maintained under Traffic Signal System Item A,-2, TEMPORARY TRAFFIC SIGNAL LOCATION and the lighting arm, luminaire and related wiring shall be maintained by the municipality (others). In this case the McHenry County Division of Transportation's Electrical Maintenance Contractor shall coordinate all repair work with the municipality (others).

The quantity of any item of work as listed in the Schedule of Prices may not reflect the actual amount that will be used. Payment will be made on the basis of actual work performed.

ITEM A - TRAFFIC SIGNAL ROUTINE MAINTENANCE

The following shall be part of Pay Items A-1 through A-4.

1. The Contractor shall maintain and repair the various installations and perform all work necessary to keep them in proper working order, to the satisfaction of the Engineer, at all times. No compensation will be allowed over and above the bid prices for meeting the requirements of Routine Maintenance.

2. The Contractor shall, after proper notification, accept maintenance of any new or existing installations, which may be taken over for maintenance by the McHenry County Division of Transportation.

3. The Contractor shall report the following to the Engineer as quickly as possible:
    a. Any work authorized by the Contractor being performed on the installations by anyone other than the Contractor.
    b. Any work, which comes to the attention of the Contractor, which may endanger any installation.
    c. Any emergency temporary repairs.
    d. Any work of an unusual nature and/or for which the Engineer has requested notification.

4. The Contractor shall respond as required to all calls by the Engineer or other parties to locate and mark any and all underground components of McHenry County maintained traffic signal and highway lighting facilities in accordance with JULIE laws. The Contractor shall locate and mark the above listed facilities within the Right-of-Way. Typical response times for routine JULIE locate tickets is 48 hours, 2 hours for emergency JULIE locate tickets, and anytime greater than 2 hours and less than 48 hours for rush or short notice JULIE locate tickets. The Contractor shall

complete the JULIE locate ticket by the starting time (Digstart) work date/time on the ticket.

McHenry County Division of Transportation currently uses Diglet, Utility Location Management Software (https://app.diglet.xyz/index.html). This software is a management portal for JULIE tickets. The Contractor shall be responsible for using this software for locating all JULIE tickets. This is a web-based software. Any associated costs with the use of this software is incident to the cost of Routine Maintenance.

5. The Contractor shall keep incoming power service and/or telephone service in proper working condition at all times. The Contractor shall coordinate and cooperate with the appropriate utility companies in this matter.

6. Patrol Inspection – The Contractor shall patrol and inspect each installation at least once every month and additionally as directed by the Engineer, and after repairs have been made, to insure said repairs were satisfactorily completed.

   This patrol inspection shall include checking for the proper operation of the following items: Signal heads (twisted/misaligned), LED outages, vehicle detection (video and/or detector loops), pedestrian push-buttons, signal controller (correct time and date) MMU (correct time and date) battery back-up system (including system activation and cleaning connectors), Emergency Vehicle Preemption System (EVPS), proper telemetry and communications, door switches, cabinet vents and fans, heat exchangers and all other specialty equipment that exists and is associated with the corresponding pay item.

   The monthly inspection shall include inspection and modification (if required) of all detection zones for all intersections with video detection. In addition, the Contractor shall modify any and all detection zones for intersections with video detection as directed by the Engineer.

   When the Contractor inspects a signalized intersection as part of a maintenance transfer inspection, it shall fulfill the requirement for that month's patrol.

   The Contractor shall prepare and maintain a list for each month's patrol inspections. For each calendar month, the list shall include all locations inspected, the date inspected, the name of the patrolman, and any significant deficiencies identified and corrected. The Contractor shall provide the patrol inspection list to the Engineer by the 25th day of the following month.

7. Replacement of burned out LED traffic signal lamps shall be scheduled and accomplished in the following manner, or as directed by the Engineer:

   a. If two or more traffic signal indications remain in operation for any given vehicle phase (movement) on any approach to an intersection, the replacement of the burned-out LED lamp shall be accomplished within twenty-four (24) hours for red indications and forty-eight (48) hours for all other indications. The twenty-four (24) hour and forty-eight (48) hour time periods begin immediately following discovery and/or notification of the outage.

   b. If only one traffic signal indication for any given vehicle phase (movement) remains in operation for any approach to an intersection, IMMEDIATE CORRECTIVE ACTION must be taken. This requirement includes but is

not limited to arrow indications where only one such indication is operational as well as any red flashing beacons. This requirement shall not have any exceptions.

c. Replacement of burned out LED traffic signal lamps shall be made with the same Manufacturer and Model Type LED module (i.e. 15-year Dialight LED replaced with 15-year Dialight LED).

When replacing burned out LED traffic signal lamps, the Contractor shall clean all the LED lamps within the signal head that the replacement is taking place. All replacement LED lamps shall meet the requirements and approval of the Engineer (See Group Re-lamp, Paragraph 19). These provisions shall not apply to knockdowns.

8. The Contractor shall replace burned out controller indicator lamps, LED and LCD displays as discovered, or when directed by the Engineer.

9. The Contractor shall repair or replace all defective or damaged equipment from any cause other than traffic, construction forces working under other County contracts, permits, or County personnel (These items shall be paid for as Extra Work). Routine Maintenance includes all repairs and equipment replacement caused by adverse weather conditions.

10. The Contractor shall maintain in stock at all times sufficient materials and equipment to perform temporary and permanent repairs within specified time limits.

11. The following shall be considered the minimum acceptable signal operation pending permanent repairs: Two (2) far side signal heads directed towards the through traffic movements of each approach, two (2) signal faces directed towards any separate turning movements (where they are provided) on each approach, and two (2) pedestrian signal faces for each pedestrian crossing. In addition, where the distance from any stop bar to the far side signal exceeds 150 feet, then a near right signal must also be maintained. The Contractor's response time for all traffic signal knockdowns shall be in accordance with the Response Timetable contained herein. When clearing a traffic signal knockdown, the Contractor shall determine if the minimum acceptable signal operations described above are present. If the minimum conditions are not present, the Contractor shall take IMMEDIATE CORRECTIVE ACTION to restore the minimum acceptable signal operations. All temporary signal faces shall contain the same type, number and size of lenses as the signal faces being replaced. The Contractor shall notify the Engineer of knockdowns reported or serviced on the first business day following the knockdown. This repair work shall be considered Routine Maintenance except for damage caused by traffic, construction forces working under County contracts, permits, or County personnel, which will be paid for as Extra Work or per D Items. When maintenance at a signalized intersection requires that the controller be disconnected, when power is available, the Contractor shall place the intersection on flashing operation, which may require the Contractor to install a flasher unit in the controller cabinet if none is provided. The signals shall flash RED for all directions unless a different indication has been directed by the Engineer. The Contractor shall first place at least one STOP sign, (Illinois Standard Sign R1-1-36 x 36 or larger), on EACH approach to the intersection as a temporary means of regulating traffic, except for those approaches to which a flashing YELLOW indication has been directed by the Engineer. All stop signs shall meet retro-reflectivity requirements set forth in the current MUTCD (Manual on Uniform Traffic Control Devices). The Engineer reserves the right to have any deficient stop sign replaced with an acceptable sign at no additional cost

to the contract. All Contractor vehicles involved with the maintenance of Traffic Signal installations shall be equipped with a sufficient number of serviceable, retro-reflective STOP signs, furnished by the Contractor, to be erected as specified herein. At all times, the Contractor must maintain a sufficient number of spare STOP signs for the replacement of existing STOP signs which are damaged or stolen.

12. Replace defective or damaged equipment that is part of a specific traffic control installation. If proper signal sequencing with full vehicle detection cannot be achieved immediately, a controller, which will provide the proper signal sequencing and full vehicle detection, shall be installed within twenty-four (24) hours of removal of the original controller. The Contractor shall notify the Engineer no later than the first business day following removal and/or replacement of any controller.

13. Controllers shall be cleaned and overhauled when the controller malfunctions, at which time it will be thoroughly bench checked at the Contractor's repair facility. A Condition Report for the controller shall be generated and may be requested by the Engineer.

14. STOP signs (Illinois Standard R1-1 36x36 or larger) shall be erected on all signalized approaches when power is not available, or if the red flashing operation is expected to be in effect for more than thirty (30) minutes after the arrival of the Contractor's personnel. All stop signs shall meet retro-reflectivity requirements set forth in the current MUTCD (Manual on Uniform Traffic Control Devices). The Engineer reserves the right to have any deficient stop sign replaced with an acceptable sign at no additional cost to the contract.

15. All permanent repairs or replacements shall be made with new equipment only, unless otherwise specifically approved by the Engineer.

16. The Contractor shall check and maintain the following items as directed by the Engineer:

    a. Controllers, conflict monitors, malfunction management units (MMU), flashers, relays, detectors, time clocks, coordination equipment, telemetry equipment, cameras, UPS equipment, and preemption equipment to insure its proper function.
    b. Align all signal posts, controller pedestals, foundations, mast arm poles, astro brackets and signal heads.
    c. Tighten all bolts.
    d. Remove the dust and debris from the interiors of controller cabinets with a brush and vacuum cleaner and replace cabinet air filters.
    e. Replace damaged, discolored, cracked or peeling signal lenses.
    f. Replace damaged or missing nut covers, mast arm shrouds, handhole covers and handles, handhole hooks, pole handhole covers, cabinet locks, and related hardware.
    g. Clean the exterior housings as well as the lenses of all image sensing and PTZ (pan/tilt/zoom) cameras in strict accordance with the manufacturer's recommendations, and as directed by the Engineer.

18. The Contractor shall be required to clean all camera lens at all traffic signals with cameras (video detection and/or PTZ cameras) at least once per year before October 1 of the Contract year. Additional cleaning may also be required to ensure proper operation of the cameras.

19. Group Re-lamping: The McHenry County Division of Transportation's traffic signal system is composed of all LED traffic signal heads. Any group re-lamping of all LED traffic signal faces (all sections) including flashing beacons shall be paid for as Extra Work. The only exception is as follows.

    a. All defective/failed LED lamps shall be replaced by the Contractor. All labor and equipment associated with replacing defective LED lamps under manufacturer warranty shall be incidental to Traffic Signal Routine Maintenance.
    b. All defective/failed LED lamps that fall outside the manufacturer's warranty shall be replaced and paid for as Extra Work.
    c. Appendix A shows all LED installation and warranty expiration dates by intersection.

    All replacement LED lamps shall meet the approval of the Engineer and shall match the existing LED lamps at each traffic signal installation.

20. The Contractor shall clean LED traffic signal lamps in accordance with the Manufacturer's recommendation at various intersections as directed by the Engineer.

21. The Contractor shall clean Illuminated street name signs in accordance with the Manufacturer's recommendation at various intersections as directed by the Engineer.

22. The Contractor shall inspect all mast arm assemblies, mast arm poles and astro brackets (or other types of hardware) supporting traffic signal heads or pedestrian signal heads. This inspection shall be completed before October 1 of the Contract year and may be performed concurrent with the group re-lamping, or separately. The Contractor must furnish in writing, to the Engineer, a progress schedule indicating the dates on which these inspections will be completed, prior to March 15th of the Contract year. The inspection shall focus on the structural elements of the mast arm assembly, and must include a close-up, arms-length investigation of the following elements:

    - Mast Arm
    - Mast-to-Pole Connection
    - Anchor Bolts
    - Pole
    - Base Plate
    - Nuts

    a. The arm of the assembly should be visually inspected at all signal head connections for any defects, such as cracks or buckles. The mast arm-to-pole connection should be inspected for significant loss of section, cracks in welds or base metal, and deterioration of the connection plates. The bolts of the mast arm-to-pole connection should be inspected for tightness and condition.

    b. The pole should be checked for external corrosion, impact damage, perforation by rust-through, and any discernible deflection, distortion or cracking. The pole should be closely checked for corrosion near the base plate, especially if mounted on a grout bed. The welds of the pole-to-base plate connection should be checked for cracks.

c. The base plate should be checked for any severe section loss or deformation.

d. The anchor bolts of the mast arm should be inspected to verify that the existing nuts are not loose or missing. The anchor bolts should also be checked for any corrosion or bending.

e. Upon discovery of any buckles and/or significant structural defects (loose nuts, severe corrosion, dents, cracks in welds or structure, etc.), the Contractor shall immediately notify the McHenry County Division of Transportation at (815) 334-4960 and take corrective action as directed by the Traffic Engineer to insure the assemblies do not pose an immediate hazard.

The Contractor's personnel must inspect the entire intersection on the same working day. The Contractor shall provide the Engineer a completed form MA-1 or MA-2 (single or double mast arm assembly), "Annual Arm Inspection Report Form" for each County maintained traffic signal mast arm assembly and pole inspected.

23. The Contractor shall keep records of repairs and services to all serial numbered pieces of equipment and furnish them to the Engineer upon request. These records must indicate the location, the malfunction, and removal and reinstallation dates of each item. The records should also indicate the serial number of the spare piece of equipment if such item is installed.

24. The Contractor shall conduct conflict monitor and/or malfunction monitor unit (MMU) testing at all County maintained intersections as directed by the Engineer. Records of the test results indicating the date, time, name of the person conducting the test, and the serial number of the unit shall be furnished to the Engineer. If any part of the test fails, the unit shall be taken in for repair and a spare unit installed and tested. The testing shall be completed before October 1 of the any Contract year and any subsequent years (renewal year) of the Contract.

    All MMU/CMU units during testing shall be returned to the original traffic signal cabinet, which it was removed from. MMU/CMU units cannot be switched between MCDOT signal cabinets unless authorized by the Engineer.

    If any part of the test fails, the unit shall be taken in for repair and a spare unit installed and tested. Once repaired, the unit shall be retested and then reinstalled at its original location. If a unit is deemed unrepairable, the Contractor shall test and install a new unit and the defective unit shall be disposed of by the Contractor. The cost of the new unit shall be paid as Extra Work.

25. The Contractor shall conduct UPS (Battery Back-up) equipment testing according to the Manufacturer's recommended testing procedure (see enclosed UPS Preventative Maintenance Report) in Appendix B of this contract. Each UPS Preventative Maintenance Report shall be completed by the Contractor after testing of UPS is complete and a copy of the report shall be give to the Engineer. All UPS installations shall be tested on a yearly basis before October 1 of the Contract year. Any UPS equipment not passing the appropriate testing shall be removed with spare equipment being installed until repairs can be made to equipment. Any batteries that require replacement shall be paid for as Extra Work.

26. The Contractor shall clean the interior of all controller cabinets and UPS cabinets at

least once per year during the duration of the Contract. Dust and debris inside the cabinets shall be removed with a brush and vacuum cleaner, and all cabinet air filters shall be replaced. The Contractor shall notify the Engineer in writing when the cleaning is complete. The annual cabinet cleaning shall be completed by October 1 of the Contract year.

27. The Contractor shall label all equipment in the traffic signal cabinet, which include controllers, MMU/CMUs, power supplies, etc. The labels shall include the intersection name, i.e. Randall Road @ Algonquin Road.

28. The Contractor shall keep an electronic inventory of all traffic signal equipment by location/intersection. Any new intersections shall be added to the inventory. The inventory shall be updated if new, permanent equipment is installed at that location. A copy of this inventory shall be given to the Engineer.

29. The Contractor is responsible for removing posters and graffiti from all components of the traffic signal installations and to repaint as directed by the Engineer.

31. The Contractor shall not make any timing or programming changes on any closed-loop system or its components except through qualified electrical technicians and with the approval of the Engineer.

    The Contractor shall maintain proper timing of the traffic control equipment. Documentation in the controller cabinet should provide recommended settings for each piece of adjustable equipment. Changes to settings other than those shown on the documentation shall be noted with the date of the change and the initials of the person making the change. The Engineer shall be contacted immediately if documentation is not present, or there is any doubt as to what the settings should be.

32. The Contractor is responsible to cover, maintain covers, and uncover traffic signal heads at locations where the traffic signal head or traffic signal head sections are not in use, as directed by the Engineer.

    An approved signal head bag designed for covering heads shall be used. The Engineer shall have the final approval of the bag used. Burlap and/or silt fence material shall not be accepted for covering of signal heads.

33. The Contractor shall maintain all components of the emergency vehicle preemption system (EVPS) at applicable intersections to the satisfaction of the Engineer. This work includes repairing or replacing defective components so as to restore the preemption system to complete working order within 72 hours of problem notification. The Contractor shall notify the local fire district and the Engineer whenever the EVPS is inoperative or any component of the EVPS is removed for service. As part of maintaining the emergency vehicle preemption system the Contractor will be required to clean the optical detector lenses and/or adjust the sensitivity of the phase selector as directed by the Engineer.

34. The Contractor shall furnish a qualified representative to perform inspections during all County traffic signal maintenance transfers. The following two types of maintenance transfers may occur: (1) a new or existing traffic signal installation will be added to the Traffic Signal Maintenance Contract, or (2) an existing traffic signal installation will have its maintenance transferred from the Maintenance Contract to another agency or contractor. All costs associated with these inspections are incidental to the cost of routine traffic signal maintenance. This item may include

high mount and/or low mount flashing beacon installations.

a. The Contractor shall analyze all detector loops at the controller cabinet insuring that each detector loop, or set of detector loops, complies with Section 886 of the Standard Specifications.

b. The Contractor shall analyze the controller program provided by the controller manufacturer to confirm that the phase and overlap designations are provided correctly in the controller program, as indicated on the traffic signal sequence drawing and cabinet wiring drawings.

c. The Contractor shall insure that the phase timings in the traffic signal controller are those provided by the McHenry County Division of Transportation.

d. The Contractor shall assist in placing the traffic signal in operation by observing the signal display and the conflict monitor or MMU operations. The Contractor shall report any operational discrepancies or signal outages to the Engineer immediately.

e. The Contractor shall assist the Engineer in walking all approaches of the signal installation, inspecting all traffic signal items for conformance with the McHenry County Division of Transportation specifications for the project. The Contractor shall also assist the Engineer in inspecting all of the traffic signal heads for proper aiming.

f. The Contractor shall assist in the testing and/or adjusting of emergency vehicle pre-emption equipment. The Contractor shall insure that whenever railroad pre-emption and emergency vehicle pre-emption are in operation simultaneously, that the railroad pre-emption has priority over emergency vehicle pre-emption.

g. The Contractor shall insure that locations containing railroad preemption are programmed in accordance with the approved railroad preemption program and that all special lockout devices are operating properly.

35. Special Tasks Required by the Engineer:

The Contractor shall be responsible for completing special tasks as directed by the Engineer. These special tasks will be associated with the maintenance and operation of the traffic signal system. The following is a representative list of special tasks the Contractor may be required to complete. This list contains examples of special tasks that may be required; however, it should not be considered all-inclusive or comprehensive in any way.

a. Inspect the timing operation of a signalized intersection at a specific time period and provide a recommendation for improving traffic flow.
b. Program timing parameter changes that have been approved by the Engineer.
c. Determine the phasing or operation of a signalized intersection.
d. Check the condition or verify the presence of equipment at a signalized location.
e. Provide a copy of timing parameters in use at a signalized location.
f. Provide recommendations to improve the safety or the operation of a signalized location.

g. Provide a compiled list of all locations meeting a specified criterion.

All costs relating to completing special tasks such as these shall be considered incidental to the cost of routine traffic signal maintenance and no additional compensation shall be allowed.

36. Unless specifically stated to the contrary, all items shall be repaired within a time frame more specifically described in the following **Repair Timetable**. This table is not to be used in place of routine maintenance schedules. The times listed are non-cumulative. Any repairs not specifically covered in the Repair Timetable, or described elsewhere, shall be completed within a time frame matching the most similar line item in the Repair Timetable. The Repair Timetable shall be subject to revision at any time, at the discretion of the Engineer.

    The Contractor shall respond to all notifications of Traffic Signal System malfunctions in a reasonable time. In addition to the daily routine and non-routine requirements of the Traffic Signal System, the Contractor shall provide sufficient qualified personnel to respond to all notifications of malfunctions on a round-the-clock basis (24 hours a day, 7 days a week). The Contractor is required to keep a time and date log of each response, from the time of the initial report to the time of final permanent repair.

    In the event the Contractor fails to meet the required times for response, service restoration, and/or permanent repairs as listed previously, the Engineer may deduct liquidated damages from the monthly billing in the following amounts:

    a. Response Time – Fifty dollars ($50.00)/hour for each hour or part of an hour past the response time limit.

    b. Service Restoration – One hundred dollars ($100.00)/hour for each hour or part of an hour past the service restoration time limit.

    c. Permanent Repairs – Five hundred dollars ($500.00)/day for each day or part of a day past the permanent repair time limit.

    The above liquidated damages shall not limit the County from withholding additional monies from the monthly billing if, in the opinion of the Engineer, proper service to the traffic signal system is seriously deficient.

REPAIR TIMETABLE (Non-cumulative)

ITEM	REPONSE TIME	SERVICE RESTORATION	PERMANENT REPAIRS
KNOCKDOWNS/FAILURES/DAMAGE:			
Cabinet (Signal and/or UPS)	1 hour	24 hours	2 weeks
Controller (Master)	1 hour	Next Working Day	2 weeks
Controller (Local)	1 hour	24 hours	1 week
UPS Inverter	1 hour	24 hours	1 week
UPS Batteries	1 hour	24 hours	2 weeks
Detector Loop	1 hour	Not Applicable	15 days
Detector Loop (priority)	1 hour	Not Applicable	10 days
Loop Detector/Amplifier	1 hour	4 hours	2 weeks
Video Detection Camera	1 hour	4 hours	2 weeks
MMU/CMU	1 hour	4 hours	2 weeks
PTZ Camera	2 hours	48 hours	2 weeks
Detector Interface Card/Mini Hub	1 hour	4 hours	2 weeks
Modem	2 hour	Next Working Day	2 weeks
Load Switch	1 hour	2 hours	2 hours
Signal Head/Lenses	1 hour	2 hours	Next Working Day
Pole/Mast Arm	1 hour	2 hours	ENG
Cabling/Conduit	1 hour	4 hours	ENG
Interconnect/Communication	1 hour	Next Working Day	ENG
Graffiti/Advertising	Next Working Day	Next Working Day	Next Working Day
Telemetry, Electrical	1 hour	2 hours	Next Working Day
Indicators/Switches/LED's/Displays	Next Working Day	Not Applicable	2 weeks
Ethernet Switches/Video Encoders	1 hour	48 hours	2 weeks
Snow/Ice/Debris/Other Obstructions	1 hour	2 hours	Next Working Day
Outages not covered elsewhere	1 hour	2 hours	Next Working Day
Filter/Cleanliness/Fans/Thermostat	Next Working Day	Next Working Day	Not Applicable
Misalignment (conflicting)	1 hour	2 hours	Next Working Day
Misalignment (non-conflicting)	2 hours	4 hours	Next Working Day
Complaints/Calls/Alarms:			
Timing/Phasing/Programming	1 hour	2 hours	ENG
Coordination Alarm/Cycle Fail	Next Working Day	ENG	ENG
Controller Alarm/Status Change	1 hour	Next Working Day	1 week
Detector Alarm/Status Change	Next Working Day	Next Working Day	ENG
CMU/MMU Flash/Local Flash	1 hour	2 hours	1 week
Door Open/Main. Req.	2 hour	4 hours	Next Working Day

ENG: acceptable to Engineer

37. Schedules for Routine Maintenance Items

The Contractor shall furnish maintenance schedules (scheduled Preventive Maintenance Programs) for the following items:

a. The Contractor shall furnish a schedule for the cleaning of the traffic signal cabinets and changing of filters, as required in Article 3, Item A, Paragraph 24.

b. The Contractor shall furnish a schedule for the annual mast arm assembly and pole inspection of all traffic signal locations containing a mast arm assembly(s) and pole(s), as required in Article 3, Item A, Paragraph 20.

Schedules for testing of equipment (MMUs and UPS) shall be delivered to the Contractor by the Engineer.

Schedules for cleaning of traffic signal heads, video camera lenses and illuminated street name signs shall be delivered to the Contractor by the Engineer.

38. The Contractor shall be responsible for clearing snow, ice, dirt, debris, vegetation, or other condition that obstructs the visibility of any traffic signal display in accordance with the REPAIR TIMETABLE. Two clearly visible signal indications of all colors and arrows are required at all times.

39. Third Party Red Light Running Enforcement Equipment, when located in the County right-of-way or connected to County maintained traffic signals shall be maintained by others and shall not be maintained under this Contract. Requests for access to traffic signal cabinets by Third Party Red Light Running Equipment owners shall be approved by the Engineer.

40. Whenever possible, the Contractor shall replace failed, deficient, or defective components/equipment utilizing the manufacturer's warranty.

ITEMS A-1 through A-4 – TRAFFIC SIGNAL ROUTINE MAINTENANCE PAY ITEMS

A-1 TRAFFIC SIGNAL LOCATION

This item shall consist of maintaining a traffic signal location, either as part of a coordinated signal system or an isolated signalized intersection. This item may include, but shall not be limited to, any number or type of the following:

- Traffic signal heads (LED), programmable signal heads (LED), traffic signal posts, mast arms, combination mast arms, brackets, and foundations. The traffic signal heads shall consist of signal sections, back plates, louvers, and/or visors.

- Pedestrian signal heads (LED), audible and countdown pedestrian signal heads, pedestrian- actuated detectors (e.g. push buttons), and associated signs.

- A fully actuated controller, solid state type, with volume-density features, railroad and/or emergency vehicle preemption, and time-base coordination. The railroad preemption, emergency vehicle preemption, and time-base coordination may be internal, a module, or external to the controller. A controller cabinet with its associated equipment, malfunction management unit (MMU), power supplies, bus interface units (BIU), load switches, flashers, relays, video monitor, system communications equipment, modems, switching units, intersection coordinators, time switches and, where applicable, control pedestal and foundation. Intersection monitoring devices, where applicable, shall be maintained.

- Inductive detector loops, magnetic detectors, radar detectors, image sensing (video) detectors, thermal imaging detectors, micro loops, preformed detector loops, microwave detectors, and amplifiers, microprocessors, relays and diodes. Communication for video detection systems, including transmitters, receivers, modems, and other miscellaneous communication equipment, regardless of its location in the system, shall be included under this pay item.

- A remote-controlled video system for monitoring traffic flow and road/pavement conditions. The video system shall include remote pan/tilt/zoom (PTZ) cameras

mounted on poles and/or mast arms, camera housings, all necessary mounting hardware, conduits, cables, connectors and related equipment. In addition, communication for the remote video system, including image digitizer (processor), transmitters, receivers, modems, and other miscellaneous communication equipment, regardless of its location in the system.

- ❖ Emergency Vehicle Preemption System (EVPS) including optical heads, discriminator card /amplifier, confirmation beacons, and associated wiring.
- ❖ UPS (Battery Back-up) Systems. The system is comprised of the UPS or Inverter unit, bypass switch, batteries, cabinet, and related wiring harnesses.
- ❖ Illuminated highway signs. The illumination shall be accomplished by incandescent lamps, fluorescent lamps, neon tubes, light emitting diodes, or fiber optics.
- ❖ Traffic signal conduit and interconnect conduit. The conduit may be in the ground or attached to structure.
- ❖ Traffic signal handholes and interconnect handholes including lids.
- ❖ Traffic signal cable and interconnect cable including copper wire and fiber optic.
- ❖ Electrical and telephone service installations.
- ❖ Fiber optic cable terminations, splices, and enclosures.
- ❖ Traffic signal wireless communication, including antennas, radios, power supply, and associated cables.
- ❖ Traffic adjusted master controllers with solid state features with associated equipment and where applicable, cabinet and foundation. The associated equipment shall consist of modems, telephone jacks, switching units, interface boards for copper and fiber optic type interconnect cables, and all associated components for a coordinated traffic control system.

A-2 TEMPORARY TRAFFIC SIGNAL LOCATION

This item shall consist of maintaining a temporary traffic signal location, either as part of a coordinated signal system or an isolated signalized intersection or as part of a temporary bridge signal. This item may include, but shall not be limited to, any number or type of the following: traffic signal posts, mast arms, combination mast arms, handholes, cabinet, system master controller, local controller, image sensors, a remote traffic PTZ camera and its associated image digitizer (processor), conflict monitor, malfunction monitor unit, detector amplifiers, modems, relays, load switches, terminal boards, power supplies, vehicle and/or pedestrian signal heads, brackets, sections, backplates, louvers, visors, vehicle detectors, pedestrian-actuated detectors, crosswalk signs, and/or electrical conduits, cables, and interconnects, and UPS systems. In addition, this item may include any number or type of the following: wood poles with down guys, span wire cable, span wire accessories, tether wires, electric service installation and cables, microwave detectors, fiber optic interconnect (aerial or in conduit), wireless communication equipment (antennas, radios, and associated equipment), and/or auxiliary components.

When directed by the Engineer, this item shall also include operational items such as controller database changes, timing changes, activation/deactivation of phases, relocation of signal heads, relocation and reconfiguration of detectors (microwave and/or video), and

bagging/un-bagging of signal heads.

A-3 FLASHING BEACON, OVERHEAD MOUNT, ONE OR MORE FACES

This item shall consist of maintaining a flashing beacon, mounted overhead, LED. This item may include, but shall not be limited to, a flasher controller in a housing, span-wire installation, and LED signal head with one or more faces and one or more sections. The span wire installation shall consist of two (2) or more wood poles with down guys, span wire cable, span wire accessories, wood pole mounted flasher cabinet and associated conduit, electric cable, and electric service installation.

A-4 FLASHING BEACON, POST MOUNT, ONE OR MORE FACES

This item shall consist of maintaining a post mount flashing beacon, LED. This item may include, but shall not be limited to, a flasher controller in a housing, electric service installation, solar panels, batteries, traffic signal post and foundation, handhole and associated conduit, and signal head with one or more faces and one or more sections. Rapid Rectangular Flashing Beacons (RRFB) shall be considered a post mount flashing beacon. Two post mount Flashing Beacons (i.e. RRFB) that are connected by wireless communication shall be paid for as two separate Flashing Beacons.

In the winter months, the Contractor shall remove snow from solar panels and the LED signal face when such snow cover affects the operation of the solar flashers and/or when directed to do so by the Engineer. Response time = Next Business Day.

The Contractor shall reset flashing beacons and inspect batteries during low battery events as directed by the Engineer. Response time = Next Business Day.

Any repairs required due to knockdowns by vehicular traffic shall be paid for on a Force Account Basis.

- Response time for knockdowns = 1 hour.
- Temporary repairs/service restoration = 4 hours.
- Repair/replacement of damage signal section housing (reuse of flasher components) = Next Business Day.
- Permanent repairs for knockdowns = 1 week.

ITEM B-1 – STREET LIGHTING ROUTINE MAINTENANCE PAY ITEMS

The following shall be part of Pay Item B-1: STREET LIGHTING LOCATION.

This item may include, but is not limited to, maintaining any of the following street light installations: a street light (luminaire) of any type (i.e. HPS, MH, LED, etc.) mounted on a combination mast arm, a traffic signal wood pole, a street light mounted under a bridge/overpass, and/or a street light mounted on its own pole. All repairs of malfunctions/damage to a street light installation shall be considered Routine Maintenance, except for damage caused by traffic, construction forces working under County contracts, permits, or County personnel, which will be paid for as Extra Work. In addition, the Contractor shall provide the following as part of Routine Maintenance of street lighting installations:

- ❖ Report to the Engineer any non-normal conditions within two working days of discovery.

- Replace all burned out lamps, faulty ballasts and broken glassware not later than two (2) working days following discovery or notification.

- Replace all burned out LED luminaires (with the same manufacturer and model LED) no later than fifteen (15) working days following discovery or notification. If directed by the Engineer, a temporary replacement luminaire may be needed while waiting for a replacement LED luminaire. Any LED street light outage shall be replaced per the Manufacturer's warranty. If outside the warranty, the outage shall be replaced as Extra Work. All temporary replacement luminaires shall be paid for as Extra Work.

- Replace broken or missing light deflectors/shields, as necessary.

- Replace any missing or damaged light pole and transformer base handhole covers as well as nut covers.

- Provide Immediate Corrective Action to restore proper working condition based upon the following chart:

INCIDENT OR PROBLEM	SERVICE RESPONSE TIME	SERVICE RESTORATION TIME	PERMANENT REPAIR TIME
Control cabinet out	1 hour	4 hours	7 Calendar days
Hanging mast arm	1 hour to clear	NA	7 Calendar days
Motorist caused damage or leaning light pole 10 degrees or more	1 hour to clear	4 hours	7 Calendar days
Circuit out – breaker	1 hour	4 hours	7 Calendar days
Circuit out – Cable trouble	1 hour	24 hours	21 Calendar days
Single Outage on Pole (Includes Nighttime Patrol or reported to Contractor)	N/A	N/A	7 Calendar days
Multiple Outages within a lighting system, (not successive or on the same circuit)	N/A	N/A	7 Calendar days
Outage of 3 or more successive lights	1 hour	4 hours	NA
Outage of 2 or more lights on the same circuit	1 hour	4 hours	NA

- The Contractor shall group re-lamp all NON-LED street lights at least once every two years of the Contract including renewal years of the contract. The lamp used shall have a 2-year lifespan and shall be approved by the Engineer and be of the same type and wattage as the lamp being replaced. The Contractor must furnish in writing, to the Engineer, a progress schedule indicating the dates on which the above work will be completed, and the work shall be completed by October 1st of the Contract year.

- The Contractor is not required to group re-lamp any LED street lights on the County system for the duration of this Contract.

- If ground conditions restrict the construction of permanent repairs, repairs shall be

performed in accordance with a maintenance schedule submitted by the Contractor and approved by the Engineer.

- ❖ The Contractor shall also perform a nighttime patrol of all non-LED lighting systems once a month. The Contractor shall look for outages within all of the County's lighting systems and any outages shall be addressed according to the response table above.

- ❖ The Contractor is not required to perform a monthly nighttime patrol of any LED lighting systems during the duration of this Contract.

ITEM E - EQUIPMENT

Under this item, for unit prices as shown in the Schedule of Prices, and when directed by the Engineer in writing, the Contractor shall furnish all materials, equipment, and labor necessary to perform the work as specified herein. All materials or work not expressly specified but necessary for the proper completion in a neat, professional manner shall be considered incidental and shall be included under the unit bid prices. The equipment unit prices shall not be required to be used for repair of knockdowns and equipment damage.

The following Illinois Department of Transportation Standards, latest revisions, shall be used as applicable for each authorization issued to the Contractor or as directed by the Engineer:

Standards: 720016-04, 805001-01, 814001-03, 814006-03, 821101-02 825001-04, 825006-03, 825011-04, 825016-04, 825021-04, 825026-04, 836001-04, 836011-02, 838001-01, 857001-01, 857006-01, 862001-01, 873001-02, 876001-04, 877001-08, 877002-04, 877006-06, 877011-10, 877012-07, 878001-11, 880001-01, 880006-01, 886001-01, 886006-01

E-1 FULL ACTUATED CONTROLLER & TYPE IV CABINET, NEMA-TS2
E-2 FULL ACTUATED CONTROLLER & TYPE V CABINET, NEMA-TS2

For both E-1 and E-2, this work shall consist of furnishing and installing an "Econolite" brand traffic actuated solid state digital controller (Cobalt model with touchscreen having newest version ASC3 software installed) in a NEMA TS2 Type 1 controller cabinet, meeting the requirements of the Standard Specifications Section 857, 863 and the included *Traffic Signal Specifications*.

Description.
This work shall consist of furnishing and installing a traffic actuated solid state digital controller in the controller cabinet of the type specified, meeting the requirements of Section 857 of the Standard Specifications, as modified herein, including malfunction management unit, load switches and flasher relays, with all necessary connections for proper operation.

If the intersection is part of an existing system and/or when specified in the plans, this work shall consist of furnishing and installing a(n) "Econolite" brand traffic actuated solid state controller (Cobalt with touchscreen, ASC3 software).

Materials.
Add the following to Article 857.02 of the Standard Specifications:

For installation as a stand-alone traffic signal, connected to a closed loop system or integrated into an advance traffic management system (ATMS), controllers shall be Econolite Cobalt w/Touchscreen (Graphics Edition) with the most recent version of ASC3 software installed. Only controllers supplied by one of the District One approved closed loop

equipment suppliers will be allowed. Unless specified otherwise on the plans or these specifications, the controller shall be of the most recent model and software version supplied by the equipment supplier at the time of the traffic signal TURN-ON. A removable controller data key shall also be provided. Individual load switches shall be provided for each vehicle, pedestrian, and right turn overlap phase. The controller shall prevent phases from being skipped during program changes and after all preemption events and shall inhibit simultaneous display of circular yellow and yellow arrow indications.

For integration into an ATMS such as Centracs, Tactics, or TransSuite, the controller shall have the latest version of NTCIP software installed. For operation prior to integration into an ATMS, the controller shall maintain existing close loop management communications.

Add the following to Article 1074.03 of the Standard Specifications:

(a)(6) Cabinets shall be designed for NEMA TS2 Type 1 operation. All cabinets shall be pre-wired for a minimum of eight (8) phases of vehicular, four (4) phases of pedestrian and four (4) phases of overlap operation.

(b)(5) Cabinets – Provide 1/8" (3.2 mm) thick unpainted aluminum alloy 5052-H32. The surface shall be smooth, free of marks and scratches. All external hardware shall be stainless steel. All seams/corners on the cabinet shall be welded.

(b) (6) Controller Harness – Provide a TS2 Type 2 “A” wired harness in addition to the TS2 Type 1 harness.

(b) (7) Surge Protection – Shall be a 120VAC Single phase Modular filter Plug-in type, supplied from an approved vendor.

(b) (8) BIU – Containment screw required.

(b) (9) Transfer Relays – Solid state or mechanical flash relays are acceptable.

(b) (10) Switch Guards – All switches shall be guarded.

(b) (11) Heating – Electric heaters (2 total), Hoffman model DAH2001A or equivalent located in upper left and lower right corners of cabinet, controlled by a thermostat on the heater itself.

(b) (12) Lighting – One (1) LED Panel shall be placed inside the cabinet top panel and one (1) LED Panel shall be placed on each side of the pull-out drawer/shelf assembly located beneath the controller support shelf. The LED Panels shall be controlled by a wall switch. Relume Traffic Control Box LED Panels and power supply or approved equivalent.

(b) (13) The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1 ½ inch (38mm) deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one (1) complete set of cabinet prints and manuals. This drawer shall support 50 lbs. (23 kg) in weight when fully extended. The drawer shall open and close smoothly. Drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 24 inches (610mm) wide.

(b) (14) Plan & Wiring Diagrams – 12” x 16” (305mm x 406mm) moisture sealed container attached to door.

(b) (15) Detector Racks – Fully wired and labeled for four (4) channels of emergency vehicle pre-emption and sixteen channels (16) of vehicular operation.

(b) (16) Field Wiring Labels – All field wiring shall be labeled.

(b) (17) Field Wiring Termination – Approved channel lugs required.

(b) (18) Power Panel – Provide a nonconductive shield.

(b) (19) Circuit Breaker – The circuit breaker shall be sized for the proposed load but shall not be rated less than 30 amps.

(b) (20) Police Door – Provide wiring and termination for plug in manual phase advance switch.

(b) (21) Railroad Pre-Emption Test Switch – Eaton 8830K13 SHA 1250 or equivalent.

(b) (22) Malfunction Management Unit (MMU) – The MMU supplied shall have a Liquid Crystal Display (LCD) and also have an Ethernet communications port.
(b) (23) Load Switch – All load switches shall have both input and output LED controller status indicators.

Basis of Payment: This work shall be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER AND CABINET of the type specified, which shall be payment in full for furnishing and installing the controller complete including malfunction management unit (LCD screen/Ethernet port), load switches and flasher relays, with necessary connections for proper operation. Removal of existing controller and cabinet shall be incidental to the cost of this item.

E-3 FULL ACTUATED CONTROLLER & TYPE IV CABINET, MODIFIED-65", NEMA-TS2

This work shall consist of furnishing and installing an "Econolite" brand traffic actuated solid state digital controller (Cobalt with Touchscreen, Graphics Edition, ASC3 software) in a NEMA TS2 Type 1 controller cabinet, meeting the requirements of the Standard Specifications Section 857, 863 and the included *Traffic Signal Specifications*.

This cabinet shall be 65" tall and include a third shelf.

Basis of Payment: This work shall be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER AND CABINET of the type specified, which shall be payment in full for furnishing and installing the controller complete including malfunction management unit (LCD screen/Ethernet port), load switches and flasher relays, with necessary connections for proper operation. Removal of existing controller and cabinet shall be incidental to the cost of this item.

E-4 INSTALL FULL ACTUATED CONTROLLER

Description.
This work shall consist of furnishing and installing a(n) "Econolite" brand traffic actuated solid state digital controller meeting the requirements of the current District One Traffic Signal Special Provisions 857.02TS Full Actuated Controller and Cabinet, and 857.02TS Railroad, Full Actuated Controller and Cabinet . This pay item shall include furnishing and installing the controller complete including malfunction management unit, load switches and flasher relays, and all necessary connections for proper operation.

Materials.
Add the following to Article 857.02 of the Standard Specifications:

Controllers shall be NTCIP compliant, Econolite Cobalt w/Touchscreen, Graphics Edition and the most recent version of ASC3 software installed unless specified otherwise on the plans or elsewhere on these specifications. A NTCIP compliant controller may be used at a traffic signal interconnected to railroad warning devices but only upon the approval of the Engineer. Only controllers supplied by one of the District One approved closed loop equipment supplier will be allowed. The controller shall be the most recent model and software version supplied by the equipment supplier at the time of the traffic signal TURN-ON and include data key. The traffic signal controller shall provide features to inhibit simultaneous display of a circular yellow ball and a yellow arrow display. Individual load switches shall be provided for each vehicle, pedestrian, and right turn overlap phase. The controller shall prevent phases from being omitted during program changes and after all preemption events.

E-5 INSTALL MASTER CONTROLLER

General.
This work shall consist of furnishing and installing a master controller, meeting the requirements of the current District One Traffic Signal Special Provisions 857.01TS FULL-ACTUATED CONTROLLER (SPECIAL), 857.02TS FULL-ACTUATED CONTROLLER AND CABINET, and 857.02TS RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET, including all necessary connections for proper operation.

If the intersection is part of an existing system and/or when specified in the plans, this work shall consist of furnishing and installing a(n) "Econolite" brand master controller.

Materials and Installation.
Revise Articles 860.02 and 860.03 of the Standard Specifications to read:

Only controllers supplied by one of the District approved closed loop equipment supplier will be allowed. Only NEMA TS 2 Type 1 Econolite closed loop systems shall be supplied. The latest model and software version of master controller shall be supplied.

Functional requirements in addition to those in Section 863 of the Standard Specifications include:

The system commands shall consist of, as a minimum, six (6) cycle lengths, five (5) offsets, three (3) splits, and four (4) special functions. The system commands shall also include commands for free or coordinated operation.

Traffic Responsive operation shall consist of the real time acquisition of system detector data, data validation, and the scaling of acquired volumes and occupancies in a deterministic fashion so as to cause the selection and implementation of the most suitable traffic plan.

Upon request by the Engineer, each master shall be delivered with up to three (3) complete sets of the latest edition of registered remote monitoring software with full manufacture's support. Each set shall consist of software on CD, DVD, or other suitable media approved by the Engineer, and a bound set of manuals containing loading and operating instruction. One copy of the software and support data shall be delivered to the Agency in charge of system operation, if other than IDOT. One of these two sets will be provided to the Agency Signal Maintenance Contractor for use in monitoring the system.

The approved manufacturer of equipment shall loan the District one master controller and two intersection controllers of the most recent models and the newest software version to be used for instructional purposes in addition to the equipment to be supplied for the Contract.

The Contractor shall arrange to install a standard voice-grade dial-up telephone line to the master controller. This shall be accomplished through the following process utilizing District One staff. This telephone line may be coupled with a DSL line and a phone filter to isolate the dial-up line. An E911 address is required.

The cabinet shall be provided with an Outdoor Network Interface for termination of the telephone service. It shall be mounted to the inside of the cabinet in a location suitable to provide access for termination of the telephone service at a later date.

Full duplex communication between the master and its local controllers is recommended, but at this time not required. The data rate shall be 1200 baud minimum and shall be capable of speeds to 38,400 or above as technology allows. The controller, when installed in an Ethernet topology, may operate non-serial communications.

The master controller shall be furnished with a NEMA rated Econolite 56K industrial modem.

E-6 INDUCTIVE LOOP SEALANT

This item shall consist of sealing loops with an approved sealant at locations specified by the Engineer. The approved sealant shall only be applied in dry condition and when the outside air temperature is above 40 degrees F. The sealant shall meet the requirements of Article 1079.02 of the Standard Specifications. Loop sealant used for resealing existing loops shall be an asphaltic-based component, either Doseal 230 or an approved equal. Sealant shall not extend more than 1/4-inch beyond the sawed slot. The Contract unit price per lineal foot shall include furnishing all materials, labor and equipment to complete the work. Lineal footage shall be measured along the sawed slot in the pavement containing the loop and lead-in.

E-7 DETECTOR LOOP, TYPE I

Procedure.
A minimum of seven (7) working days prior to the Contractor cutting loops, the Contractor shall mark the proposed loop locations and contact the Area Traffic Signal Maintenance and Operations Engineer (847) 705-4424 to inspect and approve the layout. When preformed detector loops are installed, the Contractor shall have them inspected and approved prior to the pouring of the Portland cement concrete surface, using the same notification process as above.

Installation.
Revise Article 886.04 of the Standard Specifications to read:
Loop detectors shall be installed according to the requirements of the "District One Standard Traffic Signal Design Details." Saw-cuts (homeruns on preformed detector loops) from the loop to the edge of pavement shall be made perpendicular to the edge of pavement when possible in order to minimize the length of the saw-cut (homerun on preformed detector loops) unless directed otherwise by the Engineer or as shown on the plan.

The detector loop cable insulation shall be labeled with the cable specifications.

Each loop detector lead-in wire shall be labeled in the handhole using a water proof tag, from an approved vendor, secured to each wire with nylon ties.

Resistance to ground shall be a minimum of 100 mega-ohms under any conditions of weather or moisture. Inductance shall be more than 50 and less than 700 microhenries. Quality readings shall be more than 5.

(a) Type I. All loops installed in new asphalt pavement shall be installed in the binder course and not in the surface course. The edge of pavement, curb and handhole shall be cut with a 1/4 inch (6.3 mm) deep x 4 inches (100 mm) saw cut to mark location of each loop cable.

(b) Loop sealant shall be two-component thixotropic chemically cured polyurethane from an approved vendor. The sealant shall be installed 1/8 inch (3 mm) below the pavement surface. If installed above the surface the excess shall be removed immediately.

(c) Preformed. This work shall consist of furnishing and installing a rubberized or cross-linked polyethylene heat resistant preformed traffic signal loop in accordance with the Standard Specifications, except for the following:

(d) Preformed detector loops shall be installed in the sub-base under the Portland cement concrete pavement. Loop lead-ins shall be extended to a temporary protective enclosure

near the proposed handhole location. The protective enclosure shall provide sufficient protection from other construction activities and may be buried for additional protection.

(e) Handholes shall be placed next to the shoulder or back of curb when preformed detector loops enter the handhole. CNC, included in this pay item, shall be used to protect the preformed lead-ins from back of curb to the handhole.

(f) Preformed detector loops shall be factory assembled with ends capped and sealed against moisture and other contaminants. The loop configurations and homerun lengths shall be assembled for the specific application. The loop and homerun shall be constructed using 5/8 inch (16 mm) outside diameter (minimum), 3/8 inch (9.5 mm) inside diameter (minimum) Class A oil resistant synthetic cord reinforced hydraulic hose with 250 psi (1,720 kPa) internal pressure rating or a similarly sized XLPE cable jacket. Hose for the loop and homerun assembly shall be one continuous piece. No joints or splices shall be allowed in the hose except where necessary to connect homeruns to the loops. This will provide maximum wire protection and loop system strength. Hose tee connections shall be heavy duty high temperature synthetic rubber. The tee shall be of proper size to attach directly to the hose, minimizing glue joints. The tee shall have the same flexible properties as the hose to ensure that the whole assembly can conform to pavement movement and shifting without cracking or breaking. For XLPE jacketed preformed loops, all splice connections shall be soldered, sealed, and tested before being sealed in a high impact glass impregnated plastic splice enclosure. The wire used shall be #16 THWN stranded copper. The number of turns in the loop shall be application specific. Homerun wire pairs shall be twisted a minimum of eight turns per foot. No wire splices will be allowed in the preformed loop assembly. The loop and homeruns shall be filled and sealed with a flexible sealant to insure complete moisture blockage and further protect the wire. The preformed loops shall be constructed to allow a minimum of 6.5 feet of extra cable in the handhole.

Method of Measurement.
Add the following to Article 886.05 of the Standard Specifications:

Preformed detector loops will be measured along the detector loop embedded in the pavement, rather than the actual length of the wire. Detector loop measurements shall include the saw cut and the length of the detector loop wire to the edge of pavement. The detector loop wire, including all necessary connections for proper operations, from the edge of pavement to the handhole, shall be included in the price of the detector loop. CNC, trench and backfill, and drilling of pavement or handholes shall be included in detector loop quantities.

Basis of Payment.
This work shall be paid for at the contract unit price per foot (meter) for DETECTOR LOOP, TYPE I or PREFORMED DETECTOR LOOP as specified in the plans, which price shall be payment in full for furnishing and installing the detector loop and all related connections for proper operation.

E-8 SERVICE INSTALLATION – METERED, GROUND MOUNT

Description.
This work shall consist of all materials and labor required to install, modify, or extend the electric service installation. All installations shall meet the requirements of the “District One Standard Traffic Signal Design Details”.

General.
The electric service installation shall be the electric service disconnecting means and it shall be identified as suitable for use as service equipment.

The electric utility contact information is noted on the plans and represents the current information at the time of contract preparation. The Contractor must request in writing for service and/or service necessary documents and payment are received by the utility. The Contractor shall forward copies of all correspondence between the contractor and utility company to the Engineer and Area Traffic Signal Maintenance and Operations Engineer. The service agreement and sketch shall be submitted for signature to the IDOT's Traffic Operations Programs Engineer.

Materials.

a. General. The completed control panel shall be constructed in accordance with UL Std. 508A, Industrial Control Panel, and carry the UL label. Wire terminations shall be UL listed.

b. Enclosures.

1. Pole Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 4X, unfinished single door design, fabricated from minimum 0.080-inch (2.03 mm) thick Type 5052 H-32 aluminum. Seams shall be continuous welded and ground smooth. Stainless steel screws and clamps shall secure the cover and assure a watertight seal. The cover shall be removable by pulling the continuous stainless-steel hinge pin. The cabinet shall have an oil-resistant gasket and a lock kit shall be provided with an internal O-ring in the locking mechanism assuring a watertight and dust-tight seal. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 14-inches (350 mm) high, 9-inches (225 mm) wide and 8-inches (200 mm) in depth is required. The cabinet shall be channel mounted to a wooden utility pole using assemblies recommended by the vendor.

2. Ground Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 3R unfinished single door design with back panel. The cabinet shall be fabricated from Type 5052 H-32 aluminum with the frame and door 0.125-inch (3.175 mm) thick, the top 0.250-inch (6.350 mm) thick and the bottom 0.500-inch (12.70 mm) thick. Seams shall be continuous welded and ground smooth. The door and door opening shall be double flanged. The door shall be approximately 80% of the front surface, with a full length tamperproof stainless steel .075-inch (1.91 mm) thick hinge bolted to the cabinet with stainless steel carriage bolts and nylocks nuts. The locking mechanism shall be slam-latch type with a keyhole cover. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 40-inches (1000 mm) high, 16-inches (400 mm) wide and 15-inches (375 mm) in depth is required. The cabinet shall be mounted upon a square Type A concrete foundation as indicated on the plans. The foundation is paid for separately.

3. All enclosures shall include a green external power indicator LED light with circuitry as shown in the Electrical Service-Panel Diagram detail sheet. For pole mounted service enclosures, the power indicator light shall be mounted as shown in the detail. For ground mounted enclosures, the power indicator light shall be mounted on the side of the enclosure most visible from the major roadway.

c. Electric Utility Meter Housing and Riser. The electric meter housing and meter socket shall be supplied and installed by the contractor. The contractor is to coordinate the work to be performed and the materials required with the utility

company to make the final connection at the power source. Electric utility required risers, weather/service head and any other materials necessary for connection shall also be included in the pay item. Materials shall be in accordance with the electric utility's requirements. For ground-mounted service, the electric utility meter housing shall be mounted to the enclosure. The meter shall be supplied by the utility company. Metered service shall not be used unless specified in the plans.

d. Surge Protector. Overvoltage protection, with LED indicator, shall be provided for the 120 volt load circuit by the means MOV and thermal fusing technology. The response time shall be <5n seconds and operate within a range of –40C to +85C. The surge protector shall be UL 1449 Listed.

e. Circuit Breakers. Circuit breakers shall be standard UL listed molded case, thermal-magnetic bolt-on type circuit breakers with trip free indicating handles. 120-volt circuit breakers shall have an interrupting rating of not less than 65,000 rms symmetrical amperes. Unless otherwise indicated, the main disconnect circuit breaker for the traffic signal controller shall be rated 60 amperes, 120 V and the auxiliary circuit breakers shall be rated 10 amperes, 120 V.

f. Fuses, Fuseholders and Power Indicating Light. Fuses shall be small-dimensional cylindrical fuses of the dual element time-delay type. The fuses shall be rated for 600 V AC and shall have a UL listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated voltage. The power indicating light shall be LED type with a green colored lens and shall be energized when electric utility power is present.

g. Ground and Neutral Bus Bars. A single copper ground and neutral bus bar mounted on the equipment panel shall be provided. Ground and neutral conductors shall be separated on the bus bar. Compression lugs, plus 2 spare lugs, shall be sized to accommodate the cables with the heads of the connector screws painted green for ground connections and white for neutral connections.

h. Utility Services Connection. The Contractor shall notify the Utility Company marketing representative a minimum of 30 working days prior to the anticipated date of hook-up. This 30-day advance notification will begin only after the Utility Company marketing representative has received service charge payments from the Contractor. Prior to contacting the Utility Company marketing representative for service connection, the service installation controller cabinet and cable must be installed for inspection by the Utility Company.

i. Ground Rod. Ground rods shall be copper-clad steel, a minimum of 10 feet (3.0m) in length, and 3/4 inch (20mm) in diameter. Ground rod resistance measurements to ground shall be 25 ohms or less. If necessary additional rods shall be installed to meet resistance requirements at no additional cost to the contract.

Installation.

a. General. The Contractor shall confirm the orientation of the traffic service installation and its door side with the engineer, prior to installation. All conduit entrances into the service installation shall be sealed with a pliable waterproof material.

b. Pole Mounted. Brackets designed for pole mounting shall be used. All mounting hardware shall be stainless steel. Mounting height shall be as noted on the plans or as directed by the Engineer.

c. Ground Mounted. The service installation shall be mounted plumb and level on the foundation and fastened to the anchor bolts with hot-dipped galvanized or stainless-steel nuts and washers. The space between the bottom of the enclosure and the top of the foundation shall be caulked at the base with silicone.

Basis of Payment.
The service installation shall be paid for at the contract unit price each for SERVICE INSTALLATION of the type specified which shall be payment in full for furnishing and installing the service installation complete. The CONCRETE FOUNDATION, TYPE A, which includes the ground rod, shall be paid for separately. SERVICE INSTALLATION, POLE MOUNTED shall include the 3/4-inch (20mm) grounding conduit, ground rod, and pole mount assembly. Any charges by the utility companies shall be approved by the engineer and paid for as an addition to the contract according to Article 109.05 of the Standard Specifications.

E-9 CONCRETE FOUNDATION, TYPE A
E-10 CONCRETE FOUNDATION, TYPE C

The items listed above (E-9 & E-10) shall comply with Section 878 of the Standard Specifications for Road and Bridge Construction. These items shall include anchor bolts, nuts, washers, and ground rods as specified for the type of post, pole, or cabinet being installed at the location. The size of the Type E foundation shall be specified by the Engineer.

E-11 CONCRETE HANDHOLE
E-12 CONCRETE HEAVY DUTY HANDHOLE
E-13 CONCRETE DOUBLE HANDHOLE

The items listed above (E-11 through E-13) shall comply with Section 814, Article 1020, and Article 1088.06 of the Standard Specifications for Road and Bridge Construction.

E-14 VIDEO DETECTION SYSTEM, SINGLE APPROACH

Description.
This work shall consist of furnishing and installing a video vehicle detection system as specified and/or as shown on the plans. This pay item shall include all necessary work and equipment required to have a fully operational system including but not limited to the detector unit/s, the interface unit and all the necessary hardware, cables and accessories required to complete the installation in accordance with the manufacturer's specifications.

The video vehicle detection system shall work under all weather conditions, including rain, freezing rain, snow, wind, dust, fog, and changes in temperature and light. It shall work in an ambient temperature range of -34 to 74 degrees Celsius.

The video vehicle detection system shall be compatible with the District's approved traffic controller assemblies utilizing NEMA TS 1 or NEMA TS 2 controllers and cabinet components for full time operation. The video vehicle detection system shall provide a minimum of one interface unit that has Ethernet connectivity, surge protection and shall be capable of supporting a minimum of 2 detector units. The video vehicle detection system shall include a display inside the cabinet that has a minimum 10" screen with a minimum 1280x800 resolution.

The video vehicle detection system shall be one of the following systems or an approved equivalent:

- Autoscope Vision
- Iteris Vantage Next

A representative from the supplier of the video vehicle detection system shall supervise the installation and testing of the video vehicle detection system and shall be present at the traffic signal turn-on inspection. Once the video vehicle detection system is configured, it shall not need reconfiguration to maintain performance, unless the roadway configuration or the application requirements change.

The mounting location/s of the detector unit/s shall be per the manufacturer's recommendations. If an extension mounting assembly is needed, it shall be included in this item. All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The video detection system shall be warrantied, free from material and workmanship defects for a period of two years from final inspection.

Basis of Payment.

This work shall be paid for at the contract unit price each for VIDEO DETECTION SYSTEM, SINGLE APPROACH, the price of which shall include the cost for all of the work and material described herein and includes furnishing, installing, delivery, handling, testing, set-up and all appurtenances and mounting hardware necessary for a fully operational video vehicle detection system.

TRAFFIC SIGNAL MAINTENANCE CONTRACT
LOCATION LIST

The following is a listing of the locations that the Contractor shall be responsible to maintain under this Contract (see Locations Map on following page). The list includes traffic signal locations, street lighting locations, as well as a listing of the type and number of County maintained flasher systems. The number of traffic signal locations varies due to construction, maintenance transfers, new installations, maintenance agreement revisions, and removals. The location list shall not be considered all-inclusive or comprehensive in any way, and the McHenry County Division of Transportation shall not be held accountable for any errors on the list.

Item #	Location	Type of System	Nearest Village/City
FB-1	Jefferson Street (West Union Rd) @ Main Street (Union Rd)	Overhead Flasher	Union
FB-2	Blivin Street/Richardson Road @ Main Street	Overhead Flasher	Spring Grove
FB-3	Algonquin Road, West of Hanson Rd/Hilltop Dr	Post Mount Flasher	Algonquin
FB-4	Walkup Road, North & South of Dvorak Drive	2-Post Mount Flashers	Crystal Lake
FB-5	Walkup Road @ Talismon Drive (Veterans Acres Park)	2-Post Mount Flashers (RRFB)	Crystal Lake
FB-6	Walkup Road, South of Burning Bush Drive (MCCD Bikepath)	2-Post Mount Flashers (RRFB)	Crystal Lake
FB-7	Harmony Road, E & W of Huntley High School Entrance	2-Post Mount Flashers	Huntley
FB-8	Deerpass Road, North & South of River Road	2-Post Mount Flashers	Marengo
FB-9	Cary Road @ Norman Drive	2-Post Mount Flashers (RRFB)	Cary
FB-10	Alden Road, North & South of O'Brien Road	2-Post Mount Flashers	Alden
FB-11	O'Brien Road (East & West Legs) @ Alden Road	2-Post Mount Flashers	Alden
FB-12	Country Club Road, North & South of Hillside Road	2-Post Mount Flashers	Crystal Lake
FB-13	Franklinville Road, North & South of Perkins Road	2-Post Mount Flashers	Woodstock
FB-14	Perkins Road, (East & West Legs) @ Franklinville Road	2-Post Mount Flashers	Woodstock
FB-15	Ridgefield Road, North of US RT 14 (MCCD Bikepath Crossing)	2-Post Mount Flashers (RRFB)	Crystal Lake
FB-16	Spring Grove Road, North & South of Miller Road	2-Post Mount Flashers	Spring Grove
FB-17	Miller Road, (East and West Legs) @ Spring Grove Road	2-Post Mount Flashers	Spring Grove
FB-18	Johnsburg Road, West of Chapel Hill Road (Pedestrian Crossing)	2-Post Mount Flashers (RRFB)	Johnsburg
FB-19	Chapel Hill Road @ Reed Avenue (Pedestrian Crossing)	2-Post Mount Flashers (RRFB)	Johnsburg
FB-20	Ackman Road @ Westport Ridge (Pedestrian Crossing)	2-Post Mount Flashers (RRFB)	Crystal Lake
FB-21	Ackman Road @ Amberwood Drive (Pedestrian Crossing)	2-Post Mount Flashers (RRFB)	Crystal Lake

FB-22	Pyott Road, North & South of Oak Street	2-Post Mount Flashers	Lake in the Hills
FB-23	Oak Grove Road @ Center Street (Pedestrian Crossing)	2-Post Mount Flashers (RRFB)	Chemung
FB-24	Virginia Road, south of US Route 14	2-Post Mount Flashers (RRFB)	Crystal Lake
HL-1	Algonquin Road Lighting @ Randall Road	Highway Lighting System (90; – LED Street Lights)	Algonquin
HL-2	Algonquin Road Lighting @ Harvest Gate Road/Talaga Dr	Highway Lighting System (23 – HPS Street Lights)	Lake in the Hills
HL-3	Algonquin Road Lighting @ Square Barn Road/Frank Rd	Highway Lighting System (31 – LED Street Lights)	Lake in the Hills
HL-4	Algonquin Road Lighting @ Lakewood Road	Highway Lighting System (23 – LED Street Lights)	Lake in the Hills
HL-5	Algonquin Road Lighting @ Haligus Road	Highway Lighting System (22 – LED Street Lights)	Huntley
HL-6	Rakow Road Lighting @ Pingree Road	Highway Lighting System (17 – HPS Street Lights)	Crystal Lake
HL-7	Rakow Road Lighting @ Pyott Road/Virginia Road	Highway Lighting System (66 – HPS Street Lights)	Crystal Lake
HL-8	Rakow Rd/Randall Rd Lighting @ McHenry Ave/Ackman Rd	Highway Lighting System (78 – HPS Street Lights)	Crystal Lake
HL-9	Randall Road Lighting @ Miller Road	Highway Lighting System (14 – HPS Street Lights)	Crystal Lake
HL-10	Randall Road Lighting @ Acorn Lane/Polaris Drive	Highway Lighting System (34 – LED Street Lights)	Lake in the Hills
HL-11	Randall Road Lighting @ Huntington Drive/Bunker Hill Dr	Highway Lighting System (55 – LED Street Lights)	Algonquin
HL-12	Randall Road Lighting @ Harnish Drive	Highway Lighting System (16 – HPS Street Lights)	Algonquin
HL-13	Randall Road Lighting, North of County Line Road	Highway Lighting System (24 – HPS Street Lights)	Algonquin
HL-14	Ackman Road Lighting @ Golf Course Road	Highway Lighting System (20 – HPS Street Lights)	Crystal Lake
HL-15	Bull Valley Road Lighting @ Ridgeview Drive	Highway Lighting System (10 – LED Street Lights)	McHenry
HL-16	Miller Road Lighting @ River Road	Highway Lighting System (18 – MH Street Lights)	McHenry
HL-17	McHenry Avenue (Old Miller Rd) Lighting @ Bull Valley Rd	Highway Lighting System (3 – LED Street Lights)	McHenry
HL-18	Virginia Road @ IL Rte 31 Park & Ride Parking Lot	Parking Lot Lighting (20 – MH Street Lights)	Lake in the Hills
HL-19	Johnsburg Road Lighting @ Spring Grove Road	Highway Lighting System (9 – LED Street Lights)	Johnsburg
HL-20	Johnsburg Road Lighting @ Chapel Hill Road	Highway Lighting System (16 – LED Street Lights)	Johnsburg
HL-21	Virginia Road Lighting @ Pyott Road/Main Street	Highway Lighting System (18 – HPS Street Lights)	Crystal Lake
HL-22	Miller Road Lighting @ Green Street	Highway Lighting System (12 – MH Street Lights)	McHenry
HL-23	Charles Road Lighting @ Raffel Road	Highway Lighting System (18 – LED Street Lights)	Woodstock
HL-24	River Road Lighting @ Dowell Road	Highway Lighting System (13 – LED Street Lights)	Island Lake
TS-1	Algonquin Road @ Pyott Road	Traffic Signal	Algonquin
TS-2	Algonquin Rd @ Hanson Rd/Hilltop Dr	Traffic Signal	Algonquin

TS-3	Algonquin Road @ Crystal Lake Road	Traffic Signal	Lake in the Hills
TS-4	Algonquin Road @ Harvest Gate Rd/Talaga Dr	Traffic Signal	Lake in the Hills
TS-5	Algonquin Road @ Frank Road	Traffic Signal	Lake in the Hills
TS-6	Algonquin Road @ Square Barn Road	Traffic Signal	Lake in the Hills
TS-7	Algonquin Rd @ Huntley Fire Ent	Traffic Signal	Algonquin
TS-8	Algonquin Road @ Lakewood Road	Traffic Signal	Lake in the Hills
TS-9	Algonquin Road @ Haligus Road	Traffic Signal	Huntley
TS-10	Rakow Road @ Pingree Road	Traffic Signal	Crystal Lake
TS-11	Rakow Road @ Virginia Road	Traffic Signal	Crystal Lake
TS-12	Rakow Road @ Pyott Road	Traffic Signal	Crystal Lake
TS-13	Randall Rd/Rakow Rd @ McHenry Avenue	Traffic Signal	Crystal Lake
TS-14	Randall Road @ Ackman Rd/Meredith Dr	Traffic Signal	Crystal Lake
TS-15	Randall Road @ Miller Road	Traffic Signal	Crystal Lake
TS-16	Randall Road @ Acorn Ln/Polaris Dr	Traffic Signal	Lake in the Hills
TS-17	Randall Road @ Commercial Dr	Traffic Signal	Lake in the Hills
TS-18	Randall Road @ Algonquin Road	Traffic Signal	Algonquin
TS-19	Randall Road @ Stonegate Rd	Traffic Signal	Algonquin
TS-20	Randall Road @ Huntington Dr/Bunker Hill Rd	Traffic Signal	Algonquin
TS-21	Randall Road @ Harnish Drive	Traffic Signal	Algonquin
TS-22	Virginia Road @ Pyott Rd/Main St	Traffic Signal	Crystal Lake
TS-23	Virginia Road @ Berkshire Drive	Traffic Signal	Crystal Lake
TS-24	Virginia Road @ Teckler Boulevard	Traffic Signal	Crystal Lake
TS-25	Walkup Road @ Hillside Road	Traffic Signal	Crystal Lake
TS-26	Walkup Road @ Pleasant Hill Rd/Deerwood Dr	Traffic Signal	Crystal Lake
TS-27	Walkup Road @ Edgewood Rd/Berry Ct	Traffic Signal	Crystal Lake
TS-28	Walkup Road @ Crystal Springs Road	Traffic Signal	Crystal Lake
TS-29	Crystal Lake Road @ Mason Hill Road	Traffic Signal	McHenry
TS-30	Bull Valley Road @ Crystal Lake Road	Traffic Signal	McHenry
TS-31	Bull Valley Road @ Ridgeview Drive	Traffic Signal	McHenry
TS-32	Miller Road @ Green Street	Traffic Signal	McHenry
TS-33	Miller Road @ River Road	Traffic Signal	McHenry
TS-34	Ackman Road @ Golf Course Road	Traffic Signal	Crystal Lake
TS-35	Cary Road @ Main Street	Traffic Signal	Cary
TS-36	Chapel Hill Road @ Bay Road	Traffic Signal	Johnsburg
TS-37	Chapel Hill Road @ Lincoln Road	Traffic Signal	McHenry
TS-38	Wilmot Road @ Main Street	Traffic Signal	Spring Grove
TS-39	Johnsburg Road @ Riverside Drive	Traffic Signal	Johnsburg
TS-40	Johnsburg Road @ Spring Grove Road	Traffic Signal	Johnsburg
TS-41	Harmony Road @ Hemmer Road	Temporary Traffic Signal	Huntley
TS-42	Marengo Rd/Harmony Rd @ Main St	Temporary Traffic Signal	Huntley
TS-43	Lakewood Road @ Reed Road	Traffic Signal	Lake in the Hills
TS-44	Lakewood Road @ Miller Road	Temporary Traffic Signal	Lake in the Hills

TRAFFIC SIGNAL MAINTENANCE CONTRACT
SCHEDULE OF ROUTINE MAINTENANCE PAY ITEMS

The following is a listing of the Routine Maintenance Pay Items that the Contractor shall be responsible to maintain under this Contract. The quantity of each pay item is provided to enable the Contractor to readily determine the Routine Maintenance Pay Items at a given location. This list is comprised of existing equipment owned and/or maintained by the McHenry County Division of Transportation. The list includes locations of traffic signals, flashing beacons, and street lighting systems. The Routine Maintenance Pay Items at a given location vary due to construction, maintenance transfers, new installations, maintenance agreement revisions, and removals. The Schedule of Routine Maintenance Pay Items shall not be considered all-inclusive or comprehensive in any way, and the McHenry County Division of Transportation shall not be held accountable for any errors on the list.

MCHENRY COUNTY DIVISION OF TRANSPORTATION

TRAFFIC SIGNAL MAINTENANCE CONTRACT (22-00000-01-GM)

SCHEDULE OF ROUTINE MAINTENANCE PAY ITEMS MASTER LIST FOR 2022

A1: Traffic Signal Location
A2: Temporary Traffic Signal Location
A3: Overhead Flashing Beacon
A4: Post Mount Flashing Beacon
B1: Street Light Location

#	Zone	Inter.	Location	Routine Maintenance Pay Items				
				A1	A2	A3	A4	B1
			TRAFFIC SIGNALS					
TS1	1	11	Algonquin Road @ Pyott Road	1				3
TS2	1	10	Algonquin Road @ Hanson Rd/Hilltop Dr	1				4
TS3	1	9	Algonquin Road @ Crystal Lake Road	1				4
TS4	1	8	Algonquin Road @ Harvest Gate Rd/Talaga Dr	1				
TS5	6	3	Algonquin Road @ Frank Road	1				
TS6	6	2	Algonquin Road @ Square Barn Road	1				
TS7			Algonquin Road @ Huntley Fire Station Entrance (HAWK)	1				
TS8	6	1	Algonquin Road @ Lakewood Road	1				
TS9	7	1	Algonquin Road @ Haligus Road	1				
TS10	4	5	Rakow Road @ Pingree Road	1				
TS11	4	4	Rakow Road @ Virginia Road	1				
TS12	4	3	Rakow Road @ Pyott Road	1				
TS13	4	2	Randall Rd/Rakow Rd @ McHenry Avenue	1				
TS14	4	1	Randall Road @ Ackman Rd/Meredith Dr	1				
TS15	1	7	Randall Road @ Miller Road	1				
TS16	1	6	Randall Road @ Acorn Ln/Polaris Dr	1				
TS17	1	5	Randall Road @ Commercial Dr	1				
TS18	1	4	Randall Road @ Algonquin Road	1				
TS19	1	3	Randall Road @ Stonegate Rd	1				
TS20	1	2	Randall Road @ Huntington Dr/Bunker Hill Rd	1				
TS21	1	1	Randall Road @ Harnish Drive	1				
TS22	3	1	Virginia Road @ Pyott Rd/Main St.	1				
TS23	3	2	Virginia Road @ Berkshire Drive	1				
TS24	3	3	Virginia Road @ Teckler Boulevard	1				
TS25			Walkup Road @ Hillside Road	1				4
TS26			Walkup Road @ Pleasant Hill Rd/Deerwood Dr	1				4
TS27			Walkup Road @ Edgewood Rd/Berry Ct	1				4
TS28			Walkup Road @ Crystal Springs Road	1				2
TS29			Crystal Lake Road @ Mason Hill Road	1				2
TS30			Bull Valley Road @ Crystal Lake Road	1				
TS31			Bull Valley Road @ Ridgeview Drive	1				
TS32			Miller Road @ Green Street	1				
TS33			Miller Road @ River Road	1				
TS34			Ackman Road @ Golf Course Road	1				
TS35			Cary Road @ Main Street	1				
TS36			Chapel Hill Road @ Bay Road	1				2
TS37			Chapel Hill Road @ Lincoln Road	1				4
TS38			Wilmot Road @ Main Street	1				4
TS39			Johnsburg Road @ Riverside Drive	1				4
TS40			Johnsburg Road @ Spring Grove Road	1				
TS41	5	1	Harmony Road @ Hemmer Road		1			3
TS42	5	2	Marengo Rd/Harmony Rd @ Main St		1			3
TS43	6	4	Lakewood Road @ Reed Road	1				4
TS44	6	5	Lakewood Road @ Miller Road		1			4

MCHENRY COUNTY DIVISION OF TRANSPORTATION

TRAFFIC SIGNAL MAINTENANCE CONTRACT (22-00000-01-GM)

22SCHEDULE OF ROUTINE MAINTENANCE PAY ITEMS MASTER LIST FOR 2022

A1: Traffic Signal Location
A2: Temporary Traffic Signal Location
A3: Overhead Flashing Beacon
A4: Post Mount Flashing Beacon
B1: Street Light Location

#	Zone	Inter.	Location	Routine Maintenance Pay Items				
				A1	A2	A3	A4	B1
			FLASHING BEACONS					
FB1			Jefferson Street (W. Union Rd) @ Main Street (Union Rd)			1		
FB2			Blivin Street/Richardson Road @ Main Street			1		
FB3			Algonquin Road, West of Hanson Rd/Hilltop Dr				1	
FB4			Walkup Road @ Dvorak Drive				2	
FB5			Walkup Road @ Talison Drive (Verterans Acres Park)				2	
FB6			Walkup Road, South of Burning Bush Trail (MCCD path)				2	
FB7			Harmony Road, East and West of Huntley High School				2	
FB8			Deerpass Road, North and South of River Road				2	
FB9			Cary Road, North and South of Norman Drive				2	
FB10			Alden Road, North and South of O'Brien Road				2	
FB11			O'Brien Road, (East and West Legs) @ Alden Road				2	
FB12			Country Club Road, North and South of Hillside Road				2	
FB13			Franklinville Road, North and South of Perkins Road				2	
FB14			Perkins Road, (East and West Legs) @ Franklinville Road				2	
FB15			Ridgefield Rd, North of US Rte 14 (North & South of Bikepath)				2	
FB16			Spring Grove Road. North and South of Miller Road				2	
FB17			Miller Road (East and West Legs) @ Spring Grove Road				2	
FB18			Johnsburg Road, West of Chapel Hill Road (Ped Crossing)				2	
FB19			Chapel Hill Road @ Reed Avenue (Ped Crossing)				2	
FB20			Ackman Road @ Westport Ridge (Ped Crossing)				2	
FB21			Pyott Road, North and South of Oak Street				2	
FB22			Oak Grove Road @ Center Street (Ped Crossing - Dean Foods)				2	
FB23			Virginia Road, South of US Route 14 (Ped Crossing)				2	
FB24			Ackman Road @ Amberwood Drive (Ped Crossing)				4	
			HIGHWAY LIGHTING					
HL1			Algonquin Road Lighting @ Randall Rd/Crystal Lake Rd					90
HL2			Algonquin Road Lighting @ Harvest Gate Rd/Talaga Dr					23
HL3			Algonquin Road Lighting @ Square Barn Rd/Frank Rd					31
HL4			Algonquin Road Lighting @ Lakewood Road					23
HL5			Algonquin Road Lighting @ Haligus Road					22
HL6			Rakow Road @ Pingree Road					17
HL7			Rakow Road @ Pyott Road/Virginia Road					66
HL8			Rakow/Randall Road Lighting @ McHenry Ave/Ackman Rd					78
HL9			Randall Road Lighting @ Miller Road					14
HL10			Randall Road Lighting @ Acorn Lane/Polaris Drive					34
HL11			Randall Road Lighting @ Huntington Dr/Bunker Hill Rd					55
HL12			Randall Road Lighting @ Harnish Drive					16
HL13			Randall Road Lighting, North of County Line Road					24
HL14			Ackman Road Lighting @ Golf Course Road					20
HL15			Bull Valley Road Lighting @ Ridgeview Drive					10
HL16			Miller Road Lighting @ River Road					18
HL17			McHenry Avenue (Old Miller Rd) Lighting @ Bull Valley Rd					3
HL18			Virginia Rd @ IL Rte 31 Park & Ride Commuter Parking Lot					20
HL19			Johnsburg Road Lighting @ Spring Grove Rd					9
HL20			Johnsburg Road Lighting @ Chapel Hill Road					16
HL21			Virginia Road Lighitng @ Pyott Rd/Main St					18
HL22			Miller Road Lighting @ Green Street					12
HL23			Charles Road Lighting @ Raffel Road					18
HL24			River Road Lighitng @ Dowell Road					13
			TOTAL	41	3	2	45	705

McHenry County Division of Transportation

Traffic Signal Specifications

TRAFFIC SIGNAL SPECIFICATIONS

Effective: **May 22, 2002**
Revised: **August 1, 2021**

These Traffic Signal Special Provisions and the "District 1 Standard Traffic Signal Design Details" supplement the requirements of the State of Illinois "Standard Specifications for Road and Bridge Construction." The intent of these Special Provisions is to prescribe the materials and construction methods commonly used for traffic signal installations. All material furnished shall be new. The locations and the details of all installations shall be as indicated on the Plans or as directed by the Engineer. Traffic signal construction and maintenance work shall be performed by personnel holding IMSA Traffic Signal Technician Level II certification. The work to be done under this contract consists of furnishing and installing all traffic signal work as specified in the Plans and as specified herein in a manner acceptable and approved by the Engineer.

MAST ARM SIGN PANELS
Effective: May 22, 2002
Revised: July 1, 2015
720.01TS

Add the following to Article 720.02 of the Standard Specifications:

Sign stiffening channel systems shall be aluminum and meet the requirements of ASTM 6261-T5. Sign mounting banding, buckles and buckle straps shall be manufactured from AISI 201 stainless steel.

SIGN SHOP DRAWING SUBMITTAL
Effective: January 22, 2013
Revised: July 1, 2015
720.02TS

Add the following paragraph to Article 720.03 of the Standard Specifications:

Shop drawings will be required, according to Article 105.04, for all Arterials/Expressways signs except standard highway signs covered in the MUTCD. Shop drawings shall be submitted to the Engineer for review and approval prior to fabrication. The shop drawings shall include dimensions, letter sizing, font type, colors and materials.

TRAFFIC SIGNAL GENERAL REQUIREMENTS
Effective: May 22, 2002
Revised: March 25, 2016
800.01TS

These Traffic Signal Special Provisions and the "District One Standard Traffic Signal Design Details" supplement the requirements of the State of Illinois "Standard Specifications for Road and Bridge Construction." The intent of these Special Provisions is to prescribe the materials and construction methods commonly used for traffic signal installations.

- All material furnished shall be new unless otherwise noted herein.
- Traffic signal construction and maintenance work shall be performed by personnel holding current IMSA Traffic Signal Technician Level II certification. A copy of the certification shall be immediately available upon request of the Engineer.
- The work to be done under this contract consists of furnishing, installing and maintaining all traffic signal work and items as specified in the Plans and as specified herein in a manner acceptable and approved by the Engineer.

Definitions of Terms.
Add the following to Section 101 of the Standard Specifications:

101.56 Vendor. Company that sells a particular type of product directly to the contractor or the Equipment Supplier.

101.57 Equipment supplier. Company that supplies, represents and provides technical support for IDOT District One approved traffic signal controllers and other related equipment. The Equipment Supplier shall be located within IDOT District One and shall:

- Be full service with on-site facilities to assemble, test and trouble-shoot traffic signal controllers and cabinet assemblies.
- Maintain an inventory of IDOT District One approved controllers and cabinets.
- Be staffed with permanent sales and technical personnel able to provide traffic signal controller and cabinet expertise and support.
- Technical staff shall hold current IMSA Traffic Signal Technician Level III certification and shall attend traffic signal turn-ons and inspections with a minimum 14 calendar day notice.

Submittals.
Revise Article 801.05 of the Standard Specifications to read:

All material approval requests shall be submitted electronically through the District's SharePoint System unless directed otherwise by the Engineer. Electronic material submittals shall follow the District's Traffic Operations Construction Submittals guidelines. General requirements include:

1. All material approval requests shall be made prior to or no later than the date of the preconstruction meeting. A list of major traffic signal items can be found in Article 801.05. Material or equipment which is similar or identical shall be the product of the same manufacturer, unless necessary for system continuity. Traffic signal materials and equipment shall bear the U.L. label whenever such labeling is available.
2. Product data and shop drawings shall be assembled by pay item. Only the top sheet of each pay item submittal will be stamped by the Department with the review status, except shop drawings for mast arm pole assemblies and the like will be stamped with the review status on each sheet.

3. Original manufacturer published product data and shop drawing sheets with legible dimensions and details shall be submitted for review.
4. When hard copy submittals are necessary, four complete copies of the manufacturer's descriptive literatures and technical data for the traffic signal materials shall be submitted. For hard copy or electronic submittals, the descriptive literature and technical data shall be adequate for determining whether the materials meet the requirements of the plans and specifications. If the literature contains more than one item, the Contractor shall indicate which item or items will be furnished.
5. When hard copy submittals are necessary for structural elements, four complete copies of the shop drawings for the mast arm assemblies and poles, and the combination mast arm assemblies and poles showing, in detail, the fabrication thereof and the certified mill analyses of the materials used in the fabrication, anchor rods, and reinforcing materials shall be submitted.
6. Partial or incomplete submittals will be returned without review.
7. Certain non-standard mast arm poles and special structural elements will require additional review from IDOT's Central Office. Examples include ornamental/decorative, non-standard length mast arm pole assemblies and monotube structures. The Contractor shall account for the additional review time in his schedule.
8. The contract number or permit number, project location/limits and corresponding pay code number must be on each sheet of correspondence, catalog cuts and mast arm poles and assemblies drawings.
9. Where certifications and/or warranties are specified, the information submitted for approval shall include certifications and warranties. Certifications involving inspections, and/or tests of material shall be complete with all test data, dates, and times.
10. After the Engineer reviews the submittals for conformance with the design concept of the project, the Engineer will stamp the drawings indicating their status as 'Approved', 'Approved-As-Noted', 'Disapproved', or 'Incomplete'. Since the Engineer's review is for conformance with the design concept only, it is the Contractor's responsibility to coordinate the various items into a working system as specified. The Contractor shall not be relieved from responsibility for errors or omissions in the shop, working, layout drawings, or other documents by the Department's approval thereof. The Contractor must still be in full compliance with contract and specification requirements.
11. The Contractor shall secure approved materials in a timely manner to assure construction schedules are not delayed.
12. All submitted items reviewed and marked 'APPROVED AS NOTED', 'DISAPPROVED', or 'INCOMPLETE' are to be resubmitted in their entirety, unless otherwise indicated within the submittal comments, with a disposition of previous comments to verify contract compliance at no additional cost to the contract.
13. Exceptions to and deviations from the requirements of the Contract Documents will not be allowed. It is the Contractor's responsibility to note any deviations from Contract requirements at the time of submittal and to make any requests for deviations in writing to the Engineer. In general, substitutions will not be acceptable. Requests for substitutions must demonstrate that the proposed substitution is superior to the material or equipment required by the Contract Documents. No exceptions, deviations or substitutions will be permitted without the approval of the Engineer.
14. Contractor shall not order major equipment such as mast arm assemblies prior to Engineer approval of the Contractor marked proposed traffic signal equipment locations to assure proper placement of contract required traffic signal displays, push buttons and other facilities. Field adjustments may require changes in proposed mast arm length and other coordination.

Marking Proposed Locations.

Revise "Marking Proposed Locations for Highway Lighting System" of Article 801.09 to read "Marking Proposed Locations for Highway Lighting System and Traffic Signals."

Add the following to Article 801.09 of the Standard Specifications:

It shall be the contractor's responsibility to verify all dimensions and conditions existing in the field prior to ordering materials and beginning construction. This shall include locating the mast arm foundations and verifying the mast arms lengths.

Inspection of Electrical Systems.
Add the following to Article 801.10 of the Standard Specifications:

All cabinets including temporary traffic signal cabinets shall be assembled by an approved equipment supplier in District One. The Department reserves the right to request any controller and cabinet to be tested at the equipment supplier's facility prior to field installation, at no extra cost to this contract.

Maintenance and Responsibility.
Revise Article 801.11 of the Standard Specifications to read:

a. Existing traffic signal installations and/or any electrical facilities at all or various locations may be altered or reconstructed totally or partially as part of the work on this Contract. The Contractor is hereby advised that all traffic control equipment, presently installed at these locations, may be the property of the State of Illinois, Department of Transportation, Division of Highways, County, Private Developer, Municipality or Transit Agency in which they are located. Once the Contractor has begun any work on any portion of the project, all traffic signals within the limits of this contract or those which have the item "Maintenance of Existing Traffic Signal Installation," "Temporary Traffic Signal Installation(s)" and/or "Maintenance of Existing Flashing Beacon Installation," shall become the full responsibility of the Contractor. The Contractor shall supply the Engineer, Area Traffic Signal Maintenance and Operations Engineer, IDOT ComCenter and the Department's Electrical Maintenance Contractor with two 24-hour emergency contact names and telephone numbers.

b. Automatic Traffic Enforcement equipment such as red lighting running and railroad crossing camera systems are owned and operated by others and the Contractor shall not be responsible for maintaining this equipment.

c. Regional transit, County and other agencies may also have equipment connected to existing traffic signal or peripheral equipment such as PTZ cameras, switches, transit signal priority (TSP and BRT) servers and other devices that shall be included with traffic signal maintenance at no additional cost to the contract.

d. When the project has a pay item for "Maintenance of Existing Traffic Signal Installation," "Temporary Traffic Signal Installation(s)" and/or "Maintenance of Existing Flashing Beacon Installation," the Contractor must notify both the Area Traffic Signal Maintenance and Operations Engineer at (847) 705-4424 and the Department's Electrical Maintenance Contractor, of their intent to begin any physical construction work on the Contract or any portion thereof. This notification must be made a minimum of seven (7) working days prior to the start of construction to allow sufficient time for inspection of the existing traffic signal installation(s) and transfer of maintenance to the Contractor. The Department will attempt to full-fill the Contractor's inspection date request(s), however workload and other conditions may prevent the Department from accommodating specific dates or times. The Contractor shall not be entitled to any other compensation if the requested inspection date(s) cannot be scheduled by the Department. If work is started prior to an inspection, maintenance of the traffic signal installation(s) will be transferred to the Contractor without an inspection. The Contractor will become responsible for repairing or replacing all equipment that is not operating properly or is damaged at no cost to the owner of the traffic signal. Final repairs or replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection otherwise the traffic signal installation will not be accepted.

e. The Contractor is advised that the existing and/or temporary traffic signal installation must remain in operation during all construction stages, except for the most essential down time. Any shutdown of the traffic signal installation, which exceeds fifteen (15) minutes, must have prior approval of the Engineer. Approval to shut down the traffic signal installation will only be granted during the period extending from 10:00 a.m. to 3:00 p.m. on weekdays. Shutdowns shall not be allowed during inclement weather or holiday periods.

f. The Contractor shall be fully responsible for the safe and efficient operation of the traffic signals and other equipment noted herein. Any inquiry, complaint or request by the Department, the Department's Electrical Maintenance Contractor or the public, shall be investigated and repairs begun within one hour. Failure to provide this service will result in liquidated damages of $1000 per day per occurrence. In addition, the Department reserves the right to assign any work not completed within this timeframe to the Electrical Maintenance Contractor. All costs associated to repair this uncompleted work shall be the responsibility of the Contractor. Failure to pay these costs to the Electrical Maintenance Contractor within one month after the incident will result in additional liquidated damages of $1000 per month per occurrence. Unpaid bills will be deducted from the cost of the Contract. The Department may inspect any signalizing device on the Department's highway system at any time without notification.

g. Any proposed activity in the vicinity of a highway-rail grade crossing must adhere to the guidelines set forth in the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) regarding work in temporary traffic control zones in the vicinity of highway-rail grade crossings which states that lane restrictions, flagging, or other operations shall not create conditions where vehicles can be queued across the railroad tracks. If the queuing of vehicles across the tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the crossing to prevent vehicles from stopping on the tracks, even if automatic warning devices are in place.

h. The Contractor shall be responsible to clear snow, ice, dirt, debris or other condition that obstructs visibility of any traffic signal display or access to traffic signal equipment.

i. The Contractor shall maintain the traffic signal in normal operation during short or long term loss of utility or battery back-up power at critical locations designated by the Engineer. Critical locations may include traffic signals interconnected to railroad warning devices, expressway ramps, intersection with an SRA route, critical corridors or other locations identified by the Engineer. Temporary power to the traffic signal must meet applicable NEC and OSHA guidelines and may include portable generators and/or replacement batteries. Temporary power to critical locations shall not be for separately but shall be included in the contract.

Damage to Traffic Signal System.
Add the following to Article 801.12(b) of the Standard Specifications to read:

Any traffic signal control equipment damaged or not operating properly from any cause shall be replaced with new equipment meeting current District One traffic signal specifications and provided by the Contractor at no additional cost to the Contract and/or owner of the traffic signal system, all as approved by the Engineer. Final replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection otherwise the traffic signal installation will not be accepted. Cable splices are only allowed at the bases of posts and mast arms.

Temporary replacement of damaged or knockdown of a mast arm pole assembly shall require construction of a full or partial span wire signal installation or other method approved by the Engineer to assure signal heads are located overhead and over traveled pavement. Temporary replacement of mast arm mount signals with post mount signals will not be permitted.

Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, and peripheral equipment, damaged or not operating properly from any cause, shall be the responsibility of the municipality or the Automatic Traffic Enforcement company per Permit agreement.

Traffic Signal Inspection (TURN-ON).
Revise Article 801.15(b) of the Standard Specifications to read:

It is the intent to have all electric work completed and equipment field tested by the Equipment Supplier prior to the Department's "turn-on" field inspection. If in the event the Engineer determines work is not complete and the inspection will require more than two (2) hours to complete, the inspection shall be canceled, and the Contractor will be required to reschedule at another date. The maintenance of the traffic signals will not be accepted until all punch list work is corrected and re-inspected.

When the road is open to traffic, except as otherwise provided in Section 850 of the Standard Specifications, the Contractor may request a turn-on and inspection of the completed traffic signal installation at each separate location. This request must be made to the Area Traffic Signal Maintenance and Operations Engineer at (847) 705-4424 a minimum of seven (7) working days prior to the time of the requested inspection. The Department will attempt to full-fill the Contractor's turn-on and inspection date request(s), however workload and other conditions may prevent the Department from accommodating specific dates or times. The Contractor shall not be entitled to any other compensation if the requested turn-on and inspection date(s) cannot be scheduled by the Department. The Department will not grant a field inspection until written or electronic notification is provided from the Contractor that the equipment has been field tested and the intersection is operating according to Contract requirements. The Contractor must invite local fire department personnel to the turn-on when Emergency Vehicle Preemption (EVP) is included in the project. When the contract includes the item RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM, OPTIMIZE TRAFFIC SIGNAL SYSTEM, or TEMPORARY TRAFFIC SIGNAL TIMINGS, the Contractor must notify the SCAT Consultant of the turn-on/detour implementation schedule, as well as stage changes and phase changes during construction.

The Contractor must have all traffic signal work completed and the electrical service installation connected by the utility company prior to requesting an inspection and turn-on of the traffic signal installation. The Contractor shall be responsible to provide a police officer to assist with traffic control at the time of testing.

The Contractor shall provide a representative from the control equipment vendor's office who is knowledgeable of the cabinet design and controller functions to attend the traffic signal inspection for both permanent and temporary traffic signal turn-ons.

Upon demonstration that the signals are operating and all work is completed in accordance with the Contract and to the satisfaction of the Engineer, the Engineer will then allow the signals to be placed in continuous operation. The Agency that is responsible for the maintenance of each traffic signal installation will assume the maintenance upon successful completion of this inspection.

The District requires the following Final Project Documentation from the Contractor at traffic signal turn-ons in electronic format in addition to hard copies where noted. A CD/DVD shall be submitted with separate folders corresponding to each numbered title below. The CD/DVD shall be labelled with date, project location, company and contract or permit number. Record Drawings, Inventory and Material Approvals shall be submitted prior to traffic signal turn-on for review by the Department as described here-in.

Final Project Documentation:

1. Record Drawings. Signal plans of record with field revisions marked in red ink. One hard copy set of 11"x17" record drawings shall also be provided.
2. Inventory. Inventory of new and existing traffic signal equipment including cabinet types and devices within cabinets in an Excel spread sheet format. One hard copy shall also be provided.
3. Pictures. Digital pictures of a minimum 12M pixels of each intersection approach showing all traffic signal displays and equipment. Pictures shall include controller cabinet equipment in enough detail to clearly identify manufacture and model of major equipment.
4. Field Testing. Written notification from the Contractor and the equipment vendor of satisfactory field testing with corresponding material performance measurements, such as for detector loops and fiber optic systems (see Article 801.13). One hard copy of all contract required performance measurement testing shall also be provided.
5. Materials Approval. The material approval letter. A hard copy shall also be provided.
6. Manuals. Operation and service manuals of the signal controller and associated control equipment. One hard copy shall also be provided.
7. Cabinet Wiring Diagram and Cable Logs. Five (5) hard copies 11" x 17" of the cabinet wiring diagrams shall be provided along with electronic pdf and dgn files of the cabinet wiring diagram. Five hard copies of the cable logs and electronic excel files shall be provided with cable #, number of conductors and spares, connected device/signal head and intersection location.
8. Controller Programming Settings. The traffic signal controller's timings; backup timings; coordination splits, offsets, and cycles; TBC Time of Day, Week and Year Programs; Traffic Responsive Program, Detector Phase Assignment, Type and Detector Switching; and any other functions programmable from the keyboard. The controller manufacturer shall also supply a printed form, not to exceed 11" x 17" for recording that data noted above. The form shall include a location, date, manufacturer's name, controller model and software version. The form shall be approved by the Engineer and a minimum of three (3) copies must be furnished at each turn-on. The manufacturer must provide all programming information used within the controller at the time of turn-on.
9. Warrantees and Guarantees. All manufacturer and contractor warrantees and guarantees required by Article 801.14.
10. GPS coordinate of traffic signal equipment as describe in the Record Drawings section herein.

Acceptance of the traffic signal equipment by the Department shall be based upon inspection results at the traffic signal "turn on", completeness of the required documentation and successful operation during a minimum 72 hour "burn-in" period following activation of the traffic signal. If approved, traffic signal acceptance shall be verbal at the "turn on" inspection followed by written correspondence from the Engineer. The Contractor shall be responsible for all traffic signal equipment and associated maintenance thereof until Departmental acceptance is granted.

All equipment and/or parts to keep the traffic signal installation operating shall be furnished by the Contractor. No spare traffic signal equipment is available from the Department.

All punch list work shall be completed within two (2) weeks after the final inspection. The Contractor shall notify the Electrical Maintenance Contractor to inspect all punch list work. Failure to meet these time constraints shall result in liquidated damage charges of $500 per month per incident.

All cost of work and materials required to comply with the above requirements shall be included in the pay item bid prices, under which the subject materials and signal equipment are paid, and no additional compensation will be allowed. Materials and signal equipment not complying with the above requirements shall be subject to removal and disposal at the Contractor's expense.

Record Drawings.

The requirements listed for Electrical Installation shall apply for Traffic Signal Installations in Article 801.16. Revise the 2nd paragraph of Article 801.16 of the Standard Specifications to read:

"When the work is complete, and seven days before the request for a final inspection, the reduced-size set of contract drawings, stamped "RECORD DRAWINGS", shall be submitted to the Engineer for review and approval and shall be stamped with the date and the signature of the Contractor's supervising Engineer or electrician. The record drawings shall be submitted in PDF format on CDROM as well as hardcopy for review and approval. If the contract consists of multiple intersections, each intersection shall be saved as an individual PDF file with TS# and location name in its file name.

In addition to the record drawings, copies of the final catalog cuts which have been Approved or Approved as Noted shall be submitted in PDF format along with the record drawings. The PDF files shall clearly indicate the pay item either by filename or PDF Table of Contents referencing the respective pay item number for multi-item PDF files. Specific part or model numbers of items which have been selected shall be clearly visible."

As part of the record drawings, the Contractor shall inventory all traffic signal equipment, new or existing, on the project and record information in an Excel spreadsheet. The inventory shall include equipment type, model numbers, software manufacturer and version and quantities.

Add the following to Article 801.16 of the Standard Specifications:

"In addition to the specified record drawings, the Contactor shall record GPS coordinates of the following traffic signal components being installed, modified or being affected in other ways by this contract:

- All Mast Arm Poles and Posts
- Traffic Signal Wood Poles
- Railroad Bungalow
- UPS
- Handholes
- Conduit roadway crossings
- Controller Cabinets
- Communication Cabinets
- Electric Service Disconnect locations
- CCTV Camera installations
- Fiber Optic Splice Locations
- Conduit Crossings

Datum to be used shall be North American 1983.

Data shall be provided electronically and in print form. The electronic format shall be compatible with MS Excel. Latitude and Longitude shall be in decimal degrees with a minimum of 6 decimal places. Each coordinate shall have the following information:

- File shall be named: TSXXX-YY-MM-DD (i.e. TS22157_15-01-01)
- Each intersection shall have its own file
- Row 1 should have the location name (i.e. IL 31 @ Klausen)
- Row 2 is blank
- Row 3 is the headers for the columns

- Row 4 starts the data
- Column A (Date) – should be in the following format: MM/DD/YYYY
- Column B (Item) – as shown in the table below
- Column C (Description) – as shown in the table below
- Column D and E (GPS Data) – should be in decimal form, per the IDOT special provisions

Examples:

Date	Item	Description	Latitude	Longitude
01/01/2015	MP (Mast Arm Pole)	NEQ, NB, Dual, Combination Pole	41.580493	-87.793378
01/01/2015	HH (Handhole)	Heavy Duty, Fiber, Intersection, Double	41.558532	-87.792571
01/01/2015	ES (Electrical Service)	Ground mount, Pole mount	41.765532	-87.543571
01/01/2015	CC (Controller Cabinet)		41.602248	-87.794053
01/01/2015	RSC (Rigid Steel Crossing)	IL 31 east side crossing south leg to center HH at Klausen	41.611111	-87.790222
01/01/2015	PTZ (PTZ)	NEQ extension pole	41.593434	-87.769876
01/01/2015	POST (Post)		41.651848	-87.762053
01/01/2015	MCC (Master Controller Cabinet)		41.584593	-87.793378
01/01/2015	COMC (Communication Cabinet)		41.584600	-87.793432
01/01/2015	BBS (Battery Backup System)		41.558532	-87.792571
01/01/2015	CNCR (Conduit Crossing)	4-inch IL 31 n/o of Klausen	41.588888	-87.794440

Prior to the collection of data, the contractor shall provide a sample data collection of at least six data points of known locations to be reviewed and verified by the Engineer to be accurate within 1 foot. Upon verification, data collection can begin. Data collection can be made as construction progresses or can be collected after all items are installed. If the data is unacceptable the contractor shall make corrections to the data collection equipment and or process and submit the data for review and approval as specified.

Accuracy. Data collected is to be mapping grade. A handheld mapping grade GPS device shall be used for the data collection. The receiver shall support differential correction and data shall have a minimum 1-foot accuracy after post processing.

GPS receivers integrated into cellular communication devices, recreational and automotive GPS devices are not acceptable.

The GPS shall be the product of an established major GPS manufacturer having been in the business for a minimum of 6 years."

Delete the last sentence of the 3rd paragraph of Article 801.16.

Locating Underground Facilities.
Revise Section 803 to the Standard Specifications to read:

IDOT traffic signal facilities are not part of any of the one-call locating service such as J.U.L.I.E or Digger. If this Contract requires the services of an Electrical Contractor, the Contractor shall be responsible at his/her own expense for locating existing IDOT electrical facilities prior to performing any work. If this Contract does not require the services of an Electrical Contractor, the Contractor may request one free locate for existing IDOT electrical facilities from the District One Electrical Maintenance Contractor prior to the start of any work. Additional requests may be at the expense of the Contractor. The location of underground traffic facilities does not relieve the Contractor of their responsibility to repair any facilities damaged during construction at their expense.

The exact location of all utilities shall be field verified by the Contractor before the installation of any components of the traffic signal system. For locations of utilities, locally owned equipment, and leased enforcement camera system facilities, the local Counties or Municipalities may need to be contacted: in the City of Chicago contact Digger at (312) 744-7000 and for all other locations contact J.U.L.I.E. at 1-800-892-0123 or 811.

Restoration of Work Area.
Add the following article to Section 801 of the Standard Specifications:

801.17 Restoration of work area. Restoration of the traffic signal work area shall be included in the related pay items such as foundation, conduit, handhole, underground raceways, etc. All roadway surfaces such as shoulders, medians, sidewalks, pavement, etc. shall be replaced in kind. All damage to mowed lawns shall be replaced with an approved sod, and all damage to unmowed fields shall be seeded. All brick pavers disturbed in the work area shall be restored to their original configuration as directed by the Engineer. All damaged brick pavers shall be replaced with a comparable material approved by the Engineer. Restoration of the work area shall be included in the contract without any extra compensation allowed to the Contractor.

Bagging Signal Heads.

Light tan colored traffic and pedestrian signal reusable covers shall be used to cover dark/un-energized signal sections and visors. Covers shall be made of outdoor fabric with urethane coating for repelling water, have elastic fully sewn around the cover ends for a tight fit over the visor, and have a minimum of two straps with buckles to secure the cover to the backplate. A center mesh strip allows viewing without removal for signal status testing purposes. Covers shall include a message indicating the signal is not in service.

OPTIMIZE TRAFFIC SIGNAL SYSTEM
Effective: May 22, 2002
Revised: July 1, 2015
800.02TS

Description.
This work shall consist of optimizing a closed loop traffic signal system.

OPTIMIZE TRAFFIC SIGNAL SYSTEM applies when a new or existing closed loop traffic signal system is to be optimized and a formal Signal Coordination and Timing (SCAT) Report is to be prepared. The purpose of this work is to improve system performance by optimizing traffic signal timings, developing a time of day program and a traffic responsive program.

After the signal improvements are completed, the signal system shall be optimized as specified by an approved Consultant who has previous experience in optimizing Closed Loop Traffic Signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 705-4424 for a listing of approved Consultants. Traffic signal system optimization work, including fine-tuning adjustments of the optimized system, shall follow the requirements stated in the most recent IDOT District 1 SCAT Guidelines, except as noted herein.

A listing of existing signal equipment, interconnect information, phasing data, and timing patterns may be obtained from the Department, if available and as appropriate. The existing SCAT Report is available for review at the District One office and if the Consultant provides blank a CD, copies of computer simulation files for the existing optimized system and a timing database that includes intersection displays will be made for the Consultant. The Consultant shall confer with the Traffic Signal Engineer prior to optimizing the system to determine if any extraordinary conditions exist that would affect traffic flows in the vicinity of the system, in which case, the Consultant may be instructed to wait until the conditions return to normal or to follow specific instructions regarding the optimization.

(a) The following tasks are associated with OPTIMIZE TRAFFIC SIGNAL SYSTEM.

1. Appropriate signal timings and offsets shall be developed for each intersection and appropriate cycle lengths shall be developed for the closed loop signal system.

2. Traffic counts shall be taken at all intersections after the permanent traffic signals are approved for operation by the Area Traffic Signal Operations Engineer. Manual turning movement counts shall be conducted from 6:30 a.m. to 9:30 a.m., 11:00 a.m. to 1:00 p.m., and 3:30 p.m. to 6:30 p.m. on a typical weekday from midday Monday to midday Friday and on a Saturday or Sunday, as directed by the Engineer, to account for special traffic generators such as shopping centers, educational institutes and special event facilities. The turning movement counts shall identify cars, and single-unit and multi-unit heavy vehicles.

3. As necessary, the intersections shall be re-addressed, and all system detectors reassigned in the master controller according to the current standard of District One.

4. A traffic responsive program shall be developed, which considers both volume and occupancy. A time-of-day program shall be developed for used as a back-up system.

5. Proposed signal timing plan for the new or modified intersection shall be forwarded to IDOT for review prior to implementation.

6. Consultant shall conduct on-site implementation of the timings and make fine-tuning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.

The consultant shall respond to IDOT comments and public complaints for a minimum period of 90 days from date of timing plan implementation.

7. Speed and delay studies shall be conducted during each of the count periods along the system corridor in the field before and after implementation of the proposed timing plans for comparative evaluations. These studies should utilize specialized electronic timing and measuring devices.

(b) The following deliverables shall be provided for OPTIMIZE TRAFFIC SIGNAL SYSTEM.

1. Consultant shall furnish to IDOT one (1) copy of a SCAT Report for the optimized system. The SCAT Report shall include the following elements:

Cover Page in color showing a System Map
Figures 1. System overview map – showing system number, system schematic map with numbered system detectors, oversaturated movements, master location, system phone number, cycle lengths, and date of completion. 2. General location map in color – showing signal system location in the metropolitan area. 3. Detail system location map in color – showing cross street names and local controller addresses. 4. Controller sequence – showing controller phase sequence diagrams.
Table of Contents
Tab 1: Final Report 1. Project Overview 2. System and Location Description (Project specific) 3. Methodology 4. Data Collection 5. Data Analysis and Timing Plan Development 6. Implementation a. Traffic Responsive Programming (Table of TRP vs. TOD Operation) with am, md, and pm cycle lengths 7. Evaluation a. Speed and Delay runs
Tab 2. Turning Movement Counts 1. Turning Movement Counts (Showing turning movement counts in the intersection diagram for each period, including truck percentage)
Tab 3. Synchro Analysis 1. AM: Time-Space diagram in color, followed by intersection Synchro report (Timing report) summarizing the implemented timings. 2. Midday: same as AM 3. PM: same as AM 4. Special weekend or off-peak traffic generators (shopping centers, educational facilities, arenas, etc.): same as AM
Tab 4: Speed, Delay Studies 1. Summary of before and after runs results in two (2) tables showing travel time and delay time. 2. Plot of the before and after runs diagram for each direction and time period.
Tab 5: Environmental Report
1. Environmental impact report including gas consumption, NO2, HCCO, improvements.
Tab 6: Electronic Files 1. Two (2) CDs for the optimized system. The CDs shall include the following elements: a. Electronic copy of the SCAT Report in PDF format b. Copies of the Synchro files for the optimized system c. Traffic counts for the optimized system d. New or updated intersection graphic display files for each of the system intersections and the system graphic display file including system detector locations and addresses.

Basis of Payment.

The work shall be paid for at the contract unit each for OPTIMIZE TRAFFIC SIGNAL SYSTEM, which price shall be payment in full for performing all work described herein for the entire traffic signal system. Following the completion of traffic counts, 25 percent of the bid price will be paid. Following the completion of the Synchro analysis, 25 percent of the bid price will be paid. Following the setup and fine tuning of the timings, the speed-delay study, and the TRP programming, 25 percent of the bid price will be paid. The remaining 25 percent will be paid when the system is working to the satisfaction of the engineer and an approved report and CD have been submitted.

RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM
Effective: May 22, 2002
Revised: July 1, 2015
800.03TS

Description.
This work shall consist of re-optimizing a closed loop traffic signal system according to the following Levels of work.

LEVEL I applies when improvements are made to an existing signalized intersection within an existing closed loop traffic signal system. The purpose of this work is to integrate the improvements to the subject intersection into the signal system while minimizing the impacts to the existing system operation. This type of work would be commonly associated with the addition of signal phases, pedestrian phases, or improvements that do not affect the capacity at an intersection.

LEVEL II applies when improvements are made to an existing signalized intersection within an existing closed loop traffic signal system and detailed analysis of the intersection operation is desired by the engineer, or when a new signalized or existing signalized intersection is being added to an existing system, but optimization of the entire system is not required. The purpose of this work is to optimize the subject intersection, while integrating it into the existing signal system with limited impact to the system operations. This item also includes an evaluation of the overall system operation, including the traffic responsive program.

For the purposes of re-optimization work, an intersection shall include all traffic movements operated by the subject controller and cabinet.

After the signal improvements are completed, the signal shall be re-optimized as specified by an approved Consultant who has previous experience in optimizing Closed Loop Traffic Signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 705-4424 for a listing of approved Consultants. Traffic signal system optimization work, including fine-tuning adjustments of the optimized system, shall follow the requirements stated in the most recent IDOT District 1 SCAT Guidelines, except as note herein.

A listing of existing signal equipment, interconnect information, phasing data, and timing patterns may be obtained from the Department, if available and as appropriate. The existing SCAT Report is available for review at the District One office and if the Consultant provides blank computer discs, copies of computer simulation files for the existing optimized system and a timing database will be made for the Consultant. The Consultant shall confer with the Traffic Signal Engineer prior to optimizing the system to determine if any extraordinary conditions exist that would affect traffic flows in the vicinity of the system, in which case, the Consultant may be instructed to wait until the conditions return to normal or to follow specific instructions regarding the optimization.

(a) LEVEL I Re-Optimization

1. The following tasks are associated with LEVEL I Re-Optimization.
   a. Appropriate signal timings shall be developed for the subject intersection and existing timings shall be utilized for the rest of the intersections in the system.
   b. Proposed signal timing plan for the modified intersection(s) shall be forwarded to IDOT for review prior to implementation.
   c. Consultant shall conduct on-site implementation of the timings at the turn-on and make fine-tuning adjustments to the timings of the subject intersection in the field to alleviate observed adverse operating conditions and to enhance operations. The consultant shall respond to IDOT

comments and public complaints for a minimum period of 60 days from date of timing plan implementation.

2. The following deliverables shall be provided for LEVEL I Re-Optimization.
   a. Consultant shall furnish to IDOT a cover letter describing the extent of the re-optimization work performed.
   b. Consultant shall furnish an updated intersection graphic display for the subject intersection to IDOT and to IDOT's Traffic Signal Maintenance Contractor.

(b) LEVEL II Re-Optimization

1. In addition to the requirements described in the LEVEL I Re-Optimization above, the following tasks are associated with LEVEL II Re-Optimization.
   a. Traffic counts shall be taken at the subject intersection(s) after the traffic signals are approved for operation by the Area Traffic Signal Operations Engineer. Manual turning movement counts shall be conducted from 6:30 a.m. to 9:30 a.m., 11:00 a.m. to 1:00 p.m., and 3:30 p.m. to 6:30 p.m. on a typical weekday from midday Monday to midday Friday and on a Saturday and/or Sunday, as directed by the Engineer, to account for special traffic generators such as shopping centers, educational institutes and special event facilities. The turning movement counts shall identify cars, and single-unit, multi-unit heavy vehicles, and transit buses.
   b. As necessary, the intersection(s) shall be re-addressed, and all system detectors reassigned in the master controller according to the current standard of District One.
   c. Traffic responsive program operation shall be evaluated to verify proper pattern selection and lack of oscillation and a report of the operation shall be provided to IDOT.

2. The following deliverables shall be provided for LEVEL II Re-Optimization.
   a. Consultant shall furnish to IDOT one (1) copy of a technical memorandum for the optimized system. The technical memorandum shall include the following elements:
      (1) Brief description of the project
      (2) Printed copies of the analysis output from Synchro (or other appropriate, approved optimization software file)
      (3) Printed copies of the traffic counts conducted at the subject intersection
   b. Consultant shall furnish to IDOT two (2) CDs for the optimized system. The CDs shall include the following elements:
      (1) Electronic copy of the technical memorandum in PDF format
      (2) Revised Synchro files (or other appropriate, approved optimization software file) including the new signal and the rest of the signals in the closed loop system
      (3) Traffic counts conducted at the subject intersection(s)
      (4) New or updated intersection(s) graphic display file for the subject intersection(s)
      (5) The CD shall be labeled with the IDOT system number and master location, as well as the submittal date and the consultant logo. The CD case shall include a clearly readable label displaying the same information securely affixed to the side and front.

Basis of Payment.
This work shall be paid for at the contract unit price each for RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM – LEVEL I or RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM – LEVEL II, which price shall be payment in full for performing all work described herein per intersection. Following completion of the timings and submittal of specified deliverables, 100 percent of the bid price will be paid. Each intersection will be paid for separately.

SERVICE INSTALLATION (TRAFFIC SIGNALS)
Effective: May 22, 2002
Revised: June 15, 2016
805.01TS

Revise Section 805 of the Standard Specifications to read:

Description.
This work shall consist of all materials and labor required to install, modify, or extend the electric service installation. All installations shall meet the requirements of the "District One Standard Traffic Signal Design Details".

General.
The electric service installation shall be the electric service disconnecting means and it shall be identified as suitable for use as service equipment.

The electric utility contact information is noted on the plans and represents the current information at the time of contract preparation. The Contractor must request in writing for service and/or service modification within 10 days of contract award and must follow-up with the electric utility to assure all necessary documents and payment are received by the utility. The Contractor shall forward copies of all correspondence between the contractor and utility company to the Engineer and Area Traffic Signal Maintenance and Operations Engineer. The service agreement and sketch shall be submitted for signature to the IDOT's Traffic Operations Programs Engineer.

Materials.

j. General. The completed control panel shall be constructed in accordance with UL Std. 508A, Industrial Control Panel, and carry the UL label. Wire terminations shall be UL listed.

k. Enclosures.

1. Pole Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 4X, unfinished single door design, fabricated from minimum 0.080-inch (2.03 mm) thick Type 5052 H-32 aluminum. Seams shall be continuous welded and ground smooth. Stainless steel screws and clamps shall secure the cover and assure a watertight seal. The cover shall be removable by pulling the continuous stainless-steel hinge pin. The cabinet shall have an oil-resistant gasket and a lock kit shall be provided with an internal O-ring in the locking mechanism assuring a watertight and dust-tight seal. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 14-inches (350 mm) high, 9-inches (225 mm) wide and 8-inches (200 mm) in depth is required. The cabinet shall be channel mounted to a wooden utility pole using assemblies recommended by the vendor.

2. Ground Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 3R unfinished single door design with back panel. The cabinet shall be fabricated from Type 5052 H-32 aluminum with the frame and door 0.125-inch (3.175 mm) thick, the top 0.250-inch (6.350 mm) thick and the bottom 0.500-inch (12.70 mm) thick. Seams shall be continuous welded and ground smooth. The door and door opening shall be double flanged. The door shall be approximately 80% of the front surface, with a full length tamperproof stainless steel .075-inch (1.91 mm) thick hinge bolted to the cabinet with stainless steel carriage bolts and nylocks nuts. The locking mechanism shall be slam-latch type with a keyhole cover. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 40-inches (1000 mm) high, 16-inches (400 mm) wide and 15-inches

(375 mm) in depth is required. The cabinet shall be mounted upon a square Type A concrete foundation as indicated on the plans. The foundation is paid for separately.

3. All enclosures shall include a green external power indicator LED light with circuitry as shown in the Electrical Service-Panel Diagram detail sheet. For pole mounted service enclosures, the power indicator light shall be mounted as shown in the detail. For ground mounted enclosures, the power indicator light shall be mounted on the side of the enclosure most visible from the major roadway.

l. Electric Utility Meter Housing and Riser. The electric meter housing and meter socket shall be supplied and installed by the contractor. The contractor is to coordinate the work to be performed and the materials required with the utility company to make the final connection at the power source. Electric utility required risers, weather/service head and any other materials necessary for connection shall also be included in the pay item. Materials shall be in accordance with the electric utility's requirements. For ground-mounted service, the electric utility meter housing shall be mounted to the enclosure. The meter shall be supplied by the utility company. Metered service shall not be used unless specified in the plans.

m. Surge Protector. Overvoltage protection, with LED indicator, shall be provided for the 120-volt load circuit by the means MOV and thermal fusing technology. The response time shall be <5n seconds and operate within a range of –40C to +85C. The surge protector shall be UL 1449 Listed.

n. Circuit Breakers. Circuit breakers shall be standard UL listed molded case, thermal-magnetic bolt-on type circuit breakers with trip free indicating handles. 120 volt circuit breakers shall have an interrupting rating of not less than 65,000 rms symmetrical amperes. Unless otherwise indicated, the main disconnect circuit breaker for the traffic signal controller shall be rated 60 amperes, 120 V and the auxiliary circuit breakers shall be rated 10 amperes, 120 V.

o. Fuses, Fuseholders and Power Indicating Light. Fuses shall be small-dimensional cylindrical fuses of the dual element time-delay type. The fuses shall be rated for 600 V AC and shall have a UL listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated voltage. The power indicating light shall be LED type with a green colored lens and shall be energized when electric utility power is present.

p. Ground and Neutral Bus Bars. A single copper ground and neutral bus bar mounted on the equipment panel shall be provided. Ground and neutral conductors shall be separated on the bus bar. Compression lugs, plus 2 spare lugs, shall be sized to accommodate the cables with the heads of the connector screws painted green for ground connections and white for neutral connections.

q. Utility Services Connection. The Contractor shall notify the Utility Company marketing representative a minimum of 30 working days prior to the anticipated date of hook-up. This 30 day advance notification will begin only after the Utility Company marketing representative has received service charge payments from the Contractor. Prior to contacting the Utility Company marketing representative for service connection, the service installation controller cabinet and cable must be installed for inspection by the Utility Company.

r. Ground Rod. Ground rods shall be copper-clad steel, a minimum of 10 feet (3.0m) in length, and 3/4 inch (20mm) in diameter. Ground rod resistance measurements to ground shall be 25 ohms or less. If necessary additional rods shall be installed to meet resistance requirements at no additional cost to the contract.

Installation.

d. General. The Contractor shall confirm the orientation of the traffic service installation and its door side with the engineer, prior to installation. All conduit entrances into the service installation shall be sealed with a pliable waterproof material.

e. Pole Mounted. Brackets designed for pole mounting shall be used. All mounting hardware shall be stainless steel. Mounting height shall be as noted on the plans or as directed by the Engineer.

f. Ground Mounted. The service installation shall be mounted plumb and level on the foundation and fastened to the anchor bolts with hot-dipped galvanized or stainless-steel nuts and washers. The space between the bottom of the enclosure and the top of the foundation shall be caulked at the base with silicone.

Basis of Payment.

The service installation shall be paid for at the contract unit price each for SERVICE INSTALLATION of the type specified which shall be payment in full for furnishing and installing the service installation complete. The CONCRETE FOUNDATION, TYPE A, which includes the ground rod, shall be paid for separately. SERVICE INSTALLATION, POLE MOUNTED shall include the 3/4-inch (20mm) grounding conduit, ground rod, and pole mount assembly. Any charges by the utility companies shall be approved by the engineer and paid for as an addition to the contract according to Article 109.05 of the Standard Specifications.

GROUNDING OF TRAFFIC SIGNAL SYSTEMS
Effective: May 22, 2002
Revised: July 1, 2015
806.01TS

Revise Section 806 of the Standard Specifications to read:

General.
All traffic signal systems, equipment and appurtenances shall be properly grounded in strict conformance with the NEC. This work shall be in accordance with IDOT's District One Traffic Signal Design Details.

The grounding electrode system shall include a ground rod installed with each traffic signal controller concrete foundation and all mast arm and post concrete foundations. An additional ground rod will be required at locations were measured resistance exceeds 25 ohms. Ground rods are included in the applicable concrete foundation or service installation pay item and will not be paid for separately.

Testing shall be according to Article 801.13 (a) (4) and (5).

a) The grounded conductor (neutral conductor) shall be white color coded. This conductor shall be bonded to the equipment grounding conductor only at the Electric Service Installation. All power cables shall include one neutral conductor of the same size.

b) The equipment grounding conductor shall be green color coded. The following is in addition to Article 801.04 of the Standard Specifications.

    1) Equipment grounding conductors shall be bonded to the grounded conductor (neutral conductor) only at the Electric Service Installation. The equipment grounding conductor is paid for separately and shall be continuous. The Earth shall not be used as the equipment grounding conductor.

    2) Equipment grounding conductors shall be bonded, using a UL Listed grounding connector, to all traffic signal mast arm poles, traffic signal posts, pedestrian posts, pull boxes, handhole frames and covers, conduits, and other metallic enclosures throughout the traffic signal wiring system, except where noted herein. Bonding shall be made with a splice and pigtail connection, using a sized compression type copper sleeve, sealant tape, and heat-shrinkable cap. A UL listed electrical joint compound shall be applied to all conductors' terminations, connector threads and contact points. Conduit grounding bushings shall be installed at all conduit terminations including spare or empty conduits.

    3) All metallic and non-metallic raceways shall have a continuous equipment grounding conductor, except raceways containing only detector loop lead-in circuits, circuits under 50 volts and/or fiber optic cable will not be required to include an equipment grounding conductor.

    4) Individual conductor splices in handholes shall be soldered and sealed with heat shrink. When necessary to maintain effective equipment grounding, a full cable heat shrink shall be provided over individual conductor heat shrinks.

c) The grounding electrode conductor shall be similar to the equipment grounding conductor in color coding (green) and size. The grounding electrode conductor is used to connect the ground rod to the equipment grounding conductor and is bonded to ground rods via exothermic welding, UL listed pressure connectors, and UL listed clamps.

COILABLE NON-METALLIC CONDUIT
Effective: May 22, 2002
Revised: July 1, 2015
810.01TS

Description.
This work shall consist of furnishing and installing empty coilable non-metallic conduit (CNC).

General.
The CNC installation shall be in accordance with Sections 810 and 811 of the Standard Specifications except for the following:

Add the following to Article 810.03 of the Standard Specifications:

CNC meeting the requirements of NEC Article 353 shall be used for detector loop raceways to the handholes.

Add the following to Article 811.03 of the Standard Specifications:

On temporary traffic signal installations with detector loops, CNC meeting the requirements of NEC Article 353 shall be used for detector loop raceways from the saw-cut to 10 feet (3m) up the wood pole, unless otherwise shown on the plans

Basis of Payment.
All installations of CNC for loop detection shall be included in the contract and not paid for separately.

UNDERGROUND RACEWAYS
Effective: May 22, 2002
Revised: July 1, 2015
810.02TS

Revise Article 810.04 of the Standard Specifications to read:

> "Installation. All underground conduits shall have a minimum depth of 30-inches (700 mm) below the finished grade."

Add the following to Article 810.04 of the Standard Specifications:

> "All metal conduit installed underground shall be Rigid Steel Conduit unless otherwise indicated on the plans."

Add the following to Article 810.04 of the Standard Specifications:

> "All raceways which extend outside of a structure or duct bank but are not terminated in a cabinet, junction box, pull box, handhole, post, pole, or pedestal shall extend a minimum or 300 mm (12") or the length shown on the plans beyond the structure or duct bank. The end of this extension shall be capped and sealed with a cap designed for the conduit to be capped.
>
> The ends of rigid metal conduit to be capped shall be threaded, the threads protected with full galvanizing, and capped with a threaded galvanized steel cap.
>
> The ends of rigid nonmetallic conduit and coilable nonmetallic conduit shall be capped with a rigid PVC cap of not less than 3 mm (0.125") thick. The cap shall be sealed to the conduit using a room-temperature-vulcanizing (RTV) sealant compatible with the material of both the cap and the conduit. A washer or similar metal ring shall be glued to the inside center of the cap with epoxy, and the pull cord shall be tied to this ring."

ROD AND CLEAN EXISTING CONDUIT
Effective: January 1, 2015
Revised: July 1, 2015
810.03TS

Description.
This work shall consist of inserting a duct rod or electrical fish rod or tape of sufficient length and rigidity into an electrical conduit opening in one electrical handhole, and pushing the said rod through the conduit to emerge at the next or subsequent handhole in the conduit system at the location(s) shown on the plans. The duct rod may be inserted and removed by any standard construction method which causes no damage to the conduit. The size of the conduit may vary, but there shall be no differentiation in cost for the size of the conduit.

The conduit which is to be rodded and cleaned may exist with various amounts of standing water in the handholes to drain the conduit and to afford compatible working conditions for the installation of the duct rods and/or cables. Pumping of handholes shall be included with the work of rodding and cleaning of the conduit.

Any handhole which, in the opinion of the Engineer contains excessive debris, dirt or other materials to the extent that conduit rodding and cleaning is not feasible, shall be cleaned at the Engineer's order and payment approval as a separate pay item.

Prior to removal of the duct rod, a duct cleaning attachment such as a properly sized wire brush or cleaning mandrel shall be attached to the duct rod, which by removal of the duct rod shall be pulled through the conduit to remove sand, grit, or other light obstructions from the duct to provide a clean, clear passage for the installation of cable. Whenever the installation of cables is not performed as an adjunct to or immediately following the cleaning of the duct, a light weight pulling line such as a 1/8" polyethylene line or conduit measuring tape shall be placed and shall remain in the conduit to facilitate future work. When great difficulty of either inserting the duct rod or removal of the cleaning mandrel is encountered, the duct may require further cleaning by use of a compressed air gun, or a low-pressure water hose. In the case of a broken conduit, the conduit must be excavated and repaired. The existence and location of breaks in the conduit may be determined by rodding, but the excavation and repair work required will be paid for separately.

This work shall be measured per lineal foot for each conduit cleaned. Measurements shall be made from point to point horizontally. No vertical rises shall count in the measurement.

Basis of Payment.
This work shall be paid for at the contract unit price per lineal foot for ROD AND CLEAN EXISTING CONDUIT for the installation of new electric cables in existing conduits. Such price shall include the furnishing of all necessary tools, equipment, and materials required to prepare a conduit for the installation of cable.

HANDHOLES
Effective: January 01, 2002
Revised: July 1, 2018
814.01TS

Description.
Add the following to Section 814 of the Standard Specifications:

All conduits shall enter the handhole at a depth of 30 inches (762 mm) except for the conduits for detector loops when the handhole is less than 5 feet (1.52 m) from the detector loop. All conduit ends should be sealed with a waterproof sealant to prevent the entrance of contaminants into the handhole.

Steel cable hooks shall be coated with hot-dipped galvanization in accordance with AASHTO Specification M111. Hooks shall be a minimum of 1/2 inch (13 mm) diameter with two 90 degree bends and extend into the handhole at least 6 inches (152 mm). Hooks shall be placed a minimum of 12 inches (305 mm) below the lid or lower if additional space is required.

Precast round handholes shall not be used unless called out on the plans.

The cover of the handhole frame shall be labeled “Traffic Signals" with legible raised letters. Only handholes serving IDOT traffic signal equipment shall have this label. Handhole covers for Red Light Running Cameras shall be labeled “RLRC”.

Revise the third paragraph of Article 814.03 of the Standard Specifications to read:

> “Handholes shall be constructed as shown on the plans and shall be cast-in-place, or precast concrete units. Heavy duty handholes shall be either cast-in-place or precast concrete units.”

Add the following to Article 814.03 of the Standard Specifications:

> “(c) Precast Concrete. Precast concrete handholes shall be fabricated according to Article 1042.17. Where a handhole is contiguous to a sidewalk, preformed joint filler of 1/2 inch (13 mm) thickness shall be placed between the handhole and the sidewalk.”

Cast-In-Place Handholes.
All cast-in-place handholes shall be concrete, with inside dimensions of 21-1/2 inches (546 mm) minimum. Frames and lid openings shall match this dimension.

For grounding purposes, the handhole frame shall have provisions for a 7/16-inch (11 mm) diameter stainless steel bolt cast into the frame. The covers shall have a stainless-steel threaded stint extended from the eye hook assembly for the purpose of attaching the grounding conductor to the handhole cover.

The minimum wall thickness for heavy duty hand holes shall be 12 inches (305mm).

Precast Round Handholes.
All precast handholes shall be concrete, with inside dimensions of 30 inches (762mm) diameter. Frames and covers shall have a minimum opening of 26 inches (660mm) and no larger than the inside diameter of the handhole.

For grounding purposes, the handhole frame shall have provisions for a 7/16-inch (11 mm) diameter stainless steel bolt cast into the frame. For the purpose of attaching the grounding conductor to the handhole cover, the covers shall either have a 7/16-inch (11 mm) diameter stainless steel bolt cast into the cover or a stainless-

steel threaded stint extended from an eye hook assembly. A hole may be drilled for the bolt if one cannot be cast into the frame or cover. The head of the bolt shall be flush or lower than the top surface of the cover.

The minimum wall thickness for precast heavy-duty hand holes shall be 6 inches (152 mm).

Precast round handholes shall be only produced by an approved precast vendor.

Materials.
Add the following to Section 1042 of the Standard Specifications:

"1042.17 Precast Concrete Handholes. Precast concrete handholes shall be according to Articles 1042.03(a)(c)(d)(e)."

FIBER OPTIC TRACER CABLE
Effective: May 22, 2002
Revised: July 1, 2015
817.02TS

The cable shall meet the requirements of Section 817 of the Standard Specifications, except for the following:

Add the following to Article 817.03 of the Standard Specifications:

In order to trace the fiber optic cable after installation, the tracer cable shall be installed in the same conduit as the fiber optic cable in locations shown on the plans. The tracer cable shall be continuous, extended into the controller cabinet and terminated on a barrier type terminal strip mounted on the side wall of the controller cabinet. The barrier type terminal strip and tracer cable shall be clearly marked and identified. All tracer cable splices shall be kept to a minimum and shall incorporate maximum lengths of cable supplied by the manufacturer. The tracer cable will be allowed to be spliced at handholes only. The tracer cable splice shall use a Western Union Splice soldered with resin core flux and shall be soldered using a soldering iron. Blow torches or other devices which oxidize copper cable shall not be allowed for soldering operations. All exposed surfaces of the solder shall be smooth. The splice shall be covered with a black shrink tube meeting UL 224 guidelines, Type V and rated 600V, minimum length 4 inches (100 mm) and with a minimum 1-inch (25 mm) coverage over the XLP insulation, underwater grade.

Add the following to Article 817.05 of the Standard Specifications:

Basis of Payment.
The tracer cable shall be paid for separately as ELECTRIC CABLE IN CONDUIT, TRACER, NO. 14 1C per foot (meter), which price shall include all associated labor and material for installation.

MAINTENANCE OF EXISTING TRAFFIC SIGNAL and flashing beacon INSTALLATION
Effective: May 22, 2002
Revised: July 1, 2015
850.01TS

General.

1. Full maintenance responsibility shall start as soon as the Contractor begins any physical work on the Contract or any portion thereof. If Contract work is started prior to a traffic signal inspection, maintenance of the traffic signal installation(s) will be transferred to the Contractor without an inspection.

2. The Contractor shall have electricians with IMSA Level II certification on staff to provide signal maintenance. A copy of the certification shall be immediately available upon request of the Engineer.

3. This item shall include maintenance of all traffic signal equipment and other connected and related equipment such as flashing beacons, emergency vehicle pre-emption equipment, master controllers, uninterruptable power supply (UPS and batteries), PTZ cameras, vehicle detection, handholes, lighted signs, telephone service installations, communication cables, conduits to adjacent intersections, and other traffic signal equipment.

4. Regional transit, County and other agencies may also have equipment connected to existing traffic signal or peripheral equipment such as PTZ cameras, switches, transit signal priority (TSP and BRT) servers, radios and other devices that shall be included with traffic signal maintenance at no additional cost to the contract.

5. Maintenance shall not include Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, or peripheral equipment. This equipment is operated and maintained by the local municipality and should be de-activated while on contractor maintenance.

6. The energy charges for the operation of the traffic signal installation shall be paid for by the Contractor.

Maintenance.

1. The Contractor shall check all controllers every two (2) weeks, which will include visually inspecting all timing intervals, relays, detectors, and pre-emption equipment to ensure that they are functioning properly. The Contractor shall check signal system communications and phone lines to assure proper operation. This item includes, as routine maintenance, all portions of emergency vehicle pre-emption equipment. The Contractor shall maintain in stock at all times a sufficient amount of materials and equipment to provide effective temporary and permanent repairs. Prior to the traffic signal maintenance transfer, the contractor shall supply a detailed maintenance schedule that includes dates, locations, names of electricians providing the required checks and inspections along with any other information requested by the Engineer.

2. The Contractor is advised that the existing and/or span wire traffic signal installation must remain in operation during all construction stages, except for the most essential down time. Any shutdown of the traffic signal installation, which exceeds fifteen (15) minutes, must have prior approval of the Engineer. Approval to shut down the traffic signal installation will only be granted during the period extending from 10:00 a.m. to 3:00 p.m. on weekdays. Shutdowns shall not be allowed during inclement weather or holiday periods.

3. The Contractor shall provide immediate corrective action when any part or parts of the system fail to function properly. Two far side heads facing each approach shall be considered the minimum

acceptable signal operation pending permanent repairs. When repairs at a signalized intersection require that the controller be disconnected or otherwise removed from normal operation, and power is available, the Contractor shall place the traffic signal installation on flashing operation. The signals shall flash RED for all directions unless a different indication has been specified by the Engineer. The Contractor shall be required to place stop signs (R1-1-36) at each approach of the intersection as a temporary means of regulating traffic. When the signals operate in flash, the Contractor shall furnish and equip all their vehicles assigned to the maintenance of traffic signal installations with a sufficient number of stop signs as specified herein. The Contractor shall maintain a sufficient number of spare stop signs in stock at all times to replace stop signs which may be damaged or stolen.

4. The Contractor shall provide the Engineer with 2 (two) 24 hour telephone numbers for the maintenance of the traffic signal installation and for emergency calls by the Engineer.

5. Traffic signal equipment which is lost or not returned to the Department for any reason shall be replaced with new equipment meeting the requirements of the Standard Specifications and these special provisions.

6. The Contractor shall respond to all emergency calls from the Department or others within one (1) hour after notification and provide immediate corrective action. When equipment has been damaged or becomes faulty beyond repair, the Contractor shall replace it with new and identical equipment. The cost of furnishing and installing the replaced equipment shall be borne by the Contractor at no additional charge to the contract. The Contractor may institute action to recover damages from a responsible third party. If at any time the Contractor fails to perform all work as specified herein to keep the traffic signal installation in proper operating condition or if the Engineer cannot contact the Contractor's designated personnel, the Engineer shall have the State's Electrical Maintenance Contractor perform the maintenance work. The Contractor shall be responsible for all of the State's Electrical Maintenance Contractor's costs and liquidated damages of $1000 per day per occurrence. The State's Electrical Maintenance Contractor shall bill the Contractor for the total cost of the work. The Contractor shall pay this bill within thirty (30) days of the date of receipt of the invoice or the cost of such work will be deducted from the amount due the Contractor. The Contractor shall allow the Electrical Maintenance Contractor to make reviews of the Existing Traffic Signal Installation that has been transferred to the Contractor for Maintenance.

7. Any proposed activity in the vicinity of a highway-rail grade crossing must adhere to the guidelines set forth in the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) regarding work in temporary traffic control zones in the vicinity of highway-rail grade crossings which states that lane restrictions, flagging, or other operations shall not create conditions where vehicles can be queued across the railroad tracks. If the queuing of vehicles across the tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the crossing to prevent vehicles from stopping on the tracks, even if automatic warning devices are in place.

8. Equipment included in this item that is damaged or not operating properly from any cause shall be replaced with new equipment meeting current District One traffic signal specifications and provided by the Contractor at no additional cost to the Contract and/or owner of the traffic signal system, all as approved by the Engineer. Final replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection otherwise the traffic signal installation will not be accepted. Cable splices outside the controller cabinet shall not be allowed.

9. Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, and peripheral equipment, damaged or not operating properly from any cause, shall be the responsibility of the municipality or the Automatic Traffic Enforcement Company per Permit agreement.

10. The Contractor shall be responsible to clear snow, ice, dirt, debris or other condition that obstructs visibility of any traffic signal display or access to traffic signal equipment.

11. The Contractor shall maintain the traffic signal in normal operation during short or long term loss of utility or battery back-up power at critical locations designated by the Engineer. Critical locations may include traffic signals interconnected to railroad warning devices, expressway ramps, intersection with an SRA route, critical corridors or other locations identified by the Engineer. Temporary power to the traffic signal must meet applicable NEC and OSHA guidelines and may include portable generators and/or replacement batteries. Temporary power to critical locations shall not be paid for separately but shall be included in the contract.

12. Temporary replacement of damaged or knockdown of a mast arm pole assembly shall require construction of a full or partial span wire signal installation or other method approved by the Engineer to assure signal heads are located overhead and over traveled pavement. Temporary replacement of mast arm mount signals with post mount signals will not be permitted.

Basis of Payment.

This work will be paid for at the contract unit price per each for MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION. Each intersection will be paid for separately. Maintenance of a standalone and or not connected flashing beacon shall be paid for at the contract unit price for MAINTENANCE OF EXISITNG FLASHING BEACON INSTALLATION. Each flashing beacon will be paid for separately.

TRAFFIC SIGNAL PAINTING
Effective: May 22, 2002
Revised: July 1, 2015
851.01TS

Description.
This work shall include surface preparation, powder coated finish application and packaging of new galvanized steel traffic signal mast arm poles and posts assemblies. All work associated with applying the painted finish shall be performed at the vendor's facility for the pole assembly or post or at a painting facility approved by the Engineer. Traffic signal mast arm shrouds and post bases shall also be painted the same color as the pole assemblies and posts.

Surface Preparation.
All weld flux and other contaminates shall be mechanically removed. The traffic mast arms, and post assemblies shall be degreased, cleaned, and air dried to assure all moisture is removed.

Painted Finish.
All galvanized exterior surfaces shall be coated with a urethane or triglycidyl isocyanurate (TGIC) polyester powder to a dry film thickness of 2.0 mils. Prior to application, the surface shall be mechanically etched by brush blasting (Ref. SSPC-SP7) and the zinc coated substrate preheated to 450 ºF for a minimum one (1) hour. The coating shall be electrostatically applied and cured by elevating the zinc-coated substrate temperature to a minimum of 400 ºF.

The finish paint color shall be one of the vendor's standard colors and shall be as selected by the local agency responsible for paint costs. The Contractor shall confirm, in writing, the color selection with the local responsible agency and provide a copy of the approval to the Engineer and a copy of the approval shall be included in the material catalog submittal.

Painting of traffic signal heads, pedestrian signal heads and controller cabinets is not included in this pay item.

Any damage to the finish after leaving the vendor's facility shall be repaired to the satisfaction of the Engineer using a method recommended by the vendor and approved by the Engineer. If while at the vendor's facility the finish is damaged, the finish shall be re-applied at no cost to the contract.

Warranty.
The Contractor shall furnish in writing to the Engineer, the paint vendor's standard warranty and certification that the paint system has been properly applied.

Packaging.
Prior to shipping, the poles and posts shall be wrapped in ultraviolet-inhibiting plastic foam or rubberized foam.

Basis of Payment.
This work shall be paid for at the contract unit price each for PAINT NEW MAST ARM AND POLE, UNDER 40 FEET (12.19 METER), PAINT NEW MAST ARM AND POLE, 40 FEET (12.19 METER) AND OVER, PAINT NEW COMBINATION MAST ARM AND POLE, UNDER 40 FEET (12.19 METER), PAINT NEW COMBINATION MAST ARM AND POLE, 40 FEET (12.19 METER) AND OVER, or PAINT NEW TRAFFIC SIGNAL POST of the length specified, which shall be payment in full for painting and packaging the traffic signal mast arm poles and posts described above including all shrouds, bases and appurtenances.

FULL-ACTUATED CONTROLLER (SPECIAL)
Effective: September 26, 1995
Revised: November 1, 2020
857.01TS

Description.
This work shall consist of furnishing and installing a(n) "_____" brand traffic actuated solid state digital controller meeting the requirements of the current District One Traffic Signal Special Provisions 857.02TS Full Actuated Controller and Cabinet, and 857.02TS Railroad, Full Actuated Controller and Cabinet. This pay item shall include furnishing and installing the controller complete including malfunction management unit, load switches and flasher relays, and all necessary connections for proper operation.

Materials.
Add the following to Article 857.02 of the Standard Specifications:

Controllers shall be NTCIP compliant, Econolite Cobalt (Graphics Edition) or Eagle/Siemens M60 unless specified otherwise on the plans or elsewhere on these specifications. A NTCIP compliant controller may be used at a traffic signal interconnected to railroad warning devices but only upon the approval of the Engineer. Only controllers supplied by one of the District One approved closed loop equipment suppliers will be allowed. The controller shall be the most recent model and software version supplied by the equipment supplier at the time of the traffic signal TURN-ON and include data key. The traffic signal controller shall provide features to inhibit simultaneous display of a circular yellow ball and a yellow arrow display. Individual load switches shall be provided for each vehicle, pedestrian, and right turn overlap phase. The controller shall prevent phases from being omitted during program changes and after all preemption events.

Basis of Payment.
This work will be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER (SPECIAL).

FULL-ACTUATED CONTROLLER AND CABINET
Effective: January 1, 2002
Revised: November 1, 2020
857.02TS

Description.
This work shall consist of furnishing and installing a traffic actuated solid state digital controller in the controller cabinet of the type specified, meeting the requirements of Section 857 of the Standard Specifications, as modified herein, including malfunction management unit, load switches and flasher relays, with all necessary connections for proper operation.

If the intersection is part of an existing system and/or when specified in the plans, this work shall consist of furnishing and installing a(n) "_____" brand traffic actuated solid state controller.

Materials.
Add the following to Article 857.02 of the Standard Specifications:

For installation as a stand-alone traffic signal, connected to a closed loop system or integrated into an advance traffic management system (ATMS), controllers shall be Econolite Cobalt (Graphics Edition) or Eagle/Siemens M60 unless specified otherwise on the plans or elsewhere on these specifications. Only controllers supplied by one of the District One approved closed loop equipment suppliers will be allowed. Unless specified otherwise on the plans or these specifications, the controller shall be of the most recent model and software version supplied by the equipment supplier at the time of the traffic signal TURN-ON. A removable controller data key shall also be provided. Individual load switches shall be provided for each vehicle, pedestrian, and right turn overlap phase. The controller shall prevent phases from being skipped during program changes and after all preemption events and shall inhibit simultaneous display of circular yellow and yellow arrow indications.

For integration into an ATMS such as Centracs, Tactics, or TransSuite, the controller shall have the latest version of NTCIP software installed. For operation prior to integration into an ATMS, the controller shall maintain existing close loop management communications.

Add the following to Article 1074.03 of the Standard Specifications:

(a) (6) Cabinets shall be designed for NEMA TS2 Type 1 operation. All cabinets shall be pre-wired for a minimum of eight (8) phases of vehicular, four (4) phases of pedestrian and four (4) phases of overlap operation.
(b) (1) Revise “conflict monitor” to read “Malfunction Management Unit”
(b) (5) Cabinets – Provide 1/8" (3.2 mm) thick unpainted aluminum alloy 5052-H32. The surface shall be smooth, free of marks and scratches. All external hardware shall be stainless steel.
(b) (6) Controller Harness – Provide a TS2 Type 2 “A” wired harness in addition to the TS2 Type 1 harness.
(b) (7) Surge Protection – Shall be a 120VAC Single phase Modular filter Plug-in type, supplied from an approved vendor.
(b) (8) BIU – shall be secured by mechanical means.
(b) (9) Transfer Relays – Solid state or mechanical flash relays are acceptable.
(b) (10) Switch Guards – All switches shall be guarded.
(b) (11) Heating – One (1) 200 watt, thermostatically-controlled, electric heater.

(b) (12) Lighting – One (1) LED Panel shall be placed inside the cabinet top panel and one (1) LED Panel shall be placed on each side of the pull-out drawer/shelf assembly located beneath the controller support shelf. The LED Panels shall be controlled by a door switch. The LED Panels shall be provided from an approved vendor.

(b) (13) The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1 ½ inch (38mm) deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one (1) complete set of cabinet prints and manuals. This drawer shall support 50 lbs. (23 kg) in weight when fully extended. The drawer shall open and close smoothly. Drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 18 inches (610mm) wide.

(b) (14) Plan & Wiring Diagrams – 12" x 15" (305mm x 406mm) moisture sealed container attached to door.

(b) (15) Detector Racks – Fully wired and labeled for four (4) channels of emergency vehicle pre-emption and sixteen channels (16) of vehicular operation.

(b) (16) Field Wiring Labels – All field wiring shall be labeled.

(b) (17) Field Wiring Termination – Approved channel lugs required.

(b) (18) Power Panel – Provide a nonconductive shield.

(b) (19) Circuit Breaker – The circuit breaker shall be sized for the proposed load but shall not be rated less than 30 amps.

(b) (20) Police Door – Provide wiring and termination for plug in manual phase advance switch.

Basis of Payment.

This work will be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER AND TYPE IV CABINET; FULL-ACTUATED CONTROLLER AND TYPE V CABINET; FULL-ACTUATED CONTROLLER AND TYPE SUPER P CABINET; FULL-ACTUATED CONTROLLER AND TYPE SUPER R CABINET; FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL; FULL-ACTUATED CONTROLLER AND TYPE V CABINET, SPECIAL; FULL-ACTUATED CONTROLLER AND TYPE SUPER P CABINET (SPECIAL); FULL-ACTUATED CONTROLLER AND TYPE SUPER R CABINET (SPECIAL).

RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET
Effective: January 1, 2002
Revised: November 1, 2020
857.03TS

Description.
This work shall consist of furnishing and installing a traffic actuated solid state digital controller in the controller cabinet of the type specified, meeting the requirements of Section 857 of the Standard Specifications as modified herein and including conflict monitor or MMU, load switches and flasher relays, with interlock function to the railroad preemptor and all necessary connections for proper operation.

If the intersection is part of an existing system and/or when specified in the plans, this work shall consist of furnishing and installing a(n) "_____" brand traffic actuated solid state controller.

Controller and cabinet shall be assembled only by an approved IDOT District One traffic signal equipment supplier. The equipment shall be tested and approved in the equipment supplier's District One's facility prior to field installation.

Materials.
Add the following to Article 857.02 of the Standard Specifications:

For installation as a stand-alone traffic signal, connected to a closed loop system or integrated into an advance traffic management system (ATMS), controllers shall be Econolite Cobalt (Graphics Edition) or Eagle/Siemens M60 unless specified otherwise on the plans or elsewhere on these specifications. Only controllers supplied by one of the District One approved closed loop equipment suppliers will be allowed. The controller shall be the most recent model and software version approved by IDOT for use with railroad intersections supplied by the equipment supplier at the time of the traffic signal TURN-ON unless specified otherwise on plans or this specification, and include a removable data key. Individual load switches shall be provided for each vehicle, pedestrian, and right turn overlap phase. The controller shall prevent phases from being omitted during program changes and after all preemption events and shall inhibit simultaneous display of circular yellow and yellow arrow indications.

For integration into an ATMS such as Centracs, Tactics, or TransSuite, the controller shall have the latest version of NTCIP software installed. For operation prior to integration into an ATMS, the controller shall maintain existing communications.

Controller shall comply with Article 1073.01 as amended herein.

Controller Cabinet and Peripheral Equipment shall comply with Article 1074.03 as amended in these Traffic Signal Special Provisions.

Add the following to Articles 1073.01 (c) (2) and 1074.03 (a) (5) (e) of the Standard Specifications:

Controllers and cabinets shall be new and NEMA TS2 Type 1 or NEMA TS2 Type 2 design.

Railroad interconnected controllers and cabinets shall be assembled only by an approved traffic signal equipment supplier. All railroad interconnected (including temporary railroad interconnect) controllers and cabinets shall be new, built, tested and approved by the controller equipment vendor, in the vendor's District One facility, prior to field installation. The vendor shall provide the technical equipment and assistance as required by the Engineer to fully test this equipment.

Add the following to Article 1074.03 of the Standard Specifications:

(a) (6) Cabinets shall be designed for NEMA TS2 Type 1 or NEMA TS2 Type 2 operation. All cabinets shall be pre-wired for a minimum of eight (8) phases of vehicular, four (4) phases of pedestrian and four (4) phases of overlap operation.
(b) (1) Revise "conflict monitor" to read "Malfunction Management Unit"
(b) (5) Cabinets – Provide 1/8" (3.2 mm) thick unpainted aluminum alloy 5052-H32. The surface shall be smooth, free of marks and scratches. All external hardware shall be stainless steel.
(b) (6) Controller Harness – Provide a TS2 Type 2 "A" wired harness in addition to the TS2 Type 1 harness.
(b) (7) Surge Protection – Shall be a 120VAC Single phase Modular filter Plug-in type, supplied from an approved vendor.
(b) (8) BIU – shall be secured by mechanical means.
(b) (9) Transfer Relays – Solid state or mechanical flash relays are acceptable.
(b) (10) Switch Guards – All switches shall be guarded.
(b) (11) Heating – One (1) 200 watt, thermostatically-controlled, electric heater.
(b) (12) Lighting – One (1) LED Panel shall be placed inside the cabinet top panel and one (1) LED Panel shall be placed on each side of the pull-out drawer/shelf assembly located beneath the controller support shelf. The LED Panels shall be controlled by a door switch. The LED Panels shall be provided from an approved vendor.
(b) (13) The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1 ½ inch (38mm) deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one (1) complete set of cabinet prints and manuals. This drawer shall support 50 lbs. (23 kg) in weight when fully extended. The drawer shall open and close smoothly. Drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 18 inches (610mm) wide.
(b) (14) Plan & Wiring Diagrams – 12" x 15" (3.05mm x 4.06mm) moisture sealed container attached to door.
(b) (15) Detector Racks – Fully wired and labeled for four (4) channels of emergency vehicle pre-emption and sixteen channels (16) of vehicular operation.
(b) (16) Field Wiring Labels – All field wiring shall be labeled.
(b) (17) Field Wiring Termination – Approved channel lugs required.
(b) (18) Power Panel – Provide a nonconductive shield.
(b) (19) Circuit Breaker – The circuit breaker shall be sized for the proposed load but shall not be rated less than 30 amps.
(b) (20) Police Door – Provide wiring and termination for plug in manual phase advance switch.
(b) (21) Railroad Pre-Emption Test Switch – Shall be provided from an approved vendor

Installation.
Add the following to Article 857.03 of the Standard Specifications:

The Contractor shall arrange to install a standard voice-grade dial-up telephone line and all equipment to dial into the controller and have the controller dial out to the RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET as called for on the traffic signal installation plans. If the traffic signal installation is part of a traffic signal system, a telephone line is usually not required, unless a telephone line is called for on the traffic signal plans. The Contractor shall follow the requirements for the telephone service installation as contained in the current District One Traffic Signal Special Provision for Master Controller.

Basis of Payment.

This work will be paid for at the contract unit price each for RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE IV CABINET; RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE V CABINET; RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE SUPER P CABINET; RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE SUPER R CABINET; RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL; RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE V CABINET, SPECIAL; RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE SUPER P CABINET (SPECIAL) or RAILROAD, FULL-ACTUATED CONTROLLER AND TYPE SUPER R CABINET (SPECIAL).

MASTER CONTROLLER
Effective: May 22, 2002
Revised: January 1, 2019
860.01TS

General.
This work shall consist of furnishing and installing a master controller, meeting the requirements of the current District One Traffic Signal Special Provisions 857.01TS FULL-ACTUATED CONTROLLER (SPECIAL), 857.02TS FULL-ACTUATED CONTROLLER AND CABINET, and 857.02TS RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET, including all necessary connections for proper operation.

If the intersection is part of an existing system and/or when specified in the plans, this work shall consist of furnishing and installing a(n) "_____" brand master controller.

Materials and Installation.
Revise Articles 860.02 and 860.03 of the Standard Specifications to read:

Only controllers supplied by one of the District approved closed loop equipment supplier will be allowed. Only NEMA TS 2 Type 1 Eagle/Siemens and Econolite closed loop systems shall be supplied. The latest model and software version of master controller shall be supplied.

Functional requirements in addition to those in Section 863 of the Standard Specifications include:

The system commands shall consist of, as a minimum, six (6) cycle lengths, five (5) offsets, three (3) splits, and four (4) special functions. The system commands shall also include commands for free or coordinated operation.

Traffic Responsive operation shall consist of the real time acquisition of system detector data, data validation, and the scaling of acquired volumes and occupancies in a deterministic fashion so as to cause the selection and implementation of the most suitable traffic plan.

Upon request by the Engineer, each master shall be delivered with up to three (3) complete sets of the latest edition of registered remote monitoring software with full manufacture's support. Each set shall consist of software on CD, DVD, or other suitable media approved by the Engineer, and a bound set of manuals containing loading and operating instruction. One copy of the software and support data shall be delivered to the Agency in charge of system operation, if other than IDOT. One of these two sets will be provided to the Agency Signal Maintenance Contractor for use in monitoring the system.

The approved manufacturer of equipment shall loan the District one master controller and two intersection controllers of the most recent models and the newest software version to be used for instructional purposes in addition to the equipment to be supplied for the Contract.

The Contractor shall arrange to install a standard voice-grade dial-up telephone line to the master controller. This shall be accomplished through the following process utilizing District One staff. This telephone line may be coupled with a DSL line and a phone filter to isolate the dial-up line. An E911 address is required.

The cabinet shall be provided with an Outdoor Network Interface for termination of the telephone service. It shall be mounted to the inside of the cabinet in a location suitable to provide access for termination of the telephone service at a later date.

Full duplex communication between the master and its local controllers is recommended, but at this time not required. The data rate shall be 1200 baud minimum and shall be capable of speeds to 38,400 or above as technology allows. The controller, when installed in an Ethernet topology, may operate non-serial communications.

The cabinet shall be equipped with a 9600 baud, auto dial/auto answer modem. It shall be a US robotics 33.6K baud rate or equal.

As soon as practical or within one week after the contract has been awarded, the Contractor shall contact Teresa Caldwell, Business Services Manager in the District One Business Services Section at (847) 705-4010 to request a phone line installation. A follow-up contact shall include all required information pertaining to the phone installation and should be made as soon as possible or within one week after the initial request has been made. A copy of this contact must be emailed by the Contractor to the Traffic Signal Systems Engineer. The required information to be supplied shall include (but not limited to): An E911 address for the new traffic signal controller (or nearby address); a nearby existing telephone number; what type of telephone service is needed; the name and number of the Contractor's employee for the telephone company to contact regarding site work and questions.

The usual time frame for the activation of the phone line will vary after the Business Services Section has received the Contractor’s information and will depend on location and existing available facilities. It is, therefore, imperative that the phone line conduit and pull-string be installed by the Contractor as soon as possible. The contractor shall provide the Administrative Support Manager with an expected installation date

The telephone line shall be installed and activated one month before the system final inspection.

All costs associated with the telephone line installation and activation (not including the Contract specified conduit installation between the point of telephone service and the traffic signal controller cabinet) shall be paid for by the District One Business Services Section (i.e., this will be an IDOT phone number not a Contractor phone number).

Basis of Payment.
This work will be paid for at the contract unit price each for MASTER CONTROLLER or MASTER CONTROLLER (SPECIAL).

UNINTERRUPTABLE POWER SUPPLY, SPECIAL
Effective: January 1, 2013
Revised: May 19, 2016
862.01TS

This work shall be in accordance with section 862 of the Standard Specification except as modified herein

Add the following to Article 862.01 of the Standard Specifications:

The UPS shall have the power capacity to provide normal operation of a signalized intersection that utilizes all LED type signal head optics, for a minimum of 6 (six) hours.

Add the following to Article 862.02 of the Standard Specifications:

Materials shall be according to Article 1074.04 as modified in UNINTERRUPTABLE POWER SUPPLY, SPECIAL.

Add the following to Article 862.03 of the Standard Specifications:

The UPS shall additionally include, but not be limited to, a battery cabinet, where applicable. For Super-P (Type IV) and Super-R (Type V) cabinets, the battery cabinet is integrated to the traffic signal cabinet and shall be included in the cost for the traffic signal cabinet of the size and type indicated on the plans.

The UPS shall provide reliable emergency power to the traffic signals in the event of a power failure or interruption.

Revise Article 862.04 of the Standard Specifications to read:

Installation.
When a UPS is installed at an existing traffic signal cabinet, the UPS cabinet shall partially rest on the lip of the existing controller cabinet foundation and be secured to the existing controller cabinet by means of at least four (4) stainless steel bolts. The UPS cabinet shall be completely enclosed with the bottom and back constructed of the same material as the cabinet.

When a UPS is installed at a new signal cabinet and foundation, it shall be mounted as shown on the plans.

At locations where UPS is installed and an Emergency Vehicle Priority System is in use, any existing incandescent confirmation beacons shall be replaced with LED lamps in accordance with the District One Emergency Vehicle Priority System specification at no additional cost to the contract. A concrete apron shall be provided and be in accordance with Articles 424 and 202 of the Standard Specifications. The concrete apron shall also, follow the District 1 Standard Traffic Signal Design Detail, Type D for Ground Mounted Controller Cabinet and UPS Battery Cabinet.

This item shall include any required modifications to an existing traffic signal controller as a result of the addition of the UPS including the addition of alarms.

Materials.
Revise Article 1074.04(a)(1) of the Standard Specifications to read:

The UPS shall be line interactive or double conversion and provide voltage regulation and power conditioning when utilizing utility power. The UPS shall be sized appropriately for the intersection(s) normal traffic signal

operating load. The UPS must be able to maintain the intersection's normal operating load plus 20 percent (20%) of the intersection's normal operating load. When installed at a railroad-interconnected intersection the UPS must maintain the railroad pre-emption load, plus 20 percent (20%) of the railroad preemption-operating load. The total connected traffic signal load shall not exceed the published ratings for the UPS.
The UPS shall provide a minimum of 6 (six) hours of normal operation run-time for signalized intersections with LED type signal head optics at 77 °F (25 °C) (minimum 1000 W active output capacity, with 86 percent minimum inverter efficiency).

Revise the first paragraph of Article 1074.04(a)(3) of the Standard Specifications to read:

The UPS shall have a minimum of four (4) sets of normally open (NO) and normally closed (NC) single-pole double-throw (SPDT) relay contact closures, available on a panel mounted terminal block or locking circular connectors, rated at a minimum 120 V/1 A, and labeled so as to identify each contact according to the plans.

Revise Article 1074.04(a)(10) of the Standard Specifications to read:

The UPS shall be compatible with the District's approved traffic controller assemblies utilizing NEMA TS 1 or NEMA TS 2 controllers and cabinet components for full time operation.

Revise Article 1074.04(a)(17) of the Standard Specifications to read:

When the intersection is in battery backup mode, the UPS shall bypass all internal cabinet lights, ventilation fans, cabinet heaters, service receptacles, luminaires, any lighted street name signs, any automated enforcement equipment and any other devices directed by the Engineer.

Revise Article 1074.04(b)(2)b of the Standard Specifications to read:

Batteries, inverter/charger and power transfer relay shall be housed in a separate NEMA Type 3R cabinet. The cabinet shall be Aluminum alloy, 5052-H32, 0.125-inch thick and have a natural mill finish.

Revise Article 1074.04(b)(2)c of the Standard Specifications to read:

No more than three batteries shall be mounted on individual shelves for a cabinet housing six batteries and no more than four batteries per shelf for a cabinet housing eight batteries.

Revise Article 1074.04(b)(2)e of the Standard Specifications to read:

The battery cabinet housing shall have the following nominal outside dimensions: a width of 25 in. (785 mm), a depth of 16 in. (440 mm), and a height of 41 to 48 in. (1.1 to 1.3 m). Clearance between shelves shall be a minimum of 10 in. (250 mm).

End of paragraph 1074.04(b)(2)e

The door shall be equipped with a two-position doorstop, one a 90^{o} and one at 120^{o}.

Revise Article 1074.04(b)(2)g of the Standard Specifications to read:

The door shall open to the entire cabinet, have a neoprene gasket, an Aluminum continuous piano hinge with stainless steel pin, and a three-point locking system. The cabinet shall be provided with a main door lock which shall operate with a traffic industry conventional No. 2 key. Provisions for padlocking the door shall be provided.

Add the following to Article 1074.04(b)(2) of the Standard Specifications:

j. The battery cabinet shall have provisions for an external generator connection.

Add the following to Article 1074.04(c) of the Standard Specifications:

(8) The UPS shall include a tip or kill switch installed in the battery cabinet, which shall completely disconnect power from the UPS when the switch is manually activated.

(9) The UPS shall include standard RS-232 and internal Ethernet interface.

(10) The UPS shall incorporate a flanged electric generator inlet for charging the batteries and operating the UPS. The generator connector shall be male type, twist-lock, rated as 15A, 125VAC with a NEMA L5-15P configuration and weatherproof lift cover plate. Access to the generator inlet shall be from a secured weatherproof lift cover plate or behind a locked battery cabinet police panel.

(11) The bypass switch shall include an internal power transfer relay that allows removal of the battery back-up unit, while the traffic signal is connected to utility power, without impacting normal traffic signal operation.

Revise Article 1074.04(d)(3) of the Standard Specifications to read:

All batteries supplied in the UPS shall be either gel cell or AGM type, deep cycle, completely sealed, prismatic lead calcium based, silver alloy, valve regulated lead acid (VRLA) requiring no maintenance. All batteries in a UPS installation shall be the same type; mixing of gel cell and AGM types within a UPS installation is not permitted.

Revise Article 1074.04(d)(4) of the Standard Specifications to read:

Batteries shall be certified by the manufacturer to operate over a temperature range of -13 to 160 °F (-25 to + 71 °C) for gel cell batteries and -40 to 140 °F (-40 to + 60 °C) for AGM type batteries.

Add the following to Article 1074.04(d) of the Standard Specifications:

(9) The UPS shall consist of an even number of batteries that are capable of maintaining normal operation of the signalized intersection for a minimum of 6 (six) hours. Calculations shall be provided showing the number of batteries of the type supplied that are needed to satisfy this requirement. A minimum of four batteries shall be provided.

(10) Battery Heater mats shall be provided, when gel cell type batteries are supplied.

Add the following to the Article 1074.04 of the Standard Specifications:

(e) Warranty. The warranty for an uninterruptable power supply (UPS) and batteries (full replacement) shall cover a minimum of 5 years from date the equipment is placed in operation.

(f) Installation. Bypass switch shall completely disconnect the traffic signal cabinet from the utility provider.

(g) The UPS shall be set-up to run the traffic signal continuously, without going to a red flashing condition, when switched to battery power unless otherwise directed by the Engineer. The Contractor shall confirm set-up with the Engineer. The continuous operation mode when switched to battery may require modification to unit connections and these modifications are included in the unit price for this item.

Revise Article 862.05 of the Standard Specifications to read:

Basis of Payment.
This work will be paid for at the contract unit price per each for UNINTERRUPTABLE POWER SUPPLY, SPECIAL or UNINTERRUPTABLE POWER SUPPLY AND CABINET, SPECIAL. Replacement of Emergency Vehicle Priority System confirmation beacons and any required modifications to the traffic signal controller shall be included in the cost of the UNINTERRUPTABLE POWER SUPPLY, SPECIAL or UNINTERRUPTABLE POWER SUPPLY AND CABINET, SPECIAL item. The concrete apron and earth excavation required shall be included in the cost of the UNINTERRUPTABLE POWER SUPPLY AND CABINET, SPECIAL item.

UNINTERRUPTABLE POWER SUPPLY, GROUND MOUNTED
Effective: January 1, 2012
Revised: July 1, 2015
862.02TS

This item shall consist of furnishing and installing an uninterruptable power supply. This item shall meet the same requirements as the current District One Traffic Signal Special Provision 862.01TS UNINTERRUPTABLE POWER SUPPLY, SPECIAL.

Materials shall be according to Article 1074.04 as modified in UNINTERRUPTABLE POWER SUPPLY, SPECIAL.

Installation.
The UPS shall be mounted on its own Type A square concrete foundation. The concrete foundation shall extend 2 inch past each side of the UPS cabinet and the edges shall have a continuous 1 inch chamfer at a 45 degree angle.

At locations where UPS is to be installed and Emergency Vehicle Priority System is in use, any existing incandescent confirmation beacons shall be replaced with LED lamps in accordance with the District One Emergency Vehicle Priority System specification at no additional cost to the contract. A concrete apron shall be provided with a dimension of 36 inches in front of the UPS cabinet, 5 inches deep, and a width sized appropriately to the width of the concrete foundation. The concrete apron shall follow Articles 424 and 202 of the Standard Specifications.

This item shall include any required modifications to an existing traffic signal controller.

Basis of Payment.
This item will be paid for at the contract unit price each for UNINTERRUPTABLE POWER SUPPLY, GROUND MOUNTED. Replacement of Emergency Vehicle Priority System confirmation beacons and any required modifications to the traffic signal controller shall be included in the cost of the UNINTERRUPTABLE POWER SUPPLY, GROUND MOUNTED item. The concrete foundation, concrete apron and earth excavation required shall be included in the cost of the UNINTERRUPTABLE POWER SUPPLY, GROUND MOUNTED item.

FIBER OPTIC CABLE
Effective: May 22, 2002
Revised: July 1, 2015
871.01TS

Add the following to Article 871.01 of the Standard Specifications:

The Fiber Optic cable shall be installed in conduit or as specified on the plans.

Add the following to Article 871.02 of the Standard Specifications:

The control cabinet distribution enclosure shall be 24 Port Fiber Wall Enclosure, unless otherwise indicated on plans. The fiber optic cable shall provide twelve fibers per tube for the amount of fibers called for in the Fiber Optic Cable pay item in the Contract. Fiber Optic cable may be gel filled or have an approved water blocking tape.

Add the following to Article 871.04 of the Standard Specifications:

A minimum of six multimode fibers from each cable shall be terminated with approved mechanical connectors at the distribution enclosure. Fibers not being used shall be labeled “spare." Fibers not attached to the distribution enclosure shall be capped. A minimum of 13.0 feet (4m) of extra cable length shall be provided for controller cabinets. The controller cabinet extra cable length shall be stored as directed by the Engineer.

Add the following to Article 871.06 of the Standard Specifications:

The distribution enclosure and all connectors will be included in the cost of the fiber optic cable.

Testing shall be in accordance with Article 801.13(d). Electronic files of OTDR signature traces shall be provided in the Final project documentation with certification from the Contractor that attenuation of each fiber does not exceed 3.5 dB/km nominal at 850nm for multimode fiber and 0.4 bd/km nominal at 1300nm for single mode fiber.

ELECTRIC CABLE
Effective: May 22, 2002
Revised: July 1, 2015
873.01TS

Delete “or stranded, and No. 12 or” from the last sentence of Article 1076.04 (a) of the Standard Specifications.

Add the following to the Article 1076.04(d) of the Standard Specifications:

Service cable may be single or multiple conductor cable.

GROUNDING EXISTING HANDHOLE FRAME AND COVER
Effective: May 22, 2002
Revised: July 1, 2015
873.02TS

Description.
This work shall consist of all materials and labor required to bond the equipment grounding conductor to the existing handhole frame and handhole cover. All installations shall meet the requirements of the details in the "District One Standard Traffic Signal Design Details," and applicable portions of the Standard Specifications and District One Traffic Signal Special Provisions 806.01TS GROUNDING OF TRAFFIC SIGNAL SYSTEMS and 817.01TS GROUNDING CABLE.

The equipment grounding conductor shall be bonded to the handhole frame and to the handhole cover. Two (2) ½-inch diameter x 1 ¼-inch long hex-head stainless steel bolts, spaced 1.75-inches apart center-to-center shall be fully welded to the frame and to the cover to accommodate a heavy duty UL listed grounding compression terminal. The grounding compression terminal shall be secured to the bolts with stainless steel split-lock washers and nylon-insert locknuts.

Welding preparation for the stainless-steel bolt hex-head to the frame and to the cover shall include thoroughly cleaning the contact and weldment area of all rust, dirt and contaminates. The Contractor shall assure a solid strong weld. The welds shall be smooth and thoroughly cleaned of flux and spatter. The grounding installation shall not affect the proper seating of the cover when closed.

The grounding cable shall be paid for separately.

Method of Measurement.
Units measured for payment will be counted on a per handhole basis, regardless of the type of handhole and its location.

Basis of Payment.
This work shall be paid for at the contract unit price each for GROUNDING EXISTING HANDHOLE FRAME AND COVER which shall be payment in full for grounding the handhole complete.

EMERGENCY VEHICLE PRIORITY SYSTEM LINE SENSOR CABLE, NO. 20 3/C
Effective: January 1, 2013
Revised: July 1, 2015
873.03TS

This work shall consist of furnishing and installing lead-in cable for light detectors installed at existing and/or proposed traffic signal installations as part of an emergency vehicle priority system. The work includes installation of the lead-in cables in existing and/or new conduit. The electric cable shall be shielded and have (3) stranded conductors, colored blue, orange, and yellow with a stranded tinned copper drain wire. The cable shall meet the requirements of the vendor of the Emergency Vehicle Priority System Equipment.

Basis of Payment.
This work will be paid for at the contract unit price per foot for EMERGENCY VEHICLE PRIORITY SYSTEM LINE SENSOR CABLE, NO. 20 3/C, which price shall be payment in full for furnishing, installing and making all electrical connections necessary for proper operations.

RAILROAD INTERCONNECT CABLE
Effective: May 22, 2002
Revised: July 1, 2015
873.04TS

The cable shall meet the requirements of Section 873 of the Standard Specifications, except for the following:

Add to Article 873.02 of the Standard Specifications:

c) The railroad interconnect cable shall be three conductor stranded #14 copper cable in a clear polyester binder, shielded with #36 AWG tinned copper braid with 85% coverage, and insulated with .016" polyethylene (black, blue, red). The jacket shall be black 0.045 PVC or polyethylene.

Add the following to Article 873.06 of the Standard Specifications:

Basis of Payment.
This work shall be paid for at the contract unit price per foot (meter) for ELECTRIC CABLE IN CONDUIT, RAILROAD, NO. 14 3C, which price shall be payment in full for furnishing, installing, and making all electrical connections in the traffic signal controller cabinet. Connections in the railroad controller cabinet shall be performed by railroad personnel.

TRAFFIC SIGNAL POST
Effective: May 22, 2002
Revised: November 01, 2018
875.01TS

Revise Article 1077.01 (c) of the Standard Specifications to read:

(c) Anchor Rods. The anchor rods shall be a minimum of 5/8 in. in diameter and 16 in. long and shall be according to Article 1006.09. The anchor rods shall be threaded approximately 6 in. at one end and have a bend at the other end. The first 12 in. at the threaded end shall be galvanized. One each galvanized nut and washer shall be furnished with each anchor rod. The washer shall be properly sized to fully engage and sit flush on all sides of the slot of the base plate.

Revise the first sentence of Article 1077.01 (d) of the Standard Specifications to read:

All posts shall be steel, and bases shall be cast iron. All posts and bases shall be hot dipped galvanized according to AASHTO M 111. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with 851.01TS TRAFFIC SIGNAL PAINTING Special Provisions.

PEDESTRIAN SIGNAL POST
Effective: January 1, 2020
875.02TS

Description.
This work shall consist of furnishing and installing a metal pedestrian signal post. All installations shall meet the requirements of the "District One Standard Traffic Signal Design Details".

Materials.

a. General. The pedestrian signal post shall be designed to support the traffic signal loading shown on the plans. The design and fabrication shall be according to the Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, as published by AASHTO.

b. Post. The post shall be made of steel or aluminum and have an outside diameter of 4-1/2 inches. The post shall be threaded for assembly to the base. Aluminum posts shall be according to the specifications for Schedule 80 aluminum pipe. Steel posts shall be according to the specifications for Schedule 40 steel pipe.

c. Base. The base of a steel post shall be cast iron. The base of an aluminum post shall be aluminum. The base shall be threaded for the attachment to the threaded post. The base shall be approximately 10 in. high and 6-3/4 in. square at the bottom. The bottom of the base shall be designed to accept four 5/8 in. diameter anchor rods evenly spaced in a 6 in. diameter circle. The base shall be true to pattern, with sharp clean cutting ornamentation, and equipped with access doors for cable handling. The door shall be fastened to the base with stainless steel screws. A grounding lug shall be provided inside the base.

d. Anchor Rods. The anchor rods shall be 5/8 in. in diameter and 16 in. long and shall be according to Article 1006.09. The anchor rods shall be threaded approximately 6 in. at one end and have a bend at the other end. The first 12 in. at the threaded end shall be galvanized. One each galvanized nut and trapezoidal washer shall be furnished with each anchor rod. The washer shall be properly sized to fully engage and sit flush on all sides of the slot of the base plate.

   The aluminum post and base shall be drilled at the third points around the diameter and 1/4 in. by 2 in. stainless steel bolts shall be inserted to prevent the post from turning and wobbling.

e. Finish. The steel post, steel post cap and the cast iron base shall be hot-dipped galvanized according to AASHTO M 111. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with 851.01TS TRAFFIC SIGNAL PAINTING Special Provisions. If the post and the base are threaded after the galvanization, the bare exposed metal shall be immediately cleaned to remove all cutting solvents and oils, and then spray painted with two coats of an approved galvanized paint.

The aluminum post shall have a natural finish, 100 grit or finer.

Installation.
The pedestrian signal post shall be erected plumb, securely bolted to a concrete foundation, and grounded to a ground rod according to the details shown on the plans. No more than 3/4 in. of the post threads shall protrude above the base.

A post cap shall be furnished and installed on the top of the post. The post cap shall match the material of the post. The Contractor shall apply an anti-seize paste compound on all nuts and bolts prior to assembly.

Prior to the assembly, the Contractor shall apply two additional coats of galvanized paint on the threads of the post and the base. The Contractor shall use a fabric post tightener to screw the post to the base.

Basis of Payment.
This work will be paid for at the contract unit price per each for PEDESTRIAN SIGNAL POST, of the length specified.

MAST ARM ASSEMBLY AND POLE
Effective: May 22, 2002
Revised: July 01, 2015
877.01TS

Revise the second sentence of Article 1077.03 (a)(3) of the Standard Specifications to read:

Traffic signal mast arms shall be one-piece construction, unless otherwise approved by the Engineer.

Add the following to Article 1077.03 (a)(3) of the Standard Specifications:

If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with 851.01TS TRAFFIC SIGNAL PAINTING Special Provisions.

CONCRETE FOUNDATIONS
Effective: May 22, 2002
Revised: November 01, 2018
878.01TS

Add the following to Article 878.03 of the Standard Specifications:

All anchor bolts shall be according to Article 1006.09, with all anchor bolts hot dipped galvanized a minimum of 12 in. at the threaded end.

No foundation is to be poured until the Resident Engineer gives his/her approval as to the depth of the foundation.

Add the following to the first paragraph of Article 878.05 of the Standard Specifications:

The concrete apron in front of the cabinet and UPS shall be included in this pay item.

REMOVE AND REPLACE ANCHOR BOLTS
Effective: January 1, 2014
Revised: July 1, 2015
878.02TS

This item shall consist of replacing anchor rods at existing concrete foundations for traffic signal posts. At locations specified on the plans for new traffic signal post installation, the Contractor shall inspect the existing post foundations prior to removing the existing traffic signal post. The Contractor shall verify that the pattern, spacing, and condition of the existing anchor bolts are acceptable for reuse with a new post. The Contractor shall replace unacceptable anchor bolts as approved by the Engineer.

Anchor bolts shall be according to Article 1006.09 and shall be hot dipped galvanized.

Installation.
Existing anchor bolts shall be cut flush with the top of concrete foundation.

The bolt circle of the new anchor bolts shall be rotated a minimum of 2.5-inches away from the existing anchor bolts. New anchor bolts shall be ¾-inch diameter with minimum 9-inch embedment into the existing concrete foundation and 3-inch threaded length above the top of foundation. New anchor bolts shall be installed using a HIT-RE 500 exposed adhesive anchoring system.

Method of Measurement.
The removal and replacement of anchor bolts will be measured for payment as per each foundation requiring anchor bolt replacement. This shall include all anchor bolts replaced, labor, equipment, and materials required for replacing anchor bolts at an existing foundation as specified herein.

Basis of Payment.
This item will be paid for at the contract unit price each for REMOVE AND REPLACE ANCHOR BOLTS.

CONCRETE FOUNDATION, PEDESTRIAN POST
Effective: April 1, 2019
Revised: November 1, 2020
878.03TS

This item shall follow Section 878. Traffic Signal Concrete Foundation of the Standard Specifications.

No foundation is to be poured until the Resident Engineer gives his/her approval as to the depth of the foundation.

Basis of Payment.
This work will be paid for at the contract unit price per foot of depth of CONCRETE FOUNDATION, TYPE A 12-INCH DIAMETER.

LIGHT EMITTING DIODE (LED) SIGNAL HEAD AND OPTICALLY PROGRAMMED LED SIGNAL HEAD
Effective: May 22, 2002
Revised: July 1, 2015
880.01TS

Materials.
Add the following to Section 1078 of the Standard Specifications:

1. LED modules proposed for use and not previously approved by IDOT District One will require independent testing for compliance to current VTCSH-ITE standards for the product and be Intertek ETL Verified. This would include modules from new vendors and new models from IDOT District One approved vendors.

2. The proposed independent testing facility shall be approved by IDOT District One. Independent testing must include a minimum of two (2) randomly selected modules of each type of module (i.e. ball, arrow, pedestrian, etc.) used in the District and include as a minimum Luminous Intensity and Chromaticity tests. However, complete module performance verification testing may be required by the Engineer to assure the accuracy of the vendor's published data and previous test results. An IDOT representative will select sample modules from the local warehouse and mark the modules for testing. Independent test results shall meet current ITE standards and vendor's published data. Any module failures shall require retesting of the module type. All costs associated with the selection of sample modules, testing, reporting, and retesting, if applicable, shall be the responsibility of the LED module vendor and not be a cost to this contract.

3. All signal heads shall provide 12" (300 mm) displays with glossy yellow polycarbonate housings. All head housings shall be the same color (yellow) at the intersection. For new signalized intersections and existing signalized intersections where all signals heads are being replaced, the proposed head housings shall be black. Where only selected heads are being replaced, the proposed head housing color (yellow) shall match existing head housings. Connecting hardware and mounting brackets shall be polycarbonate (black). A corrosion resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints and shall be visible to the inspector at the signal turn-on. Post top mounting collars are required on all posts and shall be constructed of the same material as the brackets.

4. The LED signal modules shall be replaced or repaired if an LED signal module fails to function as intended due to workmanship or material defects within the first **72 months** from the date of delivery. LED signal modules which exhibit luminous intensities less than the minimum values specified in Table 1 of the ITE Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement (June 27, 2005) [VTSCH], or applicable successor ITE specifications, or show signs of entrance of moisture or contaminants within the first **15 years** of the date of delivery shall be replaced or repaired. The manufacturer's written warranty for the LED signal modules shall be dated, signed by an Officer of the company and included in the product submittal to the State.

   The LED signal modules shall be designed and constructed to meet the **15 year** warranty and shall not be a 5 or 6 year warranty LED signal module with a manufacturer's written 15 year warranty.

(a) Physical and Mechanical Requirements

1. Modules can be manufactured under this specification for the following faces:

   a. 12-inch (300 mm) circular, multi-section
   b. 12-inch (300 mm) arrow, multi-section

2. The maximum weight of a module shall be 4 lbs. (1.8 kg).

3. Each module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a lens and gasket, etc.), and shall be weatherproof after installation and connection.

5. The lens of the module shall be tinted with a wavelength-matched color to reduce sun phantom effect and enhance on/off contrast. The tinting shall be uniform across the lens face. Polymeric lens shall provide a surface coating or chemical surface treatment applied to provide abrasion resistance. The lens of the module shall be integral to the unit, convex with a smooth outer surface and made of plastic. The lens shall have a textured surface to reduce glare.

6. The use of tinting or other materials to enhance ON/OFF contrasts shall not affect chromaticity and shall be uniform across the face of the lens.

7. Each module shall have a symbol of the type of module (i.e. circle, arrow, etc.) in the color of the module. The symbol shall be 1 inch (25.4 mm) in diameter. Additionally, the color shall be written out in 1/2-inch (12.7mm) letters next to the symbol.

(b) Photometric Requirements

4. The LEDs utilized in the modules shall be AlInGaP technology for red and InGaN for green and amber indications, and shall be the ultra-bright type rated for 100,000 hours of continuous operation from -40 °C to +74 °C.

(c) Electrical

1. Maximum power consumption for LED modules is per Table 2.

2. Operating voltage of the modules shall be 120 VAC. All parameters shall be measured at this voltage.

3. The modules shall be operationally compatible with currently used controller assemblies (solid state load switches, flashers, and conflict monitors).

4. When a current of 20 mA AC (or less) is applied to the unit, the voltage read across the two leads shall be 15 VAC or less.

5. The LED modules shall provide constant light output under power. Modules with dimming capabilities shall have the option disabled or set on a non-dimming operation.

6. LED arrows shall be wired such that a catastrophic loss or the failure of one or more LED will not result in the loss of the entire module.

(d) Retrofit Traffic Signal Module

1. The following specification requirements apply to the Retrofit module only. All general specifications apply unless specifically superseded in this section.

2. Retrofit modules can be manufactured under this specification for the following faces:

a. 12-inch (300 mm) circular, multi-section
b. 12-inch (300 mm) arrow, multi-section

3. Each Retrofit module shall be designed to be installed in the doorframe of a standard traffic signal housing. The Retrofit module shall be sealed in the doorframe with a one-piece EPDM (ethylene propylene rubber) gasket.

4. The maximum weight of a Retrofit module shall be 4 lbs. (1.8 kg).

5. Each Retrofit module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a lens and gasket, etc.), and shall be weatherproof after installation and connection.

6. Electrical conductors for modules, including Retrofit modules, shall be 39.4 inches (1m) in length, with quick disconnect terminals attached.

7. The lens of the Retrofit module shall be integral to the unit, shall be convex with a smooth outer surface and made of plastic or of glass.

(e) The following specification requirements apply to the 12-inch (300 mm) arrow module only. All general specifications apply unless specifically superseded in this section.

1. The arrow module shall meet specifications stated in Section 9.01 of the Equipment and Material Standards of the Institute of Transportation Engineers (November 1998) [ITE Standards], Chapter 2 (Vehicle Traffic Control Signal Heads) or applicable successor ITE specifications for arrow indications.

2. The LEDs arrow indication shall be a solid display with a minimum of three (3) outlining rows of LEDs and at least one (1) fill row of LEDs.

(f) The following specification requirement applies to the 12-inch (300 mm) programmed visibility (PV) module only. All general specifications apply unless specifically superseded in this section.

1. The LED module shall be a module designed and constructed to be installed in a programmed visibility (PV) signal housing without modification to the housing.

Basis of Payment.
Add the following to the first paragraph of Article 880.04 of the Standard Specifications:

The price shall include furnishing the equipment described above, all mounting hardware and installing them in satisfactory operating condition.

Revise the second paragraph of Article 880.04 of the Standard Specifications to read:

If the work consists of retrofitting an existing polycarbonate traffic signal head with light emitting diodes (LEDs), it will be paid for as a SIGNAL HEAD, LED, RETROFIT, of the type specified, and of the particular kind of material, when specified. Price shall be payment in full for removal of the existing module, furnishing the equipment described above including LED modules, all mounting hardware, and installing them in satisfactory operating condition. The type specified will indicate the number of signal faces, the number of signal sections in each signal face and the method of mounting.

FLASHING BEACON INSTALLATION, RELOCATION AND REMOVAL
Effective: January 1, 2007
Revised: July 1, 2015
880.02TS

This work shall consist of furnishing and installing a new flashing beacon installation, solar powered flashing beacon installation, relocation of existing flashing beacon, and/or the removal of the existing flashing beacon installation as shown on the plans and as described herein. The energy charges for the operation of the flashing beacon installation shall be paid for by the Department unless otherwise directed by the Engineer.

The installation, relocation and removal of flashing beacon installation shall be according to the applicable portions of Sections 800 and 1000 of the Standard Specifications for Road and Bridge Construction and District 1 Flashing Beacon Installation Details except as revised herein. LED signal heads shall be as modified in 880.01TS LED SIGNAL HEAD AND OPTICALLY PROGRAMMED LED SIGNAL HEAD Special Provision.

(a) Flashing Beacon Installation. This item shall consist of installing a post mounted 12-inch (300 mm) L.E.D. single section red or yellow flashing beacon on a new or existing post as shown on the plans or as directed by the Engineer. This item shall include furnishing and installing a flasher controller in an aluminum cabinet, or integrated within the signal head, 12 inch (300 mm) L.E.D. red or yellow signal section with a dimmer if required by the Engineer, and all other hardware necessary to complete the installation.

(b) Solar Powered Flashing Beacon Installation. This item shall consist of installation of a solar powered flashing beacon, post mounted as shown on the plans or as directed by the Engineer. This item shall consist of furnishing and installing a 12 inch (300 mm) single red or yellow flashing module on a new or existing post as shown on the plans or as directed by the Engineer. This item shall include furnishing and installing a flasher controller that is integrated within the signal head, with discrete solar panels, LED module, battery, electronics, compact housing and be capable of operating 24 hours, 7 days a week. The flasher unit shall be installed on standard wood or metal posts. The flash pattern shall be MUTCD compliant and have alternate flash patterns available. The battery shall have a life span of a minimum of 5 years and be field replaceable. The battery and electronics may be located inside the solar panel housing or signal head. The sections of the flasher unit shall be secured with tamper resistant stainless-steel hardware and unless otherwise noted, the housing shall be black in color.

(c) Relocate Existing Flashing Beacon. Relocation of an existing flashing beacon installation, as shown on the plans or as directed by the Engineer, shall meet the above requirements. This work shall include the complete relocation of the existing flashing beacon installation, the backfilling of the holes created by the removal of the poles, restoration of the surface to match the adjoining area.

(d) Remove Existing Flashing Beacon Installation Complete. Removal of an existing flashing beacon installation shall be as shown on the plans or as directed by the Engineer and shall be according to applicable portions of Section 895 of the Standard Specifications. This work shall include a complete removal of an existing flashing beacon installation, backfilling of the holes created by the removal of the poles and restoration of the surface to match the adjoining area. The flashing beacon installation will be removed only after the permanent signal installation is accepted for maintenance, or as directed by the Engineer.

Basis of Payment.

This work shall be paid for at the contract unit price each for FLASHING BEACON INSTALLATION; SOLAR POWERED FLASHING BEACON INSTALLATION; RELOCATE EXISTING FLASHING BEACON or REMOVE EXISTING FLASHING BEACON INSTALLATION COMPLETE. The price shall be payment in full for all labor and material necessary to complete the work described above.

LIGHT EMITTING DIODE (LED) PEDESTRIAN SIGNAL HEAD
Effective: May 22, 2002
Revised: July 1, 2015
881.01TS

Add the following to the third paragraph of Article 881.03 of the Standard Specifications:

No mixing of different types of pedestrian traffic signals or displays will be permitted.

Add the following to Article 881.03 of the Standard Specifications:

(a) Pedestrian Countdown Signal Heads.

(1) Pedestrian Countdown Signal Heads shall not be installed at signalized intersections where traffic signals and railroad warning devices are interconnected.

(2) Pedestrian Countdown Signal Heads shall be 16-inch (406mm) x 18 inch (457mm), for single units with glossy yellow polycarbonate housings. All pedestrian head housings shall be the same color (yellow) at the intersection. For new signalized intersections and existing signalized intersections where all pedestrian heads are being replaced, the proposed head housings shall be black. Where only selected heads are being replaced, the proposed head housing color (yellow) shall match existing head housings. Connecting hardware and mounting brackets shall be polycarbonate (black). A corrosion resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints and shall be visible to the inspector at the signal turn-on.

(3) Each pedestrian signal LED module shall be fully MUTCD compliant and shall consist of double overlay message combining full LED symbols of an Upraised Hand and a Walking Person. “Egg Crate” type sun shields are not permitted. Numerals shall measure 9 inches (229mm) in height and easily identified from a distance of 120 feet (36.6m).

Materials.
Add the following to Article 1078.02 of the Standard Specifications:

General.

1. The module shall operate in one mode: Clearance Cycle Countdown Mode Only. The countdown module shall display actual controller programmed clearance cycle and shall start counting when the flashing clearance signal turns on and shall countdown to “0” and turn off when the steady Upraised Hand (symbolizing Don’t Walk) signal turns on. Module shall not have user accessible switches or controls for modification of cycle.

2. At power on, the module shall enter a single automatic learning cycle. During the automatic learning cycle, the countdown display shall remain dark.

3. The module shall re-program itself if it detects any increase or decrease of Pedestrian Timing. The counting unit will go blank once a change is detected and then take one complete pedestrian cycle (with no counter during this cycle) to adjust its buffer timer.

4. If the controller preempts during the Walking Person (symbolizing Walk), the countdown will follow the controller's directions and will adjust from Walking Person to flashing Upraised Hand. It will start to count down during the flashing Upraised Hand.

5. If the controller preempts during the flashing Upraised Hand, the countdown will continue to count down without interruption.

6. The next cycle, following the preemption event, shall use the correct, initially programmed values.

7. If the controller output displays Upraised Hand steady condition and the unit has not arrived to zero or if both the Upraised Hand and Walking Person are dark for some reason, the unit suspends any timing and the digits will go dark.

8. The digits will go dark for one pedestrian cycle after loss of power of more than 1.5 seconds.

9. The countdown numerals shall be two (2) “7 segment” digits forming the time display utilizing two rows of LEDs.

10. The LED module shall meet the requirements of the Institute of Transportation Engineers (ITE) LED purchase specification, “Pedestrian Traffic Control Signal Indications - Part 2: LED Pedestrian Traffic Signal Modules,” or applicable successor ITE specifications, except as modified herein.

11. The LED modules shall provide constant light output under power. Modules with dimming capabilities shall have the option disabled or set on a non-dimming operation.

12. In the event of a power outage, light output from the LED modules shall cease instantaneously.

13. The LEDs utilized in the modules shall be AlInGaP technology for Portland Orange (Countdown Numerals and Upraised Hand) and GaN technology for Lunar White (Walking Person) indications.

14. The individual LEDs shall be wired such that a catastrophic loss or the failure of one or more LED will not result in the loss of the entire module.

Basis of Payment.
Add the following to the first paragraph of Article 881.04 of the Standard Specifications:

The price shall include furnishing the equipment described above, all mounting hardware and installing them in satisfactory operating condition.

Add the following to Article 881.04 of the Standard Specifications:

If the work consists of retrofitting an existing polycarbonate pedestrian signal head and pedestrian countdown signal head with light emitting diodes (LEDs), it will be paid for as a PEDESTRIAN SIGNAL HEAD, LED, RETROFIT, of the type specified, and of the particular kind of material, when specified. Price shall be payment in full for furnishing the equipment described above including LED modules, all mounting hardware, and installing them in satisfactory operating condition.

TRAFFIC SIGNAL BACKPLATE
Effective: May 22, 2002
Revised: July 1, 2015
882.01TS

Delete 1st sentence of Article 1078.03 of the Standard Specifications and add "All backplates shall be louvered, formed ABS plastic".

Add the following to the third paragraph of Article 1078.03 of the Standard Specifications. The retroreflective backplate shall not contain louvers.

Delete second sentence of the fourth paragraph of Article 1078.03 the Standard Specifications.

Add the following to the fourth paragraph of Article 1078.03 of the Standard Specifications:

When retro reflective sheeting is specified, it shall be Type ZZ sheeting according to Article 1091.03 and applied in preferred orientation for the maximum angularity according to the vendor's recommendations. The retroreflective sheeting shall be installed under a controlled environment at the vendor/equipment supplier before shipment to the contractor. The formed plastic backplate shall be prepared and cleaned, following recommendations of the retroreflective sheeting manufacturer.

DETECTOR LOOP
Effective: May 22, 2002
Revised: July 1, 2018
886.01TS

Procedure.
A minimum of seven (7) working days prior to the Contractor cutting loops, the Contractor shall mark the proposed loop locations and contact the Area Traffic Signal Maintenance and Operations Engineer (847) 705-4424 to inspect and approve the layout. When preformed detector loops are installed, the Contractor shall have them inspected and approved prior to the pouring of the Portland cement concrete surface, using the same notification process as above.

Installation.
Revise Article 886.04 of the Standard Specifications to read:
Loop detectors shall be installed according to the requirements of the "District One Standard Traffic Signal Design Details." Saw-cuts (homeruns on preformed detector loops) from the loop to the edge of pavement shall be made perpendicular to the edge of pavement when possible in order to minimize the length of the saw-cut (homerun on preformed detector loops) unless directed otherwise by the Engineer or as shown on the plan.

The detector loop cable insulation shall be labeled with the cable specifications.

Each loop detector lead-in wire shall be labeled in the handhole using a waterproof tag, from an approved vendor, secured to each wire with nylon ties.

Resistance to ground shall be a minimum of 100 mega-ohms under any conditions of weather or moisture. Inductance shall be more than 50 and less than 700 microhenries. Quality readings shall be more than 5.

(g) Type I. All loops installed in new asphalt pavement shall be installed in the binder course and not in the surface course. The edge of pavement, curb and handhole shall be cut with a 1/4 inch (6.3 mm) deep x 4 inches (100 mm) saw cut to mark location of each loop cable.

(h) Loop sealant shall be two-component thixotropic chemically cured polyurethane from an approved vendor. The sealant shall be installed 1/8 inch (3 mm) below the pavement surface. If installed above the surface the excess shall be removed immediately.

(i) Preformed. This work shall consist of furnishing and installing a rubberized or cross-linked polyethylene heat resistant preformed traffic signal loop in accordance with the Standard Specifications, except for the following:

(j) Preformed detector loops shall be installed in the sub-base under the Portland cement concrete pavement. Loop lead-ins shall be extended to a temporary protective enclosure near the proposed handhole location. The protective enclosure shall provide sufficient protection from other construction activities and may be buried for additional protection.

(k) Handholes shall be placed next to the shoulder or back of curb when preformed detector loops enter the handhole. CNC, included in this pay item, shall be used to protect the preformed lead-ins from back of curb to the handhole.

(l) Preformed detector loops shall be factory assembled with ends capped and sealed against moisture and other contaminants. The loop configurations and homerun lengths shall be assembled for the specific application. The loop and homerun shall be constructed using 5/8 inch (16 mm) outside diameter

(minimum), 3/8 inch (9.5 mm) inside diameter (minimum) Class A oil resistant synthetic cord reinforced hydraulic hose with 250 psi (1,720 kPa) internal pressure rating or a similarly sized XLPE cable jacket. Hose for the loop and homerun assembly shall be one continuous piece. No joints or splices shall be allowed in the hose except where necessary to connect homeruns to the loops. This will provide maximum wire protection and loop system strength. Hose tee connections shall be heavy duty high temperature synthetic rubber. The tee shall be of proper size to attach directly to the hose, minimizing glue joints. The tee shall have the same flexible properties as the hose to ensure that the whole assembly can conform to pavement movement and shifting without cracking or breaking. For XLPE jacketed preformed loops, all splice connections shall be soldered, sealed, and tested before being sealed in a high impact glass impregnated plastic splice enclosure. The wire used shall be #16 THWN stranded copper. The number of turns in the loop shall be application specific. Homerun wire pairs shall be twisted a minimum of eight turns per foot. No wire splices will be allowed in the preformed loop assembly. The loop and homeruns shall be filled and sealed with a flexible sealant to ensure complete moisture blockage and further protect the wire. The preformed loops shall be constructed to allow a minimum of 6.5 feet of extra cable in the handhole.

Method of Measurement.
Add the following to Article 886.05 of the Standard Specifications:

Preformed detector loops will be measured along the detector loop embedded in the pavement, rather than the actual length of the wire. Detector loop measurements shall include the saw cut and the length of the detector loop wire to the edge of pavement. The detector loop wire, including all necessary connections for proper operations, from the edge of pavement to the handhole, shall be included in the price of the detector loop. CNC, trench and backfill, and drilling of pavement or handholes shall be included in detector loop quantities.

Basis of Payment.
This work shall be paid for at the contract unit price per foot (meter) for DETECTOR LOOP, TYPE I or PREFORMED DETECTOR LOOP as specified in the plans, which price shall be payment in full for furnishing and installing the detector loop and all related connections for proper operation.

DETECTOR LOOP REPLACEMENT AND/OR INSTALLATION (ROADWAY GRINDING, RESURFACING, & PATCHING OPERATIONS)
Effective: January 1, 1985
Revised: January 5, 2016
886.02TS

The following Traffic Signal Special Provisions and the "District 1 Standard Traffic Signal Design Details" supplement the requirements of the State of Illinois "Standard Specifications for Road and Bridge Construction" Sections 810, 886, 1079 and 1088.

The intent of this Special Provision is to prescribe the materials and construction methods commonly used to replace traffic signal detector loops and replace magnetic signal detectors with detector loops during roadway resurfacing, grinding and patching operations. Loop detector replacement will not require the transfer of traffic signal maintenance from the District Electrical Maintenance Contractor to this contract's electrical contractor. Replacement of magnetic detector will require wiring revisions inside the control cabinet and therefore the transfer of maintenance will be required. All material furnished shall be new. The locations and the details of all installations shall be as indicated on the Plans or as directed by the Engineer.

The work to be provided under this contract consists of furnishing and installing all traffic signal work as specified on the Plans and as specified herein in a manner acceptable and approved by the Engineer.

Notification of Intent to Work.
Contracts such as pavement grinding or patching which result in the destruction of traffic signal detection require a notification of intent to work and an inspection. A minimum of seven (7) working days prior to the detection removal, the Contractor shall notify the:

- Traffic Signal Maintenance and Operations Engineer at (815-334-4960)
- Electrical Maintenance Contractor

at which time arrangements will be made to adjust the traffic controller timing to compensate for the absence of detection.

Failure to provide proper notification may require the District's Electrical Maintenance Contractor to be called to investigate complaints of inadequate traffic signal timing. All costs associated with these expenses will be paid for by the Contractor at no additional expense to the Department according to Section 109 of the "Standard Specifications."

Acceptance of Material.
The Contractor shall provide:

1. All material approval requests shall be submitted a minimum of seven (7) days prior to the delivery of equipment to the job site, or within 30 consecutive calendar days after the contract is awarded, or within 15 consecutive calendar days after the preconstruction meeting, whichever is first.
2. Four (4) copies of a letter listing the vendor's name and model numbers of the proposed equipment shall be supplied. The letter will be reviewed by the Traffic Design Engineer to determine whether the equipment to be used is approved. The letters will be stamped as approved or not approved accordingly and returned to the Contractor.
3. One (1) copy of material catalog cuts.
4. The contract number, permit number or intersection location must be on each sheet of the letter and material catalog cuts as required in items 2 and 3.

Inspection of Construction.
When the road is open to traffic, except as otherwise provided in Section 801 and 850 of the Standard Specifications, the Contractor must request a turn-on and inspection of the completed detector loop installation at each separate location. This request must be made to the Traffic Signal Maintenance and Operations Engineer at (847)705-4424 a minimum of seven (7) working days prior to the time of the requested inspection.

Acceptance of the traffic signal equipment by the Department shall be based upon inspection results at the traffic signal "turn on." If approved, traffic signal acceptance shall be verbal at the "turn on" inspection followed by written correspondence from the Engineer. If this work is not completed in time, the Department reserves the right to have the work completed by others at the Contractor's expense.

All cost of work and materials required to comply with the above requirements shall be included in the pay item bid price, under which the subject materials and signal equipment are paid, and no additional compensation will be allowed. Materials and signal equipment not complying with the above requirements will be subject to removal and disposal at the Contractor's expense.

Restoration of Work Area.
Restoration of the traffic signal work area due to the detector loop installation and/or replacement shall be included in the cost of this item. All roadway surfaces such as shoulders, medians, sidewalks, pavement shall be replaced as shown in the plans or in kind. All damage to mowed lawns shall be replaced with an approved sod, and all damage to un-mowed fields shall be seeded.

Removal, Disposal and Salvage of Existing Traffic Signal Equipment.
The removal, disposal, and salvage of existing traffic signal equipment shall be included in the cost of this item. All material and equipment removed shall become the property of the Contractor and disposed of by the Contractor outside the State's right-of-way. No additional compensation shall be provided to the Contractor for removal, disposal or salvage expense for the work in this contract.

DETECTOR LOOP REPLACEMENT.
This work shall consist of replacing existing detector loops which are destroyed during grinding, resurfacing, or patching operations.

If damage to the detector loop is unavoidable, replacement of the existing detection system will be necessary. This work shall be completed by an approved Electrical Contractor as directed by the Engineer.

Replacement of the loops shall be accomplished in the following manner: The Engineer shall mark the location of the replacement loops. The Traffic Signal Maintenance and Operations Engineer shall be called to approve loop locations prior to the cutting of the pavement. The Contractor may reuse the existing coilable non-metallic conduit (CNC) located between the existing handhole and the pavement if it hasn't been damaged. CNC meeting the requirements of NEC Article 353 shall be used for detector loop raceways to the handholes. All burrs shall be removed from the edges of the existing conduit which could cause damage to the new detector loop during installation. If the existing conduit is damaged beyond repair, if it cannot be located, or if additional conduits are required for each proposed loop; the Contractor shall be required to drill through the existing pavement into the appropriate handhole, and install 1" (25 mm) CNC. This work and the required materials shall not be paid for separately but shall be included in the pay item Detector Loop Replacement. Once suitable CNC raceways is established, the loop may be cut, installed, sealed and spliced to the twisted-shielded lead-in cable in the handhole.

All loops installed in new asphalt pavement shall be installed in the binder course and not in the surface course. The edge of pavement or the curb shall be cut with a 1/4" (6.3 mm) deep x 4" (100 mm) saw-cut to mark location of each loop lead-in.

A minimum of seven (7) working days prior to the Contractor cutting loops, the Contractor shall have the proposed loop locations marked and contact the Traffic Signal Maintenance and Operations Engineer (847)705-4424 to inspect and approve the layout.

Loop detectors shall be installed according to the requirements of the "District 1 Standard Traffic Signal Design Details." Saw-cuts from the loop to the edge of pavement shall be made perpendicular to the edge of pavement when possible in order to minimize the length of the saw-cut unless directed otherwise by the Engineer or as shown on the plan.

The detector loop cable insulation shall be labeled with the cable specifications.

Each loop detector lead-in wire shall be labeled in the handhole using a waterproof tag, from an approved vendoer, secured to each wire with nylon ties. The lead-in wire, including all necessary connections for proper operation, from the edge of pavement to the handhole, shall be included in the detector loop pay item.

Loop sealant shall be a two-component thixotropic chemically cured polyurethane. The sealant shall be installed 1/8" (3 mm) below the pavement surface. If installed above the surface the excess shall be removed immediately.

Round loop(s) 6 ft (1.8 m) diameter may be substituted for 6 ft (1.8 m) by 6 ft (1.8 m) square loop(s) and shall be paid for as 24 feet (7.2 m) of detector loop.

Resistance to ground shall be a minimum of 100 mega-ohms under any conditions of weather or moisture. Inductance shall be more than 50 and less than 700 microhenries. Quality readings shall be more than 5.

Heat shrink splices shall be used according to the "District 1 Standard Traffic Signal Design Details."

Detector loop replacement shall be measured along the sawed slot in the pavement containing the loop cable up to the edge of pavement, rather than the actual length of the wire in the slot. Drilling handholes, sawing the pavement, furnishing and installing CNC to the appropriate handhole, cable splicing to provide a fully operable detector loop, testing and all trench and backfill shall be included in this item.

Basis of Payment.
Detector Loop Replacement shall be paid for at the contract unit price per foot (meter) of DETECTOR LOOP REPLACEMENT.

MAGNETIC DETECTOR REMOVAL AND DETECTOR LOOP INSTALLATION.
This work shall consist of the removal of existing magnetic detectors, magnetic detector lead-in cable and magnetic detection amplifiers and related control equipment wiring, installation of detector lead-in cable, detector loops, detector amplifiers and related equipment wiring. The detector loop, cable, and amplifier shall be installed according to the applicable portions of the "Standard Specifications" and the applicable portions of the Special Provision for "Detector Loop Replacement." All drilling of handholes, furnishing and installing CNC, cable splicing, trench and backfill, removal of equipment, and removing cable from conduit shall be included in this item.

Basis of Payment.

Magnetic Detector Removal and Detector Loop Installation shall be paid for at the contract unit price per foot (meter) for DETECTOR LOOP, TYPE I, per each for INDUCTIVE LOOP DETECTOR, and foot (meter) for ELECTRIC CABLE IN CONDUIT, LEAD-IN, NO. 14 1 PAIR.

RADAR VEHICLE DETECTION SYSTEM
Effective: July 01, 2015
Revised: May 9, 2017
886.03TS

Description.
This work shall consist of furnishing and installing a radar vehicle detection system as specified and/or as shown on the plan. This pay item shall include all necessary work and equipment required to have a fully operational system including but not limited to the detector unit/s, the interface unit and all the necessary hardware, cable and accessories required to complete the installation in accordance with the manufacturer's specifications.

The radar vehicle detection system shall work under all weather conditions, including rain, freezing rain, snow, wind, dust, fog, and changes in temperature and light. It shall work in an ambient temperature range of -34 to 74 degrees Celsius. It shall have a max power output of 75 watts or less.

The radar vehicle detection system shall be compatible with the District's approved traffic controller assemblies utilizing NEMA TS 1 or NEMA TS 2 controllers and cabinet components for full time operation. The radar vehicle detection system shall provide a minimum of one interface unit that has Ethernet connectivity, surge protection and shall be capable of supporting a minimum of 2 detector units.

The stop bar radar vehicle detection system shall have true presence capabilities in which it can detect stopped, slow moving or turning vehicles similar to the Departments in-pavement detection. This is especially important at side streets where driveways are near the intersection. The radar shall be able to drop the call if the vehicle leaves the detection zone. A manufacture statement confirming proper operation is required along each catalog cut submittal. The Department will not allow substitutes for other types of detection.

The far back radar detection shall have a detection range of 400 feet or better.

A representative from the supplier of the radar vehicle detection system shall supervise the installation and testing of the radar vehicle detection system and shall be present at the traffic signal turn-on inspection. Once the radar vehicle detection system is configured, it shall not need reconfiguration to maintain performance, unless the roadway configuration or the application requirements change.

The mounting location/s of the detector unit/s shall be per the manufacturer's recommendations. If an extension mounting assembly is needed, it shall be included in this item. All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The radar vehicle detection system shall be warrantied, free from material and workmanship defects for a period of two years from final inspection.

Basis of Payment.
This work shall be paid for at the contract unit price each for RADAR VEHICLE DETECTION SYSTEM, SINGLE APPROACH, STOP BAR; RADAR VEHICLE DETECTION SYSTEM, SINGLE APPROACH, FAR BACK; RADAR VEHICLE DETECTION SYSTEM, SINGLE APPROACH, STOP BAR AND FAR BACK, the price of which shall include the cost for all of the work and material described herein and includes furnishing, installing, delivery, handling, testing, set-up and all appurtenances and mounting hardware necessary for a fully operational radar vehicle detection system.

VIDEO VEHICLE DETECTION SYSTEM
Effective: January 1, 2020
886.04TS

Description.
This work shall consist of furnishing and installing a video vehicle detection system as specified and/or as shown on the plans. This pay item shall include all necessary work and equipment required to have a fully operational system including but not limited to the detector unit/s, the interface unit and all the necessary hardware, cables and accessories required to complete the installation in accordance with the manufacturer's specifications.

The video vehicle detection system shall work under all weather conditions, including rain, freezing rain, snow, wind, dust, fog, and changes in temperature and light. It shall work in an ambient temperature range of -34 to 74 degrees Celsius.

The video vehicle detection system shall be compatible with the District's approved traffic controller assemblies utilizing NEMA TS 1 or NEMA TS 2 controllers and cabinet components for full time operation. The video vehicle detection system shall provide a minimum of one interface unit that has Ethernet connectivity, surge protection and shall be capable of supporting a minimum of 2 detector units. The video vehicle detection system shall include a display inside the cabinet that has a minimum 10" screen with a minimum 1280x800 resolution.

The video vehicle detection system shall be one of the following systems or an approved equivalent:
- Autoscope Vision
- Iteris Vantage Next

A representative from the supplier of the video vehicle detection system shall supervise the installation and testing of the video vehicle detection system and shall be present at the traffic signal turn-on inspection. Once the video vehicle detection system is configured, it shall not need reconfiguration to maintain performance, unless the roadway configuration or the application requirements change.

The mounting location/s of the detector unit/s shall be per the manufacturer's recommendations. If an extension mounting assembly is needed, it shall be included in this item. All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The video detection system shall be warrantied, free from material and workmanship defects for a period of two years from final inspection.

Basis of Payment.
This work shall be paid for at the contract unit price each for VIDEO VEHICLE DETECTION SYSTEM, SINGLE APPROACH, the price of which shall include the cost for all of the work and material described herein and includes furnishing, installing, delivery, handling, testing, set-up and all appurtenances and mounting hardware necessary for a fully operational video vehicle detection system.

EMERGENCY VEHICLE PRIORITY SYSTEM
Effective: May 22, 2002
Revised: July 1, 2015
887.01TS

Revise Section 887 of the Standard Specifications to read:

It shall be the Contractor's responsibility to contact the municipality or fire district to verify the brand of emergency vehicle pre-emption equipment to be installed prior to the contract bidding. The equipment must be completely compatible with all components of the equipment currently in use by the Agency.

All new installations shall be equipped with Confirmation Beacons as shown on the "District One Standard Traffic Signal Design Details." The Confirmation Beacon shall consist of a 6 watt Par 38 LED flood lamp with a 30 degree light spread, or a 7 watt Par 30 LED flood lamp with a 15 degree or greater spread, maximum 7 watt energy consumption at 120V, and a 2,000 hour warranty for each direction of pre-emption. The lamp shall have an adjustable mount with a weatherproof enclosure for cable splicing. All hardware shall be cast aluminum or stainless steel. Holes drilled into signal poles, mast arms, or posts shall require rubber grommets. In order to maintain uniformity between communities, the confirmation beacons shall indicate when the control equipment receives the pre-emption signal. The pre-emption movement shall be signalized by a flashing indication at the rate specified by Section 4L.01 of the "Manual on Uniform Traffic Control Devices," and other applicable sections of future editions. The stopped pre-empted movements shall be signalized by a continuous indication.

All light operated systems shall include security and transit preemption software and operate at a uniform rate of 14.035 Hz ±0.002, or as otherwise required by the Engineer, and provide compatible operation with other light systems currently being operated in the District.

This item shall include any required modifications to an existing traffic signal controller as a result of the addition of the EMERGENCY VEHICLE PRIORITY SYSTEM.

Basis of Payment.
The work shall be paid for at the contract unit price each for furnishing and installing LIGHT DETECTOR and LIGHT DETECTOR AMPLIFIER. Furnishing and installing the confirmation beacon shall be included in the cost of the Light Detector. Any required modifications to the traffic signal controller shall be included in the cost of the LIGHT DETECTOR AMPLIFIER. The preemption detector amplifier shall be paid for on a basis of (1) one each per intersection controller and shall provide operation for all movements required in the pre-emption phase sequence.

RELOCATE EXISTING EMERGENCY VEHICLE PRIORITY SYSTEM, DETECTOR UNIT
Effective: January 1, 2002
Revised: July 1, 2015
887.02TS

This item shall consist of relocating the existing emergency vehicle priority system, detector unit (single channel or dual channel) from its existing location to a new traffic signal post or mast arm assembly and pole, and connecting it to an emergency vehicle priority system, phasing unit. If the existing Emergency Vehicle Priority System, Detector Unit Assembly includes a Confirmation Beacon, the Confirmation Beacon shall also be relocated and connected to the Emergency Vehicle Priority System, Detector Unit and shall be included at no cost in this item.

The emergency vehicle system is not to be inoperative for more than 8 hours and the Contractor must notify the Municipality or Fire Protection District 72 hours prior to the disconnection of the equipment.

Basis of Payment.
This item will be paid for at the contract unit price each for RELOCATE EXISTING EMERGENCY VEHICLE PRIORITY SYSTEM, DETECTOR UNIT.

RELOCATE EXISTING EMERGENCY VEHICLE PRIORITY SYSTEM, PHASING UNIT
Effective: January 1, 2002
Revised: July 1, 2015
887.03TS

This item shall consist of relocating the existing emergency vehicle priority system phasing unit from an existing traffic signal controller cabinet to a new traffic signal controller cabinet, as indicated in the plans or as directed by the Engineer.

The work shall include disconnecting the emergency vehicle priority system phasing unit(s) and reconnecting it into the new traffic signal controller cabinet.

The emergency vehicle system is not to be inoperative for more than 8 hours and the Contractor must notify the Municipality or Fire Protection District 72 hours prior to the disconnection of the equipment. The Contractor must demonstrate to the satisfaction of the Engineer that the emergency vehicle system operates properly.

Basis of Payment.
This item will be paid for on a basis of one (1) each per intersection for RELOCATE EXISTING EMERGENCY VEHICLE PRIORITY SYSTEM, PHASING UNIT.

CONFIRMATION BEACON
Effective: January 1, 2002
Revised: July 1, 2015
887.04TS

This item shall consist of furnishing and installing a Traffic Signal Emergency Confirmation Beacon (single channel or dual channel) at the locations specified on the plans and as described as follows for intersections which have existing emergency preemption systems previously installed.

Confirmation Beacon, Single Channel - Where the light detector is used to detect a single direction of traffic, one LED lamp for only that direction shall be provided. In cases where the detector covers opposing directions of traffic and has a single output, a separate lamp for each direction shall be provided but they shall have identical indications.

Confirmation Beacon, Dual Channel - A separate LED lamp with appropriate separate indications for each direction shall be provided.

It shall be the Contractor's responsibility to verify the existing brand of emergency vehicle equipment at the intersection and the confirmation beacons must be completely compatible with all existing components. The Confirmation Beacon shall consist of a 6 watt Par 38 LED flood lamp with a 30 degree light spread, or a 7 watt Par 30 LED flood lamp with a 15 degree or greater spread, maximum 7 watt energy consumption at 120V, and a 2,000 hour warranty for each direction of pre-emption. The lamp shall have an adjustable mount with a weatherproof enclosure for cable splicing. All hardware shall be cast aluminum or stainless steel. No new holes may be drilled into signal poles, mast arms, or posts. The Confirmation Beacon shall be mounted to the existing light detector hardware as shown on the mounting detail in the plans. In order to maintain uniformity between communities, the Confirmation Beacons shall indicate when the control equipment receives the pre-emption signal. The pre-emption movement shall be signalized by a flashing indication at the rate specified by Section 4L.01 of the "Manual on Uniform Traffic Control Devices," and other applicable sections of future editions. The stopped pre-empted movements shall be signalized by a continuous indication.

Any modification required to the existing light detector installation to meet the requirements of the mounting detail shown in the plans shall be included in this item.

Basis of Payment.
This work will be paid for at the contract unit price per each for CONFIRMATION BEACON.

PEDESTRIAN PUSH-BUTTON
Effective: May 22, 2002
Revised: July 1, 2015
888.01TS

Description.
Revise Article 888.01 of the Standard Specifications to read:

This work shall consist of furnishing and installing a latching (single call) or non-latching (dual call) pedestrian push-button and a regulatory pedestrian instruction sign according to MUTCD, sign series R10-3e 9" x 15" sign with arrow(s) for a count-down pedestrian signal. The pedestrian station sign size without count-down pedestrian signals shall accommodate a MUTCD sign series R10-3b or R10-3d 9" x 12" sign with arrow(s).

Installation.
Add the following to Article 888.03 of the Standard Specifications:

A mounting bracket and/or extension shall be used to assure proper orientation when two pedestrian push buttons are required for one post. The price of the bracket and/or extension shall be included in the cost of the pedestrian push button. The contractor is not allowed to install a push-button assembly with the sign below the push-button in order to meet mounting requirements.

Materials.
Revise Article 1074.02(a) of the Standard Specifications to read:

The pedestrian push-button housing shall be constructed of aluminum alloy according to ASTM B 308 6061-T6 and powder coated yellow, unless otherwise noted on the plans. The housing shall be furnished with suitable mounting hardware.

Revise Article 1074.02(e) of the Standard Specifications to read:

Stations shall be designed to be mounted to a post, mast arm pole or wood pole. The station shall be aluminum and shall accept a 3 inch (75mm) round push-button assembly and a regulatory pedestrian instruction sign according to MUTCD, sign series R10-3e 9" x 15" sign with arrow(s) for a count-down pedestrian signal. The pedestrian station size without count-down pedestrian signals shall accommodate a MUTCD sign series R10-3b or R10-3d 9" x 12" sign with arrow(s).

Add the following to Article 1074.02 of the Standard Specifications:

(f) Location. Pedestrian pushbuttons and stations shall be mounted to a post, mast arm pole or wood pole as shown on the plans and shall be fully ADA accessible from a paved or concrete surface. See the District's Detail sheets for orientation and mounting details.

Basis of Payment.
Revise Article 888.04 of the Standard Specifications to read:

This work will be paid for at the contract unit price per each for PEDESTRIAN PUSH-BUTTON or PEDESTRIAN PUSH-BUTTON, NON-LATCHING.

ACCESSIBLE PEDESTRIAN SIGNALS
Effective: April 1, 2003
Revised: July 1, 2015
888.02TS

Description.
This work shall consist of furnishing and installing pedestrian push button accessible pedestrian signals (APS) type. Each APS shall consist of an interactive vibrotactile pedestrian pushbutton with speaker, an informational sign, a light emitting diode (LED) indicator light, a solid-state electronic control board, a power supply, wiring, and mounting hardware. The APS shall meet the requirements of the MUTCD and Sections 801 and 888 of the Standard Specifications, except as modified herein.

Electrical Requirements.
The APS shall operate with systems providing 95 to 130 VAC, 60 Hz and throughout an ambient air temperature range of -29 to +160 °F (-34 to +70 °C).

The APS shall contain a power protection circuit consisting of both fuse and transient protection.

Audible Indications.
A pushbutton locator tone shall sound at each pushbutton with volume settings a maximum of 5 dBA louder than ambient sound.

If two accessible pedestrian pushbuttons are placed less than 10 ft (3 m) apart or placed on the same pole, the audible walk indication shall be a speech walk message.

A clear, verbal message shall be used to communicate the pedestrian walk interval. This message shall sound throughout the WALK interval only. The verbal message shall be modeled after: "Street Name." Walk Sign is on to cross "Street Name." No other messages shall be used to denote the WALK interval.

Where two accessible pedestrian pushbuttons are separated by at least 10 ft (3 m), the walk indication shall be an audible percussive tone. It shall repeat at 8 to 10 ticks per second with a dominant frequency of 880 Hz.

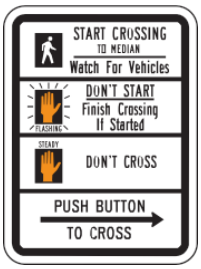
Automatic volume adjustments in response to ambient traffic sound level shall be provided up to a maximum volume of 100 dBA. Locator tone and verbal messages shall be no more than 5 dB louder than ambient sound.

Pedestrian Pushbutton.
Pedestrian pushbuttons shall be at least 2 in. (50 mm) in diameter or width. The force required to activate the pushbutton shall be no greater than 3.5 lb (15.5 N).

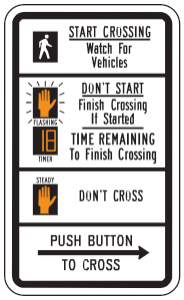
A red LED indicator shall be located on or near the pushbutton which, when activated, acknowledges the pedestrians request to cross the street. The recorded messages and roadway designations shall be confirmed with the engineer and included with submitted product data.

Signage.
A sign shall be located immediately above the pedestrian pushbutton and parallel to the crosswalk controlled by the pushbutton. The sign shall be one of the following standard MUTCD designs: R10-3b, R10-3d, or R10-3e.

R10-3b



R10-3d



R10-3e

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

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

Training.
The Contractor shall provide APS onsite training for Department personnel and person(s) or group that requested the installation of the APS. APS features and operation shall be demonstrated during the training. The training shall be presented by the APS equipment supplier. Time, date, and location of the training and demonstration shall be coordinated with the Engineer.

Basis of Payment.
This work will be paid for at the contract unit price each for a pedestrian push button, ACCESSIBLE PEDESTRIAN SIGNALS type and shall include furnishing, installation, mounting hardware, message programming, and training.

TEMPORARY TRAFFIC SIGNAL INSTALLATION
Effective: May 22, 2002
Revised: January 1, 2017
890.01TS

Revise Section 890 of the Standard Specifications to read:

Description.
This work shall consist of furnishing, installing, maintaining, and removing a temporary traffic signal installation as shown on the plans, including but not limited to temporary signal heads, emergency vehicle priority systems, interconnect, vehicle detectors, uninterruptable power supply, and signing. Temporary traffic signal controllers and cabinets interconnected to railroad traffic control devices shall be new. When temporary traffic signals will be operating within a county or local agency Traffic Management System, the equipment must be NTCIP compliant and compatible with the current operating requirements of the Traffic Management System.

General.
Only an approved controller equipment supplier will be allowed to assemble temporary traffic signal and railroad traffic signal cabinet. Traffic signal inspection and TURN-ON shall be according to 800.01TS TRAFFIC SIGNAL GENERAL REQUIREMENTS special provision.

Construction Requirements.

(a) Controllers.

1. Only controllers supplied by one of the District approved closed loop equipment supplier will be approved for use at temporary signal locations. All controllers used for temporary traffic signals shall be fully actuated NEMA microprocessor based with RS232 data entry ports compatible with existing monitoring software approved by IDOT District 1, installed in NEMA TS2 cabinets with 8 phase back panels, capable of supplying 255 seconds of cycle length and individual phase length settings up to 99 seconds. On projects with one lane open and two-way traffic flow, such as bridge deck repairs, the temporary signal controller shall be capable of providing an adjustable all red clearance setting of up to 30 seconds in length. All controllers used for temporary traffic signals shall meet or exceed the requirements of Section 857 of the Standard Specifications with regards to internal time base coordination and preemption. All railroad interconnected temporary controllers and cabinets shall be new and shall satisfy the requirements of Article 857.02 of the Standard Specifications and as modified herein.

2. Only control equipment, including controller cabinet and peripheral equipment, supplied by one of the District approved closed loop equipment suppliers will be approved for use at temporary traffic signal locations. All control equipment for the temporary traffic signal(s) shall be furnished by the Contractor unless otherwise stated in the plans. On projects with multiple temporary traffic signal installations, all controllers shall be the same manufacturer brand and model number with the latest version software installed at the time of the signal TURN-ON.

(b) Cabinets. All temporary traffic signal cabinets shall have a closed bottom made of aluminum alloy. The bottom shall be sealed along the entire perimeter of the cabinet base to ensure a water, dust and insect-proof seal. The bottom shall provide a minimum of two (2) 4-inch (100 mm) diameter holes to run the electric cables through. The 4-inch (100 mm) diameter holes shall have a bushing installed to protect the electric cables and shall be sealed after the electric cables are installed.

(c) Grounding. Grounding shall be provided for the temporary traffic signal cabinet meeting or exceeding the applicable portions of the National Electrical Code, Section 806 of the Standard Specifications and shall meet the requirements of the 806.01TS GROUNDING OF TRAFFIC SIGNAL SYSTEMS special provision.

(d) Traffic Signal Heads. All traffic signal sections shall be 12 inches (300 mm). Pedestrian signal sections shall be 16-inch (406mm) x 18 inch (457mm). Traffic signal sections shall be LED with expandable view, unless otherwise approved by the Engineer. Pedestrian signal heads shall be Light Emitting Diode (LED) Pedestrian Countdown Signal Heads except when a temporary traffic signal is installed at an intersection interconnected with a railroad grade crossing. When a temporary traffic signal is installed at an intersection interconnected with a railroad grade crossing, Light Emitting Diode (LED) Pedestrian Signal Heads shall be furnished. The temporary traffic signal heads shall be placed as indicated on the temporary traffic signal plan or as directed by the Engineer. If no traffic staging is in place or will not be staged on the day of the turn on, the temporary traffic signal shall have the signal head displays, signal head placements and controller phasing match the existing traffic signal or shall be as directed by the engineer. The Contractor shall furnish enough extra cable length to relocate heads to any position on the span wire or at locations illustrated on the plans for construction staging. The temporary traffic signal shall remain in operation during all signal head relocations. Each temporary traffic signal head shall have its own cable from the controller cabinet to the signal head.

(e) Interconnect.

1. Temporary traffic signal interconnect shall be provided using fiber optic cable or wireless interconnect technology as specified in the plans. The Contractor may request, in writing, to substitute the fiber optic temporary interconnect indicated in the contract documents with a wireless interconnect. The Contractor must provide assurances that the radio device will operate properly at all times and during all construction staging. If approved for use by the Engineer, the Contractor shall submit marked-up traffic signal plans indicating locations of radios and antennas and installation details. If wireless interconnect is used, and in the opinion of the engineer, it is not viable, or if it fails during testing or operations, the Contractor shall be responsible for installing all necessary poles, fiber optic cable, and other infrastructure for providing temporary fiber optic interconnect at no cost to the contract.

2. The existing system interconnect and phone lines are to be maintained as part of the Temporary Traffic Signal Installation specified for on the plan. The interconnect, including any required fiber splices and terminations, shall be installed into the temporary controller cabinet as per the notes or details on the plans. All labor and equipment required to install and maintain the existing interconnect as part of the Temporary Traffic Signal Installation shall be included in the cost of TEMPORARY TRAFFIC SIGNAL INSTALLATION. When shown in the plans, temporary traffic signal interconnect equipment shall be furnished and installed. The temporary traffic signal interconnect shall maintain interconnect communications throughout the entire signal system for the duration of the project. Any temporary signal within an existing closed loop traffic signal system shall be interconnected to that system using similar brand control equipment at no additional cost to the contract.

3. Temporary wireless interconnect. The radio interconnect system shall be compatible with Eagle or Econolite controller closed loop systems. This work shall include all temporary wireless interconnect components, at the adjacent existing traffic signal(s) to provide a completely operational closed loop system. This work shall include all materials, labor and

testing to provide the completely operational closed loop system as shown on the plans. The radio interconnect system shall include the following components:

a. Rack or Shelf Mounted RS-232 Frequency Hopping Spread Spectrum (FHSS) Radio
b. Software for Radio Configuration (Configure Frequency and Hopping Patterns)
c. Antennas (Omni Directional or Yagi Directional)
d. Antenna Cables, LMR400, Low Loss. Max. 100-ft from controller cabinet to antenna
e. Brackets, Mounting Hardware, and Accessories Required for Installation
f. RS232 Data Cable for Connection from the radio to the local or master controller
g. All other components required for a fully functional radio interconnect system

All controller cabinet modifications and other modifications to existing equipment that are required for the installation of the radio interconnect system components shall be included in the cost of TEMPORARY TRAFFIC SIGNAL INSTALLATION.

The radio interconnect system may operate at 900Mhz (902-928) or 2.4 Ghz depending on the results of a site survey. The telemetry shall have an acceptable rate of transmission errors, time outs, etc. comparable to that of a hardwire system.

The proposed or existing master controller and telemetry module shall be configured for use with the radio interconnect at a minimum rate of 9600 baud.

The radio interconnect system shall include all other components required for a complete and fully functional telemetry system and shall be installed in accordance to the vendors recommendations.

(f) Emergency Vehicle Pre-Emption. All emergency vehicle preemption equipment (light detectors, light detector amplifiers, confirmation beacons, etc.) as shown on the temporary traffic signal plans shall be provided by the Contractor. It shall be the Contractor's responsibility to contact the municipality or fire district to verify the brand of emergency vehicle preemption equipment to be installed prior to the contract bidding. The equipment must be completely compatible with all components of the equipment currently in use by the Agency. All light operated systems shall operate at a uniform rate of 14.035 hz ±0.002, or as otherwise required by the Engineer, and provide compatible operation with other light systems currently being operated in the District. All labor and material required to install and maintain the Emergency Vehicle Preemption installation shall be included in the item Temporary Traffic Signal Installation.

(g) Vehicle Detection. All temporary traffic signal installations shall have vehicular detection installed at all approaches of the intersection and as directed by the Engineer. Pedestrian push buttons shall be provided for all pedestrian signal heads/phases as directed by the Engineer. Microwave vehicle sensors or video vehicle detection system shall be approved by IDOT prior to Contractor furnishing and installing. The Contractor shall install, wire, and adjust the alignment of the microwave vehicle sensor or video vehicle detection system in accordance to the manufacturer’s recommendations and requirements. The Contractor shall be responsible for adjusting the alignment of the microwave vehicle sensor or video vehicle detection system for all construction staging changes and for maintaining proper alignment throughout the project. An equipment supplier shall be present and assist the contractor in setting up and maintaining the microwave vehicle sensor or video vehicle detection system. An in-cabinet video monitor shall be provided with all video vehicle detection systems and shall be included in the item Temporary Traffic Signal Installation.

(h) Uninterruptable Power Supply. All temporary traffic signal installations shall have Uninterruptable Power Supply (UPS). The UPS cabinet shall be mounted to the temporary traffic

signal cabinet and shall be according to the applicable portions of Section 862 of the Standard Specifications and as modified in 862.01TS UNITERRUPTABLE POWER SUPPLY, SPECIAL Special Provision.

(i) Signs. All existing street name and intersection regulatory signs shall be removed from existing poles and relocated to the temporary signal span wire. If new mast arm assembly and pole(s) and posts are specified for the permanent signals, the signs shall be relocated to the new equipment at no extra cost. Any intersection regulatory signs that are required for the temporary traffic signal shall be provided as shown on the plans or as directed by the Engineer. Relocation, removing, bagging and installing the regulatory signs for the various construction stages shall be provided as shown on the plans or as directed by the Engineer. If Illuminated Street Name Signs exist they shall be taken down and stored by the contractor and reflecting street name signs shall be installed on the temporary traffic signal installation.

(j) Energy Charges. The electrical utility energy charges for the operation of the temporary traffic signal installation shall be paid for by others if the installation replaces an existing signal. Otherwise charges shall be paid for under 109.05 of the Standard Specifications.

(k) Maintenance. Maintenance shall meet the requirements of the Standard Specifications and 850.01TS MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION Special Provisions. Maintenance of temporary signals and of the existing signals shall be included in the cost of the TEMPORARY TRAFFIC SIGNAL INSTALLATION pay item. When temporary traffic signals are to be installed at locations where existing signals are presently operating, the Contractor shall be fully responsible for the maintenance of the existing signal installation as soon as he begins any physical work on the Contract or any portion thereof. In addition, a minimum of seven (7) days prior to assuming maintenance of the existing traffic signal installation(s) under this Contract, the Contractor shall request that the Resident Engineer contact the Bureau of Traffic Operations (847) 705-4424 for an inspection of the installation(s).

(l) Temporary Traffic Signals for Bridge Projects. Temporary Traffic Signals for bridge projects shall follow the State Standards, Standard Specifications, Special Provisions and any plans for Bridge Temporary Traffic Signals included in the plans. The installation shall meet the Standard Specifications and all other requirements in this TEMPORARY TRAFFIC SIGNAL INSTALLATION specification. In addition all electric cable shall be aerially suspended, at a minimum height of 18 feet (5.5m) on temporary wood poles (Class 5 or better) of 45 feet (13.7 m) minimum height. The signal heads shall be span wire mounted or bracket mounted to the wood pole or as directed by the Engineer. The Controller cabinet shall be mounted to the wood pole as shown in the plans, or as directed by the Engineer. Microwave vehicle sensors or video vehicle detection system may be used in place of detector loops as approved by the Engineer.

(m) Temporary Portable Traffic Signal for Bridge Projects.

1. The controller and cabinet shall be NEMA type designed for NEMA TS2 Type 1 operation. Controller and LED signal displays shall meet the applicable Standard Specifications and all other requirements in this TEMPORARY TRAFFIC SIGNAL INSTALLATION special provision.

2. Work shall be according to Article 701.18(b) of the Standard Specifications except as noted herein.

3. General.

a. The temporary portable bridge traffic signals shall be trailer-mounted units. The trailer-mounted units shall be set up securely and level. Each unit shall be self-contained and consist of two signal heads. The left signal head shall be mounted on a mast arm capable of extending over the travel lane. Each unit shall contain a solar cell system to facilitate battery charging. There shall be a minimum of 12 days backup reserve battery supply and the units shall be capable of operating with a 120 V power supply from a generator or electrical service.

b. All signal heads located over the travel lane shall be mounted at a minimum height of 17 feet (5m) from the bottom of the signal back plate to the top of the road surface. All far right signal heads located outside the travel lane shall be mounted at a minimum height of 8 feet (2.5m) from the bottom of the signal back plate to the top of the adjacent travel lane surface.

c. The long all red intervals for the traffic signal controller shall be adjustable up to 250 seconds in one-second increments.

d. As an alternative to detector loops, temporary portable bridge traffic signals may be equipped with microwave sensors or other approved methods of vehicle detection and traffic actuation.

e. All portable traffic signal units shall be interconnected using hardwire communication cable. Radio communication equipment may be used only with the approval of the Engineer. If radio communication is used, a site analysis shall be completed to ensure that there is no interference present that would affect the traffic signal operation. The radio equipment shall meet all applicable FCC requirements.

f. The temporary portable bridge traffic signal system shall meet the physical display and operational requirements of conventional traffic signals as specified in Part IV and other applicable portions of the currently adopted version of the Manual on Uniform Traffic Control Devices (MUTCD) and the Illinois MUTCD. The signal system shall be designed to continuously operate over an ambient temperature range between -30 ºF (-34 ºC) and 120 ºF (48 ºC). When not being utilized to inform and direct traffic, portable signals shall be treated as non-operating equipment according to Article 701.11.

Basis of Payment.

This work shall be paid for at the contract unit price each for TEMPORARY TRAFFIC SIGNAL INSTALLATION, TEMPORARY BRIDGE TRAFFIC SIGNAL INSTALLATION, or TEMPORARY PORTABLE BRIDGE TRAFFIC SIGNAL INSTALLATION, the price of which shall include all costs for the modifications required for traffic staging, changes in signal phasing as required in the Contract plans, microwave vehicle sensors, video vehicle detection system, any maintenance or adjustment to the microwave vehicle sensors/video vehicle detection system, the temporary wireless interconnect system, temporary fiber optic interconnect system, all material required, the installation and complete removal of the temporary traffic signal, and any changes required by the Engineer. Each intersection will be paid for separately.

TEMPORARY TRAFFIC SIGNAL TIMING
Effective: May 22, 2002
Revised: July 1, 2015
890.02TS

Description.
This work shall consist of developing and maintaining appropriate traffic signal timings for the specified intersection for the duration of the temporary signalized condition, as well as impact to existing traffic signal timings caused by detours or other temporary conditions.

All timings and adjustments necessary for this work shall be performed by an approved Consultant who has previous experience in optimizing Closed Loop Traffic signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 705-4424 for a listing of approved Consultants.

The following tasks are associated with TEMPORARY TRAFFIC SIGNAL TIMING.

(a) Consultant shall attend temporary traffic signal inspection (turn-on) and/or detour meeting and conduct on-site implementation of the traffic signal timings.

(b) Consultant shall be responsible for making fine-tuning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.

(c) Consultant shall provide monthly observation of traffic signal operations in the field.

(d) Consultant shall provide on-site consultation and adjust timings as necessary for construction stage changes, temporary traffic signal phase changes, and any other conditions affecting timing and phasing, including lane closures, detours, and other construction activities.

(e) Consultant shall make timing adjustments and prepare comment responses as directed by the Area Traffic Signal Operations Engineer.

(f) Return original timing plan once construction is complete.

Basis of Payment.
The work shall be paid for at the contract unit price each for TEMPORARY TRAFFIC SIGNAL TIMING, which price shall be payment in full for performing all work described herein per intersection. When the temporary traffic signal installation is turned on and/or detour implemented, 50 percent of the bid price will be paid. The remaining 50 percent of the bid price will be paid following the removal of the temporary traffic signal installation and/or detour.

ILLUMINATED SIGN, LED
Effective: May 22, 2002
Revised: July 1, 2015
891.01TS

Revise the second paragraph of Article 1084.01(a) to read:

The exterior surface of the housing shall be acid-etched, and shop painted with one coat of zinc-chromate primer and two coats of exterior enamel. The housing shall be the same color (yellow or black) to match the existing or proposed signal heads. The painting shall be according to Section 851 of the Standard Specifications.

Add the following to Article 1084.01 (b) of the Standard Specifications:

The message shall be formed by rows of LEDs. The sign face shall be 24 inches (600 mm) by 24 inches (600 mm).

Revise Article 1084.01(d) to read:

Mounting hardware shall be black polycarbonate or galvanized steel and similar to mounting Signal Head hardware and bracket specified herein and shall provide tool free access to the interior.

LED INTERNALLY ILLUMINATED STREET NAME SIGN
Effective: May 22, 2002
Revised: July 1, 2018
891.02TS

Description.
This work shall consist of furnishing and installing a LED internally illuminated street name sign.

Materials.
The illuminated street name sign shall be as follows.

(a) Description.
The LEDs shall be white in color. The LED internally illuminated street name sign shall display the designated street name clearly and legibly in the daylight hours without being energized and at night when energized. White translucent Type ZZ reflective sheeting sign faces with the street name applied in transparent green shall be installed on the street sign acrylic panels which shall be affixed to the interior of the sign enclosure. Sheeting material shall be of one continuous piece. Paneling shall not be allowed. Hinged door(s) shall be provided for easy access to perform general cleaning and maintenance operations. Illumination shall occur with LED Light Engine as specified.

(b) Environmental Requirements.
The LED lamp shall be rated for use in the ambient operating temperature range of -40 to +50°C (-40 to +122°F) for storage in the ambient temperature range of -40 to +75°C (-40 to +167°F).

(c) General Construction.
1. The LED components, power supply, and wiring harness shall be arranged as to allow for maintenance, up to and including the replacement of all three components. The LED Light Engine shall be mounted in the top and/or bottom of the sign housing and no components of the light source shall sit between the sign faces.

2. The assembly and manufacturing processes of the LED Light Engine shall be designed to ensure that all LED and electronic components are adequately supported to withstand mechanical shocks and vibrations in compliance with the specifications of the ANSI C136.31-2001 standards.

(d) Mechanical Construction.
1. The sign shall be constructed using a weatherproof, aluminum housing consisting of an extruded aluminum with the maximum sign dimensions of 30” in height, 96” in length, 10.75” in depth (including the drip edge) and shall not weight more than 110 pounds. All housing corners are continuous TIG (Tungsten Inert Gas) welded to provide a weatherproof seal.

2. The sign doors shall be continuous TIG welded along the two corners with the other two screwed together to make one side of the door removable for installation of the sign face. The door is fastened to the housing on the bottom by a full-length stainless-steel hinge. The sign shall also be fabricated in a way to ensure that no components fall out while a technician is opening or working inside the sign enclosure. The door shall be held secure onto a 1” wide by 5/32” thick neoprene gasket by an appropriate number of quarter-turn fasteners to form a watertight seal between the door and the housing.

3. The sign face shall be constructed of .125” white translucent polycarbonate or acrylic. Sign legend shall be according to D1 Mast Arm Mounted Street Name Sign detail and MUTCD. The sign face legend background shall consist of translucent Type ZZ white reflective sheeting and transparent

green film applied to the front of the sign face. The legend shall be framed by a white border. A logo symbol and/or name of the community may be included with approval of the Engineer.

All fasteners and hardware shall be corrosion resistant stainless steel. No special tools shall be required for routine maintenance.

4. All wiring shall be secured by insulated wire compression nuts or barrier type terminal blocks.

5. A wire entrance junction box shall be supplied with the sign assembly. The box may be supplied mounted to the exterior or interior of the sign and shall provide a weather tight seal.

6. A photoelectric switch shall be mounted inside control cabinet to control lighting functions for day and night display. Each sign shall be individually fused.

7. Brackets and Mounting: LED internally illuminated street name signs will be factory drilled to accommodate mast arm two-point support assembly mounting brackets unless indicated otherwise in the plans.

(e) Electrical.

1. Photocell shall be rated 105-305V, turn on at 1.5 fcs. with a 3-5 second delay. A manufacturer's warranty of six (6) years shall be provided. Power consumption shall be no greater than 1 watt at 120V.

2. The LED Light Engine shall operate from a 60 +- 3 cycle AC line power over a voltage range of 80 to 135 Vac rms. Fluctuations in line voltage over the range of 80 to 135 Vac shall not affect luminous intensity by more than +- 10%.

3. Total harmonic distortion induced into the AC power line by the LED Light Engine, operated at a nominal operating voltage and at a temperature of +25^{o}C (+77^{o}F), shall not exceed 20%.

4. The LED Light Engine shall cycled ON and OFF with a photocell as shown on the detail sheet and shall not exceed 120 Watts. The signs shall be installed such that they are not energized when traffic signals are powered by an alternate energy source such as a generator or uninterruptable power supply (UPS).

(f) Photometric Requirements.

1. The entire surface of the sign panel shall be evenly illuminated. The average maintained luminous intensity measured across the letters, operating under the conditions defined in Environmental Requirements and Wattage Sections shall be of a minimum value of 100 cd/m^2.

2. The manufacturer shall make available independent laboratory test results to verify compliance to Voltage Range and Luminous Intensity Distribution Sections.

3. LED shall have a color temperature of 5200k nominal, CRI of 80 with a life expectancy of 75,000 hrs.

(g) Quality Assurance.

The LED Light Engine shall be manufactured in accordance with a vendor quality assurance (QA) program. The production QA shall include statistically controlled routine tests to ensure minimum performance levels of the LED Light Engine build to meet this specification. QA process and test result documentations shall be kept on file for a minimum period of seven (7) years. The LED Light Engine that does not satisfy the production QA testing performance requirements shall not be labeled, advertised, or sold as conforming to these specifications. Each LED Light Engine shall be identified by a manufacturer's serial number for warranty purposes. LED Light Engines shall be replaced or repaired if they fail to

function as intended due to workmanship or material defects within the first sixty (60) months from the date of acceptance. LED Light Engines that exhibit luminous intensities less than the minimum value specified in Photometric Section within the first thirty-six (36) months from the date of acceptance shall be replaced or repaired.

Installation.
The sign shall be located on a steel traffic signal mast arm no further than 8-feet from the center of the pole to the center of the sign at a height of between 16 to 18-feet above traveled pavement. Mounting hardware shall be from an approved vendor, utilizing stainless steel components.

Basis of Payment.
This work will be paid for at the contract unit price each for LED INTERNALLY ILLUMINATED STREET NAME SIGN, of the length as specified in the contract plans which shall be payment in full for furnishing and installing the LED internally illuminated street name sign, complete with circuitry and mounting hardware including photo cell, circuit breaker, fusing, relay, connections and cabling as shown on the plans for proper operation and installation.

The Illuminated street name sign cable will be paid for at the contract unit price per foot for ELECTRIC CABLE IN CONDUIT, STREET NAME SIGN, NO. 14 3C, TYPE SOOW, which price shall be payment in full for furnishing, installing and making all electrical connections necessary for proper operations.

MODIFY EXISTING CONTROLLER CABINET
Effective: May 22, 2002
Revised: July 1, 2015
895.01TS

The work shall consist of modifying an existing controller cabinet as follows:

(a) Uninterruptable Power Supply (UPS). The addition of uninterruptable power supply (UPS) to an existing controller cabinet could require the relocation of the existing controller cabinet items to allow for the installation of the uninterruptable power supply (UPS) components inside the existing controller cabinet as outlined under Sections 862 and 1074.04 of the Standard Specifications and the wiring of UPS alarms.

(b) Light Emitting Diode (LED) Signal Heads, Light Emitting Diode (LED) Optically Programmed Signal Heads and Light Emitting Diode (LED) Pedestrian Signal Heads. The contractor shall verify that the existing load switches meet the requirements of Section 1074.03(b)(2) of the Standard Specifications and the recommended load requirements of the light emitting diode (LED) signal heads that are being installed at the existing traffic signal. If any of the existing load switches do not meet these requirements, they shall be replaced, as directed by the Engineer.

(c) Light Emitting Diode (LED), Signal Head, Retrofit. The contractor shall verify that the existing load switches meet the requirements of Section 1074.03(b)(2) of the Standard Specifications and the recommended load requirements of light emitting diode (LED) traffic signal modules, pedestrian signal modules, and pedestrian countdown signal modules as specified in the plans. If any of the existing load switches do not meet these requirements, they shall be replaced, as directed by the Engineer.

(d) This item shall include the upgrade of all non-railroad controller software to the latest version available at the time of the signal TURN-ON.

Basis of Payment.
Modifying an existing controller cabinet will be paid for at the contract unit price per each for MODIFY EXISTING CONTROLLER CABINET. This shall include all material and labor required to complete the work as described above, the removal and disposal of all items removed from the controller cabinet, as directed by the Engineer. The equipment for the Uninterruptable Power Supply (UPS) and labor to install it in the existing controller cabinet shall be included in the pay item Uninterruptable Power Supply, Special or Uninterruptable Power Supply, Ground Mounted.

REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT
Effective: May 22, 2002
Revised: July 1, 2015
895.02TS

Add the following to Article 895.05 of the Standard Specifications:

The traffic signal equipment which is to be removed and is to become the property of the Contractor shall be disposed of outside the right-of-way at the Contractor’s expense.

All equipment to be returned to the State shall be delivered by the Contractor to the State's Traffic Signal Maintenance Contractor's main facility. The Contractor shall contact the State's Electrical Maintenance Contractor to schedule an appointment to deliver the equipment. No equipment will be accepted without a prior appointment. All equipment shall be delivered within 30 days of removing it from the traffic signal installation. The Contractor shall provide one hard copy and one electronic file of a list of equipment that is to remain the property of the State, including model and serial numbers, where applicable. The Contractor shall also provide a copy of the Contract plan or special provision showing the quantities and type of equipment. Controllers and peripheral equipment from the same location shall be boxed together (equipment from different locations may not be mixed) and all boxes and controller cabinets shall be clearly marked or labeled with the location from which they were removed. If equipment is not returned according to these requirements, it will be rejected by the State's Electrical Maintenance Contractor. The Contractor shall be responsible for the condition of the traffic signal equipment from the time Contractor takes maintenance of the signal installation until the acceptance of a receipt drawn by the State's Electrical Maintenance Contractor indicating the items have been returned in good condition.

The Contractor shall safely store and arrange for pick up or delivery of all equipment to be returned to agencies other than the State. The Contractor shall package the equipment and provide all necessary documentation as stated above.

Traffic signal equipment which is lost or not returned to the Department for any reason shall be replaced with new equipment meeting the requirements of these Specifications at no cost to the contract.

MODIFY EXISTING TYPE "D" FOUNDATION
Effective: January 1, 2002
Modified: July 1, 2015
895.03TS

This item shall consist of the partial removal of an existing Type "D" Foundation at the location shown on the plans, or as directed by the Engineer. The existing foundation shall be removed to a depth of at least twelve (12) inches below finished grade. All concrete debris shall be disposed of outside the right-of-way. The existing conduit shall remain in place and shall be carefully protected. The new conduits from the double handhole shall be installed, if required, as shown on the plans.

The removal of the existing traffic signal controller and cabinet shall be included in this pay item, as well as the removing and reinstalling of the existing cable(s) from conduit.

Upon completion of the above work, holes for steel dowels of the size indicated shall be drilled in the remaining concrete where indicated on the drawings.

The adjacent area shall be excavated and forming with anchor bolts and new conduit stubs provided to provide a concrete foundation for a Type IV or Type V cabinet. The Contractor shall follow the recommendations of the vendor, subject to approval of the Engineer, in forming and constructing the foundation.

Provide a three (3) foot by four (4) foot wide Portland cement concrete apron sidewalk, five (5) inches thick, on the side of the access door to the controller to facilitate servicing the controller and cabinet.

Anchor bolts shall be new and shall meet all the requirements of Section 1006.09 of the Standard Specifications.

Basis of Payment.
This work shall be paid for at the contract unit price each for MODIFY EXISTING TYPE "D" FOUNDATION.

REBUILD EXISTING HANDHOLE
Effective: January 1, 2002
Revised: July 1, 2015
895.04TS

This item shall consist of rebuilding and bringing to grade a handhole at a location shown on the plans or as directed by the Engineer. The work shall consist of removing the handhole frame and cover and the walls of the handhole to a depth of eight (8) inches below the finished grade.

Upon completion of the above work, four (4) holes, four (4) inches in depth and one half (1/2) inch in diameter, shall be drilled into the remaining concrete; one hole centered on each of the four handhole walls. Four (4) #3 steel dowels, eight (8) inches in length, shall be furnished and shall be installed in the drilled holes with a masonry epoxy.

All concrete debris shall be disposed of outside the right-of-way.

The area adjacent to each side of the handhole shall be excavated to allow forming. All steel hooks, handhole frame, cover, and concrete shall be provided to construct a rebuilt handhole according to applicable portions of Section 814 of the Standard Specification and as modified in 814.01TS HANDHOLES Special Provision. The existing frame and cover shall be replaced if it was damaged during removal or as determined by the Engineer.

Basis of Payment.
This work shall be paid for at the contract unit price each for REBUILD EXISTING HANDHOLE, which price shall be payment in full for all labor, materials, and equipment necessary to complete the work described above and as indicated on the drawings.

REBUILD EXISTING HANDHOLE TO HEAVY-DUTY HANDHOLE
Effective: January 1, 2002
Revised: July 1, 2015
895.05TS

This item shall consist of partial removal of an existing concrete traffic signal handhole, reconstruction to the specifications of heavy duty handhole including new frame and cover and bringing it to grade at location(s) shown in the plans or as directed by the Engineer. This work shall consist of removing the existing handhole frame and cover and the walls of the handhole to a depth of fifteen (15) inches below the finished grade.

Upon completion of the above work, four (4) holes, four (4) inches in depth, and one-half (1/2) inch in diameter shall be drilled into the top of the remaining concrete; one hole centered into each of the four handhole walls. Four (4) #3 steel dowels eight inches in length, shall be furnished and installed in the drilled holes with a masonry epoxy.

All concrete debris shall be disposed of outside the right-of-way.

Any pavement or asphalt surface removal required to install the new concrete shall have straight and neat edges using a method approved by the Engineer. Care shall be taken to protect the existing traffic signal cable. Any cable damage shall be reported immediately and repaired as directed by the Area Traffic Signal Engineer.

All steel hooks, handhole frame, cover, and concrete shall be provided to construct a rebuilt heavy duty handhole according to applicable portions of Section 814 of the Standard Specification and as modified in 814.01TS HANDHOLES Special Provision.

Basis of Payment.
This work shall be paid for at the contract unit price each for REBUILD EXISTING HANDHOLE TO HEAVY-DUTY HANDHOLE.

RELOCATE EXISTING PEDESTRIAN PUSH-BUTTON
Effective: August 4, 2017
895.06TS

Relocation.
Revise the last paragraph of Article 895.02 of the Standard Specifications to read:

When relocating an existing pedestrian push-button, the related sign shall be removed and installed at the new location. The push-button shall be installed according to Article 888.03. Mounting / extension brackets shall be used to assure that the push button is accessible from a paved or concrete surface and is in full compliance with ADA. Mounting / extension brackets shall not be paid for separately but shall be included in the cost of the RELOCATE EXISTING PEDESTRIAN PUSH-BUTTON pay item.

TRAFFIC CONTROL PLAN

The Engineer shall be responsible for the administration of the Traffic Control Plan.

Construction and or maintenance operations shall be conducted in a manner such that streets will be open to emergency traffic and accessible as required to local traffic. Removal and replacement of curb and gutter and driveways (if required) shall be planned so as to cause a minimum of inconvenience to the abutting property owners. **Two-way movement on all roads and access to abutting properties shall be maintained at all times.**

Special attention is called to Article 107.09 and the applicable parts of Section 701, 702 and 703 of the Standard Specifications for Road and Bridge Construction and the following Highway Standards, Supplemental Specifications and Recurring Special Provisions or other Special Provisions relating to traffic control.

Highway Standards:	701001-02, 701006-05, 701011-04, 701101-05, 701106-02, 701201-05, 701206-05, 701301-04, 701316-13, 701321-18, 701421-08, 701422-10, 701426-09, 701427-05, 701501-06, 701502-09, 701601-09, 701602-10, 701606-10, 701701-10, 701801-06, 701901-08
Bureau of Local Roads and Streets Special Provisions:	BLR 17-4, BLR 18-6

Other Special Provisions:

For projects that shall exceed four (4) days in duration, all signs except those referring to daily lane closures shall be post-mounted.

The Contractor shall obtain, erect, maintain, and remove any and all signs, barricades, flaggers, and other traffic control devices as may be necessary for the purpose of regulating, warning, and guiding traffic. Placement and maintenance of all traffic control devices shall be as directed by the Engineer. The Engineer shall be the sole judge as to the acceptability of placement and maintenance of the traffic control devices.

All traffic control and traffic control devices shall be considered incidental and will not be measured for payment unless otherwise shown on the plans and in the schedule of prices.

APPENDIX A:

MCHENRY COUNTY DIVISION OF TRANSPORTATION

LED Traffic Signal Head Retrofit

Date Retrofited

Year 2021

#	Location	LED Retrofit Date Retrofited	WARRANTY EXPIRATION DATE	LED Module Manufacturer	NOTES:	Additional Notes
	TRAFFIC SIGNALS					
TS1	Algonquin Road @ Pyott Road	October-15	October-30	Dialight XL15	15-year warranty	
TS2	Algonquin Road @ Hanson Rd/Hilltop Dr	October-15	October-30	Dialight XL15	15-year warranty	
TS3	Algonquin Road @ Crystal Lake Road	June-21	June-36	LEOTECH	15-year warranty	
TS4	Algonquin Road @ Harvest Gate Road	October-13	October-19	GE, VLA	6-year warranty	
TS5	Algonquin Road @ Frank Road	October-13	October-19	GE, VLA	6-year warranty	
TS6	Algonquin Road @ Square Barn Road	October-13	October-19	GE, VLA	6-year warranty	
TS7	Algonquin Road @ Huntley Fire Station Entrance (HAWK)	July-11	July-16	GE, GT1	DO NOT RE-LAMP	Do not re-lamp!
TS8	Algonquin Road @ Lakewood Road	October-13	October-19	GE, VLA	6-year warranty	
TS9	Algonquin Road @ Haligus Road	February-14	February-20	GE, GT1	6-year warranty	
TS10	Rakow Road @ Pingree Road	October-18	October-33	Dialight XL15	15-year warranty	
TS11	Rakow Road @ Virginia Road	October-18	October-33	Dialight XL15	15-year warranty	
TS12	Rakow Road @ Pyott Road	October-18	October-33	Dialight XL15	15-year warranty	
TS13	Randall Rd/Rakow Rd @ McHenry Avenue	October-18	October-33	Dialight XL15	15-year warranty	
TS14	Randall Road @ Ackman Road	October-18	October-33	Dialight XL15	15-year warranty	
TS15	Randall Road @ Miller Road	November-13	November-19	GE, VLA	6-year warranty	
TS16	Randall Road @ Acorn Lane	July-21	July-39	LEOTECH	15-year warranty	
TS17	Randall Road @ Commercial Drive	July-21	July-39	LEOTECH	15-year warranty	
TS18	Randall Road @ Algonquin Road	July-21	July-39	LEOTECH	15-year warranty	
TS19	Randall Road @ Stonegate Road	July-21	July-39	LEOTECH	15-year warranty	
TS20	Randall Road @ Huntington Dr/Bunker Hill Rd	July-21	July-39	LEOTECH	15-year warranty	
TS21	Randall Road @ Harnish Drive	July-21	July-39	Dialight XL15	15-year warranty	
TS22	Virginia Road @ Pyott Rd/Main St	November-15	November-21	GE, VLA	6-year warranty	
TS23	Virginia Road @ Berkshire Drive	April-15	April-30	Dialight XL15	15-year warranty	
TS24	Virginia Road @ Teckler Boulevard	January-15	January-30	Dialight XL15	15-year warranty	
TS25	Walkup Road @ Hillside Road	September-16	September-31	Dialight XL15	15-year warranty	
TS26	Walkup Road @ Pleasant Hill Rd/Deerwood Dr	September-16	September-31	Dialight XL15	15-year warranty	
TS27	Walkup Road @ Edgewood Rd/Berry Ct	September-16	September-31	Dialight XL15	15-year warranty	
TS28	Walkup Road @ Crystal Springs Road	September-16	September-31	Dialight XL15	15-year warranty	
TS29	Crystal Lake Road @ Mason Hill Road	October-18	October-33	LEOTECH	15-year warranty	
TS30	Bull Valley Road @ Crystal Lake Road	September-14	September-29	Dialight XL15	15-year warranty	
TS31	Bull Valley Road @ Ridgeview Drive	February-16	February-31	Dialight XL15	15-year warranty	
TS32	Miller Road @ Green Street	June-16	June-22	GE, VLA	6-year warranty	
TS33	Miller Road @ River Road	September-19	September-34	LEOTECH	15-year warranty	
TS34	Ackman Road @ Golf Course Road	May-17	May-32	Dialight XL15	15-year warranty	
TS35	Cary Road @ Main Street	April-15	April-30	Dialight XL15	15-year warranty	
TS36	Chapel Hill Road @ Bay Road	October-18	October-33	LEOTECH	15-year warranty	
TS37	Chapel Hill Road @ Lincoln Road	January-15	January-30	Dialight XL15	15-year warranty	
TS38	Wilmot Road @ Main Street	May-17	May-32	Dialight XL15	15-year warranty	
TS39	Johnsburg Road @ Riverside Drive	September-19	September-34	LEOTECH	15-year warranty	
TS40	Johnsburg Road @ Spring Grove Road	September-19	September-34	LEOTECH	15-year warranty	
TS41	Harmony Road @ Hemmer Road	August-14	August-20	GE, VLA	6-year warranty	
TS42	Marengo Rd/Harmony Rd @ Main St	August-14	August-20	GE, VLA	6-year warranty	
TS43	Lakewood Road @ Reed Road	December-16	December-31	Dialight XL15	15-year warranty	
TS44	Marengo Rd/Harmony Rd @ Main St	December-16	December-31	Dialight XL15	15-year warranty	

APPENDIX

B: UPS TESTING FORMS

UPS SERVICE MAINTENANCE

UPS INFORMATION

_____

_____

UPS LOCATION_____

UPS ID#

UPS TYPE_____

CUSTOMER_____

ADDRESS_____

STATE/PROVINCE_____

ZIP /POSTALCODE_____

TEL# FAX_____

INPUT VOLTAGE_____ OUTPUT VOLTAGE _____

BYPASS SWITCH_____ BYPASS TYPE _____

BATTERY TYPE,_____ BATTERY QUANTITY_____

BATTERY VOLTAGE_____

BATTERY BANK VOLTAGE_____

HAS A PMI BEEN PERFORMED BEFORE_____

HOW LONG HAS THE UPS BEEN IN SERVICE_____

HAVE ANY OF THE COMPONENTS BEEN REPLACED_____

I THE UPS IS FUNCTIONING PROPERLY, IS IT READY TO START A LOAD TEST

_____

IF SO, TURN OFF THE AC USING THE BYPASS AC SWITCH, AND MONITOR THE SWITCHING TO BATTERY. DOES IT MAINTAIN THE LOAD_____

	y	N
IS THE LOCATION DUSTY		
IS THE UPS OPERATIONAL		
IF NOT, IS IT IN BYPASS		
ARE THE FANS DIRTY		
ARE THE FANS NOISEY		
ARE THE BATTERY CABLES TIGHT		
ARE THE BATTERY TERMINALS CLEAN		
ARE THE AC CONNECTORS TIGHT		
IS THE UPS DAMAGED EXTERNALLY		
IS THE UPS DIRTY AND DUSTY INSIDE		
IS THERE ANY VISUAL DAMAGE		
DO THE FANS NEED REPLACING		

TESTING THE BATTERY BANK

USING AND RMS METER DOCUMENT THE BATTERY VOLTAGE OF EACH BATTERY UNDER THESE OPERATING CONDITIONS

	NORMAL OPERATION	ON INVERTER FULL LOAD	INVERTER NO LOAD	POWER DOWN BATTERIES DISCONNECTED
1	_____	_____	_____	_____
2	_____	_____	_____	_____
3	_____	_____	_____	_____
4	_____	_____	_____	_____
5	_____	_____	_____	_____
6	_____	_____	_____	_____
7	_____	_____	_____	_____
8	_____	_____	_____	_____
9	_____	_____	_____	_____
10	_____	_____	_____	_____

DOCUMENT EACH BATTERY VOLTAGE READING, PERFORM THIS TESTING ONLY IF THE BATTERY CABLES ARE TIGHT AND CLEAN, IF THEY ARE NOT, THE READING MAY BE INCORRECT

BATTERY RUNTIME IS BASED ON TOTAL BATTERY VOLTAGE, IF YOU HAVE MULTIPLE BATTERIES, THE READINGS WILL BE COMPARED TO EACH OTHER.

- NORMAL OPERATION WILL SHOW THE HIGHEST BATTERY VOLTAGE READING
- NO LOAD WILL SHOW THE SECOND HIGHEST
- POWER DOWN STATE, THE NEXT.
- INVERTER THE LOWEST.

WHEN A BATTERY IS BEING DISCHARGED UNDER LOAD, THE VOLTAGE WILL FALL VERY QUICKLY THEN STABALIZE.

EG, IF THE READING IS 13.1 V, AND THE UPS IS PLACED IN INVERTER MODE, THE BATTERY WILL DROP TO 12.4V THEN BECOME MORE STABLE. AT THIS POINT IT WIL FALL SLOWLY. IF THE BATTERY VOLTAGE CONTINUES TO DROP TO LESS THAN 11.sv THIS INDICATES A WEAK BATTERY

THE IDEAL BATTERY VOLTAGE, IS WHEN THEY ARE ALL IDENTICAL, BUT THIS IS NOT POSSIBLE. IF THEY ARE WHITNIN 1 /10 OF A VOLT OF EACH OTHER, THIS IS VERY GOOD

UNDER NORMAL OPERATION IF BATTERIES VARY MORE THAN 3/10 OF A VOLT AND ALL THE CONNECTIONS ARE TIGHT, THIS INDICATES A POTENTIALLY WEAK BATTERY.

TO VERIFY THIS, WHEN THE UPS IS PLACED IN THE INVERTER MODE BY DICONNECTING THE AC. ANY WEAK BATTERY(S) WILL FALL MORE QUICKLY, REPLACE THE WEAK BATTERY(S)

(IF THE BATTERIES ARE MORE THAN THREE YEARS OLD, REPLACE THE ENTIRE STRING)

WHEN THE BATTERIES ARE BEING TESTED AND THE UPS IS IN NORMAL OPERATION OR INVERTER MODE THE BATTERY VOLTAGE MAY VARY WITH THE CHANGE IN LOAD DEMANDS. WHEN THE INTERSECTION GOES FROM LED REDS TO AMBER INCANDESCENT, THE BATTERY VOLTAGE MAY BE LOWER.

HAS THE UPS PASSED _____

THE BATTERIES, ARE THE WITHIN ACCEPTABLE LIMITS _____

HAVE THE FANS BEEN REPLACED OR CLEANED _____

HAS THE UPS BEEN CLEANED _____

HAVE THE BATTERY CABLES BEEN TIGHTENED _____

IS THE BYPASS IN THE UPS POSITION _____

IS THE UPS READY. _____

IF AGM GELL BATTERIES ARE USED IN PLACE OF THE OPTIMA 900, THEREPLACEMENT PERIOD AND OR BATTERY FAILURE WILL BE HIGHER. ALWAYS REPLACE BATTERIES WITH THE SAME BATTERIES (MFG & RATING) DO NOT MIX BATTERY RATINGS AND OR MANUFACTURER.

NOTES

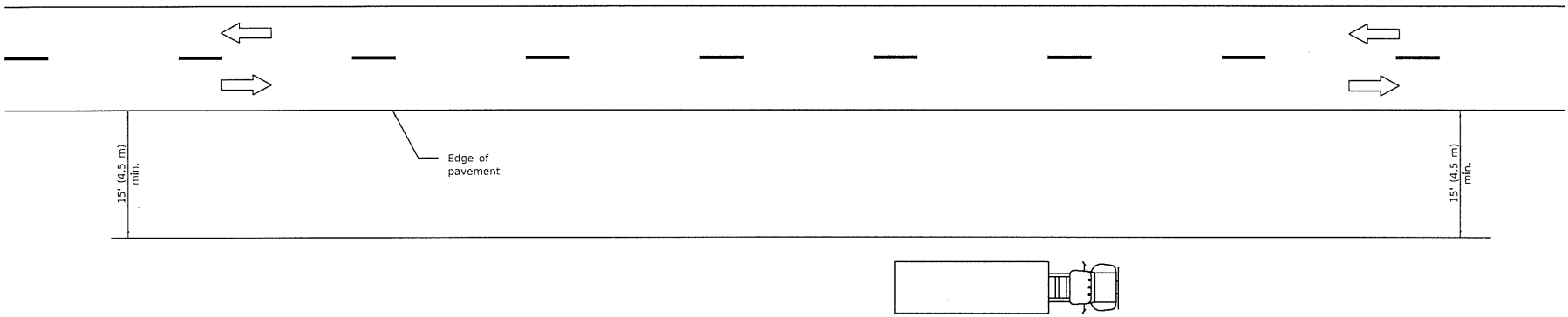
ON SITE TECHNICIAN_____

APPROVED BY _____

DATE COMPLETED_____

INTENTIONALLY

BLANK



TYPICAL APPLICATIONS

Landscaping work

Utility work

Fencing contracts and maintenance

Cleaning culverts

GENERAL NOTES

This Standard is used where at all times all vehicles, equipment, workers or their activities are more than 15' (4.5 m) from the edge of pavement.

When the work operation requires that two or more work vehicles cross the 15' (4.5 m) clear zone in any one hour, traffic control shall be according to Standard 701006.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009
ENGINEER OF OPERATIONS

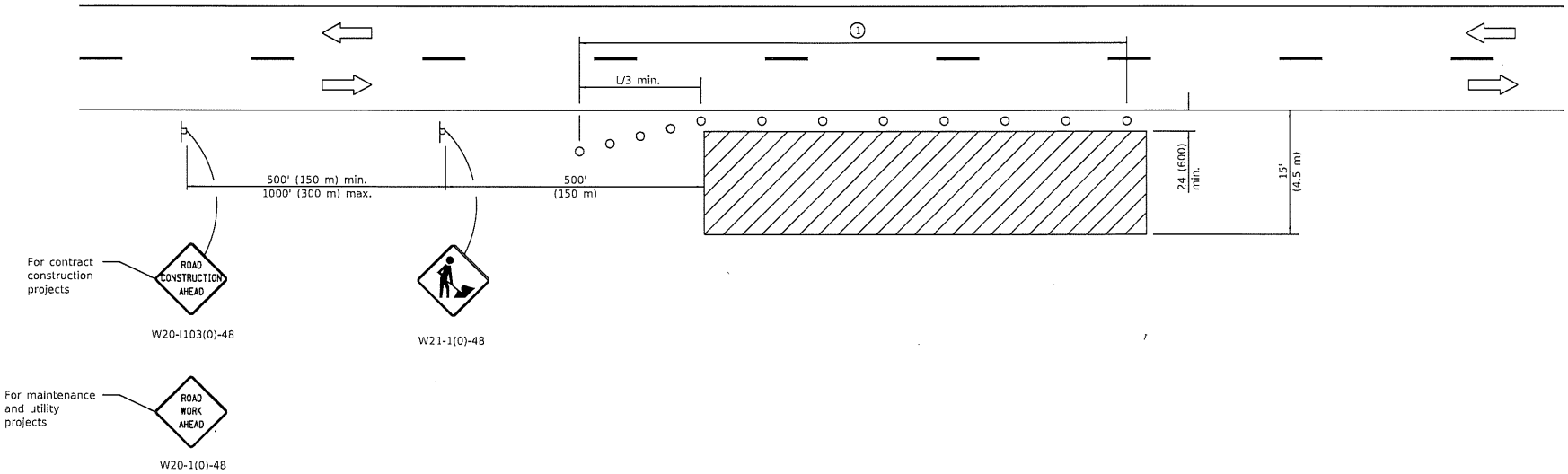
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to
	English (metric).
1-1-05	Revised title and notes.

OFF-RD OPERATIONS, 2L, 2W, MORE THAN 15' (4.5 m) AWAY

STANDARD 701001-02



TYPICAL APPLICATIONS

Utility operations
Culvert extensions
Side slope changes
Guardrail installation and maintenance
Delineator installation
Landscaping operations
Shoulder repair
Sign installation and maintenance

SYMBOLS

Work area

Sign

Cone, drum or barricade

① When the work operation exceeds one hour, cones, drums or barricades shall be placed at 25' (8 m) centers for L/3 distance, and at 50' (15 m) centers through the remainder of the work area.

GENERAL NOTES

This Standard is used where any vehicles, equipment, workers or their activities will encroach in the area 15' (4.5 m) to 24 (600) from the edge of pavement.

Calculate L as follows:

SPEED LIMIT	FORMULAS English	(Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

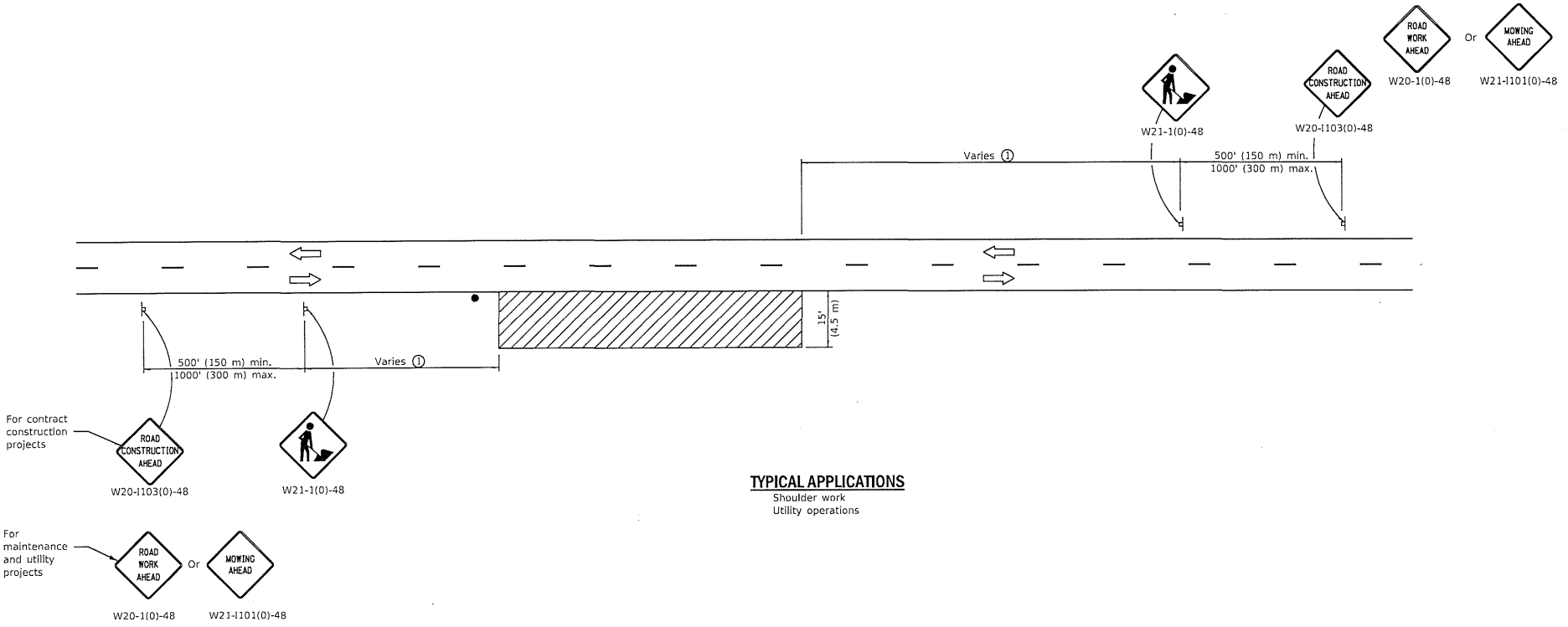
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-14	Revised workers sign
	number to agree with
	current MUTCD.
1-1-13	Omitted text 'WORKERS'
	sign.

OFF-RD OPERATIONS, 2L, 2W, 15' (4.5 m) TO 24" (600 mm) FROM PAVEMENT EDGE

STANDARD 701006-05



TYPICAL APPLICATIONS

Shoulder work
Utility operations

SYMBOLS

Work area

Sign

● *Flagger with traffic control sign when required*

(1) Minimum distance is 200' (60 m). Maximum distance to be determined by the Engineer but should not exceed ½ the length required for one normal working day's operation, or 4 miles (6.4 km) whichever is less.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities require an intermittent or continuous moving operation on the shoulder, where the average speed is 1 mph (2 km/h) or less.

When the work operation does not exceed 60 minutes, traffic control may be according to Standard 701301.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

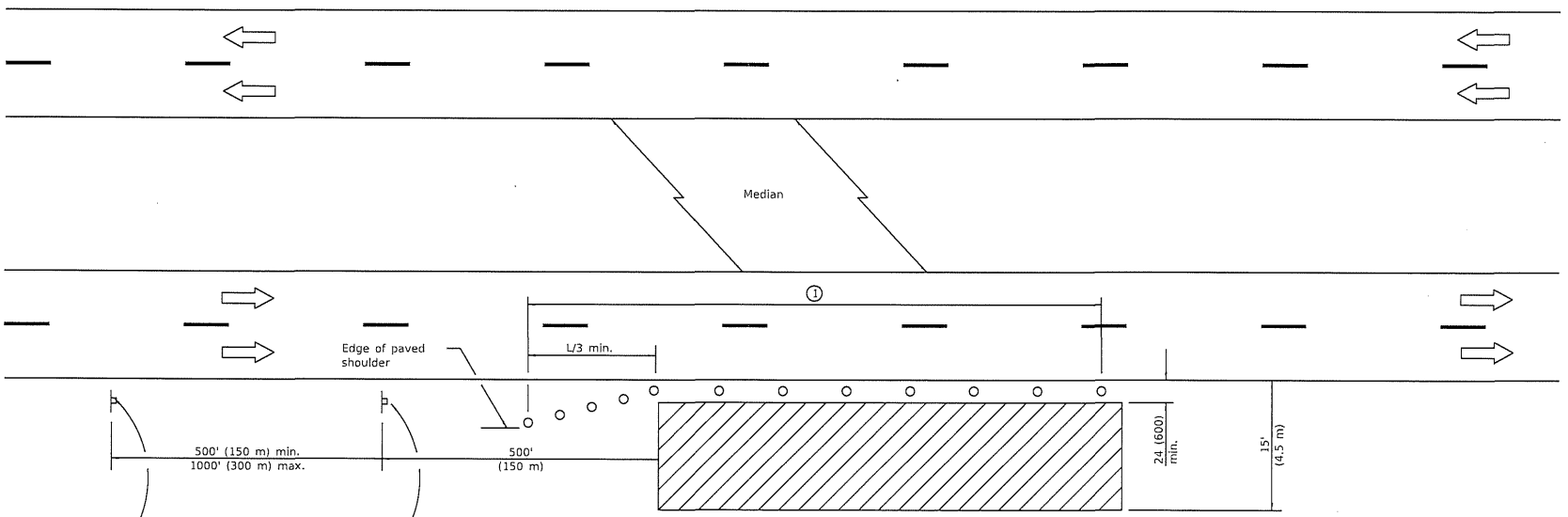
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-14	Revised workers sign
	number to agree with
	current MUTCD.
1-1-13	Omitted text 'WORKERS'
	sign.

OFF-RD MOVING OPERATIONS, 2L, 2W, DAY ONLY

STANDARD 701011-04



For contract construction projects

W20-I103(0)-48

W21-1(0)-48

For maintenance and utility projects

W20-1(0)-48

TYPICAL APPLICATIONS

Utility operations
Culvert extensions
Side slope changes
Guardrail installation and maintenance
Delineator installation
Landscaping operations
Shoulder repair
Sign installation and maintenance

① When the work operation exceeds one hour, cones, drums or barricades shall be placed at 25' (8 m) centers for L/3 distance, and at 50' (15 m) centers through the remainder of the work area.

SYMBOLS

Work area

Sign

Cone, drum or barricade

GENERAL NOTES

This Standard is used where any vehicles, equipment, workers or their activities will encroach in the area 15' (4.5 m) to 24 (600) from the edge of pavement.

Calculate L as follows:

SPEED LIMIT	FORMULAS English	(Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED April 1, 2016
ENGINEER OF SAFETY ENGINEERING

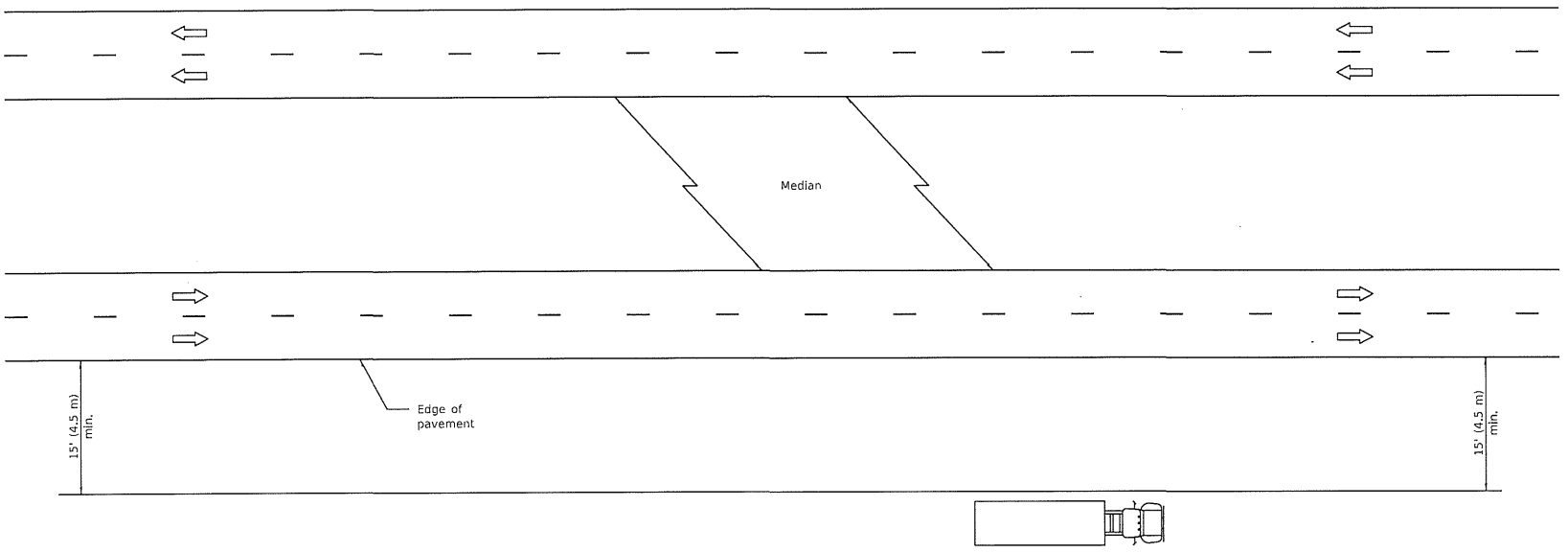
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
4-1-16	Corrected typo in title.
1-1-14	Revised workers sign
	number to agree with
	current MUTCD.

OFF-RD OPERATIONS, MULTILANE, 15' (4.5 m) TO 24" (600 mm) FROM PAVEMENT EDGE

STANDARD 701101-05



TYPICAL APPLICATIONS

Landscaping work
Utility work
Fencing contracts

GENERAL NOTES

This Standard is used where at all times all vehicles, equipment, workers or their activities are more than 15' (4.5 m) from the edge of pavement.

When the work operation requires that two or more work vehicles cross the 15' (4.5 m) clear zone in any one hour, traffic control shall be according to Standard 701101.

This Standard also applies to work performed in the median more than 15' (4.5 m) from either pavement.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009
ENGINEER OF OPERATIONS

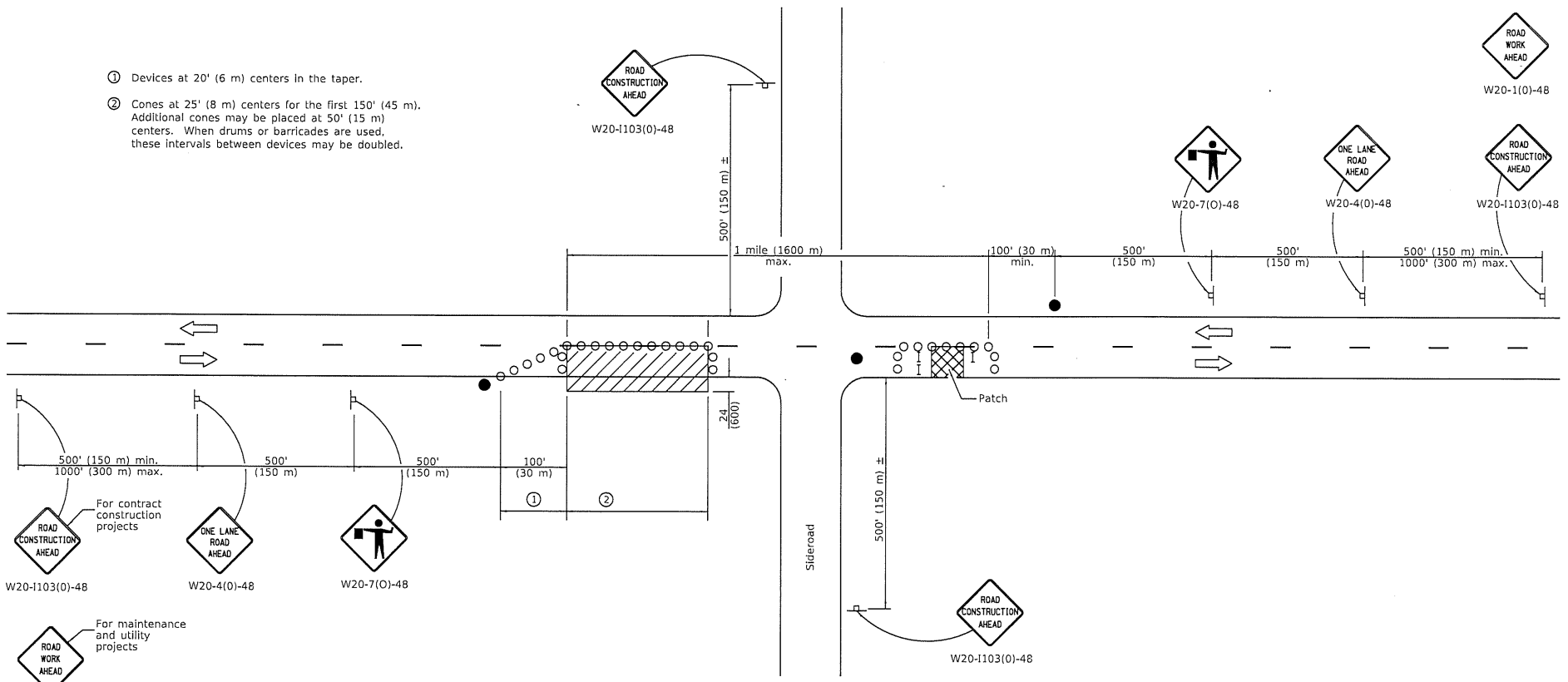
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-07

DATE	REVISIONS
1-1-05	Switched units to
	English (metric).
1-1-05	Revised title.

OFF-RD OPERATIONS, MULTILANE, MORE THAN 15' (4.5 m) AWAY

STANDARD 701106-02



TYPICAL APPLICATIONS

Isolated patching
Utility operations
Storm sewer
Culverts
Cable placement

SYMBOLS

- Work area
- Sign
- Barricade or drum
- Cone, drum or barricade
- Flagger with traffic control sign

GENERAL NOTES

This Standard is used where at any time, any vehicles, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of pavement for daylight operation.

When the distance between successive work areas exceeds 2000' (600 m), additional warning signs, flaggers, and taper shall be placed as shown.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

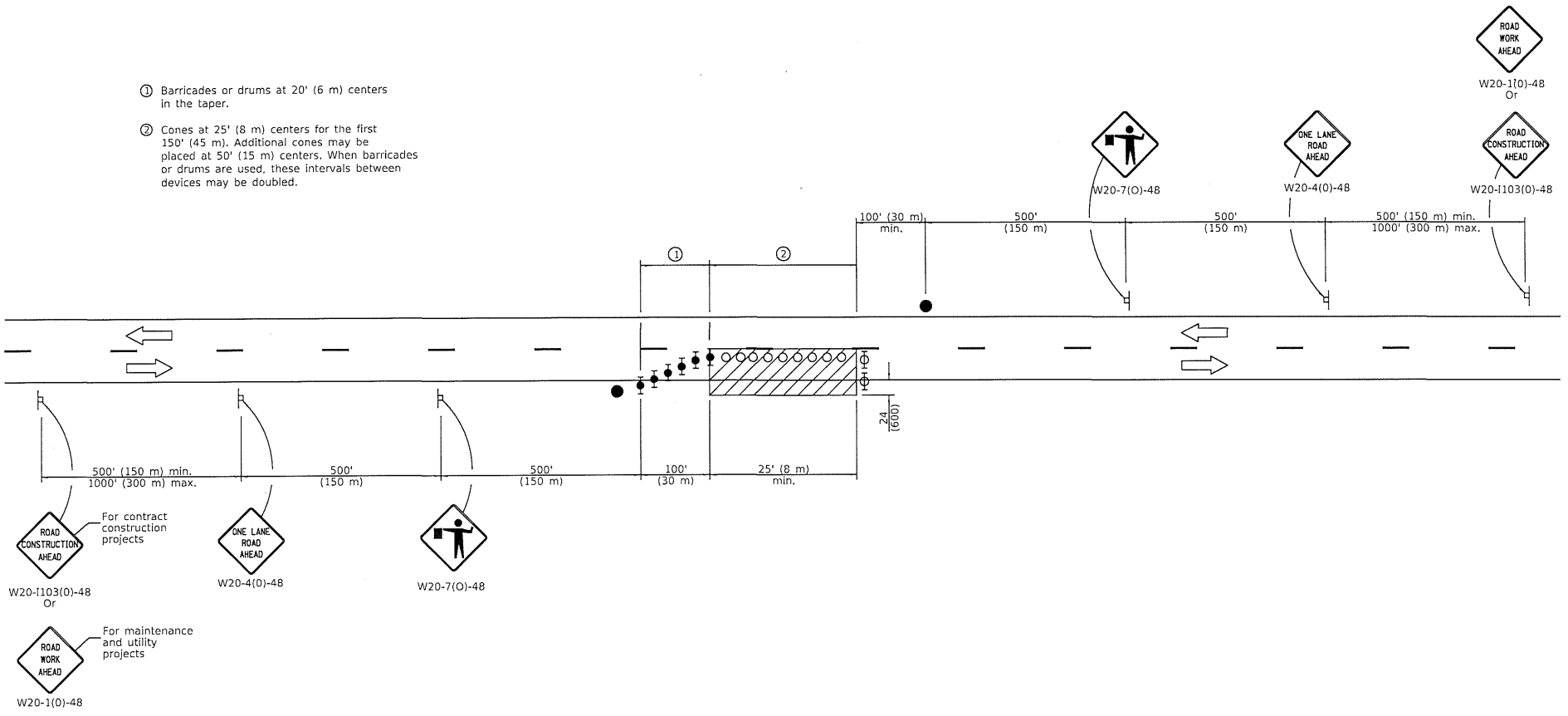
DATE	REVISIONS
1-1-19	Revised device spacing in taper.
1-1-11	Revised flagger sign.

LANE CLOSURE, 2L, 2W, DAY ONLY, FOR SPEEDS ≥ 45 MPH

STANDARD 701201-05

① Barricades or drums at 20' (6 m) centers in the taper.

② Cones at 25' (8 m) centers for the first 150' (45 m). Additional cones may be placed at 50' (15 m) centers. When barricades or drums are used, these intervals between devices may be doubled.



TYPICAL APPLICATIONS

Isolated patch
Installation of drainage structure
Utility operations

SYMBOLS

- Work area
- Sign
- Flagger with traffic control sign
- Cone, drum or barricade
- Barricade or drum with flashing light
- Barricade or drum with steady burning light

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) from the edge of pavement for nighttime operation.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

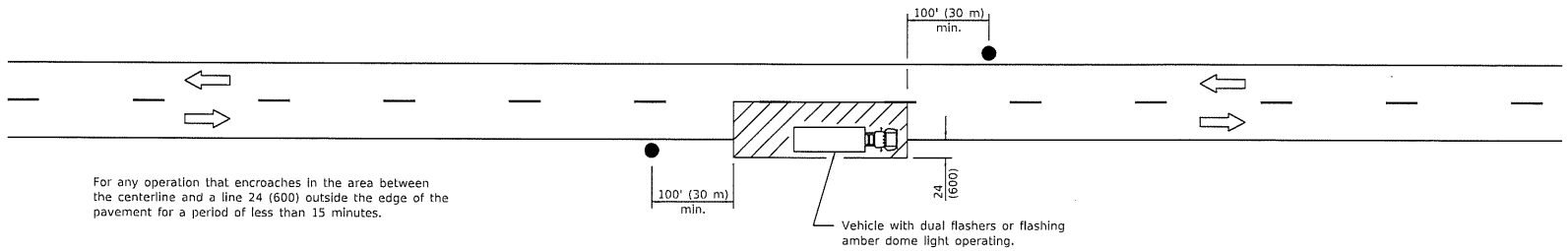
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

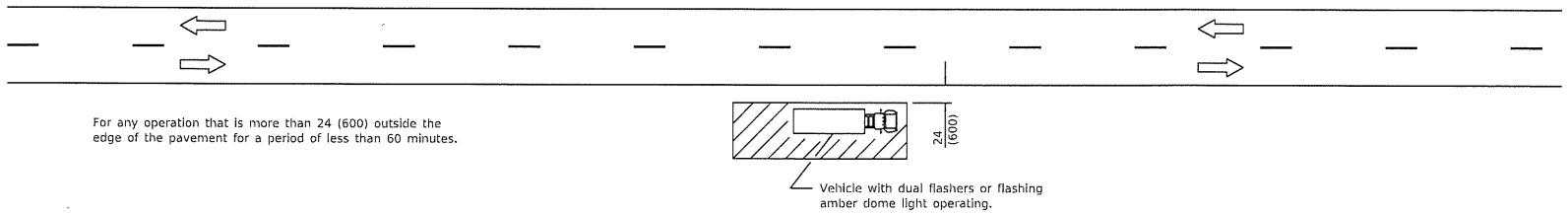
DATE	REVISIONS
1-1-19	Revised device spacing in taper
	and added cones as an option.
1-1-18	Omitted steady burning
	lights in tangent.

LANE CLOSURE, 2L, 2W, NIGHT ONLY, FOR SPEEDS ≥ 45 MPH

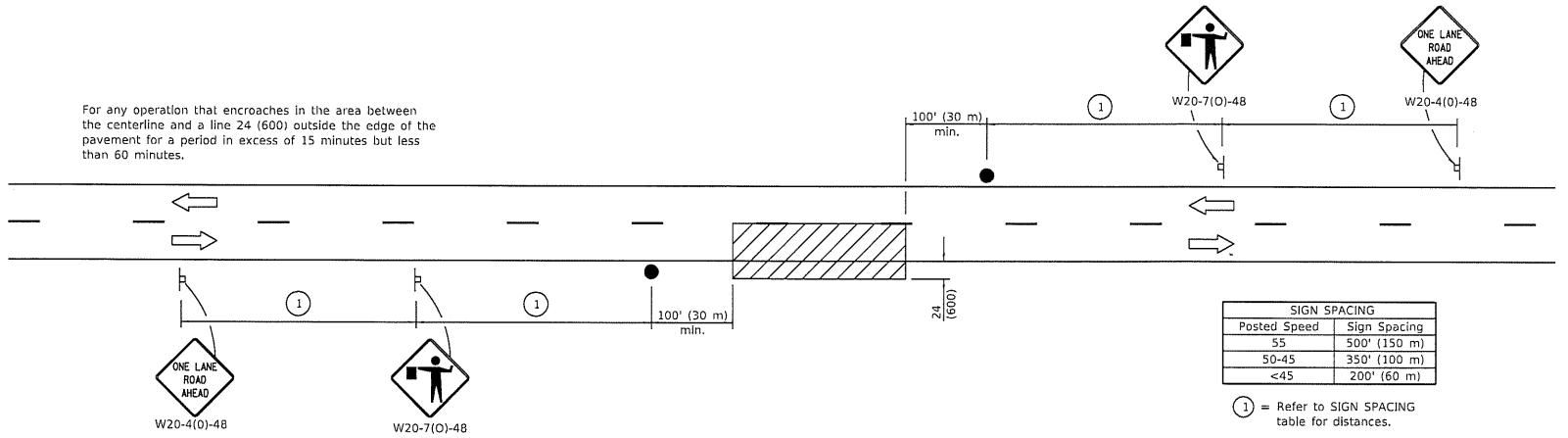
STANDARD 701206-05



For any operation that encroaches in the area between the centerline and a line 24 (600) outside the edge of the pavement for a period of less than 15 minutes.



For any operation that is more than 24 (600) outside the edge of the pavement for a period of less than 60 minutes.



For any operation that encroaches in the area between the centerline and a line 24 (600) outside the edge of the pavement for a period in excess of 15 minutes but less than 60 minutes.

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

(1) = Refer to SIGN SPACING table for distances.

TYPICAL APPLICATIONS

Marking patches
Field survey
String line
Utility operations
Cleaning up debris on pavement

SYMBOLS

Work area

Sign on portable or permanent support

Flagger with traffic control sign

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2011
ENGINEER OF SAFETY ENGINEERING

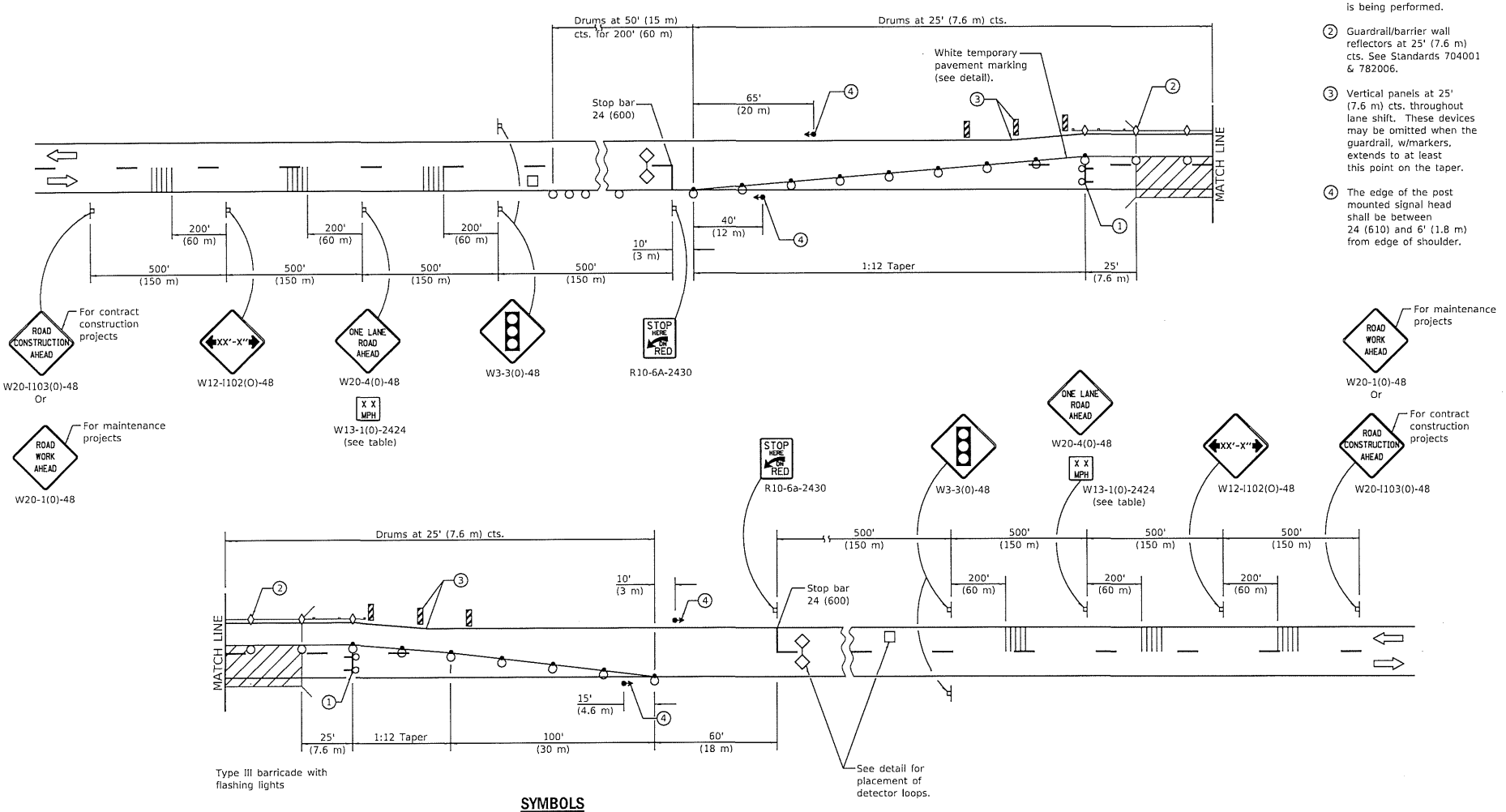
APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-11	Revised flagger sign.
1-1-09	Switched units to
	English (metric).

LANE CLOSURE, 2L, 2W, SHORT TIME OPERATIONS

STANDARD 701301-04



1. Type III barricade to be placed when no work is being performed.
2. Guardrail/barrier wall reflectors at 25' (7.6 m) cts. See Standards 704001 & 782006.
3. Vertical panels at 25' (7.6 m) cts. throughout lane shift. These devices may be omitted when the guardrail, w/markers, extends to at least this point on the taper.
4. The edge of the post mounted signal head shall be between 24 (610) and 6' (1.8 m) from edge of shoulder.

SYMBOLS

- Work area
- Sign
- Traffic signal
- Detector loops
- Type III barricade with flashing lights
- Drum with steady burn bi-directional light
- Temporary rumble strip (when specified)
- Crystal, bidirectional guardrail/barrier wall reflector
- Double vertical panel (see detail)
- Drum

See Sheet 2 for GENERAL NOTES.

Illinois Department of Transportation

PASSED January 1, 2020
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

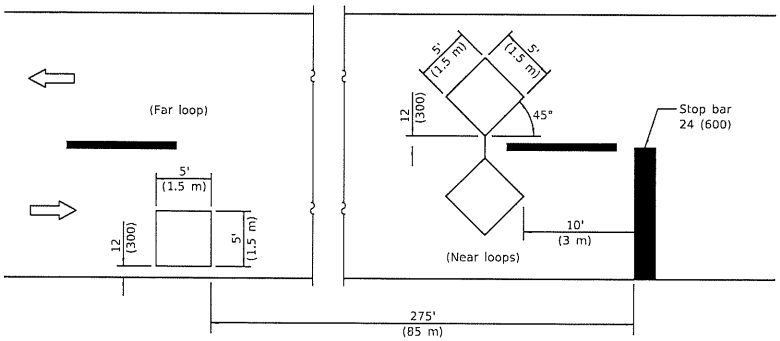
ISSUED 1-1-17

DATE	REVISIONS
1-1-20	Revised from F-shape to
	constant slope parapet.
1-1-18	Omitted lights in tangents.
	Changed lights in tapers
	to steady burn bi-dir.
1-1-17	Revised note (3).

LANE CLOSURE, 2L, 2W, BRIDGE REPAIR, FOR SPEEDS ≥ 45 MPH

(Sheet 1 of 2)

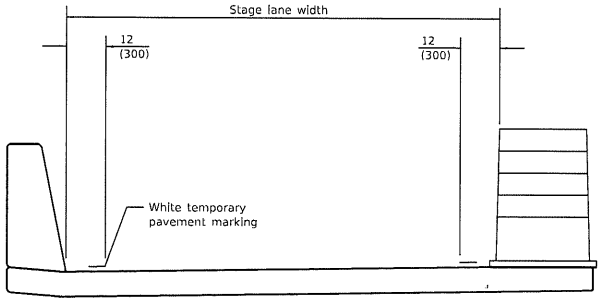
STANDARD 701316-13



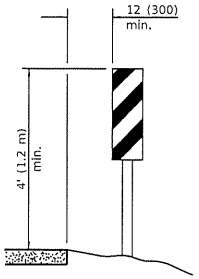
DETECTOR LOOPS

TRAFFIC SIGNAL SEQUENCE						
PHASE	A			B		
INTERVAL	1	2	3	4	5	6
NORTHBOUND OR EASTBOUND	G	Y	R	R	R	R
SOUTHBOUND OR WESTBOUND	R	R	R	G	Y	R

ADVISORY SPEED LIMIT	
NORMAL POSTED SPEED	ADVISORY SPEED
55 - 45 mph	40 mph
40 mph	35 mph
35 - 30 mph	30 mph



TEMPORARY PAVEMENT MARKING



VERTICAL PANELS

(Post mounted, one each side)

GENERAL NOTES

This Standard is used where, at any time any vehicle, equipment, workers or their activities will encroach on one lane of a bridge and traffic signals are required.

When traffic signals are not in operation, flaggers shall be used and traffic control devices shall conform to Standard 701201 or 701206.

Existing or temporary pavement markings shall be on both sides of open lane from stop bar to stop bar.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2020
ENGINEER OF SAFETY PROG. AND ENGINEERING

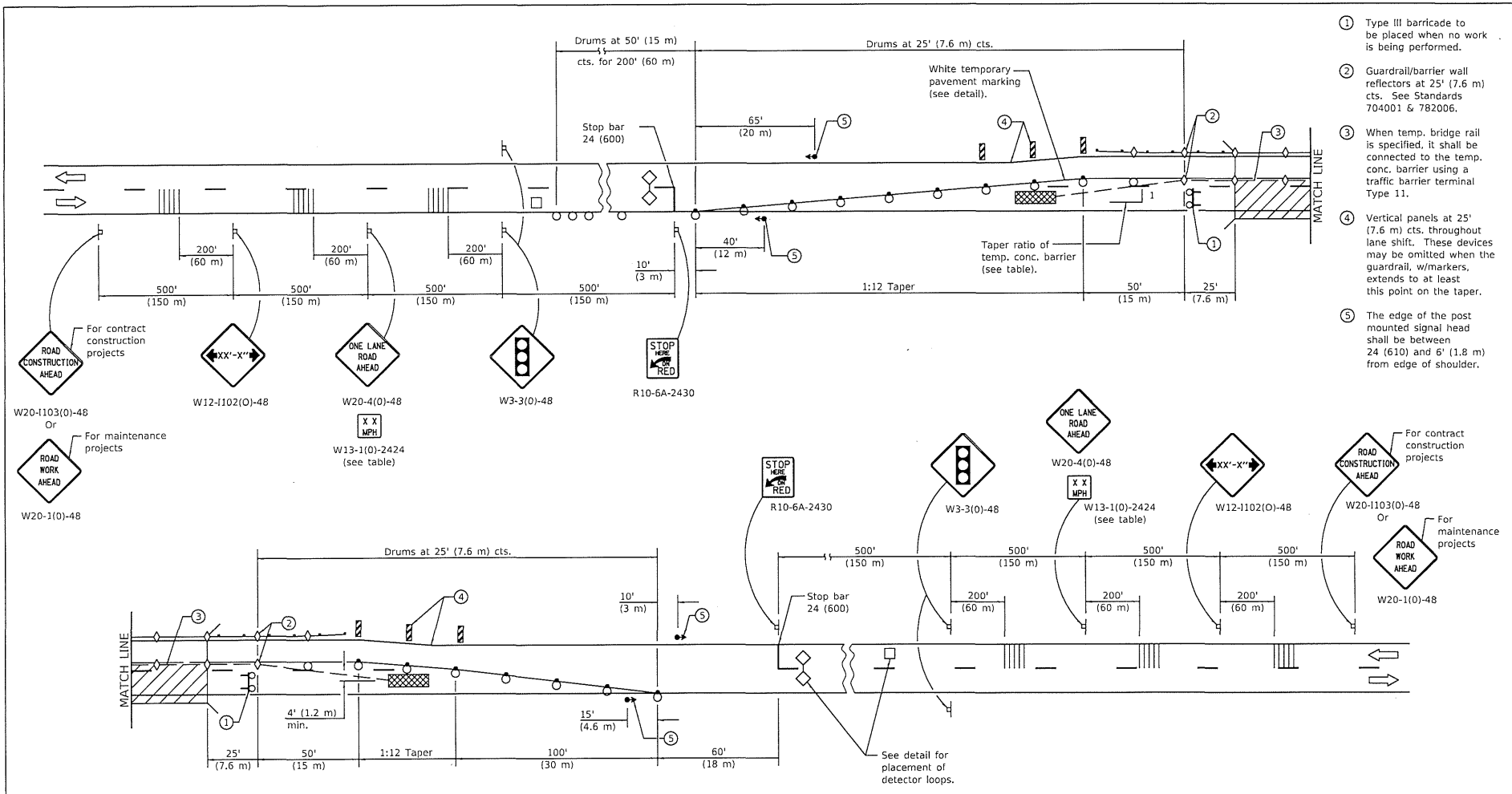
APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

LANE CLOSURE, 2L, 2W, BRIDGE REPAIR, FOR SPEEDS ≥ 45 MPH

(Sheet 2 of 2)

STANDARD 701316-13



1. Type III barricade to be placed when no work is being performed.
2. Guardrail/barrier wall reflectors at 25' (7.6 m) cts. See Standards 704001 & 782006.
3. When temp. bridge rail is specified, it shall be connected to the temp. conc. barrier using a traffic barrier terminal Type 11.
4. Vertical panels at 25' (7.6 m) cts. throughout lane shift. These devices may be omitted when the guardrail, w/markers, extends to at least this point on the taper.
5. The edge of the post mounted signal head shall be between 24 (610) and 6' (1.8 m) from edge of shoulder.

SYMBOLS

- Work area
- Sign
- Type III barricade with flashing lights
- Traffic signal
- Detector loops
- Impact attenuator
- Drum with steady burning bi-directional light
- Temporary concrete barrier
- Temporary rumble strip (when specified)
- Double vertical panel (see detail)
- Crystal, bidirectional guardrail/barrier wall reflector
- Drum

See Sheet 2 for GENERAL NOTES

Illinois Department of Transportation

PASSED January 1, 2020
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

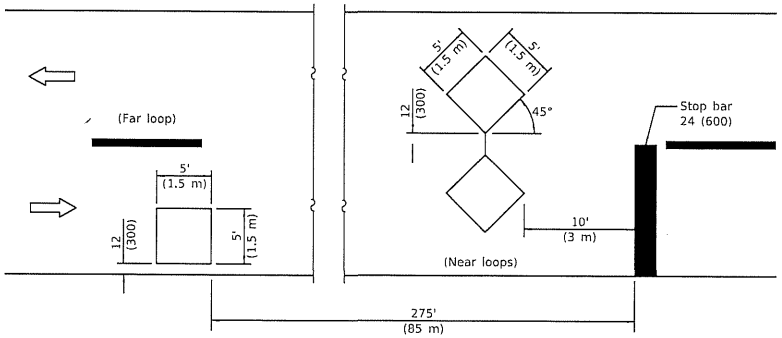
ISSUED 1-1-97

DATE	REVISIONS
1-1-20	Revised from F-shape to
	constant slope parapet.
1-1-18	Omitted lights in tangents.
1-1-17	Added flashing lights to
	Type III barricades. Revised
	note (4).

LANE CLOSURE, 2L, 2W, BRIDGE REPAIR WITH BARRIER

(Sheet 1 of 2)

STANDARD 701321-18

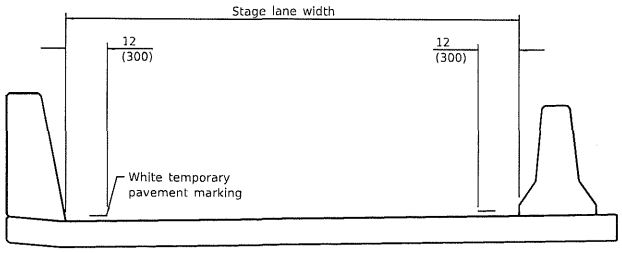


DETECTOR LOOPS

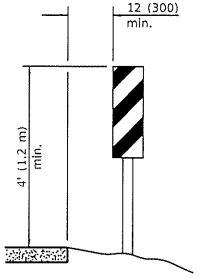
TRAFFIC SIGNAL SEQUENCE						
PHASE	A			B		
INTERVAL	1	2	3	4	5	6
NORTHBOUND OR EASTBOUND	G	Y	R	R	R	R
SOUTHBOUND OR WESTBOUND	R	R	R	G	Y	R

TEMPORARY CONCRETE BARRIER	
NORMAL POSTED SPEED	TAPER RATIO
40 mph AND ABOVE	12:1
BELOW 40 mph	8:1

ADVISORY SPEED LIMIT	
NORMAL POSTED SPEED	ADVISORY SPEED
55 - 45 mph	40 mph
40 mph	35 mph
35 - 30 mph	30 mph



TEMPORARY PAVEMENT MARKING



VERTICAL PANELS

(Post mounted, one each side)

GENERAL NOTES

This Standard is used where, at any time, any vehicle, equipment, workers, or their activities will encroach on one lane of a bridge. Traffic signals and a positive barrier are required.

Traffic signals shall be operational only when all traffic controls are in place. When traffic signals are not in operation, flaggers shall be used and traffic control shall conform to Standard 701201 or 701206.

Temporary concrete barrier shall be according to Standard 704001.

Existing or temporary pavement markings shall be on both sides of open lane from stop bar to stop bar.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2020
ENGINEER OF SAFETY PROG. AND ENGINEERING

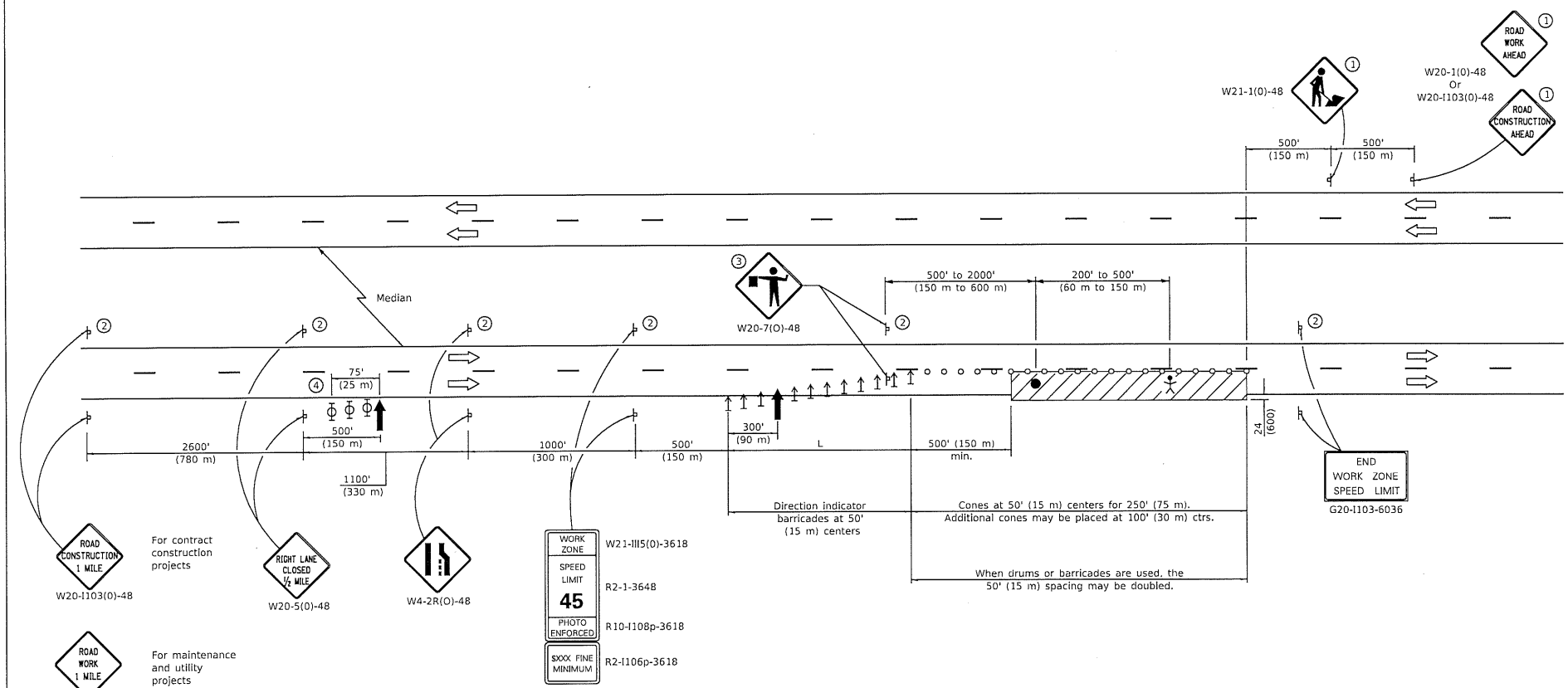
APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

LANE CLOSURE, 2L, 2W, BRIDGE REPAIR WITH BARRIER

(Sheet 2 of 2)

STANDARD 701321-18



L = lane width X taper ratio	
Normal Posted Speed	Taper Ratio
mph	
55	55/1
45	45/1

TYPICAL APPLICATIONS

Pavement patch
Utility operations
Bituminous resurfacing

SYMBOLS

- Arrow board
- Work area
- Sign
- Direction indicator barricade
- Cone, drum or barricade
- Flagger with traffic control sign
- Worker
- Type II barricade, drum, or vertical barricade with monodirectional flashing light

1. Undivided roadway only with left lane closure in opposite direction.
2. Omitted when median is less than 10' (3 m).
3. FLAGGER signs shall be moved as necessary to maintain the required spacing between the sign and each separate work activity.
4. Three Type II barricades, drums, or vertical barricades at 25' (8 m) centers.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement.

This Standard also applies when work is being performed in the left lane. Under these conditions, LEFT LANE CLOSED signs shall be substituted for RIGHT LANE CLOSED signs. On undivided highways, signs shall be added in the opposite direction as shown.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2017
ENGINEER OF SAFETY PROG. AND ENGINEERING

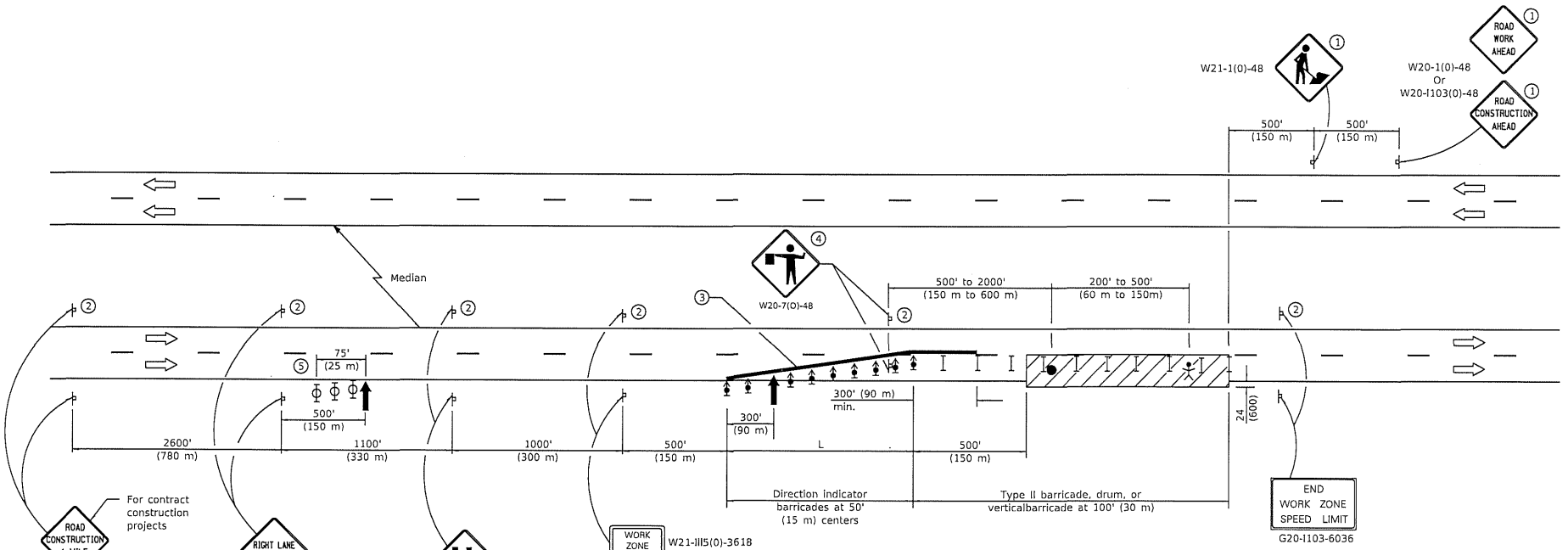
APPROVED January 1, 2017
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-04

DATE	REVISIONS
1-1-17	Rev. END WORK ZONE SPEED
	LIMIT sign. Changed device
	spacing at first arr. brd.
1-1-15	Revised END WORK ZONE SPEED
	LIMIT sign dimensions.

LANE CLOSURE, MULTILANE, DAY OPERATIONS ONLY, FOR SPEEDS ≥ 45 MPH TO 55 MPH

STANDARD 701421-08



L = lane width X taper ratio	
Normal Posted Speed	Taper Ratio
mph	
55	55/1
45	45/1

SYMBOLS

- Arrow board
- Work area
- Sign
- Direction indicator barricade with steady burn monodirectional light
- Type II barricade, drum, or vertical barricade
- Flagger with traffic control sign
- Worker
- Type II barricade, drum, or vertical barricade with monodirectional flashing light

(1) Undivided roadway only with left lane closure in opposite direction.

(2) Omitted when median is less than 10' (3 m).

(3) Reflectorized temporary pavement marking tape shall be placed throughout the taper and for 300' (90 m) along-side the work area where the closure time is greater than fourteen days. The edge line shall be white for right lane closures and yellow for left lane closures.

(4) FLAGGER signs shall be moved as necessary to maintain the required spacing between the sign and each separate work activity.

(5) Three Type II barricades, drums, or vertical barricades at 25' (8 m) centers.

GENERAL NOTES

This standard is used where at any time any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement for daylight operation exceeding one day.

This standard also applies when work is being performed in the left lane. Under these conditions LEFT LANE CLOSED signs shall be substituted for RIGHT LANE CLOSED signs. On undivided highways, signs shall be added in the opposite direction as shown.

A check barricade shall be placed in the middle of the closed lane and at the shoulder at 1000' (300 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2018
ENGINEER OF SAFETY PROG. AND ENGINEERING

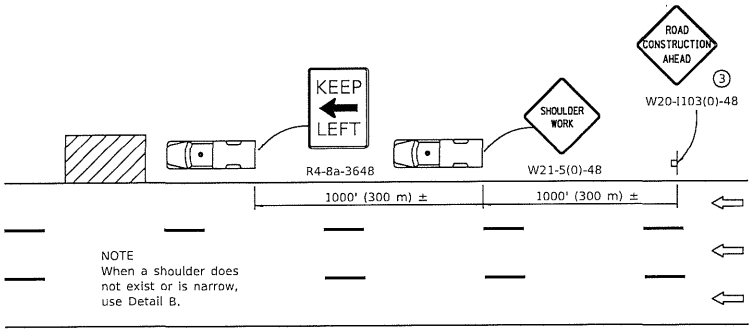
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

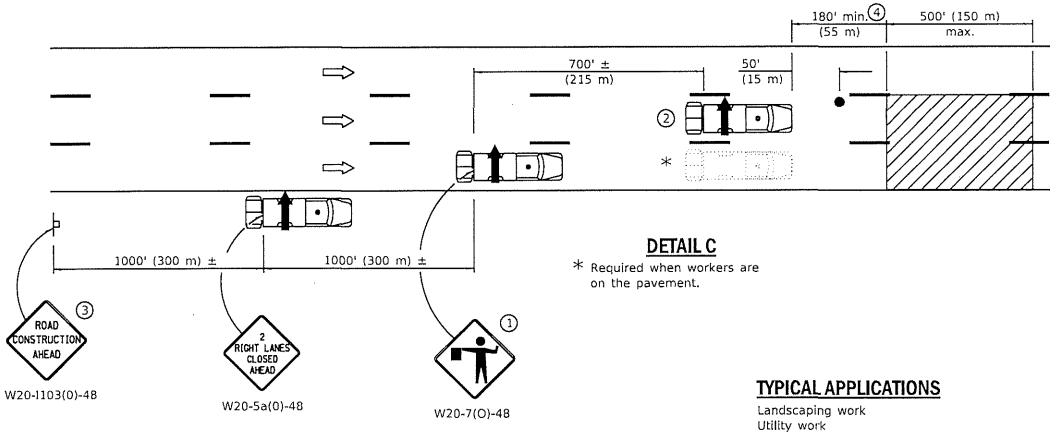
DATE	REVISIONS
1-1-18	Omitted lights in tangent.
1-1-17	Rev. END WORK ZONE SPEED
	LIMIT sign. Changed device
	spacing at first arr. brd.

LANE CLOSURE, MULTILANE, FOR SPEEDS ≥ 45 MPH TO 55 MPH

STANDARD 701422-10



DETAIL A

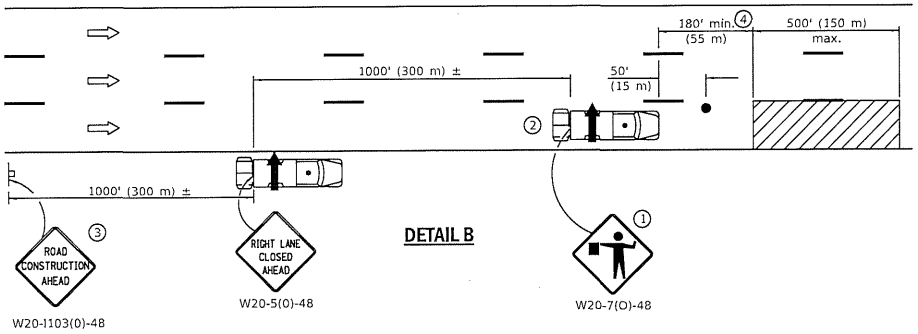


DETAIL C

* Required when workers are on the pavement.

TYPICAL APPLICATIONS

Landscaping work
Utility work
Pavement marking
Weed spraying
Roadometer measurements
Debris cleanup
Crack pouring



DETAIL B

1. Flaggers are required when workers are on the pavement.
2. For striping operations only. See sign arrow detail on this standard.
3. For stationary operations which are on the roadway or shoulder, greater than 15 minutes and up to 1 hour.
4. The distance between the work and the lead truck may vary according to terrain or paint/crack sealing drying time.

G20-I101-2430
(appropriate arrow)
2 (when striping only)

GENERAL NOTES

This Standard is used where any vehicle, equipment, workers or their activities will require: 1) stationary operations up to 1 hour, or 2) a continuous or intermittent moving operation where the average speed of movement is greater than 1 mph (2 km/h).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions, KEEP RIGHT signs shall be substituted for KEEP LEFT signs and arrow board indications shall be directed to the right.

All dimensions are in inches (millimeter) unless otherwise shown.

SYMBOLS

- Arrow board
- Work area
- Truck with flashing amber light
- Truck/Trailer mounted attenuator
- Flagger with traffic control sign
- Sign

Illinois Department of Transportation

PASSED January 1, 2017
ENGINEER OF SAFETY PROG. AND ENGINEERING

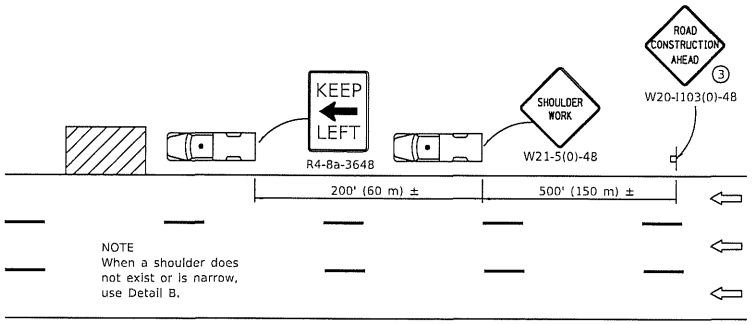
APPROVED January 1, 2017
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17

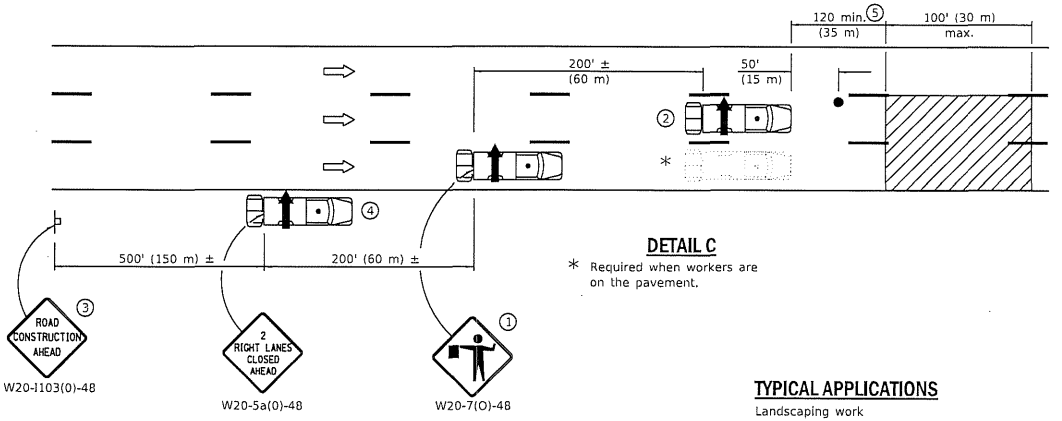
DATE	REVISIONS
1-1-17	Revised 'NOTE' on DETAIL A
	to use DETAIL B in lieu
	of DETAIL C.
4-1-16	Added trailer option for
	attenuator symbol. Added
	note 4. Revised gen. notes.

LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS ≥ 45 MPH

STANDARD 701426-09

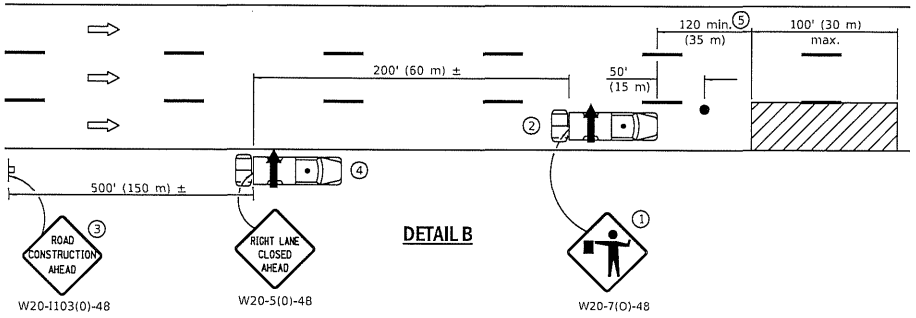


DETAIL A



DETAIL C

* Required when workers are on the pavement.



DETAIL B

TYPICAL APPLICATIONS

Landscaping work
Utility work
Pavement marking
Weed spraying
Roadometer measurements
Debris cleanup
Crack pouring

G20-I101-2430
(appropriate arrow)
(2)(when striping only)

1. Flaggers are required when workers are on the pavement.
2. For striping operations only. See sign arrow detail on this standard.
3. For stationary operations which are on the roadway or shoulder, greater than 15 minutes and up to 1 hour.
4. Omit truck, attenuator and arrow board when no shoulder exists due to curb and gutter.
5. The distance between the work and the lead truck may vary according to terrain or paint/crack sealing time.

SYMBOLS

- Arrow board
- Work area
- Truck with flashing amber light
- Truck/Trailer mounted attenuator
- Flagger with traffic control sign
- Sign

GENERAL NOTES

This Standard is used where any vehicle, equipment, workers or their activities will require: 1) stationary operations up to 1 hour, or 2) a continuous or intermittent moving operation where the average speed of movement is greater than 1 mph (2 km/h).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions, KEEP RIGHT signs shall be substituted for KEEP LEFT signs and arrow board indications shall be directed to the right.

All dimensions are in inches (millimeter) unless otherwise shown.

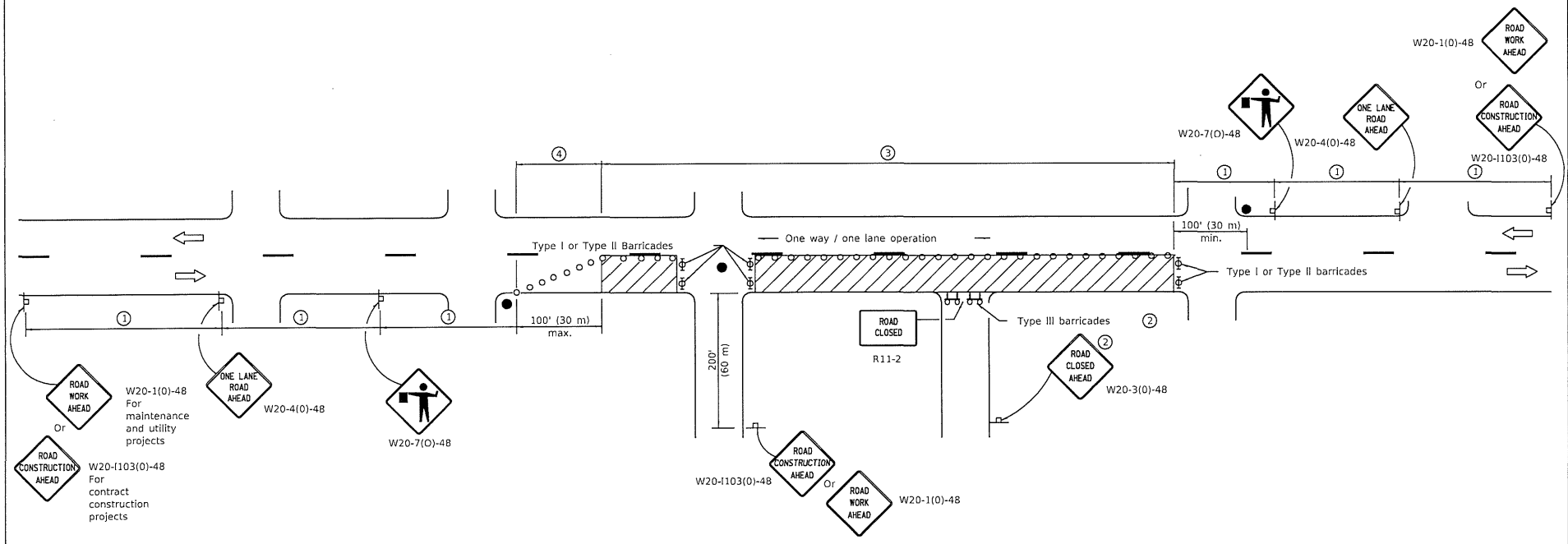
Illinois Department of Transportation

PASSED January 1, 2017
ENGINEER OF SAFETY PROG. AND ENGINEERING
APPROVED January 1, 2017
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED 1-1-11

DATE	REVISIONS
1-1-17	Revised 'NOTE' on DETAIL A
	to use DETAIL B in lieu of
	DETAIL C.
4-1-16	Rev. gen. notes. Added
	note (5). Rev. dist. between
	work and lead truck.

LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS ≤ 40 MPH

STANDARD 701427-05



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Work area
- Cone, drum or barricade (not required for moving operations)
- Sign on portable or permanent support
- Flagger with traffic control sign
- Barricade or drum with flashing light
- Type III barricade with flashing lights

(1) Refer to SIGN SPACING TABLE for distances.

(2) For approved sideroad closures.

(3) Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.

(4) Cones, drums or barricades at 20' (6 m) centers.

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an urban area.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2011
ENGINEER OF SAFETY ENGINEERING

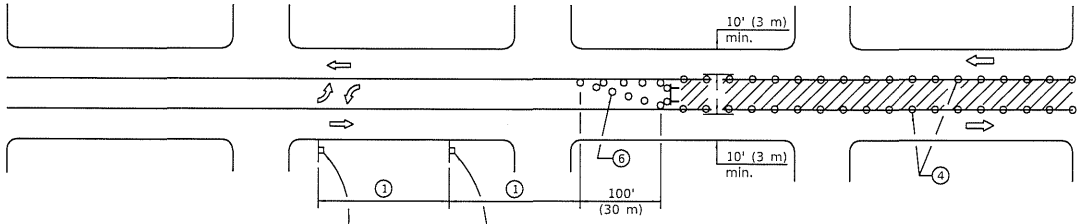
APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-11	Revised flagger sign.
1-1-09	Switched units to
	English (metric).
	Corrected sign No.'s.

URBAN LANE CLOSURE, 2L, 2W, UNDIVIDED

STANDARD 701501-06



CASE I

(Signs required for both directions)

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Work area
- Barricade or drum with flashing light
- Flagger with traffic control sign
- Cone, drum or barricade
- Sign on portable or permanent support
- Type III barricade with flashing lights

(1) Refer to SIGN SPACING TABLE for distances.

(2) Required for speeds > 40 mph (70 km/h).

(3) Required if work exceeds 500' (164 m) or 1 block.

(4) Cones at 25' (8 m) centers for 250' (75 m) on approach. Additional cones may be placed at 50' (15 m) centers. When drums or type I or II barricades are used, the interval between devices may be doubled.

(5) For approved sideroad closures.

(6) Cones, drums or barricades at 20' (6 m) centers in taper.

(7) Use flagger sign only when flagger is present.

GENERAL NOTES

This Standard is used to close one lane of an urban, two lane, two way roadway with a bidirectional turn lane.

Case I applies when no workers are present. When workers are present, two lanes shall be closed and traffic control shall be according to Standard 701501.

Calculate L as follows:

SPEED LIMIT	FORMULAS English	(Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

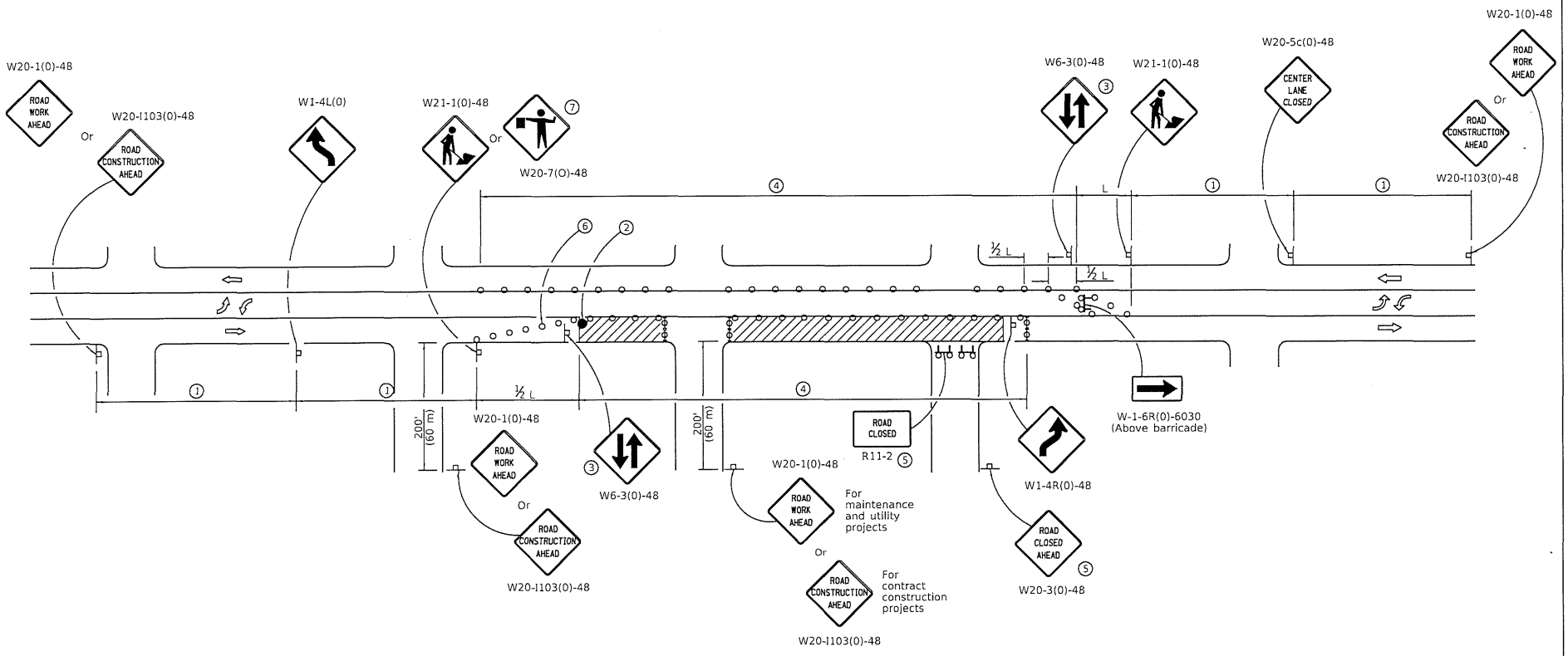
ISSUED 1-1-01

DATE	REVISIONS
1-1-19	Revised to allow cones at night.
1-1-18	Corrected sign number for
	TWO WAY TRAFFIC sign for
	CASE II.

URBAN LANE CLOSURE, 2L, 2W, WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 1 of 2)

STANDARD 701502-09



CASE II

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

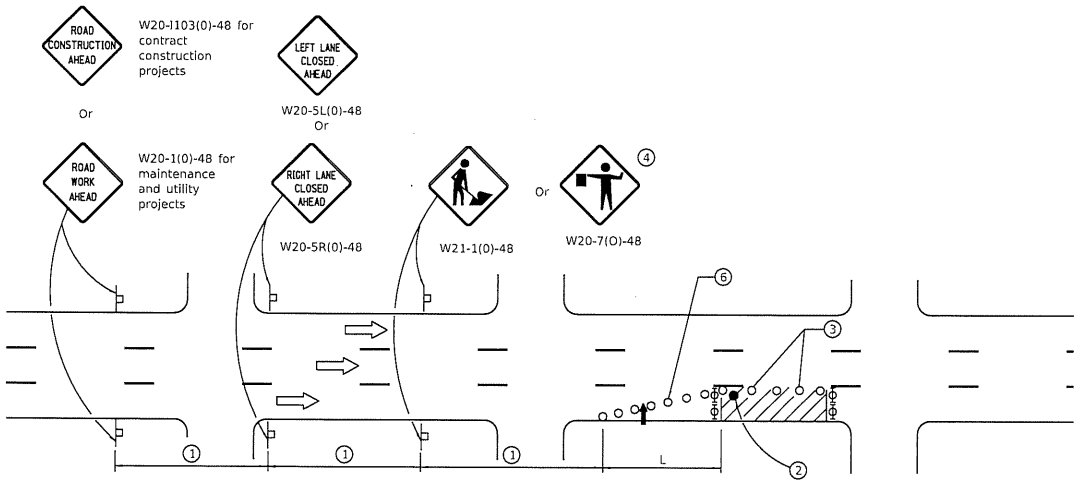
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-01

URBAN LANE CLOSURE, 2L, 2W, WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 2 of 2)

STANDARD 701502-09



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Arrow board
- Cone, drum or barricade
- Sign on portable or permanent support
- Work area
- Barricade or drum with flashing light
- Type III barricade with flashing lights
- Flagger with traffic control sign.

(1) Refer to SIGN SPACING TABLE for distances.

(2) Required for speeds > 40 MPH

(3) Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.

(4) Use flagger sign only when flagger is present.

(5) For approved sideroad closures.

(6) Cones, drums or barricades at 20' (6 m) in taper.

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement during shoulder operations or where construction requires lane closures in urban areas.

Calculate L as follows:

SPEED LIMIT	FORMULAS English	(Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	$L=(W)(S)$	$L=0.65(W)(S)$

W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1 2014
ENGINEER OF SAFETY ENGINEERING

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

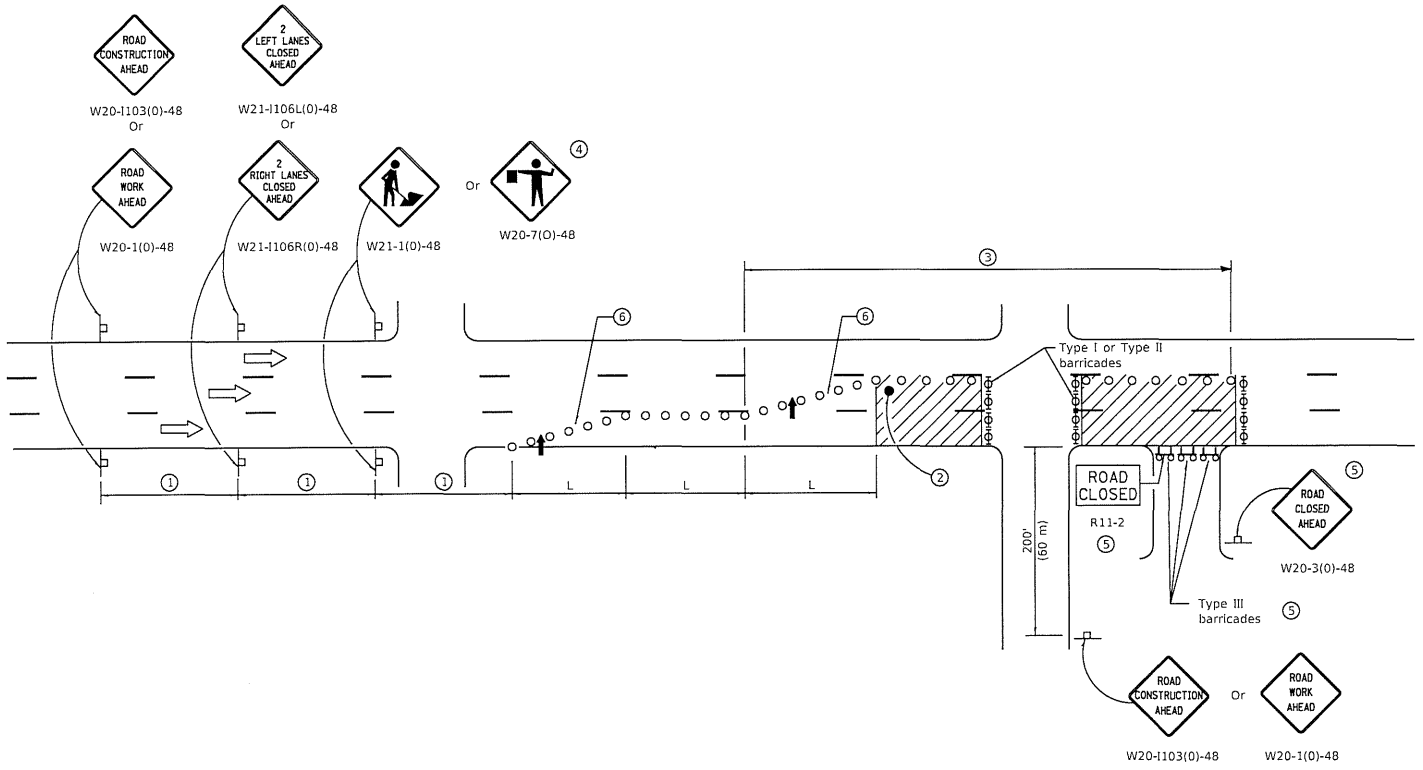
ISSUED 1-1-97

DATE	REVISIONS
1-1-14	Revised workers sign
	number to agree with
	current MUTCD.
1-1-13	Omitted text 'WORKERS'
	sign.

URBAN LANE CLOSURE, MULTILANE, 1W OR 2W WITH NONTRAVERSABLE MEDIAN

(Sheet 1 of 2)

STANDARD 701601-09



Illinois Department of Transportation

PASSED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

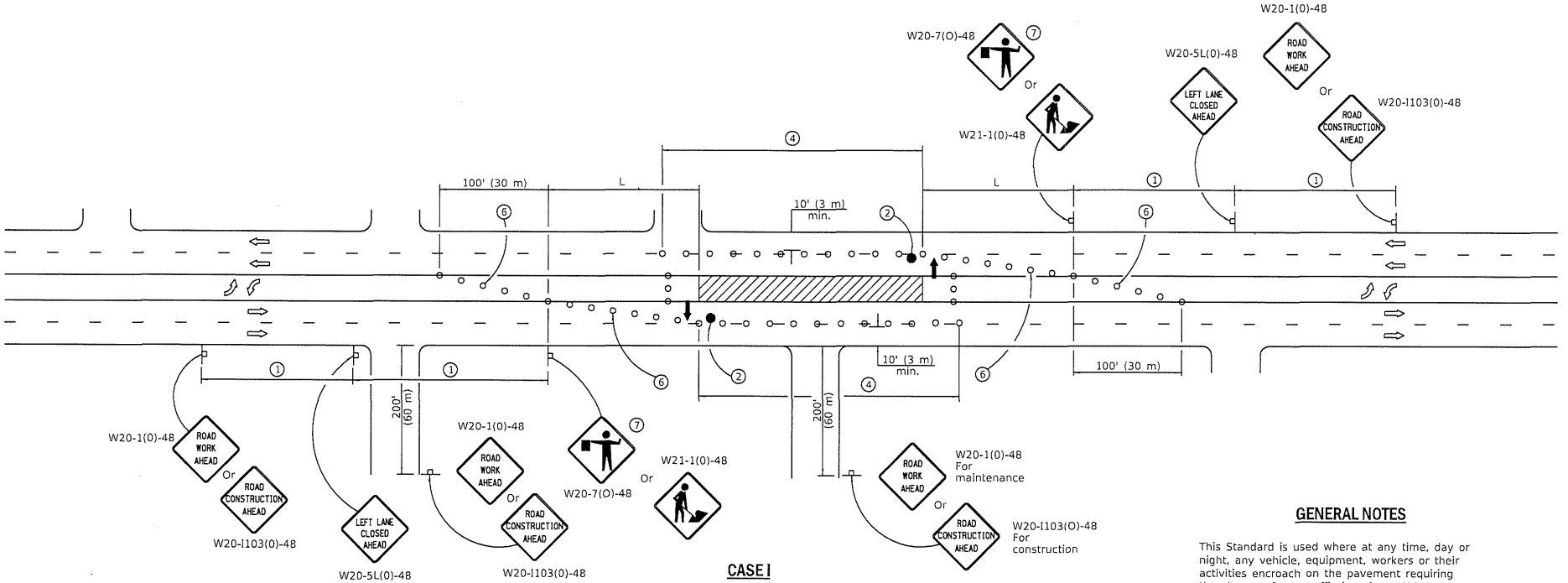
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

URBAN LANE CLOSURE, MULTILANE, 1W OR 2W WITH NONTRAVERSABLE MEDIAN

(Sheet 2 of 2)

STANDARD 701601-09



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Arrow board
- Work area
- Barricade or drum with steady burning mondirectional light
- Flagger with traffic control sign
- Cone, drum or barricade
- Sign on portable or permanent support
- Type III barricade with flashing lights

CASE I

1. Refer to SIGN SPACING TABLE for distances.
2. Required for speeds > 40 mph (70 km/h).
3. Required if work exceeds 500' (164 m) or 1 block, repeat every 1 mile (1.6 km).
4. Cones at 25' (8 m) centers for 250' (75 m) on approach. Additional cones may be placed at 50' (15 m) centers. When drums or type I or II barricades are used, the interval between devices may be doubled.
5. For approved sideroad closures.
6. Cones, drums or barricades at 20' (6 m) centers in taper.
7. Use flagger sign only when flagger is present.

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an Urban area.

If the work operation is performed between 9:00 a.m. and 3:00 p.m. and does not exceed 15 min. Traffic protection shall be as shown for Standard 701426.

Calculate L as follows:

SPEED LIMIT	FORMULAS English	(Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

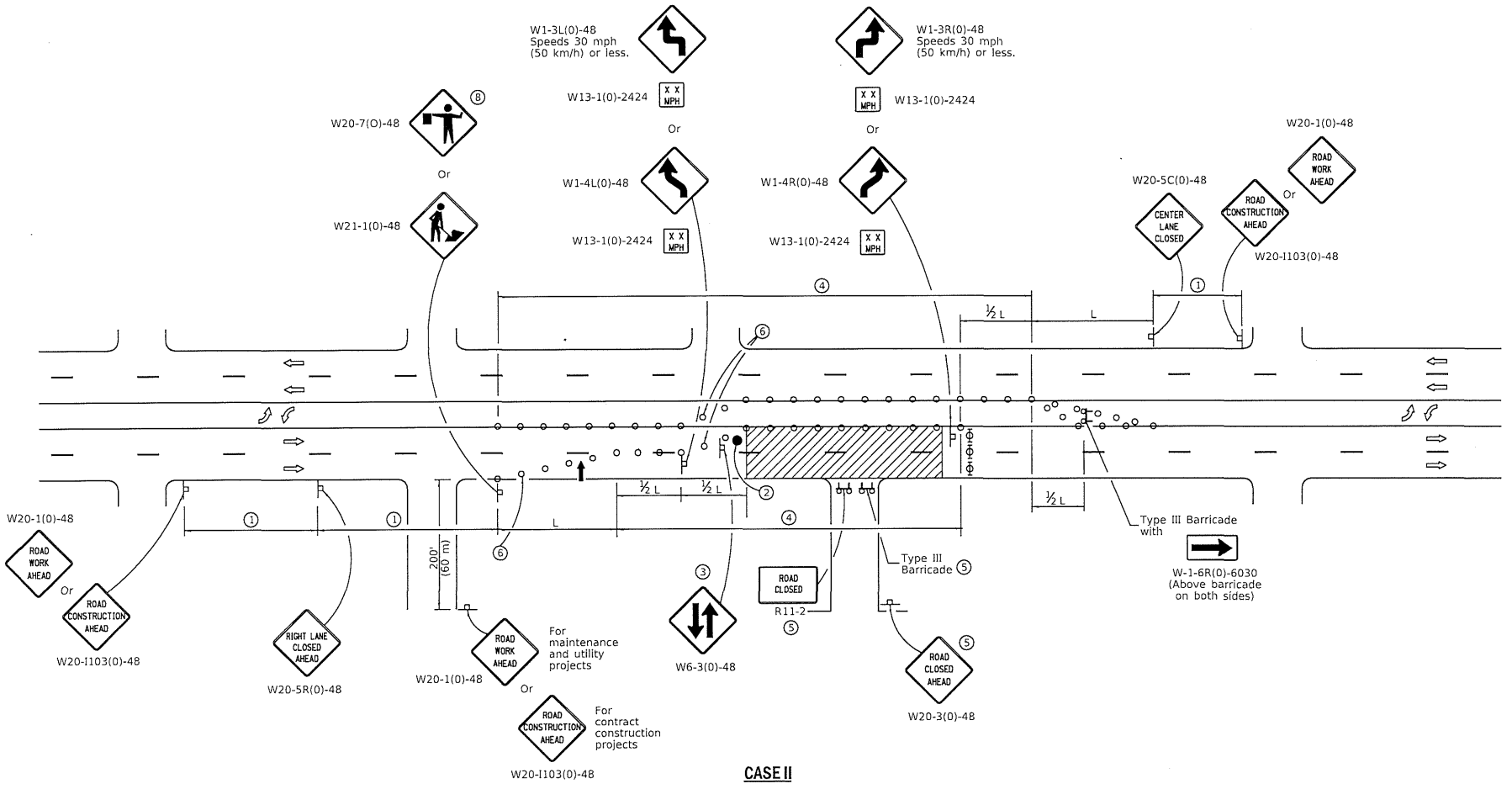
ISSUED 1-1-13

DATE	REVISIONS
1-1-19	Revised to allow cones at night.
1-1-18	Moved arrow boards into
	closed lanes for CASE I.

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 1 of 4)

STANDARD 701602-10



CASE II

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

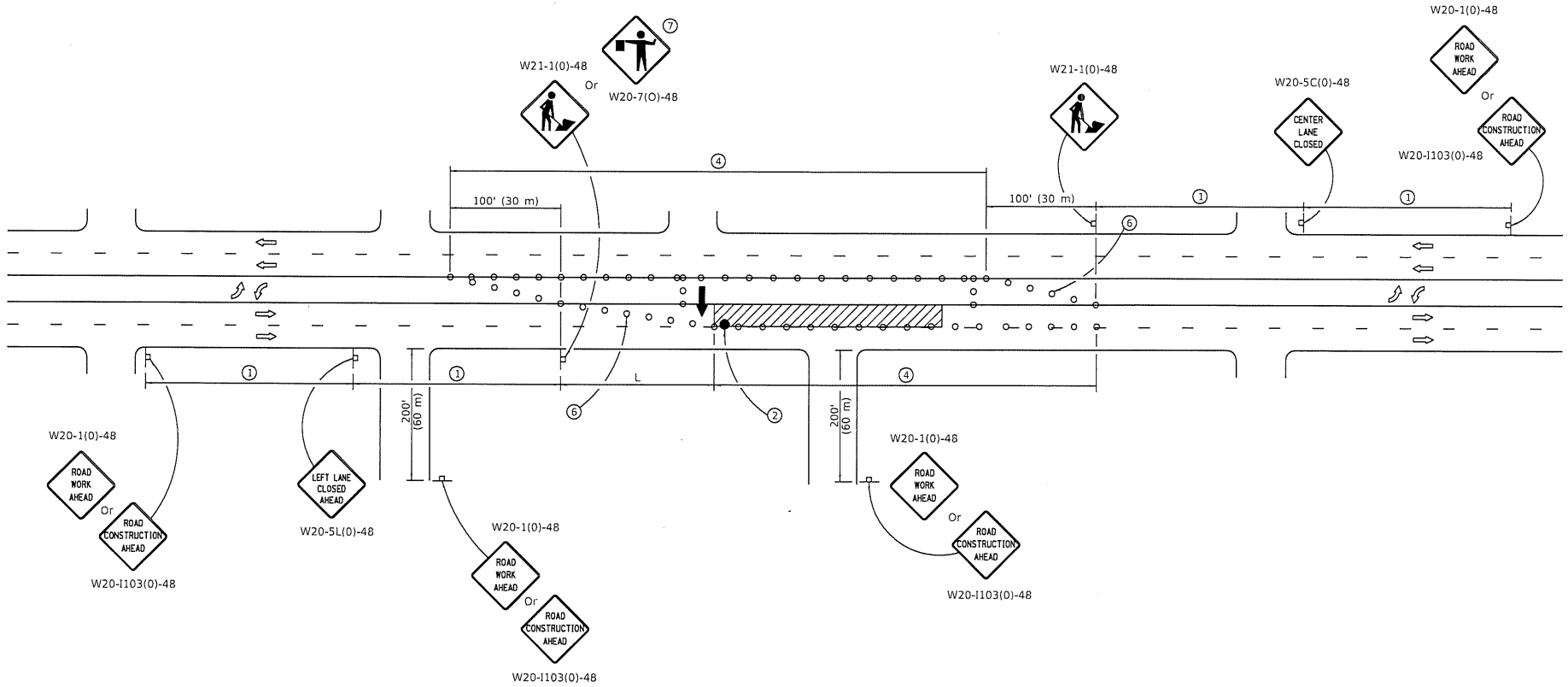
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 2 of 4)

STANDARD 701602-10



CASE III

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

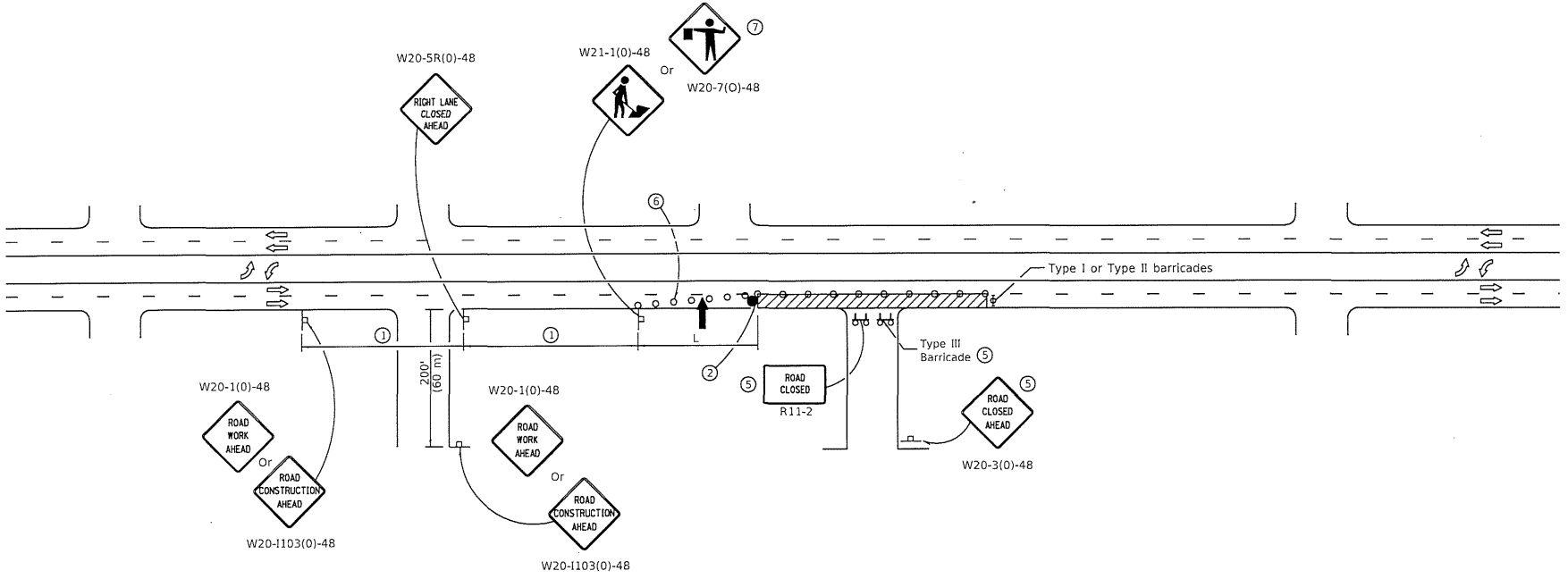
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 3 of 4)

STANDARD 701602-10



CASE IV

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

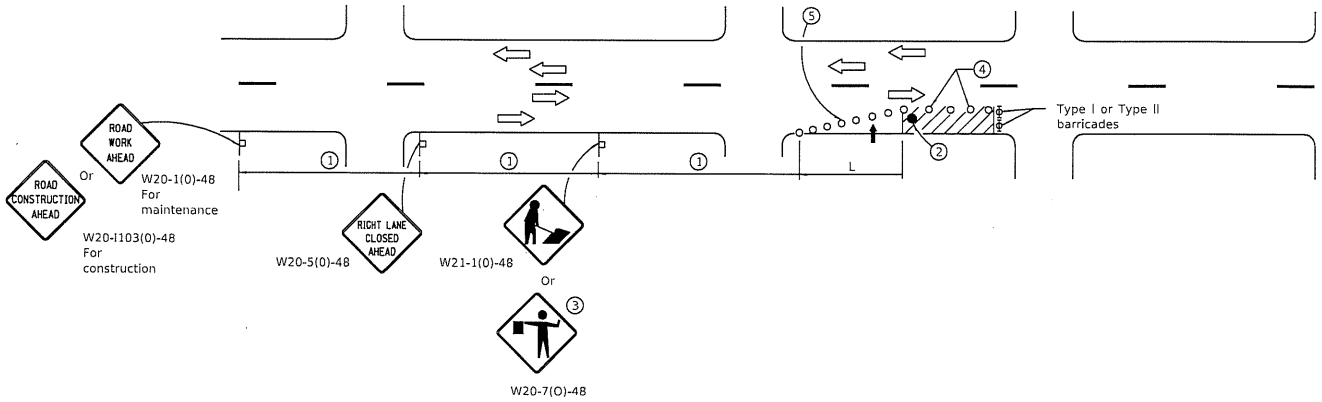
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 4 of 4)

STANDARD 701602-10



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Arrow board
- Cone, drum or barricade
- Sign on portable or permanent support
- Work area
- Barricade or drum with flashing light
- Flagger with traffic control sign.

(1) Refer to SIGN SPACING TABLE for distances.

(2) Required for speeds > 40 mph.

(3) Use flagger sign only when flagger is present.

(4) Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.

(5) Cones, drums or barricades at 20' (6 m) centers in taper.

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an Urban area.

Calculate L as follows:

SPEED LIMIT	FORMULAS English	(Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2015
ENGINEER OF SAFETY ENGINEERING

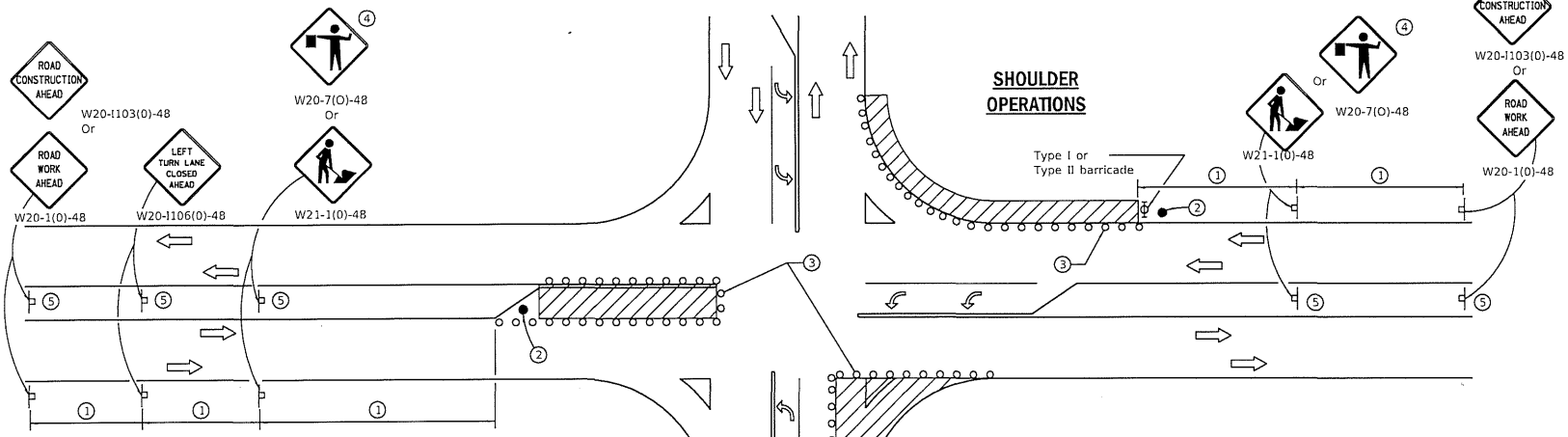
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-15	Renamed standard. Moved
	case on Sheet 2 to new
	Highway Standard.
1-1-14	Revised workers sign
	number to agree with
	current MUTCD.

URBAN SINGLE LANE CLOSURE, MULTILANE, 2W WITH MOUNTABLE MEDIAN

STANDARD 701606-10



LEFT TURN LANE OR CENTER MEDIAN OPERATIONS

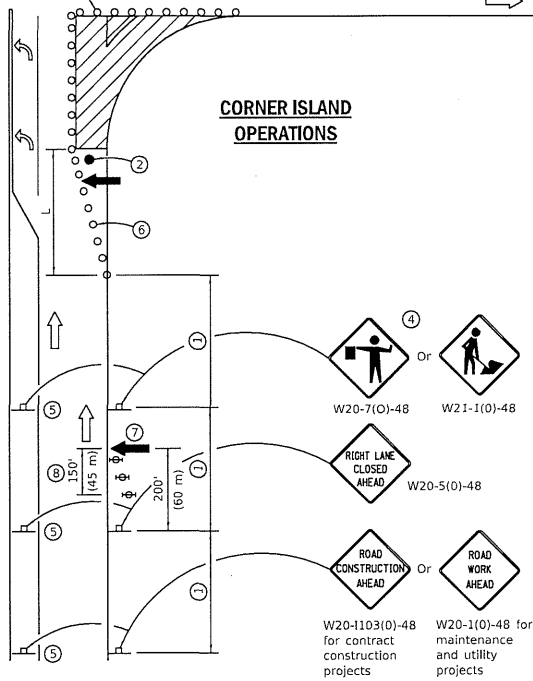
1. Refer to SIGN SPACING TABLE for distance.
2. Required for speed > 40 mph.
3. Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.
4. Use flagger sign only when flagger is present.
5. Omit this sign when median is less than 10' (3 m) or for bi-directional turn lanes.
6. Cones, drums or barricades at 20' (6 m) centers in taper.
7. Advanced arrow board required for speeds > 45 mph.
8. Three Type II barricades, drums or vertical barricades at 50' (15 m) centers.

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Work area
- Cone, drum or barricade
- Sign on portable or permanent support
- Arrow board
- Barricade or drum with flashing light
- Flagger with traffic control sign

CORNER ISLAND OPERATIONS



GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement during shoulder operations or where construction requires lane closures in an urban area.

Calculate L as follows:

SPEED LIMIT	FORMULAS English	(Metric)
40 mph (70 km/h) or less:	$L=\frac{WS^2}{60}$	$L=\frac{WS^2}{150}$
45 mph (80 km/h) or greater:	L=(W)(S)	L=0.65(W)(S)

W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED April 1, 2016
ENGINEER OF SAFETY ENGINEERING

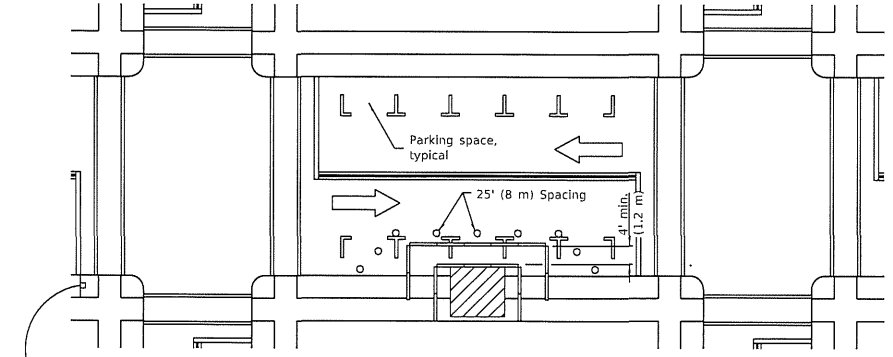
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
4-1-16	Corrected sign number for
	LEFT TURN LANE CLOSED
	AHEAD.
1-1-14	Added devices at arrow
	board upstream from taper.
	Rev. workers sign number.

URBAN LANE CLOSURE, MULTILANE INTERSECTION

STANDARD 701701-10



① ROAD CONSTRUCTION AHEAD — W20-I103(0)-48 for contract construction projects

Or

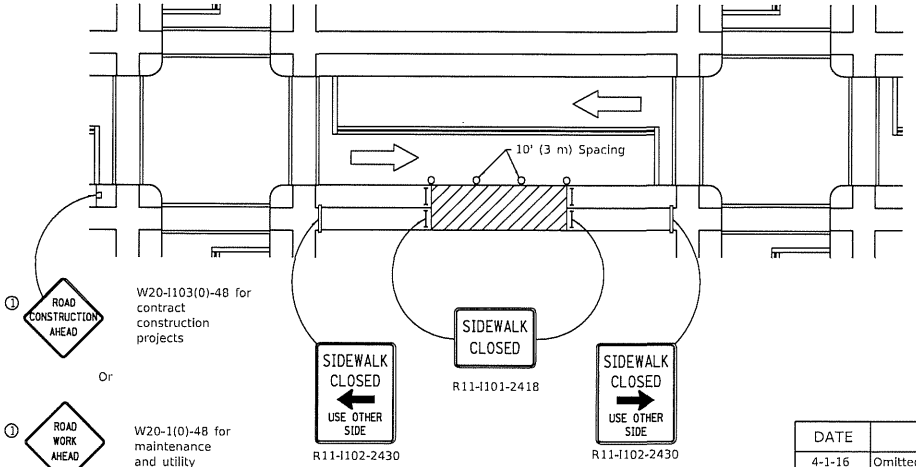
① ROAD WORK AHEAD — W20-1(0)-48 for maintenance and utility projects

SIDEWALK DIVERSION

① Omit whenever duplicated by road work traffic control.

SYMBOLS

- Work area
- Sign on portable or permanent support
- Barricade or drum
- Cone, drum or barricade
- Type III barricade
- Detectable pedestrian channelizing barricade



① ROAD CONSTRUCTION AHEAD — W20-I103(0)-48 for contract construction projects

Or

① ROAD WORK AHEAD — W20-1(0)-48 for maintenance and utility projects

SIDEWALK CLOSURE

GENERAL NOTES

This Standard is used where, at any time, pedestrian traffic must be rerouted due to work being performed.

This Standard must be used in conjunction with other Traffic Control & Protection Standards when roadway traffic is affected.

Temporary facilities shall be detectable and accessible.

The temporary pedestrian facilities shall be provided on the same side of the closed facilities whenever possible.

The SIDEWALK CLOSED / USE OTHER SIDE sign shall be placed at the nearest crosswalk or intersection to each end of the closure. Where the closure occurs at a corner, the signs shall be erected on the corners across the street from the closure. The SIDEWALK CLOSED signs shall be used at the ends of the actual closures.

Type III barricades and R11-2-4830 signs shall be positioned as shown in "ROAD CLOSED TO ALL TRAFFIC" detail on Standard 701901.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED April 1, 2016
ENGINEER OF SAFETY ENGINEERING

APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

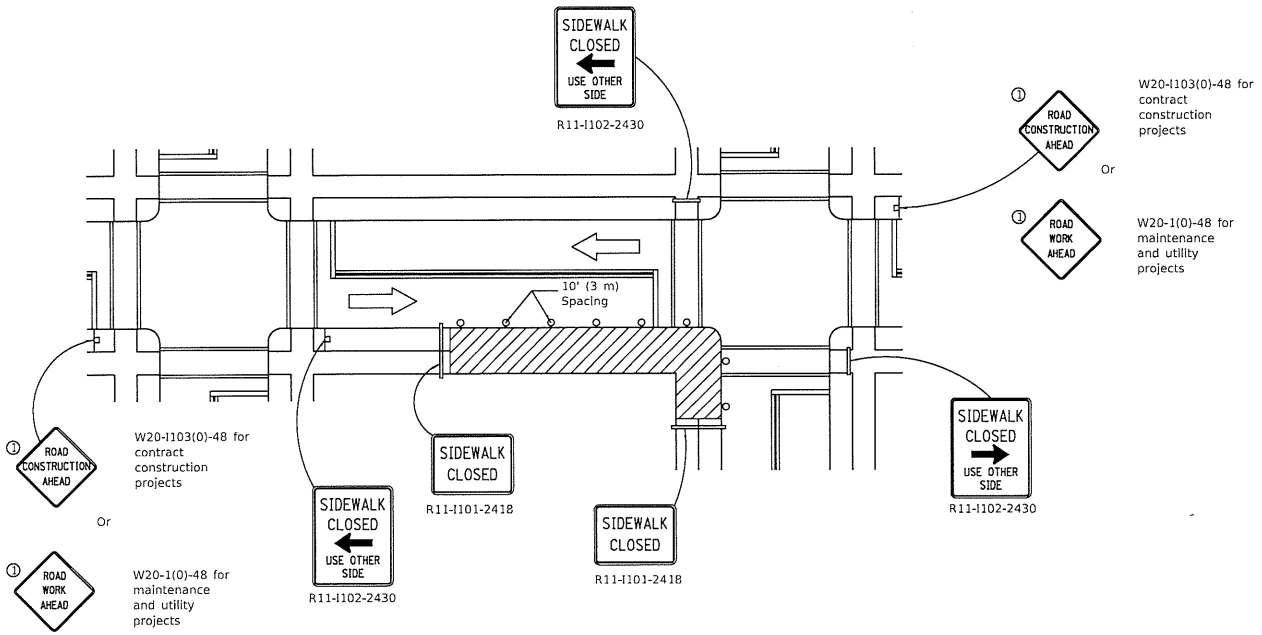
ISSUED 1-1-97

DATE	REVISIONS
4-1-16	Omitted orange safety fence
	from standard as this is
	covered in the std. spec.
1-1-12	Added SIDEWALK DIVERSION.
	Modified appearance of
	plan views. Renamed Std.

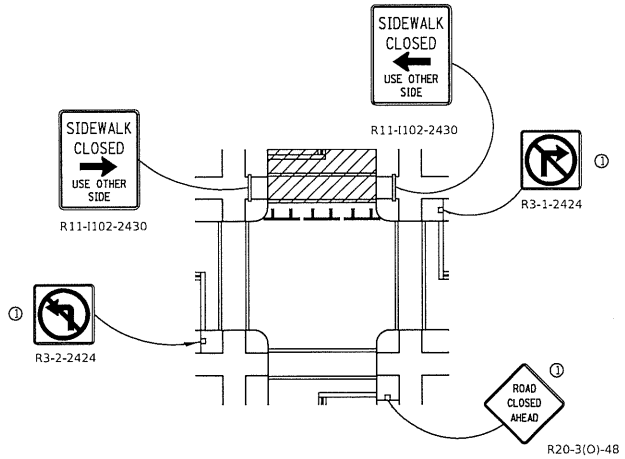
SIDEWALK, CORNER OR CROSSWALK CLOSURE

(Sheet 1 of 2)

STANDARD 701801-06



CORNER CLOSURE



CROSSWALK CLOSURE

Illinois Department of Transportation

PASSED April 1, 2016
ENGINEER OF SAFETY ENGINEERING

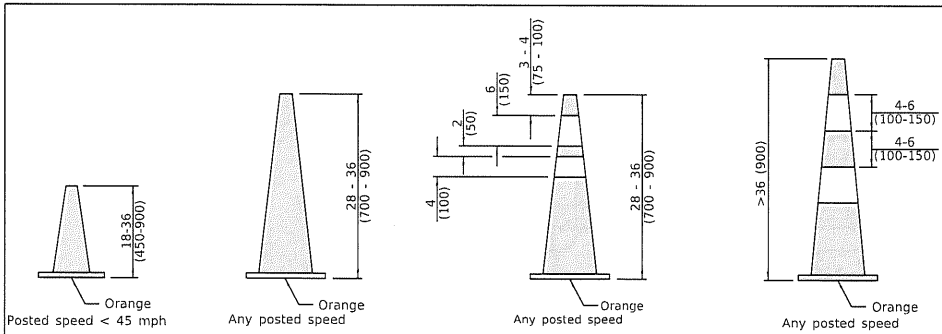
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

SIDEWALK, CORNER OR CROSSWALK CLOSURE

(Sheet 2 of 2)

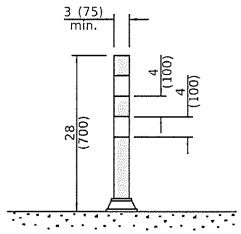
STANDARD 701801-06



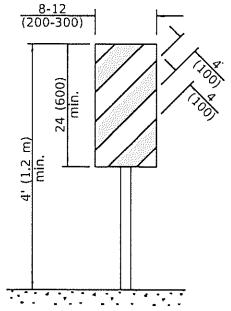
DAYTIME USE

DAY OR NIGHTTIME USE

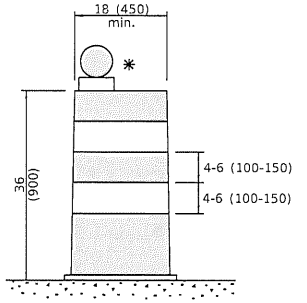
CONES



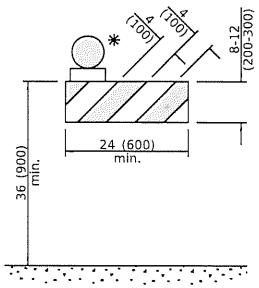
TUBULAR MARKER



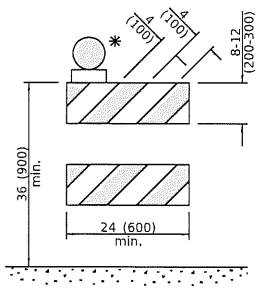
VERTICAL PANEL
POST MOUNTED



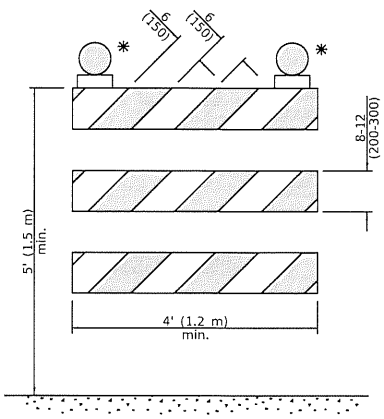
DRUM



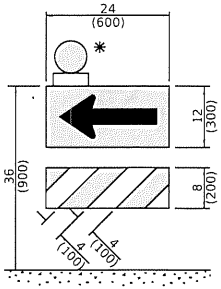
TYPE I BARRICADE



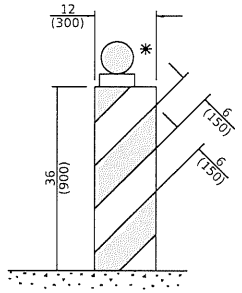
TYPE II BARRICADE



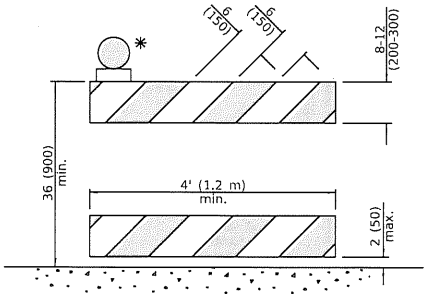
TYPE III BARRICADE



DIRECTION INDICATOR BARRICADE



VERTICAL BARRICADE



DETECTABLE PEDESTRIAN CHANNELIZING BARRICADE

* Warning lights (if required)

GENERAL NOTES

All heights shown shall be measured above the pavement surface.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

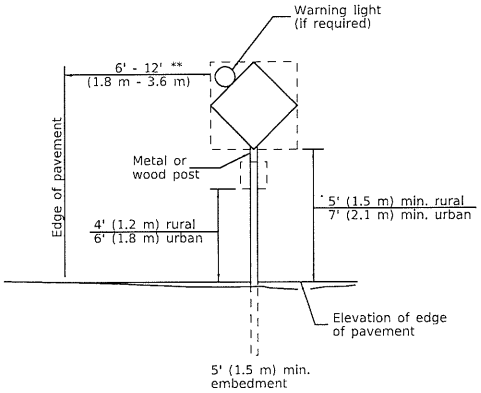
ISSUED 1-1-13

DATE	REVISIONS
1-1-19	Revised cone usage and
	added cones >36" (900 m) height.
1-1-18	Revised END WORK ZONE
	SPEED LIMIT sign from
	orange to white background.

TRAFFIC CONTROL DEVICES

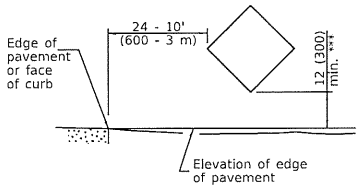
(Sheet 1 of 3)

STANDARD 701901-08



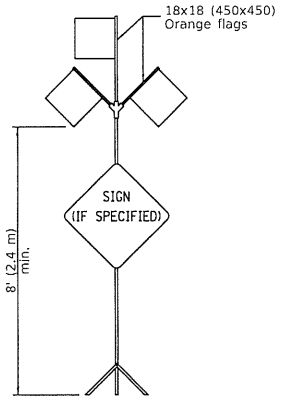
POST MOUNTED SIGNS

** When curb or paved shoulder are present this dimension shall be 24 (600) to the face of curb or 6' (1.8 m) to the outside edge of the paved shoulder.

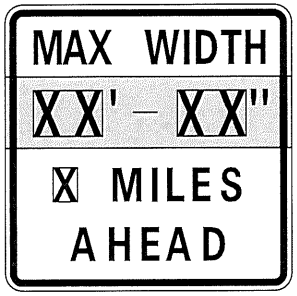


SIGNS ON TEMPORARY SUPPORTS

*** When work operations exceed four days, this dimension shall be 5' (1.5 m) min. If located behind other devices, the height shall be sufficient to be seen completely above the devices.



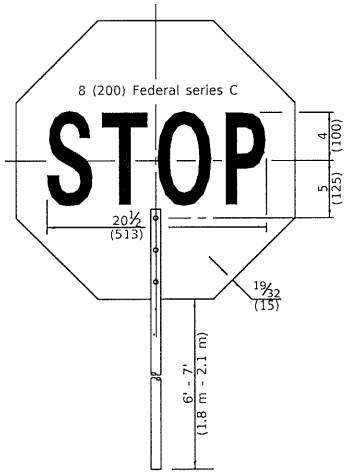
HIGH LEVEL WARNING DEVICE



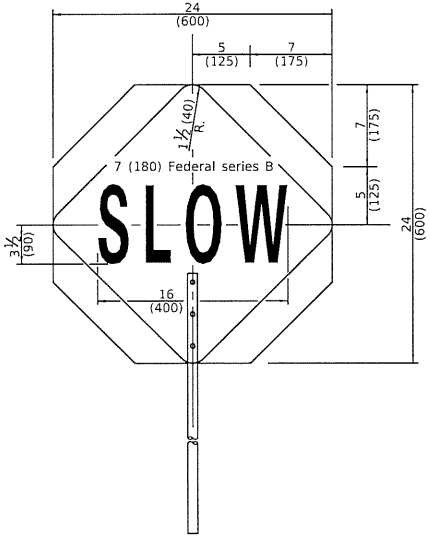
W12-I103-4848

WIDTH RESTRICTION SIGN

XX'-XX" width and X miles are variable.



FRONT SIDE



REVERSE SIDE

FLAGGER TRAFFIC CONTROL SIGN

ROAD CONSTRUCTION NEXT X MILES

G20-I104(0)-6036

END CONSTRUCTION

G20-I105(0)-6024

This signing is required for all projects 2 miles (3200 m) or more in length.

ROAD CONSTRUCTION NEXT X MILES sign shall be placed 500' (150 m) in advance of project limits.

END CONSTRUCTION sign shall be erected at the end of the job unless another job is within 2 miles (3200 m).

Dual sign displays shall be utilized on multi-lane highways.

WORK LIMIT SIGNING

WORK ZONE — W21-III5(0)-3618

SPEED LIMIT XX — R2-1-3648

PHOTO ENFORCED — R10-I108p-3618 ****

$XXX FINE MINIMUM — R2-I106p-3618

Sign assembly as shown on Standards or as allowed by District Operations.

END WORK ZONE SPEED LIMIT — G20-I103-6036

This sign shall be used when the above sign assembly is used.

HIGHWAY CONSTRUCTION SPEED ZONE SIGNS

**** R10-I108p shall only be used along roadways under the juristiction of the State.

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

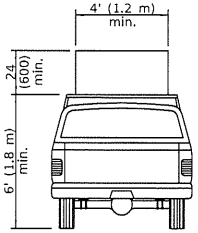
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

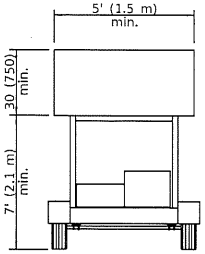
TRAFFIC CONTROL DEVICES

(Sheet 2 of 3)

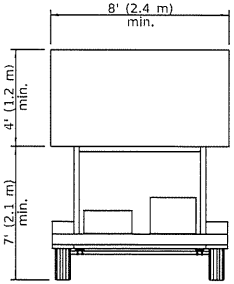
STANDARD 701901-08



TYPE A ROOF MOUNTED

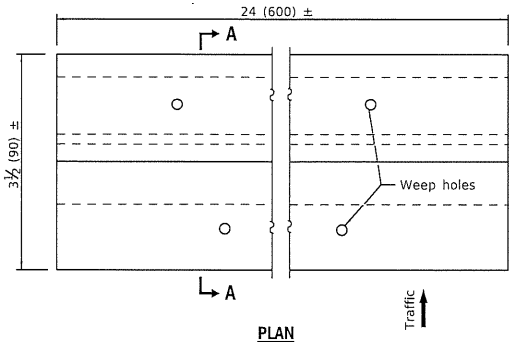


TYPE B ROOF OR TRAILER MOUNTED

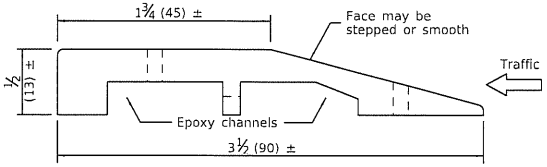


TYPE C TRAILER MOUNTED

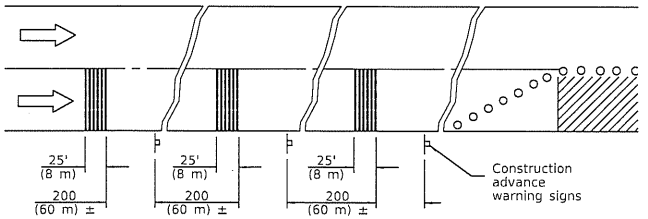
ARROW BOARDS

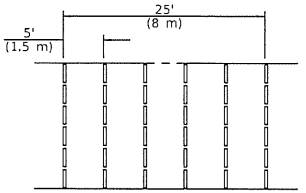


PLAN



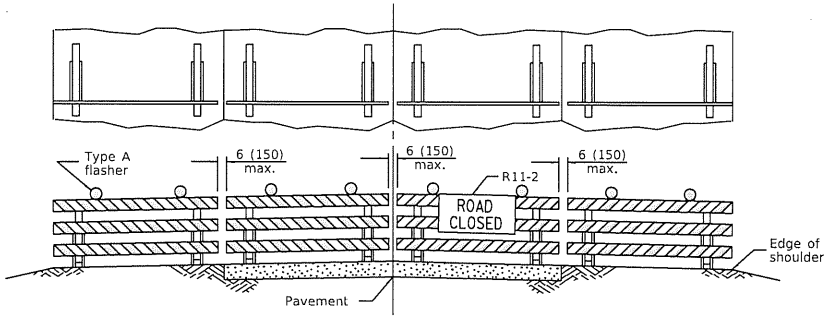
SECTION A-A





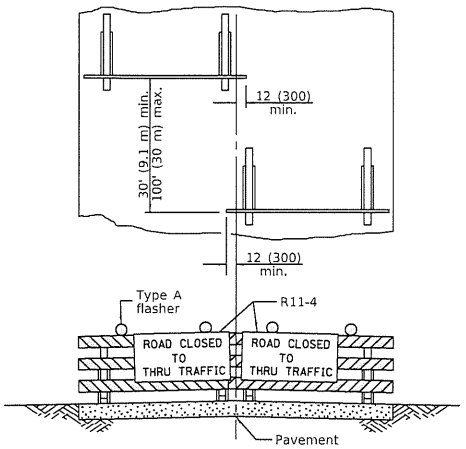
TYPICAL INSTALLATION

TEMPORARY RUMBLE STRIPS



ROAD CLOSED TO ALL TRAFFIC

Reflectorized striping may be omitted on the back side of the barricades. If a Type III barricade with an attached sign panel which meets NCHRP 350 is not available, the sign may be mounted on an NCHRP 350 temporary sign support directly in front of the barricade.



ROAD CLOSED TO THRU TRAFFIC

Reflectorized striping shall appear on both sides of the barricades. If a Type III barricade with an attached sign panel which meets NCHRP 350 is not available, the signs may be mounted on NCHRP 350 temporary sign supports directly in front of the barricade.

TYPICAL APPLICATIONS OF TYPE III BARRICADES CLOSING A ROAD

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF SAFETY PROG. AND ENGINEERING

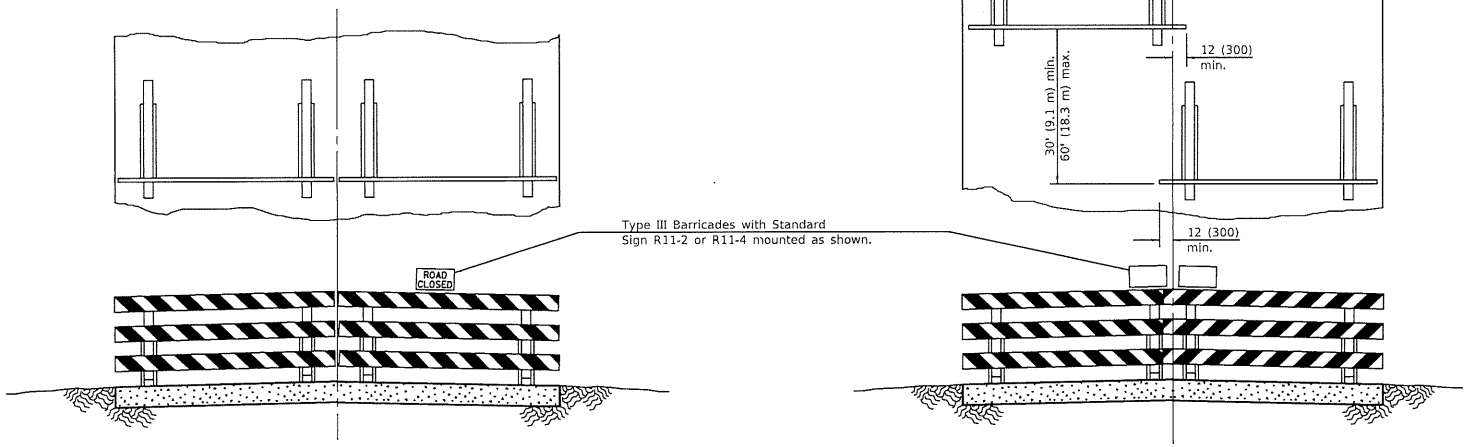
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

TRAFFIC CONTROL DEVICES

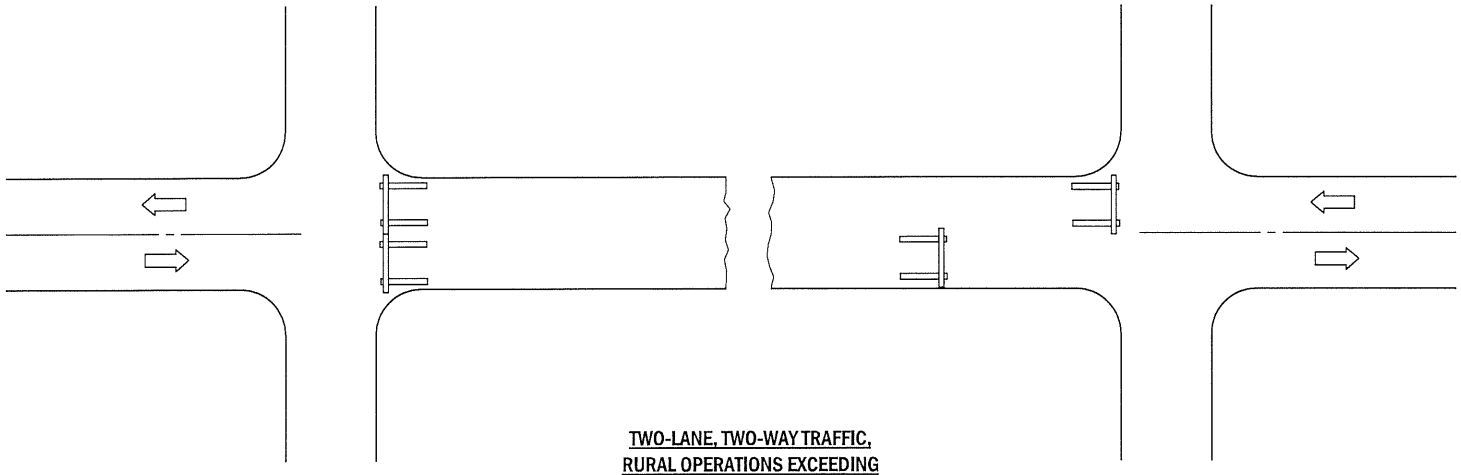
(Sheet 3 of 3)

STANDARD 701901-08



Resident traffic and day labor force's equipment to use road shoulder for passing barricade.

Use when shoulders are too narrow for passage of traffic.



TWO-LANE, TWO-WAY TRAFFIC, RURAL OPERATIONS EXCEEDING ONE DAYLIGHT PERIOD

GENERAL NOTES

Type III barricades to be width of pavement only.

Reflectorized striping shall appear on both sides of barricades. Barricades shall be positioned so that stripes slope downward toward the side on which traffic is to pass.

Although not shown, advance warning signs with minimum dimensions of 36x36 (900x900) and black legends on orange reflectorized backgrounds shall be utilized where needed.

This case is for use on rural local roads where the local authority considers this protection to be appropriate for the specific job conditions.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

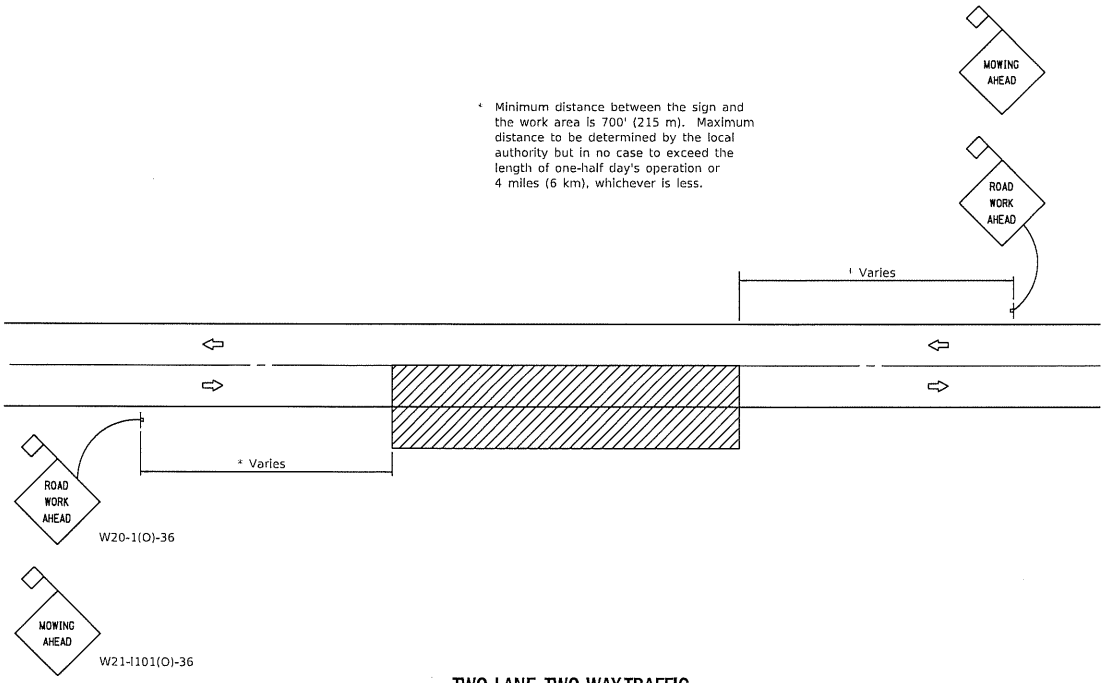
PASSED January 1, 2009
ENGINEER OF LOCAL ROADS AND STREETS
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-09	Switched units to
	English (metric).
1-1-98	Rev. "R11-1" to "R11-4".
	Rev. 4th General Note.

TRAFFIC CONTROL DEVICES - DAY LABOR CONSTRUCTION

STANDARD B.L.R. 17-4



* Minimum distance between the sign and the work area is 700' (215 m). Maximum distance to be determined by the local authority but in no case to exceed the length of one-half day's operation or 4 miles (6 km), whichever is less.

TWO-LANE, TWO-WAY TRAFFIC
RURAL OPERATIONS
DAY OPERATIONS ONLY

SYMBOLS

Work area

Sign with 18x18 (450x450) min. orange flag attached.

TYPICAL APPLICATIONS

MOWING
SPREADING AGGREGATE
WEED SPRAYING
SURFACE MAINTENANCE
BITUMINOUS RESURFACING
CRACK POURING
SHOULDER REPAIR
CLEANING DITCHES

GENERAL NOTES

Maintenance operations shall be confined to one traffic lane, leaving the opposite lane open to traffic. At least 500' (150 m) of both traffic lanes shall be available for traffic movement between work areas at intervals not greater than 1000' (300 m).

When operations are on the pavement and stationary or moving at a speed less than 4 mph (6 kph), a ONE LANE AHEAD, or other appropriate sign, shall be installed in each direction between the ROAD WORK AHEAD sign and the work area. The distance between this sign and the work area shall be a minimum of 400' (120 m) but in no case to exceed the length of one-half day's operation or 4 miles (6 km), whichever is less. The distance between the two signs shall be approximately 400' (120 m).

All signs are to be removed at completion of the day's operation.

Any unattended obstacle, excavation, or pavement drop off greater than 3 (75) in the work area shall be protected by Type I or Type II barricades with flashing lights.

Longitudinal dimensions may be adjusted slightly to fit field conditions.

All vehicles, equipment, men, and their acitvities are restricted at all times to one side of the pavment.

Flashing lights or rotating beacons are required for all maintenance vehicles while in operation.

Applicable operations illustrated in Standard 701301 may be used when operations do not exceed 15 minutes on the pavement or 60 minutes on the shoulder respectively.

All warning signs shall have minimum dimensions of 36x36 (900x900) and have black legend on an orange reflectorized background.

When fluorescent signs are used, orange flags are not required.

This case is for use on rural local roads where the local authority considers this protection to be appropriate for the specific job conditions.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2015
ENGINEER OF LOCAL ROADS AND STREETS

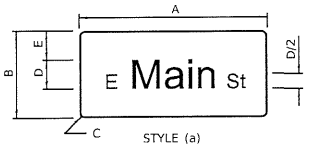
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-15

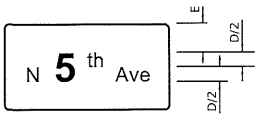
DATE	REVISIONS
1-1-15	Corrected RWA sign number.
1-1-09	Switched units to
	English (metric). Moved
	one General Note.

TRAFFIC CONTROL DEVICES- DAY LABOR MAINTENANCE

STANDARD B.L.R. 18-6



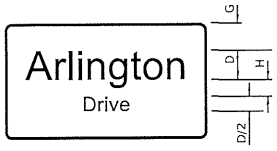
STYLE (a)



STYLE (b)

STYLE (c)

STYLE (d)



STYLE (e)

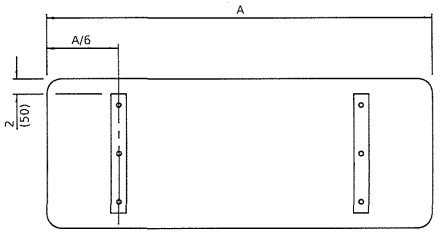
When road classification only is on the second line, it should not be abbreviated.

STYLE (f)

TYPICAL SIGN STYLES

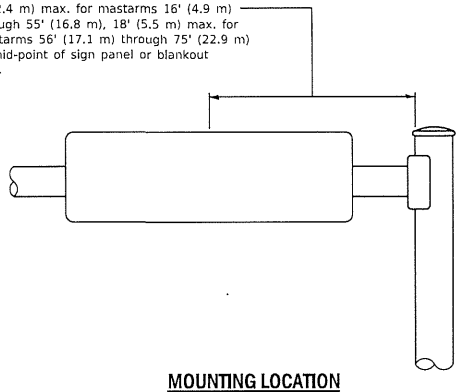
SIGN STYLE	DIMENSIONS								LETTER SIZE UC/LC PRIMARY			BORDER
	A	B	C	D	E	F	G	H	1	2	*	
a,b,d	Var.	12 (300)	1½ (40)	6 (150)	3 (75)	- -	- -	- -	6/4½ (150/115)	- -	- -	⅜ (10)
	Var.	18 (450)	1½ (40)	8 (200)	5 (125)	- -	- -	- -	8/6 (200/150)	- -	- -	⅜ (15)
	Var.	24 (600)	1½ (40)	10 (250)	7 (175)	- -	- -	- -	10/7½ (250/190)	- -	- -	⅜ (15)
	Var.	30 (750)	1⅛ (45)	12 (300)	9 (225)	- -	- -	- -	12/9 (400/300)	- -	- -	¾ (20)
c,e	Var.	24 (600)	1½ (40)	6 (150)	- -	- -	5½ (140)	4 (100)	6/4½ (150/115)	- -	3 (75)	⅜ (15)
	Var.	30 (750)	1⅛ (45)	8 (200)	- -	- -	7 (175)	4½ (115)	8/6 (200/150)	- -	4 (100)	¾ (20)
	Var.	36 (900)	2¼ (60)	10 (250)	- -	- -	7½ (190)	6 (150)	10/7½ (250/190)	- -	5 (125)	¾ (20)
	Var.	42 (1050)	3 (75)	12 (300)	- -	- -	8½ (215)	7 (175)	12/9 (400/300)	- -	6 (150)	1 (25)
f	Var.	24 (600)	1½ (40)	6 (150)	4 (100)	4 (100)	- -	- -	6/4½ (150/115)	6/4½ (150/115)	- -	⅜ (15)
	Var.	30 (750)	1⅛ (45)	8 (200)	4½ (115)	5 (125)	- -	- -	8/6 (200/150)	8/6 (200/150)	- -	¾ (20)
	Var.	42 (1050)	3 (75)	10 (250)	7½ (190)	7 (175)	- -	- -	10/7½ (250/190)	10/7½ (250/190)	- -	1 (25)
	Var.	48 (1200)	3 (75)	12 (300)	7½ (190)	8 (200)	- -	- -	12/9 (400/300)	12/9 (400/300)	- -	1 (25)

* Supplemental Messages



SUPPORTING CHANNELS

8' (2.4 m) max. for mastarms 16' (4.9 m) through 55' (16.8 m), 18' (5.5 m) max. for mastarms 56' (17.1 m) through 75' (22.9 m) to mid-point of sign panel or blankout sign.



MOUNTING LOCATION

GENERAL NOTES

All signs shall have a white reflectorized legend and border on a green reflectorized background.

The sign panels shall be mounted as shown on Standard 720001 or as specified in the plans.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2018
ENGINEER OF OPERATIONS

APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

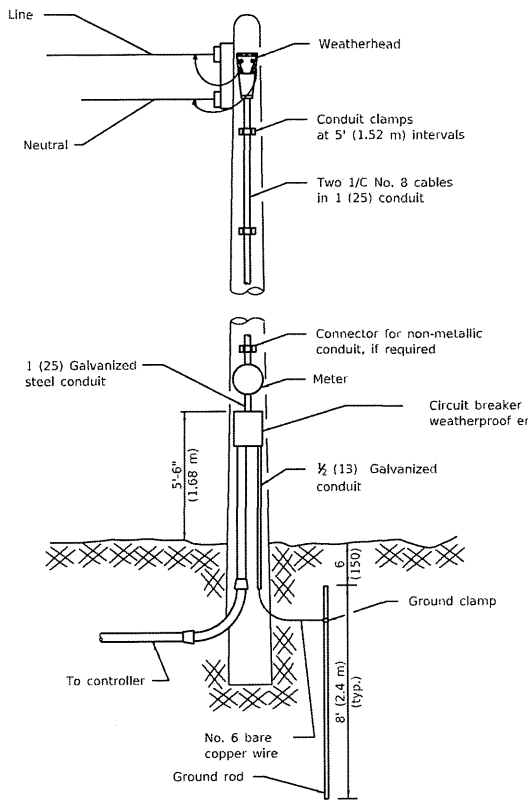
DATE	REVISIONS
1-1-18	Revised MOUNTING LOCATION
	detail.
1-1-12	Revised table and
	lettering to upper/lower
	case per current MUTCD.

MAST ARM MOUNTED STREET NAME SIGNS

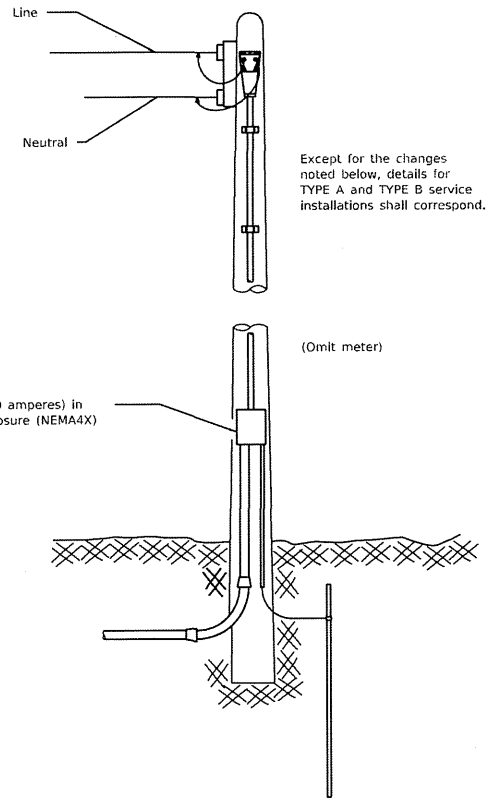
STANDARD 720016-04

INTENTIONALLY

BLANK

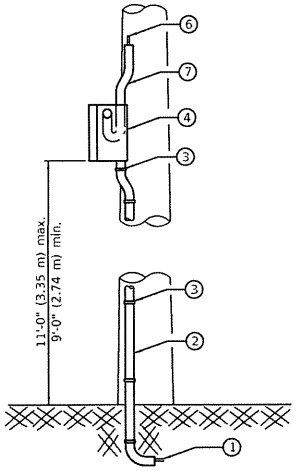


TYPE A



Except for the changes noted below, details for TYPE A and TYPE B service installations shall correspond.

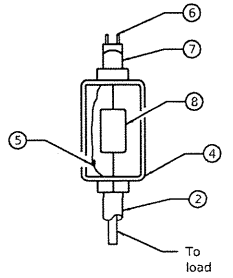
TYPE B

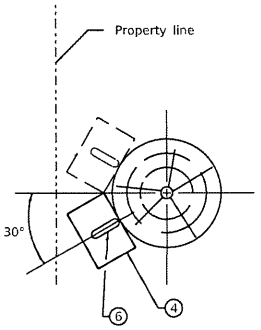


The following equipment is to be furnished and installed on the TYPE C installation.

1. Cable in conduit (electric cable, No. 6, 2/C except where otherwise specified)
2. Galvanized steel conduit 1¼ (32) with bend
3. Galvanized conduit clamps
4. Aluminum weatherproof box with gasketed cover. Weatherproof box shall be installed facing the adjacent property line. (See diagram for alternate installation.)
5. Ground stud for neutral connection
6. Service cables
7. Offset weatherproof fitting
8. Circuit breaker

TYPE C





ALTERNATE INSTALLATION

(Installation when weatherproof box cannot be installed facing the adjacent property line.)

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009
ENGINEER OF OPERATIONS

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

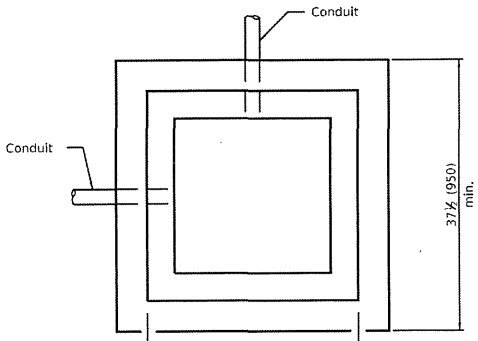
DATE	REVISIONS
1-1-09	Switched units to
	English (metric).
1-1-02	Renum. Standard 2373-1.

ELECTRICAL SERVICE INSTALLATION DETAILS

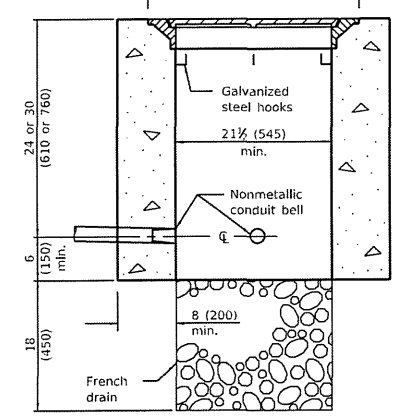
STANDARD 805001-01

INTENTIONALLY

BLANK

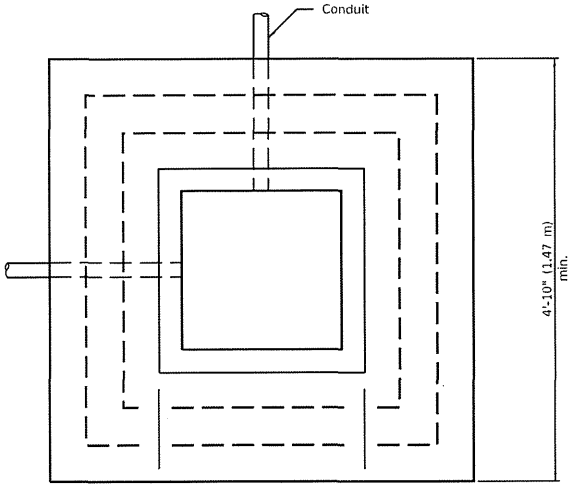


PLAN

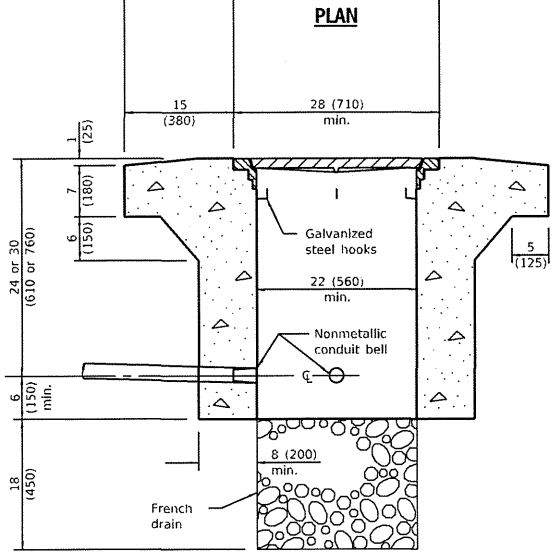


ELEVATION

PORTLAND CEMENT CONCRETE

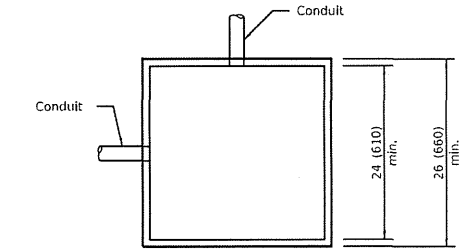


PLAN

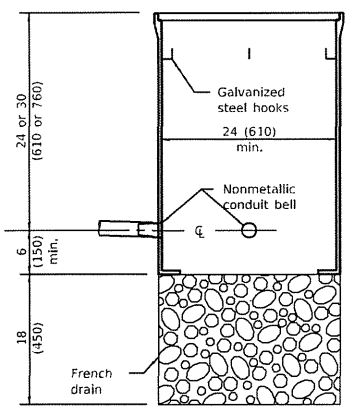


ELEVATION

PORTLAND CEMENT CONCRETE
HEAVY DUTY



PLAN



ELEVATION

COMPOSITE CONCRETE

All dimensions are in inches (millimeters) unless otherwise shown.

QUANTITIES

Depth	Concrete yd³ (m³)	
	Handhole	Heavy Duty Handhole
30 (762)	0.61 (0.47)	0.98 (0.75)
36 (914)	0.73 (0.56)	1.10 (0.84)

Illinois Department of Transportation

PASSED January 1, 2015
ENGINEER OF OPERATIONS

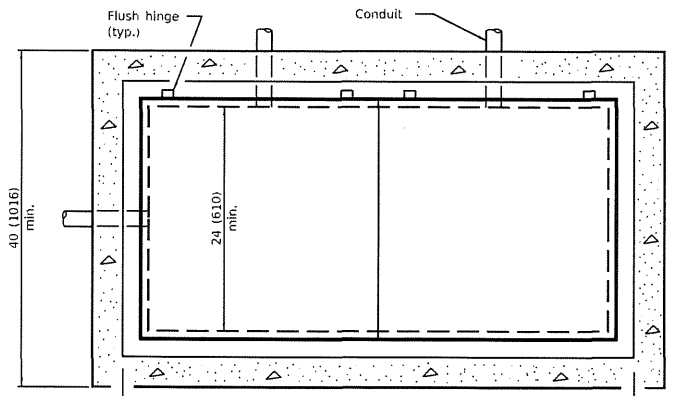
APPROVED January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-15	Corrected dimension on
	heavy duty handhole. Added
	concrete quantities table.
1-1-09	Switched units to
	English (metric).

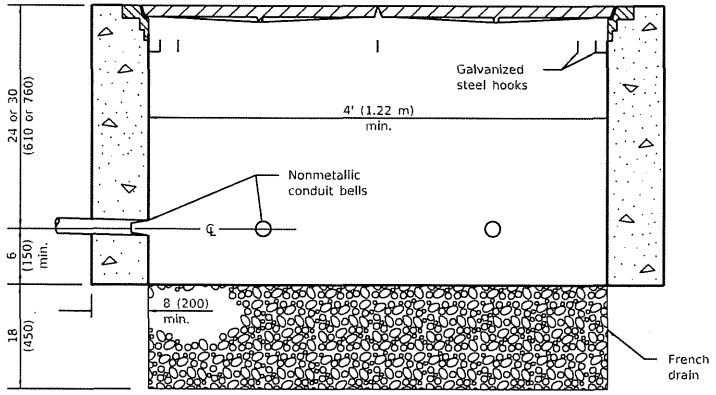
HANDHOLES

STANDARD 814001-03



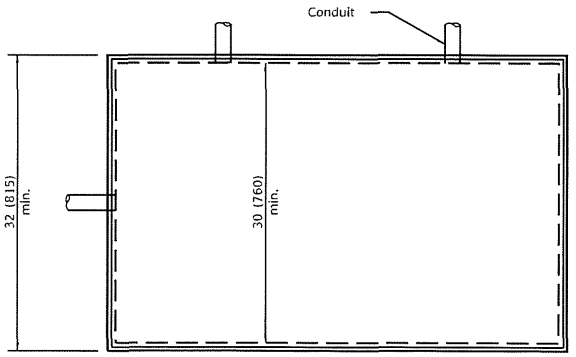
PLAN

4'-6" (1.37 m)
min.



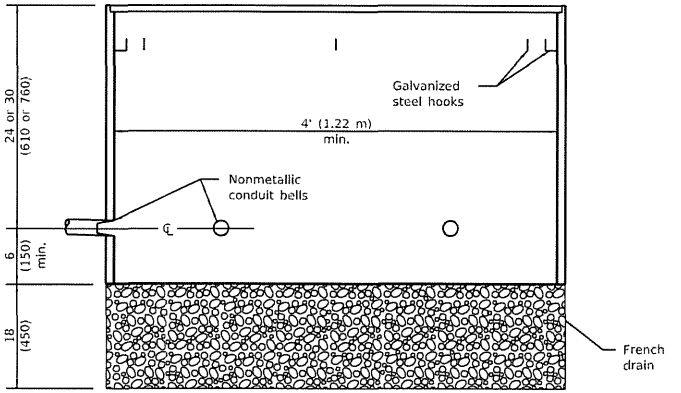
ELEVATION

PORTLAND CEMENT CONCRETE



PLAN

4'-2" (1.27 m)
min.



ELEVATION

COMPOSITE CONCRETE

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2021
ENGINEER OF OPERATIONS

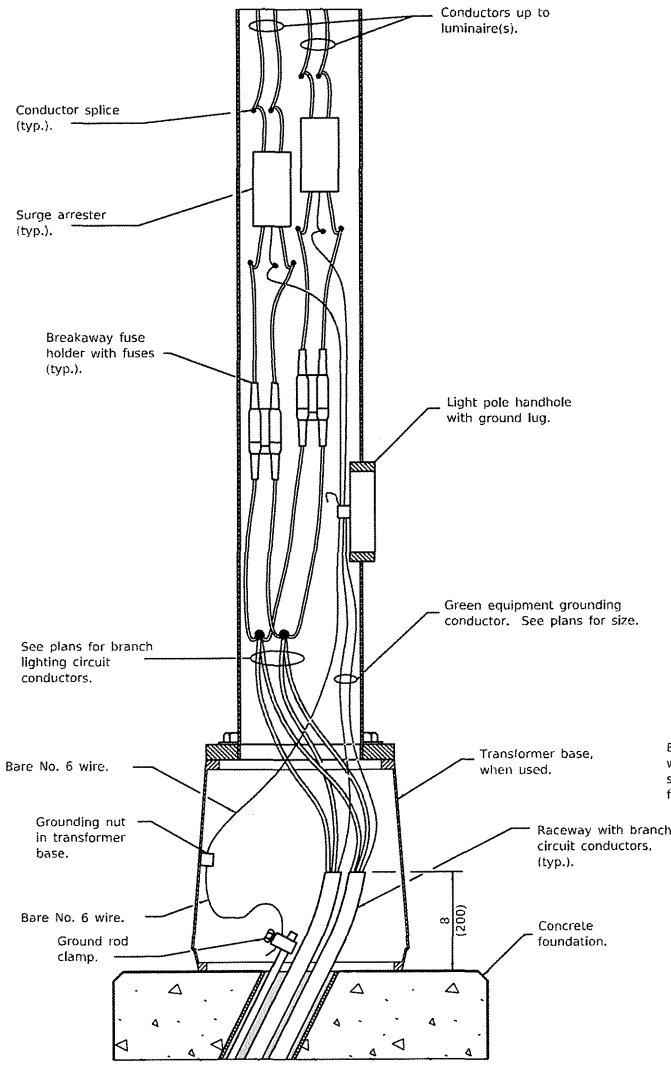
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

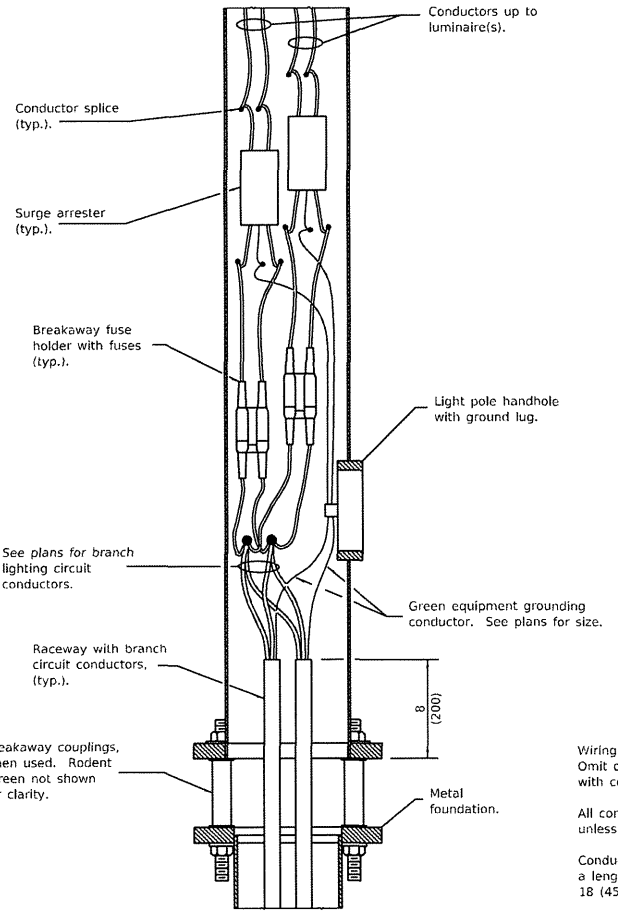
DATE	REVISIONS
1-1-21	Corrected dimension in Portland
	Cement Concrete Plan view.
1-1-09	Switched units to English (metric).

DOUBLE HANDHOLES

STANDARD 814006-03



ELEVATION AT POLE BASE WITH CONCRETE FOUNDATION



ELEVATION AT POLE BASE WITH METAL FOUNDATION
(Rodent screen not shown)

GENERAL NOTES

Wiring for twin luminaire installation shown. Omit one fuse holder and one surge arrester with connections for single luminaire installation.

All conductors originating in pole shall be No. 10 unless noted otherwise.

Conductors extended into light poles shall be of a length sufficient for splices to be withdrawn 18 (450) out of pole handole.

Any voids in the foundation shall be filled with fine aggregate.

See Standard 836001 for Light Pole Foundation and ground rod.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2017
ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2017
ENGINEER OF DESIGN AND ENVIRONMENT

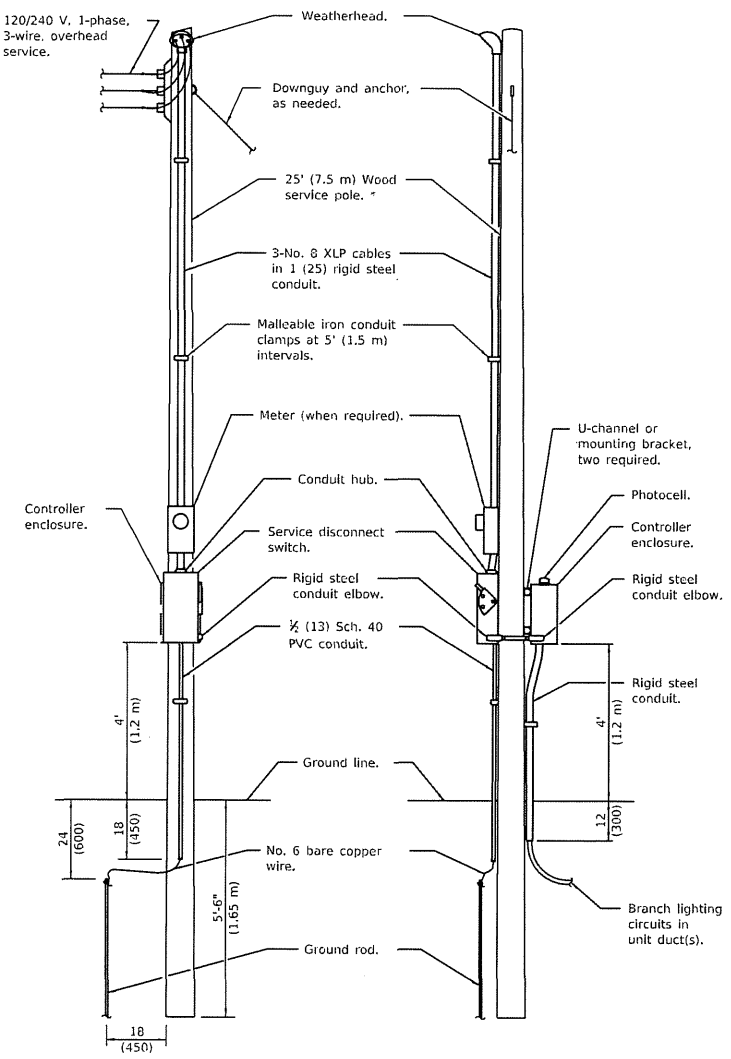
ISSUED 1-1-14

DATE	REVISIONS
1-1-17	Renamed standard.
1-1-15	Changed 'protector' to
	'arrester'.

LUMINAIRE WIRING IN POLE

STANDARD 821101-02

30 AMP

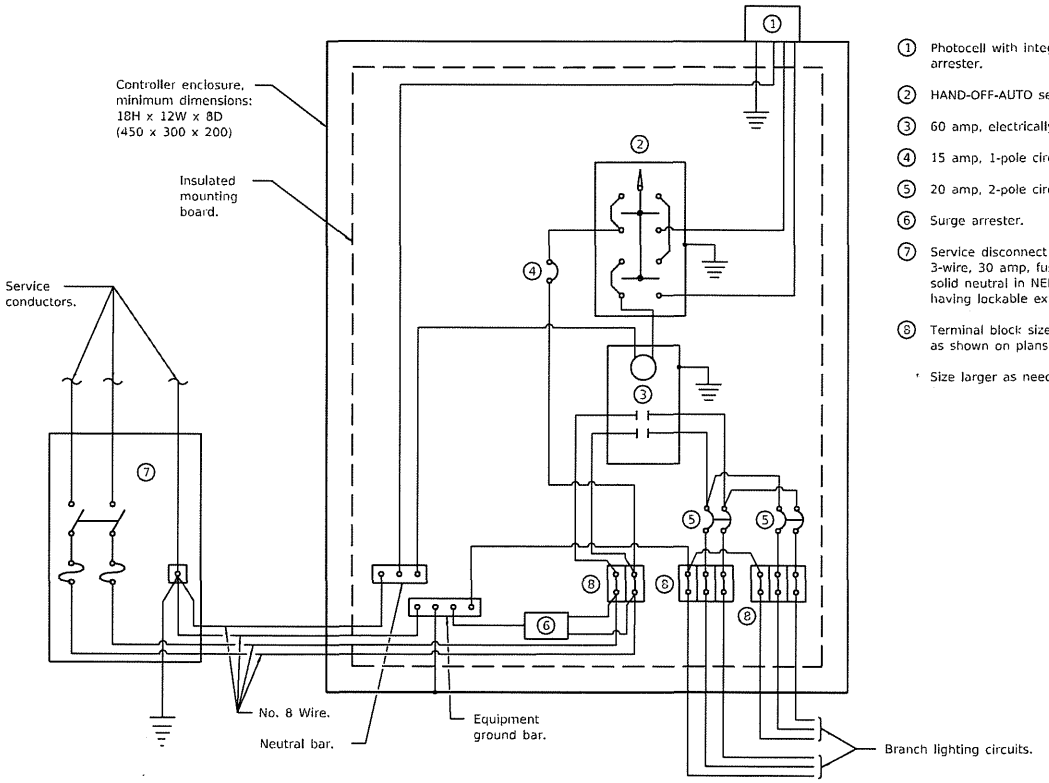


FRONT **SIDE**

ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.



CONTROL SCHEMATIC

1. Photocell with integral surge arrester.
2. HAND-OFF-AUTO selector switch.
3. 60 amp, electrically held contactor.
4. 15 amp, 1-pole circuit breaker.
5. 20 amp, 2-pole circuit breaker.
6. Surge arrester.
7. Service disconnect switch - 2-pole, 3-wire, 30 amp, fused at 30 amp, solid neutral in NEMA 4X enclosure having lockable external handle.
8. Terminal block sized for conductors as shown on plans.

* Size larger as needed.

GENERAL NOTES

Provide 12x9x1 (305x225x25) watertight pouch mounted inside controller door with as-built plans and schematics.

Provide engraved nameplate on front of enclosure reading "LIGHTING".

Enclosure shall be mounted to pole with pole-bands and lag-bolts.

Work pad not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-19

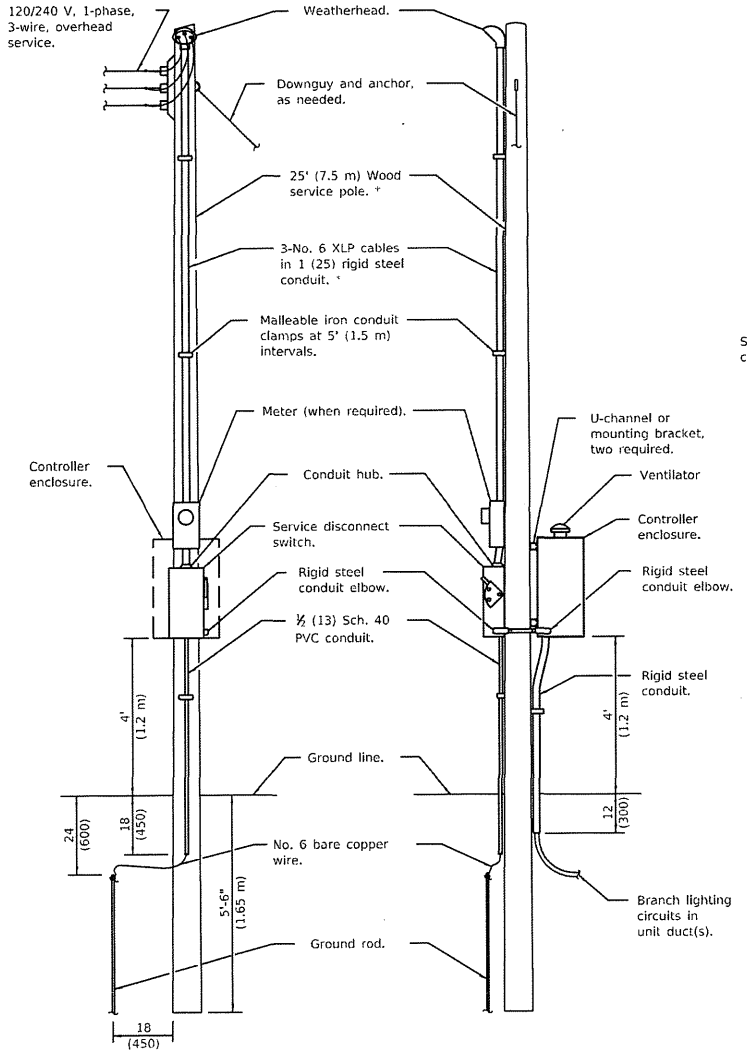
DATE	REVISIONS
1-1-19	Replaced ** note with new note
	regarding consulting utility
	company standards for installation.
4-1-16	Corrected connection at
	terminal block.

LIGHTING CONTROLLER POLE MOUNTED, 240V

(Sheet 1 of 2)

STANDARD 825001-04

60 AMP

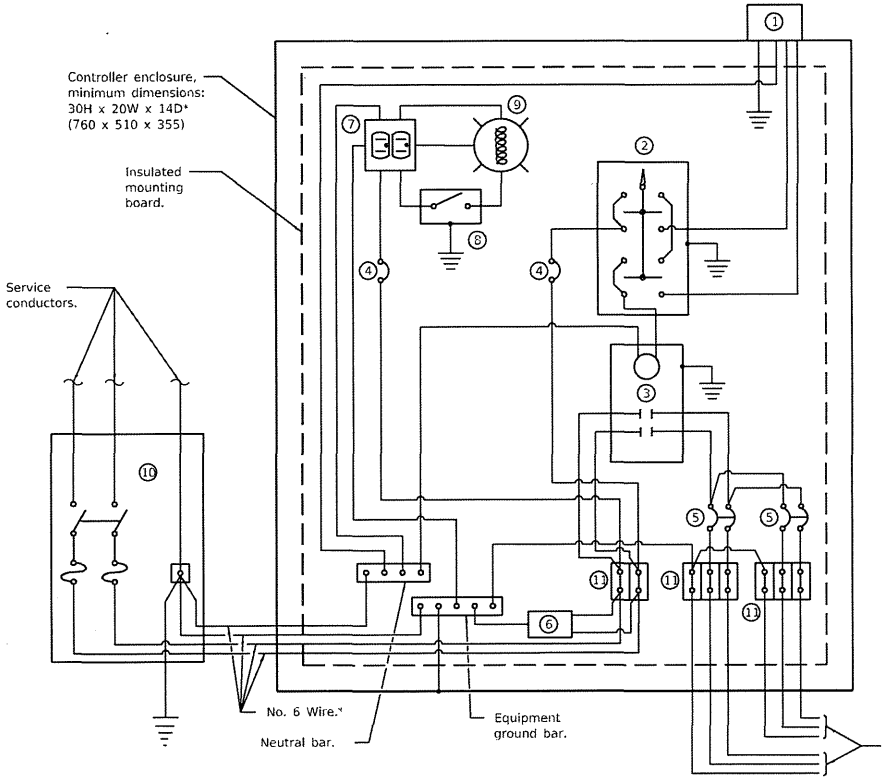


FRONT **SIDE**

ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.



CONTROL SCHEMATIC

1. Photocell with integral surge arrester.
2. HAND-OFF-AUTO selector switch.
3. 100 amp*, electrically held contactor.
4. 15 amp, 1-pole circuit breaker.
5. 20 amp*, 2-pole circuit breaker (two spares required but not shown).
6. Surge arrester.
7. GFCI duplex receptacle.
8. Single-pole, single-throw switch.
9. Incandescent luminaire, enclosed and gasketted with 100 watt lamp.
10. Service disconnect switch - 2-pole, 3-wire, 60 amp*, fused at 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
11. Terminal block sized for conductors as shown on plans.

* Size larger as needed.

Illinois Department of Transportation

PASSED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

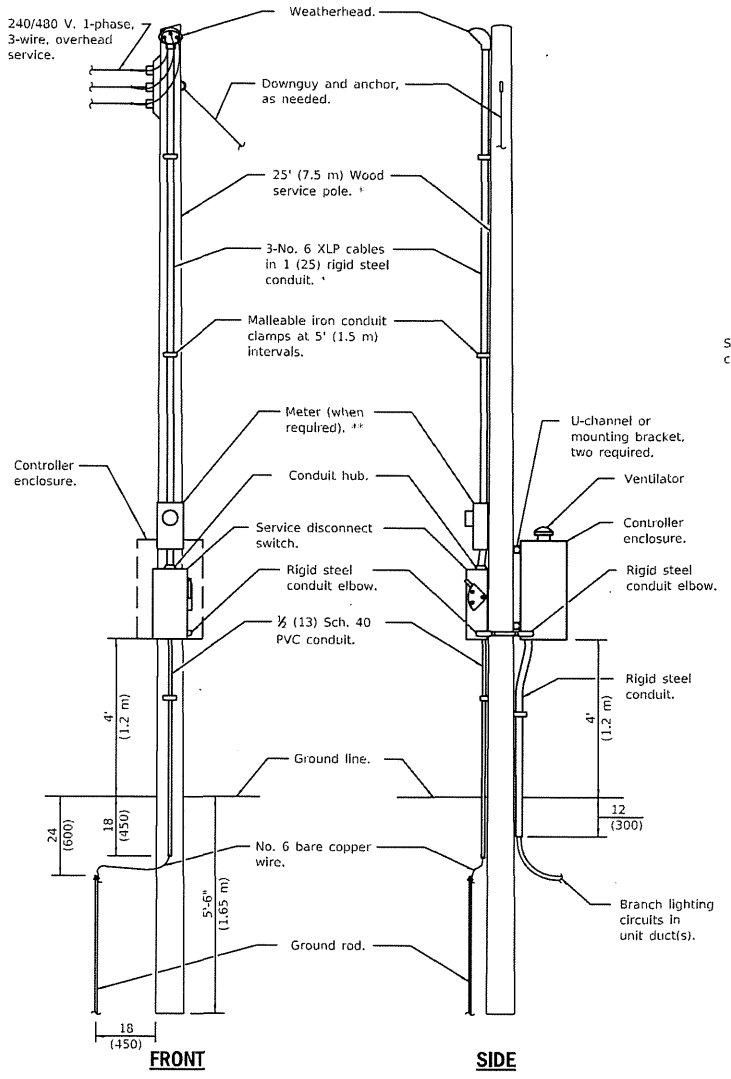
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-19

LIGHTING CONTROLLER POLE MOUNTED, 240V

(Sheet 2 of 2)

STANDARD 825001-04



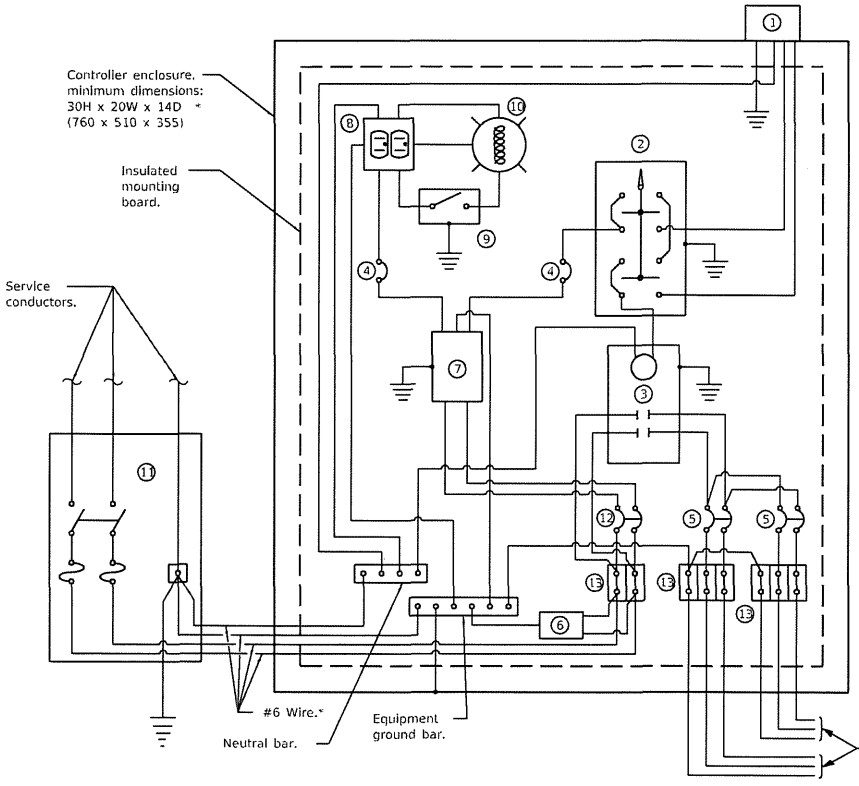
FRONT **SIDE**

ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.

** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.



CONTROL SCHEMATIC

1. Photocell with integral surge arrester.
2. HAND-OFF-AUTO selector switch.
3. 100 amp*, electrically held contactor.
4. 15 amp, 1-pole circuit breaker.
5. 20 amp*, 2-pole circuit breaker (two spares required but not shown).
6. Surge arrester.
7. Transformer - 1KVA*, 480V primary, 120/240V secondary, single-phase, 60Hz.
8. GFCI duplex receptacle.
9. Single-pole, single-throw switch.
10. Incandescent luminaire, enclosed and gasketted with 100 watt lamp.
11. Service disconnect switch - 2-pole, 3-wire, 60 amp*, fused at 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
12. 15 amp, 2-pole circuit breaker.
13. Terminal block sized for conductors as shown on plans.

* Size larger as needed.

GENERAL NOTES

Provide 12x9x1 (305x225x25) watertight pouch mounted inside controller door with as-built plans and schematics.

Provide engraved nameplate on front of enclosure reading "LIGHTING".

Enclosure shall be mounted to pole with pole-bands and lag-bolts.

Work pad not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

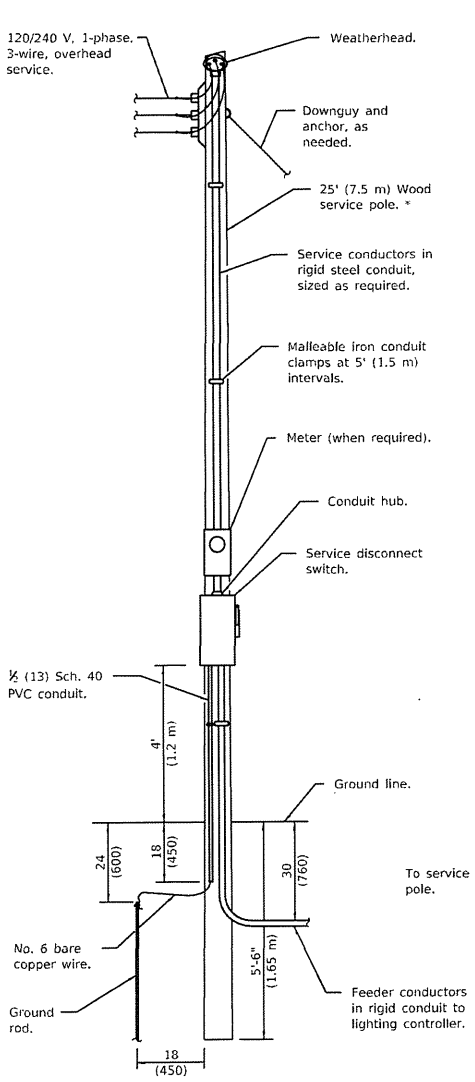
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-19

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding utility company standards. Made *** the ** note.
1-1-15	Added note (13).

LIGHTING CONTROLLER POLE MOUNTED, 480V

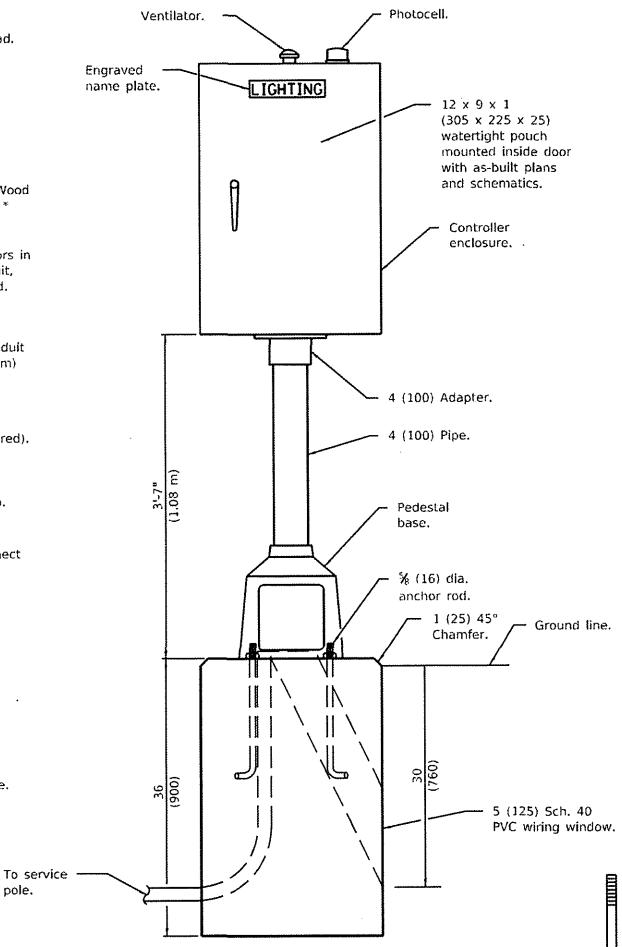
STANDARD 825006-03



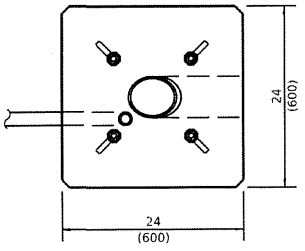
ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.

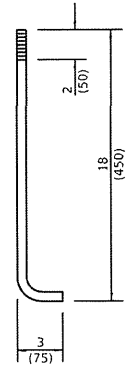


LIGHTING CONTROLLER

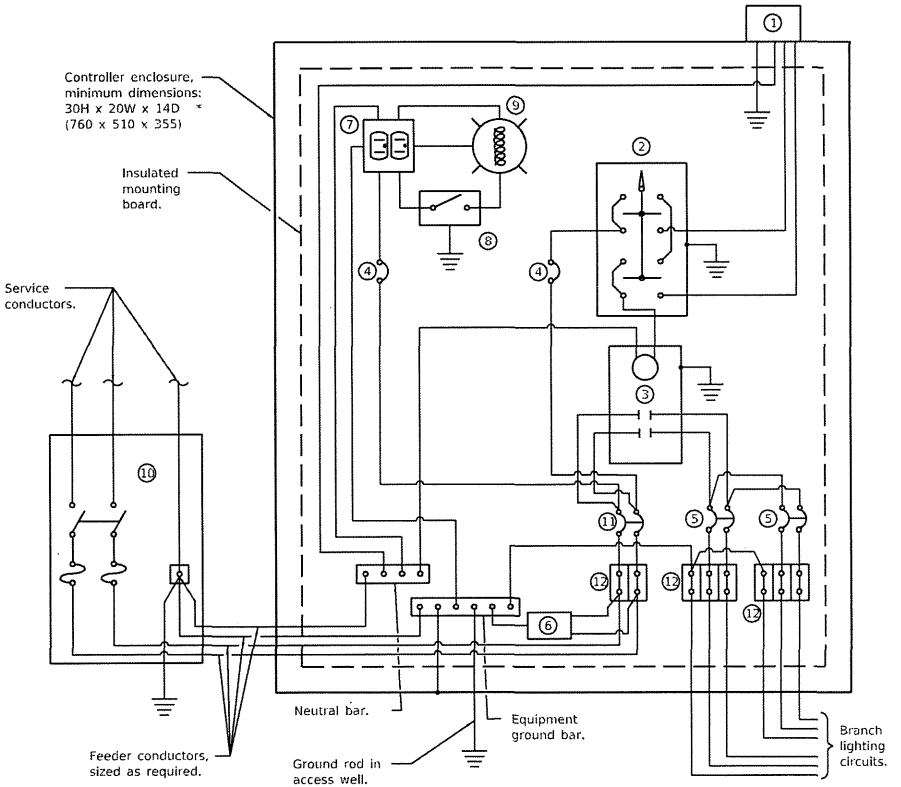


FOUNDATION (PLAN)

(Work pad not shown.)



ANCHOR ROD DETAIL



CONTROL SCHEMATIC

1. Photocell with integral surge arrester.
2. HAND-OFF-AUTO selector switch.
3. 100 amp*, electrically held contactor.
4. 15 amp, 1-pole circuit breaker.
5. 20 amp*, 2-pole circuit breaker (two spares required but not shown).
6. Surge arrester.
7. GFCI duplex receptacle.
8. Single-pole, single-throw switch.
9. Incandescent luminaire, enclosed and gasketted with 100 watt lamp.
10. Service disconnect switch - 2-pole, 3-wire, 60 amp*, fused at 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
11. 60 amp*, 2-pole circuit breaker.
12. Terminal block sized for conductors as shown on plans.

* Size larger as needed.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Replaced * note with new note regarding consulting utility company standards for installation.
1-1-15	Added note (12).

LIGHTING CONTROLLER PEDESTAL MOUNTED, 240V

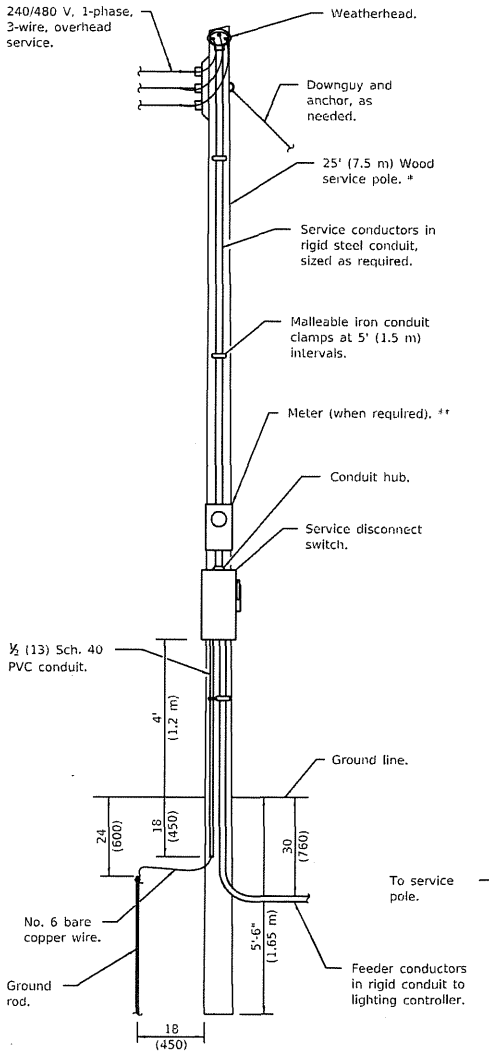
STANDARD 825011-04

Illinois Department of Transportation

PASSED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-19

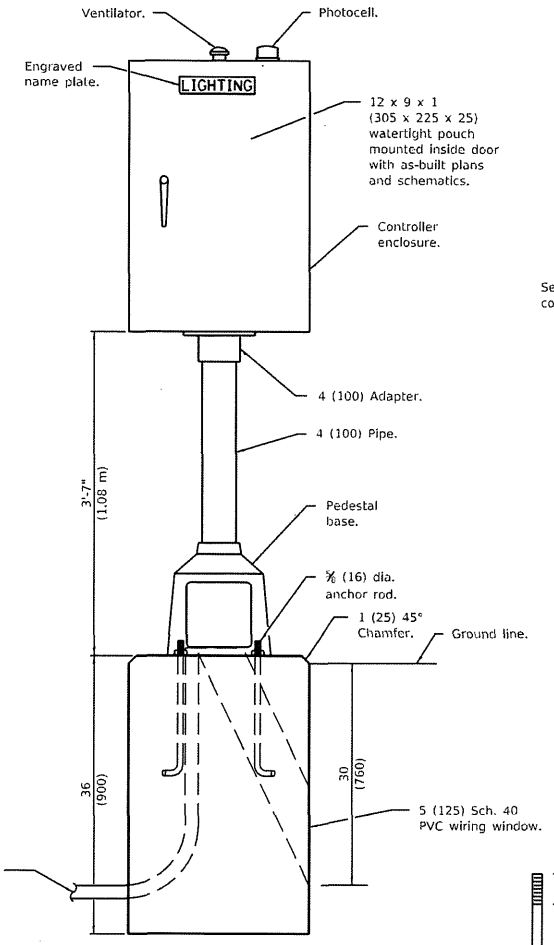


ELECTRIC SERVICE INSTALLATION

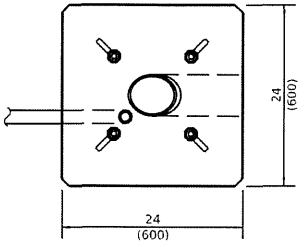
(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.

** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

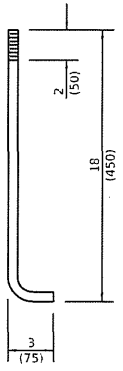


LIGHTING CONTROLLER

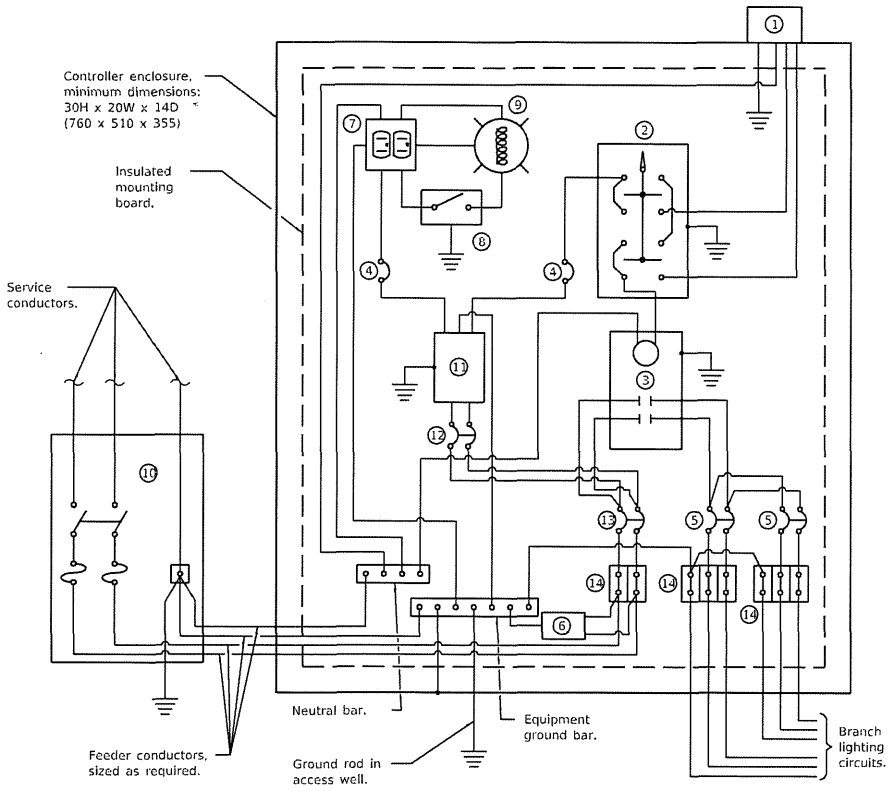


FOUNDATION (PLAN)

(Work pad not shown.)



ANCHOR ROD DETAIL



CONTROL SCHEMATIC

1. Photocell with integral surge arrester.
2. HAND-OFF-AUTO selector switch.
3. 100 amp*, electrically held contactor.
4. 15 amp, 1-pole circuit breaker.
5. 20 amp*, 2-pole circuit breaker (two spares required but not shown).
6. Surge arrester.
7. GFCI duplex receptacle.
8. Single-pole, single-throw switch.
9. Incandescent luminaire, enclosed and gasketted with 100 watt lamp.
10. Service disconnect switch - 2-pole, 3-wire, 60 amp*, fused at 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
11. Transformer - 1KVA*, 480V primary, 120/240V secondary, single-phase, 60Hz.
12. 15 amp, 2-pole circuit breaker.
13. 60 amp*, 2-pole circuit breaker.
14. Terminal block sized for conductors as shown on plans.

* Size larger as needed.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

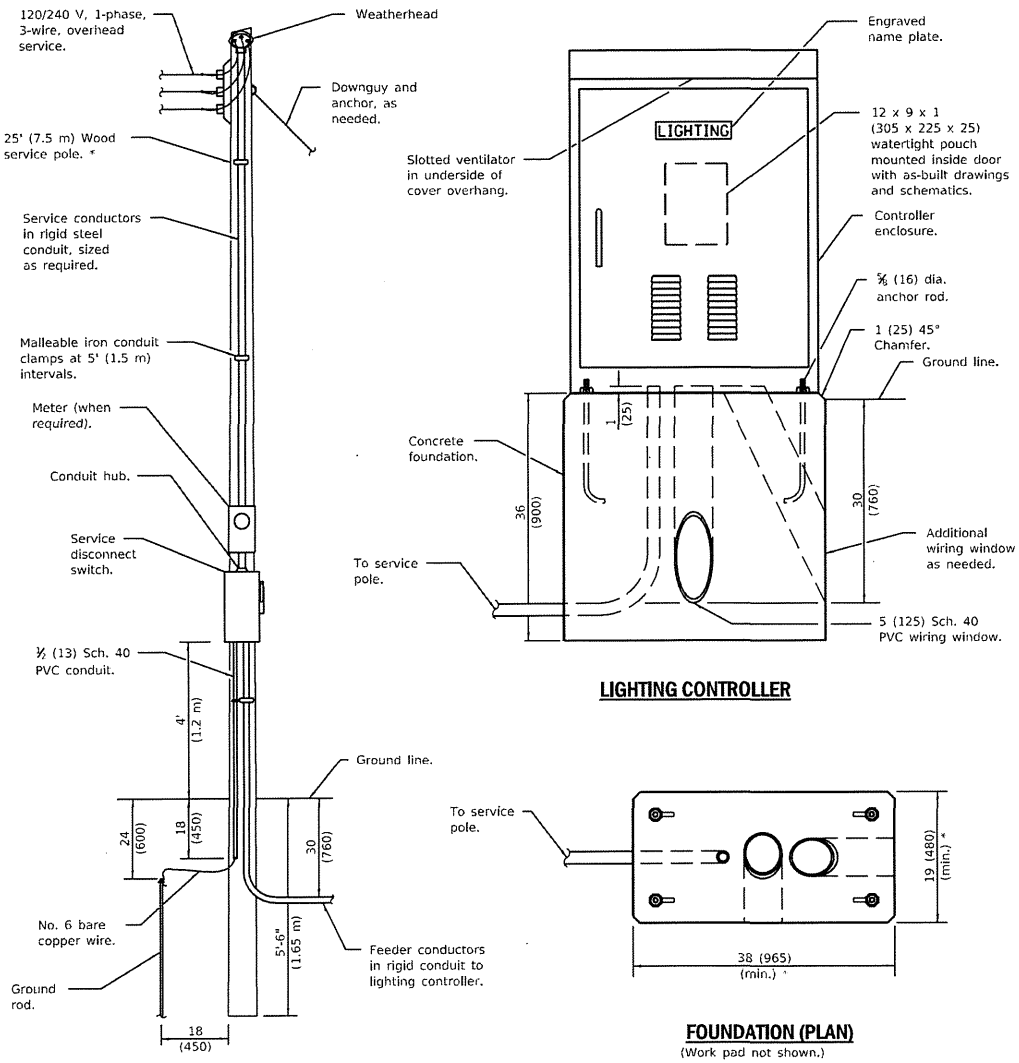
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-19

DATE	REVISIONS
1-1-19	Replaced ** note with new note
	regarding utility company
	standards. Made ** the ** note.
1-1-15	Added note (14).

LIGHTING CONTROLLER PEDESTAL MOUNTED, 480V

STANDARD 825016-04



ELECTRIC SERVICE INSTALLATION

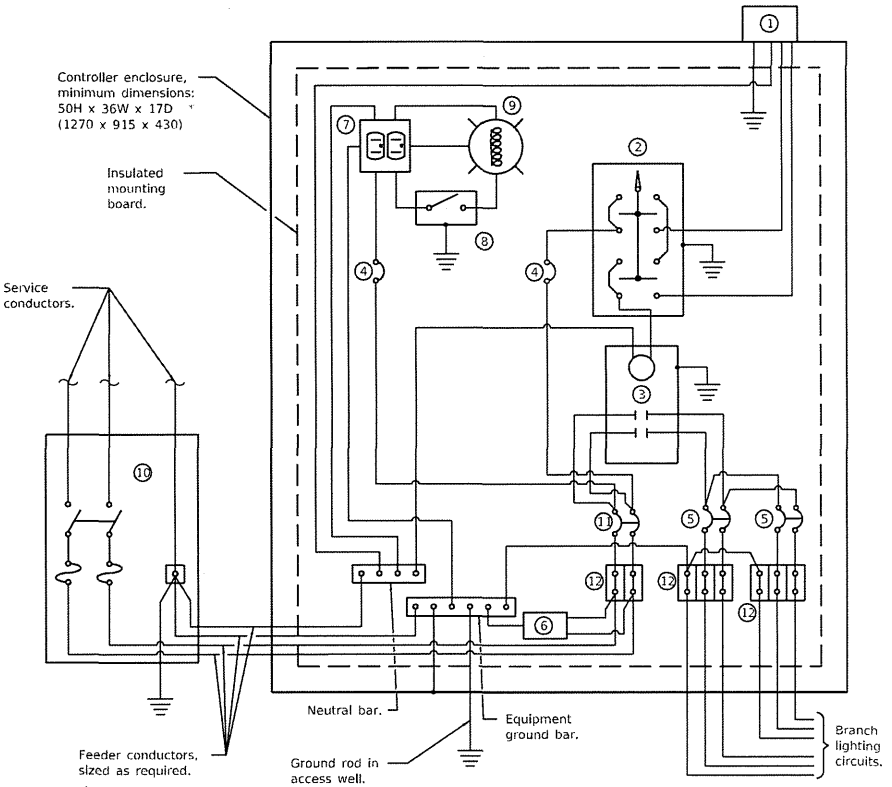
(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.

LIGHTING CONTROLLER

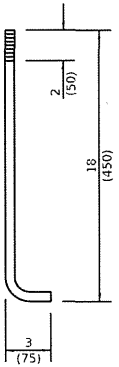
FOUNDATION (PLAN)

(Work pad not shown.)



CONTROL SCHEMATIC

1. Photocell with integral surge arrester.
2. HAND-OFF-AUTO selector switch.
3. 100 amp*, electrically held contactor.
4. 15 amp, 1-pole circuit breaker.
5. 20 amp*, 2-pole circuit breaker (two spares required but not shown).
6. Surge arrester.
7. GFCI duplex receptacle.
8. Single-pole, single-throw switch.
9. Incandescent luminaire, enclosed and gasketted with 100 watt lamp.
10. Service disconnect switch - 2-pole, 3-wire, 100 amp*, fused at 100 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
11. 100 amp*, 2-pole circuit breaker.
12. Terminal block sized for conductors as shown on plans.



ANCHOR ROD DETAIL

* Size larger as needed.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Replaced ** note with new note
	regarding consulting utility
	company standards for installation.
1-1-15	Added note (12).

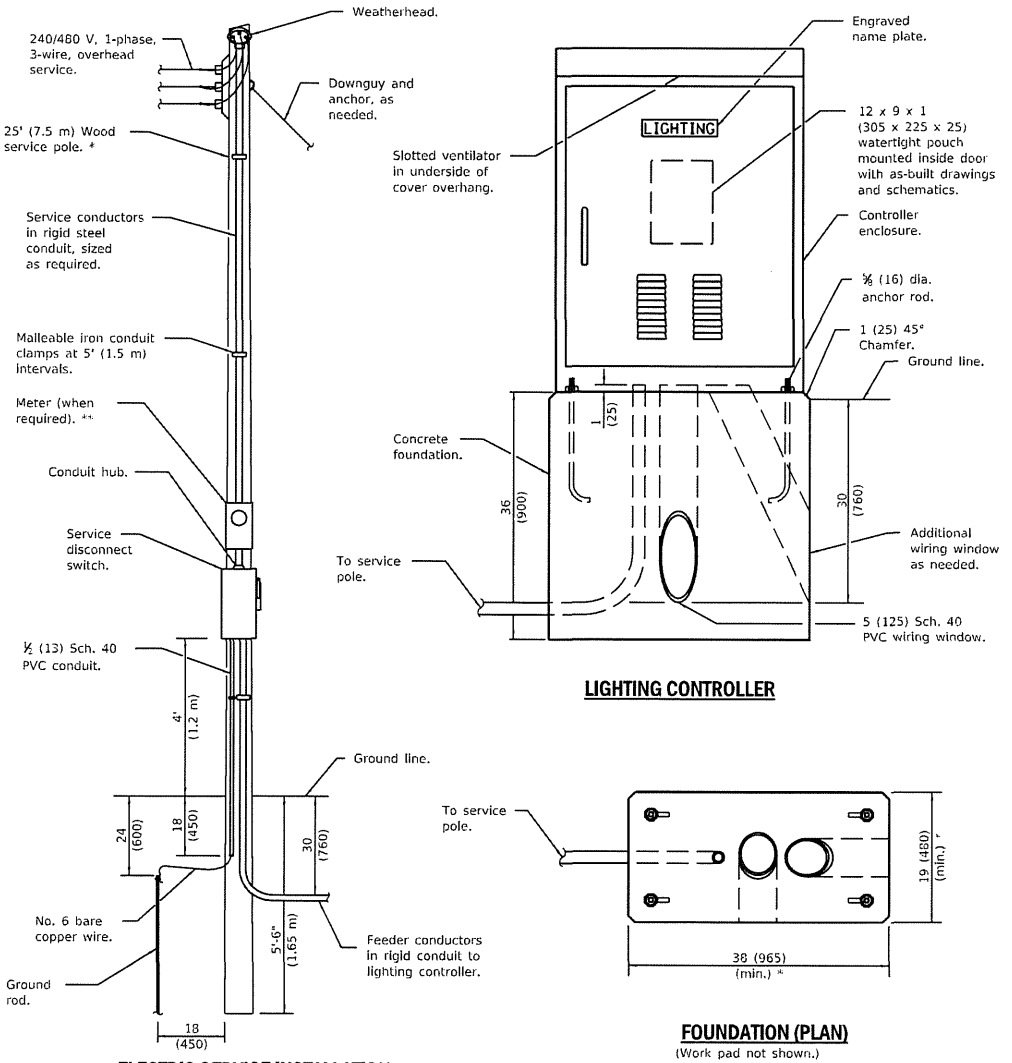
Illinois Department of Transportation

PASSED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-10

LIGHTING CONTROLLER BASE MOUNTED, 240V

STANDARD 825021-04



ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

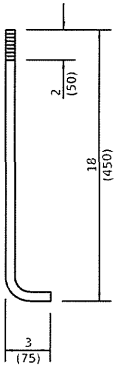
* Size larger as needed.

** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

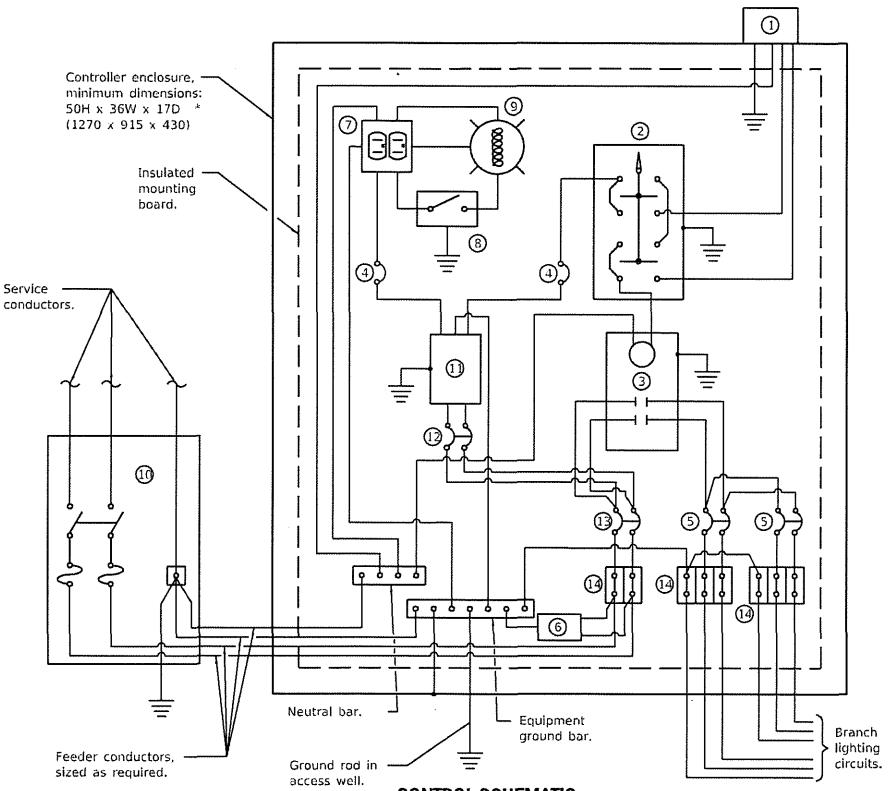
LIGHTING CONTROLLER

FOUNDATION (PLAN)

(Work pad not shown.)



ANCHOR ROD DETAIL



CONTROL SCHEMATIC

1. Photocell with integral surge arrester.
2. HAND-OFF-AUTO selector switch.
3. 100 amp*, electrically held contactor.
4. 15 amp, 1-pole circuit breaker.
5. 20 amp*, 2-pole circuit breaker (two spares required but not shown).
6. Surge arrester.
7. GFCI duplex receptacle.
8. Single-pole, single-throw switch.
9. Incandescent luminaire, enclosed and gasketted with 100 watt lamp.
10. Service disconnect switch - 2-pole, 3-wire, 100 amp*, fused at 100 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
11. Transformer - 1KVA*, 480V primary, 120/240V secondary, single-phase, 60Hz.
12. 15 amp, 2-pole circuit breaker.
13. 100 amp*, 2-pole circuit breaker.
14. Terminal block sized for conductors as shown on plans.

* Size larger as needed.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-19

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding utility company standards. Made *** the ** note.
1-1-15	Added note (14).

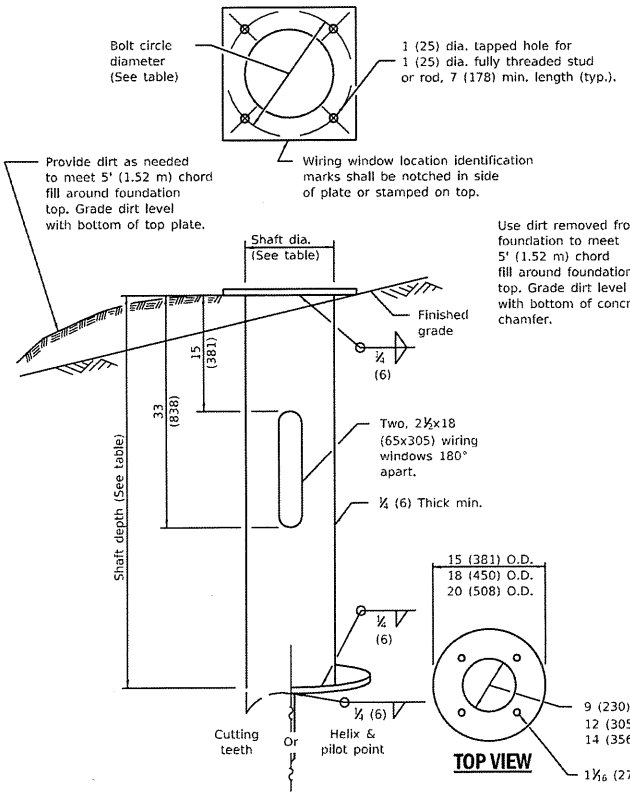
LIGHTING CONTROLLER BASE MOUNTED, 480V

STANDARD 825026-04

LIGHT POLE MOUNTING HEIGHT	BOLT CIRCLE DIAMETER	METAL FOUNDATION			CONCRETE FOUNDATION		
		SHAFT DIAMETER	SHAFT DEPTH	TOP PLATE (min)	SHAFT DIAMETER	SHAFT DEPTH	ANCHOR ROD LENGTH
≤30' (9.1 m)	11½ (292)	8⅝ (220)	6' (1.83 m)	12 x 12 x 1 (300 x 300 x 25)	24 (610)	5'-0" (1.52 m)	4'-9" (1.45 m)
31'-35' (9.4 m - 10.7 m)	11½ (292)	8⅝ (220)	6' (1.83 m)	12 x 12 x 1 (300 x 300 x 25)	24 (610)	5'-6" (1.67 m)	5'-3" (1.60 m)
36'-40' (10.9 m - 12.2 m)	15 (381) ②	8⅝ (220)	6' (1.83 m) ①	15 x 15 x 1¼ (375 x 375 x 31)	30 (762)	6'-0" (1.83 m)	5'-9" (1.75 m)
41'-45' (12.5 m - 13.7 m)	15 (381) ②	8⅝ (220)	6' (1.83 m) ①	15 x 15 x 1¼ (375 x 375 x 31)	30 (762)	6'-6" (1.98 m)	6'-3" (1.90 m)
46'-50' (14.0 m - 15.2 m)	15 (381) ②	8⅝ (220)	8' (2.44 m)	15 x 15 x 1¼ (375 x 375 x 31)	30 (762)	7'-0" (2.13 m)	6'-9" (2.00 m)

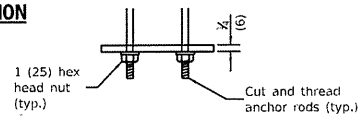
① 8⅝ x 8'-0" (220 x 2.44 m) for twin luminaires.

② Bolt circle diam. shall be 17 (430) when a transformer base is used.

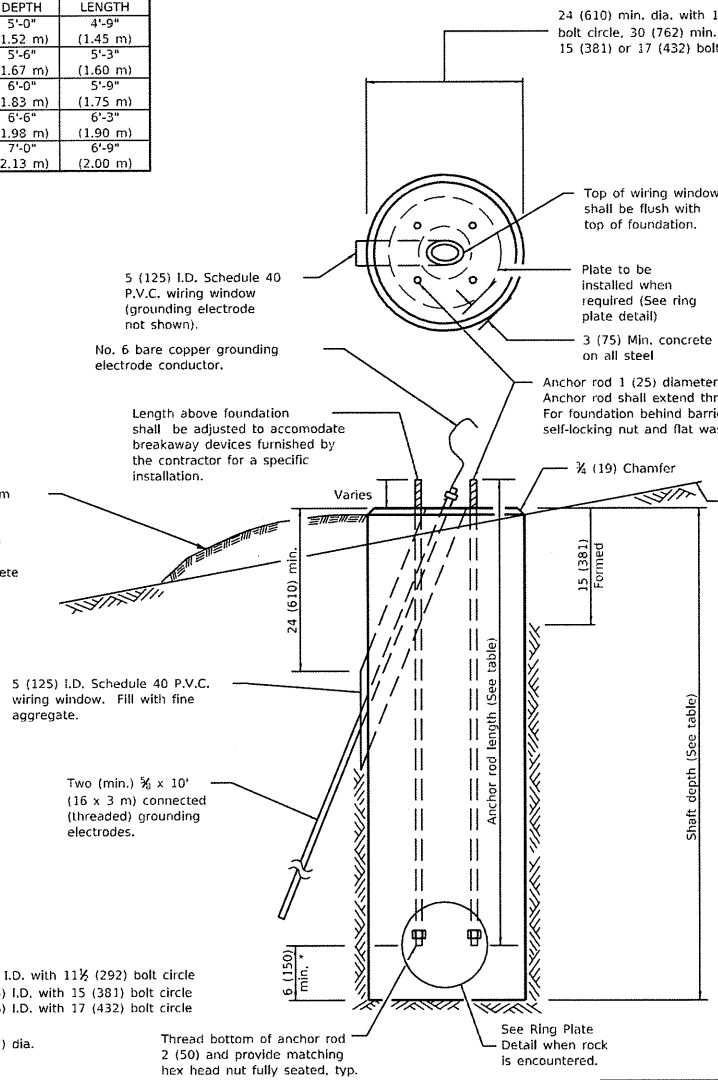


TOP VIEW

METAL FOUNDATION

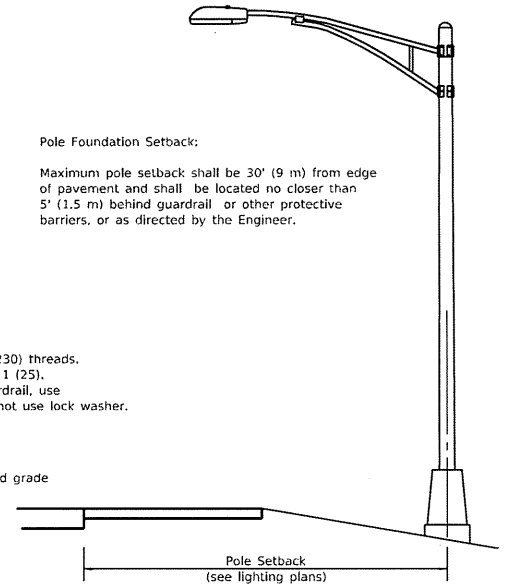


RING PLATE DETAIL



* If the required anchor rod length above top of foundation is less than 3 (75), anchor rods may be lowered below 6 (150).

CONCRETE FOUNDATION



Pole Foundation Setback:

Maximum pole setback shall be 30' (9 m) from edge of pavement and shall be located no closer than 5' (1.5 m) behind guardrail or other protective barriers, or as directed by the Engineer.

GENERAL NOTES

All foundations are designed to be located on slopes not exceeding 2:1 where soils have an unconfined compressive strength of at least 1.0 TSF. The Contractor shall verify the soil strength during drilling for concrete foundations or by monitoring installation resistance of metal foundations and notify the Engineer if other conditions are encountered.

When rock is encountered the foundation depth may be reduced 6 (150) for every 12 (300) of embedment in rock. The minimum foundation depth shall be 4'-6" (1.37 m) with cut anchor rods 6 (150) above bottom of excavated hole. See ring plate detail.

Anchor rods shall be increased in diameter as needed for 50' (15.2 m) mounting height or above. The Contractor shall match the breakaway device size or slotted hole size in the pole base plate to accomodate larger rod sizes.

Transformer bases shall not be used on metal foundations.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

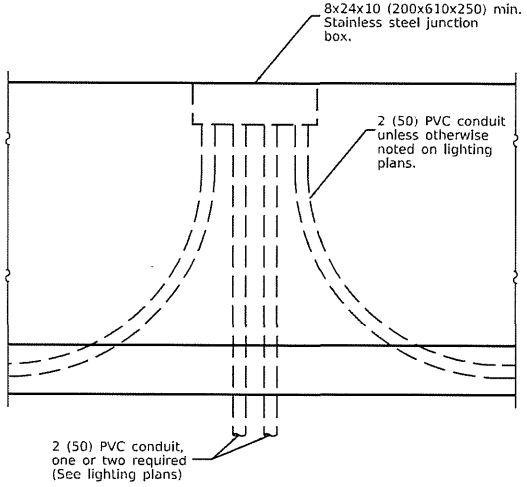
ISSUED 1-1-19

DATE	REVISIONS
1-1-19	Omitted multimount luminaire
	to agree with BDE Manual.
1-1-18	Replaced rod hooks with
	nuts.

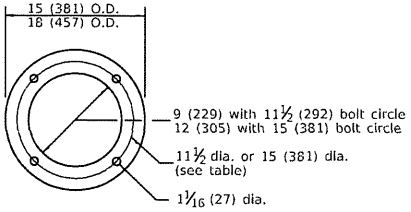
LIGHT POLE FOUNDATION

STANDARD 836001-04

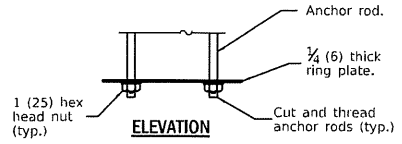
FOUNDATION TABLE				
LIGHT POLE MOUNTING HEIGHT	SHAFT DIAMETER	SHAFT DEPTH	ANCHOR ROD LENGTH	ANCHOR ROD CIRCLE DIA.
≤30' (9.1 m)	24 (610)	36 (914)	6'-2" (1.88 m)	11½ (292)
31'-35' (9.4 m - 10.7 m)	24 (610)	3'-6" (1.06 m)	6'-8" (2.03 m)	11½ (292)
36'-40' (10.9 m - 12.2 m)	30 (762)	4'-0" (1.22 m)	7'-2" (2.18 m)	15 (381)
41'-45' (12.5 m - 13.7 m)	30 (762)	4'-6" (1.37 m)	7'-8" (2.34 m)	15 (381)
46'-50' (14.0 m - 15.2 m)	30 (762)	5'-0" (1.52 m)	8'-2" (2.49 m)	15 (381)



JUNCTION BOX ELEVATION

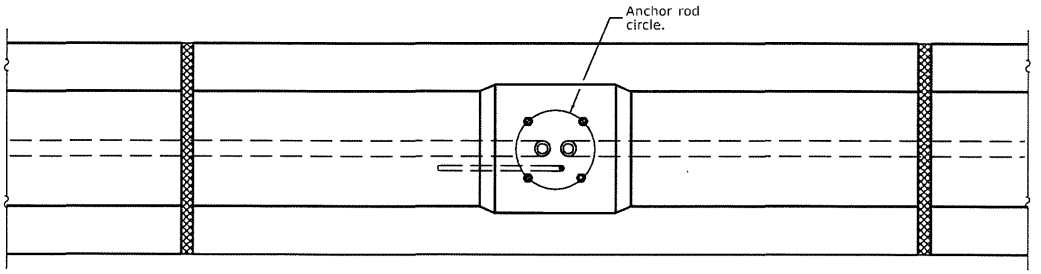


PLAN

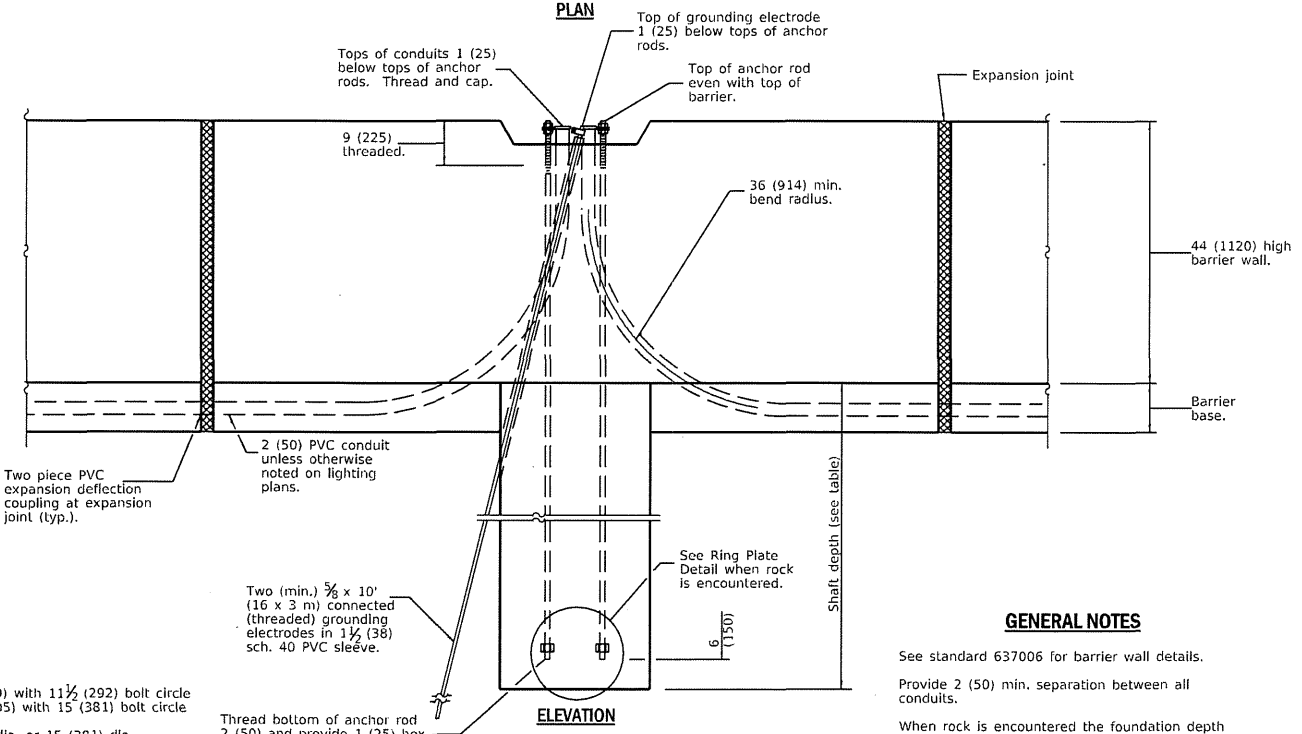


ELEVATION

RING PLATE DETAIL



PLAN



ELEVATION

LIGHT POLE FOUNDATION

GENERAL NOTES

See standard 637006 for barrier wall details.

Provide 2 (50) min. separation between all conduits.

When rock is encountered the foundation depth may be reduced 6 (150) for every 12 (300) of embedment in rock. The minimum foundation depth shall be 30 (760) with cut anchor rods 6 (150) above bottom of excavated hole. See ring plate detail.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1. 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF

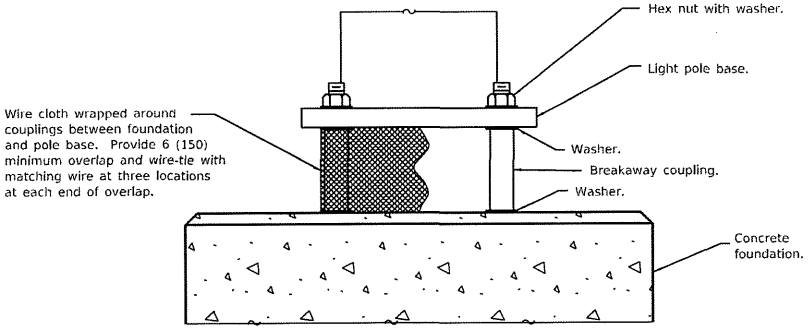
APPROVED January 1. 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-19

DATE	REVISIONS
1-1-19	Revised standard for new
	constant slope median barrier.
	Renamed standard.
1-1-14	Modified grounding meathod.
	Revised general notes.

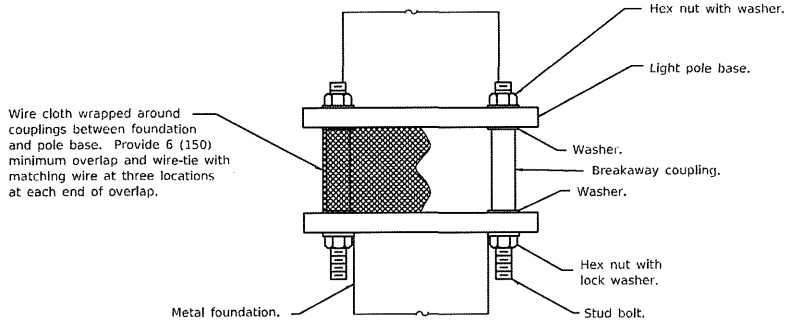
LIGHT POLE FOUNDATION WITH 44 IN. (1120 mm) CONCRETE BARRIER

STANDARD 836011-02



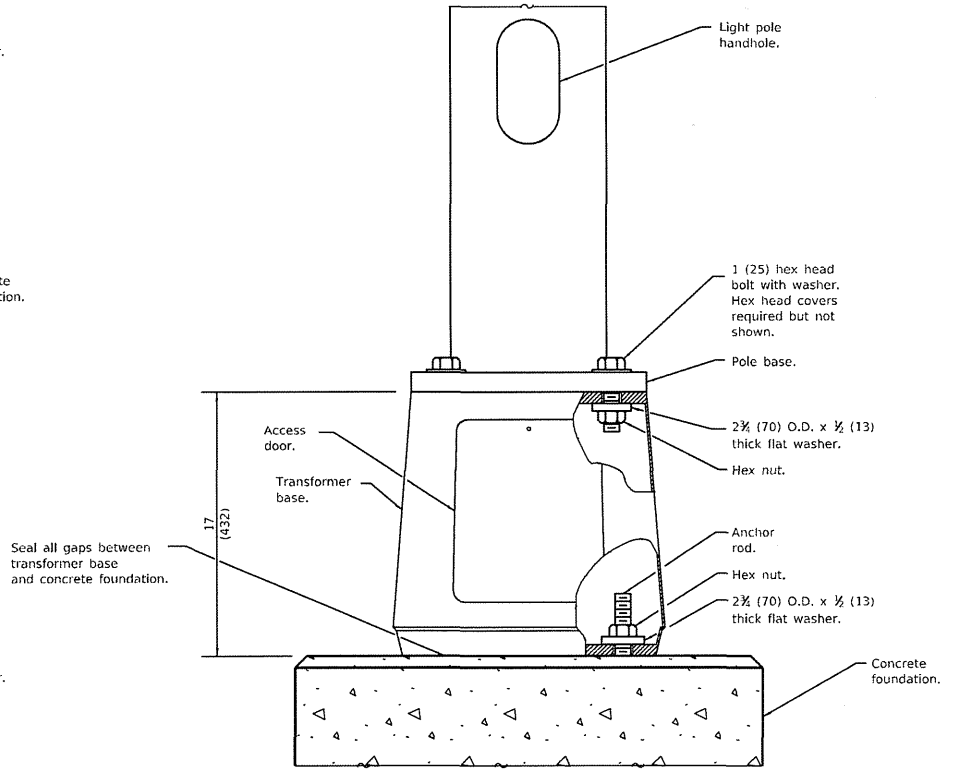
BREAKAWAY COUPLINGS ON CONCRETE FOUNDATION FOR STEEL LIGHT POLE

(Provide pole base skirt around wire cloth when required.)



BREAKAWAY COUPLINGS ON METAL FOUNDATION FOR STEEL POLE

(Provide pole base skirt around wire cloth when required.)



BREAKAWAY TRANSFORMER BASE FOR STEEL OR ALUMINUM POLE

(Steel pole shown)

See Sheet 2 for GENERAL NOTES.

Illinois Department of Transportation

PASSED January 1, 2018
ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

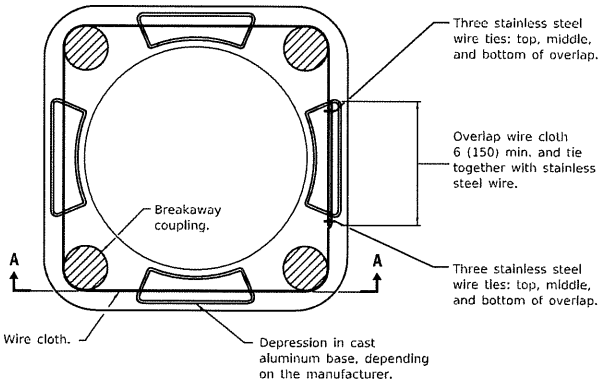
ISSUED 1-1-12

DATE	REVISIONS
1-1-18	Revised to show rodent
	shield installation for
	aluminum poles.
1-1-14	New Standard.

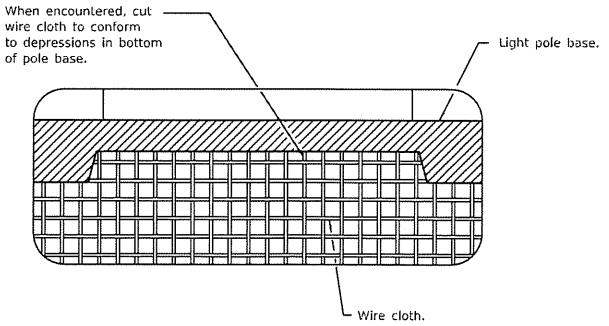
BREAKAWAY DEVICES

(Sheet 1 of 2)

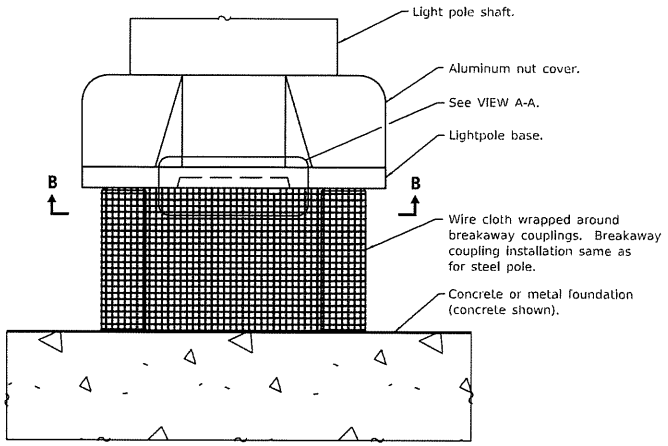
STANDARD 838001-01



VIEW B-B



VIEW A-A



BREAKAWAY COUPLINGS FOR ALUMINUM POLES

(Provide pole base skirt around wire cloth when required.)

GENERAL NOTES

See light pole standard for details not shown.

Use largest transformer base bolt circle possible.

Transformer bases shall not be installed on metal foundations.

Washers on top of pole base shall cover the entire bolt slot.

See Standard 836001 for Light Pole Foundation.

Wire cloth shall be stainless steel, have a maximum opening of ¼ (6), and have a minimum wire size of AWG No. 16 (1.6).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1. 2018
ENGINEER OF PRELIMINARY ENGINEERING

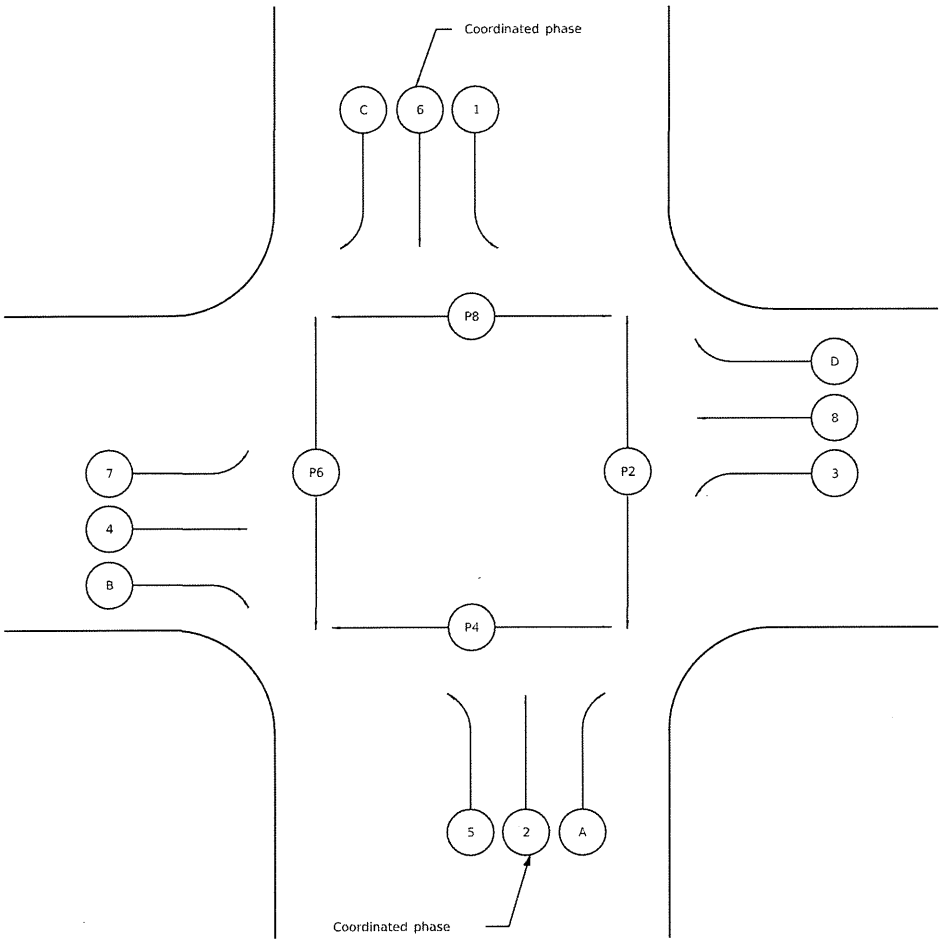
APPROVED January 1. 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

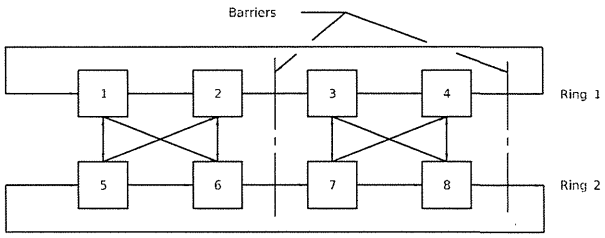
BREAKAWAY DEVICES

(Sheet 2 of 2)

STANDARD 838001-01



STANDARD PHASE DESIGNATION DIAGRAM (NEMA)



NEMA EIGHT PHASE DUAL RING ACTUATED CONFIGURATION

LEGEND

(X), [X]	Vehicular phase no. x
(PX)	Pedestrian phase no. x
(A), (B), (C), (D)	Right turn overlaps where:
(A) = (2) + (3)	
(B) = (4) + (5)	
(C) = (6) + (7)	
(D) = (8) + (1)	
NEMA	National Electrical Manufacturers Association

Illinois Department of Transportation

PASSED January 1, 2009
ENGINEER OF OPERATIONS

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

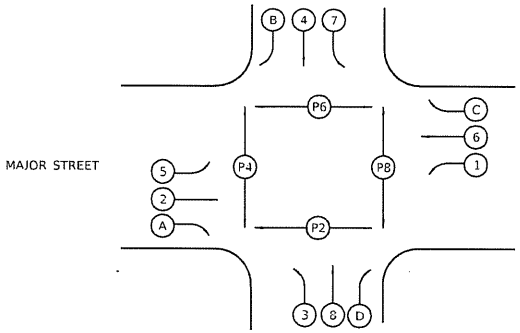
ISSUED 1-1-97

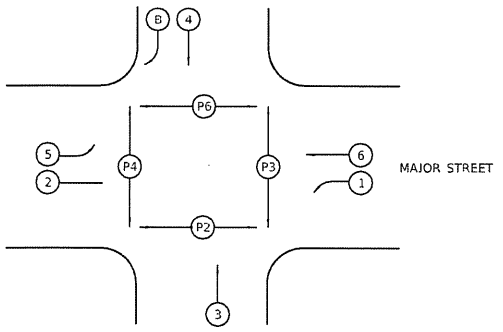
DATE	REVISIONS
1-1-09	Omitted note regarding
	units of length.
1-1-97	Renum. Standard 2393-2.

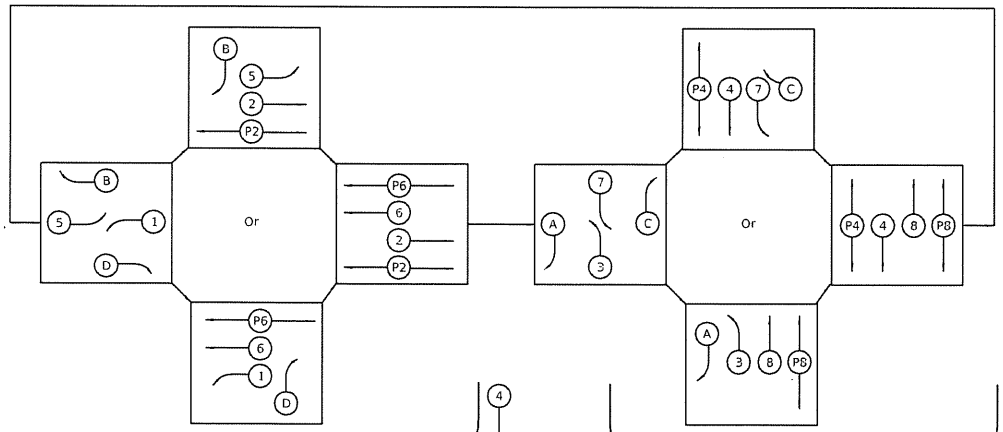
STANDARD PHASE DESIGNATION DIAGRAMS AND PHASE SEQUENCES

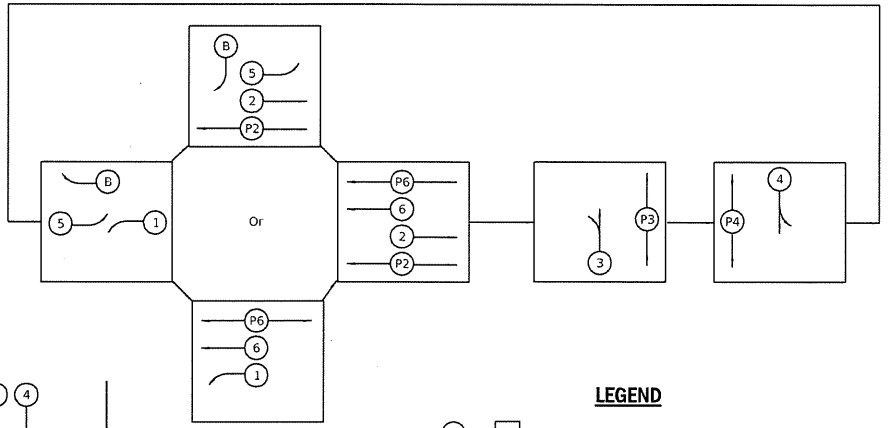
(Sheet 1 of 2)

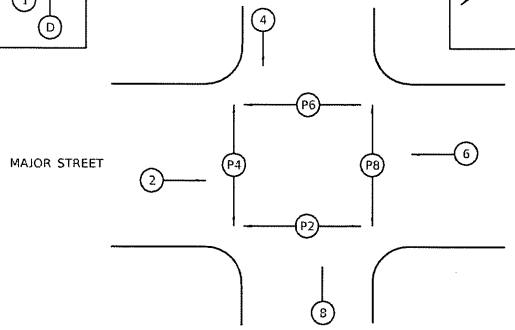
STANDARD 857001-01

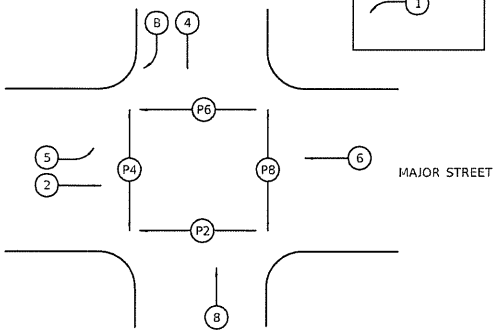


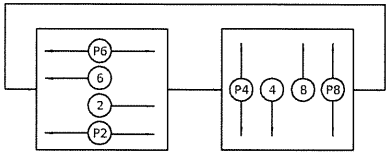


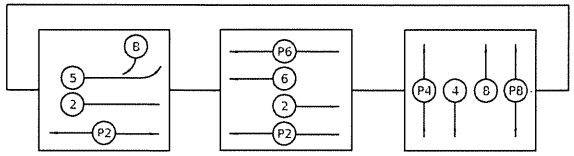












LEGEND

(X), [X]	Vehicular phase no. x
(PX)	Pedestrian phase no. x
(A), (B), (C), (D)	Right turn overlaps where:
(A) = (2) + (3)	
(B) = (4) + (5)	
(C) = (6) + (7)	
(D) = (8) + (1)	
NEMA	National Electrical Manufacturers Association

Illinois Department of Transportation

PASSED January 1, 2009
ENGINEER OF OPERATIONS

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

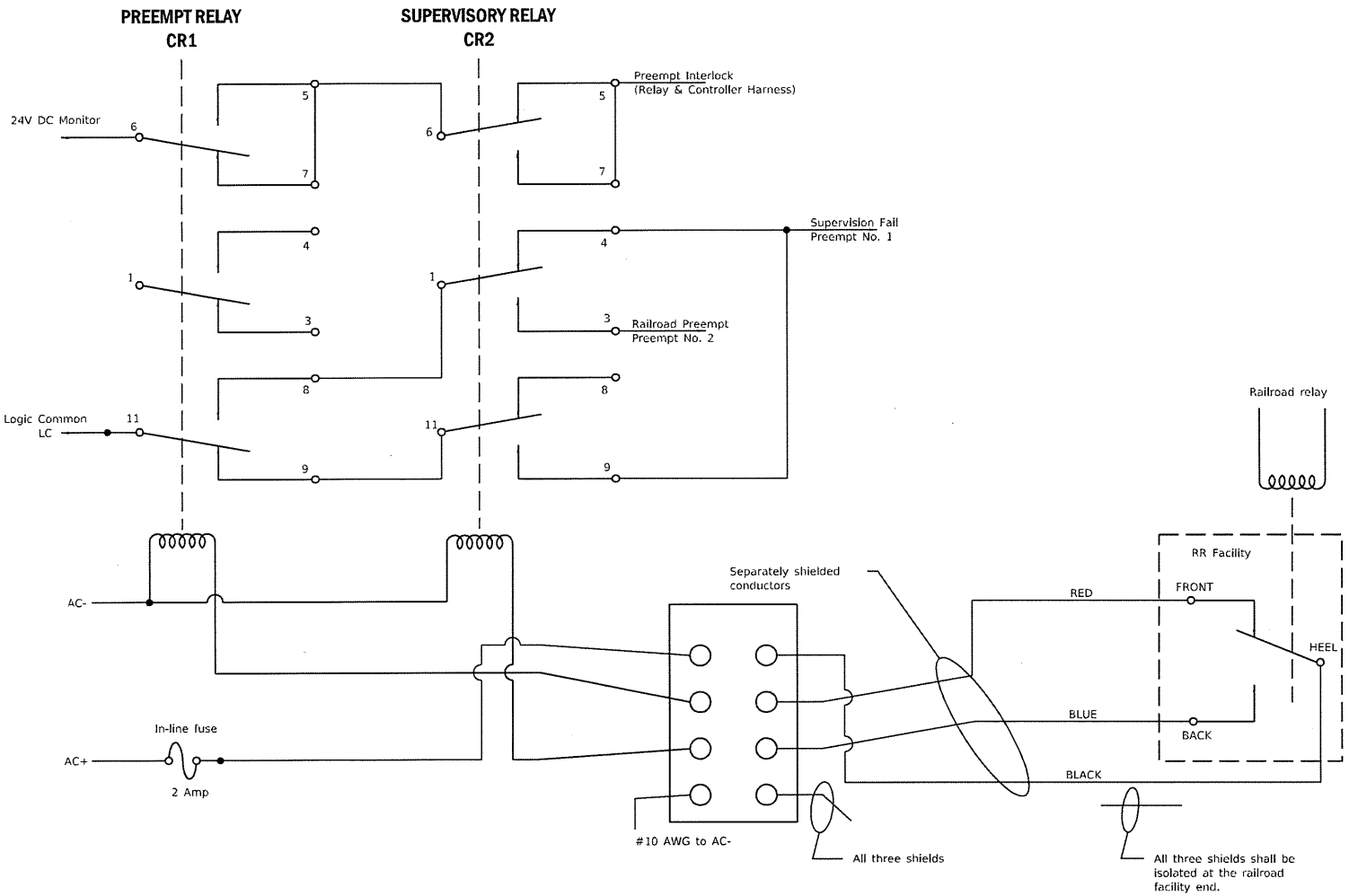
ISSUED 1-1-97

PHASE DESIGNATION DIAGRAMS AND CORRESPONDING PHASE SEQUENCES

STANDARD PHASE DESIGNATION DIAGRAMS AND PHASE SEQUENCES

(Sheet 2 of 2)

STANDARD 857001-01



RELAYS IN NON-PREEMPT STATE - RAILROAD AND PREEMPT RELAYS ENERGIZED

GENERAL NOTES

CR1 and CR2 are 120VAC 3PDT Relays.

Supervision Fail is Preempt No. 1, causing traffic signal controller to implement all-red flash following track clearance phase.

Railroad Preempt is Preempt No. 2, causing traffic signal controller to implement railroad preemption routine following 1 second delay.

Preempt No. 1 and Preempt No. 2 shall have priority over all other preempts. The railroad preemption routine shall abbreviate each and all active pedestrian phases by immediately entering into flashing DON'T WALK and timing concurrently with the associated vehicle yellow change interval.

Illinois Department of Transportation

PASSED January 1, 2009
ENGINEER OF OPERATIONS

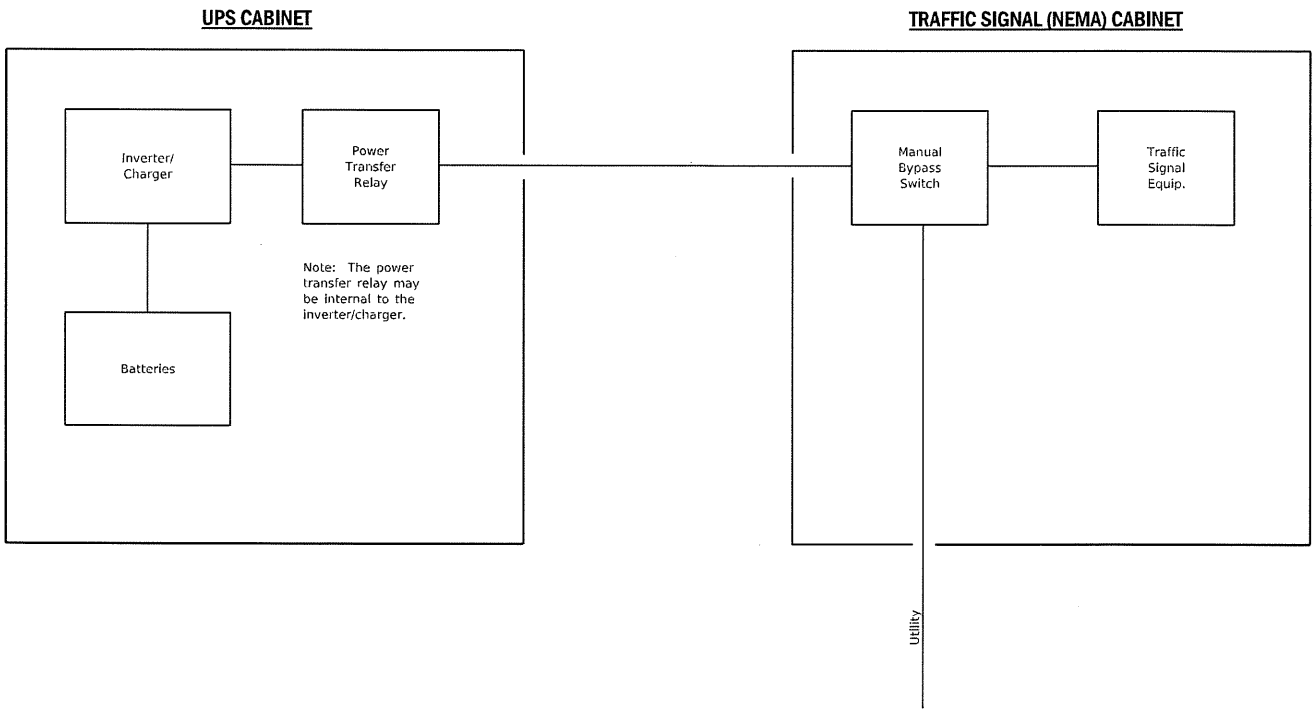
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-04

DATE	REVISIONS
1-1-09	Omitted note regarding
	units of length.
1-1-04	New Standard.

SUPERVISED RAILROAD INTERCONNECT CIRCUIT

STANDARD 857006-01



SINGLE LINE BLOCK DIAGRAM

Illinois Department of Transportation

PASSED January 1, 2009
ENGINEER OF OPERATIONS

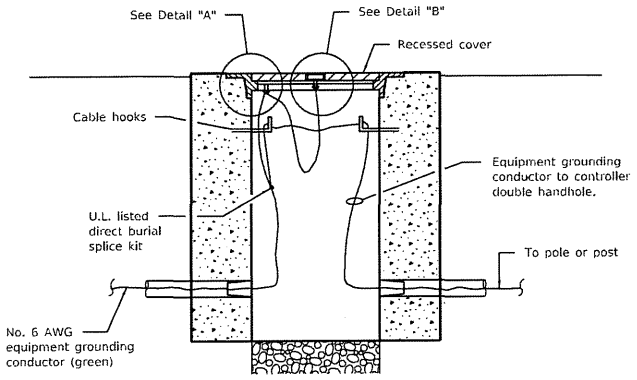
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-06

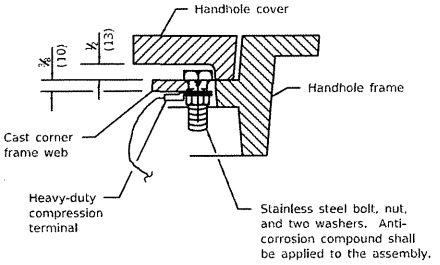
DATE	REVISIONS
1-1-09	Omitted note regarding
	units of length.
4-1-06	New Standard

UNINTERRUPTABLE POWER SUPPLY (UPS)

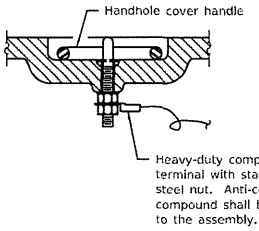
STANDARD 862001-01



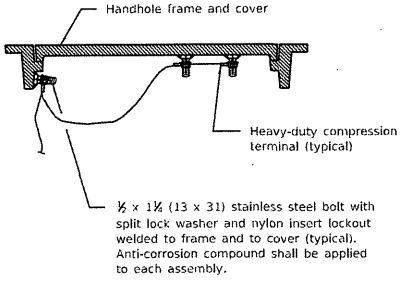
BONDING A HANDHOLE COVER & FRAME



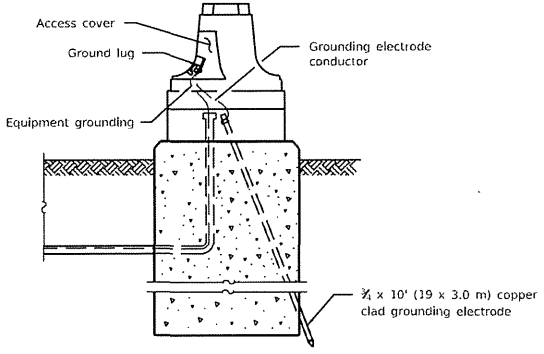
DETAIL "A"



DETAIL "B"

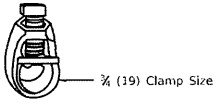


BONDING AN EXISTING HANDHOLE COVER & FRAME



GROUNDING A MAST ARM POLE/POST

HEAVY-DUTY COMPRESSION TERMINAL



HEAVY-DUTY GROUND ROD CLAMP

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009
ENGINEER OF OPERATIONS

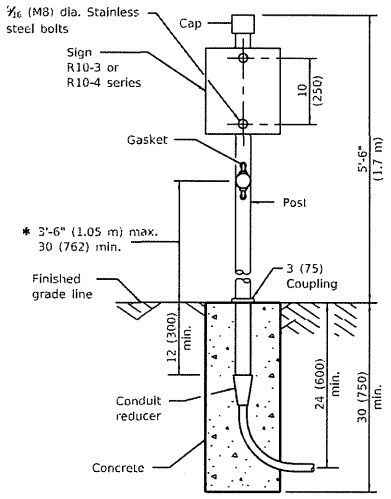
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-09

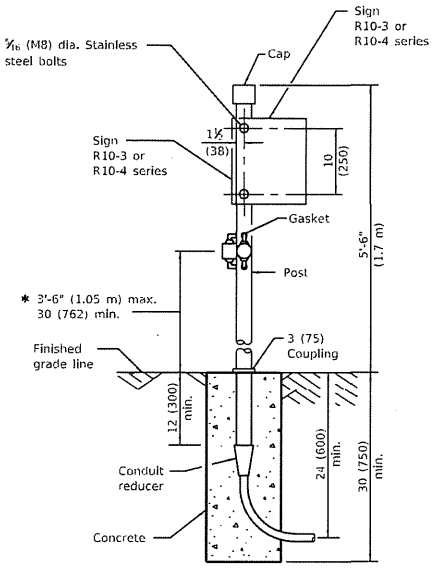
DATE	REVISIONS
1-1-09	Switched units to
	English (metric).
1-1-07	Revised terminology.

TRAFFIC SIGNAL GROUNDING & BONDING

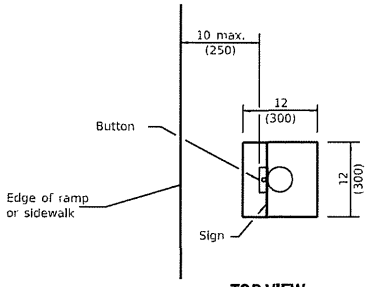
STANDARD 873001-02



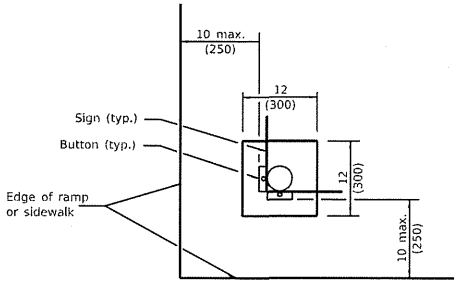
PEDESTRIAN ONE PUSH BUTTON POST



PEDESTRIAN TWO PUSH BUTTON POST



TOP VIEW
TYPICAL ONE BUTTON



TOP VIEW
TYPICAL TWO BUTTONS

* 36 (914) prefered

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED April 1, 2016
ENGINEER OF OPERATIONS

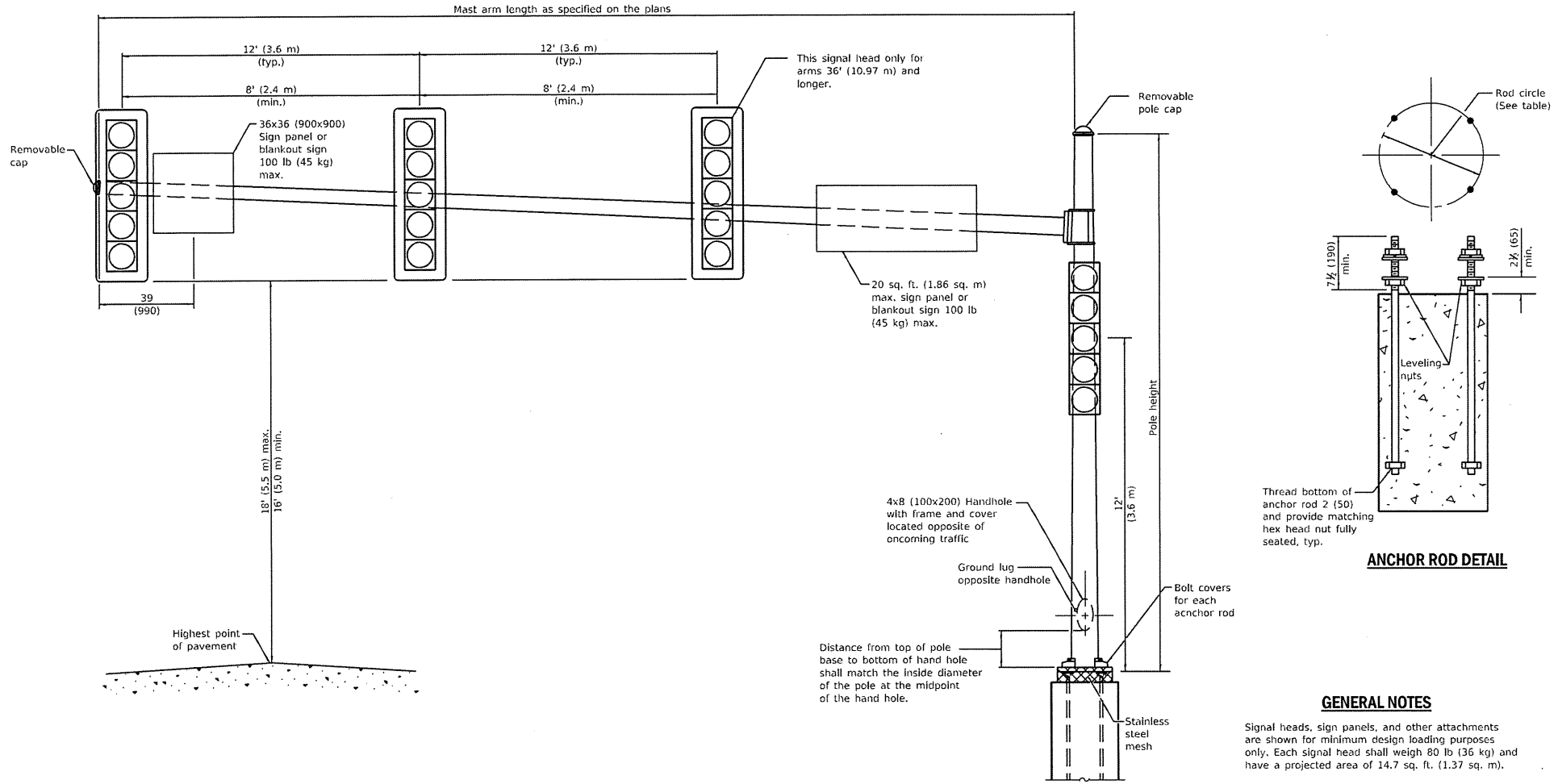
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-07

DATE	REVISIONS
4-1-16	Revised sign numbers
	for concistency with
	current MUTCD.
1-1-14	Revised and added
	dimensions for PROWAG
	reach range requirements.

PEDESTRIAN PUSH BUTTON POST

STANDARD 876001-04



ANCHOR ROD DETAIL

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
16' thru 40' (4.87 m thru 12.20 m)	18 (450)	1¾ x 7' (44 x 2.10 m)
42' thru 55' (12.80 m thru 16.80 m)	21 (535)	1¾ x 7' (44 x 2.10 m)

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panel or blankout sign closest to pole.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2020
ENGINEER OF OPERATIONS

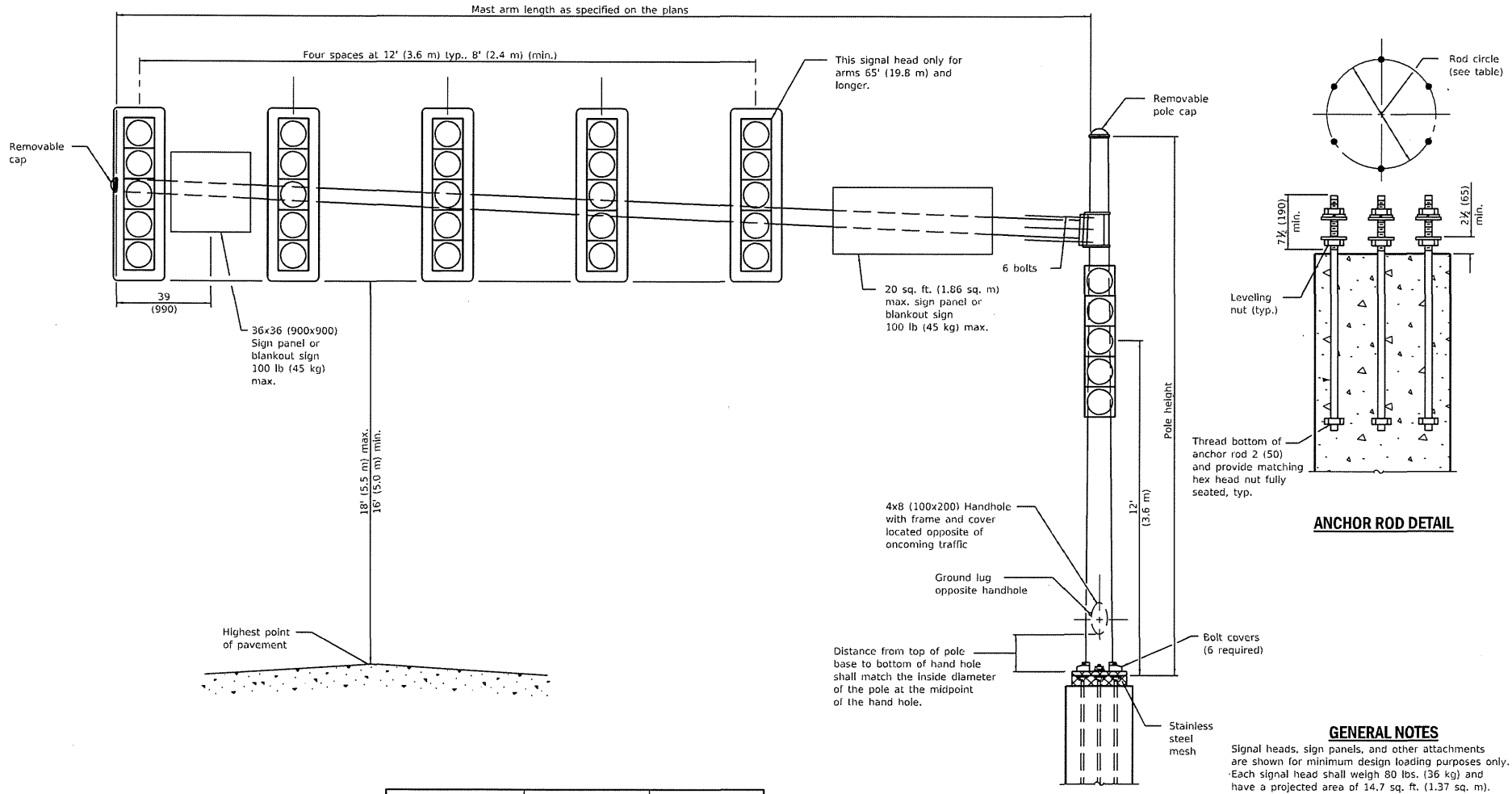
APPROVED January 1, 2020
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

DATE	REVISIONS
1-1-20	Revised mast arm length.
1-1-18	Revised table for LRFD reqs.
	Revised GEN. NOTES for sign
	locaton. Replaced rod hooks
	with nuts.

STEEL MAST ARM ASSEMBLY AND POLE 16' THROUGH 55'

STANDARD 877001-08



ANCHOR ROD DETAIL

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
56' thru 64' (17.07 m thru 19.51 m)	24 (610)	1¾ x 7' (44 x 2.10 m)
65' thru 75' (19.81 m thru 22.86 m)	27 (685)	2 x 7'-6" (51 x 2.29 m)

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lbs. (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panel or blankout sign closest to pole.

All dimensions are in inches (millimeters) unless otherwise shown.

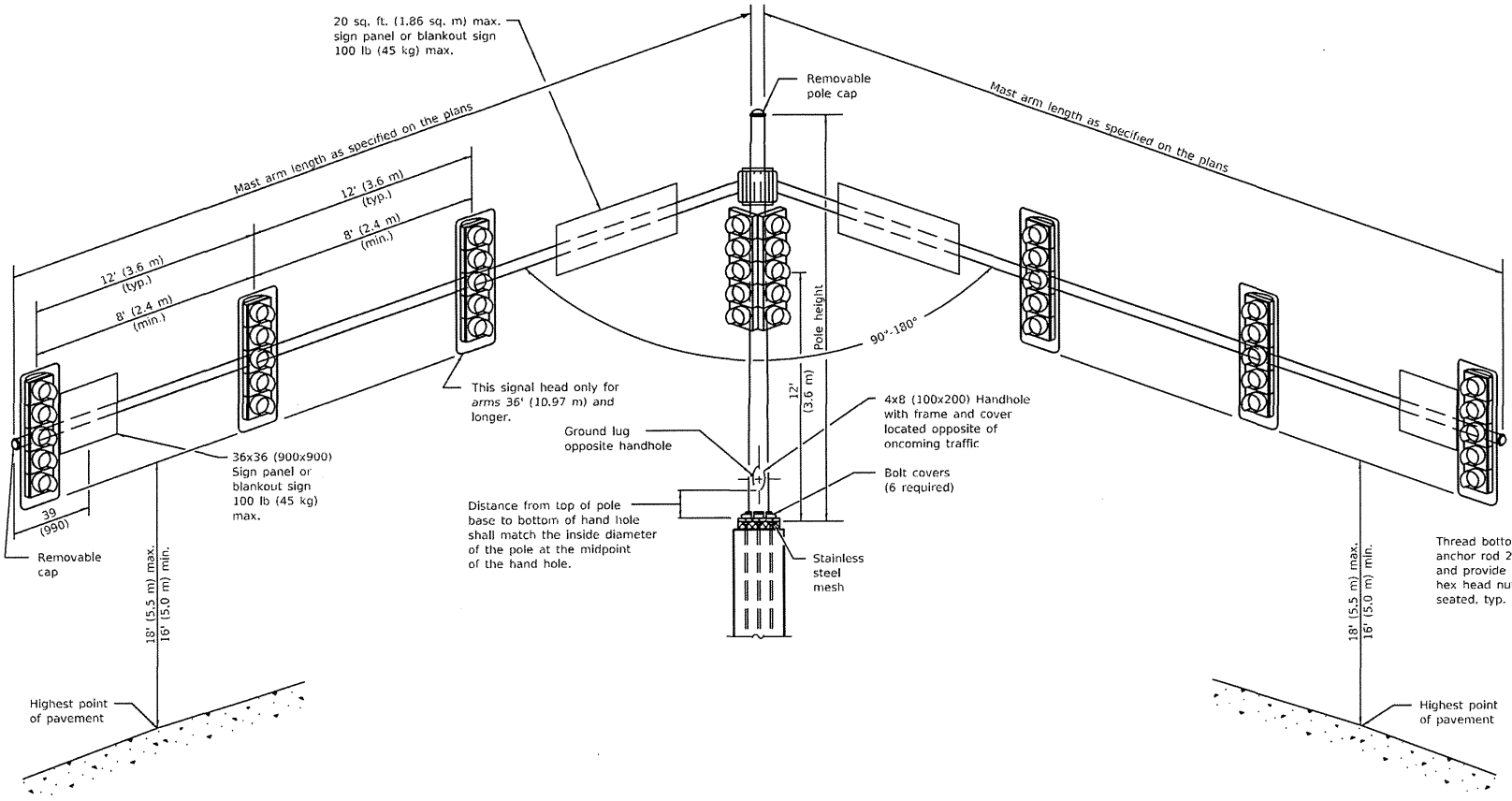
Illinois Department of Transportation

PASSED January 1, 2018
ENGINEER OF OPERATIONS
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED 1-1-18

DATE	REVISIONS
1-1-18	Rev. hand hole loc. Rev. Gen. Notes for sign loc. Replaced rod hooks with nuts.
4-1-16	Changed sign panel to 36x36 and 100 lb max.

STEEL MAST ARM ASSEMBLY AND POLE 56' THROUGH 75'

STANDARD 877002-04



ANCHOR ROD DETAIL

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
16' thru 30' (4.87 m thru 9.14 m)	18 (450)	1¾ x 7' (44 x 2.10 m)
32' thru 50' (9.75 m thru 15.24 m)	21 (535)	2 x 7'-6" (51 x 2.29 m)

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panels or blankout signs closest to pole.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2018
ENGINEER OF OPERATIONS

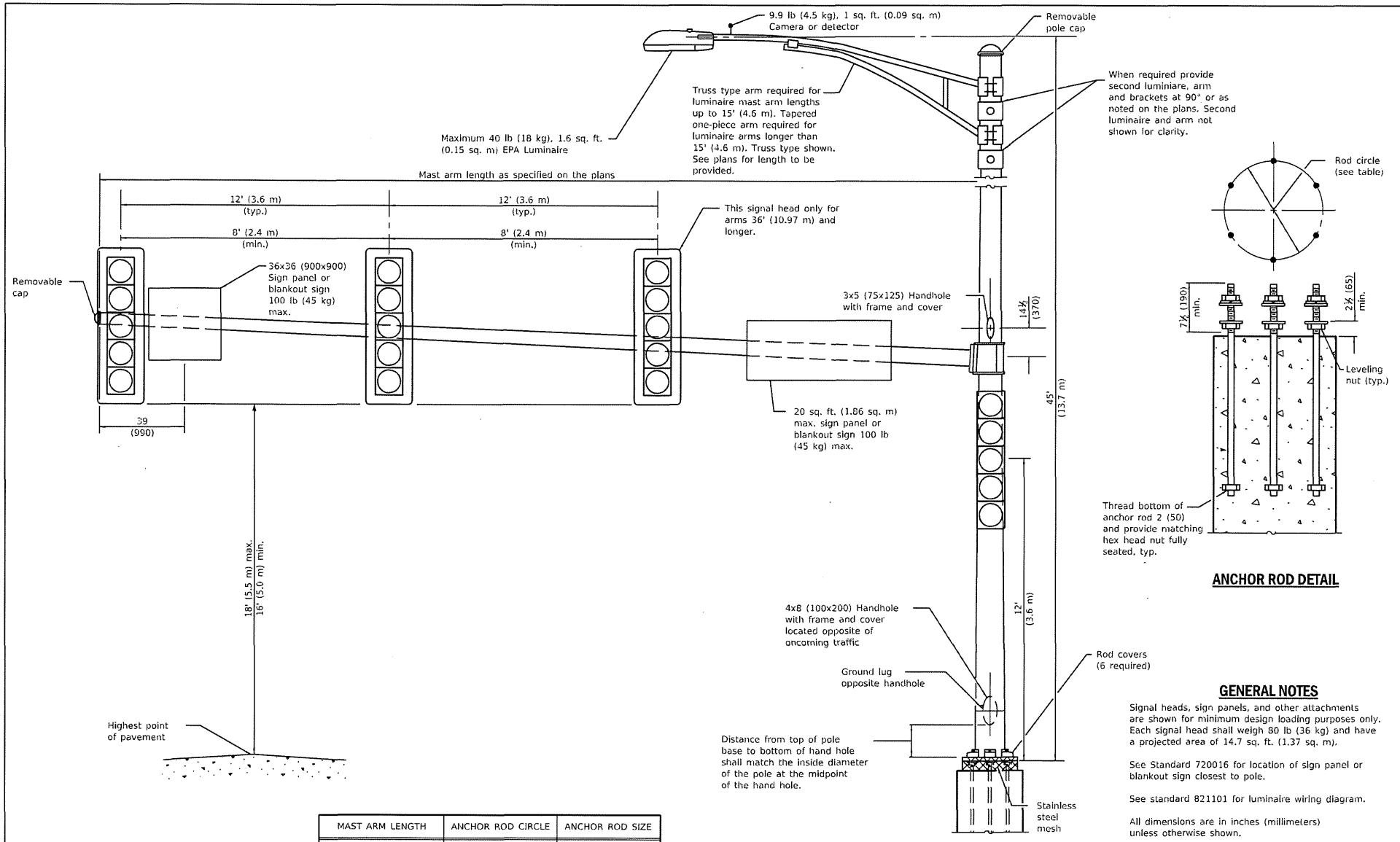
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

DATE	REVISIONS
1-1-18	Revised for RLFD reqs. Revised
	GEN. NOTES for sign locaton.
	Revised ANCHOR ROD DETAIL.
4-1-16	Changed sign panel to 36x36.
	Added max weight of 100 lb.
	Modified dim. to outer signal.

STEEL MAST ARM ASSEMBLY AND POLE WITH DUAL MAST ARMS

STANDARD 877006-06



ANCHOR ROD DETAIL

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
16' thru 35' (4.87 m thru 10.67 m)	18 (450)	1¾ x 7' (44 x 2.10 m)
36' thru 55' (10.97 m thru 16.80 m)	21 (535)	1¾ x 7' (44 x 2.10 m)

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panel or blankout sign closest to pole.

See standard 821101 for luminaire wiring diagram.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF OPERATIONS

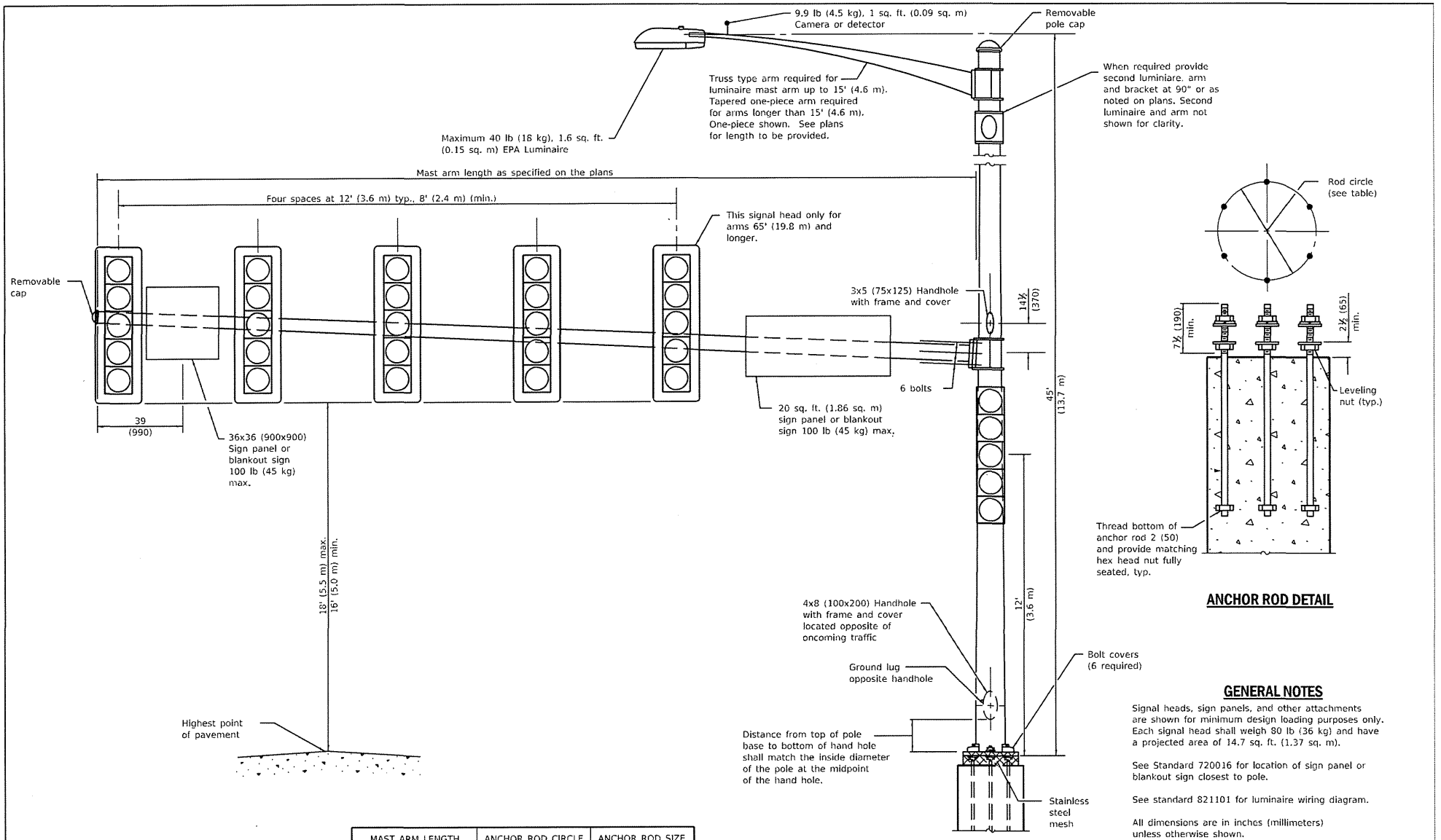
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

DATE	REVISIONS
1-1-19	Remove tenon top info.
	Rev. luminaire arm info.
	Rev. second luminaire info.
1-1-18	Revised for LRFD reqs. Revised
	GEN. NOTES for sign locaton.
	Revised ANCHOR ROD DETAIL.

STEEL COMB. MAST ARM ASSEMBLY AND POLE 16' THROUGH 55'

STANDARD 877011-10



ANCHOR ROD DETAIL

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
56' thru 64' (17.07 m thru 19.51 m)	24 (610)	1¾ x 7' (44 x 2.10 m)
65' thru 75' (19.81 m thru 22.86 m)	27 (685)	2 x 7'-6" (51 x 2.29 m)

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panel or blankout sign closest to pole.

See standard 821101 for luminaire wiring diagram.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2019
ENGINEER OF OPERATIONS

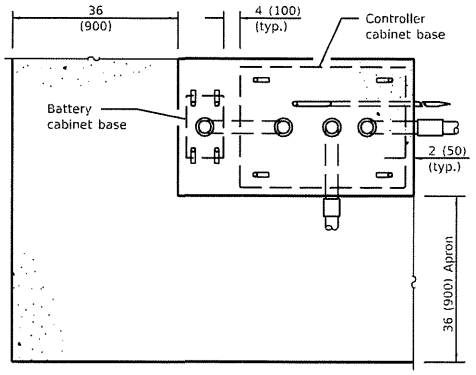
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-08

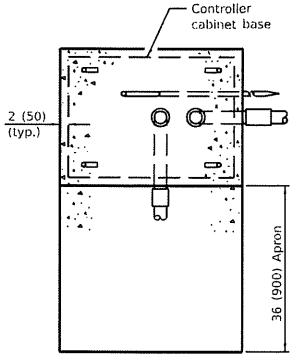
DATE	REVISIONS
1-1-19	Remove tenon top info.
	Rev. luminaire arm info.
	Rev. second luminair info.
1-1-18	Rev. hand hole location. Rev.
	Gen. Notes for sign location.
	Replaced rod hooks with nuts.

STEEL COMB. MAST ARM ASSEMBLY AND POLE 56' THROUGH 75'

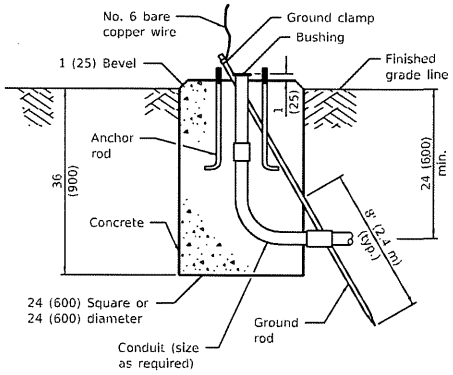
STANDARD 877012-07



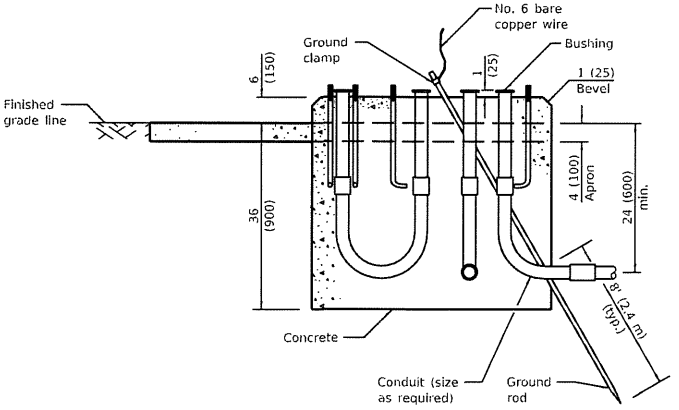
TOP VIEW



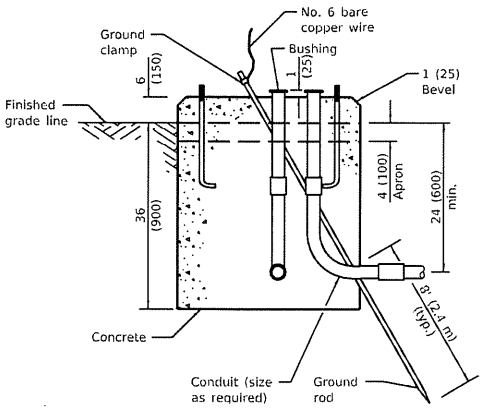
TOP VIEW



TYPE A



TYPE C
FOR GROUND MOUNTED
CONTROLLER CABINET
AND UPS BATTERY CABINET



TYPE D
FOR GROUND MOUNTED
CONTROLLER CABINET

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2021
ENGINEER OF OPERATIONS

APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

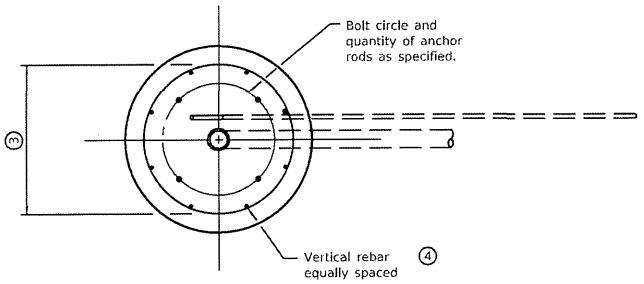
ISSUED 1-1-07

DATE	REVISIONS
1-1-21	Revised anchor rod end in
	Type E detail.
1-1-15	Revised TYPE E detail.

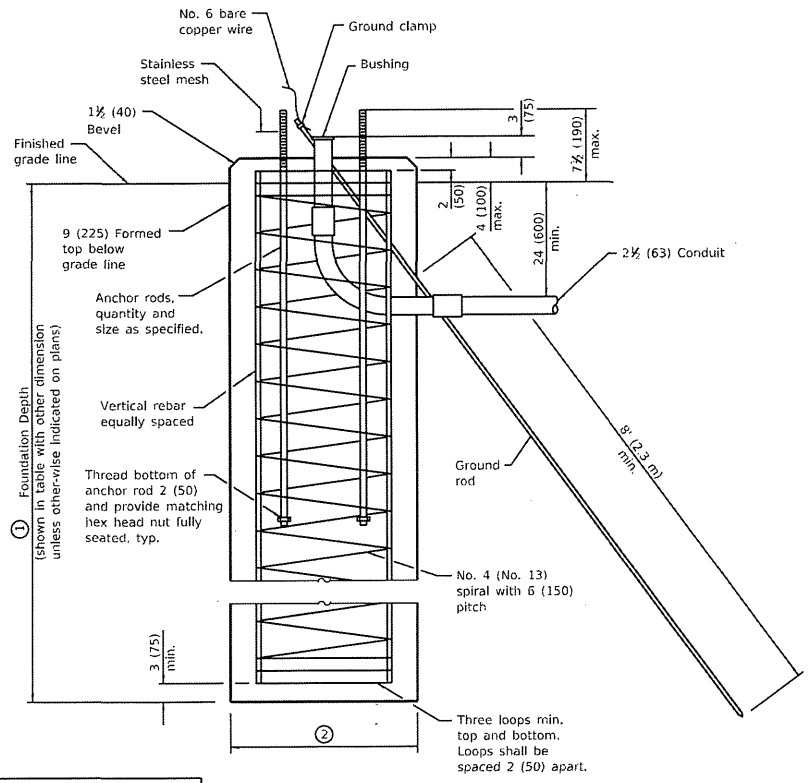
CONCRETE FOUNDATION DETAILS

(Sheet 1 of 2)

STANDARD 878001-11



TOP VIEW



TYPE E

Mast Arm Length	① Foundation Depth *	② Foundation Diameter	③ Spiral Diameter	④ Quantity of Rebars	Size of Rebars
Less than 30' (9.1 m)	10'-0" (3.0 m)	30 (750)	24 (600)	8	6 (19)
Greater than or equal to 30' (9.1 m) and less than 40' (12.2 m)	13'-6" (4.1 m)	30 (750)	24 (600)	8	6 (19)
	11'-0" (3.4 m)	36 (900)	30 (750)	12	7 (22)
Greater than or equal to 40' (12.2 m) and less than 50' (15.2 m)	13'-0" (4.0 m)	36 (900)	30 (750)	12	7 (22)
Greater than or equal to 50' (15.2 m) and up to 55' (16.8 m)	15'-0" (4.6 m)	36 (900)	30 (750)	12	7 (22)
Greater than or equal to 56' (16.8 m) and less than 65' (19.8 m)	21'-0" (6.4 m)	42 (1060)	36 (900)	16	8 (25)
Greater than or equal to 65' (19.8 m) and up to 75' (22.9 m)	25'-0" (7.6 m)	42 (1060)	36 (900)	16	8 (25)

* For standard and combination mast arm assemblies. Foundation depths for standard dual mast arms with the longest arm length upto and including 55' (16.8 m) shall be increased by 1' (0.3 m) of that shown in the table, based on the longer of the two arms.

These foundation depths are for sites which have cohesive soils (clayey silt, sandy clay, etc.) along the length of the shaft, with an average Unconfined Compressive Strength (Qu) > 1.0 tsf (100 kpa). This strength shall be verified by boring data prior to construction or with testing by the Engineer during foundation drilling. The Bureau of Bridges & Structures should be contacted for a revised design if other conditions are encountered.

Illinois Department of Transportation

PASSED January 1, 2021
ENGINEER OF OPERATIONS

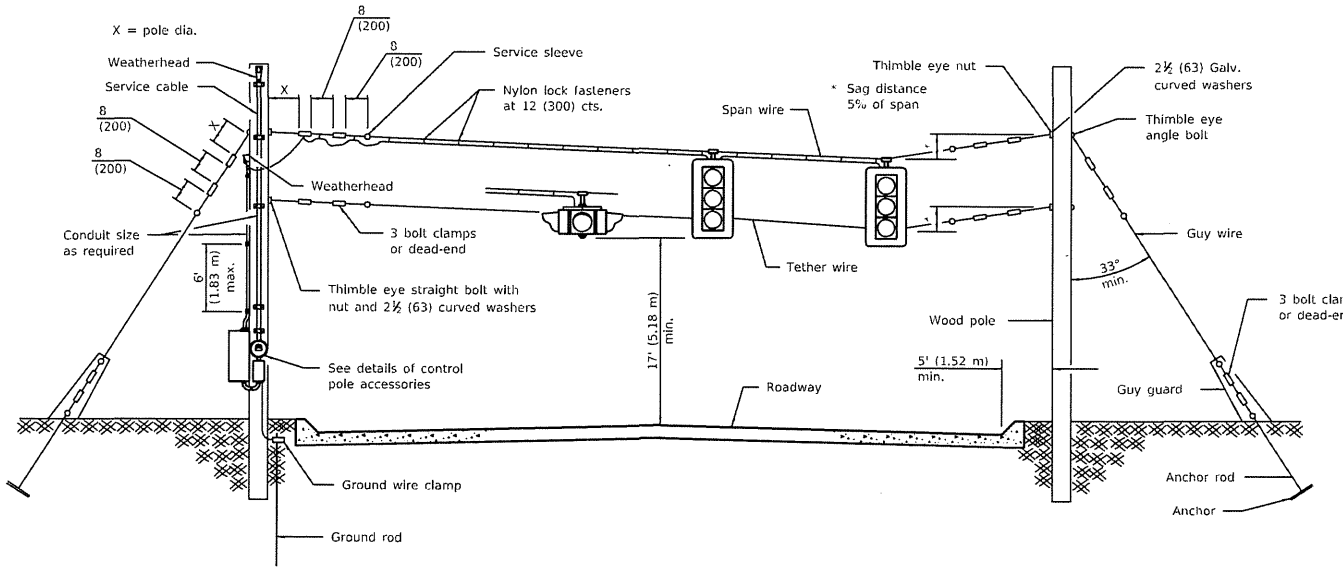
APPROVED January 1, 2021
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-21

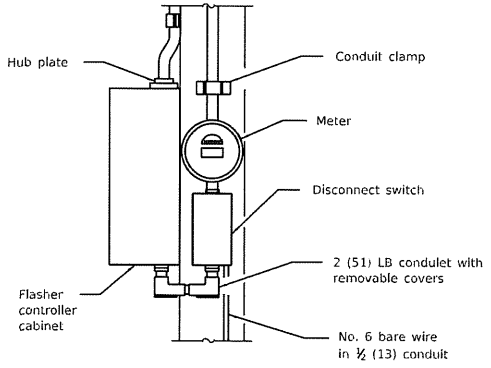
CONCRETE FOUNDATION DETAILS

(Sheet 2 of 2)

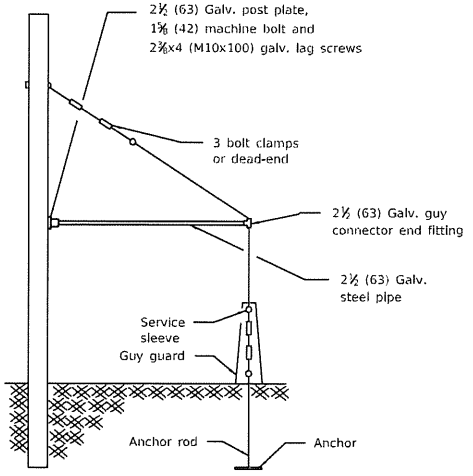
STANDARD 878001-11



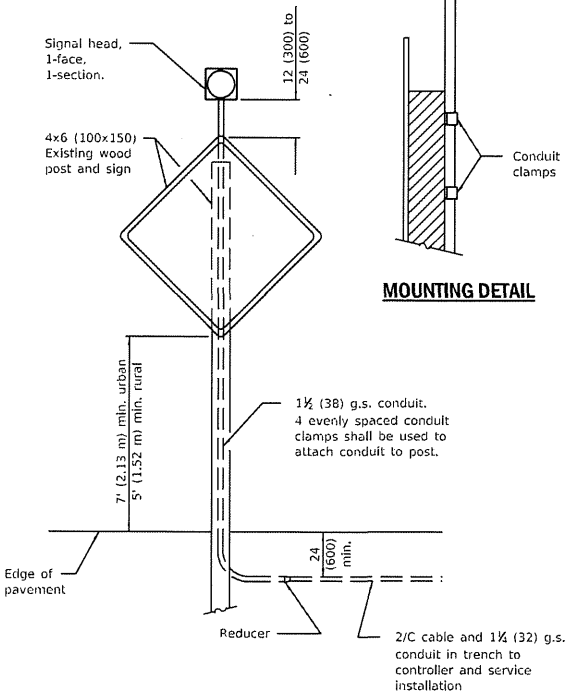
SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON



CONTROL POLE DETAIL



SIDEWALK GUY DETAIL



POST MOUNTED FLASHING BEACON

MOUNTING DETAIL

All dimensions are in inches (millimeters) unless otherwise shown.

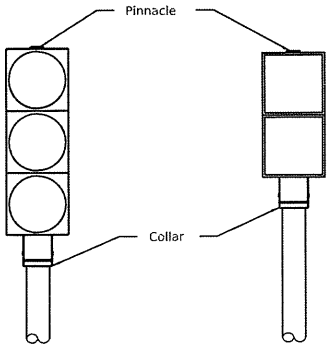
Illinois Department of Transportation

PASSED January 1, 2009
ENGINEER OF OPERATIONS
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT
ISSUED 1-1-09

DATE	REVISIONS
1-1-09	Switched units to
	English (metric).
1-1-02	Renum. Standard 840001.

SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON INSTALLATION

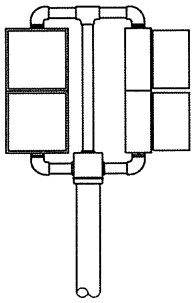
STANDARD 880001-01



POST MOUNTED TRAFFIC SIGNAL HEAD

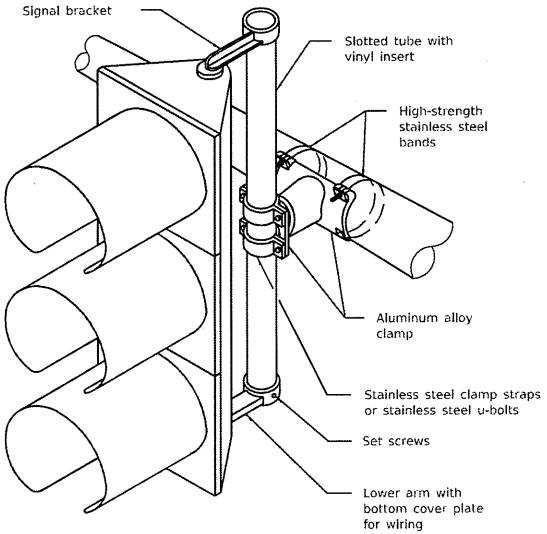
POST MOUNTED PEDESTRIAN SIGNAL HEAD

ONE WAY

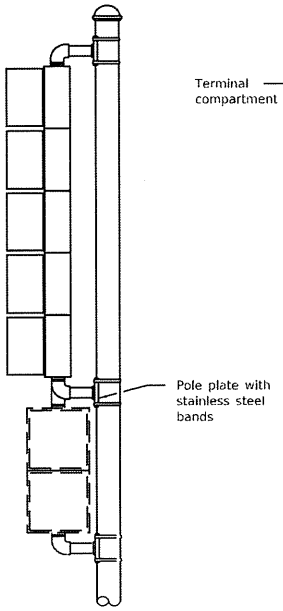


POST MOUNTED PEDESTRIAN SIGNAL HEAD

TWO WAY

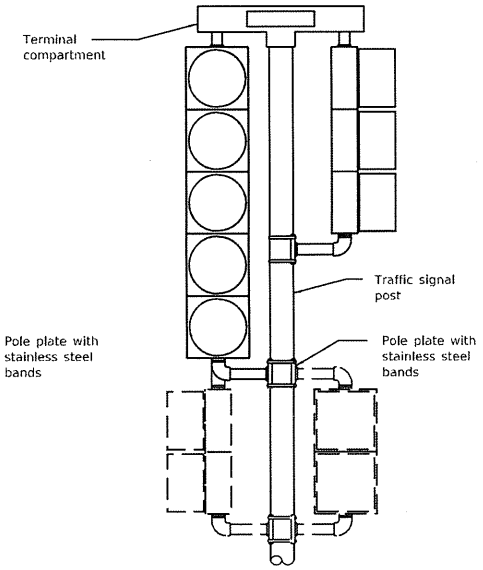


STEEL MAST ARM MOUNTING

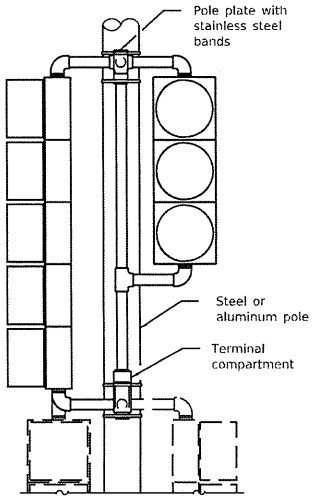


BRACKET MOUNTED TRAFFIC SIGNAL HEAD

ONE WAY



BRACKET MOUNTED TRAFFIC SIGNAL HEAD



BRACKET MOUNTED TRAFFIC SIGNAL HEAD

TWO WAY

Illinois Department of Transportation

PASSED January 1, 2009
ENGINEER OF OPERATIONS

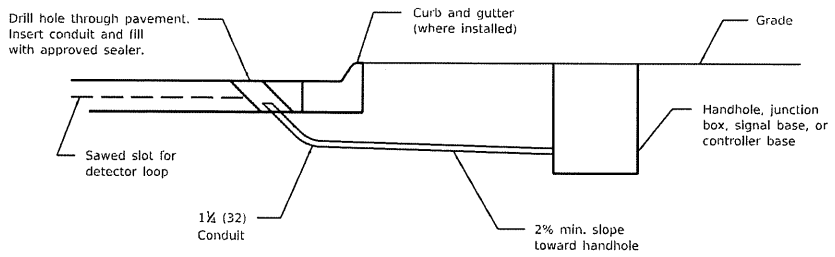
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-09

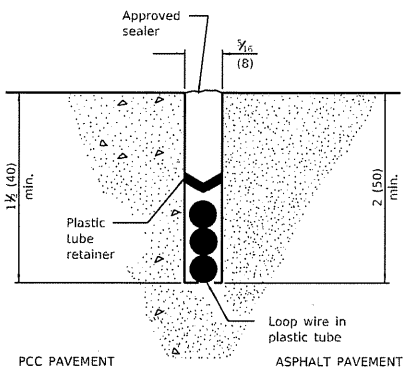
DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
1-1-02	Renum. Standard 840006.

TRAFFIC SIGNAL MOUNTING DETAILS

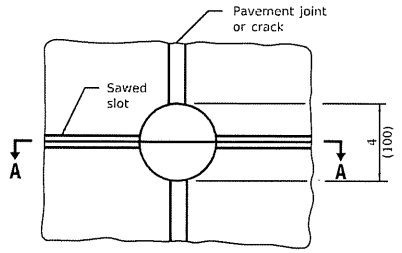
STANDARD 880006-01



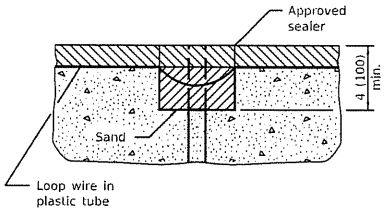
DETECTOR LOOP LEAD-IN



DETECTOR LOOP INSTALLATION



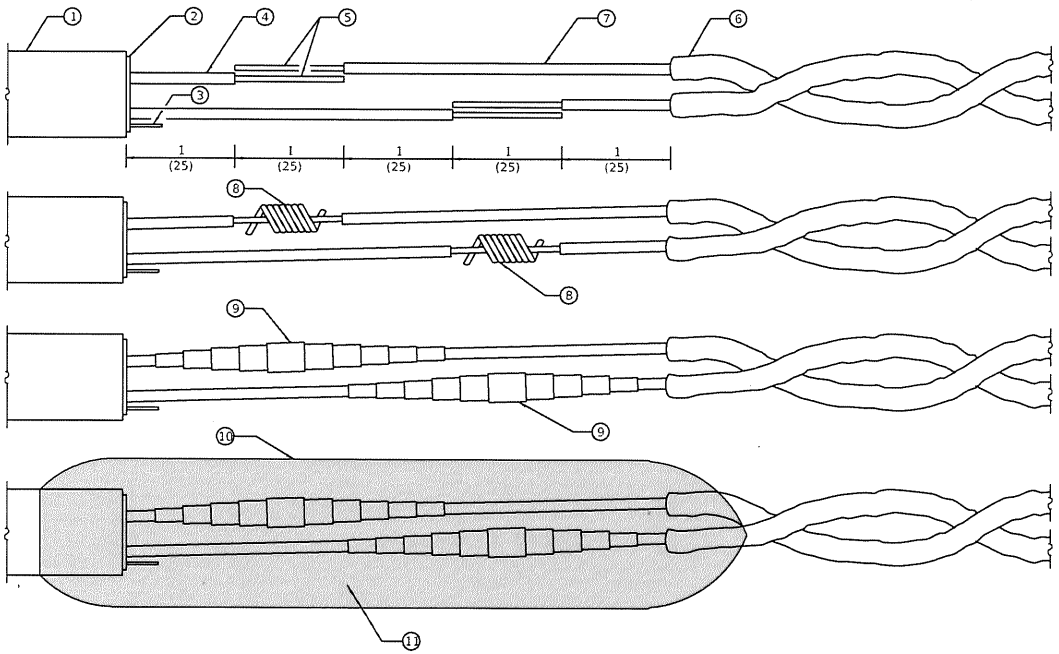
PLAN



SECTION A-A

NOTE
Loop wire shall follow saw cut to bottom, forming slack section at joint.

DETECTOR LOOP AT PAVEMENT JOINT OR PAVEMENT CRACK



LOOP WIRE AND LEAD-IN CABLE SPLICE

① = Lead-in cable (single pair or multipair)
② = Lead-in cable shield
③ = Lead-in cable shield drain-wire
④ = Lead-in cable insulated conductor
⑤ = Bare conductor
⑥ = Loop wire in tube
⑦ = Loop wire insulated conductor
⑧ = Twisted and resin soldered conductor
⑨ = Electrical tape insulated spice
⑩ = Rigid mold
⑪ = Waterproof and dielectric resin

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009
ENGINEER OF OPERATIONS

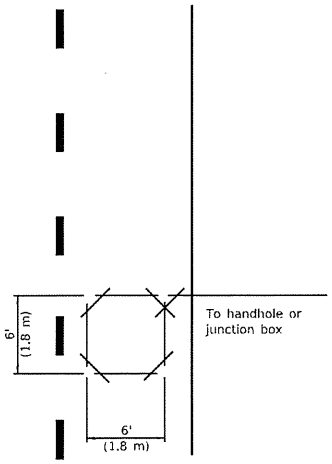
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

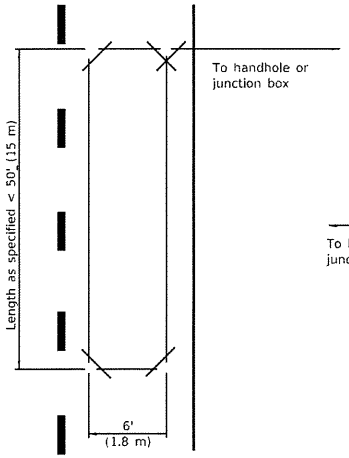
DATE	REVISIONS
1-1-09	Switched units to
	English (metric)
1-1-02	Renum. Standard 846001.

DETECTOR LOOP INSTALLATIONS

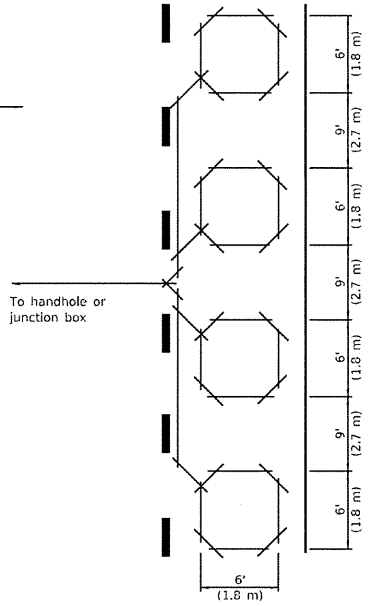
STANDARD 886001-01



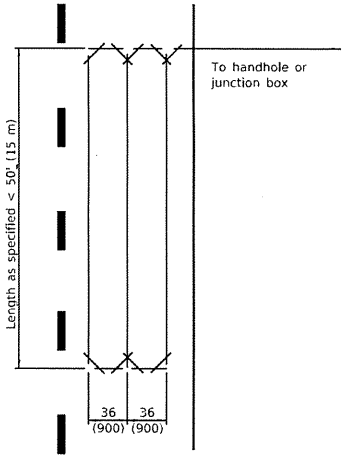
FOR POINT DETECTION
SHORT LOOP



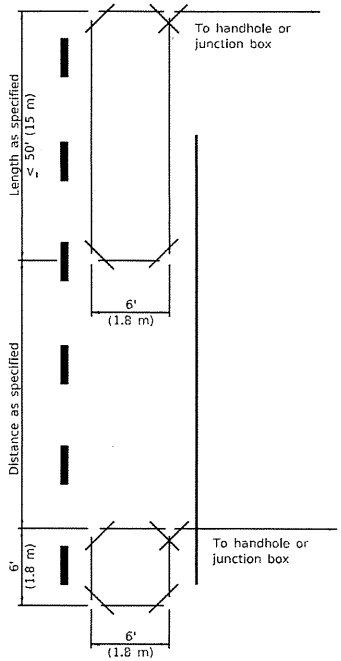
FOR PRESENCE DETECTION
LONG LOOP



FOR PRESENCE DETECTION
MULTIPLE LOOP IN SERIES

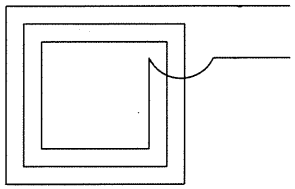


FOR PRESENCE DETECTION
QUADRUPOLE LOOP

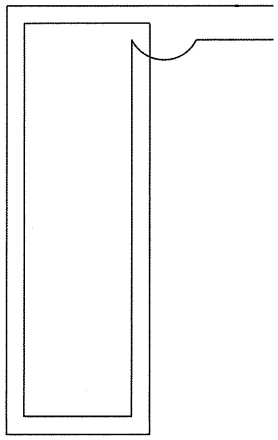


FOR EXTENDED-CALL DETECTION

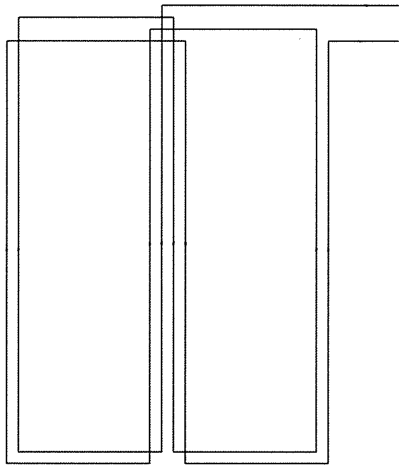
SLOT PLAN



SHORT LOOP



LONG LOOP



QUADRUPOLE LOOP

WIRING DIAGRAM

All dimensions are in inches (millimeters)
unless otherwise shown.

DATE	REVISIONS
1-1-09	Switched units to English (metric)
1-1-02	Renum. Standard 846006.

TYPICAL LAYOUTS FOR DETECTION LOOPS

STANDARD 886006-01

Illinois Department of Transportation

PASSED January 1, 2009
ENGINEER OF OPERATIONS

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02

INTENTIONALLY

BLANK