RETURN WITH BID

Illinois Department of Transportation

Local Public Agency
Formal Contract Proposal

PROPOSAL SUBMITTED BY		
Contractor's Name		
Street		P.O. Box
City	State	Zip Code

NOT FOR BID

STATE OF ILLINOIS

COUNTY OF McHenry

(Name of City, Village, Town or Road District)

FOR THE IMPROVEMENT OF

STREET NAME OR ROUTE NO. Various

SECTION NO. 15-00000-01-GM

TYPES OF FUNDS NON-MFT

☒ SPECIFICATIONS (required) ☐ PLANS (required)

For Municipal Projects

Submitted/Approved/Passed

☐ Mayor ☐ President of Board of Trustees ☐ Municipal Official

Date

Department of Transportation

☒ Released for bid based on limited review

Joseph R Kopecki JR

Regional Engineer

August 15, 2015

Date

For County and Road District Projects

Submitted/Approved

Highway Commissioner

Date

Submitted/~~Approved~~

Joseph R Kopecki JR

County Engineer/Superintendent of Highways

August 15, 2014

Date

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

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

County McHenry
Local Public Agency McHenry County
Section Number 15-00000-01-GM
Route Various

NOTICE TO BIDDERS

Sealed proposals for the improvement described below will be received at the office of McHenry County DOT,
16111 Nelson Rd Woodstock, IL 60098 (Address) until 10:00 AM (Time) on September 11, 2014 (Date)

Sealed proposals will be opened and read publicly at the office of McHenry County DOT
16111 Nelson Rd Woodstock, IL 60098 (Address) at 10:00 AM (Time) on September 11, 2014 (Date)

DESCRIPTION OF WORK

Name 2015 Traffic Signal and Highway Lighting Maintenance Length: _____ feet (_____ miles)
Location _____
Proposed Improvement 2015 traffic signal and highway lighting maintenance. Also includes maintenance of flashers and RWIS locations.

1. Plans and proposal forms will be available in the office of McHenry County Division of Transportation
16111 Nelson Road Woodstock, IL 60098 (Address)

2. ☒ Prequalification
If checked, the 2 low bidders must file within 24 hours after the letting an "Affidavit of Availability" (Form BC 57), in duplicate, 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 one original 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. BLR 12200: Local Public Agency Formal Contract Proposal
   b. BLR 12200a Schedule of Prices
   c. BLR 12230: Proposal Bid Bond (if applicable)
   d. BLR 12325: Apprenticeship or Training Program Certification (**do not use for federally funded projects**)
   e. BLR 12326: Affidavit of Illinois Business Office

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.

PROPOSAL

County McHenry
Local Public Agency McHenry County
Section Number 15-00000-01-GM
Route Various

1. Proposal of _____

for the improvement of the above section by the construction of 2015 traffic signal and highway lighting maintenance. Also includes maintenance of flashers and RWIS locations.

a total distance of _____ feet, of which a distance of _____ feet, (miles) are to be improved.

2. The plans for the proposed work are those prepared by McHenry County Division of Transportation and approved by the Department of Transportation on _____
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. 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:

William LeFew Treasurer of McHenry County

The amount of the check is 5 % Bid Bond ( ).

7. in the event that one proposal guaranty check is intended to cover two or more proposals, the amount must be equal to the sum of the proposal guaranties, which would be required for each individual proposal. If the proposal guaranty check is placed in another proposal, it will be found in the proposal for: Section Number 15-00000-01-GM.
8. 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 or check shall be forfeited to the Awarding Authority.
9. 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 product 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.
10. A bid will be declared unacceptable if neither a unit price nor a total price is shown.
11. The undersigned submits herewith the schedule of prices on BLR 12200a covering the work to be performed under this contract.
12. The undersigned further agrees that if awarded the contract for the sections contained in the combinations on BLR 12200a, 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.

RETURN WITH BID

Illinois Department of Transportation

SCHEDULE OF PRICES

County McHenry
Local Public Agency McHenry County
Section 15-00000-01-GM
Route Various

Schedule for Multiple Bids

Combination Letter	Sections Included in Combinations	Total

Schedule for Single Bid

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

Bidder's Proposal for making Entire Improvements

Item No.	Items	Unit	Quantity	Unit Price	Total
	See Following Schedule of Prices Sheets				

SCHEDULE OF PRICES

McHenry County Division of Transportation

ITEM NO.	ITEM DESCRIPTION	Estimated Quantity	Unit	Unit Price	Total Price
	TRAFFIC SIGNAL AND STREET LIGHTING MONTHLY ROUTINE MAINTENANCE				
A-1	TRAFFIC SIGNAL LOCATION	38	Each	/MO.	/MO.
A-2	TEMPORARY TRAFFIC SIGNAL LOCATION	2	Each	/MO.	/MO.
A-3	FLASHING BEACON (OVERHEAD MOUNT)	2	Each	/MO.	/MO.
A-4	FLASHING BEACON (POST MOUNT)	33	Each	/MO.	/MO.
B-1	STREET LIGHT LOCATION	525	Each	/MO.	/MO.
C-1	RWIS (ROAD WEATHER INFORMATION SYSTEM)	4	Each	/MO.	/MO.
	Monthly Subtotal for Routine Maintenance (A, B, and C Items)				/MO.
D-1	HOURLY RATE FOR EXTRA WORK	400	Hour		
	Subtotal for Extra Work (D Item)				
	TRAFFIC SIGNAL EQUIPMENT				
				NOT FOR BID	
E-1	FULL ACTUATED CONTROLLER & TYPE IV CABINET, NEMA-TS2	1	Each		
E-2	FULL ACTUATED CONTROLLER & TYPE V CABINET, NEMA-TS2	1	Each		
E-3	FULL ACTUATED CONTROLLER & TYPE IV CABINET, MODIFIED 65", NEMA-TS2	1	Each		
E-4	INSTALL FULL ACTUATED CONTROLLER	1	Each		
E-5	INSTALL MASTER CONTROLLER	1	Each		
E-6	INDUCTIVE LOOP SEALANT	150	Foot		

INTENTIONALLY

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SCHEDULE OF PRICES

McHenry County Division of Transportation

ITEM NO.	ITEM DESCRIPTION	Estimated Quantity	Unit	Unit Price	Total Price
E-7	INDUCTIVE LOOP DETECTOR AMPLIFIER WITH CALLING DETECTOR RELAY, DIGITAL DESIGN	4	Each		
E-8	DETECTOR LOOP, TYPE I	400	Foot		
E-9	TRANSCEIVER - FIBER OPTIC	2	Each		
E-10	SERVICE INSTALLATION	2	Each		
E-11	SERVICE INSTALLATION, GROUND MOUNT	2	Each		
E-12	CONCRETE FOUNDATION, TYPE A	12	Foot		
E-13	CONCRETE FOUNDATION, TYPE E (30-INCH)	15	Foot		
E-14	CONCRETE FOUNDATION, TYPE E (36-INCH)	30	Foot		
E-15	CONCRETE FOUNDATION, TYPE E (42-INCH)	30	Foot		
E-16	CONCRETE FOUNDATION, TYPE C	12	Foot		
E-17	CONCRETE HANDHOLE	2	Each	NOT FOR BID	
E-18	CONCRETE HEAVY DUTY HANDHOLE	2	Each		
E-19	CONCRETE DOUBLE HANDHOLE	2	Each		
E-20	REBUILD EXISTING HANDHOLE	2	Each		
E-21	REBUILD EXISTING HEAVY DUTY HANDHOLE	2	Each		
E-22	REBUILD EXISTING DOUBLE HANDHOLE	2	Each		
E-23	ROTATE SIGNAL PHASING AT AN EXISTING TRAFFIC SIGNAL INTERSECTION	2	Each		
E-24	DRILL EXISTING HANDHOLE	4	Each		
E-25	INDUSTRIAL GRADE MODEM	2	Each		
E-26	VIDEO DETECTION SYSTEM (BY APPROACH/LEG)	4	Each		
	Subtotal for Signal Equipment (E Items)				

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SCHEDULE OF PRICES

McHenry County Division of Transportation

ITEM NO.	ITEM DESCRIPTION	Estimated Quantity	Unit	Unit Price	Total Price
	TEMPORARY TRAFFIC SIGNAL INSTALLATION				
				NOT FOR BID	
F-1	INSTALL TEMPORARY TRAFFIC SIGNAL, FOUR APPROACHES OR LESS	1	Each		
F-2	REMOVE EXISTING TEMPORARY TRAFFIC SIGNAL, FOUR APPROACHES OR LESS	1	Each		
	Subtotal for Temporary Signal (F Items)				
	CALCULATION OF TOTAL CONTRACT PRICE				
1)	Subtotal for Routine Maintenance (A, B, and C Items) YEARLY TOTAL = {MONTHLY SUBTOTAL FOR ROUTINE MAINTENANCE (A, B, and C ITEMS) X 12 MONTHS}				/YR.
2)	Subtotal for Extra Work (D Item)				
3)	Subtotal for Signal Equipment (E Items)				
4)	Subtotal for Temporary Signal (F Items)				
	TOTAL CONTRACT PRICE [SUM OF ITEMS/LINES 1) THROUGH 4)]				

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CONTRACTOR CERTIFICATIONS

County McHenry
Local Public Agency McHenry County
Section Number 15-00000-01-GM
Route Various

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 Deliquency.** 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 procedures established by the appropriate revenue Act, its liability for the tax or the amount of 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 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 in 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 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 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 in 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 of 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 cancelled.

County McHenry
Local Public Agency McHenry County
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SIGNATURES

(If an individual)

Signature of Bidder _____

Business Address _____

(If a partnership)

Firm Name _____

Signed By _____

Business Address _____

Inset Names and Addressed of All Partners _____ NOT FOR BID

(If a corporation)

Corporate Name _____

Signed By _____
President

Business Address _____

insert Names of Officers
President _____
Secretary _____
Treasurer _____

Attest: _____
Secretary

Illinois Department of Transportation

Local Agency Proposal Bid Bond

Route Various
County McHenry
Local Agency McHenry County
Section 15-00000-01-GM

RETURN WITH BID

PAPER BID BOND

WE _____ as PRINCIPAL,

and _____ as SURETY,

are held jointly, severally and firmly bound unto the above Local Agency (hereafter referred to as "LA") 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 LA 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 LA 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 LA 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 LA determines the PRINCIPAL has failed to enter into a formal contract in compliance with any requirements set forth in the preceding paragraph, then the LA 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 _____

Principal

NOT FOR BID

_____ (Company Name)

By: _____ (Signature and Title)

_____ (Company Name)

By: _____ (Signature and Title)

(If PRINCIPLE 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)

By: _____ (Signature of Attorney-in-Fact)

STATE OF ILLINOIS,
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 of _____

My commission expires _____

_____ (Notary Public)

ELECTRONIC BID BOND

☐ **Electronic bid bond is allowed (box must be checked by LA 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 LA 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 and Title)

_____ Date

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RETURN WITH BID

Illinois Department of Transportation

Affidavit of Illinois Business Office

County McHenry
Local Public Agency McHenry County
Section Number 15-00000-01-GM
Route Various

State of Illinois)
) ss.
County of McHenry)

NOT FOR BID

I, _____ of _____, _____,
(Name of Affiant) (City of Affiant) (State of Affiant

being first duly sworn upon oath, states 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 this proposal, _____, will maintain a
(bidder)
business office in the State of Illinois which will be located in _____ County, Illinois.
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)

_____
(Print Name of Affiant)

This instrument was acknowledged before me on day of _____, _____.

(SEAL)

_____
(Signature of Notary Public)

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Illinois Department of Transportation

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

Affidavit of Availability
For the Letting of 9/11/2014

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	
Contract Number						
Contract With						
Estimated Completion Date						
Total Contract Price		NOT FOR BID				Accumulated Totals
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.

						Accumulated Totals
Earthwork						
Portland Cement Concrete Paving						
HMA Plant Mix						
HMA Paving						
Clean & Seal Cracks/Joints						
Aggregate Bases & Surfaces						
Highway, R.R. and Waterway Structures						
Drainage						
Electrical						
Cover and Seal Coats						
Concrete Construction						
Landscaping						
Fencing						
Guardrail						
Painting						
Signing						
Cold Milling, Planning & Rotomilling						
Demolition						
Pavement Markings (Paint)						
Other Construction (List)						
						$ 0.00
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					

I, being duly sworn, do hereby declare that 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.

Subscribed and sworn to before me

this _____ day of _____ , _____ Type or Print Name _____

Officer or Director Title

_____ Signed _____

Notary Public

My commission expires _____

Company _____

(Notary Seal)

Address _____

_____

Illinois Department of Transportation

Apprenticeship or Training Program Certification

Return with Bid

Route Various
County McHenry
Local Agency McHenry County
Section 15-00000-01-GM

All contractors are required to complete the following certification:

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

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

NOT FOR BID

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 bidders' 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:

I. Except as provided in paragraph IV 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.

II. The undersigned bidder further certifies for work to be performed by subcontract that each of its subcontractors submitted for approval 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.

III. 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.

IV. Except for any work identified above, any bidder or subcontractor that 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 workforce and positions of ownership. ☐

NOT FOR BID

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 after award 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: _____ By: _____
(Signature)

Address: _____ Title: _____

Mchenry County Prevailing Wage for July 2014

(See explanation of column headings at bottom of wages)

Trade Name	RG	TYP	C	Base	FRMAN	M-F>8	OSA	OSH	H/W	Pensn	Vac	Trng
ASBESTOS ABT-GEN		ALL		38.200	38.700	1.5	1.5	2.0	13.42	10.48	0.000	0.500
ASBESTOS ABT-MEC		BLD		35.100	37.600	1.5	1.5	2.0	11.17	10.76	0.000	0.720
BOILERMAKER		BLD		44.240	48.220	2.0	2.0	2.0	6.970	17.54	0.000	0.350
BRICK MASON		BLD		41.580	45.740	1.5	1.5	2.0	9.700	12.80	0.000	1.040
CARPENTER		ALL		42.520	44.520	1.5	1.5	2.0	13.29	12.76	0.000	0.630
CEMENT MASON		ALL		42.900	44.900	2.0	1.5	2.0	9.900	16.32	0.000	0.500
CERAMIC TILE FNSHER		BLD		35.810	0.000	1.5	1.5	2.0	10.55	8.440	0.000	0.710
COMMUNICATION TECH		BLD		36.360	38.460	1.5	1.5	2.0	12.27	10.25	0.000	0.640
ELECTRIC PWR EQMT OP		ALL		37.890	51.480	1.5	1.5	2.0	5.000	11.75	0.000	0.380
ELECTRIC PWR GRNDMAN		ALL		29.300	51.480	1.5	1.5	2.0	5.000	9.090	0.000	0.290
ELECTRIC PWR LINEMAN		ALL		45.360	51.480	1.5	1.5	2.0	5.000	14.06	0.000	0.450
ELECTRIC PWR TRK DRV		ALL		30.340	51.480	1.5	1.5	2.0	5.000	9.400	0.000	0.300
ELECTRICIAN		ALL		43.660	48.030	1.5	1.5	2.0	12.88	12.29	0.000	0.760
ELEVATOR CONSTRUCTOR		BLD		49.900	56.140	2.0	2.0	2.0	12.73	13.46	3.990	0.600
FENCE ERECTOR	E	ALL		35.840	37.840	1.5	1.5	2.0	13.01	11.51	0.000	0.300
FENCE ERECTOR	S	ALL		45.060	48.660	2.0	2.0	2.0	10.52	18.81	0.000	0.400
GLAZIER		BLD		40.000	41.500	1.5	2.0	2.0	12.49	15.99	0.000	0.940
HT/FROST INSULATOR		BLD		46.950	49.450	1.5	1.5	2.0	11.17	11.96	0.000	0.720
IRON WORKER	E	ALL		43.000	45.000	2.0	2.0	2.0	13.45	20.65	0.000	0.350
IRON WORKER	S	ALL		45.060	48.660	2.0	2.0	2.0	10.52	18.81	0.000	0.400
IRON WORKER	W	ALL		36.290	38.100	2.0	2.0	2.0	8.640	22.69	0.000	0.500
LABORER		ALL		38.000	38.750	1.5	1.5	2.0	13.42	10.48	0.000	0.500
LATHER		ALL		42.520	44.520	1.5	1.5	2.0	13.29	12.76	0.000	0.630
MACHINIST		BLD		44.350	46.850	1.5	1.5	2.0	6.760	8.950	1.850	0.000
MARBLE FINISHERS		ALL		30.520	0.000	1.5	1.5	2.0	9.700	12.55	0.000	0.590
MARBLE MASON		BLD		40.780	44.860	1.5	1.5	2.0	9.700	12.71	0.000	0.740
MATERIAL TESTER I		ALL		28.000	0.000	1.5	1.5	2.0	13.42	10.48	0.000	0.500
MATERIALS TESTER II		ALL		33.000	0.000	1.5	1.5	2.0	13.42	10.48	0.000	0.500
MILLWRIGHT		ALL		42.520	44.520	1.5	1.5	2.0	13.29	12.76	0.000	0.630
OPERATING ENGINEER		BLD	1	47.100	51.100	2.0	2.0	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		BLD	2	45.800	51.100	2.0	2.0	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		BLD	3	43.250	51.100	2.0	2.0	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		BLD	4	41.500	51.100	2.0	2.0	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		BLD	5	50.850	51.100	2.0	2.0	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		BLD	6	48.100	51.100	2.0	2.0	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		BLD	7	50.100	51.100	2.0	2.0	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		HWY	1	45.300	49.300	1.5	1.5	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		HWY	2	44.750	49.300	1.5	1.5	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		HWY	3	42.700	49.300	1.5	1.5	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		HWY	4	41.300	49.300	1.5	1.5	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		HWY	5	40.100	49.300	1.5	1.5	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		HWY	6	48.300	49.300	1.5	1.5	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		HWY	7	46.300	49.300	1.5	1.5	2.0	17.10	11.80	1.900	1.250
ORNAMNTL IRON WORKER	E	ALL		43.900	46.400	2.0	2.0	2.0	13.36	17.24	0.000	0.650
ORNAMNTL IRON WORKER	S	ALL		45.060	48.660	2.0	2.0	2.0	10.52	18.81	0.000	0.400
PAINTER		ALL		40.980	42.980	1.5	1.5	1.5	10.00	8.200	0.000	1.350
PAINTER SIGNS		BLD		33.920	38.090	1.5	1.5	1.5	2.600	2.710	0.000	0.000
PILEDRIVER		ALL		42.520	44.520	1.5	1.5	2.0	13.29	12.76	0.000	0.630
PIPEFITTER		BLD		46.000	49.000	1.5	1.5	2.0	9.000	15.85	0.000	1.780
PLASTERER		BLD		41.250	43.730	1.5	1.5	2.0	11.10	11.69	0.000	0.550
PLUMBER		BLD		46.650	48.650	1.5	1.5	2.0	13.18	11.46	0.000	0.880
ROOFER		BLD		39.700	42.700	1.5	1.5	2.0	8.280	10.06	0.000	0.530

SHEETMETAL WORKER		BLD	43.250	45.250	1.5	1.5	2.0	10.65	12.90	0.000	0.820
SIGN HANGER		BLD	26.070	27.570	1.5	1.5	2.0	3.800	3.550	0.000	0.000
SPRINKLER FITTER		BLD	49.200	51.200	1.5	1.5	2.0	10.75	8.850	0.000	0.450
STEEL ERECTOR	E	ALL	42.070	44.070	2.0	2.0	2.0	13.45	19.59	0.000	0.350
STEEL ERECTOR	S	ALL	45.060	48.660	2.0	2.0	2.0	10.52	18.81	0.000	0.400
STONE MASON		BLD	41.580	45.740	1.5	1.5	2.0	9.700	12.80	0.000	1.040
~~SURVEY WORKER~~-> NOT IN EFFECT			37.000	37.750	1.5	1.5	2.0	12.97	9.930	0.000	0.500
TERRAZZO FINISHER		BLD	37.040	0.000	1.5	1.5	2.0	10.55	10.32	0.000	0.620
TERRAZZO MASON		BLD	40.880	43.880	1.5	1.5	2.0	10.55	11.63	0.000	0.820
TILE MASON		BLD	41.840	45.840	2.0	1.5	2.0	10.20	9.560	0.000	0.880
TRAFFIC SAFETY WRKR		HWY	28.250	29.850	1.5	1.5	2.0	4.896	4.175	0.000	0.000
TRUCK DRIVER		ALL 1	35.850	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TRUCK DRIVER		ALL 2	36.000	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TRUCK DRIVER		ALL 3	36.200	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TRUCK DRIVER		ALL 4	36.400	36.400	1.5	1.5	2.0	7.200	6.000	0.000	0.150
TUCKPOINTER		BLD	42.800	43.800	1.5	1.5	2.0	8.180	12.66	0.000	0.650

Legend:

RG (Region)
TYP (Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers)
C (Class)
Base (Base Wage Rate)
FRMAN (Foreman Rate)
M-F>8 (OT required for any hour greater than 8 worked each day, Mon through Fri.
OSA (Overtime (OT) is required for every hour worked on Saturday)
OSH (Overtime is required for every hour worked on Sunday and Holidays)
H/W (Health & Welfare Insurance)
Pensn (Pension)
Vac (Vacation)
Trng (Training)

Explanations

MCHENRY COUNTY

FENCE ERECTOR (EAST) - That part of the county East and Northeast of a line following Route 31 North to Route 14, northwest to Route 47 north to the Wisconsin State Line.

IRONWORKERS (EAST) - That part of the county East of Rts. 47 and 14.

IRONWORKERS (SOUTH) - That part of the county South of Route 14 and East of Route 47.

IRONWORKERS (WEST) - That part of the county West of Route 47.

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous

materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER

The grouting, cleaning, and polishing of all classes of tile, whether for interior or exterior purposes, all burned, glazed or unglazed products; all composition materials, granite tiles, warning detectable tiles, cement tiles, epoxy composite materials, pavers, glass, mosaics, fiberglass, and all substitute materials, for tile made in tile-like units; all mixtures in tile like form of cement, metals, and other materials that are for and intended for use as a finished floor surface, stair treads, promenade roofs, walks, walls, ceilings, swimming pools, and all other places where tile is to form a finished interior or exterior. The mixing of all setting mortars including but not limited to thin-set mortars, epoxies, wall mud, and any other sand and cement mixtures or adhesives when used in the preparation, installation, repair, or maintenance of tile and/or similar materials. The handling and unloading of all sand, cement, lime, tile, fixtures, equipment, adhesives, or any other materials to be used in the preparation, installation, repair, or maintenance of tile and/or similar materials. Ceramic Tile Finishers shall fill all joints and voids regardless of method on all tile work, particularly and especially after installation of said tile work. Application of any and all protective coverings to all types of tile installations including, but not be limited to, all soap compounds, paper products, tapes, and all polyethylene coverings, plywood, masonite, cardboard, and any new type of products that may be used to protect tile installations, Blastrac equipment, and all floor scarifying equipment used in preparing floors to receive tile. The clean up and removal of all waste and materials. All demolition of existing tile floors and walls to be re-tiled.

COMMUNICATIONS TECHNICIAN

Construction, installation, maintenance and removal of telecommunication facilities (voice, sound, data and video), telephone, security systems, fire alarm systems that are a component of a multiplex system and share a common cable, and data inside wire, interconnect, terminal equipment, central offices, PABX and equipment, micro waves, V-SAT, bypass, CATV, WAN (wide area network), LAN (local area networks), and ISDN (integrated system digital network), pulling of wire in raceways, but not the installation of raceways.

MARBLE FINISHER

Loading and unloading trucks, distribution of all materials (all stone, sand, etc.), stocking of floors with material, performing all rigging for heavy work, the handling of all material that may be needed for the installation of such materials, building of scaffolding, polishing if needed, patching, waxing of material if

damaged, pointing up, caulking, grouting and cleaning of marble, holding water on diamond or Carborundum blade or saw for setters cutting, use of tub saw or any other saw needed for preparation of material, drilling of holes for wires that anchor material set by setters, mixing up of molding plaster for installation of material, mixing up thin set for the installation of material, mixing up of sand to cement for the installation of material and such other work as may be required in helping a Marble Setter in the handling of all material in the erection or installation of interior marble, slate, travertine, art marble, serpentine, alberene stone, blue stone, granite and other stones (meaning as to stone any foreign or domestic materials as are specified and used in building interiors and exteriors and customarily known as stone in the trade), carrara, sanionyx, vitrolite and similar opaque glass and the laying of all marble tile, terrazzo tile, slate tile and precast tile, steps, risers treads, base, or any other materials that may be used as substitutes for any of the aforementioned materials and which are used on interior and exterior which are installed in a similar manner.

MATERIAL TESTER I: Hand coring and drilling for testing of materials; field inspection of uncured concrete and asphalt.

MATERIAL TESTER II: Field inspection of welds, structural steel, fireproofing, masonry, soil, facade, reinforcing steel, formwork, cured concrete, and concrete and asphalt batch plants; adjusting proportions of bituminous mixtures.

OPERATING ENGINEER - BUILDING

Class 1. Asphalt Plant; Asphalt Spreader; Autograde; Backhoes with Caisson Attachment; Batch Plant; Benoto (requires Two Engineers); Boiler and Throttle Valve; Caisson Rigs; Central Redi-Mix Plant; Combination Back Hoe Front End-loader Machine; Compressor and Throttle Valve; Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Conveyor (Truck Mounted); Concrete Paver Over 27E cu. ft; Concrete Paver 27E cu. ft. and Under: Concrete Placer; Concrete Placing Boom; Concrete Pump (Truck Mounted); Concrete Tower; Cranes, All; Cranes, Hammerhead; Cranes, (GCI and similar Type); Creter Crane; Spider Crane; Crusher, Stone, etc.; Derricks, All; Derricks, Traveling; Formless Curb and Gutter Machine; Grader, Elevating; Grouting Machines; Heavy Duty Self-Propelled Transporter or Prime Mover; Highlift Shovels or Front Endloader 2-1/4 yd. and over; Hoists, Elevators, outside type rack and pinion and similar machines; Hoists, One, Two and Three Drum; Hoists, Two Tugger One Floor; Hydraulic Backhoes; Hydraulic Boom Trucks; Hydro Vac (and similar equipment); Locomotives, All; Motor Patrol; Lubrication Technician; Manipulators; Pile Drivers and Skid Rig; Post Hole Digger; Pre-Stress Machine; Pump Cretes Dual Ram; Pump Cretes: Squeeze Cretes-Screw Type Pumps; Gypsum Bulker and Pump; Raised and Blind Hole Drill; Roto Mill Grinder; Scoops - Tractor Drawn; Slip-Form Paver; Straddle Buggies; Operation of Tie Back Machine; Tournapull; Tractor with Boom and Side Boom; Trenching Machines.

Class 2. Boilers; Broom, All Power Propelled; Bulldozers; Concrete Mixer (Two Bag and Over); Conveyor, Portable; Forklift Trucks; Highlift Shovels or Front Endloaders under 2-1/4 yd.; Hoists, Automatic; Hoists, Inside Elevators; Hoists, Sewer Dragging Machine; Hoists, Tugger Single Drum; Laser Screed; Rock Drill (Self-Propelled); Rock Drill (Truck Mounted); Rollers, All; Steam Generators; Tractors,

All; Tractor Drawn Vibratory Roller; Winch Trucks with "A" Frame.

Class 3. Air Compressor; Combination Small Equipment Operator; Generators; Heaters, Mechanical; Hoists, Inside Elevators (remodeling or renovation work); Hydraulic Power Units (Pile Driving, Extracting, and Drilling); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Low Boys; Pumps, Well Points; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 4. Bobcats and/or other Skid Steer Loaders; Oilers; and Brick Forklift.

Class 5. Assistant Craft Foreman.

Class 6. Gradall.

Class 7. Mechanics; Welders.

OPERATING ENGINEERS - HIGHWAY CONSTRUCTION

Class 1. Asphalt Plant; Asphalt Heater and Planer Combination; Asphalt Heater Scarfire; Asphalt Spreader; Autograder/GOMACO or other similar type machines: ABG Paver; Backhoes with Caisson Attachment; Ballast Regulator; Belt Loader; Caisson Rigs; Car Dumper; Central Redi-Mix Plant; Combination Backhoe Front Endloader Machine, (1 cu. yd. Backhoe Bucket or over or with attachments); Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Paver over 27E cu. ft.; Concrete Placer; Concrete Tube Float; Cranes, all attachments; Cranes, Tower Cranes of all types: Creter Crane: Spider Crane; Crusher, Stone, etc.; Derricks, All; Derrick Boats; Derricks, Traveling; Dredges; Elevators, Outside type Rack & Pinion and Similar Machines; Formless Curb and Gutter Machine; Grader, Elevating; Grader, Motor Grader, Motor Patrol, Auto Patrol, Form Grader, Pull Grader, Subgrader; Guard Rail Post Driver Truck Mounted; Hoists, One, Two and Three Drum; Heavy Duty Self-Propelled Transporter or Prime Mover; Hydraulic Backhoes; Backhoes with shear attachments up to 40' of boom reach; Lubrication Technician; Manipulators; Mucking Machine; Pile Drivers and Skid Rig; Pre-Stress Machine; Pump Cretes Dual Ram; Rock Drill - Crawler or Skid Rig; Rock Drill - Truck Mounted; Rock/Track Tamper; Roto Mill Grinder; Slip-Form Paver; Snow Melters; Soil Test Drill Rig (Truck Mounted); Straddle Buggies; Hydraulic Telescoping Form (Tunnel); Operation of Tieback Machine; Tractor Drawn Belt Loader; Tractor Drawn Belt Loader (with attached pusher - two engineers); Tractor with Boom; Tractaire with Attachments; Traffic Barrier Transfer Machine; Trenching; Truck Mounted Concrete Pump with Boom; Raised or Blind Hole Drills (Tunnel Shaft); Underground Boring and/or Mining Machines 5 ft. in diameter and over tunnel, etc; Underground Boring and/or Mining Machines under 5 ft. in diameter; Wheel Excavator; Widener (APSCO).

Class 2. Batch Plant; Bituminous Mixer; Boiler and Throttle Valve; Bulldozers; Car Loader Trailing Conveyors; Combination Backhoe Front Endloader Machine (Less than 1 cu. yd. Backhoe Bucket or over or with attachments); Compressor and Throttle Valve; Compressor, Common Receiver (3); Concrete Breaker or Hydro Hammer; Concrete Grinding Machine; Concrete Mixer or Paver 7S Series to and including 27 cu. ft.; Concrete Spreader; Concrete Curing Machine, Burlap Machine, Belting Machine and Sealing Machine; Concrete Wheel Saw; Conveyor Muck Cars (Haglund or Similar Type); Drills, All; Finishing Machine -

Concrete; Highlift Shovels or Front Endloader; Hoist - Sewer Dragging Machine; Hydraulic Boom Trucks (All Attachments); Hydro-Blaster; Hydro Excavating (excluding hose work); Laser Screed; All Locomotives, Dinky; Off-Road Hauling Units (including articulating) Non Self-Loading Ejection Dump; Pump Cretes: Squeeze Cretes - Screw Type Pumps, Gypsum Bulker and Pump; Roller, Asphalt; Rotary Snow Plows; Rototiller, Seaman, etc., self-propelled; Self-Propelled Compactor; Spreader - Chip - Stone, etc.; Scraper - Single/Twin Engine/Push and Pull; Scraper - Prime Mover in Tandem (Regardless of Size); Tractors pulling attachments, Sheeps Foot, Disc, Compactor, etc.; Tug Boats.

Class 3. Boilers; Brooms, All Power Propelled; Cement Supply Tender; Compressor, Common Receiver (2); Concrete Mixer (Two Bag and Over); Conveyor, Portable; Farm-Type Tractors Used for Mowing, Seeding, etc.; Forklift Trucks; Grouting Machine; Hoists, Automatic; Hoists, All Elevators; Hoists, Tugger Single Drum; Jeep Diggers; Low Boys; Pipe Jacking Machines; Post-Hole Digger; Power Saw, Concrete Power Driven; Pug Mills; Rollers, other than Asphalt; Seed and Straw Blower; Steam Generators; Stump Machine; Winch Trucks with "A" Frame; Work Boats; Tamper-Form-Motor Driven.

Class 4. Air Compressor; Combination - Small Equipment Operator; Directional Boring Machine; Generators; Heaters, Mechanical; Hydraulic Power Unit (Pile Driving, Extracting, or Drilling); Light Plants, All (1 through 5); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Pumps, Well Points; Vacuum Trucks (excluding hose work); Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 5. SkidSteer Loader (all); Brick Forklifts; Oilers.

Class 6. Field Mechanics and Field Welders

Class 7. Dowell Machine with Air Compressor; Gradall and machines of like nature.

SURVEY WORKER - Operated survey equipment including data collectors, G.P.S. and robotic instruments, as well as conventional levels and transits.

TRAFFIC SAFETY - work associated with barricades, horses and drums used to reduce lane usage on highway work, the installation and removal of temporary lane markings, and the installation and removal of temporary road signs.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION

Class 1. Two or three Axle Trucks. A-frame Truck when used for transportation purposes; Air Compressors and Welding Machines, including those pulled by cars, pick-up trucks and tractors; Ambulances; Batch Gate Lockers; Batch Hopperman; Car and Truck Washers; Carry-alls; Fork Lifts and Hoisters; Helpers; Mechanics Helpers and Greasers; Oil Distributors 2-man operation; Pavement Breakers; Pole Trailer, up to 40 feet; Power Mower Tractors; Self-propelled Chip Spreader; Skipman; Slurry Trucks, 2-man operation; Slurry Truck Conveyor Operation, 2 or 3 man; Teamsters; Unskilled Dumpman; and Truck Drivers hauling warning lights, barricades, and portable toilets on the job site.

Class 2. Four axle trucks; Dump Crets and Adgetors under 7 yards;

Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnapulls or Turnatrailers when pulling other than self-loading equipment or similar equipment under 16 cubic yards; Mixer Trucks under 7 yeards; Ready-mix Plant Hopper Operator, and Winch Trucks, 2 Axles.

Class 3. Five axle trucks; Dump Crets and Adgetors 7 yards and over; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnatrailers or turnapulls when pulling other than self-loading equipment or similar equipment over 16 cubic yards; Explosives and/or Fission Material Trucks; Mixer Trucks 7 yards or over; Mobile Cranes while in transit; Oil Distributors, 1-man operation; Pole Trailer, over 40 feet; Pole and Expandable Trailers hauling material over 50 feet long; Slurry trucks, 1-man operation; Winch trucks, 3 axles or more; Mechanic--Truck Welder and Truck Painter.

Class 4. Six axle trucks; Dual-purpose vehicles, such as mounted crane trucks with hoist and accessories; Foreman; Master Mechanic; Self-loading equipment like P.B. and trucks with scoops on the front.

TERRAZZO FINISHER

The handling of sand, cement, marble chips, and all other materials that may be used by the Mosaic Terrazzo Mechanic, and the mixing, grinding, grouting, cleaning and sealing of all Marble, Mosaic, and Terrazzo work, floors, base, stairs, and wainscoting by hand or machine, and in addition, assisting and aiding Marble, Masonic, and Terrazzo Mechanics.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.

MATERIAL TESTER & MATERIAL TESTER/INSPECTOR I AND II

Notwithstanding the difference in the classification title, the

classification entitled "Material Tester I" involves the same job duties as the classification entitled "Material Tester/Inspector I". Likewise, the classification entitled "Material Tester II" involves the same job duties as the classification entitled "Material Tester/Inspector II".

CHECK SHEET
FOR
RECURRING SPECIAL PROVISIONS

Adopted January 1, 2014

The following RECURRING SPECIAL PROVISIONS indicated by an "X" are applicable to this contract and are included by reference:

RECURRING SPECIAL PROVISIONS

CHECK SHEET
FOR
LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS

Adopted January 1, 2014

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 #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, 2010

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 Articles 701.19(d) and 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, 2013

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 judgement 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 judgement 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:

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 judgement 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 judgement 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. The Contractor 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."

Illinois Department of Transportation

Special Provisions

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction", Adopted January 1, 2012, 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 Specifications and Recurring Special Provisions indicated on the Check Sheet included here in which apply to and govern the construction of 15-00000-01-GM, and in case of conflict with any part, or parts, of said Specifications, the said Special Provisions shall take precedence and shall govern.

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TABLE OF CONTENTS
(Specifications and Special Provisions)

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

ARTICLE I - DESCRIPTION OF WORK

This Contract is for the maintenance of Traffic Signal Systems, Street Lighting Systems, Highway Flasher Systems, Road Weather Information Systems 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, or displaced equipment resulting from any cause whatsoever in the shortest possible time; and (6) perform all activities required and described herein.

ARTICLE II - INSTRUCTION TO BIDDERS

II-1. COMPETENCY OF BIDDERS

Each bidder shall be pre-qualified to comply with all of the requirements of Check Sheet LRS6 Illinois Department of Transportation's Supplemental Specifications and Recurring Special Provisions.

II-2. EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS, AND SITE OF WORK

The prospective bidder shall before submitting His 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.

II-3. AWARD AND EXECUTION OF CONTRACT

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.

II-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 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.

The Contractor shall notify all utility owners of the proposed construction schedule, and 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.

II-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.

II-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.

II-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 by product 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 pre-fabricated 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.

II-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.

II-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 III – GENERAL PROVISIONS AND SPECIFICATIONS

III-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:

a. 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
- 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

b. 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

c. McHenry County Division of Transportation Standards and Specifications

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

III-2. DEFINITION OF TERMS

a. Contract Period

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

b. 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.

c. 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.

d. 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 III, Section 8, of this Contract.

e. 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 IV - Special Provisions.

f. 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.

g. Manual on Traffic Control

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

h. 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 repair 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 IV - Special Provisions.

i. Special or Specialty Items

Any pay item for maintenance work that is paid for on a unit basis when authorized by the Engineer. Such work shall be performed as specified herein and when required in accordance with the Maintenance Schedule.

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

Any day the Offices of the Department are open for normal business.

m. Yard

The portion of the McHenry County Division of Transportation designated for the storage of materials and equipment.

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.

III-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 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.

b. 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. The Contractor shall respond promptly in restoring, replacing, repairing, and realigning equipment covered in this Contract when notified by any source.

c. 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 III, Section 6 of this Contract for specific requirements.

d. The Contractor shall be required to attend a monthly progress/coordination meeting with the Engineer or authorized representatives of the Engineer/Division of

Transportation. The meeting shall be held on a date and at a location determined by the Engineer.

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.

Iil-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

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 Specialty Items and Extra Work.

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 Contractor shall provide electrician maintenance workforce personnel that are IMSA Traffic Signal Electrician Level II certified. 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 Trouble-Shooting
- Office Administration

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, Specialty Items, 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 vehicles used by the Contractor shall conform to all applicable laws and shall carry such lights and safety appurtenances as may be prescribed by the Department. Patrol and construction vehicles operated by the Contractor in connection with this Contract shall be equipped with two-way radios. Supervisory vehicles operated by the Contractor in connection with this Contract shall be equipped with two-way radios and cellular telephones designed for expediting and maintaining 24 hour communications with the Contractor's headquarters. Contractor's supervisory personnel shall be equipped with and carry communication pagers at all times. A listing of cellular telephone numbers and pager telephone numbers shall be prepared and furnished to the Engineer one (1) week prior to the beginning of the Contract.

The Contractor shall maintain a high-speed Internet connection on a personal computer in the radio room/dispatch center. Refer to Article III-11, paragraph 8. Reports and Forms, for more information on this requirement.

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 Shops

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) and 24-hour dispatch center.

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

i. Extra Work

The Contractor shall perform Extra Work, as authorized under Article III, Section 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. 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.

Specialty and 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.

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. Access Responsibility

The Contractor is required to provide access to equipment for other contractors and consultants who have approved contracts to work on the systems. 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 interconnecting cable, conduit and handholes between various parts of the traffic signal system 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. Within thirty (30) calendar days after award of the Contract, the Contractor shall prepare an itemized inventory of his spare components and equipment. The spare components inventory shall include ALL of the following: (1) the manufacturer and model number of the spare component, (2) the quantity of each spare component in the inventory, (3) the serial number of each spare component, when indicated by the manufacturer, (4) the current location of each spare component (i.e. specific shop location or intersection where installed), and (5) dates installed and subsequently removed from Department traffic signal locations. 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, 2 keys per lock shall be furnished to the Engineer.

w. Restoration of Work Area

Restoration of the traffic signal work area shall be incidental to the related pay item such as foundation, conduit, handhole, trench and backfill, etc. and no extra compensation shall be allowed. 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 un-mowed fields shall be seeded, in accordance with Standard Specifications 250 and 252, respectively.

10. 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 Federal Construction Safety and Health Standards.

III-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 the event the Contractor determines that the equipment is not in proper working order he shall immediately notify the Engineer in writing within six (6) working days. If upon the expiration of the 6 working days, the Contractor has failed to notify the Engineer that the equipment is not in proper working order, it shall constitute Contractor's acceptance of maintenance responsibilities. 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.

III-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.

III-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.

III-8. EXTRA WORK & SPECIALTY ITEM 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, Specialty Work, and work involving a combination of Extra Work and Specialty Items 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 III, Section 7 of this Contract.

a. Extra work includes replacing or making temporary and permanent repairs to all equipment, which is damaged by traffic. Included are knockdowns of traffic signal heads and posts, mast arm assemblies, cabinets or any other piece of equipment.

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 III, Section 7 of this Contract.

e. 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.

f. 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.

g. 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 Engineer, 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.

III-9. 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 Working under County and Motor Fuel Tax (MFT) Contracts

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 Specialty Work Pay Items and/or Extra Work provided for under Article III, Section 8 of this Contract.

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

Damage to underground cable caused by County personnel in the performance of their assigned duties shall be paid for by the County as Specialty Items and/or Extra Work, as provided for Under Article III, Section 8 of this Contract. The Contractor shall request an inspection by the Engineer of the damaged cable at the site of the damage prior to making permanent repairs.

d. Record Keeping Requirements for Third Party Damages

The Contractor shall prepare Radio Room 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. Radio Room Reports, Work Order Reports, and pictures of the damage shall be completed and forwarded to the Engineer within 48 hours of occurrence or discovery.

III-10. METHOD OF BILLING

After the first and before the tenth day of each month, the Contractor shall submit invoices in duplicate to the Engineer for Routine Maintenance work performed during the preceding month. Bills received before the first of the month for the preceding month shall not be accepted by the Engineer and will not be paid, no exceptions.

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.

After the 1st day and before the 10th day of each month, the Engineer shall provide the Contractor, in writing, a list of Routine Maintenance pay items and quantities for the previous 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 insure 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.

III-11. 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.

III-12. REPORTS AND FORMS

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

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. Radio Room Report

Whenever defective, non-operative, or damaged equipment is reported to the Contractor by telephone or radio, a sequentially numbered Radio Room Report shall be initiated. Copies of said reports shall be provided to the Engineer weekly. The Copy of the Radio Room 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 Radio Room 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 Radio Room Report shall be maintained with the associated Radio Room 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

Every Monday morning, the Contractor shall fax a Weekly Traffic Signal Maintenance Report to the Engineer. This report shall include location, item description, date and time notified, caller, reference number (radio room ticket number), date competed, and status/remarks. The report shall cover the previous 7 days, ending on Sunday. 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 radio room only by MCDOT or by local law enforcement agencies) to perform maintenance on MCDOT's traffic signals and highway lighting.

8. High-Speed Interconnect Connection with E-Mail Capability

Maintenance communication and documentation between the McHenry County Division of Transportation and the Contractor will be moving towards and electronic/E-Mail format. For this reason, the Contractor shall maintain a high-speed Internet connection on a personal computer in the radio room/dispatch center. The PC shall have E-Mail capability, such as Microsoft Outlook, etc.

9. After Hours Call-Out Notification

When after hours calls are received by the Contractor's Radio Room, the Contractor shall notify the Department through either text or e-mail of the emergency call.

III-13. DURATION OF CONTRACT

This Contract shall be in full force from 12:01 AM December 1, 2014 to 12:00 midnight November 30, 2015 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 also reserves the right to extend this Contract for a period of 12 months from 12:01 AM December 1, 2015 to 12:00 midnight November 30, 2016 under the same terms and conditions as the original Contract. The County shall notify the Contractor in writing of its intention to exercise this option prior to September 1, 2014.

ARTICLE IV - SPECIAL PROVISIONS

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, UPS (Uninterruptible Power Supply) systems, and vehicle counting stations.

The traffic signal 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.

At locations where a traffic signal head or pedestrian signal head assembly shares a pole with a highway lighting (luminaire) assembly, each component shall be paid for under its respective pay item. In all cases where combination mast arms are used, the pole and foundation shall be considered part of the traffic signal installation and shall be maintained as part of the signal system.

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 Items, and the luminaire shall be maintained under the Traffic Signal System Item B, 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, 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 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.

5. If required during long periods or power service disruption (power outages in excess of 4 hours), a gas powered generator shall be furnished to power any traffic signal (permanent or temporary) through the UPS generator plug until the utility company restores power.

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) UPS system, proper telemetry and communications, and cabinet vents and fans. 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.

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.

    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 17). 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).

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.

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, 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.

16. The Contractor shall be required to clean all camera lens at all traffic signals with cameras (video detection) at least once per year before October 1 of the Contract year.

17. 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.

18. The Contractor shall clean all LED traffic signal lamps in accordance with the Manufacturer's recommendation for cleaning LED lamps at various intersections as directed by the Engineer. The cleaning of the LED lamps shall take place before October 1 of the Contract year.

19. The Contractor shall clean all Illuminated street name signs in accordance with the Manufacturer's recommendation for cleaning the street name sign faces at various intersections as directed by the Engineer. The cleaning shall take place before October 1 of the Contract year.

20. 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) 334-4971 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.

21. 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.

22. 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 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.

23. 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 (agreed unit price).

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

least once during the first year of this Contract and once during the renewal year of this 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.

25. 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.

26. 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 Department.

27. 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.

28. 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.

25. 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.

26. If the situation arises the Contractor is responsible for maintaining any and all "bagged" signal heads in connection with any and all signal indications that as directed by the Engineer must be bagged. This work includes bagging, un-bagging, or re-bagging these signal heads as needed or as directed by the Engineer. Burlap and/or silt fence material shall not be accepted for bagging of signal heads. An approved signal head bag designed for bagging heads shall be used. This bag shall be black with a black mesh front opening so the signal indications can be seen for testing purposes. The Engineer shall have the final approval of the bag used. Currently there are no "bagged" signal heads at any traffic signal under MCDOT's jurisdiction.

27. The Electrical Maintenance 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 insure 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.

h. The Contractor shall test all UPS equipment (batteries) according to the Manufacturer's recommendations (Appendix B) to ensure proper operation of the UPS equipment.

28. 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.

29. 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.

REPAIR TIME TABLE (Non cumulative)

ITEM	REPONSE TIME	SERVICE RESTORATION	PERMANENT REPAIRS
KNOCKDOWNS/FAILURES/DAMAGE:			
Cabinet (Signal and/or UPS)	1 hour	12 hours	2 weeks
Controller (Master)	1 hour	Next Working Day	2 weeks
Controller (Local)	1 hour	12 hours	1 week
UPS Inverter	1 hour	12 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 Image Sensor	1 hour	4 hours	2 weeks
MMU/CMU	1 hour	4 hours	2 weeks
PTZ Camera	2 hours	48 hours	2 weeks
Video Image Processor	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	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
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

30. 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.

31. 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 IV, Item A, Paragraph 16.

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 IV, Item A, Paragraph 18.

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.

32. Maintenance of various fire preemption equipment that is part of MCDOT traffic signal systems will not be paid for under this Contract. It will be the responsibility of the Contractor to coordinate preemption equipment maintenance activities with the local fire department districts, which have jurisdiction over the preemption equipment. Any changes or upgrades to the preemption equipment requested by the fire departments must be approved by the Engineer before work can begin. All replacement Confirmation Beacons shall be LED beacons (no exceptions) of the type approved by the Engineer.

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), pedestrian signal heads with count-down timers, pedestrian- actuated detectors (e.g. push buttons), and associated signs.

- A semi-actuated or 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, 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.

- 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. Traffic signal cable and interconnect cable including copper wire and fiber optic. Electrical and telephone service installations.

- 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, 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.

Any snow accumulation on Flashing Beacon solar panels that cause the Beacons to not operate properly, shall be removed and the Beacon reset to normal operation. Response time for this type of call is 4 hours.

ITEM B - STREET LIGHTING ROUTINE MAINTENANCE

The following shall be part of Pay Item B-1.

This item may include, but is not limited to, maintaining any of the following street light installations: a street light (luminaire) mounted on a combination mast arm, 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 or per D Items. 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 broken or missing light deflectors/shields, as necessary.
- Replace any missing or damages light pole and transformer base handhole 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 – Needs to reset breaker	1 hour	4 hours	NA

Circuit out – Cable trouble	1 hour	24 hours	21 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
Outage (single or multiple) found on night outage survey or reported to Contractor	NA	NA	2 Working days

- The Contractor shall group re-lamp all street lights at least once during the twelve (12) month period of this Contract, group re-lamping is not required during the renewal year of this 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.

  NOTE: Any LED street lights on the County system are not required to be re-lamped by the Contractor.

- 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 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.

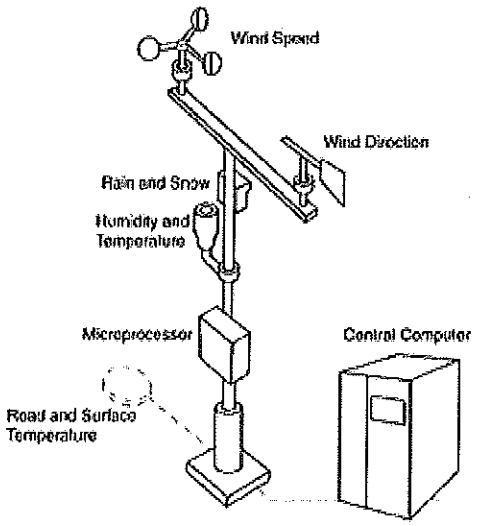
ITEM B-1 - STREET LIGHTING ROUTINE MAINTENANCE PAY ITEMS

B-1 STREET LIGHTING LOCATION

Please refer to Article IV, Item B of this Contract.

ITEM C – ROAD WEATHER INFORMATION SYSTEM

This item consists of maintaining a Road Weather Information System (RWIS). This system is comprised of a variety of sensors and equipment used to measure and monitor road and weather conditions. Individual sensors are attached to a recording device (remote processing unit; RPU) that is mounted to a tower forming what is known as an outstation.



Schematic of RWIS Outstation

Sensors used within an RWIS atmospheric sensors, surface sensors, cameras, surface pucks, and non-invasive sensors.

The following shall be part of Pay Item C-1.

1. Preventative maintenance shall be performed according to Appendix C: Preventative Maintenance Checklist. This maintenance shall be performed at each RWIS location between April 1 and October 1 of the Contract Year.
2. Response time for malfunctioning RWIS equipment:
    a. During the period from November through April, the Response Time shall be Forty Eight (48) hours.
    b. During the period from April through November, the Response Time shall be Five (5) days.
3. Response time for knockdowns:
    a. Response time of 1 hour to clear knockdown and service restoration/permanent repairs according to 2a. and 2b. above.
4. Coordination with the vendor/supplier/manufacturer of the RWIS equipment may be required for all maintenance activities that may be performed on RWIS equipment.
5. Monthly patrols of the RWIS sites are not required.

ITEM D - HOURLY RATE FOR EXTRA WORK

This item shall consist of the hourly rate for one electrician and the equipment needed to do the work, for the unit price as shown in the Schedule of Prices, Pay Item D-1.

Note: Vehicle rates shall be paid for separately according to accepted rates for the type of vehicular equipment used.

Hours in the schedule of prices are an estimate for this Contract. The County reserves the right to increase or decrease the number of hours within this Contract.

Also any overtime or double time worked by the Contractor on this contract shall be paid for based on the above hourly rate for extra work.

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. When knockdowns and damage to equipment occur, EQUIPMENT ITEMS shall be used when possible in the repair of knockdowns. Any material used outside of EQUIPMENT ITEMS shall be paid for as Extra Work. Any overage of listed quantities in the schedule of prices will be paid for at that unit price for EQUIPMENT ITEMS, no exceptions.

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: 720016-03, 805001-01, 814001-02, 814006-02, 873001-02, 877001-05, 877002-02, 877006-04, 877011-05, 877012-02, 878001-09, 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

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

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 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

Add the following to Section 857.00 of the Standard Specifications:

Controllers shall be NEMA TS2 Type 1 compatible, Econolite ASC3-2100 unless specified otherwise on the plans or elsewhere on these specifications. Only controllers supplied by one of the District 1 approved closed loop equipment manufacturers will be allowed. The controller shall be the most recent model and software version supplied by the manufacturer at the time of the approval. 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 over lap phase.

By December 31, 2002, the controller shall provide a background timer, which will prevent phases from being skipped during program changes.

E-5 INSTALL MASTER CONTROLLER

Revise Sections 860.02 - Materials and 860.03 - Installation of the Standard Specifications to read:

Only controllers supplied by one of the District approved closed loop equipment manufacturers 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.

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

Functional requirements in addition to those in section 863 of the Standard Specification include:

By December 31, 2002, the Master Controller shall provide a background timer which will prevent phases from being skipped during program changes.

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.

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.

The cabinet shall be provided with a Siecor CAC 3000, or equivalent, 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. The CAC 3000 shall be equipped with a standard Three-Electrode Heavy Duty Gas Tube Surge Arrestor.

The cabinet shall provide a caller identification unit with 50 number memory.

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

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 suitable media (CD, 3 1/2" or 5 1/4" floppy disks as requested 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 his use in monitoring the system.

The Contractor shall be required to setup graphic displays and all software parameters for every intersection to be interconnected under this Contract, including complete viewing and control capabilities from IDOT remote monitor.

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 Department staff.

As soon as practical or within one week after the contract has been awarded, the Contractor shall contact (via phone) the Traffic Engineer at the McHenry County Division of Transportation at (815) 334-4960 to request a phone line installation.

A follow-up fax transmittal to the Traffic Engineer (815-334-4989) with all required information pertaining to the phone installation is required from the Contractor as soon as possible or within one week after the initial request has been made. The required information to be supplied on the fax shall include (but not limited to): A street 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 is 4-6 weeks after the MCHD has received the Contractor supplied fax. It is, therefore, imperative that the phone line conduit and pull-string be installed by the Contractor in anticipation of this time frame. On jobs which include roadway widening in which the conduit cannot be installed until this widening is completed, the Contractor will be allowed to delay the phone line installation request to the Business Services Section until a point in time that is 4-6 weeks prior to the anticipated completion of the traffic signal work. The contractor shall provide the Administrative Support Manager with an expected installation date considering the 4-6 week processing time.

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 McHenry County Division of Transportation (i.e., this will be an MCDOT phone number not a Contractor phone number).

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 INDUCTIVE LOOP DETECTOR AMPLIFIER WITH CALLING DETECTOR RELAY, DIGITAL DESIGN

This item shall comply with Section 885 and Article 1079.01 of the Standard Specifications. At the direction of the Engineer, where two or more loop sensor units are called for at the same location, multi-channel amplifiers may be furnished. When Contract work requires a new cabinet, the installation shall provide rack-mounted detector amplifiers.

E-8 DETECTOR LOOP, TYPE I

Revise Section 886 of the Standard Specifications to read:

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 Area Traffic Signal Maintenance and Operations Engineer (815) 334-4960 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.

Loop detectors shall be installed according to the requirements of the "District 1 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 Panduit 250W175C water proof tag, or an approved equal, 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 6.3 mm (1/4") deep x 100 mm (4") saw cut to mark location of each loop lead-in.

Loop sealant shall be a two-component thixotropic chemically cured polyurethane either Chemque Q-Seal 295, Percol Elastic Cement A/C Grade or an approved equal. The sealant shall be installed 3 mm (1/8") below the pavement surface, if installed above the surface the overlap shall be removed immediately.

Detector loop measurements shall include the saw cut and the length of the loop lead-in to the edge of pavement. The lead-in wire, including all necessary connections for proper operations, from the edge of pavement to the handhole, shall be incidental to the price of the detector loop. Unit duct, trench and backfill, and drilling of pavement or handholes shall be incidental to detector loop quantities.

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

Preformed detector loops shall be installed in new pavement constructed of Portland cement concrete and shall be placed in the substrate. Loop lead-ins shall be protected to the satisfaction of the Engineer.

Handholes shall be placed next to the shoulder or back of curb when preformed detector loops enter the handhole.

Preformed detector loops shall be factory assembled. Homeruns and interconnects shall be pre-wired and shall be an integral part of the loop assembly. The loop configurations and homerun lengths shall be assembled for the specific application. The loop and homerun shall be constructed using 17.2 mm (11/16") outside diameter (minimum), 9.5 mm (3/8") inside diameter (minimum) Class A oil resistant synthetic cord reinforced hydraulic hose with 1,720 kPa (250 psi) internal pressure rating. 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 or interconnects 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 insure that the whole assembly can conform to pavement movement and shifting without cracking or breaking. 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 four 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.

Basis of Payment. This work shall be paid for at the contract unit price per meter (foot) 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-9 TRANSCEIVER - FIBER OPTIC

This item shall consist of furnishing and installing a fiber optic transceiver for an existing controller. This item shall comply with Section 864 of the Standard Specifications for Road and Bridge Construction, and shall include 2 each fiber optic modems and all necessary associated components to provide database upload/download capabilities, as well as the other features of the associated monitoring software as directed by the Engineer.

E-10 SERVICE INSTALLATION
E-11 SERVICE INSTALLATION, GROUND MOUNT

Revise Section 805.00 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 details in the "District 1 Standard Traffic Signal Design Details" and applicable portions of the Specifications.

Materials.

a. General. The completed control panel shall be constructed in accordance with UL Std. 508, 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 2.03 mm (0.080-inch) 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 350 mm (14-inches) high, 225 mm (9-inches) wide and 200 mm (8-inches) in depth is required. The cabinet shall be channel mounted to a wooden utility pole using assemblies recommended by the manufacturer.

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 3.175 mm (0.125-inch) thick, the top 6.350 mm (0.250-inch) thick and the bottom 12.70 mm (0.500-inch) 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 1.91 mm (.075-inch) 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 1000 mm (40-inches high), 400 mm (16-inches) wide and 375 mm (15-inches) 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.

c. 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.

d. 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, otherwise noted on the plans, 120 V and the auxiliary circuit breakers shall be rated 10 amperes, 120 V.

e. 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.

f. 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.

g. 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.

h. Ground Rod. Ground rods shall be copper-clad steel, a minimum of 3.0 meters (10') in length, and 20mm (3/4") 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 type A foundation, which includes the ground rod shall be paid for separately. SERVICE INSTALLATION, POLE MOUNTED shall include the 20mm (3/4") grounding conduit, ground rod, and pole mount assembly. Any changes 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-12 CONCRETE FOUNDATION, TYPE A
E-13 CONCRETE FOUNDATION, TYPE E (30-INCH)
E-14 CONCRETE FOUNDATION, TYPE E (36-INCH)
E-15 CONCRETE FOUNDATION, TYPE E (42-INCH)
E-16 CONCRETE FOUNDATION, TYPE C

The items listed above 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-17 CONCRETE HANDHOLE
E-18 CONCRETE HEAVY DUTY HANDHOLE
E-19 CONCRETE DOUBLE HANDHOLE

The items listed above shall comply with Section 814, Article 1020, and Article 1088.06 of the Standard Specifications for Road and Bridge Construction.

E-20 REBUILD EXISTING HANDHOLE
E-21 REBUILD EXISTING HEAVY DUTY HANDHOLE
E-22 REBUILD EXISTING DOUBLE HANDHOLE

This item shall comply with Section 814, Article 1020, and Article 1088.06 of the Standard Specifications for Road and Bridge Construction. This pay item shall include any of the following: rebuilding, raising, and/or re-aligning any type of handhole at a location designated by the Engineer. This item shall include steel hooks, frame, cover, concrete, and all labor and equipment necessary to complete construction to the satisfaction of the Engineer. REBUILD EXISTING HEAVY DUTY HANDHOLE shall include all heavy-duty handholes (roadway or shoulder).

E-23 ROTATE SIGNAL PHASING AT AN EXISTING TRAFFIC SIGNAL INTERSECTION

This item shall consist of revising the traffic signal phasing at an existing traffic signal intersection. The proposed sequence of operation shall conform to the current "Standard Phase Designation Diagrams and Phase Sequences" Highway Standard, the District's phase diagrams and notes, the District's chart sequence of operations or as directed by the Engineer. The phase rotation shall consist of the following items:

1. Modify all incoming field wiring to provide the new sequence of operations which includes all signal heads, pedestrian heads, internally illuminated signs, emergency vehicle preemption, confirmation beacons, vehicle detectors, pedestrian detectors and system detectors.
2. Modify the controller programming and phase overlaps to provide the proposed sequence of operations.
3. All back panel modifications as required to provide the proposed sequence of operations and system detection.
4. The Contractor shall provide five (5) copies (11" x 17") of revised cabinet wiring diagrams.
5. The Contractor shall provide revised cable logs indicating the number of each cable, the field location the cable is terminated at, and all cables must be tagged with an I.D. number that corresponds with the revised cable log.

E-24 DRILL EXISTING HANDHOLE

This item shall comply with Section 879 of The Standard Specifications for Road and Bridge Construction.

E-25 INDUSTRIAL GRADE MODEM

This pay item shall include providing and installing an industrial grade phone Modem at a location designated by the Engineer. The Modem shall be an Econolite 56K Modem and shall be capable of communicating at 56 kps. This pay item shall include hardware, connectors, and related equipment necessary to complete the installation in accordance with the manufacturer's specifications. The installation of the telephone service will be accomplished by the McHenry County Division of Transportation.

E-26 VIDEO DETECTION SYSTEM (BY APPROACH/LEG)

This specification sets forth the minimum requirements for a system that monitors vehicles on a roadway via processing of video images and provides detector outputs to a traffic controller or similar device. The work shall consist of furnishing and installing an Autoscope Solo Terra or approved equal video vehicle detection system including all necessary hardware, cable and accessories necessary to complete the installation in accordance with the manufacturer's specifications.

The Video Detection System (By Approach/Leg) shall consist of the proper equipment required to detect vehicles for one leg of traffic. This equipment includes integrated machine vision processor sensor (MVP), electrical interface panel, and a detector interface card. Four units of the Video Detection System (By Approach/Leg) shall comprise and/or be equivalent to a video detection system for a complete four leg intersection. Video detection zones shall be user-defined through interactive graphics by placing lines and/or boxes in an image or a VGA monitor. The system shall calculate traffic parameters in real-time and provide local non-volatile data storage for later downloading and analysis.

See following VIDEO DETECTION SYSTEM specification in McHenry County's Traffic Signal Specifications that are a part of this document.

ITEM F - TEMPORARY TRAFFIC SIGNAL INSTALLATION

F-1 INSTALL TEMPORARY TRAFFIC SIGNAL, FOUR APPROACHES OR LESS;
F-2 REMOVE EXISTING TEMPORARY TRAFFIC SIGNAL, FOUR APPROACHES OR LESS;

Under these items, for a unit price per installation, as shown in the Schedule of Prices and directed by the Engineer in writing, the Contractor shall either install or remove a temporary traffic signal installation. Installation of a temporary traffic signal shall be according to MCDOT traffic signal specifications contained in this contract with the following exceptions: All equipment shall be new from signal heads, LED modules, signal cabinets and controllers and other signal equipment. If required by the Engineer, vehicle detection and UPS equipment shall be install on the temporary traffic signal and each will be paid for separately.

I. Install Temporary Traffic Signal Installation

a. Plans for the temporary traffic signal installation shall be supplied by the Engineer.

b. The temporary traffic signal installation shall be installed in compliance with the Department's Traffic Signal Specifications.

c. All parts of the temporary traffic signal installation shall become property of the McHenry County Division of Transportation upon acceptance of the installation.

d. All signal equipment shall be new.

e. The temporary traffic signal shall be installed in compliance with IDOT Standard 880001-01.

II. Remove Existing Temporary Traffic Signal

This work will consist of removing all equipment, poles, mounting hardware, signal heads, controller cabinets and any other equipment associated with the specified temporary installation, and delivering the equipment to the McHenry County Division of Transportation's yard in Woodstock, IL. All holes caused by the removal of wood poles shall be backfilled with sand as directed by the engineer. This work will be paid for at the Contract unit price each for REMOVE EXISTING TEMPORARY TRAFFIC SIGNAL, which will be payment in full for all work.

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	Crystal Lake
FB-6	Walkup Road, South of Burning Bush Drive (MCCD path)	2-Post Mount Flashers	Crystal Lake
FB-7	Harmony Road, E & W of Huntley High School Ent	2-Post Mount Flashers	Huntley
FB-8	Deerpass Road, North & South of River Road	2-Post Mount Flashers	Marengo
FB-9	Marengo Road (East & West Legs) @ South Union Road	2-Post Mount Flashers	Union
FB-10	South Union Road, North & South of Marengo Road	2-Post Mount Flashers	Union
FB-11	Cary Road, North & South of Norman Drive	2-Post Mount Flashers	Cary
FB-12	Alden Road, North & South of O'Brien Road	2-Post Mount Flashers	Alden
FB-13	O'Brien Road (East & West Legs) @ Alden Road	2-Post Mount Flashers	Alden
FB-14	Country Club Road , North & South of Hillside Road	2-Post Mount Flashers	Crystal Lake
FB-15	Franklinville Road, North & South of Perkins Road	2-Post Mount Flashers	Woodstock
FB-16	Perkins Road, (East & West Legs) @ Franklinville Road	2-Post Mount Flashers	Woodstock
FB-17	Ridgefield Road, North of US RT 14 (N & S of Bikepath)	2-Post Mount Flashers	Crystal Lake
FB-18	Spring Grove Road, North & South of Miller Road	2-Post Mount Flashers	Spring Grove
FB-19	Miller Road, (East and West Legs) @ Spring Grove Road	2-Post Mount Flashers	Spring Grove
FB-20	Johnsburg Road, West of Chapel Hill Rd (Ped Crossing)	2-Post Mount Flashers	Johnsburg

HL-1	Algonquin Road Lighting @ Randall Road	Highway Lighting System	Algonquin
HL-2	Algonquin Road Lighting @ Harvest Gate Road/Talaga Dr	Highway Lighting System	Lake in the Hills
HL-3	Algonquin Road Lighting @ Square Barn Road/Frank Rd	Highway Lighting System	Lake in the Hills
HL-4	Algonquin Road Lighting @ Lakewood Road	Highway Lighting System	Lake in the Hills
HL-5	Algonquin Road Lighting @ Haligus Road	Highway Lighting System	Huntley
HL-6	Rakow Road @ Pingree Road	Highway Lighting System	Crystal Lake
HL-7	Rakow Road @ Pyott Road/Virginia Road	Highway Lighting System	Crystal Lake
HL-8	Rakow Rd/Randall Rd Lighting @ McHenry Ave/Ackman Rd	Highway Lighting System	Crystal Lake
HL-9	Randall Road Lighting @ Miller Road	Highway Lighting System	Crystal Lake
HL-10	Randall Road Lighting @ Acorn Lane/Polaris Drive	Highway Lighting System	Lake in the Hills
HL-11	Randall Road Lighting @ Huntington Drive/Bunker Hill Dr	Highway Lighting System	Algonquin
HL-12	Randall Road Lighting @ Harnish Drive	Highway Lighting System	Algonquin
HL-13	Randall Road Lighting, North of County Line Road	Highway Lighting System	Algonquin
HL-14	Ackman Road Lighting @ Golf Course Road	Highway Lighting System	Crystal Lake
HL-15	Bull Valley Road Lighting @ Ridgeview Drive	Highway Lighting System	McHenry
HL-16	Miller Road Lighting @ River Road	Highway Lighting System	McHenry
HL-17	McHenry Avenue (Old Miller Rd) Lighting @ Bull Valley Rd	Highway Lighting System	McHenry
HL-18	Virginia Road @ IL Rte 31 Park & Ride Parking Lot	Parking Lot Lighting	Lake in the Hills
HL-19	Johnsburg Road Lighting @ Spring Grove Road	Highway Lighting System	Johnsburg
TS-1	Algonquin Road @ Pyott Road	Traffic Signal	Algonquin
TS-2	Algonquin Road @ 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 Road/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 Road @ Huntley Fire Station Entrance	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 Road/Meredith Drive	Traffic Signal	Crystal Lake
TS-15	Randall Road @ Miller Road	Traffic Signal	Crystal Lake
TS-16	Randall Road @ Acorn Lane/Polaris Drive	Traffic Signal	Lake in the Hills
TS-17	Randall Road @ Algonquin Road	Traffic Signal	Algonquin
TS-18	Randall Road @ Huntington Dr/Bunker Hill Rd	Traffic Signal	Algonquin
TS-19	Randall Road @ Harnish Drive	Traffic Signal	Algonquin
TS-20	Virginia Road @ Pyott Rd/Main St	Traffic Signal	Crystal Lake
TS-21	Virginia Road @ Berkshire Drive	Traffic Signal	Crystal Lake
TS-22	Virginia Road @ Teckler Boulevard	Traffic Signal	Crystal Lake
TS-23	Walkup Road @ Hillside Road	Traffic Signal	Crystal Lake
TS-24	Walkup Road @ Pleasant Hill Road/Deerwood Dr	Traffic Signal	Crystal Lake
TS-25	Walkup Road @ Edgewood Road/Berry Court	Traffic Signal	Crystal Lake
TS-26	Walkup Road @ Crystal Springs Road	Traffic Signal	Crystal Lake
TS-27	Crystal Lake Road @ Mason Hill Road	Traffic Signal	McHenry
TS-28	Bull Valley Road @ Crystal Lake Road	Traffic Signal	McHenry
TS-29	Bull Valley Road @ Ridgeview Drive	Traffic Signal	McHenry
TS-30	Miller Road @ Green Street	Traffic Signal	McHenry
TS-31	Miller Road @ River Road	Traffic Signal	McHenry
TS-32	Ackman Road @ Golf Course Road	Traffic Signal	Crystal Lake
TS-33	Cary Road @ Main Street	Traffic Signal	Cary
TS-34	Chapel Hill Road @ Bay Road	Traffic Signal	Johnsburg
TS-35	Chapel Hill Road @ Lincoln Road	Traffic Signal	McHenry
TS-36	Wilmot Road @ Main Street	Traffic Signal	Spring Grove
TS-37	Johnsburg Road @ Riverside Drive	Traffic Signal	Johnsburg
TS-38	Johnsburg Road @ Spring Grove Road	Traffic Signal	Johnsburg
TS-39	Harmony Road @ Hemmer Road	Temporary Traffic Signal	Huntley
TS-40	Marengo Rd/Harmony Rd @ Main St	Temporary Traffic Signal	Huntley
RW-1	Kishwaukee Valley Road, West of Root Road	RWIS	Marengo
RW-2	Rakow Road @ Pyott Road	RWIS	Crystal Lake
RW-3	Miller Road Bridge, West of River Road	RWIS	McHenry
RW-4	Lawrence Road @ Weidner Road	RWIS	Harvard

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 (15-00000-01-GM)

SCHEDULE OF ROUTINE MAINTENANCE PAY ITEMS MASTER LIST FOR 2015

A1: Traffic Signal Location
A2: Temporary Traffic Signal Location
A3: Overhead Flashing Beacon
A4: Post Mount Flashing Beacon
B1: Street Light Location
C1: RWIS (Road Weather Information System)

#	Zone	Inter.	Location	Routine Maintenance Pay Items					
				A1	A2	A3	A4	B1	C1
			TRAFFIC SIGNALS						
TS1	1	10	Algonquin Road @ Pyott Road	1				3	
TS2	1	9	Algonquin Road @ Hanson Rd/Hilltop Dr	1				4	
TS3	1	8	Algonquin Road @ Crystal Lake Road	1				4	
TS4	1	7	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			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	6	Randall Road @ Miller Road	1					
TS16	1	5	Randall Road @ Acorn Ln/Polaris Dr	1					
TS17	1	4	Randall Road @ Algonquin Road	1					
TS18	1	3	Randall Road @ Huntington Dr/Bunker Hill Rd	1					
TS19	1	2	Randall Road @ Harnish Drive	1					
TS20	3	1	Virginia Road @ Pyott Rd/Main St.	1					
TS21	3	2	Virginia Road @ Berkshire Drive	1					
TS22	3	3	Virginia Road @ Teckler Boulevard	1					
TS23			Walkup Road @ Hillside Road	1				4	
TS24			Walkup Road @ Pleasant Hill Rd/Deerwood Dr	1				4	
TS25			Walkup Road @ Edgewood Rd/Berry Ct	1				4	
TS26			Walkup Road @ Crystal Springs Road	1				2	
TS27			Crystal Lake Road @ Mason Hill Road	1				2	
TS28			Bull Valley Road @ Crystal Lake Road	1					
TS29			Bull Valley Road @ Ridgeview Drive	1					
TS30			Miller Road @ Green Street	1					
TS31			Miller Road @ River Road	1					
TS32			Ackman Road @ Golf Course Road	1					
TS33			Cary Road @ Main Street	1					
TS34			Chapel Hill Road @ Bay Road	1				2	
TS35			Chapel Hill Road @ Lincoln Road	1				4	
TS36			Wilmot Road @ Main Street	1				4	
TS37			Johnsburg Road @ Riverside Drive	1				4	
TS38			Johnsburg Road @ Spring Grove Road	1					
TS39			Harmony Road @ Hemmer Road		1			3	
TS40			Marengo Rd/Harmony Rd @ Main St		1			3	

MCHENRY COUNTY DIVISION OF TRANSPORTATION

TRAFFIC SIGNAL MAINTENANCE CONTRACT (15-00000-01-GM)

SCHEDULE OF ROUTINE MAINTENANCE PAY ITEMS MASTER LIST FOR 2015

A1: Traffic Signal Location
A2: Temporary Traffic Signal Location
A3: Overhead Flashing Beacon
A4: Post Mount Flashing Beacon
B1: Street Light Location
C1: RWIS (Road Weather Information System)

			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			Marengo Road (East and West Legs) @ South Union Road				2		
FB10			South Union Road, North and South of Marengo Road				2		
FB11			Cary Road, North and South of Norman Drive				2		
FB12			Alden Road, North and South of O'Brien Road				2		
FB13			O'Brien Road, (East and West Legs) @ Alden Road				2		
FB14			Country Club Road, North and South of Hillside Road				2		
FB15			Franklinville Road, North and South of Perkins Road				2		
FB16			Perkins Road, (East and West Legs) @ Franklinville Road				2		
FB17			Ridgefield Road, North of US Rte 14 (North & South of Bikepath)				2		
FB18			Spring Grove Road. North and South of Miller Road				2		
FB19			Miller Road (East and West Legs) @ Spring Grove Road				2		
			HIGHWAY LIGHTING						
HL1			Algonquin Road Lighting @ Randall Rd/Crystal Lake Rd					40	
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					24	
HL11			Randall Road Lighting @ Huntington Dr/Bunker Hill Rd					20	
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	
			RWIS (ROAD WEATHER INFORMATION SYSTEM)						
RW1			Kishwaukee Valley Road, West of Noe Road						1
RW2			Rakow Road @ Pyott Road						1
RW3			Miller Road Bridge, West of River Road						1
RW4			Lawrence Road @ Weidner Road						1
			TOTAL	38	2	2	33	525	4

McHenry County Division of Transportation

Traffic Signal Specifications

TRAFFIC SIGNAL SPECIFICATIONS

Effective: January 1, 2010
Revised: March 1, 2013

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.

SECTION 720 SIGNING

MAST ARM SIGN PANELS.

Add the following to Section 720.02 of the Standard Specifications:

Signs attached to poles or posts (such as mast arm signs) shall have mounting brackets and sign channels which are equal to and completely interchangeable with those used by the McHenry County Sign Shop. Signfix Aluminum Channel Framing System is currently recommended, but other brands of mounting hardware are acceptable based upon the Department's approval. All signs shall have a white reflectorized legend and border on a green reflectorized background, and shall meet ASTM Type XI and IDOT Type ZZ reflective sheeting. The sign face shall not have any holes. 3M Scotch Joining Systems bonding tape or approved equal shall be used in place of screws or rivets.

DIVISION 800 ELECTRICAL

SUBMITTALS.

Revise Section 801.05 of the Standard Specifications to read:

All material approval requests shall be submitted in accordance with the District's current Electrical Product Data and Documentation Submittal Guidelines. General requirements include:

a. Material approval requests shall be submitted at the preconstruction meeting, including major traffic signal items listed in the table in Article 801.05.All material or equipment which are 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.

b. Product data and shop drawings shall be assembled by pay item and separated from of other pay item submittals. 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.

c. Four complete copies of the manufacturer's descriptive literatures and technical data for the traffic signal materials. The descriptive literatures 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.

d. Seven 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.

e. Partial or incomplete submittals will be returned without review.

f. Certain non-standard mast arm poles and structures will require additional review from IDOT's Central Office. Examples include ornamental/decorative and non-standard length mast arm pole assemblies. The Contractor shall account for the additional review time in his schedule.
g. The contract number or permit number, project location/limits and corresponding pay code number must be on each sheet of the letter, material catalog cuts and mast arm poles and assemblies drawings.
h. 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.
i. 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 Corrected', 'Not Approved', or 'Please Resubmit'. 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.
j. All submitted items reviewed and marked 'APPROVED AS CORRECTED', or 'NOT APPROVED' or 'PLEASE RESUBMIT' 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.
k. Exceptions, Deviations and Substitutions. In general, 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.

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."

INSPECTION OF ELECTRICAL SYSTEMS.

Add the following to Section 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 facilities prior to field installation, at no extra cost to this contract.

MAINTENANCE AND RESPONSIBILITY.

Revise Section 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, or the Municipality 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. Automatic Traffic Enforcement equipment is not owned by the State and the

Contractor shall not be responsible for maintaining it during construction. The Contractor shall supply the Engineer, Area Traffic Signal Maintenance and Operations Engineer, Department's Electrical Maintenance Contractor with two 24-hour emergency contact names and telephone numbers.

b) 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 (815) 334-4960 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. 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.

c) Contracts such as pavement grinding or patching which result in the destruction of traffic signal loops do not require maintenance transfer, but require a notification of intent to work and an inspection. A minimum of seven (7) working days prior to the loop removal, the Contractor shall notify the Area Traffic Signal Maintenance and Operations Engineer at (815) 334-4960 and the Department's Electrical Maintenance Contractor, at which time arrangements will be made to adjust the traffic controller timing to compensate for the absence of detection. See additional requirements in these specifications under Inductive Loop Detector.

d) 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 shutdown 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.

e) The Contractor shall be fully responsible for the safe and efficient operation of the traffic signals. 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 $500 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 $500 per month per occurrence. Unpaid bills will be deducted from the cost of the Contract. The Department's Electrical Maintenance Contractor may inspect any signalizing device on the Department's highway system at any time without notification.

f) 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.

DAMAGE TO TRAFFIC SIGNAL SYSTEM.

Revise Section 801.12(b) of the Standard Specifications to read:

Any damaged equipment or equipment not operating properly from any cause whatsoever shall be repaired with new equipment meeting current MCDOT traffic signal specifications 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 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. Cable splices outside the controller cabinet shall not be allowed.

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

TRAFFIC SIGNAL INSPECTION (TURN-ON).

Revise Section 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 vendor 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 (815) 334-4960 a minimum of seven (7) working days prior to the time of the requested inspection. The Department will not grant a field inspection until notification is provided from the Contractor that the equipment has been field tested and the intersection is operating according to Contract requirements. There shall be no Friday traffic signal turn-ons allow by the MCDOT. The Department's facsimile number is (815) 334-4989. 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 direct traffic at the time of testing.

The Contractor shall provide a representative from the control equipment vendor's office 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 Department requires the following from the Contractor at traffic signal turn-ons.

1. One set of signal plans of record with field revisions marked in red ink.
2. Notification from the Contractor and the equipment vendor of satisfactory field testing.
3. A knowledgeable representative of the controller equipment supplier shall be required at the traffic signal turn-on. The representative shall be knowledgeable of the cabinet design and controller functions.
4. A copy of the approved material letter.
5. One (1) copy of the operation and service manuals of the signal controller and associated control equipment.

6. Five (5) copies (280 mm X 430 mm) 11" x 17" of the cabinet wiring diagrams.
7. Five (5) copies of the traffic signal installation cable log.
8. The controller manufacturer shall provide a printer at the turn-on to supply a printed form, not to exceed (280 mm X 430 mm) 11" x 17" for recording 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 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. All manufacturer and contractor warrantees and guarantees required by Article 801.14

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. 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:

a. "When the work is complete, and seven days before the request for a final inspection, the full-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.

b. 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."

c. Additional requirements are listed in the District's Electrical Product Data and Documentation Guidelines.

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
- Handholes
- Conduit roadway crossings
- Controller Cabinets
- Communication Cabinets
- Electric Service Disconnect locations
- CCTV Camera installations
- Fiber Optic Splice Locations

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:

1. Description of item
2. Designation or approximate station if the item is undesignated
3. Latitude
4. Longitude

Examples:

Description	Designation	Latitude	Longitude
Mast Arm Pole Assembly (dual, combo, etc)	MP (SW, NW, SE or NE corner)	41.580493	-87.793378
FO mainline splice handhole	HHL-ST31	41.558532	-87.792571
Handhole	HH	41.765532	-87.543571
Electric Service	Elec Srv	41.602248	-87.794053
Conduit crossing	SB IL83 to EB I290 ramp SIDE A	41.584593	-87.793378
PTZ Camera	PTZ	41.584600	-87.793432
Signal Post	Post	41.558532	-87.792571
Controller Cabinet	CC	41.651848	-87.762053
Master Controller Cabinet	MCC	41.580493	-87.793378
Communication Cabinet	ComC	41.558532	-87.789771
Fiber splice connection	Toll Plaza34	41.606928	-87.794053

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 100 feet. 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 5 meter 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 803.00 to the Standard Specifications to read:

If this Contract requires the services of an Electrical Contractor, the Contractor shall be responsible at his/her own expense for locating existing MCDOT 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 MCDOT electrical facilities from the Department's 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 the local Counties or Municipalities may need to be contacted, in the City of Chicago contact D.I.G.G.E.R. 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 or 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.

ELECTRIC SERVICE INSTALLATION.

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 details in the "District 1 Standard Traffic Signal Design Details" and applicable portions of the Specifications.

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. The service agreement and sketch shall be submitted for signature to the Traffic Program's engineer.

Materials.

i. 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.

j. Enclosures.
   1. Pole Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 4X, unfinished single door design, fabricated from minimum 2.03 mm (0.080-inch) 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 350 mm (14-inches) high, 225 mm (9-inches) wide and 200 mm (8-inches) in depth is required. The cabinet shall be channel mounted to a wooden utility pole using assemblies recommended by the manufacturer.

   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 3.175 mm (0.125-inch) thick, the top 6.350 mm (0.250-inch) thick and the bottom 12.70 mm (0.500-inch) 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 1.91 mm (.075-inch) 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 1000 mm (40-inches high), 400 mm (16-inches) wide and 375 mm (15-inches) 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.

k. 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.

l. 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, otherwise noted on the plans, 120 V and the auxiliary circuit breakers shall be rated 10 amperes, 120 V.

m. 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.

n. 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.

o. 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.

p. Ground Rod. Ground rods shall be copper-clad steel, a minimum of 3.0 meters (10') in length, and 20mm (3/4") 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 20mm (3/4") grounding conduit, ground rod, and pole mount assembly. Any changes 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.

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. See IDOT District 1 Traffic Signal detail plan sheet for additional information.

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 foundation paid item and will not be paid for separately.

Testing shall be according to Section 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 Section 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 Listed grounding connector, to all traffic signal mast arm poles, traffic signal posts, pedestrian posts, pull boxes, handhole frames and covers and other metallic enclosures throughout the traffic signal wiring system, except where noted herein. A Listed electrical joint compound shall be applied to all conductors terminations, connector threads and contact points.

3) All metallic and non-metallic raceways containing traffic signal circuit runs 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, listed pressure connectors, listed clamps or other approved listed means.

GROUNDING EXISTING HANDHOLE FRAME AND COVER.

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 Specifications.

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 Listed grounding compression terminal (Burndy type YGHA or approved equal). 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 handhoie 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.

COILABLE NON-METALLIC CONDUIT.

Description.
This work shall consist of furnishing and installing empty coilable non-metallic conduit (CNC) for detector loop raceways.

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.

Revise Article 810.04 - Installation of the Standard Specifications to read:

All underground conduit shall have a minimum depth of 2 ½ ft (750 mm) below the finished grade and shall be installed to avoid existing and proposed utilities within the project limits.

HANDHOLES.

Add the following to Section 814.00 of the Standard Specifications:

All handholes shall be concrete, poured in place, with inside dimensions of 21-1/2" (549 mm) minimum. Frames and lid openings shall match this dimension. The cover of the handhole frame shall be labeled "Traffic Signals" with legible raised letters.

For grounding purposes the handhole frame shall have provisions for a 7/16" (15.875 mm) diameter stainless bolt cast into one corner of 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 frame.

The minimum wall thickness for heavy duty hand holes shall be 12" (300 mm).

All conduits shall enter the handhole at a depth of 30" (760 mm) except for the conduits for detector loops when the handhole is less than 5' (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 (12.7 mm) diameter with two 90 degree bends and extend into the handhole at least 6 inches (150 mm). Hooks shall be placed a minimum of 12 inches (300 mm) below the lid or lower if additional space is required.

GROUNDING CABLE.

The cable shall meet the requirements of Section 817 of the "Standard Specifications," except for the following:

Add to Section 817.02 (b) of the Standard Specifications:

Unless otherwise noted on the Plans, traffic signal grounding conductor shall be one conductor, #6 gauge copper, with a XLP jacket.

The traffic signal grounding conductor shall be bonded, using a Listed grounding connector (Burndy type KC/K2C, as applicable, or approved equal), to all proposed and existing traffic signal mast arm poles and traffic/pedestrian signal posts, including push button posts. The grounding conductor shall be bonded to all proposed and existing pull boxes, handhole frames and covers and other metallic enclosures throughout the traffic signal wiring system and noted herein and detailed on the plans. Bonding to existing handhole frames and covers shall be paid for separately.

Revise Section 817.05 of the Standard Specifications to read:

Basis of Payment. Grounding cable shall be measured in place for payment in (meter) foot. Payment shall be at the contract unit price for EQUIPMENT GROUNDING CONDUCTOR, NO. 6, 1C, which price includes all associated labor and material including grounding clamps, splicing, exothermic welds/other Listed connectors and hardware.

RAILROAD INTERCONNECT CABLE.

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:

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 873.05 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.

FIBER OPTIC TRACER CABLE.

The cable shall meet the requirements of Section 817 of the "Standard Specifications," except for the following:

Add to Section 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. The tracer cable shall be continuous, extended into the controller cabinet and terminated on a terminal strip mounted on the side wall of the controller cabinet. The terminal strip and tracer cable shall be clearly marked and identified. The tracer cable will be allowed to be spliced at the handholes only. All tracer cable splices shall be kept to a minimum and shall incorporate maximum lengths of cable supplied by the manufacturer. The tracer cable splice shall use a Western Union Splice soldered with resin core flux. All exposed surfaces of the solder shall be smooth. Splices shall be soldered using a soldering iron. Blow torches or other devices which oxidize copper cable shall not be allowed for soldering operations. The splice shall be covered with WCSMW 30/100 heat shrink tube, minimum length (100 mm) 4" and with a minimum (25 mm) 1" coverage over the XLP insulation, underwater grade.

Revise Section 817.05 of the Standard Specifications to read:

Basis of Payment. The tracer cable shall be paid for separately as ELECTRIC CABLE IN CONDUIT, TRACER, NO. 14 1C per (meter) foot, which price shall include all associated labor and material for installation.

MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION.

Revise Articles 850.02 and 850.03 of the Standard Specification to read:

Procedure.
The energy charges for the operation of the traffic signal installation shall be paid for by others. Full maintenance responsibility shall start as soon as the Contractor begins any physical work on the Contract or any portion thereof.

The Contractor shall have electricians with IMSA Level II certification on staff to provide signal maintenance.

This item shall include maintenance of all traffic signal equipment at the intersection, including emergency vehicle pre-emption equipment, master controllers, uninterruptible power supply (UPS and batteries), telephone service installations, communication cables, conduits to adjacent intersections, and other traffic signal equipment, but shall not include Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, or peripheral equipment, not owned by the State.

Maintenance.
The maintenance shall be according to MAINTENANCE AND RESPONSIBILITY in Division 800 of these specifications and the following:

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. 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.

The Contractor shall assume all locating duties of the traffic signal during the extent of the project. These locating duties shall include existing underground traffic signal utilities and all newly installed traffic signal utilities not yet transferred to/or accepted by the MCDOT. The Contractor shall not be required to locate any abandoned traffic signal utilities.

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.

The Contractor shall provide the Engineer with a 24 hour telephone number for the maintenance of the traffic signal installation and for emergency calls by the Engineer.

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.

The Contractor shall respond to all emergency calls from the Department or others within one 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 County's Electrical Maintenance Contractor perform the maintenance work required. The County'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.

TRAFFIC ACTUATED CONTROLLER.

Add the following to Section 857.02 of the Standard Specifications:

Controllers shall be NEMA TS2 Type 1 compatible, Econolite ASC3-1000 or ASC3-2100 as shown on the plans or approved equal unless specified otherwise on the plans or elsewhere on these specifications. Only controllers supplied by one of the District 1 approved closed loop equipment manufacturers will be allowed. The controller shall be the most recent model and software version supplied by the manufacturer at the time of the approval. 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 over lap phase. The controller shall prevent phases from being skipped during program changes and after all preemption events. The controller shall be equipped with an Ethernet port and removable data key to save the controller database.

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 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 Provisions under Master Controller.

MASTER CONTROLLER.

Revise Sections 860.02 - Materials and 860.03 - Installation of the Standard Specifications to read:

Only controllers supplied by one of the District approved closed loop equipment manufacturers will be allowed. Only NEMA TS 2 Type 1 Econolite or approved equal 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 Specification 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 Contractor shall be required to setup graphic displays and all software parameters for every intersection to be interconnected under this Contract, including complete viewing and control capabilities from IDOT remote monitor.

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 or approved equal.

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 Department staff.

As soon as practical or within one week after the contract has been awarded, the Contractor shall contact (via phone) the Traffic Engineer at the McHenry County Division of Transportation at (815) 334-4960 to request a phone line installation.

A follow-up fax transmittal to the Traffic Engineer (815-334-4989) with all required information pertaining to the phone installation is required from the Contractor as soon as possible or within one week after the initial request has been made. The required information to be supplied on the fax shall include (but not limited to): A street 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 is 4-6 weeks after the MCDOT has received the Contractor supplied fax. It is, therefore, imperative that the phone line conduit and pull-string be installed by the Contractor in anticipation of this time frame. On jobs which include roadway widening in which the conduit cannot be installed until this widening is completed, the Contractor will be allowed to delay the phone line installation request to the Business Services Section until a point in time that is 4-6 weeks prior to the anticipated completion of the traffic signal work. The contractor shall provide the Administrative Support Manager with an expected installation date considering the 4-6 week processing time.

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 McHenry County Division of Transportation (i.e., this will be an MCDOT phone number not a Contractor phone number).

UNINTERRUPTIBLE POWER SUPPLY.

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 six hours.

Add the following to Article 862.02 of the Standard Specifications:

Materials shall be according to Article 1074.04 as modified in UNINTERRUPTIBLE POWER SUPPLY in Division 1000 of these specifications.

Add the following to Article 862.03 of the Standard Specifications:

The UPS shall additionally include, but not be limited to, a battery cabinet. 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 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. When LED lamps are installed resistors shall be required to be placed on the load switches to eliminate any voltage leaking to the LED lamps. The resistor type shall be that recommended by the vendor of the preemption equipment. A concrete apron 67 in. x 50 in. x 5 in. (1702mm x 1270mm x 130mm) shall be provided on the side of the existing Type D Foundation, where the UPS cabinet is located. The concrete apron shall follow the District 1 Standard Traffic Signal Design Detail, Type D for Ground Mounted Controller Cabinet and UPS Battery Cabinet. The concrete apron shall follow Articles 424 and 202 of the Standard Specifications.

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 UNINTERRUPTIBLE POWER SUPPLY. Replacement of Emergency Vehicle Priority System confirmation beacons and installation of load switch resistors shall be included in the cost of the UNINTERRUPTIBLE POWER SUPPLY item.

FIBER OPTIC CABLE.

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 872.02 of the Standard Specifications:

The control cabinet distribution enclosure shall be CSC FTWO12KST-W/O 12 Port Fiber Wall Enclosure or an approved equivalent. The fiber optic cable shall provide six 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 and sealed. 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.

Basis of Payment. The work shall be paid for at the contract unit price for FIBER OPTIC CABLE IN CONDUIT, NO. 62.5/125, MM12F SM12F, per (meter) foot for the cable in place, including distribution enclosure and all connectors.

MAST ARM ASSEMBLY AND POLE.

Revise Article 877.01 of the Standard Specifications to read:

Description.
This work shall consist of furnishing and installing a steel mast arm and assembly and a galvanized steel or extruded aluminum shroud for protection of the base plate.

Revise Article 877.03 of the Standard Specifications:

Mast arm assembly and pole shall be as follows.

(a) Steel Mast Arm Assembly and Pole and Steel Combination Mast Arm Assembly and Pole. The steel mast arm assembly and pole and steel combination mast arm assembly and pole shall consist of a traffic signal mast arm, a luminaire mast arm or davit (for combination pole only), a pole, and a base, together with anchor rods and other appurtenances. The configuration of the mast arm assembly, pole, and base shall be according to the details shown on the plans.

(1) Loading. The mast arm assembly and pole, and combination mast arm assembly and pole shall be designed for the loading shown on the Highway Standards or elsewhere on the plans, whichever is greater. The design shall be according to AASHTO "Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals" 1994 Edition for 80 mph (130 km/hr) wind velocity. However, the arm-to-pole connection for tapered signal and luminaire arms shall be according to the "ring plate" detail as shown in Figure 11-1(f) of the 2002 Interim, to the AASHTO "Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals" 2001 4th Edition.

(2) Structural Steel Grade. The mast arm and pole shall be fabricated according to ASTM A 595, Grade A or B, ASTM A 572 Grade 55, or ASTM A 1011 Grade 55 HSLAS Class 2. The base and flange plates shall be of structural steel according to AASHTO M 270 Grade 50 (M 270M Grade 345). Luminaire arms and trussed arms 15 ft (4.5 m) or less shall be fabricated from one steel pipe or tube size according to ASTM A 53 Grade B or ASTM A 500 Grade B or C. All mast arm assemblies, poles, and bases shall be galvanized according to AASHTO M 111.

(3) Fabrication. The design and fabrication of the mast arm assembly, pole, and base shall be according to the requirements of the Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals published by AASHTO. The mast arm and pole may be of single length or sectional design. If section design is used, the overlap shall be at least 150 percent of the maximum diameter of the overlapping section and shall be assembled in the factory.

The manufacturer will be allowed to slot the base plate in which other bolt circles may fit, providing that these slots do not offset the integrity of the pole. Circumferential welds of tapered arms and poles to base plates shall be full penetration welds.

(4) Shop Drawing Approval. The Contractor shall submit detailed drawings showing design materials, thickness of sections, weld sizes, and anchor rods to the Engineer for approval prior to fabrication. These drawings shall be at least 11 x 17 in. (275 x 425 mm) in size and of adequate quality for microfilming.

(b) Anchor Rods. The anchor rods shall be ASTM F 1554 Grade 105, coated by the hot-dip galvanizing process according to AASHTO M 232, and shall be threaded a minimum of 7 1/2 in. (185 mm) at one end and have a bend at the other end. The first 12 in. (300 mm) at the threaded end shall be galvanized. Two nuts, one lock washer, and one flat washer shall be furnished with each anchor rod. All nuts and washers shall be galvanized.

(c) The galvanized steel or extruded aluminum shroud shall have dimensions similar to those detailed in the "District One Standard Traffic Signal Design Details." The shroud shall be installed such that it allow air to circulate throughout the mast arm but not allow infestation of insects or other animals, and such that it is not hazardous to probing fingers and feet.

Add the following to Article 877.04 of the Standard Specifications:

The shroud shall not be paid for separately but shall be included in the cost of the mast arm assembly and pole.

CONCRETE FOUNDATIONS.

Add the following to Section 878.03 of the Standard Specifications:

All anchor bolts shall be according to Section 1006.09, except all anchor bolts shall be hot dipped galvanized the full length of the anchor bolt including the hook.

Concrete Foundations, Type "A" for Traffic Signal Posts shall provide anchor bolts with the bolt pattern specified within the "District 1 Standard Traffic Signal Design Details." All Type "A" foundations shall be a minimum depth of 1.22 m (48").

Concrete Foundations, Type "C" for Traffic Signal Cabinets with Uninterruptible Power Supply (UPS) cabinet installations shall be a combined concrete foundation with the UPS portion of the foundation located on the signal power panel side of the controller foundation. The dimensions of the Type C foundation shall be a minimum of 72 inches long and 36 inches wide. All Type "C" foundations shall be a minimum depth of 48 inches. The concrete apron in front Type IV or V cabinet shall be 36 in. x 72 in. x 4 in. The concrete apron in front of the UPS cabinet shall be 36 in. x 72 in. x 4 in. Anchor bolts shall provide bolt spacing as required by the manufacturer.

Concrete Foundations, Type "D" for Traffic Signal Cabinets shall be a minimum of 48 inches (1.22 m) long and 31 inches (790 mm) wide. All Type "D" foundations shall be a minimum depth of 48 inches (1.22 m). The concrete apron shall be 36 in. x 48 in. x 5 in. (910 mm X 1220 mm X 130 mm). Anchor bolts shall provide bolt spacing as required by the manufacturer.

Concrete Foundations, Type "E" for Mast Arm and Combination Mast Arm Poles shall meet the current requirements listed in the Highway Standards.

Foundations used for Combination Mast Arm Poles shall provide an extra 2-1/2 inch (65 mm) raceway.

No foundation is to be poured until the Resident Engineer gives his/her approval as to the depth of the foundation.

LIGHT EMITTING DIODE (LED) SIGNAL HEAD AND OPTICALLY PROGRAMMED LED SIGNAL HEAD.

Add the following to the first paragraph of Article 880.04 of the Standard Specifications:

Basis of Payment.
The price shall include furnishing the equipment described above, all mounting hardware and installing them in satisfactory operating condition.

LIGHT EMITING DIODE (LED), SIGNAL HEAD, RETROFIT

Description.
This work shall consist of retrofitting an existing polycarbonate traffic signal head with a traffic signal module, pedestrian signal module, and pedestrian countdown signal module, with light emitting diodes (LEDs) as specified in the plans.

Materials.
Materials shall be according to LIGHT EMITTING DIODE (LED) AND OPTICALLY PROGRAMMED LED SIGNAL HEAD, AND LIGHT EMITTING DIODE (LED) PEDESTRIAN SIGNAL HEAD in Divisions 880, 881 and 1000 of these specifications.

Add the following to Article 880.04 of the Standard Specifications:

Basis of Payment.
This item shall be paid for at the contract unit price each for SIGNAL HEAD, LED, RETROFIT, or PEDESTRIAN SIGNAL HEAD, LED, RETROFIT, for the type and number of polycarbonate signal heads, faces, and sections specified, which 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. The type specified will indicate the number of faces and the method of mounting.

LIGHT EMITTING DIODE (LED) PEDESTRIAN SIGNAL HEAD

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 the housings glossy black polycarbonate. 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).

Add the following to Article 881.04 of the Standard Specifications:

Basis of Payment.
The price shall include furnishing the equipment described above, all mounting hardwire and installing them in satisfactory operating condition.

DETECTOR LOOP.

Revise Section 886 of the Standard Specifications to read:

Description.
This work shall consist of furnishing and installing a detector loop in the pavement.

Procedure.
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 Area Traffic Signal Maintenance and Operations Engineer (815) 334-4960 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.
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 Panduit PLFIM water proof tag, or an approved equal, 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 lead-in.

(b) Loop sealant shall be a two-component thixotropic chemically cured polyurethane either Chemque Q-Seal 295, Percol Elastic Cement AC Grade or an approved equal. The sealant shall be installed 1/8 inch (3 mm) below the pavement surface, if installed above the surface the overlap shall be removed immediately.

(c) Detector loop measurements shall include the saw cut and the length of the loop lead-in to the edge of pavement. The lead-in 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. Unit duct, trench and backfill, and drilling of pavement or handholes shall be included in detector loop quantities.

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

(e) Preformed detector loops shall be installed in new pavement constructed of Portland cement concrete using mounting chairs or tied to re-bar or the preformed detector loops may be placed in the sub-base. 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.

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

(g) Preformed detector loops shall be factory assembled with ends capped and sealed against moisture and other contaminants. Homeruns and interconnects shall be pre-wired and shall be an integral part of the loop assembly. The loop configurations and homerun lengths shall be assembled for the specific application. The loop and homerun shall be constructed using 11/16 inch (17.2 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 or interconnects 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 insure 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 four 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.
This work will be measured for payment in feet (meters) in place. Type I detector loop will be measured along the sawed slot in the pavement containing the loop and lead-in, rather than the actual length of the wire. Preformed detector loops will be measured along the detector loop and lead-in embedded in the pavement, rather than the actual length of the wire.

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.

EMERGENCY VEHICLE PRIORITY SYSTEM.

Revise Section 887.00 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, maximum 6 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 4D-11 of the "Manual on Uniform Traffic Control Devices." The stopped pre-empted movements shall be signalized by a continuous indication.

Due to electric voltage leakage of the load switches in the cabinet, a resistor shall be installed on each load switch used for preemption to eliminate this occurrence.

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.

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 incidental to the cost of the Light Detector. 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.

EMERGENCY VEHICLE PRIORITY SYSTEM LINE SENSOR CABLE, NO. 20 3/C

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 manufacturer 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.

TEMPORARY TRAFFIC SIGNAL INSTALLATION.

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, uninterruptible 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 equipment vendor will be allowed to assemble the temporary traffic signal cabinet. Also, an approved equipment vendor shall assemble and test a temporary railroad traffic signal cabinet. (Refer to the "Inspection of Controller and Cabinet" specification). A representative of the approved control equipment vendor shall be present at the temporary traffic signal turn-on inspection.

Construction Requirements.

(a) Controllers.

1. Only controllers supplied by one of the District approved closed loop equipment manufacturers 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 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 as modified herein.

2. Only control equipment, including controller cabinet and peripheral equipment, supplied by one of the District approved closed loop equipment manufacturers 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 current software installed.

(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 807 of the Standard Specifications and shall meet the requirements of the District 1 Traffic Signal Specifications for "Grounding of Traffic Signal Systems".

(d) Traffic Signal Heads. All traffic signal sections and pedestrian signal sections shall be 12 inches (300 mm). 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. 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 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 item 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.

3. Temporary wireless interconnect, compete. The radio interconnect system shall be compatible with Eagle or Econolite controller closed loop systems. This item 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 this item.

   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 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 manufacturers recommendations.

   The following radio equipment is currently approved for use in Region One/District One: Encon Model 5100 and Intuicom Communicator II.

(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 as shown on the plans or as directed by the Engineer. Pedestrian push buttons shall be provided for all pedestrian signal heads/phases as shown on the plans or as directed by the Engineer. All approaches shall have vehicular detection provided by Video Vehicle Detection System as shown on the plans or as directed by the Engineer. The microwave vehicle sensor or video vehicle detection system shall be approved by IDOT before 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. A representative of the approved control equipment vendor 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) Uninterruptible Power Supply. All temporary traffic signal installations shall have Uninterruptible Power Supply (UPS). The UPS cabinet shall be mounted to the temporary traffic signal cabinet and meet the requirements of Uninterruptible Power Supply in Divisions 800 and 1000 of these specifications.

(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.

(j) Energy Charges. The electrical utility energy charges for the operation of the 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 MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION in Division 800 of these specifications. 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 County's Traffic Operations Engineer (815) 334-4960 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, District 1 Traffic Signal Specifications and any plans for Bridge Temporary Traffic Signals included in the plans. The installation shall meet the above requirements for "Temporary Traffic Signal Installation". 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 or as directed by the Engineer. Microwave vehicle sensors or video vehicle detection may be used in place of the detector loops as approved by the Engineer.

(m) Temporary Portable Traffic Signal for Bridge Projects.

1. Unless otherwise directed by the Engineer, temporary portable traffic signals shall be restricted to use on roadways of less than 8000 ADT that have limited access to electric utility service, shall not be installed on projects where the estimated need exceeds ten (10) weeks, and shall not be in operation during the period of November through March. The Contractor shall replace the temporary portable traffic signals with temporary span wire traffic signals noted herein at no cost to the contract if the bridge project or Engineer requires temporary traffic signals to remain in operation into any part of period of November through March. If, in the opinion of the engineer, the reliability and safety of the temporary portable traffic signal is not similar to that of a temporary span wire traffic signal installation, the Contractor shall replace the temporary portable traffic signals with temporary span wire traffic signals noted herein at no cost to the contract.

2. The controller and LED signal displays shall meet the Standard Specifications and all other requirements in this TEMPORARY TRAFFIC SIGNAL INSTALLATION specification.

3. Work shall be according to Article 701.18(b) of the Standard Specifications except as noted herein.

4. 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 of the Manual on Uniform Traffic Control Devices (MUTCD). The signal system shall be designed to continuously operate over an ambient temperature range between -30 °F (-34 °C) and 120 °F (48 °C). When not being utilized to inform and direct traffic, portable signals shall be treated as nonoperating equipment according to Article

701.11.

g. Basis of Payment. This work will be paid for according to Article 701.20(c).

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, all material required, the installation and complete removal of the temporary traffic signal.

REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT.

Add the following to Section 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 by them outside the right-of-way at their expense.

All equipment to be returned to the County shall be delivered by the Contractor to the County's Traffic Signal Maintenance Contractor's main facility. The Contractor shall contact the County'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 5 copies of a list of equipment that is to remain the property of the State, including model and serial numbers, where applicable. He 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 with these requirements, it will be rejected by the County's Electrical Maintenance Contractor. The Contractor shall be responsible for the condition of the traffic signal equipment from the time he takes maintenance of the signal installation until the acceptance of a receipt drawn by the County's Electrical Maintenance Contractor indicating the items have been returned in good condition.

The Contractor shall safely store and arrange for pick up 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.

TRAFFIC SIGNAL PAINTING.

Description.
This work shall include surface preparation, powder type painted 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 manufacturing 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 degrees F 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 degrees F.

The finish paint color shall be one of the manufacturer'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.

Traffic signal heads, pedestrian signal heads and controller cabinets are not included in this pay item.

Any damage to the finish after leaving the manufacturer's facility shall be repaired to the satisfaction of the Engineer using a method approvable by the Engineer and manufacturer. If while at the manufacturer's facility the finish is damaged, the finish shall be re-applied.

Warranty.
The Contractor shall furnish in writing to the Engineer, the paint manufacturer'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 POLE, UNDER 40 FEET (12.19 METER); PAINT NEW MAST ARM POLE, 40 FEET (12.19 METER) AND OVER; PAINT NEW COMBINATION MAST ARM POLE, UNDER 40 FEET (12.19 METER); PAINT NEW COMBINATION MAST ARM POLE, 40 FEET (12.19 METER) AND OVER; or TRAFFIC SIGNAL POST of any height, 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.

ILLUMINATED STREET NAME SIGN

Description.
This work shall consist of furnishing and installing a LED internally illuminated street name sign.

Materials.
Materials shall be in accordance with ILLUMINATED STREET NAME SIGN in Division 1000 of these specifications.

Installation.
The sign can be mounted on most steel mast arm poles. Mounting on aluminum mast arm pole requires supporting structural calculations. Some older or special designed steel mast arm poles may require structural evaluation to assure that construction of the mast arm pole is adequate for the proposed additional loading. Structural calculations and other supporting documentation as determined by the Engineer shall be provided by the contractor for review by the Department.

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 Pelco model SE-5015, or approved equal, utilizing stainless steel components.

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 uninterruptible power supply (UPS). The signs shall be connected to the generator or UPS bypass circuitry.

Basis of Payment.
This work will be paid for at the contract unit price each for ILLUMINATED STREET NAME SIGN, of the length specified which shall be payment in full for furnishing and installing the LED internally illuminated street 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.

RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM

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 (815) 334-4960 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 disks, 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) 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 new or 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.

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 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. The turning movement counts shall identify cars, and single-unit, multi-unit heavy vehicles, and transit buses.
   b. 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.
   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
      (4) New or updated intersection graphic display file for the subject intersection
      (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.

OPTIMIZE TRAFFIC SIGNAL SYSTEM

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 (815) 334-4960 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 disks, 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 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. 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 MCDOT 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.

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 MCDOT 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) 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
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 the report and CD have been submitted.

TEMPORARY TRAFFIC SIGNAL TIMING

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.

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 (815) 334-4960 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 conduct on-site implementation of the traffic signal timings. Make fine-turning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.

(b) Consultant shall provide monthly observation of traffic signal operations in the field.

(c) 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.

(d) Consultant shall make timing adjustments and prepare comment responses as directed by the Area Traffic Signal Engineer.

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, 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.

MODIFYING EXISTING CONTROLLER CABINET.

The work shall consist of modifying an existing controller cabinet as follows:

(a) Uninterruptible Power Supply (UPS). The addition of uninterruptible 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 uninterruptible power supply (UPS) components inside the existing controller cabinet as outlined under Sections 862 and 1074.04 of the Standard Specifications.

(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(5)(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(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.

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 Uninterruptible Power Supply (UPS) and labor to install it in the existing controller cabinet shall be included in the pay item Uninterruptible Power Supply. Modifying an existing controller will be paid for at the contract unit price per each for MODIFY EXISTING CONTROLLER, per Sections 895.04 and 895.08 of the Standard Specifications.

DIVISION 1000 MATERIALS

PEDESTRIAN PUSH-BUTTON.

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 shall be unfinished (not painted), unless otherwise noted on the plans. The housing shall be furnished with suitable mounting hardware.

All push buttons shall be mechanical buttons. Latching buttons with LED indicators are not accepted by the Department.

Revise Article 1074-02(e) of the Standard Specifications to read:

Stations shall be designed to be mounted directly 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 R10-3 9 x 12 inch 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 R10-3 9 x 12 inch sign with arrow(s).

Add the following to Article 1074.02(a) of the Standard Specifications:

(f) Location. Pedestrian push-buttons and stations shall be mounted directly to a post, mast arm pole or wood pole as shown on the plans and shall be fully accessible from a paved or concrete surface. See the District's Detail sheets for orientation and mounting details.

CONTROLLER CABINET AND PERIPHERAL EQUIPMENT.

Revise Section 1074.03 of the Standard Specifications to read:

Add the following to Article 1074.03 of the Standard Specifications:

(a) 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 – ASC Zone IT (50 kA rating) with LED status indicators. Model 91391 Zone IT base station and Model 91375 Zone IT or equivalent ASC model.

(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" (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 – 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.

RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET.

Controller shall comply with Article 1073.01 as amended in these Traffic Signal Special Provisions.

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 design.

A method of monitoring and/or providing redundancy to the railroad preemptor input to the controller shall be included as a component of the Railroad, Full Actuated Controller and Cabinet installation and be verified by the traffic signal equipment supplier prior to installation.

Railroad interconnected controllers and cabinets shall be assembled only by an approved traffic signal equipment supplier. The equipment shall be tested and approved in the equipment supplier's District One facility prior to field installation.

UNINTERRUPTIBLE POWER SUPPLY (UPS)

Revise Article 1074.04(a)(1) of the Standard Specifications to read:

The UPS shall be an on-line, double conversion system only 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 connected load, plus 20 percent (20%). The total connected traffic signal load shall not exceed the published ratings for the UPS. The UPS shall provide a minimum of six (3) hours of normal operation run-time for signalized intersections with LED type signal head optics at 77 °F (25 °C) (minimum 700 W/1000 VA active output capacity, with 90 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, 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 cabinet shall be a California Chassis aluminum cabinet, Part Number FCU104013, with a natural aluminum mill finish, or approved equal.

The external cabinet dimensions shall be 41 inches tall by 25 inches wide by 16 inches deep, excluding the door. Shelf clearance shall be a minimum of 10 inches. The cabinet shall house all batteries, the UPS, the Bypass Switch, and the wiring harnesses.

When installed, the cabinet for the UPS shall rest on the traffic signal cabinet foundation and shall also be secured to the right side of the traffic signal cabinet.

A blue LED indicator light shall be mounted on the side of the UPS cabinet facing traffic and shall turn on to indicate when cabinet power has been disrupted and the UPS is in operation. The light shall be a minimum of 1" in diameter, be viewable from the driving lanes, and shall be large enough and visible enough to be seen from 200 feet away.

The cabinet shall provide an external connection for an AC generator to power the signals, if necessary, during an extended utility power outage. The external connection shall be a NEMA Style 5-15 male flanged receptacle. A police door shall provided in the upper half of the main door end encompasses the full area of the outlet panel. This shall be location of the outlet to supply an external connection for an AC generator listed above. The standard dimensions of the panel are 7½" high, 12" wide and 2½" deep and are located directly behind the police door. A skeleton lock by Corbin is furnished for the police door unless otherwise specified.

UPS

End of paragraph 1074.04(b) (2)e

The door shall be equipped with a two position doorstop, one a 90 degree and one at 120 degree.

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 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 (Hubbell model HBL4716C or approved equal). Access to the generator inlet shall be from a secured weatherproof lift cover plate or behind a locked battery cabinet police panel.

Battery System.

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 leadcalcium 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 a number of batteries that match the voltage requirements of the entire string of batteries per manufacturer, (i.e. 36 volt/3 batteries, 72 volt/6 batteries) that are capable of maintaining normal operation of the signalized intersection for a minimum of three hours. Calculations shall be provided showing the number of batteries of the type supplied that are needed to satisfy this requirement. A minimum of three batteries shall be provided.

Add the following to the Article 1074.04 of the Standard Specifications:

(e) Warranty. The warranty for an uninterruptible power supply (UPS) shall cover a minimum of two years from date the equipment is placed in operation; however, the batteries of the UPS shall be warranted for full replacement for a minimum of five years from the date the traffic signal and UPS are placed into service.

ELECTRIC CABLE.

Delete "or stranded, and No. 12 or" from the last sentence of Section 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.

TRAFFIC SIGNAL POST.

Add the following to Section 1077.03 (b) of the Standard Specifications:

All posts and bases shall be steel and hot dipped galvanized. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with TRAFFIC SIGNAL PAINTING in Division 800 of these specifications.

PEDESTRIAN PUSH-BUTTON POST.

Add the following to Article 1077.02(b) of the Standard Specifications:

All posts and bases shall be steel and hot-dipped galvanized. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with Traffic Signal Painting in Division 800 of these specifications.

MAST ARM ASSEMBLY AND POLE.

Add the following to Section 1077.03 (a) of the Standard Specifications:

Traffic signal mast arms shall be one piece construction, unless otherwise approved by the Engineer. All poles shall be galvanized. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with with TRAFFIC SIGNAL PAINTING in Division 800 of these specifications.

The shroud shall be of sufficient strength to deter pedestrian and vehicular damage. The shroud shall be constructed and designed to allow air to circulate throughout the mast arm but not allow infestation of insects or other animals, and such that it is not hazardous to probing fingers and feet. All mounting hardware shall be stainless steel.

LIGHT EMITTING DIODE (LED) TRAFFIC SIGNAL HEAD.

Add the following to Section 1078 of the Standard Specifications to read:

1. All signal and pedestrian 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 signal and/or pedestrian heads are being replaced, the proposed head housings shall be **yellow**. 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 corrosive 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.

2. All signal heads shall have a "baseball" cap visor for each section. Tunnel visors shall not be accepted. All cap visors shall be black polycarbonate.

3. Pedestrian signal heads shall be furnished with the international symbolic "Walking Person" and "Upraised Palm" lenses. Egg crate sun shields are not permitted.

4. Signal heads shall be positioned according to the "McHenry County Signal Design Guidelines."

5. LED signal heads (All Face and Section Quantities), (All Mounting Types) shall conform fully to the requirements of Articles 1078.01 and 1078.02 of the Standard Specifications amended herein.

6. 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 show signs of entrance of moisture or contaminants within the first **72 months** 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 Department.

(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
   c. 12 inch (300 mm) pedestrian, 2 sections

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 weather proof after installation and connection.

4. Material used for the lens and signal module construction shall conform to ASTM specifications for the materials.

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

1. The minimum initial luminous intensity values for the modules shall conform to the values in Table 1 of the VTCSH (2005) for circular signal indications, and as stated in Table 3 of these specifications for arrow and pedestrian indications at 25°C.

2. The modules shall meet or exceed the illumination values stated in Article 1078.01(3)c of the "Standard Specifications for Road and Bridge Construction," Adopted January 1, 2007 for circular signal indications, and Table 3 of these specifications for arrow and pedestrian indications, throughout the useful life based on normal use in a traffic signal operation over the operating temperature range.

3. The measured chromaticity coordinates of the modules shall conform to the chromaticity requirements of Section 4.2 of the VTCSH (2005).

4. The LEDs utilized in the modules shall be AlInGaP technology for red and Portland orange (pedestrian) and InGaN for green, amber and white (pedestrian) 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
   c. 12 inch (300 mm) pedestrian, 2 sections

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 weather proof 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 VTCSH-ITE 2004 or applicable successor.

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.

(g) The following specification requirements apply to the 12 inch (300 mm) Pedestrian module only. All general specifications apply unless specifically superseded in this section.

1. Each pedestrian signal LED module shall provide the ability to actuate the solid upraised hand and the solid walking person on one 12 inch (300mm) section.

2. Two (2) pedestrian sections shall be installed. The top section shall be wired to illuminate only the upraised hand and the bottom section shall be the walking man.

3. "Egg Crate" type sun shields are not permitted. All figures must be a minimum of 9 inches (225mm) in height and easily identified from a distance of 120-feet (36.6m).

LIGHT EMITTING DIODE (LED) PEDESTRIAN COUNTDOWN SIGNAL HEAD.

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. The module shall allow for consecutive cycles without displaying the steady Upraised Hand.

5. The module shall recognize preemption events and temporarily modify the crossing cycle accordingly.

6. 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.

7. If the controller preempts during the flashing Upraised Hand, the countdown will continue to count down without interruption.

8. The next cycle, following the preemption event, shall use the correct, initially programmed values.

9. 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.

10. The digits will go dark for one pedestrian cycle after loss of power of more than 1.5 seconds.

11. The countdown numerals shall be two (2) "7 segment" digits forming the time display utilizing two rows of LEDs.

12. 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.

13. 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.

14. In the event of a power outage, light output from the LED modules shall cease instantaneously.

15. The LEDs utilized in the modules shall be AlInGaP technology for Portland Orange (Countdown Numerals and Upraised Hand) and InGaN technology for Lunar White (Walking Person) indications.

16. 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.

Electrical.

1. Maximum power consumption for LED modules is 29 watts.

2. The measured chromaticity shall remain unchanged over the input line voltage range listed of 80 VAC to 135 VAC.

TRAFFIC SIGNAL BACKPLATE.

Delete second sentence of the fourth paragraph of Article 1078.03 f 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 manufacturer's recommendations. The retro reflective sheeting shall be installed under a controlled environment at the manufacturer/supplier

before shipment to the contractor. The aluminum backplate shall be prepared and cleaned, following recommendations of the retro reflective sheeting manufacturer.

INDUCTIVE LOOP DETECTOR.

Add the following to Section 1079.01 of the Standard Specifications:

Contracts requiring new cabinets shall provide for card mounted detector amplifiers. Loop amplifiers shall provide LCD displays with loop frequency, inductance, and change of inductance readings.

ILLUMINATED SIGN, LIGHT EMITTING DIODE.

Delete last sentence of Article 1084.01(a) and add "Mounting hardware shall be black polycarbonate or galvanized steel and similar to mounting Signal Head hardware and brackets specified herein and shall provide tool free access to the interior.

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).

Add the following to Article 1084.01 of the Standard Specifications:

(e) The light emitting diode (LED) blank out signs shall be manufactured by National Sign & Signal Company, or an approved equal and consist of a weatherproof housing and door, LEDs and transformers.

ILLUMINATED STREET NAME SIGN.

The illuminate street name sign shall be as follows.

(a) Description.
The LEDs shall be white in color and utilize InGaN or UV thermally efficient technology. The LED Light Engines shall be designed to fit inside a standard fluorescent illuminated street sign housing in lieu of fluorescent lamps and ballasts or a slim line type housing. 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. The sign assemblies are generally available in four-, six-, or eight-foot lengths but are also available in 6 inch increments. White translucent 3M DG^3 reflective sheeting sign faces with the street name applied in 3M/Scotchlite Series 1177 or current 3M equivalent transparent green shall be installed in hinged doors on the side of the sign 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 Light Engine shall be a single, self-contained device, for installation in an existing street sign housing. The power supply must be designed to fit and mounted on the inside wall at one end of the street sign housing. The LED Light Engine shall be mounted within the inner top portion of the 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.

3. The Manufacturer/Vendor shall supply shop drawings of the fixtures, sign, sign message and mounting hardware for approval. All hardware used to install the sign shall be in accordance with the manufacturer's recommendations.

(d) Mechanical Construction.

1. The sign shall be constructed using a weatherproof, aluminum housing consisting of an extruded aluminum top with a minimum thickness of .140" x 10 ¾" deep (including the drip edge). The extruded aluminum bottom is .094" thick x 5 7/8" deep. The ends of the housing shall be cast aluminum with a minimum thickness of .250". A six-foot sign shall be 72 5/8" long and 22 5/16" tall and not weigh more than 77 pounds. An eight-foot sign shall be 96 5/8" long and 22 5/16" tall and not weigh more than 92 pounds. All corners are continuous TIG (Tungsten Inert Gas) welded to provide a weatherproof seal around the entire housing.

2. The door shall be constructed of extruded aluminum. Two corners are continuous TIG welded 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, .040" x 1 1/8" open stainless steel hinge. The door shall be held secure onto a 1" wide by 5/32" thick neoprene gasket by three (six total for two-way sign) 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. The letters shall be 8" upper case and 6" lower case. The sign face legend background shall consist of 3M/Scotchlite Series 4090T or current equivalent 3M translucent diamond grade DG^3 white and 3M/Scotchlite Series 1177 or current 3M equivalent transparent green acrylic EC (electronic cut-able) film applied to the front of the sign face. The legend shall be framed by a white polycarbonate border.

4. All fasteners and hardware shall be corrosion resistant stainless steel. No tools are required for routine maintenance.

5. All wiring shall be secured by insulated wire compression nuts.

6. 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 provide a weather tight seal.

7. Each sign shall be activated by the same photocell/power panel mounted/installed inside the traffic signal cabinet on the left side of the cabinet when facing into the cabinet. All signs shall be wired to the same power panel with lighting contactor sized for the power consumption of the LED signs. The photo-cell shall be mounted above the door and under the lip of the signal cabinet on the left side of the cabinet.

8. Brackets and Mounting: LED internally-illuminated street name signs will be factory drilled to accommodate mast arm two-point support assembly mounting brackets.

(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°C (+77°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 the following maximum power values:

4-Foot Sign	60 W max
6-Foot Sign or less	90 W max
8-Foot Sign or less	120 W max

The signs shall not be energized when traffic signals are powered by an alternate energy source such as a generator or uninterruptable power source (UPS). The signs shall be connected to the generator or UPS bypass circuitry.

(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. Twelve (12) 1.25 watt LED units shall be mounted on 1-inch x 22-inch metal cone printed circuit boards (MCPCB). The viewing angle shall be 120 degrees. 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.

FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL.

This work shall consist of furnishing and installing an "Econolite" brand traffic actuated solid state digital controller ASC3-1000 or ASC3-2100 as specified in the plans or approved equal in a NEMA TS2 Type 1 controller cabinet, meeting the requirements of the Standard Specifications Section 857 and the included Traffic Signal Specifications.

Basis of Payment: This work shall be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER AND CABINET (SPECIAL) of the type specified, which shall be payment in full for furnishing and installing the controller complete including conflict monitor, load switches and flasher relays, with necessary connections for proper operation.

The type specified will indicate the type of cabinet. For example, FULL-ACTUATED CONTROLLER AND TYPE IV CABINET (SPECIAL).

ELECTRIC CABLE IN CONDUIT, SIGNAL, NO. 18, 3/C

This work shall consist of furnishing and installing a Belden YR52311 electric cable, or approved equal, in existing and/or new conduit. The cable shall consist of 18 AWG stranded bare copper, three (3) conductors,

with HDPE insulation, and HDPE jacket and shall be capable of broadband over power communication. The nominal outside diameter shall be 0.341-inch.

The signal cable, No. 18, 3/C shall be run directly from the Autoscope Terra Interface Panel (TIP) to the Autoscope Terra MVP on the mast arm with no splicing of the cable allowed.

Basis of Payment: This work will be paid for at the contract unit price per foot for ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 18, 3/C, which price shall be payment in full for furnishing, installing and making all electrical connections necessary for proper operation.

VIDEO DETECTION SYSTEM, (COMPLETE INTERSECTION).

1. Video Detection – General

This specification sets forth the minimum requirements for a system that monitors vehicles on a roadway via processing of video images. The detection of vehicles passing through the field-of-view of an image sensor shall be made available to a large variety of end user applications as simple contact closure outputs that reflect the current real-time detector or alarm states (on/off) or as summary traffic statistics that are reported locally or remotely. The contact closure outputs shall be provided to a traffic signal controller and comply with the National Electrical Manufacturers Association (NEMA) type C or D detector rack or 170 input file rack standards.

The system architecture shall fully support Ethernet networking of system components through a variety of industry standard and commercially available infrastructures that are used in the traffic industry. The data communications shall support direct connect, [modem,] and multi-drop interconnects. Simple, standard Ethernet wiring shall be supported to minimize overall system cost and improve reliability, utilizing existing infrastructure and ease of system installation and maintenance. Both streaming video and data communications shall optionally be interconnected over long distances through fiber optic, microwave, or other commonly used digital communications transport configurations.

On the software application side of the network, the system shall be integrated through a client-server relationship. A communications server application shall provide the data communications interface between as few as one to as many as hundreds of Machine Vision Processor (MVP) sensors and a number of client applications. The client applications shall either be hosted on the same PC as the communications server or may be distributed over a local area network of PC's using the industry standard TCP/IP network protocol. Multiple client applications shall execute simultaneously on the same host or multiple hosts, depending on the network configuration. Additionally, a web-browser interface shall allow use of industry standard Internet web browsers to connect to MVP sensors for setup, maintenance, and playing digital streaming video.

1.1. System Hardware

The machine vision system hardware shall consist of three components: 1) a color, 22x zoom, MVP sensor 2) a modular cabinet interface unit 3) a communication interface panel. Additionally, an optional personal computer (PC) shall host the server and client applications that are used to program and monitor the system components. The real-time performance shall be observed by viewing the video output from the sensor with overlaid flashing detectors to indicate the current detection state (on/off). The MVP sensor shall optionally store cumulative traffic statistics internally in non-volatile memory for later retrieval and analysis.

The MVP shall communicate to the modular cabinet interface unit via the communications interface panel and the software applications using the industry standard TCP/IP network protocol. The MVP shall have a built-in, Ethernet-ready, Internet Protocol (IP) address and shall be addressable with no plug in devices or converters required. The MVP shall provide standard MPEG-4 streaming digital video. Achievable frame rates shall vary from 5 to 30 frames/sec as a function of video quality and available bandwidth.

The modular cabinet interface unit shall communicate directly with up to eight (8) MVP sensors and shall

comply with the form factor and electrical characteristics to plug directly into a NEMA type C or D detector rack providing up to thirty-two (32) inputs and sixty-four (64) outputs or a 170 input file rack providing up to sixteen (16) contact closure inputs and twenty-four (24) contact closure outputs to a traffic signal controller.

The communication interface panel shall provide four (4) sets of three (3) electrical terminations for three-wire power cables for up to eight (8) MVP sensors that may be mounted on a pole or mast arm with a traffic signal cabinet or junction box. The communication interface panel shall provide high-energy transient protection to electrically protect the modular cabinet interface unit and connected MVP sensors. The communications interface panel shall provide single-point Ethernet connectivity via RJ45 connector for communication to and between the modular cabinet interface module and the MVP sensors.

1.2. System Software

The MVP sensor embedded software shall incorporate multiple applications that perform a variety of diagnostic, installation, fault tolerant operations, data communications, digital video streaming, and vehicle detection processing. The detection shall be reliable, consistent, and perform under all weather, lighting, and traffic congestion levels. An embedded web server shall permit standard internet browsers to connect and perform basic configuration, maintenance, and video streaming services.

There shall be a suite of client applications that reside on the host client / server PC. The applications shall execute under Microsoft Windows XP or Vista. Available client applications shall include:

- Master network browser: Learn a network of connected modular cabinet interface units and MVP sensors, display basic information, and launch applications software to perform operations within that system of sensors.
- Configuration setup: Create and modify detector configurations to be executed on the MVP sensor and the modular cabinet interface unit.
- Operation log: Retrieve, display, and save field hardware run-time operation logs of special events that have occurred.
- Software install: Reconfigure one or more MVP sensors with a newer release of embedded system software.
- Streaming video player: Play and record streaming video with flashing detector overlay.
- Data retrieval: Fetch once or poll for traffic data and alarms and store on PC storage media.
- Communications server: Provide fault-tolerant, real-time TCP/IP communications to / from all devices and client applications with full logging capability for systems integration.

2. Functional Capabilities

2.1. MVP Sensor

The MVP sensor shall be an integrated imaging color CCD array with zoom lens optics, high-speed, dual-core image processing hardware bundled into a sealed enclosure. The CCD array shall be directly controlled by the dual-core processor, thus providing high-quality video for detection that has virtually no noise to degrade detection performance. It shall be possible to zoom the lens as required for setup and operation. It shall provide JPEG video compression as well as standard MPEG-4 digital streaming video with flashing detector overlay. The MVP shall provide direct real-time iris and shutter speed control. The MVP image sensor shall be equipped with an integrated 22x zoom lens that can be changed using either configuration computer software. The digital streaming video output and all data communications shall be transmitted over the three-wire power cable.

2.1.1. Power

The MVP sensor shall operate on 110/220 VAC, 50/60Hz at a maximum of 25 watts. The camera and processor electronics shall consume a maximum of 10 watts and the remaining 15 watts shall support an enclosure heater.

2.1.2. Detection Zone Programming

Placement of detection zones shall be by means of a PC with a Windows XP or Vista operating system, a keyboard, and a mouse. The PC monitor shall be able to show the detection zones superimposed on images of traffic scenes.

The detection zones shall be created by using a mouse to draw detection zones on the PC monitor. Using the mouse and keyboard it shall be possible to place, size, and orient detection zones to provide optimal road coverage for vehicle detection. It shall be possible to download detector configurations from the PC to the MVP sensor and cabinet interface module, to retrieve the detector configuration that is currently running in the MVP sensor, and to back up detector configurations by saving them to the PC fixed disks or other removable storage media.

The supervisor computer's mouse and keyboard shall be used to edit previously defined detector configurations to permit adjustment of the detection zone size and placement, to add detectors for additional traffic applications, or to reprogram the MVP sensor for different traffic applications or changes in installation site geometry or traffic rerouting.

2.1.3. Optimal Detection

The video detection system shall optimally detect vehicle passage and presence when the MVP sensor is mounted 30 feet (10 m) or higher above the roadway, when the image sensor is adjacent to the desired coverage area, and when the distance to the farthest detection zone locations are not greater than ten (10) times the mounting height of the MVP. The recommended deployment geometry for optimal detection also requires that there be an unobstructed view of each traveled lane where detection is required. Although optimal detection may be obtained when the MVP is mounted directly above the traveled lanes, the MVP shall not be required to be directly over the roadway. The MVP shall be able to view either approaching or receding traffic or both in the same field of view. The preferred MVP sensor orientation shall be to view approaching traffic since there are more high contrast features on vehicles as viewed from the front rather than the rear. The MVP sensor placed at a mounting height that minimizes vehicle image occlusion shall be able to simultaneously monitor a maximum of six (6) traffic lanes when mounted at the road-side or up to eight (8) traffic lanes when mounted in the center with four lanes on each side.

2.2. Modular Cabinet Interface Unit

The modular cabinet interface unit shall provide the hardware and software means for up to eight (8) MVP sensors to communicate real-time detection states and alarms to a local traffic signal controller. It shall comply with the electrical and protocol specifications of the detector rack standards. The card shall have 1500 Vrms isolation between rack logic ground and street wiring.

The modular cabinet interface unit shall be a simple interface card that plugs directly into a 170 input file rack or a NEMA type C or D detector rack. The modular cabinet interface unit shall occupy only 2 slots of the detector rack. The modular cabinet interface unit shall accept up to sixteen (16) phase inputs and shall provide up to twenty-four (24) detector outputs.

2.3. Communications Interface Panel

The communications interface panel shall support up to eight MVPs. The communications interface panel shall accept 110/220 VAC, 50/60 Hz power and provide predefined wire termination blocks for MVP power connections, a Broadband-over-Power-Line (BPL) transceiver to support up to 10MB/s interdevice communications, electrical surge protectors to isolate the modular cabinet interface unit and MVP sensors, and an interface connector to cable directly to the modular cabinet interface unit.

The interface panel shall provide power for up to eight (8) MVP sensors, taking local line voltage 110/220 VAC, 50/60 Hz and producing 110/220 VAC, 50/60 Hz, at about 30 watts to each MVP sensor. Two ½-amp SLO-BLO fuses shall protect the communications interface panel.

3. System Installation & Training

The supplier of the video detection system may supervise the installation and testing of the video detection system and computer equipment as required by the contracting agency.

Training is available to personnel of the contracting agency in the operation, set up, and maintenance of the video detection system. The MVP sensor and its support hardware / software is a sophisticated leading-edge technology system. Proper instruction from certified instructors is recommended to ensure that the end user has complete competency in system operation. The User's Guide is not an adequate substitute for practical classroom training and formal certification by an approved agency.

4. Warranty, Service, & Support

For a minimum of two (2) years, the supplier shall warrant the video detection system. An option for additional year(s) warranty for up to 5 years shall be available. Ongoing software support by the supplier shall include software updates of the MVP sensor, modular cabinet interface unit, and supervisor computer applications. These updates shall be provided free of charge during the warranty period. The supplier shall maintain a program for technical support and software updates following expiration of the warranty period. This program shall be available to the contracting agency in the form of a separate agreement for continuing support.

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, 701101-04, 701106-02, 701201-04, 701206-03, 701301-04, 701301-04, 701421-06, 701422-06, 701501-06, 701502-04, 701601-09, 701602-07, 701606-09, 701701-08, 701801-05, 701901-03
Bureau of Local Roads and Streets Special Provisions:	BLR 17-4, BLR 17-5

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.

MCHENRY COUNTY DIVISION OF TRANSPORTATION

LED Traffic Signal Heads

Installation & Warranty Dates

#	Zone	Inter.	Location	LED Retrofit Date Retrofited	LED WARRANTY EXPIRATION DATE
			TRAFFIC SIGNALS		
TS1			Algonquin Road @ Pyott Road	August-10	August-15
TS2			Algonquin Road @ Hanson Rd/Hilltop Dr	August-10	August-15
TS3			Algonquin Road @ Crystal Lake Road	January-10	January-15
TS4			Algonquin Road @ Harvest Gate Road	October-13	October-19
TS5			Algonquin Road @ Frank Road	October-13	October-19
TS6			Algonquin Road @ Square Barn Road	October-13	October-19
TS7			Algonquin Road @ Huntley Fire Station Entrance (HAWK)	July-11	July-16
TS8			Algonquin Road @ Lakewood Road	October-13	October-19
TS9			Algonquin Road @ Haligus Road	February-14	February-20
TS10			Rakow Road @ Pingree Road	November-12	November-17
TS11			Rakow Road @ Virginia Road	November-12	November-17
TS12			Rakow Road @ Pyott Road	November-12	November-17
TS13			Randall Rd/Rakow Rd @ McHenry Avenue	November-12	November-17
TS14			Randall Road @ Ackman Road	November-12	November-17
TS15			Randall Road @ Miller Road	November-13	November-19
TS16			Randall Road @ Acorn Lane	November-13	November-19
TS17			Randall Road @ Algonquin Road	January-10	January-15
TS18			Randall Road @ Huntington Dr/Bunker Hill Rd	November-12	November-17
TS19			Randall Road @ Harnish Drive	January-10	January-15
TS20			Virginia Road @ Pyott Rd/Main St	January-10	January-15
TS21			Virginia Road @ Berkshire Drive	January-10	January-15
TS22			Virginia Road @ Teckler Boulevard	July-09	July-14
TS23			Walkup Road @ Hillside Road	July-11	July-16
TS24			Walkup Road @ Pleasant Hill Rd/Deerwood Dr	July-11	July-16
TS25			Walkup Road @ Edgewood Rd/Berry Ct	July-11	July-16
TS26			Walkup Road @ Crystal Springs Road	July-11	July-16
TS27			Crystal Lake Road @ Mason Hill Road	June-13	June-18
TS28			Bull Valley Road @ Crystal Lake Road	July-09	July-14
TS29			Bull Valley Road @ Ridgeview Drive	November-10	November-15
TS30			Miller Road @ Green Street	October-08	October-13
TS31			Miller Road @ River Road	October-13	October-18
TS32			Ackman Road @ Golf Course Road	December-11	December-16
TS33			Cary Road @ Main Street	January-10	January-15
TS34			Chapel Hill Road @ Bay Road	October-12	October-17
TS35			Chapel Hill Road @ Lincoln Road	August-09	August-14
TS36			Wilmot Road @ Main Street	January-12	January-17
TS37			Johnsburg Road @ Riverside Drive	March-14	March-19
TS38			Johnsburg Road @ Spring Grove Road	March-14	March-19
TS39			Harmony Road @ Hemmer Road	August-14	August-20
TS40			Marengo Rd/Harmony Rd @ Main St	August-14	August-20

APPENDIX

B: UPS TESTING FORMS

INTENTIONALLY

BLANK

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 _____

IF 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 11.5V 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, THE REPLACEMENT 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

APPENDIX C: RWIS PREVENTATIVE MAINTENANCE CHECKLIST

CUSTOMER:

LOCATION: SYS #

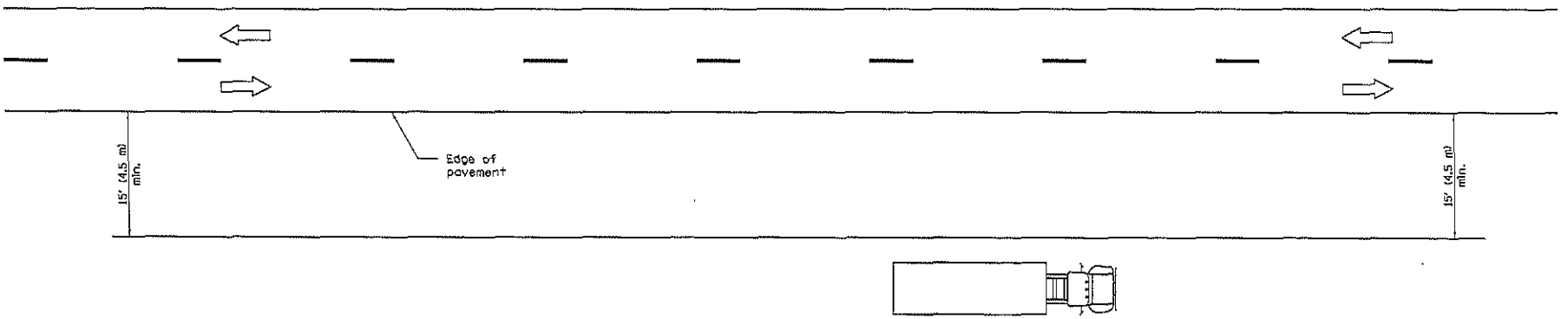
DATE: TECHNICIAN:

____ Check the stability of the RPU cabinet.
____ Replace the padlock if rusty or hard to open.
____ Clean the dirt, trash, and insect nest from inside the cabinet. Remember Safety First.
____ Use duct seal, steel wool & / or caulking to seal up any holes in the cabinet.
____ Check all RPU and panel hardware tighten or replace.
____ Check power supply voltages.
____ Make sure all unused inputs are grounded.
____ On the RPU check the power supply voltages at the indicated test points. The voltage requirements for + or - 12 volt, within □0.50 volts of value marked at test point. The voltage requirements for + or - 5 volt, within □0.25 volts of value marked at test point.
____ Check to see if there is a ground wire from the buss bar to the terminal strip for sensor three.
____ Using an OHM meter check for leakage in the Sensor cable or splice. Remove the Sensor from the Term Board and check pins 1-10 on the Sensor connector to the bus bar.
____ Clean the grid or lens on the PRECIP sensor and check operation.
____ Wash the screen around the Thies RH sensor and clean the shield.
____ Perform the shock test on the Thies RH sensor. Wrap a warm wet towel around the stem for 30 minutes. The sensor should read 93 to 95 percent.
____ Check the calibration of the RH sensor with a known source and compare the reading with the data transmitted by the RPU.
____ Check the calibration of the Air Temp sensor and compare with the reading transmitted by the RPU.
____ Replace the bearings in the RM Young wind sensor.
____ Check the wind direction at all four compass points and compare with the reading transmitted by the RPU.
____ Check the operation of the wind speed sensor and compare the reading with the data transmitted by the RPU.
____ Check the physical condition of the radio antenna and coax line.
____ Check the aim of the beam radio antenna.
____ Check the forward and reflected power of the radio.
____ Check the radio power supply for proper voltage.
____ Check the operation of the modem and power interrupter.
____ Make a voice call on the telephone line and check for noise on the line.
____ Verify Latitude and Longitude readings with GPS and report the readings.
____ Check and adjust if needed the Dry voltages for each sensor and compare with the data transmitted by the RPU.
____ Update any hardware changes to the latest version.
What was changed added or deleted?

NOTES:

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

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

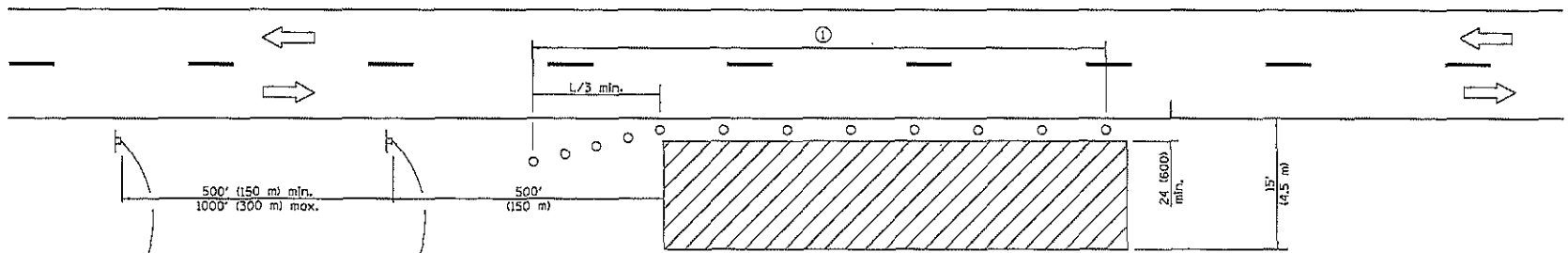
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-09

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-05	Revised title and notes.

OFF-RD OPERATIONS, 2L, 2W, MORE THAN 15' (4.5 m) AWAY

STANDARD 701001-02



For contract construction projects

W20-1103(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

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

APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

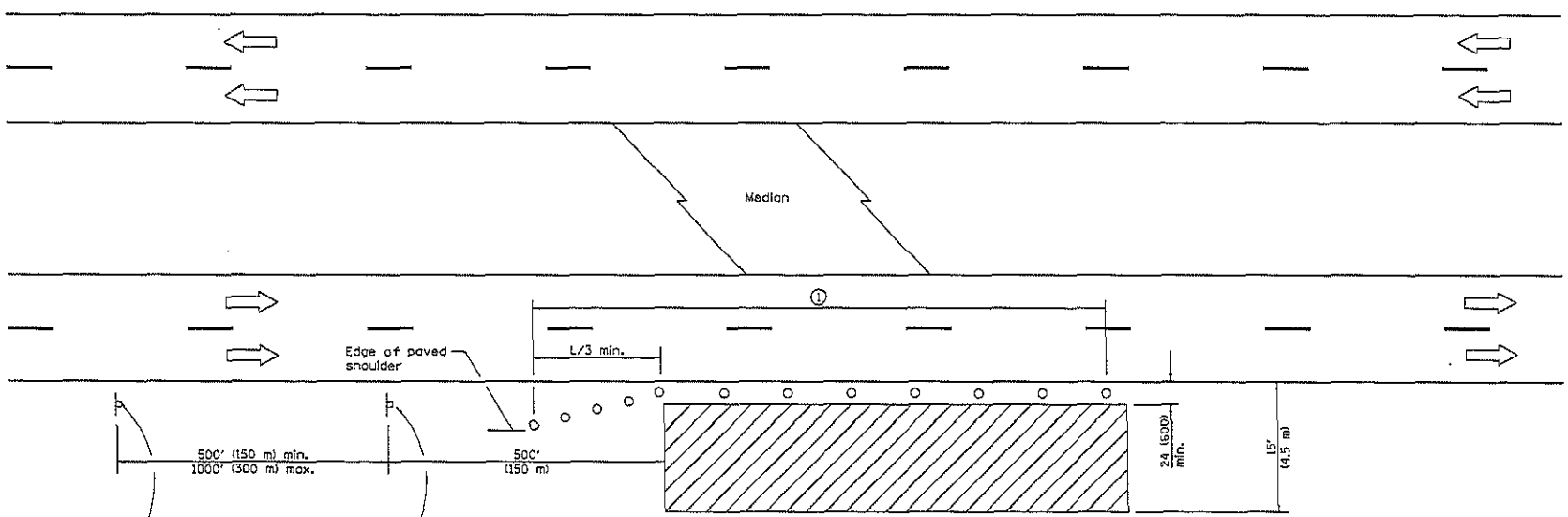
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-14

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



For contract construction projects

W20-1103(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

APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

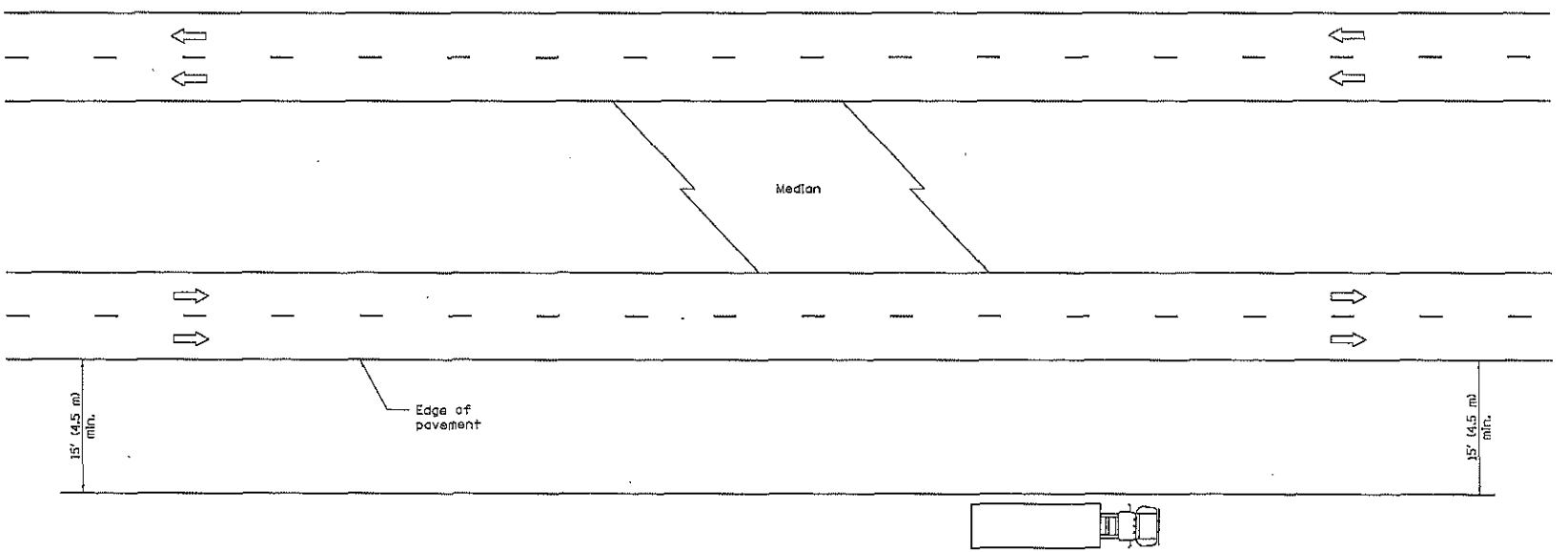
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-14

DATE	REVISIONS
1-1-14	Revised workers sign
	number to agree with
	current MUTCD.
1-1-13	Omitted text 'WORKERS'
	sign.

OFF-RD OPERATIONS, MULTILANE, 15' (4.5 m) TO 24 " (600 mm) FROM PAVEMENT EDGE

STANDARD 701101-04



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

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

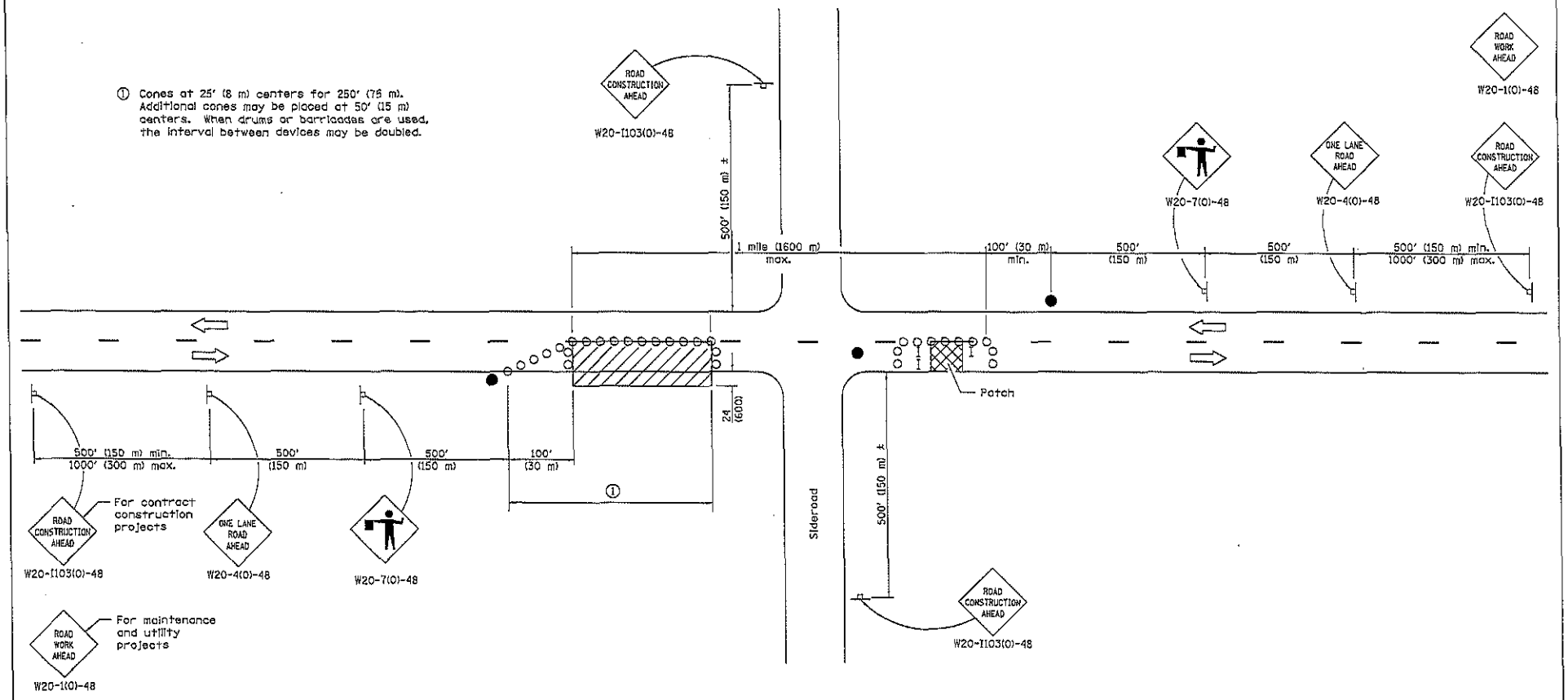
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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, 2011
ENGINEER OF SAFETY ENGINEERING

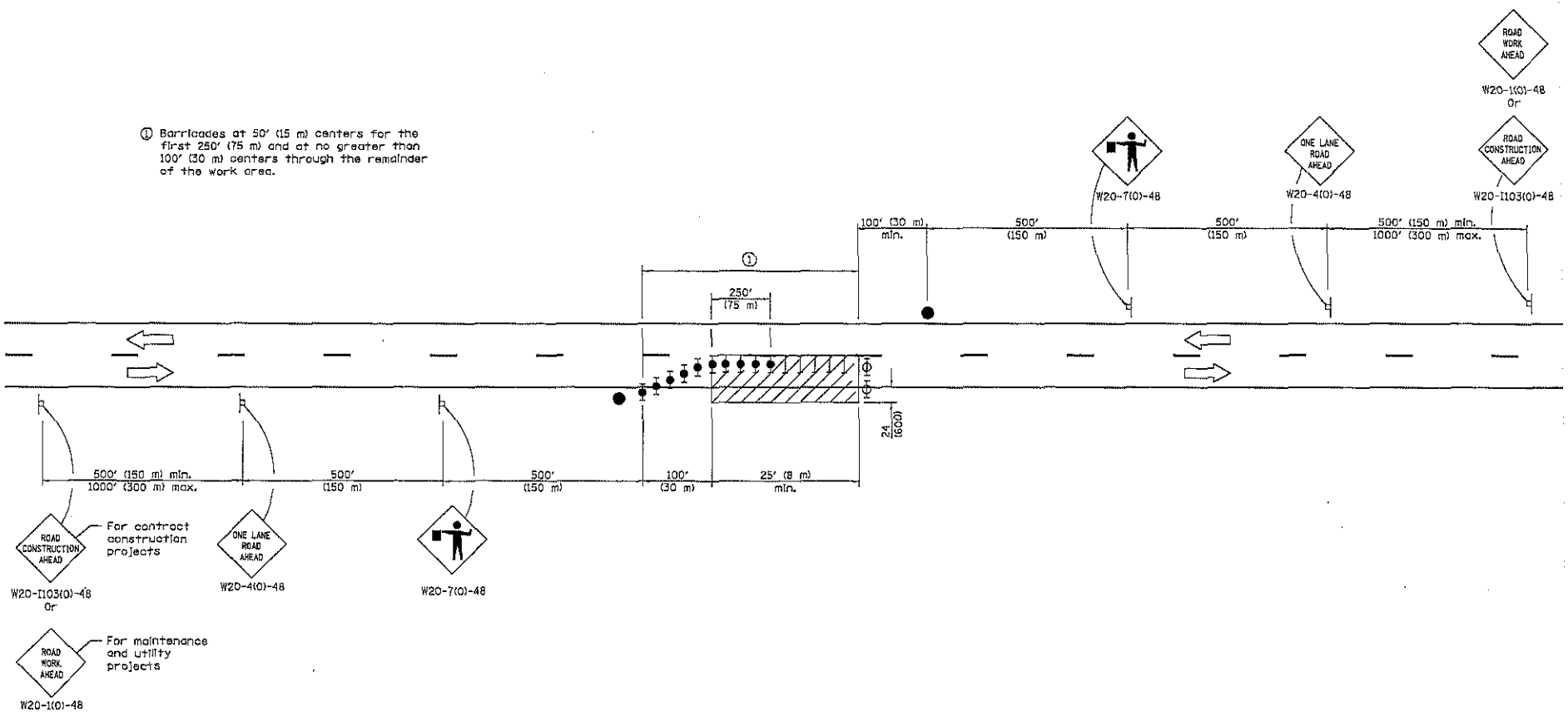
APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-11

DATE	REVISIONS
1-1-11	Revised flagger sign.
1-1-09	Switched units to
	English (metric).
	Corrected sign No.'s.

LANE CLOSURE, 2L, 2W, DAY ONLY, FOR SPEEDS ≥ 45 MPH

STANDARD 701201-04



TYPICAL APPLICATIONS

Isolated patch
Installation of drainage structure
Utility operations

SYMBOLS

- Work area
- Sign
- Flagger with traffic control sign
- Barricade or drum
- 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, 2011
ENGINEER OF SAFETY ENGINEERING

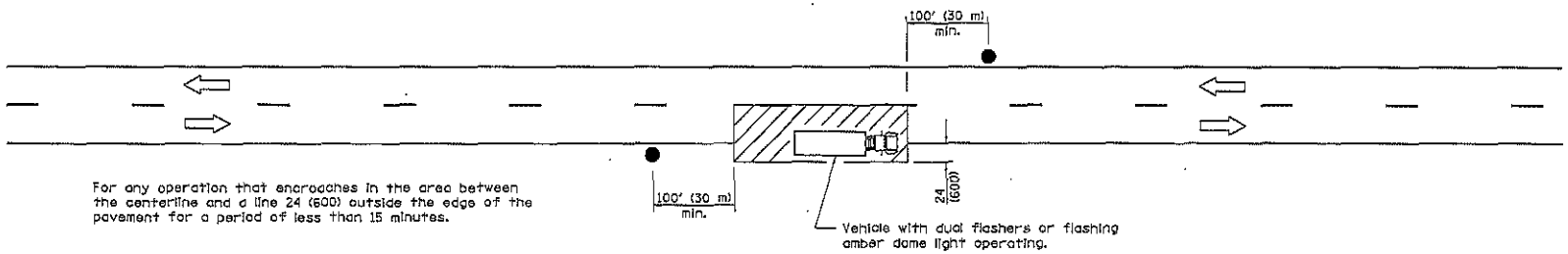
APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

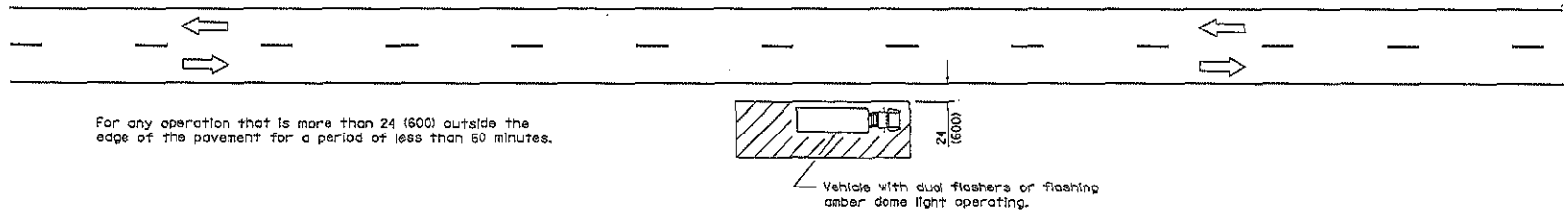
DATE	REVISIONS
1-1-11	Revised flagger sign.
1-1-09	Switched units to
	English (metric).
	Corrected sign No.'s.

LANE CLOSURE, 2L, 2W, NIGHT ONLY, FOR SPEEDS ≥ 45 MPH

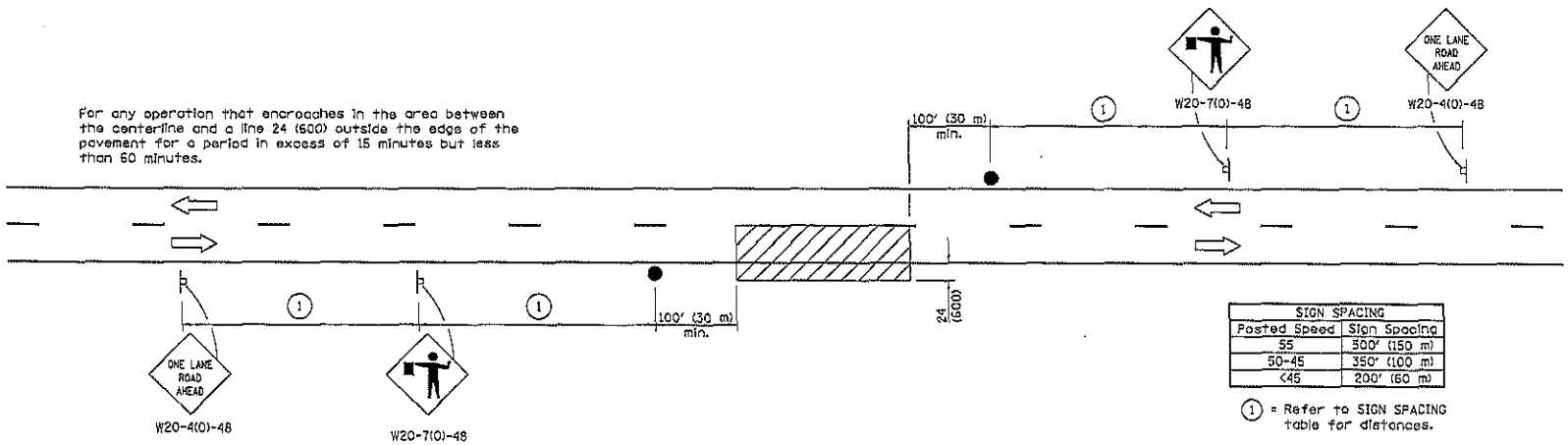
STANDARD 701206-03



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

APPROVED January 1 2011
ENGINEER OF SAFETY ENGINEERING

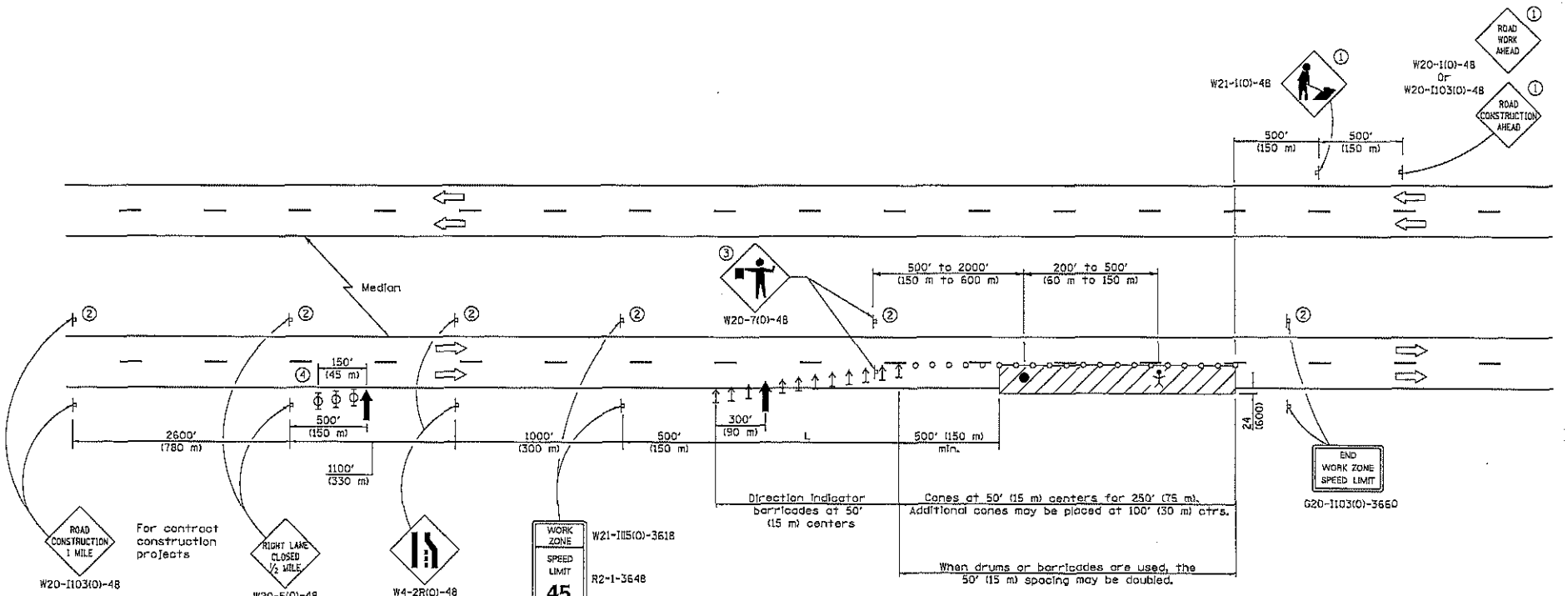
APPROVED January 1 2011
ENGINEER OF DESIGN AND ENVIRONMENT

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



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 50' (15 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

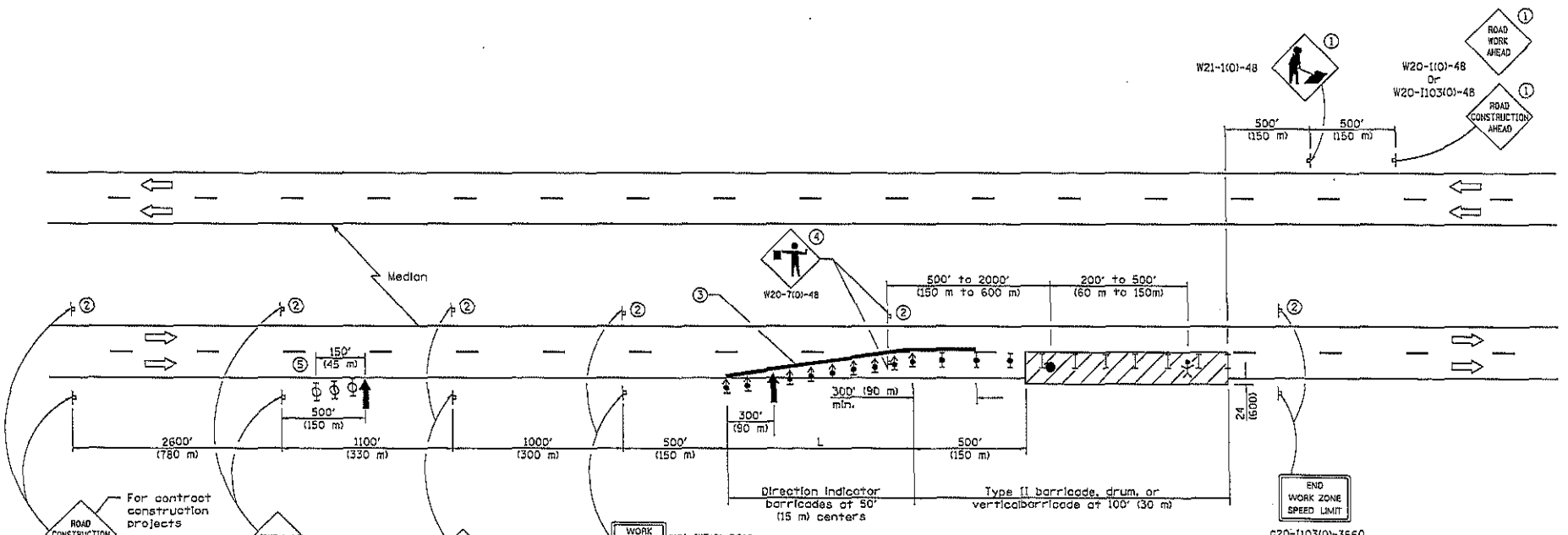
APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-04

DATE	REVISIONS
1-1-14	Revised workers sign number
	to agree withcurrent MUTCD.
	Rev. PHOTO ENFORCED sign no.
1-1-12	Omit WORKERS sign. Rep. Begins
	sign with PHOTO ENFORCED.
	Added devices at arrowboard.

LANE CLOSURE, MULTILANE, DAY OPERATIONS ONLY, FOR SPEEDS ≥ 45 MPH TO 55 MPH

STANDARD 701421-06



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
- Type II barricade, drum, or vertical barricade with steady burn monodirectional light
- 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 50' (15 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

APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

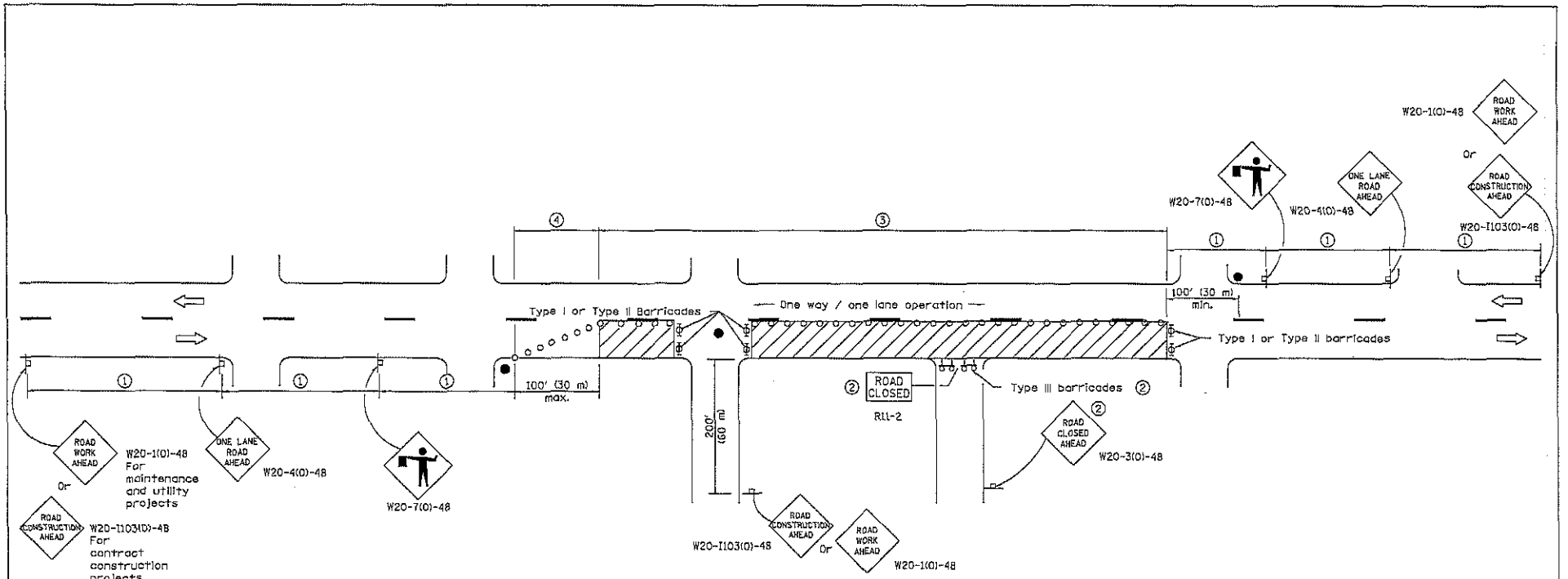
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-14

DATE	REVISIONS
1-1-14	Revised workers sign number
	to agree with current MUTCD.
	Rev. PHOTO ENFORCED sign no.
1-1-13	Modified signage. Added
	devices at first arrow brd.
	Omitted raised markers.

LANE CLOSURE, MULTILANE, FOR SPEEDS ≥ 45 MPH TO 55 MPH

STANDARD 701422-06



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

APPROVED January 19, 2011
ENGINEER OF SAFETY ENGINEERING

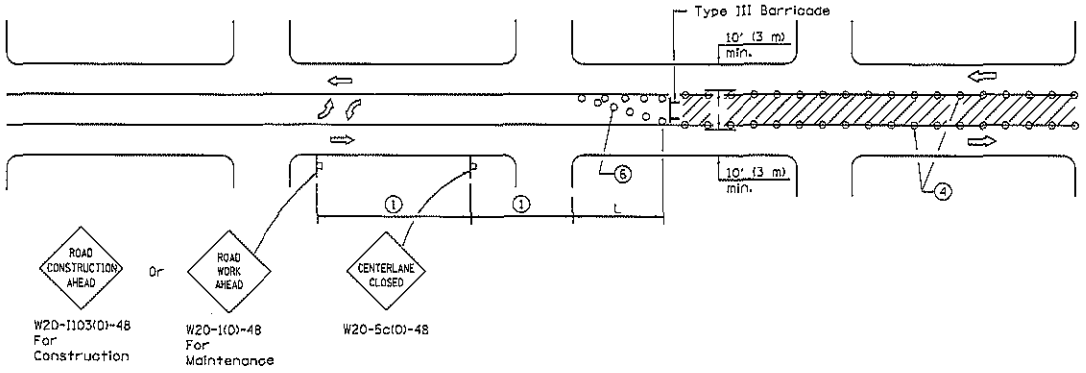
APPROVED January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT

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 (Cones for daytime use only)
- Sign on portable or permanent support

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). Additional cones may be placed at 15 m (50') 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	FORMULAS (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, 2014
ENGINEER OF SAFETY ENGINEERING

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

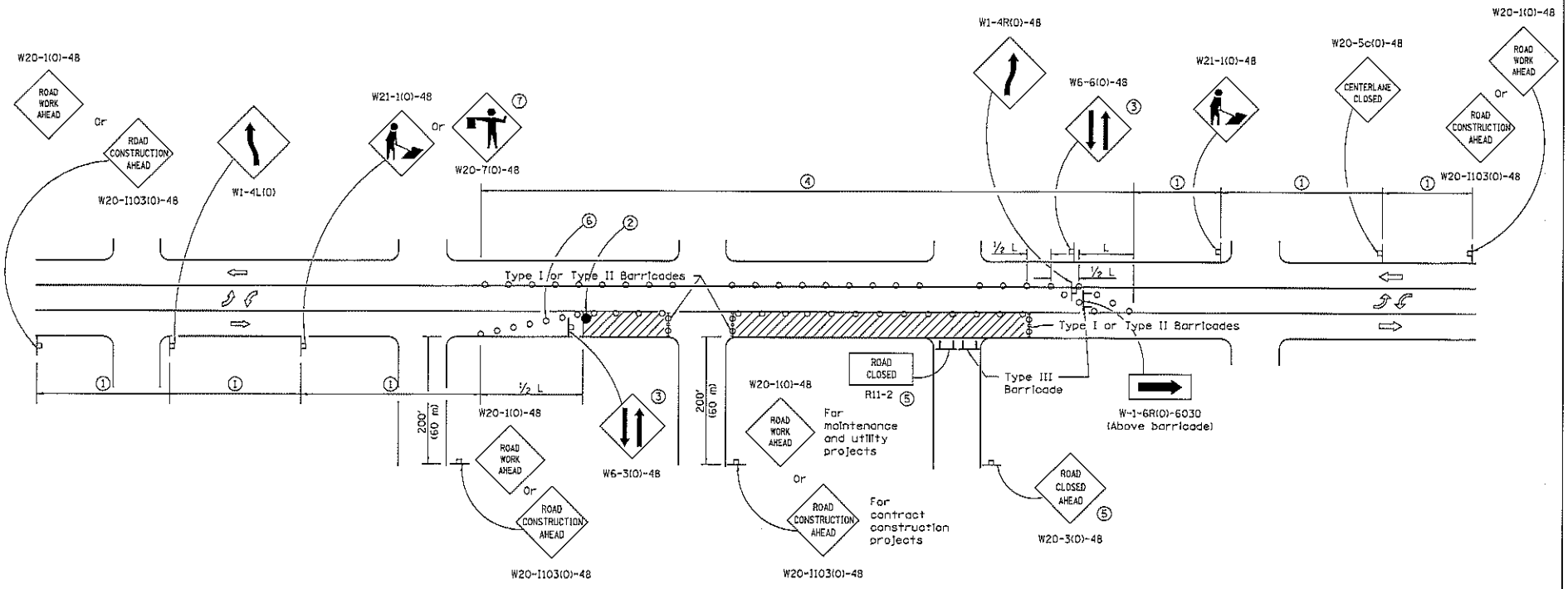
ISSUED 1-1-01

DATE	REVISIONS
1-1-14	Omitted original note (4).
	Rev. workers sign no. to
	agree with current MUTCD.
1-1-13	Omitted text 'WORKERS'
	sign.

URBAN LANE CLOSURE, 2L, 2W, WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 1 of 2)

STANDARD 701502-06



CASE II

Illinois Department of Transportation

APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

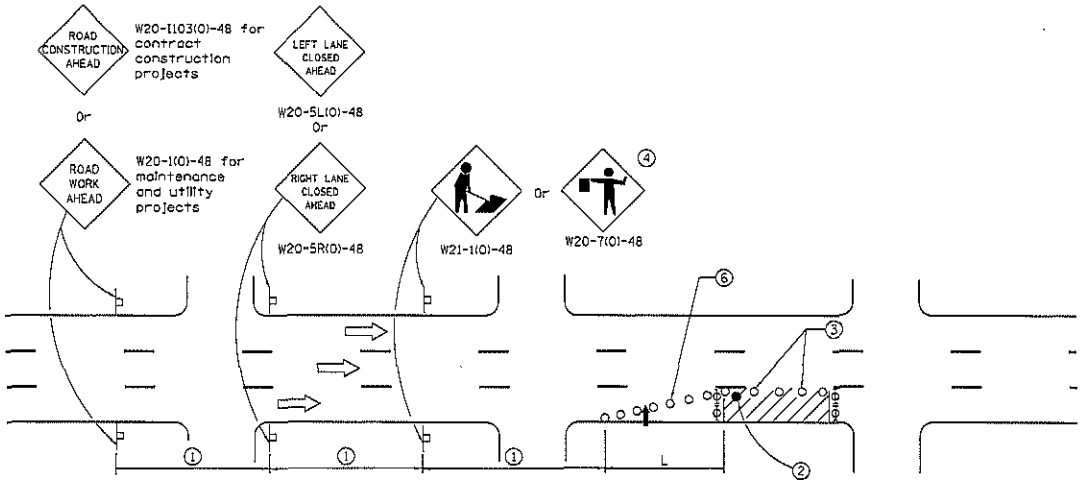
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

10-1-1 035551

URBAN LANE CLOSURE, 2L, 2W, WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 2 of 2)

STANDARD 701502-06



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

APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

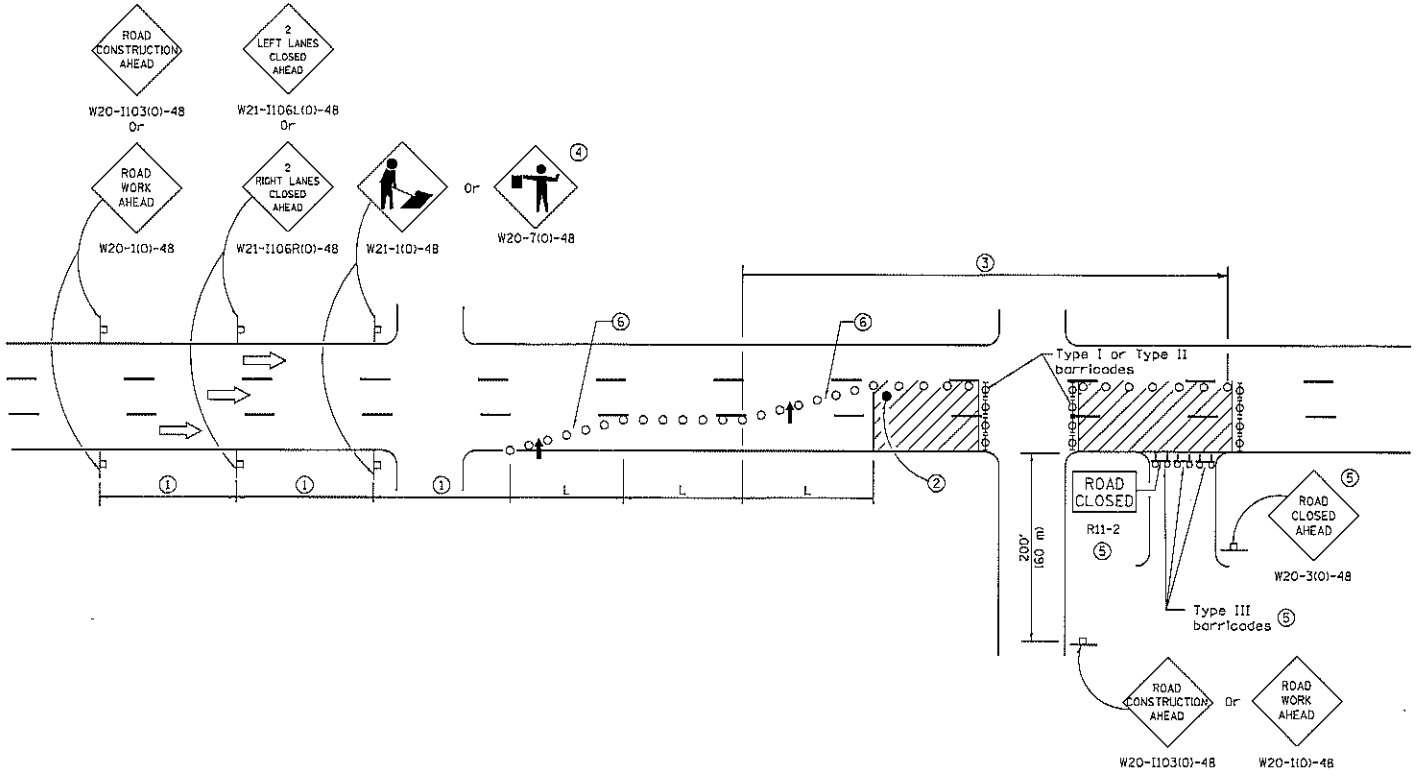
ISSUED 1-1-97

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

APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

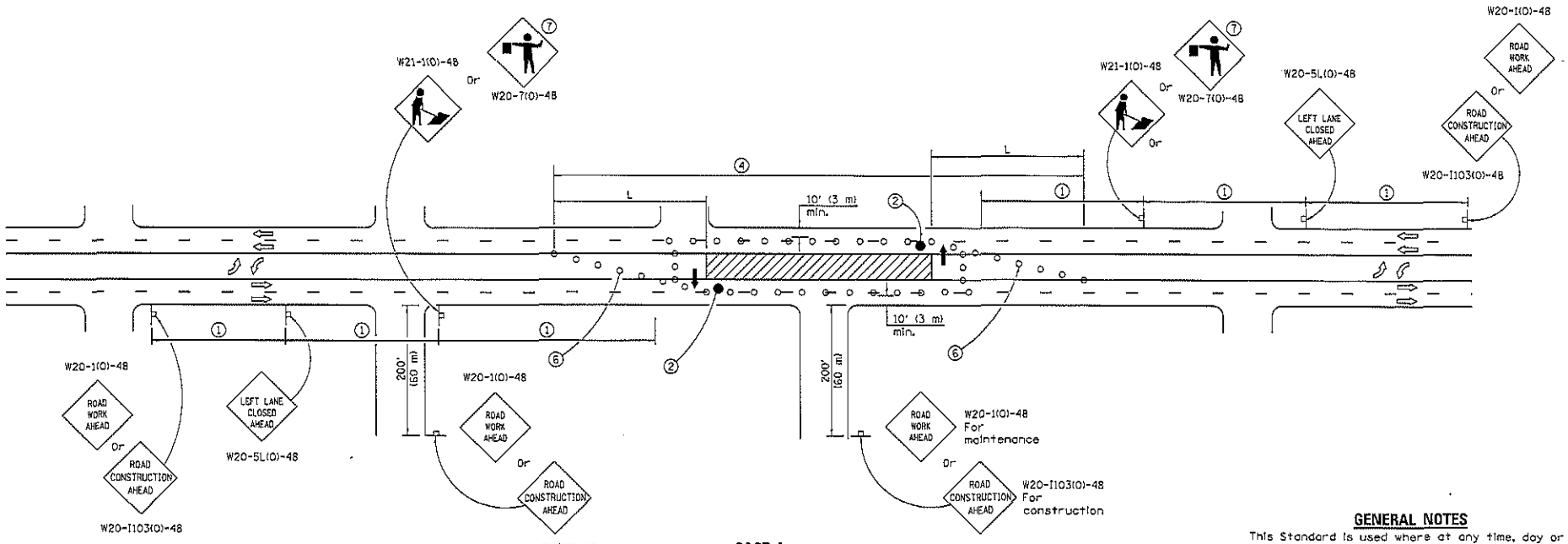
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

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 omnidirectional light
- Flagger with traffic control sign
- Cone, drum or barricade (Cones for daytime use only)
- Sign on portable or permanent support
- Type III Barricade

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). 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 siderod 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, 2014
ENGINEER OF SAFETY ENGINEERING

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

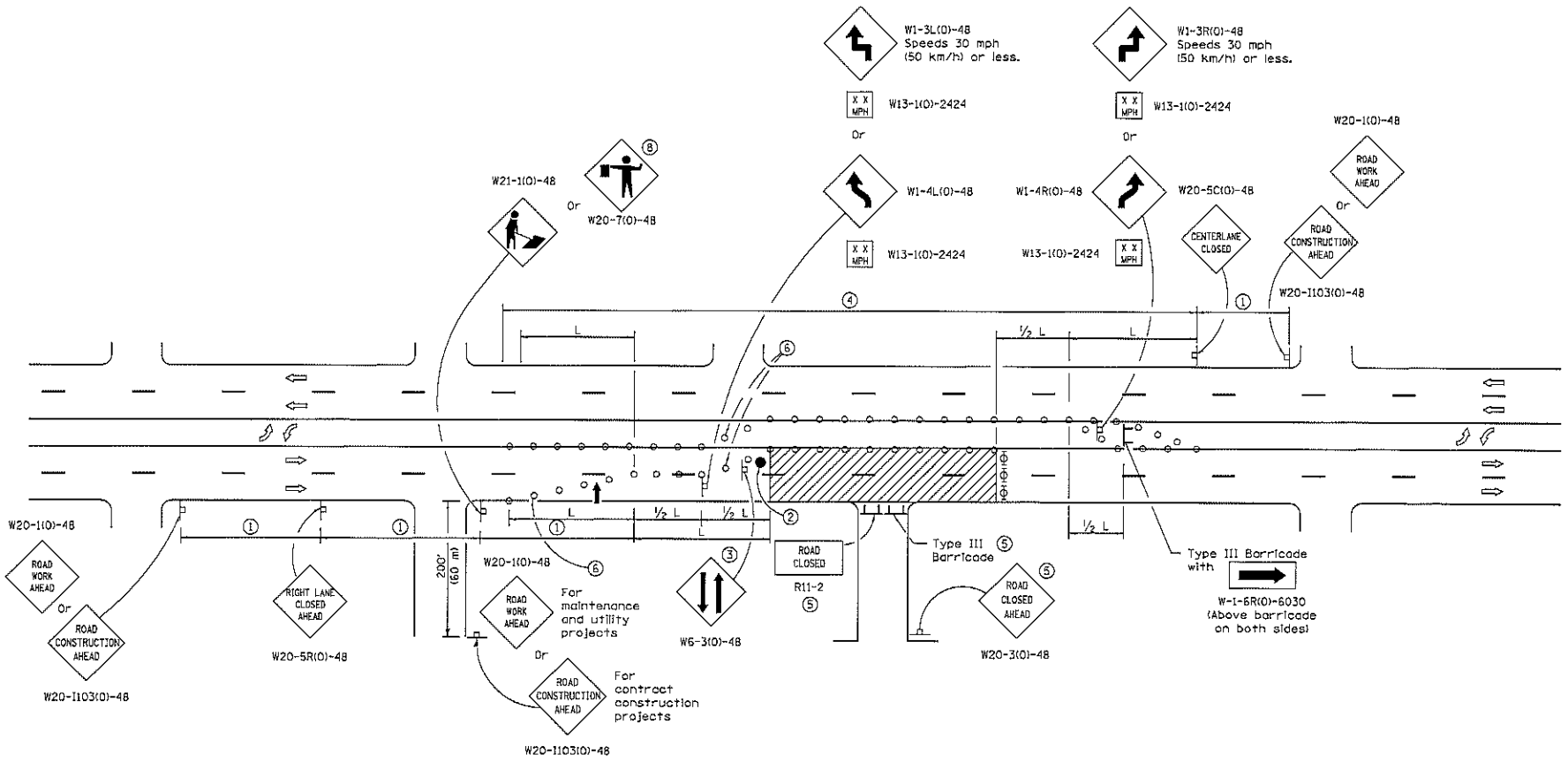
ISSUED 1-1-14

DATE	REVISIONS
1-1-14	Omitted original note (4).
	Rev. workers sign no. to
	agree with current MUTCD.
1-1-13	Omitted text 'WORKERS'
	sign.

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 1 of 4)

STANDARD 701602-07



CASE II

Illinois Department of Transportation

APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

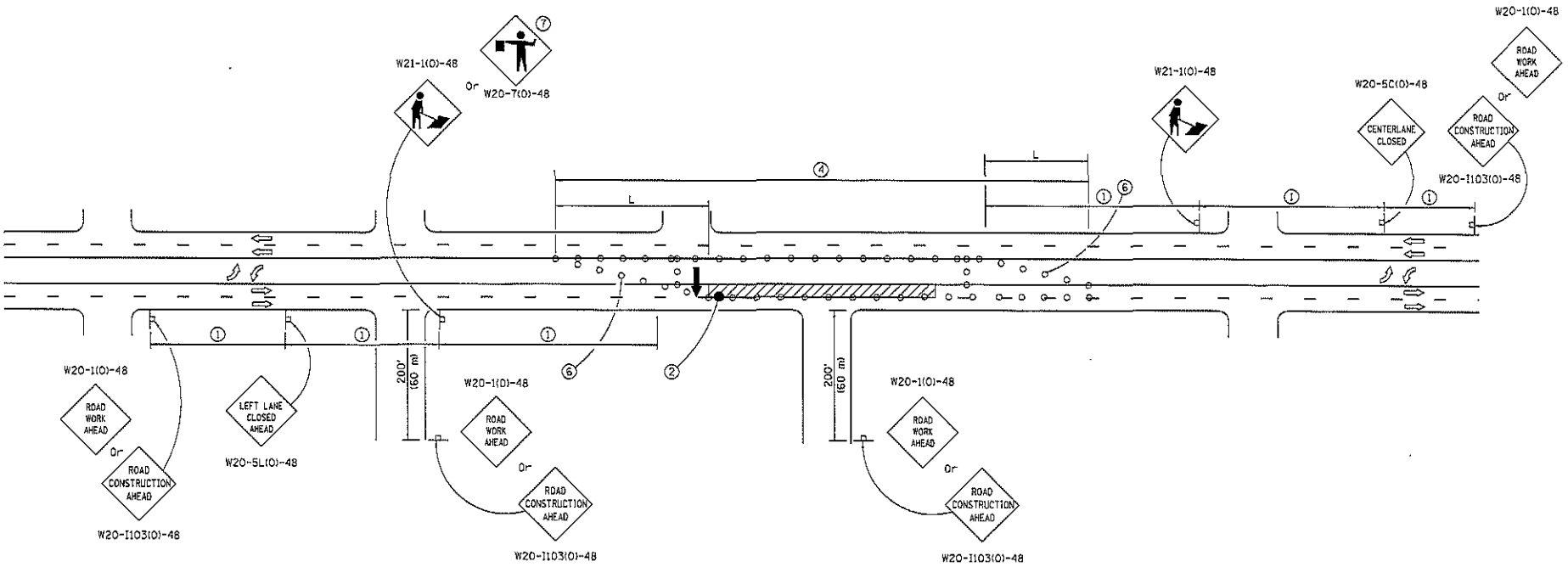
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-01

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 2 of 4)

STANDARD 701602-07



CASE III

Illinois Department of Transportation

APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

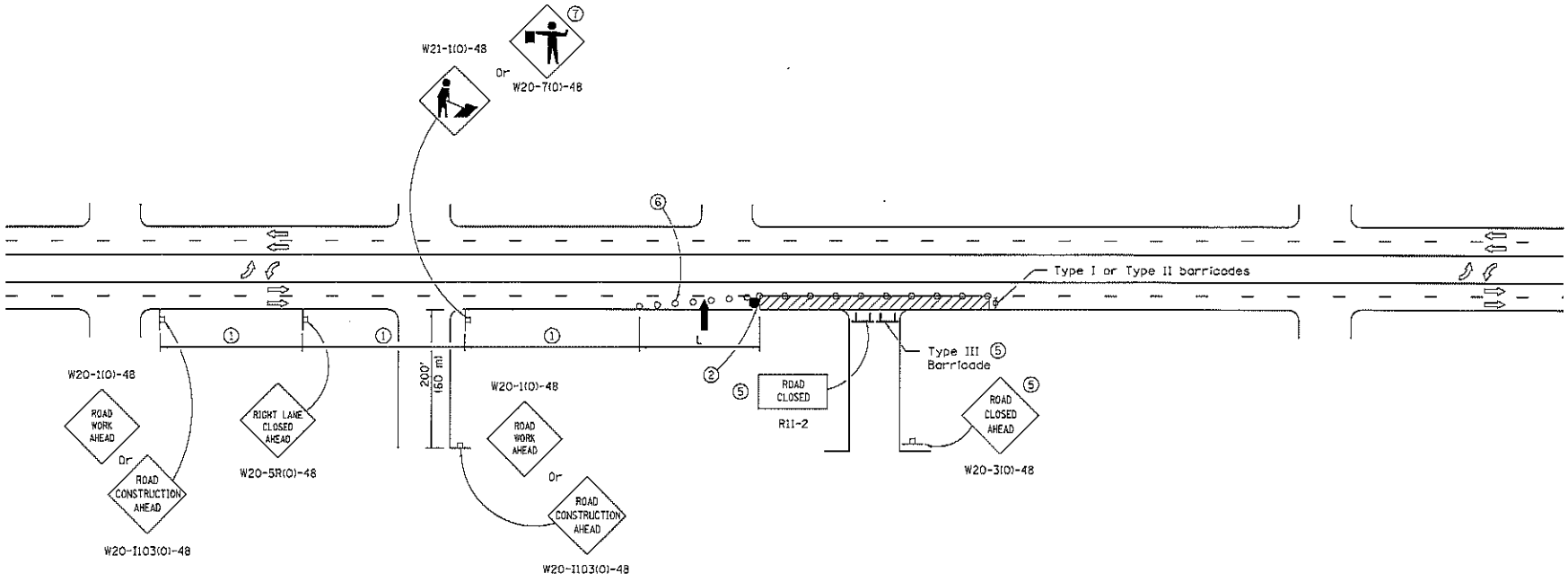
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-10

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 3 of 4)

STANDARD 701602-07



CASE IV

Illinois Department of Transportation

APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

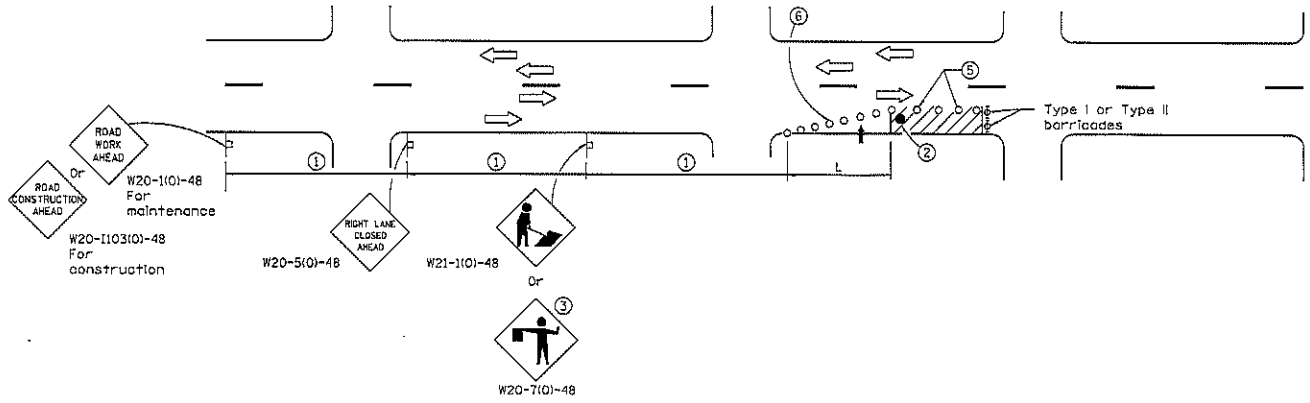
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-14

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 4 of 4)

STANDARD 701602-07



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) Use flagger sign only when flagger is present.

(4) For approved sideroad closures.

(5) 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.

(6) Cones, drums or barricades at 20' (6 m) centers in taper.

(7) Repeat every 1 mile (1.6 km).

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 or more traffic lanes 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

APPROVED January 2, 2014
ENGINEER OF SAFETY ENGINEERING

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

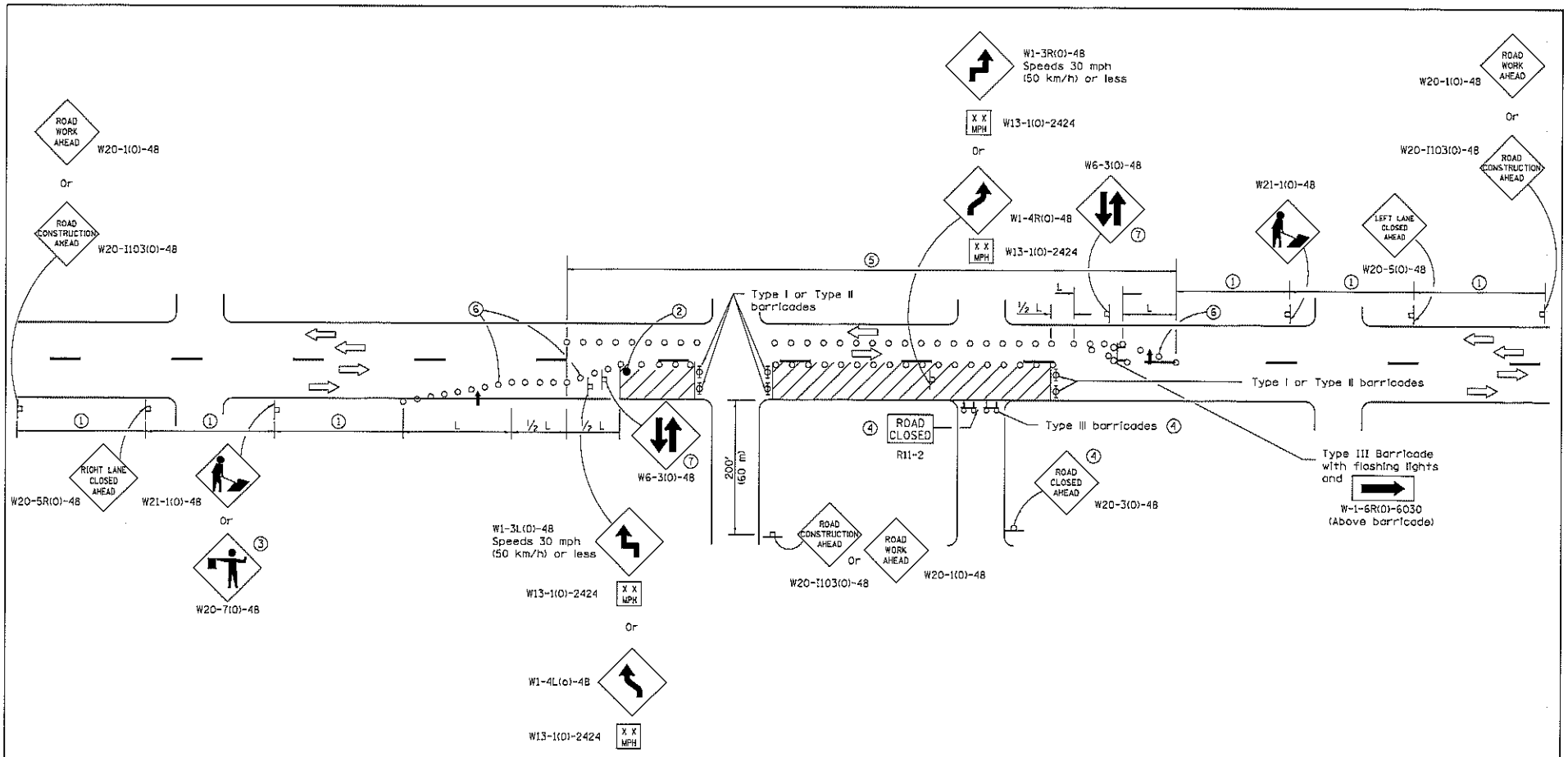
ISSUED 1-1-97

DATE	REVISIONS
1-1-14	Revised workers sign number to agree with current MUTCD.
1-1-12	Corrected dimension in note (6). Omitted W21-1110 sign. Added W-1-6R sign.

URBAN LANE CLOSURE, MULTILANE, 2W WITH MOUNTABLE MEDIAN

(Sheet 1 of 2)

STANDARD 701606-09



Illinois Department of Transportation

APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

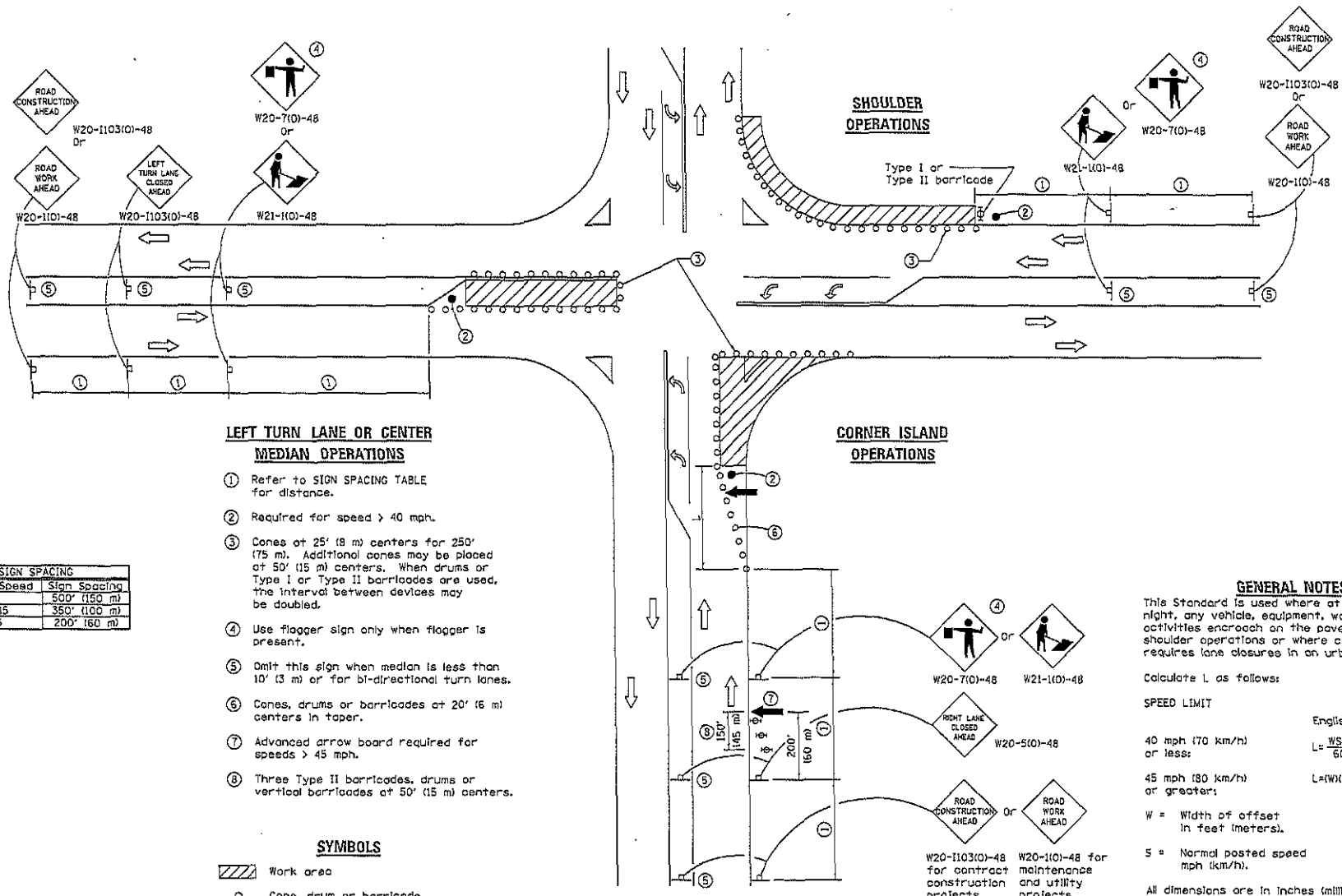
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

URBAN LANE CLOSURE, MULTILANE, 2W WITH MOUNTABLE MEDIAN

(Sheet 2 of 2)

STANDARD 701606-09



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

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

APPROVED January 1, 2014
ENGINEER OF SAFETY ENGINEERING

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

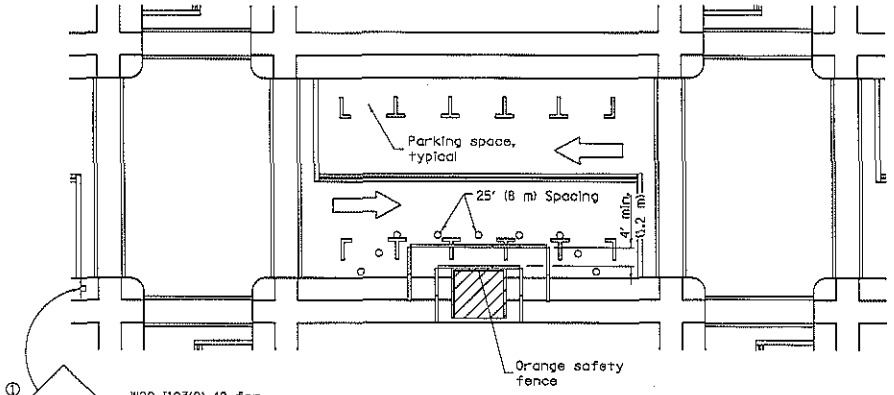
DATE	REVISIONS
1-1-14	Added devices at arrow board upstream from taper.
	Rev. workers sign number.
1-1-12	Revised flagger sign.
	Omitted W21-1110 sign.

URBAN LANE CLOSURE, MULTILANE INTERSECTION

STANDARD 701701-09

INTENTIONALLY

BLANK



① Omit whenever duplicated by road work traffic control.

① ROAD CONSTRUCTION AHEAD — W20-1103(0)-48 for contract construction projects

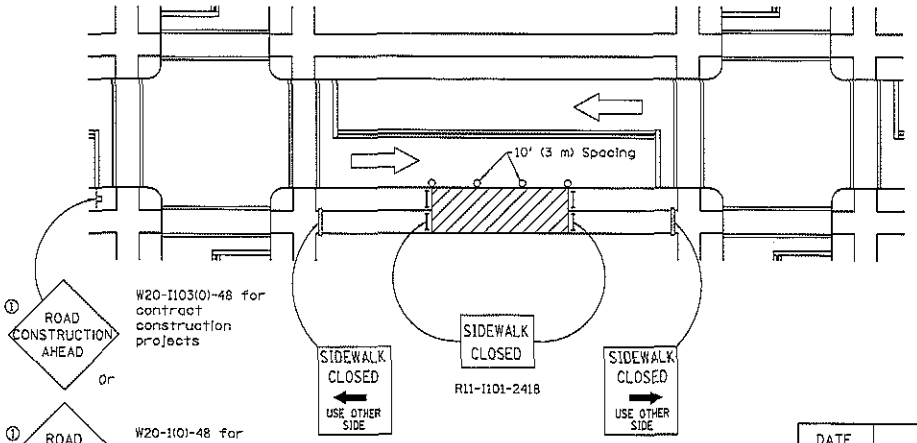
Or

① ROAD WORK AHEAD — W20-1(0)-48 for maintenance and utility projects

SIDEWALK DIVERSION

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 — W20-1103(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 701501.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2012
ENGINEER OF SAFETY ENGINEERING

APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

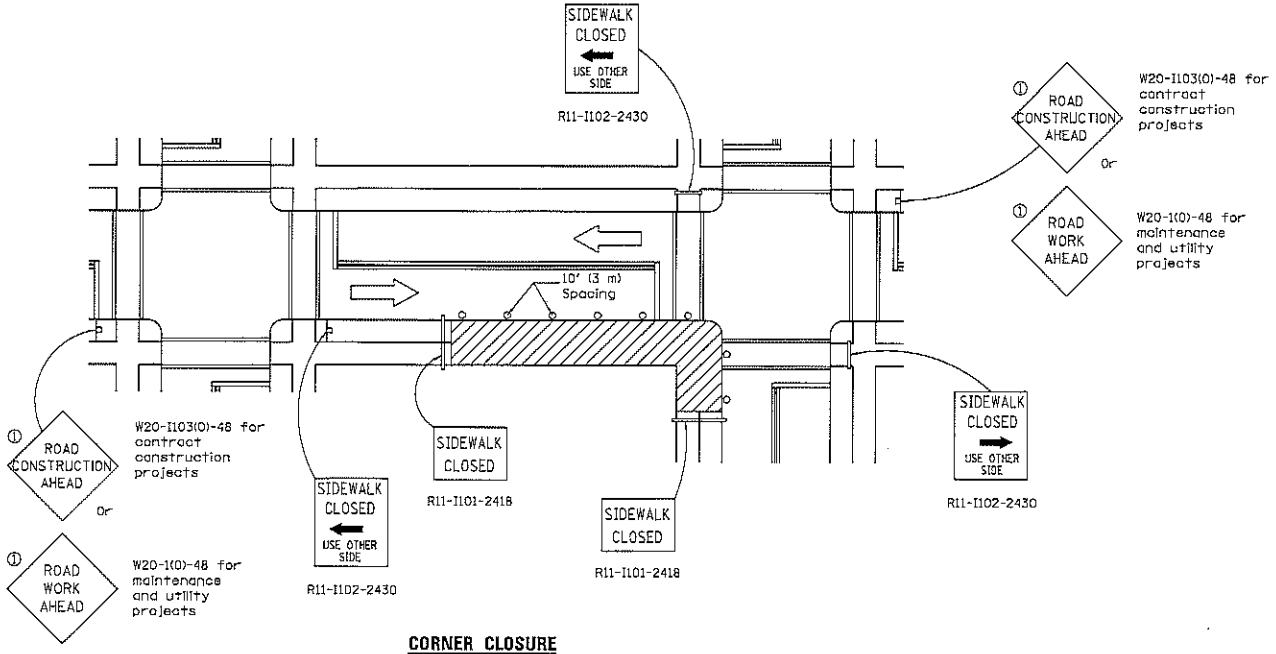
ISSUED 1-1-97

DATE	REVISIONS
1-1-12	Added SIDEWALK DIVERSION.
	Modified appearance of
	plan views. Renamed Std.
1-1-09	Switched units to
	English (metric),
	702001 to 701901.

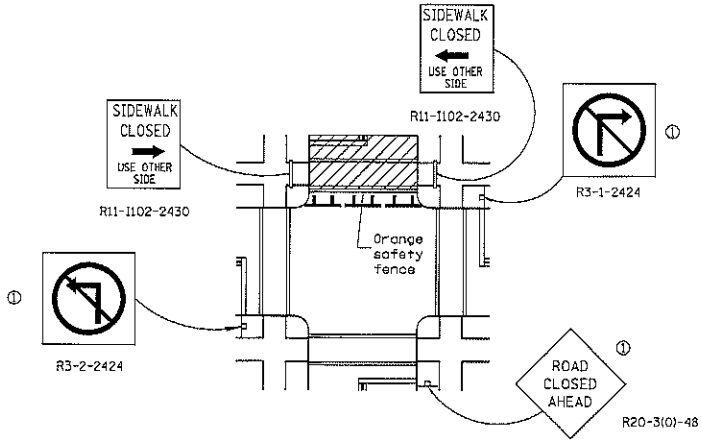
SIDEWALK, CORNER OR CROSSWALK CLOSURE

(Sheet 1 of 2)

STANDARD 701801-05



CORNER CLOSURE



CROSSWALK CLOSURE

Illinois Department of Transportation

APPROVED January 1, 2012
ENGINEER OF SAFETY ENGINEERING

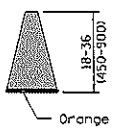
APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

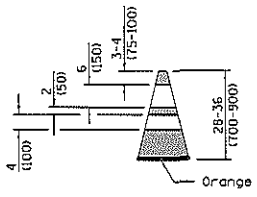
SIDEWALK, CORNER OR CROSSWALK CLOSURE

(Sheet 2 of 2)

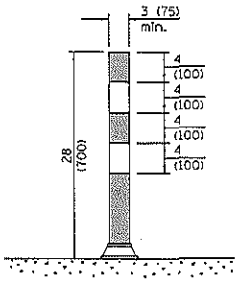
STANDARD 701801-05



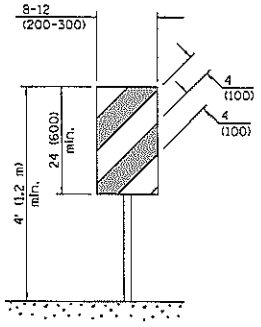
CONE



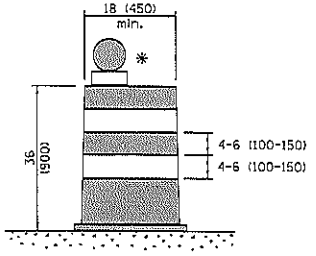
REFLECTORIZED CONE



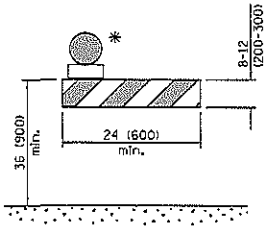
FLEXIBLE DELINEATOR



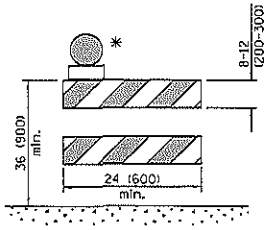
VERTICAL PANEL
POST MOUNTED



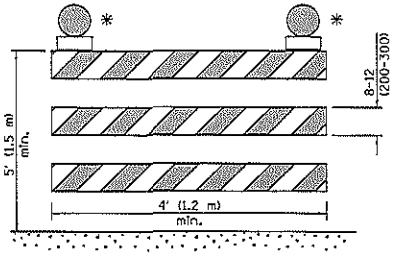
DRUM



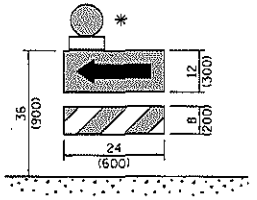
TYPE I BARRICADE



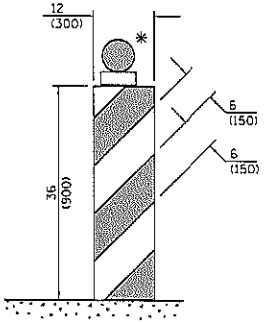
TYPE II BARRICADE



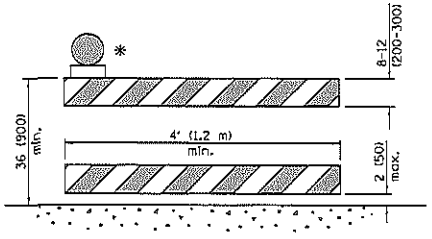
TYPE III BARRICADE



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, 2014
ENGINEER OF OPERATIONS

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

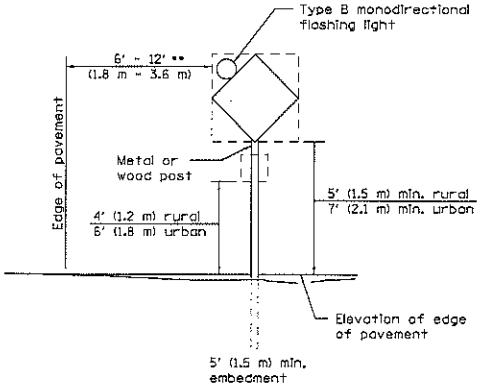
ISSUED 1-1-14

DATE	REVISIONS
1-1-14	Modified flagger sign height.
	Added highway construction
	speed zone signs.
1-1-12	Added DETECTABLE PEDESTRIAN
	CHANNELIZING BARRICADE.

TRAFFIC CONTROL DEVICES

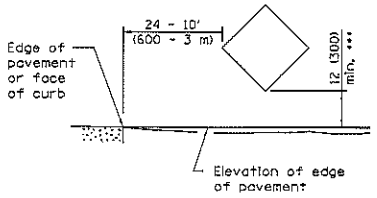
(Sheet 1 of 3)

STANDARD 701901-03



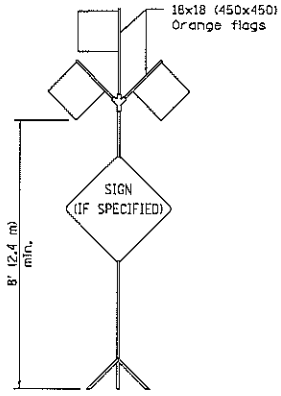
POST MOUNTED SIGNS

** 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.

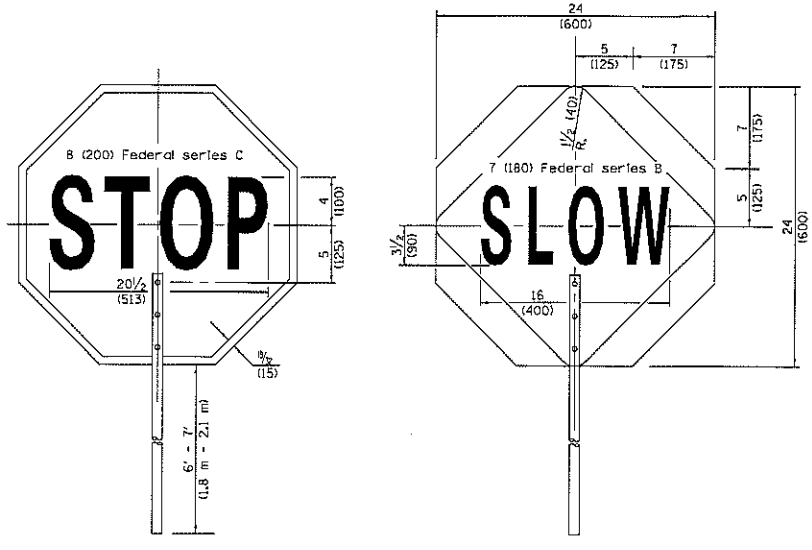


SIGNS ON TEMPORARY SUPPORTS

*** 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



FRONT SIDE

REVERSE SIDE

FLAGGER TRAFFIC CONTROL SIGN

ROAD CONSTRUCTION NEXT X MILES — G20-1(10)-6036

END CONSTRUCTION — G20-2a(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 — W21-1(15)(0)-3618

SPEED LIMIT XX — R2-1-3648

PHOTO ENFORCED — R10-1(08)p-3618

$XXX FINE MINIMUM — R2-1(06)p-3618

Sign assembly as shown on Standards or as allowed by District Operations.

END WORK ZONE SPEED LIMIT — G20-1(03)(0)-3660

This sign shall be used when the above sign assembly is used.

HIGHWAY CONSTRUCTION SPEED ZONE SIGNS

Illinois Department of Transportation

APPROVED January 1, 2014
ENGINEER OF OPERATIONS

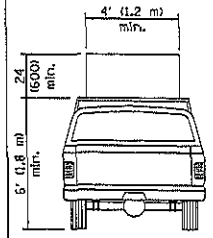
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-14

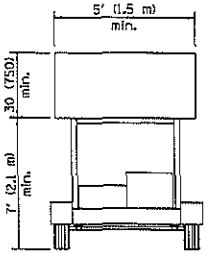
TRAFFIC CONTROL DEVICES

(Sheet 2 of 3)

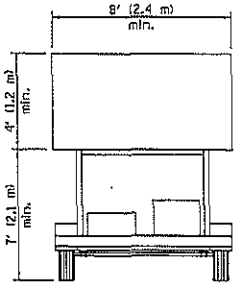
STANDARD 701901-03



TYPE A
ROOF
MOUNTED

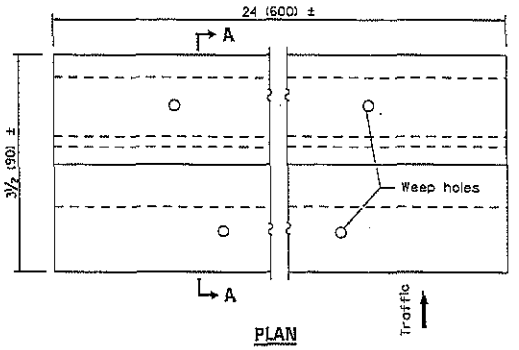


TYPE B
ROOF OR TRAILER
MOUNTED

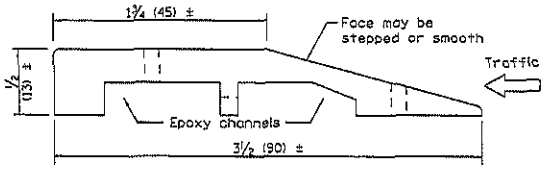


TYPE C
TRAILER
MOUNTED

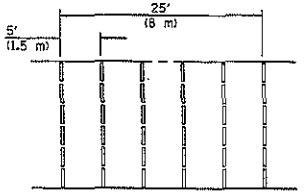
ARROW BOARDS



PLAN

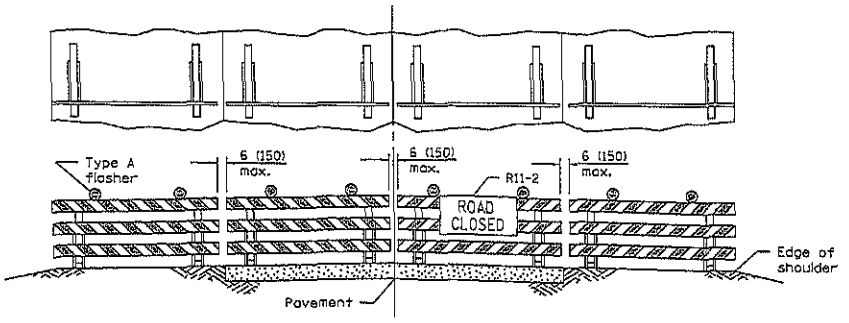


SECTION A–A



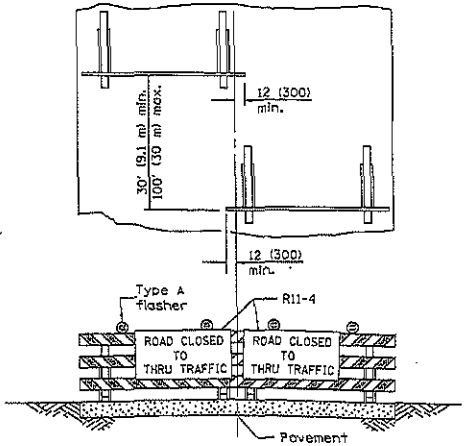
TYPICAL INSTALLATION

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, 2014
ENGINEER OF OPERATIONS

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 16-1-1

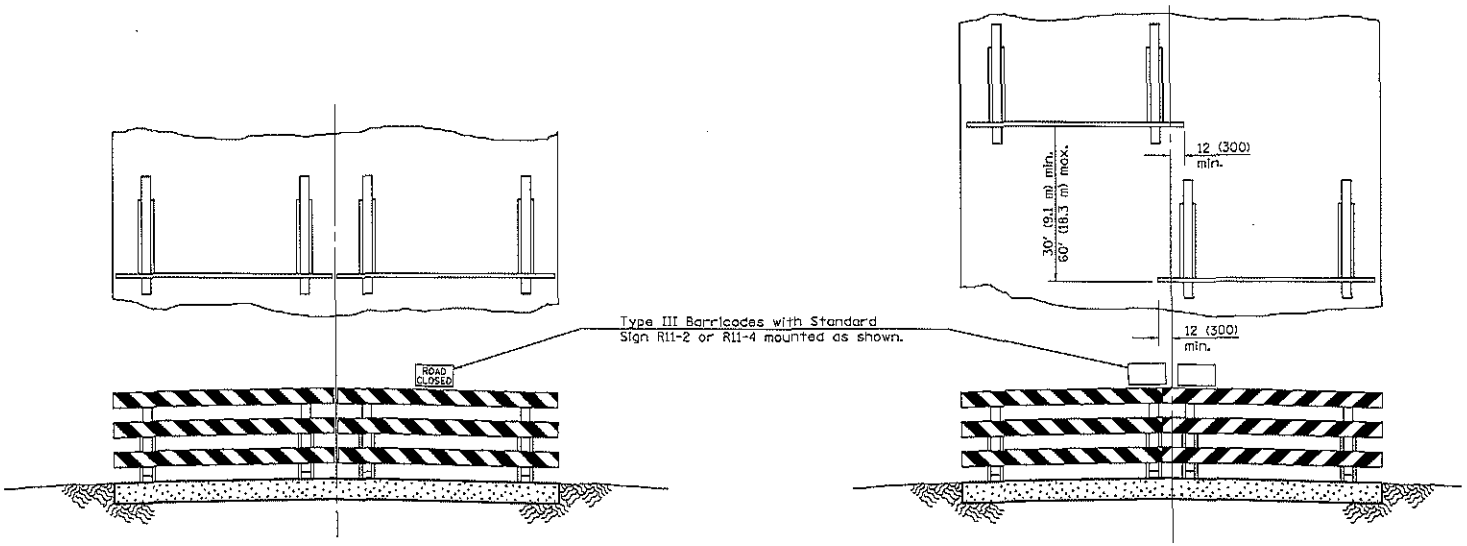
TRAFFIC CONTROL DEVICES

(Sheet 3 of 3)

STANDARD 701901-03

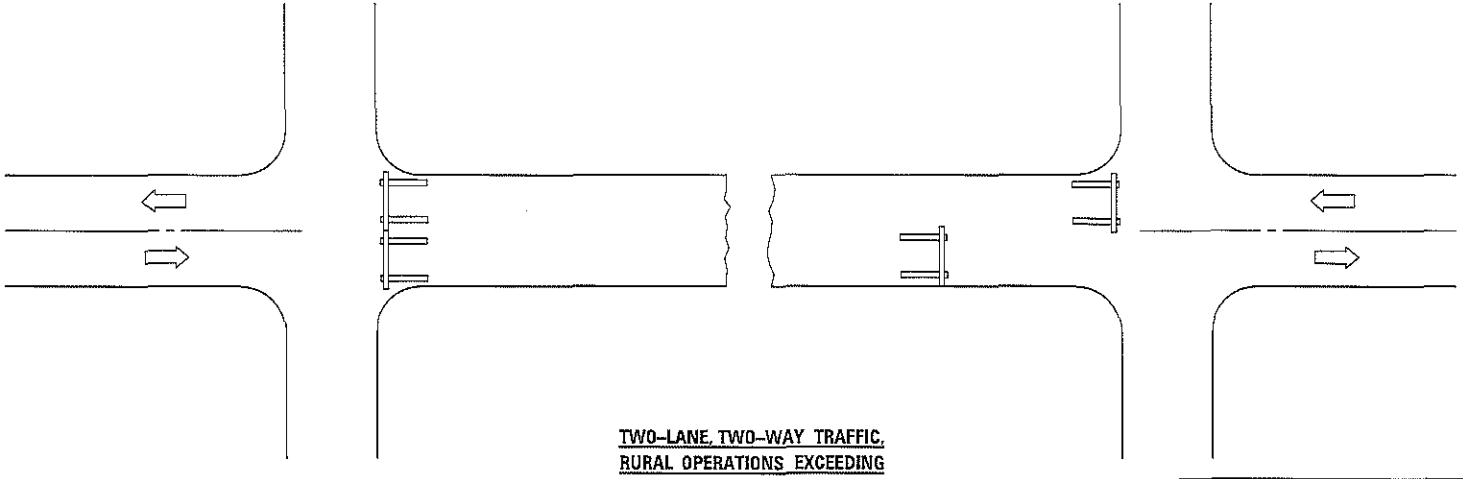
INTENTIONALLY

BLANK



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

APPROVED January 1, 2009
ENGINEER OF LOCAL ROADS AND STREETS

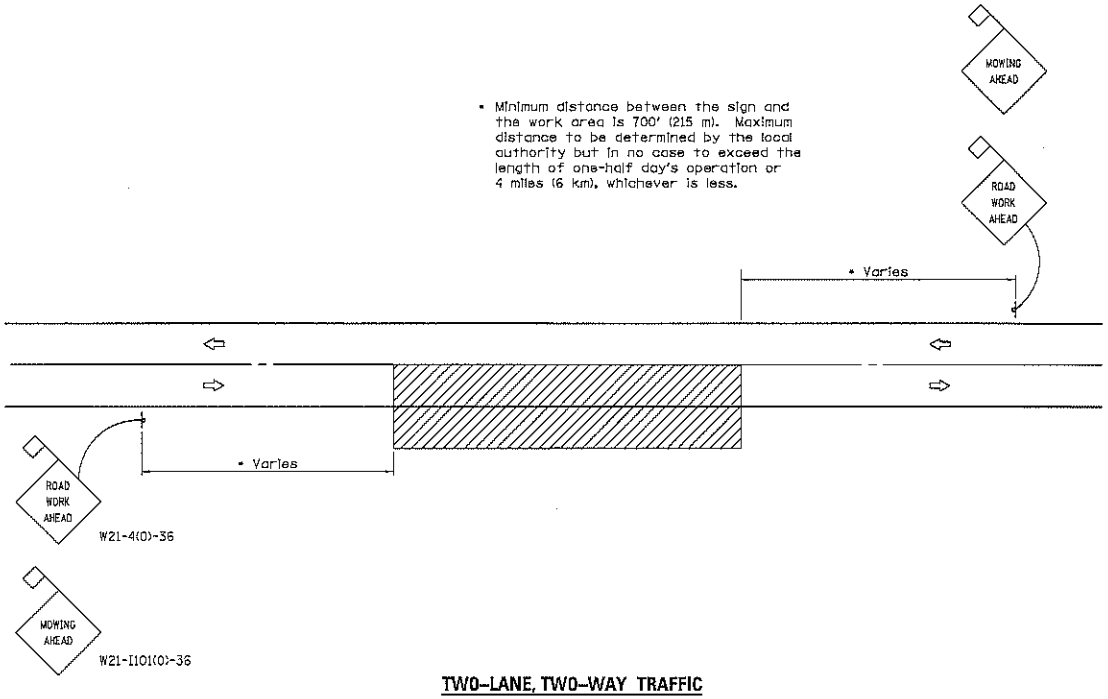
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

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 activities 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

APPROVED January 1, 2009
ENGINEER OF LOCAL ROADS AND STREETS

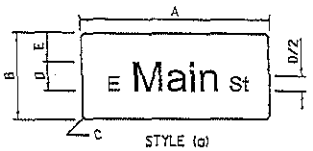
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

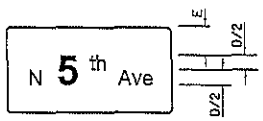
DATE	REVISIONS
1-1-09	Switched units to English (metric). Moved one General Note.
1-1-99	Delete ROW Line.

TRAFFIC CONTROL DEVICES--DAY LABOR MAINTENANCE

STANDARD B.L.R. 18-5

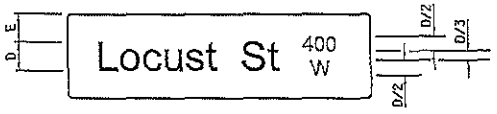


STYLE (a)



STYLE (b)

STYLE (c)



STYLE (d)

STYLE (e)

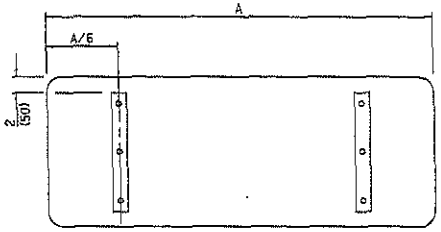
When road classification only is on the second line, it should not be abbreviated.

STYLE (f)

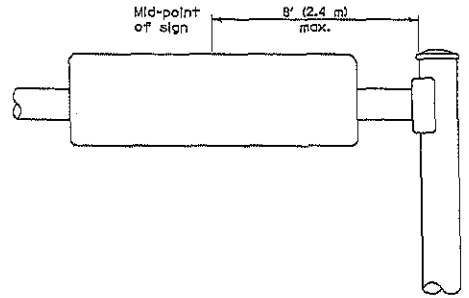
TYPICAL SIGN STYLES

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)	-	-	⅝ (15)
	Var.	24 (600)	1½ (40)	10 (250)	7 (175)	-	-	-	10/7½ (250/190)	-	-	⅝ (15)
	Var.	30 (750)	1⅞ (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)	⅝ (15)
	Var.	30 (750)	1⅞ (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)	-	⅝ (15)
	Var.	30 (750)	1⅞ (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



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

APPROVED January 1, 2012
ENGINEER OF OPERATIONS

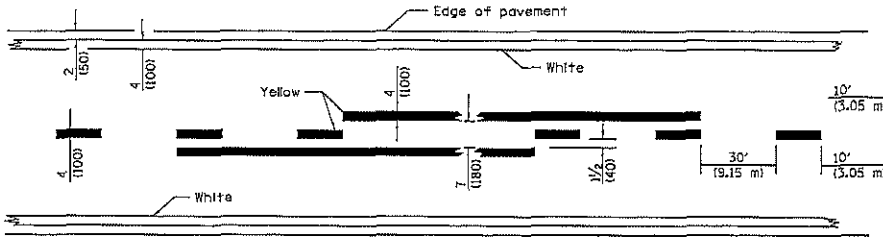
APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

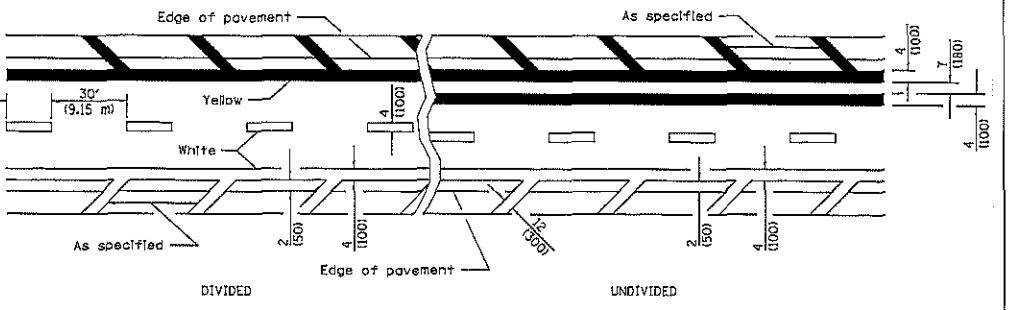
DATE	REVISIONS
1-1-12	Revised table and
	lettering to upper/lower
	case per current MUTCD.
1-1-09	Switched units to
	English (metric).

MAST ARM MOUNTED STREET NAME SIGNS

STANDARD 720016-03

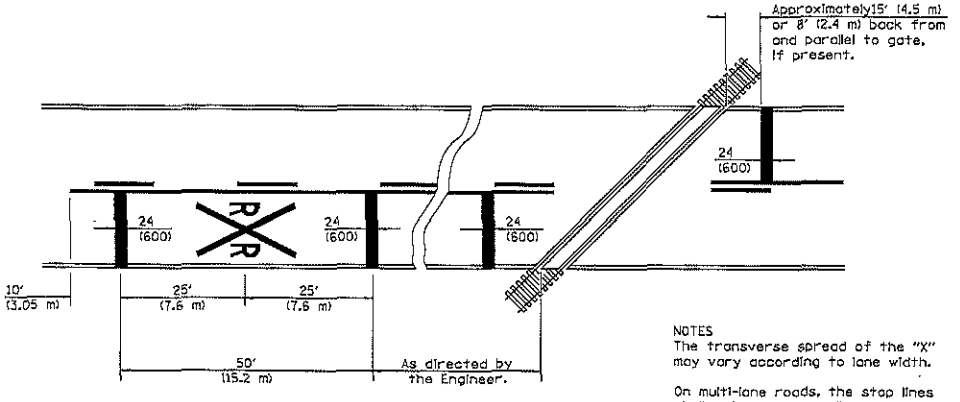


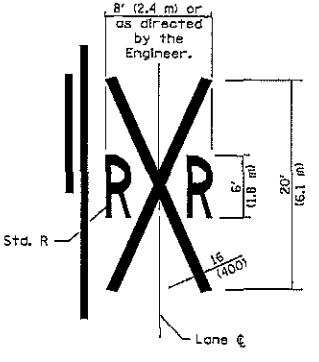
2 LANE



MULTI LANE

LANE AND EDGE LINES





NOTES
The transverse spread of the "X" may vary according to lane width.

On multi-lane roads, the stop lines shall extend across all approach lanes and separate RXR symbols shall be placed adjacent to each other in each lane.

When the pavement marking symbol is used, a portion of the symbol should be located directly adjacent to the Advance Warning Sign (W10-1) as placed by Table 2C-4, Condition B of the MUTCD.

PAVEMENT MARKINGS AT RAILROAD–HIGHWAY GRADE CROSSING

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2014
ENGINEER OF OPERATIONS
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

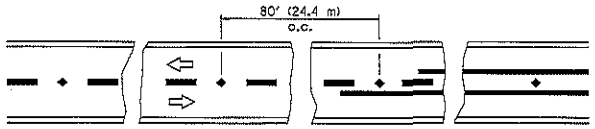
ISSUED 1-1-97

DATE	REVISIONS
1-1-14	Added bike symbol. Renamed
	'LANE DROP ARROW' detail to
	'LANE-REDUCTION ARROW'.
1-1-12	Updated reference to
	current MUTCD table in
	notes.

TYPICAL PAVEMENT MARKINGS

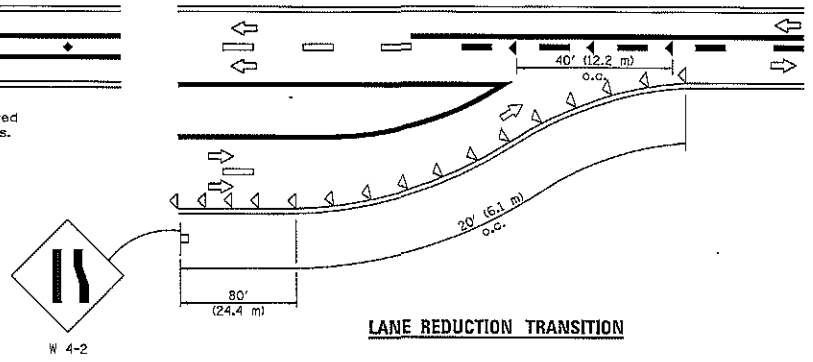
(Sheet 1 of 2)

STANDARD 780001–04

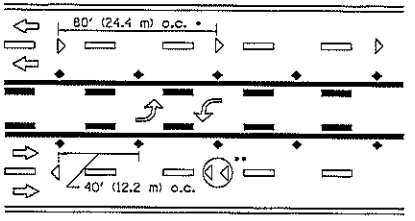


Reduce to 40' (12.2 m) o.c. on curves with posted or advisory speeds of 45 mph (70 km/h) or less.

TWO-LANE /TWO-WAY

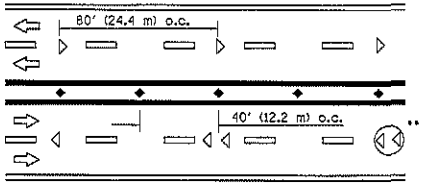


LANE REDUCTION TRANSITION



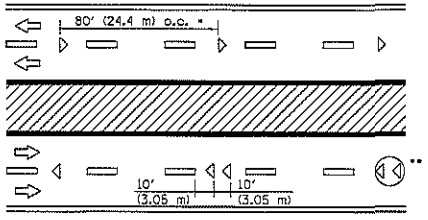
*,** See MULTI LANE DIVIDED detail for lane marker notes.

TWO-WAY LEFT TURN



*,** See MULTI LANE DIVIDED detail for lane marker notes.

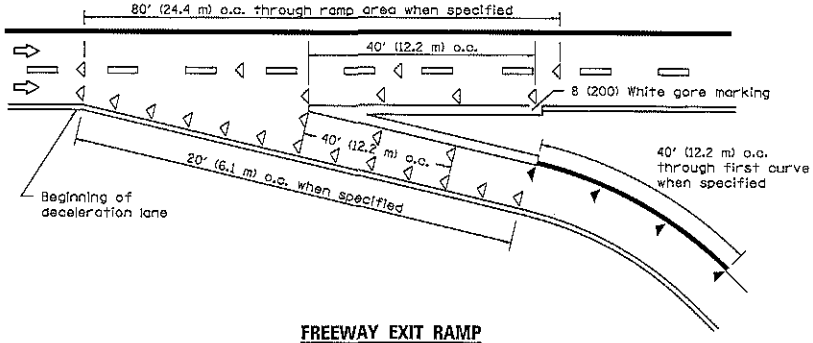
MULTI-LANE UNDIVIDED



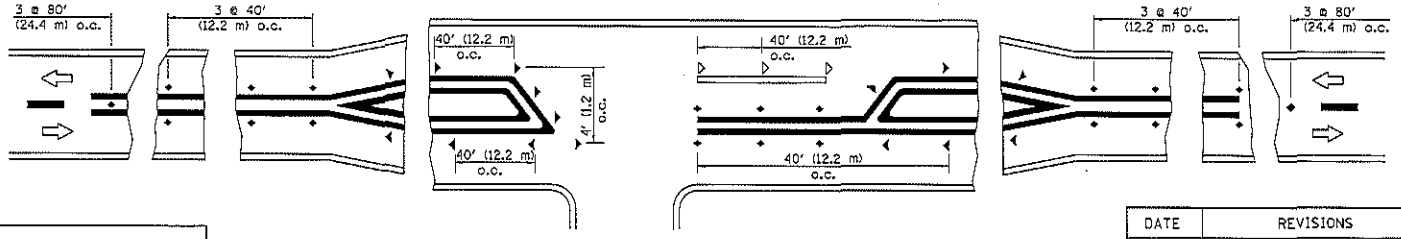
* Reduce to 40' (12.2 m) o.c. on curves where advisory speeds are 10 mph (15 km/h) lower than posted speeds.

** Where double lane line markers are specified, they shall be spaced as shown.

MULTI-LANE DIVIDED



FREEWAY EXIT RAMP



RURAL LEFT TURN

SYMBOLS

- Yellow stripe
- White stripe
- One-way amber marker
- One-way crystal marker
- Two-way amber marker

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

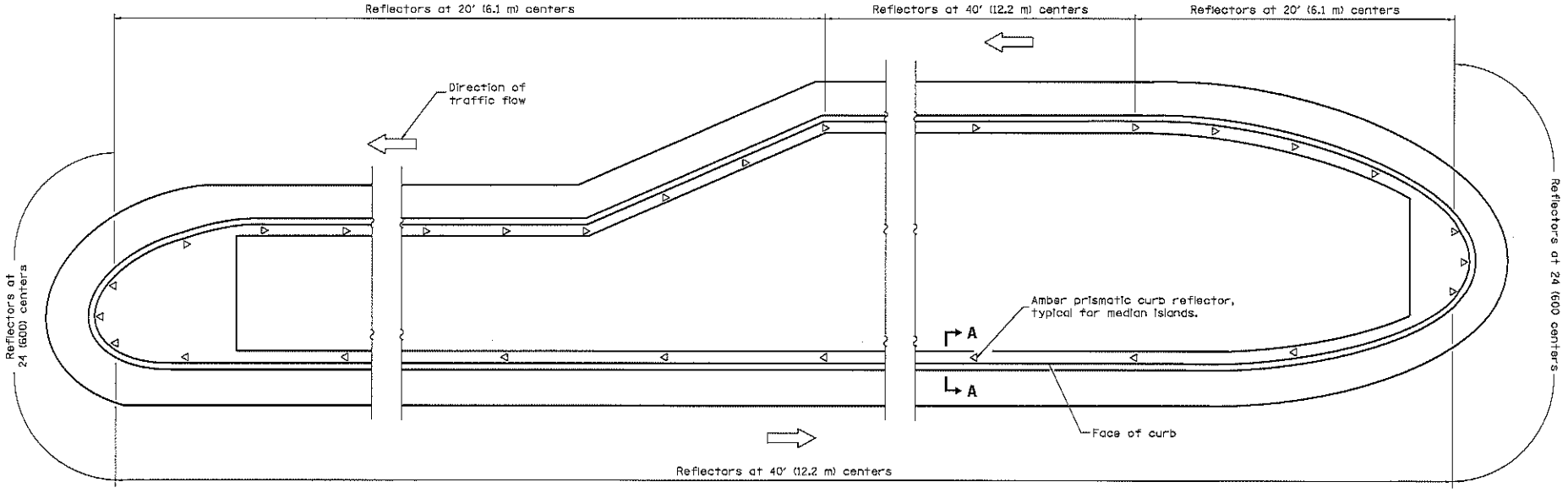
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-09

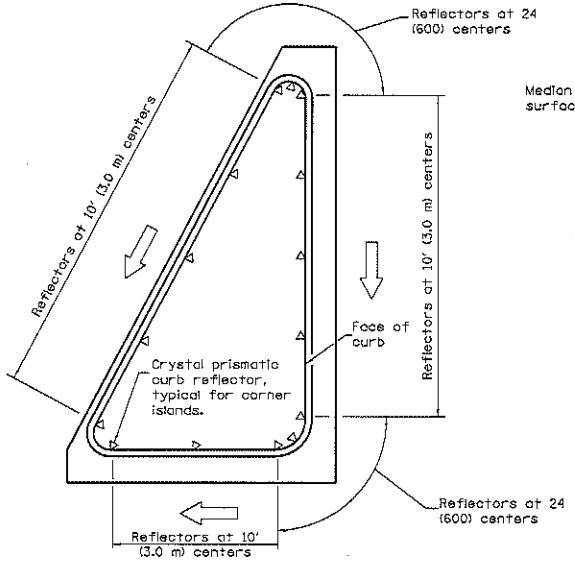
DATE	REVISIONS
1-1-09	Switched units to
	English (metric).
1-1-99	Extended double line to
	show different scenario
	in RURAL LEFT TURN.

TYPICAL APPLICATIONS RAISED REFLECTIVE PAVEMENT MARKERS

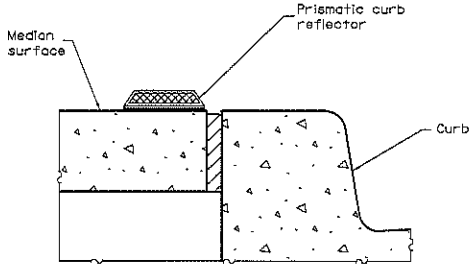
STANDARD 781001-03



MEDIAN ISLAND



CORNER ISLAND



SECTION A–A
(Similar for corner islands.)

GENERAL NOTES

Prismatic curb reflectors shall be monodirectional and oriented with the reflective face toward approaching traffic.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2012
ENGINEER OF OPERATIONS

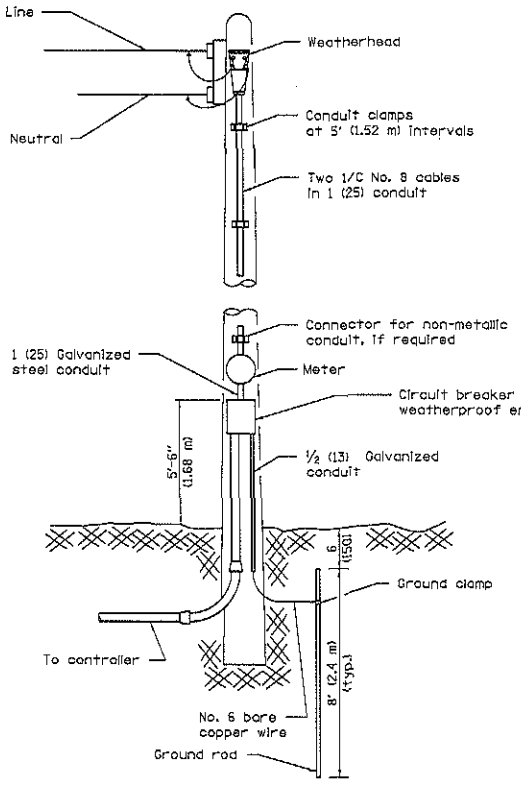
APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

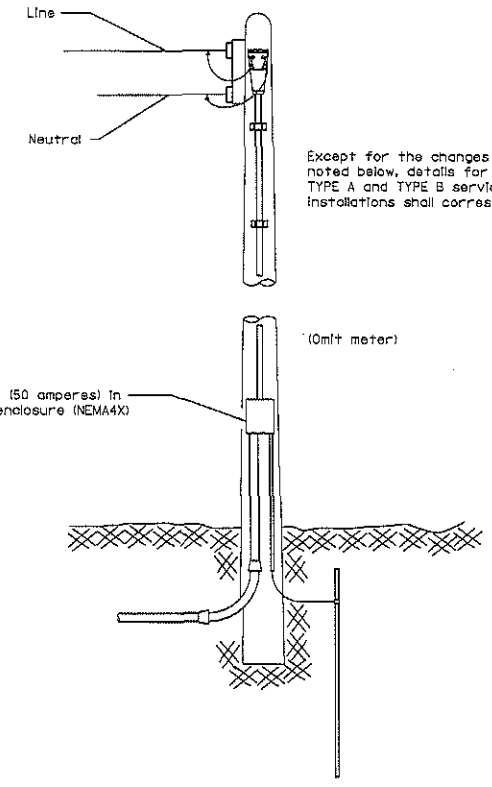
DATE	REVISIONS
1-1-12	New standard.

PRISMATIC CURB REFLECTORS

STANDARD 782001

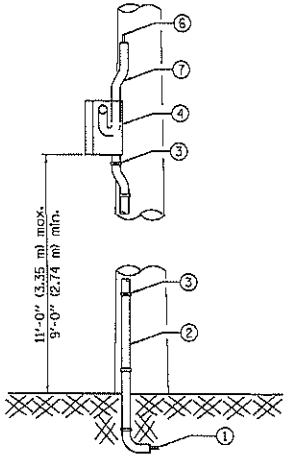


TYPE A



TYPE B

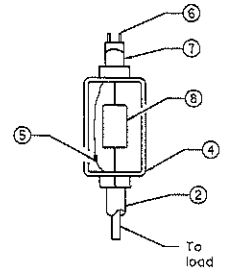
Except for the changes noted below, details for TYPE A and TYPE B service installations shall correspond.

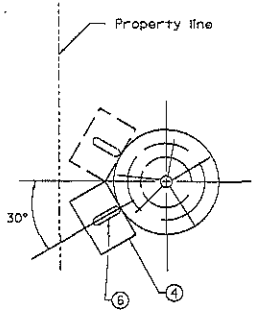


The following equipment is to be furnished and installed on the TYPE C installation.

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

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

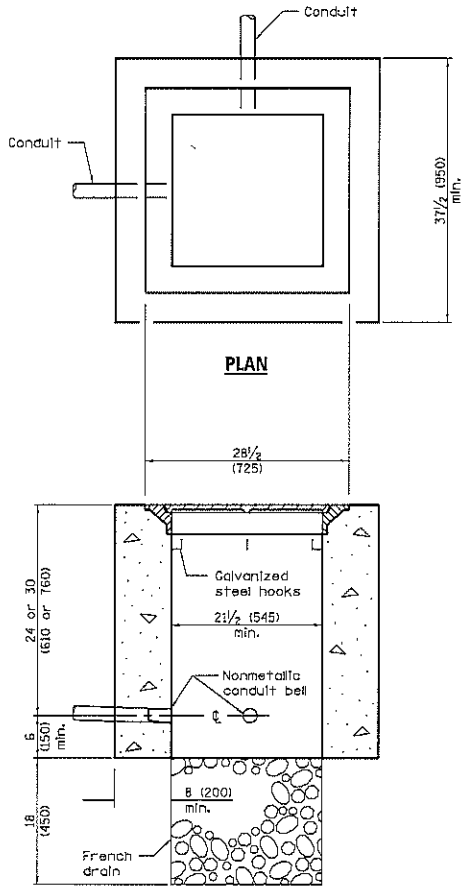
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 20-1-1

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Renum. Standard 2373-1.

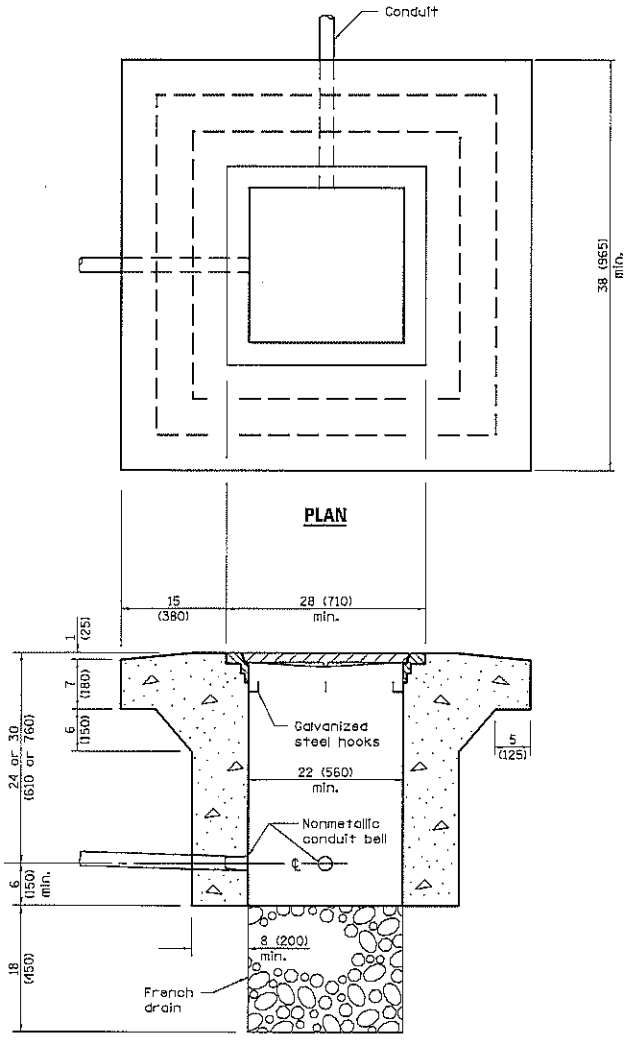
ELECTRICAL SERVICE INSTALLATION DETAILS

STANDARD 805001-01



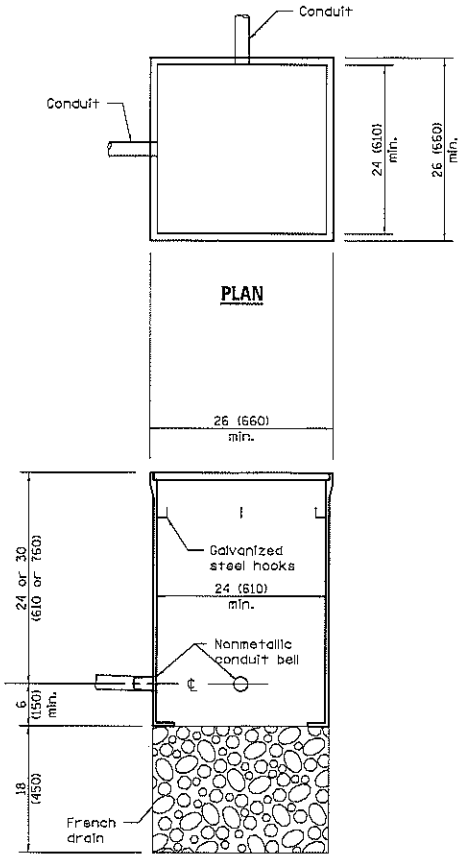
ELEVATION

PORTLAND CEMENT CONCRETE



ELEVATION

PORTLAND CEMENT CONCRETE
HEAVY DUTY



ELEVATION

COMPOSITE CONCRETE

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

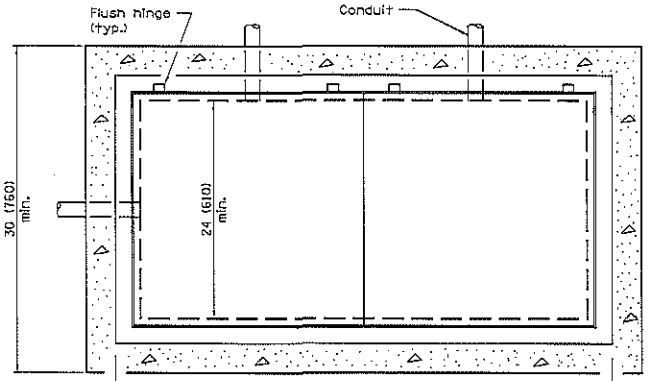
APPROVED January 1, 2009
ENGINEER OF OPERATIONS
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-07

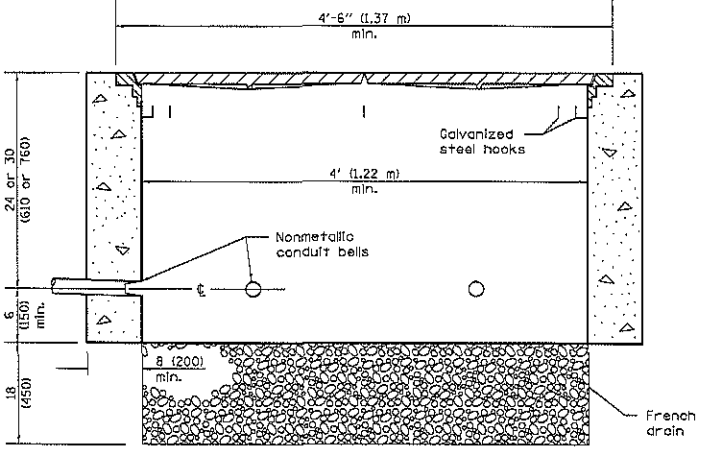
DATE	REVISIONS
1-1-09	Switched units to
	English (metric).
1-1-07	Revised composite conc.
	handhole. Rem. weights
	of frames and covers.

HANDHOLES

STANDARD 814001-02

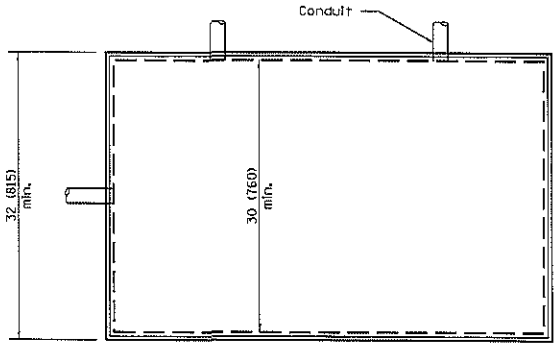


PLAN

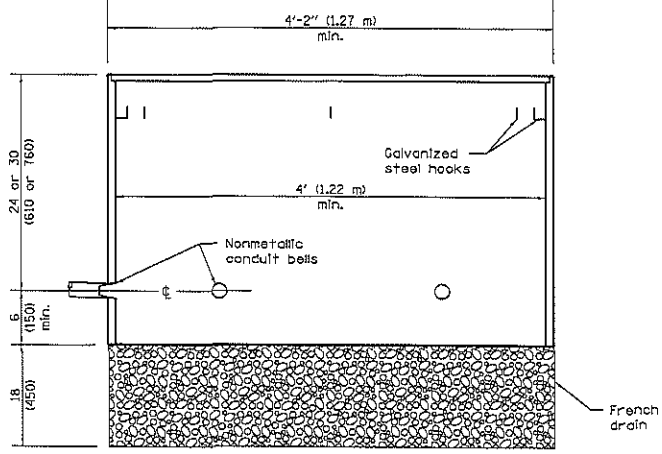


ELEVATION

PORTLAND CEMENT CONCRETE



PLAN



ELEVATION

COMPOSITE CONCRETE

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

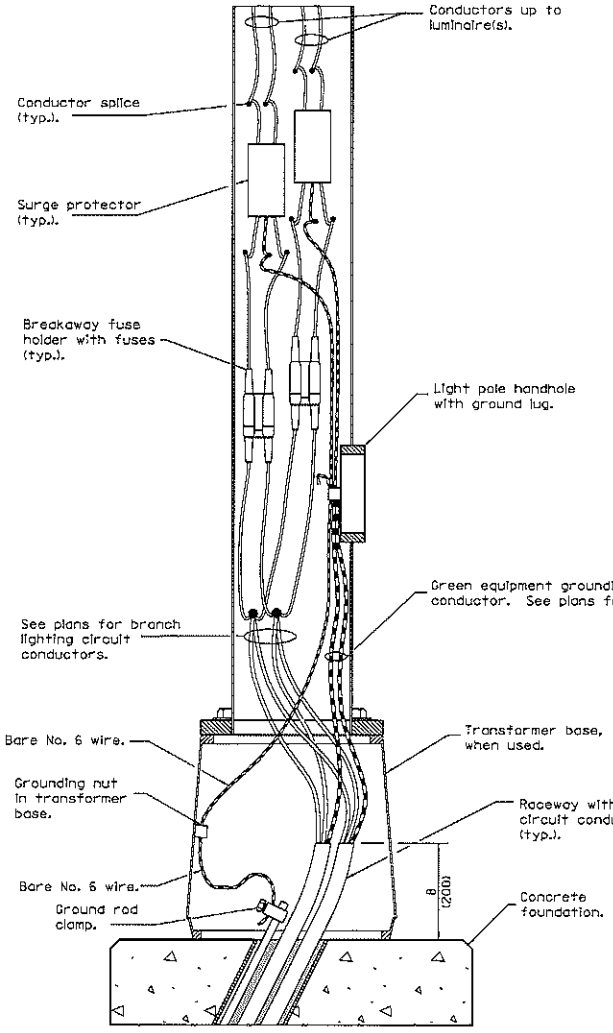
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

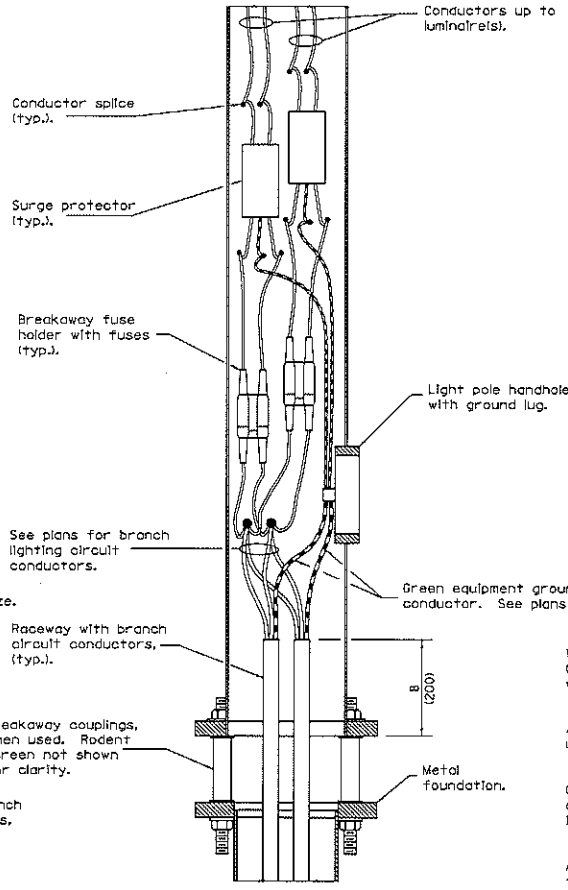
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Revised composite conc. handhole. Rem. weights of frames and covers.

DOUBLE HANDHOLES

STANDARD 814006-02



ELEVATION AT POLE BASE WITH CONCRETE FOUNDATION



ELEVATION AT POLE BASE WITH METAL FOUNDATION
(Rodent screen not shown)

Wiring for twin luminaire installation shown. Omit one fuse holder and one surge protector with connections for single luminaire installation.

GENERAL NOTES

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

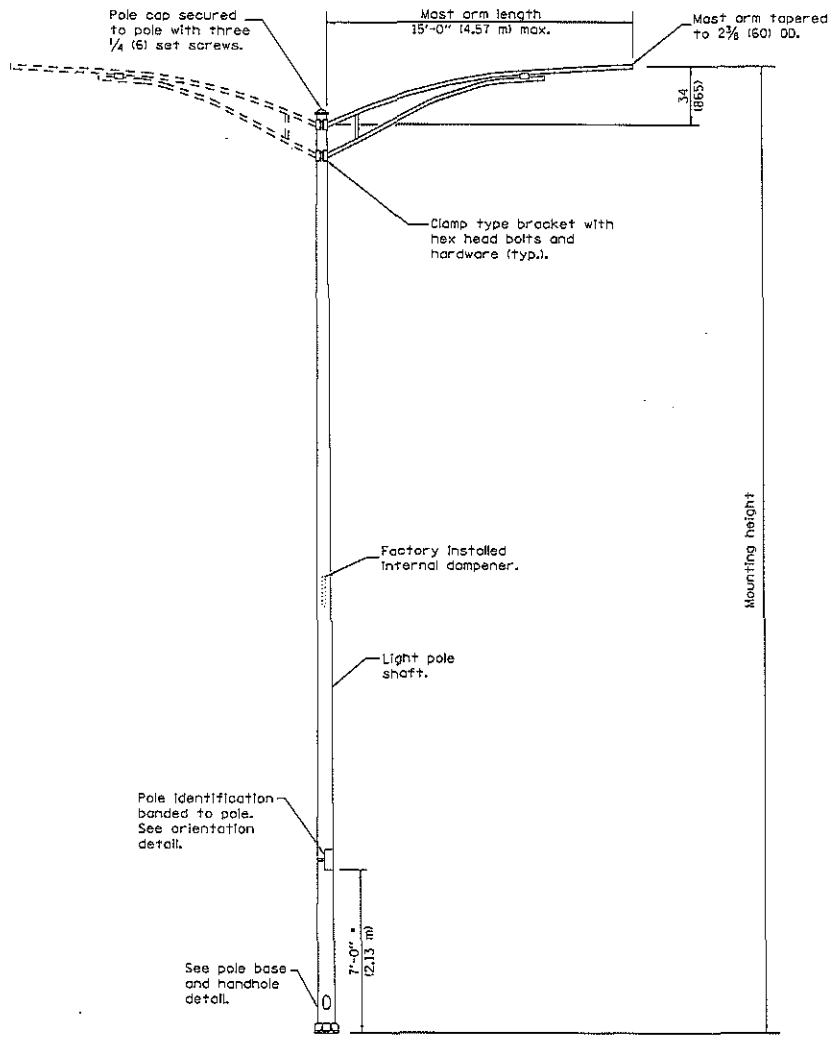
PASSED January 1, 2014
ENGINEER OF PRELIMINARY ENGINEERING
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-14

DATE	REVISIONS
1-1-14	New standard.

LUMINAIRE WIRING DIAGRAM

STANDARD 821101



MAST ARM LIGHT POLE

(Single or twin mount)

* Unless directed otherwise by the Engineer.

POLE		
MOUNTING HEIGHT	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
35' (10.7 m) or less	8 tapered to 4½ (200 to 114)	0.25 (6)
Greater than 35' (10.7 m) to 45' (13.7 m)	10 tapered to 6 (250 to 150)	0.25 (6)
Greater than 45' (13.7 m) to 50' (15.2 m)	10 tapered to 6 (250 to 150)	0.312 (8)

POLE BASE	
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER
35' (10.7 m) or less	11½ (290)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)

GENERAL NOTES

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Voids in light pole base shall be sealed to prevent rodent entry.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2014
ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

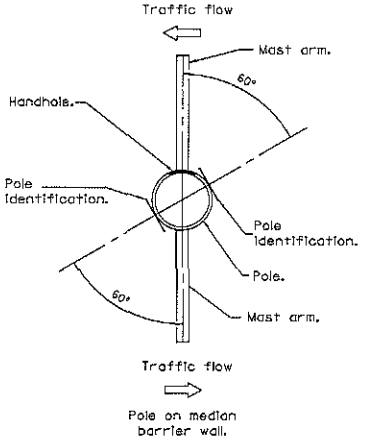
ISSUED 1-1-12

DATE	REVISIONS
1-1-14	Added pole mounted on bridge parapet. Modified attachment of screen.
1-1-13	Added "barrier or retaining wall" to POLE BASE DETAIL.

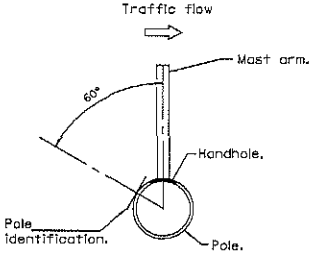
LIGHT POLE
ALUMINUM MAST ARM

(Sheet 1 of 2)

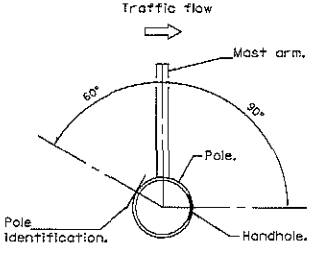
STANDARD 830001-02



Pole on median barrier wall.

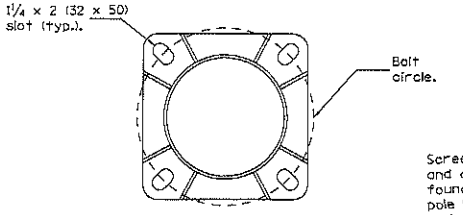


Pole on barrier wall, retaining wall or parapet.

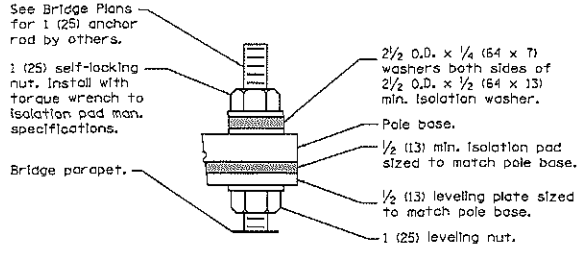


Pole on ground mounted foundation.

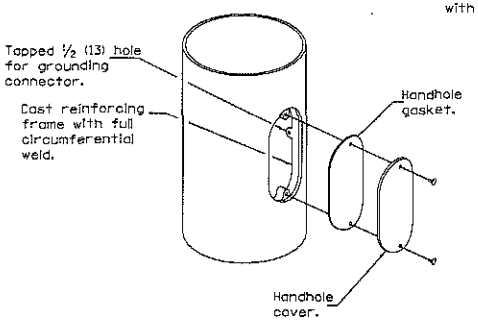
HANDHOLE /IDENTIFICATION ORIENTATION DETAIL



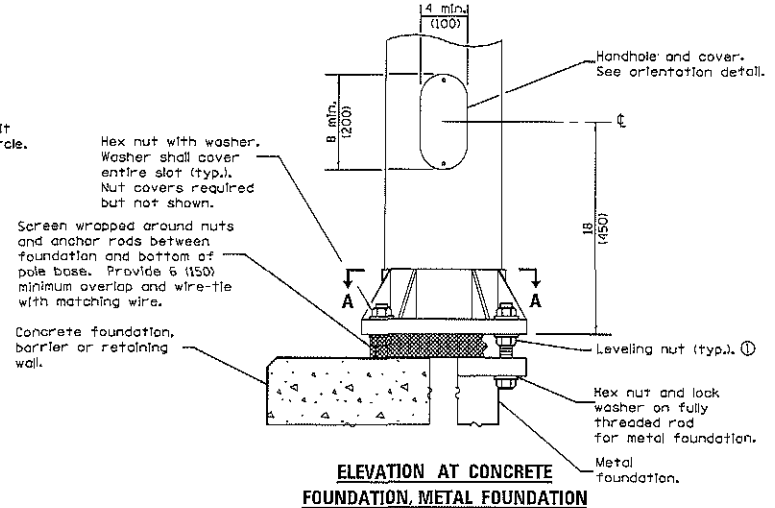
SECTION A–A
(Bolts not shown)



DETAIL A

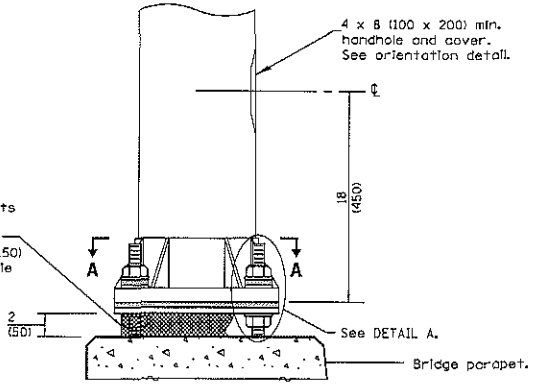


HANDHOLE DETAIL



ELEVATION AT CONCRETE FOUNDATION, METAL FOUNDATION OR RETAINING WALL

① Omit leveling nuts when breakaway devices are required.



ELEVATION AT BRIDGE PARAPET

POLE BASE DETAILS

Illinois Department of Transportation

PASSED January 1, 2014
ENGINEER OF PRELIMINARY ENGINEERING

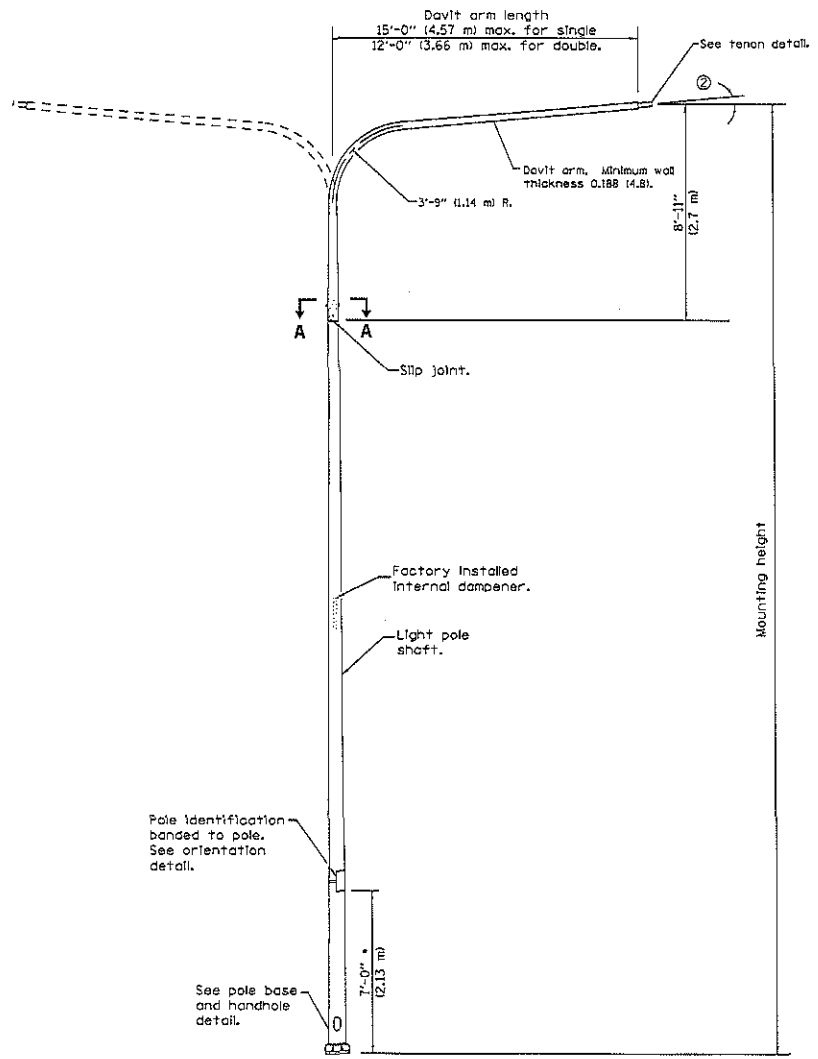
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-14

LIGHT POLE ALUMINUM MAST ARM

(Sheet 2 of 2)

STANDARD 830001–02

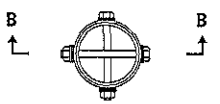


POLE BASE	
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER
35' (10.7 m) or less	11½ (290)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)

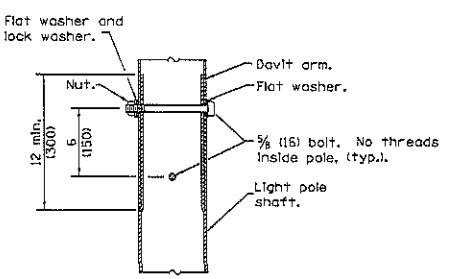
POLE LOWER SHAFT			
MOUNTING HEIGHT	LOWER SHAFT LENGTH ①	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
30' (9.1 m)	21'-1" (6.4 m)	8 tapered to 6 (200 to 114)	0.25 (6)
35' (10.7 m)	26'-1" (7.9 m)	8 tapered to 6 (200 to 114)	0.25 (6)
40' (12.2 m)	31'-1" (9.5 m)	10 tapered to 6 (250 to 150)	0.25 (6)
45' (13.7 m)	36'-1" (11.0 m)	10 tapered to 6 (250 to 150)	0.25 (6)
50' (15.2 m)	41'-1" (12.5 m)	10 tapered to 6 (250 to 150)	0.312 (8)

① Lower shaft length shall be from the bottom of the pole base to the bottom of the slip joint.

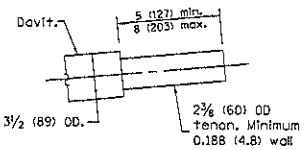
② 5° max. for unloaded pole, 1.5° max. for loaded pole.



SECTION A–A



SECTION B–B



TENON DETAIL

GENERAL NOTES

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Voids in light pole base shall be sealed to prevent rodent entry.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

All dimensions are in inches (millimeters) unless otherwise shown.

DAVIT LIGHT POLE

(Single or twin mount)

* Unless directed otherwise by the Engineer.

Illinois Department of Transportation

PASSED January 1, 2014
ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

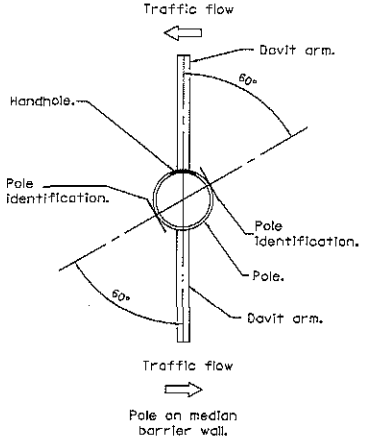
ISSUED 21-1-13

DATE	REVISIONS
1-1-14	Added pole mounted on
	bridge parapet. Modified
	attachment of screen.
1-1-13	Added 'barrier or retaining
	wall' to POLE BASE DETAIL.

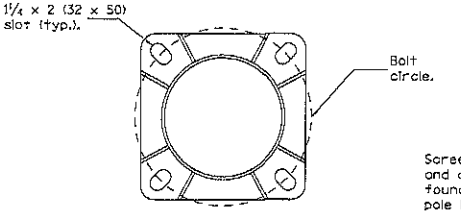
LIGHT POLE
ALUMINUM DAVIT ARM

(Sheet 1 of 2)

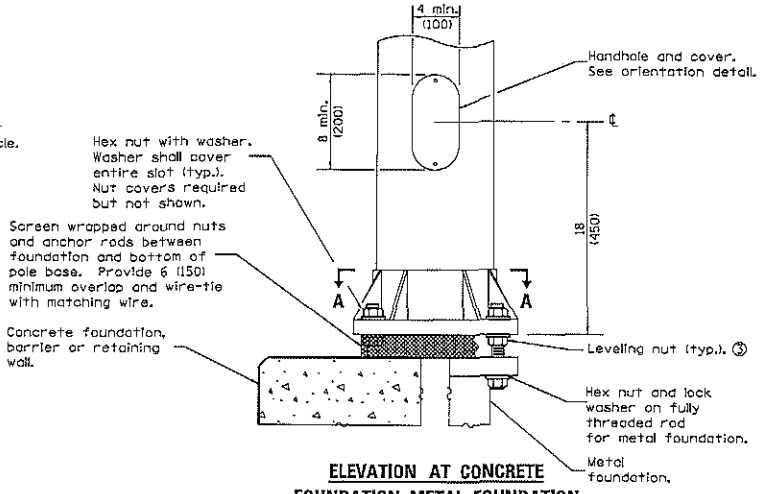
STANDARD 830006-02



Pole on median barrier wall.

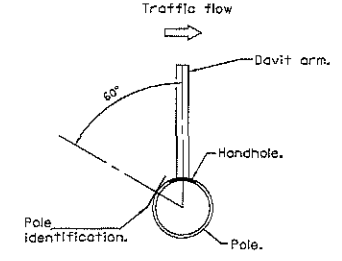


SECTION A–A
(Bolts not shown)

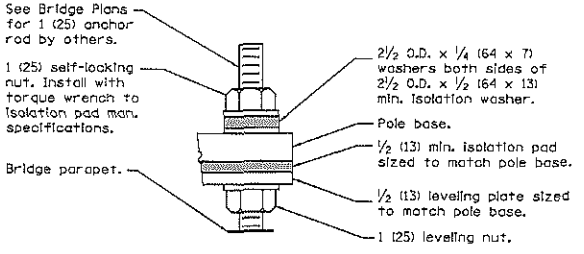


ELEVATION AT CONCRETE FOUNDATION, METAL FOUNDATION OR RETAINING WALL

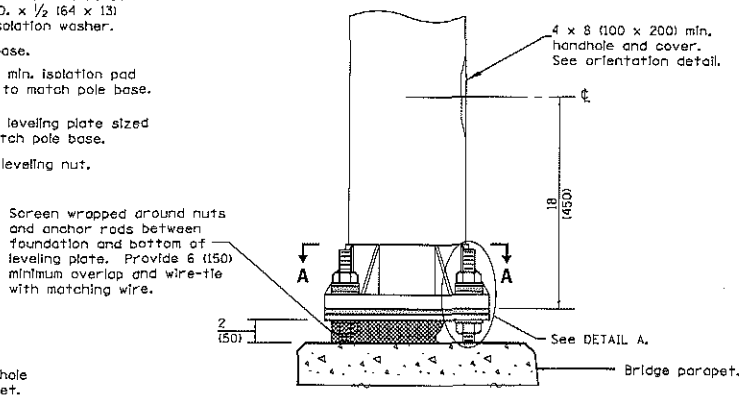
③ Omit leveling nuts when breakaway devices are required.



Pole on barrier wall, retaining wall or parapet.

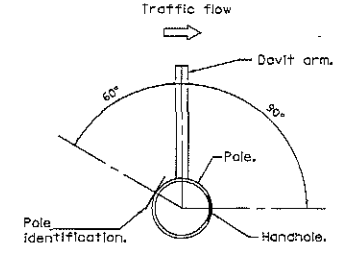


DETAIL A



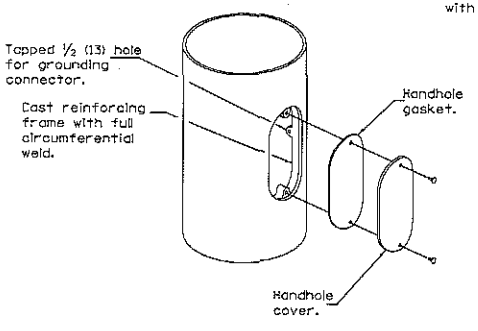
ELEVATION AT BRIDGE PARAPET

POLE BASE DETAILS



Pole on ground mounted foundation.

HANDHOLE /IDENTIFICATION ORIENTATION DETAIL



HANDHOLE DETAIL

Illinois Department of Transportation

PASSED January 1, 2014
ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

LIGHT POLE
ALUMINUM DAVIT ARM

(Sheet 2 of 2)

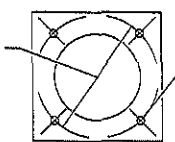
STANDARD 830006-02

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 (1)
≤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) (3)	8⅝ (220)	6' (1.83 m) (2)	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) (3)	8⅝ (220)	6' (1.83 m) (2)	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) (3)	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) Length does not include 4 (100) hook.

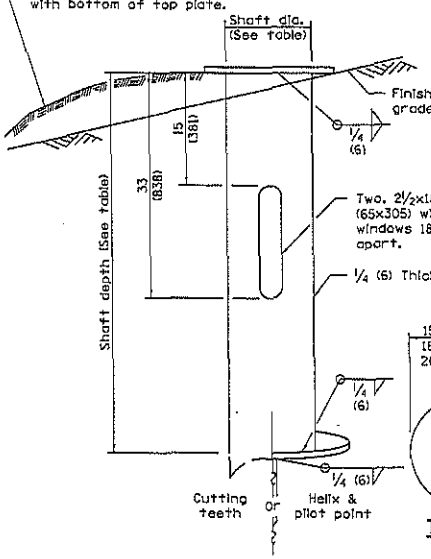
(2) 8⅝ x 8'-0" (220 x 2.44 m) for twin luminaires.

(3) Bolt circle diam. shall be 17 (430) when a transformer base is used.



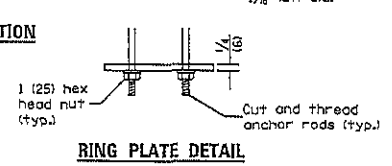
Wiring window location identification marks shall be notched in side of plate or stamped on top.

Provide dirt as needed to meet 5' (1.52 m) chord fill around foundation top. Grade dirt level with bottom of top plate.



TOP VIEW

METAL FOUNDATION



RING PLATE DETAIL

24 (610) min. dia. with 11½ (292) bolt circle, 30 (762) min. dia. with 15 (381) or 17 (432) bolt circle. (3)

Top of wiring window shall be flush with top of foundation.

Plate to be installed when required (See ring plate detail)

5 (125) I.D. Schedule 40 P.V.C. wiring window (grounding electrode not shown).

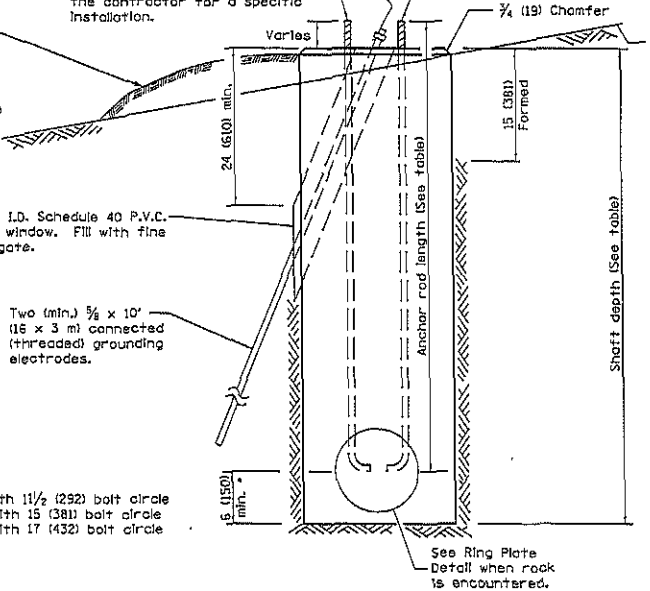
3 (75) Min. concrete cover on all steel

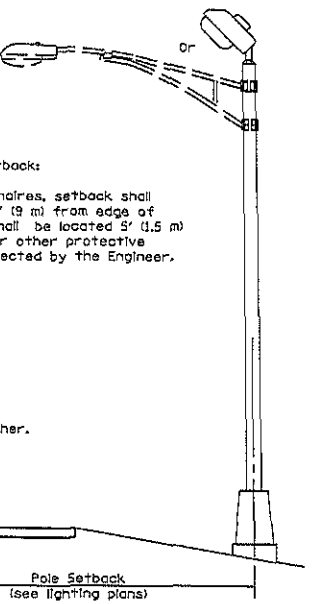
No. 6 bare copper grounding electrode conductor.

Anchor rod 1 (25) diameter with 9 (230) threads. Anchor rod shall extend through nut 1 (25). For foundation behind barrier or guardrail, use self-locking nut and flat washer. Do not use lock washer.

Length above foundation shall be adjusted to accomodate breakaway devices furnished by the contractor for a specific installation.

Use dirt removed from foundation to meet 5' (1.52 m) chord fill around foundation top. Grade dirt level with bottom of concrete chamfer.





Pole Foundation Setback:

For multimount luminaires, setback shall be a minimum of 30' (9 m) from edge of pavement. Poles shall be located 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.

* 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

Illinois Department of Transportation

PASSED January 1, 2013
(Acting)
ENGINEER OF PRELIMINARY ENGINEERING

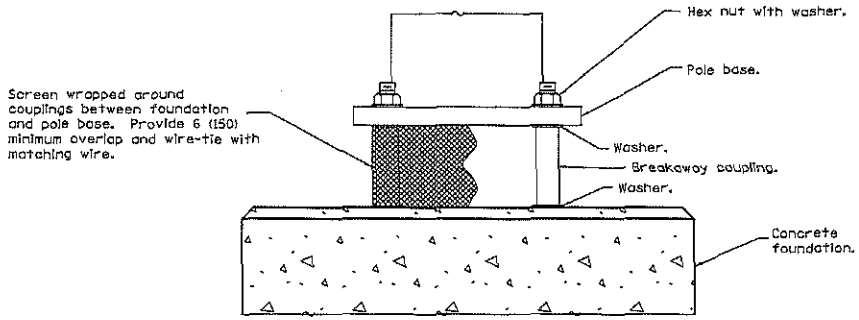
APPROVED January 1, 2013
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-13

DATE	REVISIONS
1-1-13	Revised concrete foundation notes, pole foundation setback notes, ring plate det.
1-1-12	Revised metal foundation wiring window dimensions.

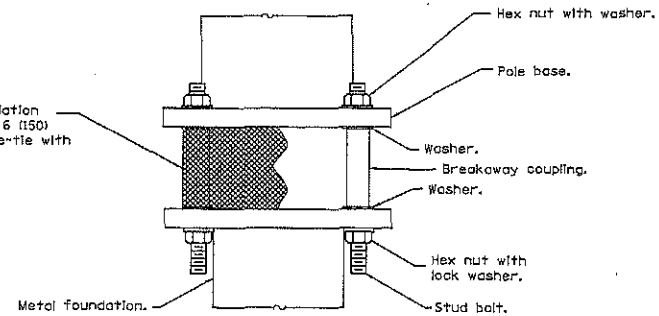
LIGHT POLE FOUNDATION

STANDARD 836001-02



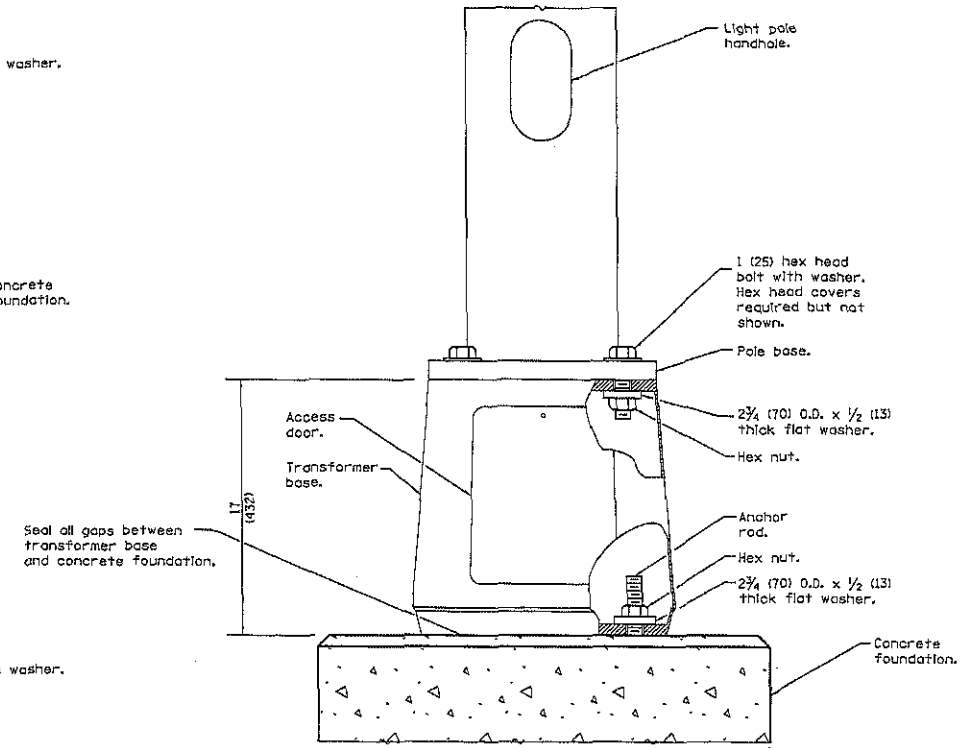
BREAKAWAY COUPLINGS ON CONCRETE FOUNDATION

(Provide pole base skirt around screen when required.)



BREAKAWAY COUPLINGS ON METAL FOUNDATION

(Provide pole base skirt around screen when required.)



BREAKAWAY TRANSFORMER BASE

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.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2014
ENGINEER OF PRELIMINARY ENGINEERING

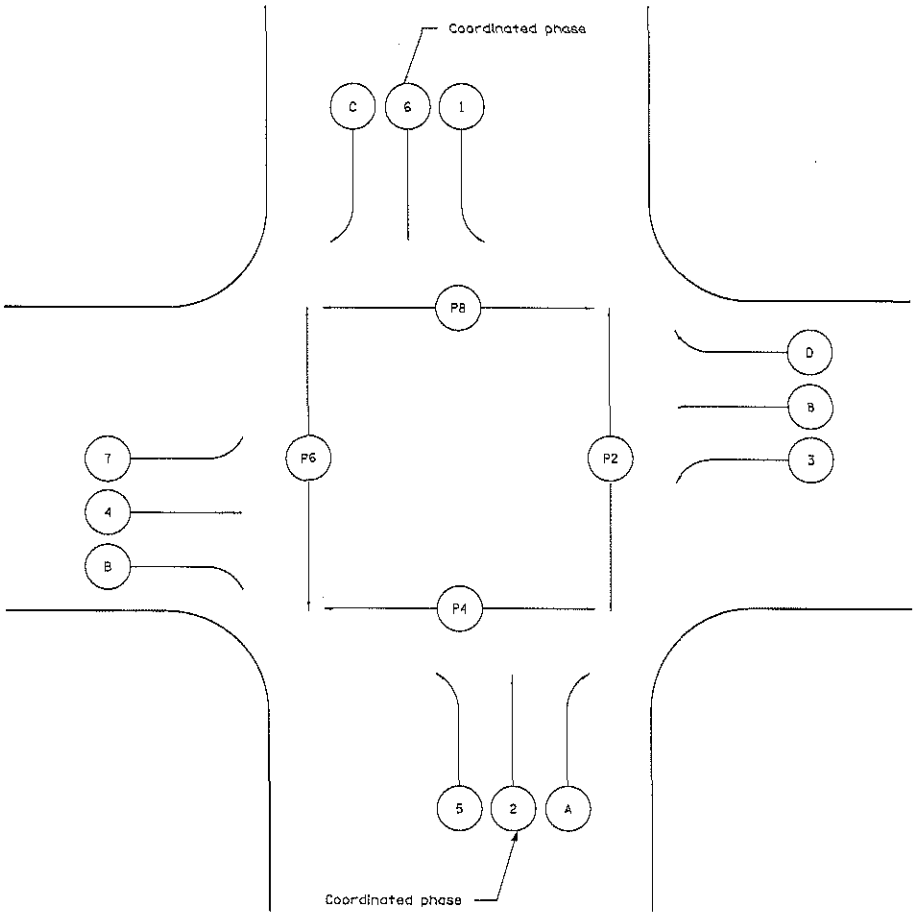
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

(30551) 1-1-14

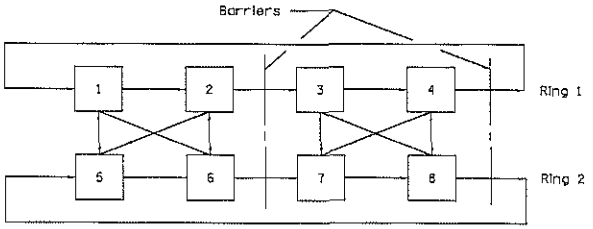
DATE	REVISIONS
1-1-14	New Standard.

BREAKAWAY DEVICES

STANDARD 838001



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

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

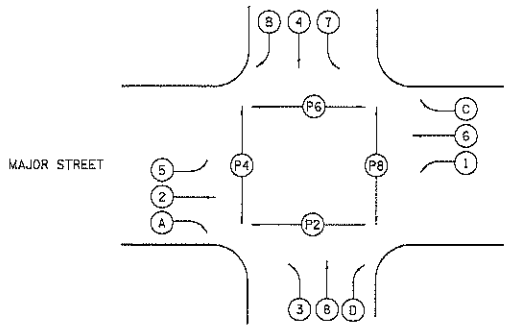
1-1-09

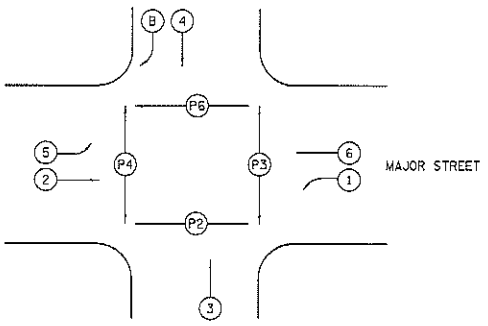
DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
1-1-97	Renum. Standard 2393-2.

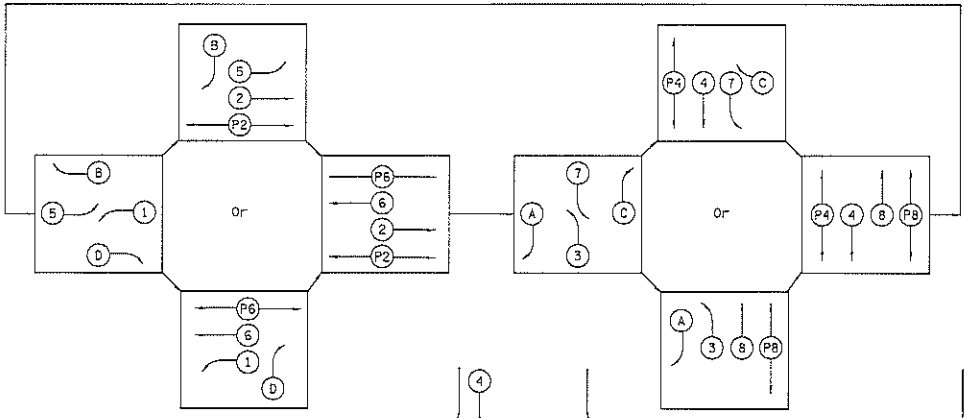
STANDARD PHASE DESIGNATION DIAGRAMS AND PHASE SEQUENCES

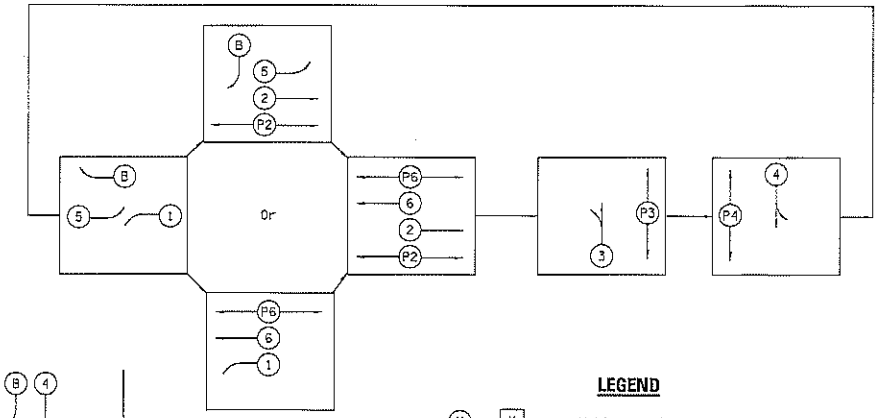
(Sheet 1 of 2)

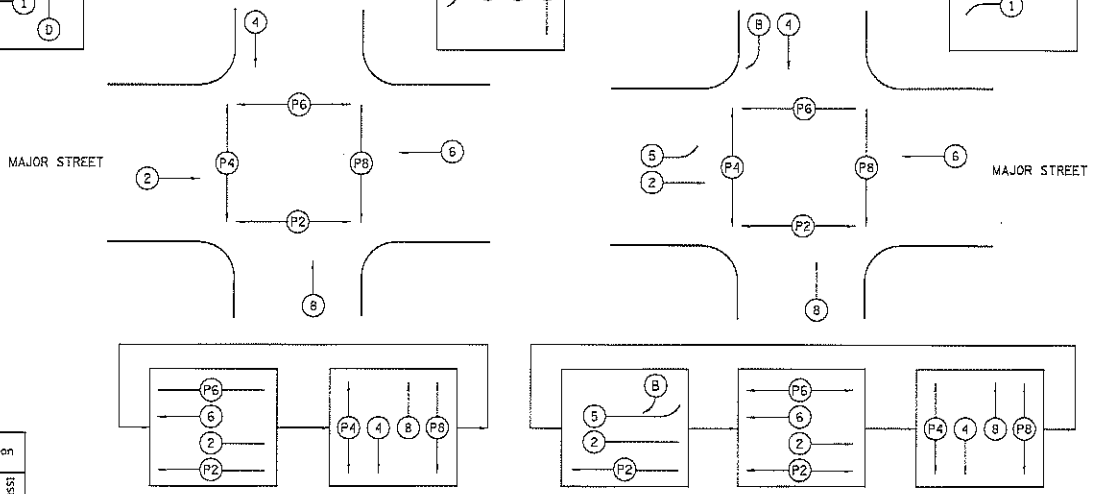
STANDARD 857001-01











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

PHASE DESIGNATION DIAGRAMS AND CORRESPONDING PHASE SEQUENCES

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

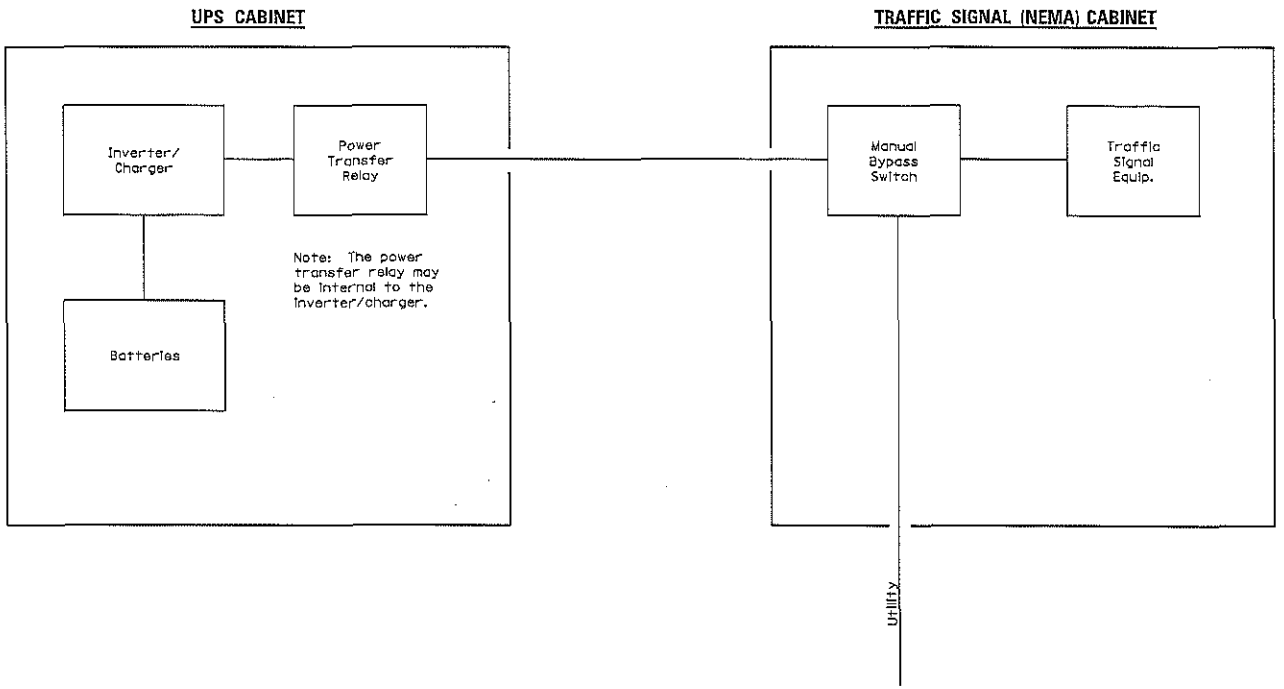
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

STANDARD PHASE DESIGNATION DIAGRAMS AND PHASE SEQUENCES

(Sheet 2 of 2)

STANDARD 857001-01



SINGLE LINE BLOCK DIAGRAM

Illinois Department of Transportation

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

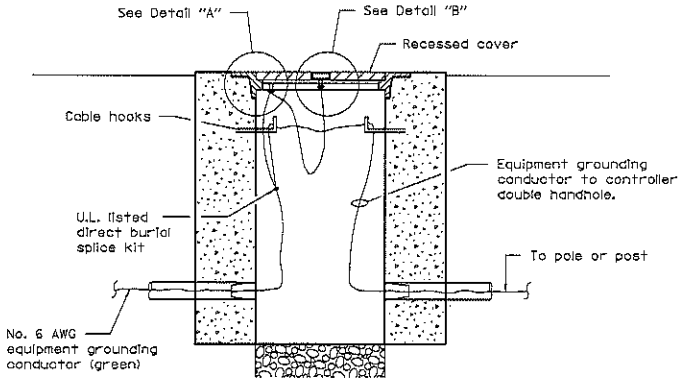
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-06

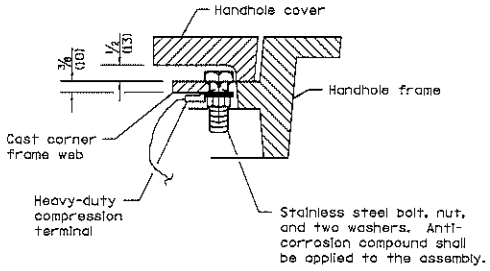
DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
4-1-06	New Standard

UNINTERRUPTABLE POWER SUPPLY (UPS)

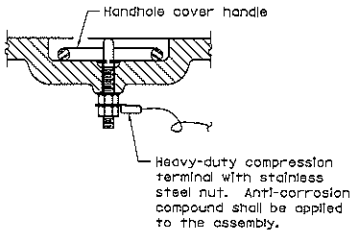
STANDARD 862001-01



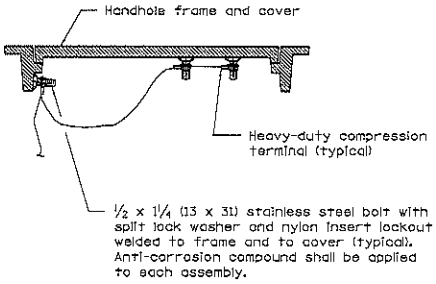
BONDING A HANDHOLE COVER & FRAME



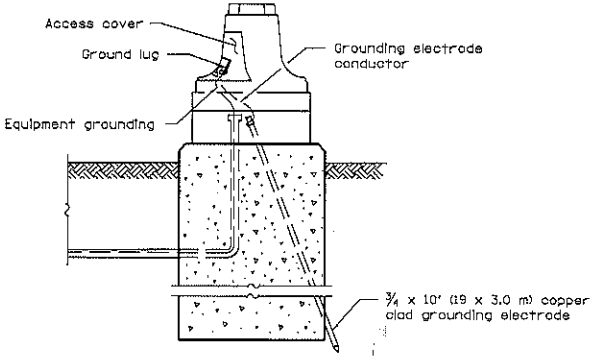
DETAIL "A"



DETAIL "B"

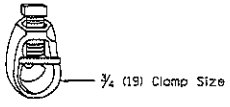


BONDING AN EXISTING HANDHOLE COVER & FRAME



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

APPROVED January 1, 2009
ENGINEER OF OPERATIONS

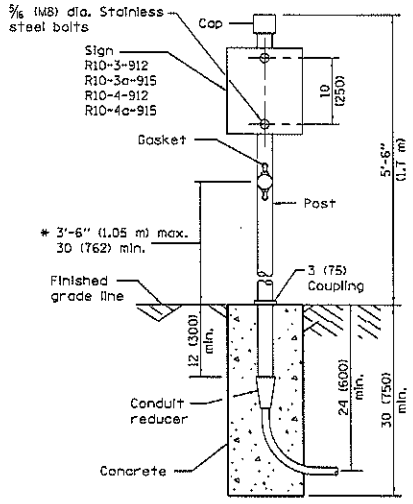
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-08

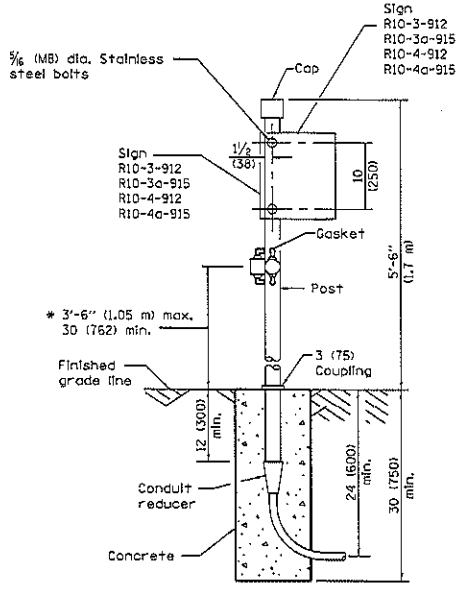
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Revised terminology.

TRAFFIC SIGNAL GROUNDING & BONDING

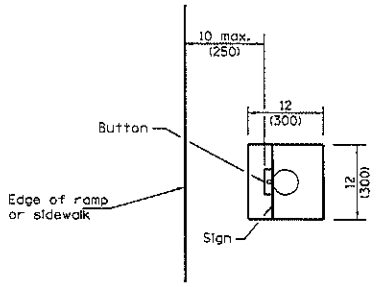
STANDARD 873001-02



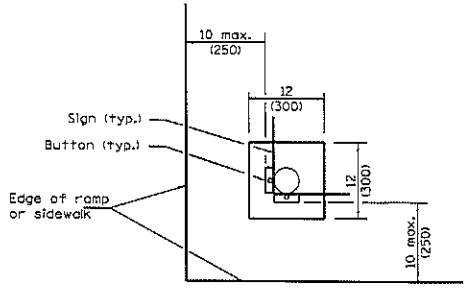
PEDESTRIAN ONE PUSH BUTTON POST



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

APPROVED January 1, 2014
ENGINEER OF OPERATIONS

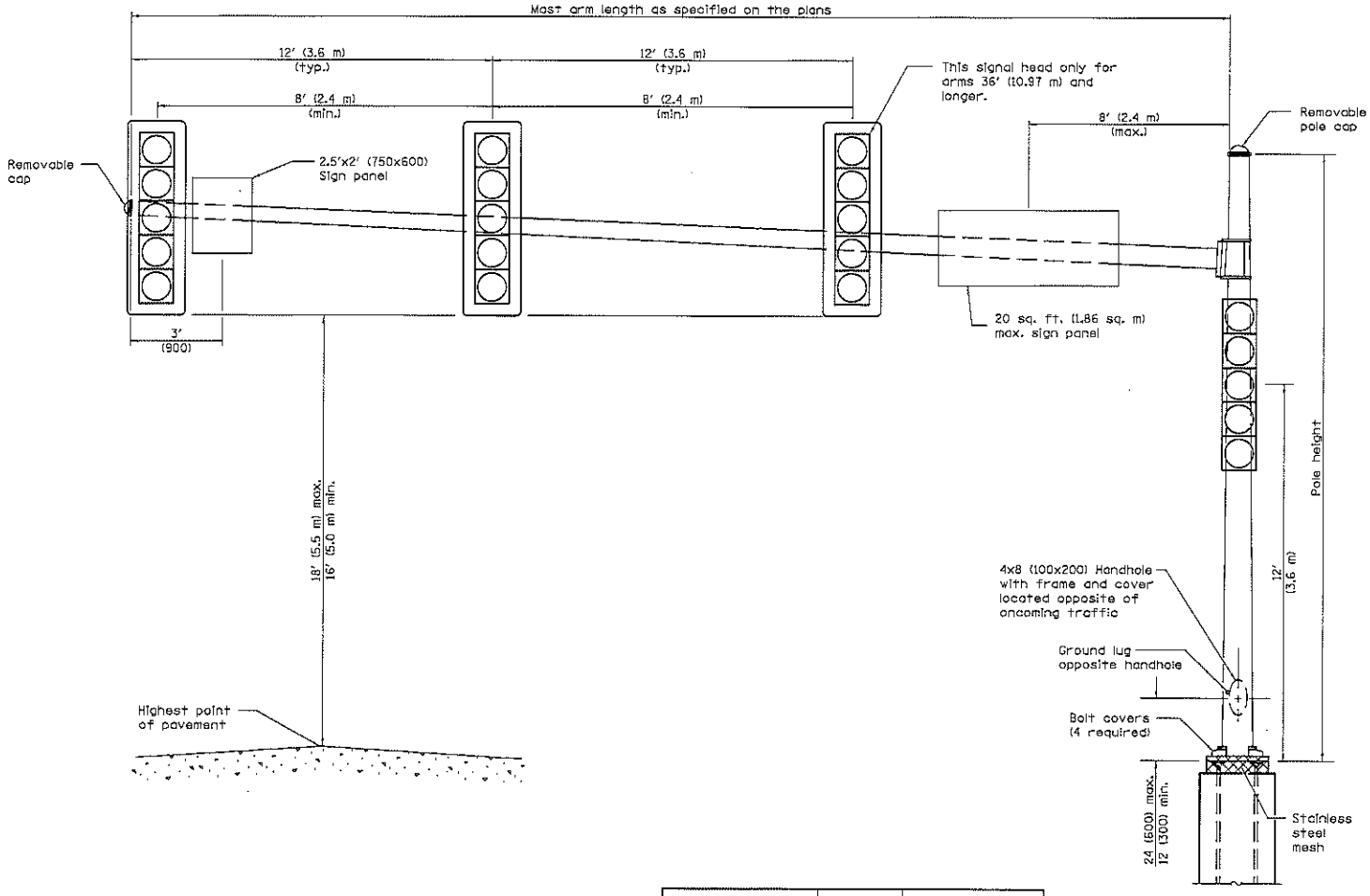
APPROVED January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT

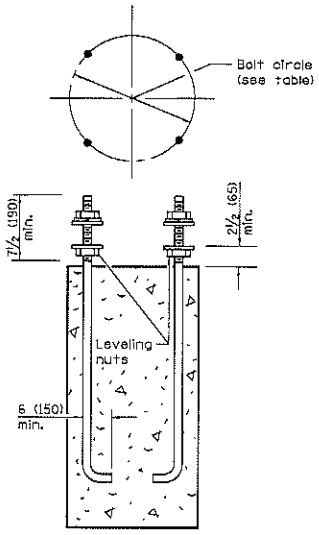
ISSUED 1-1-07

DATE	REVISIONS
1-1-14	Revised and added
	dimensions for PROWAG
	reach range requirements.
1-1-12	Revised sign installation
	for one and two button
	stations.

PEDESTRIAN PUSH BUTTON POST

STANDARD 876001-03





ANCHOR ROD DETAIL

MAST ARM LENGTH	BOLT CIRCLE	ANCHOR ROD SIZE
16' thru 20' (4.87 m thru 6.10 m)	15 (380)	1½ x 5' (38 x 1.5 m)
22' thru 30' (6.71 m thru 9.14 m)	18 (450)	1½ x 5' (38 x 1.5 m)
32' thru 40' (9.75 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).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2012
ENGINEER OF OPERATIONS

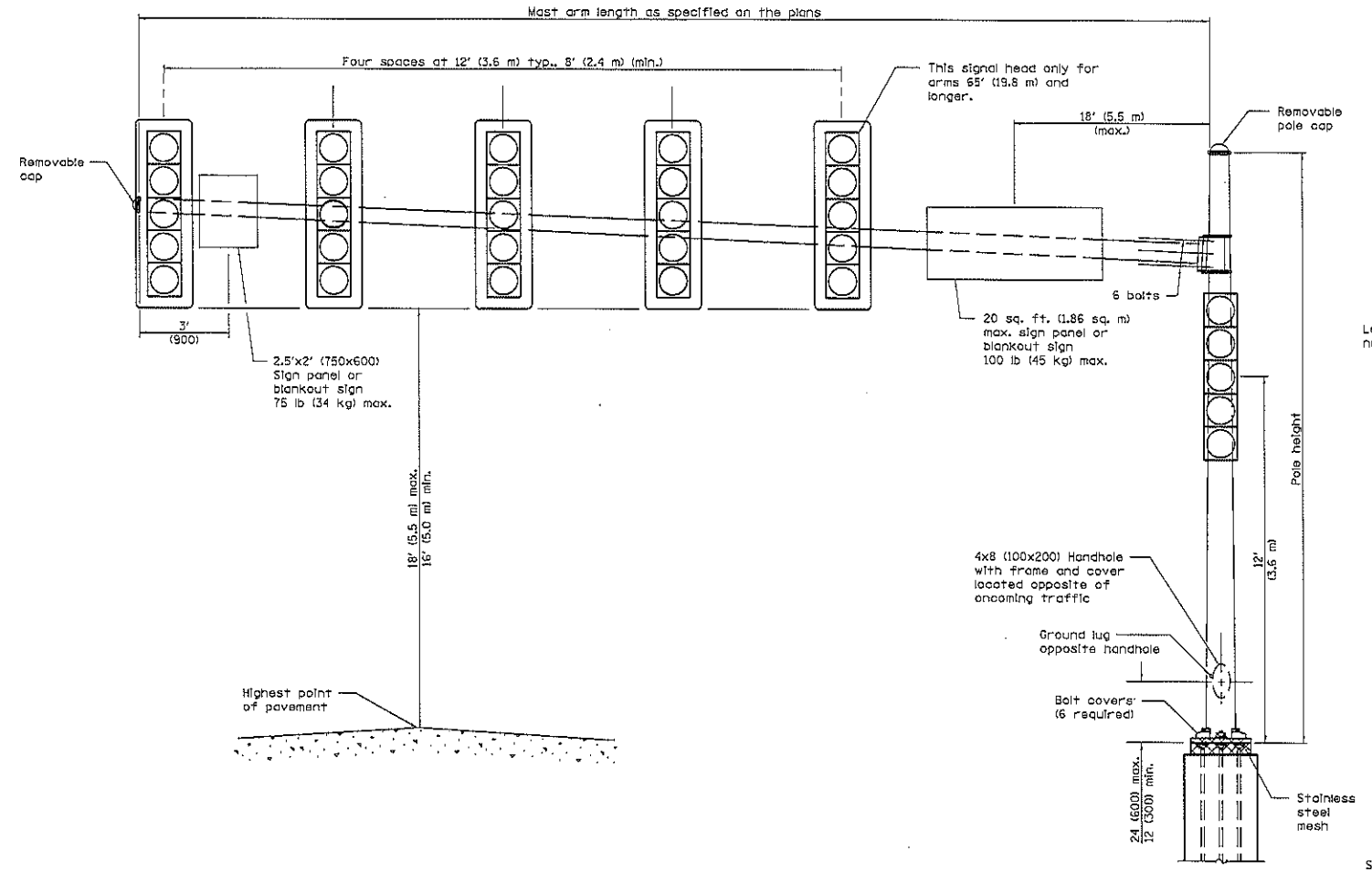
APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

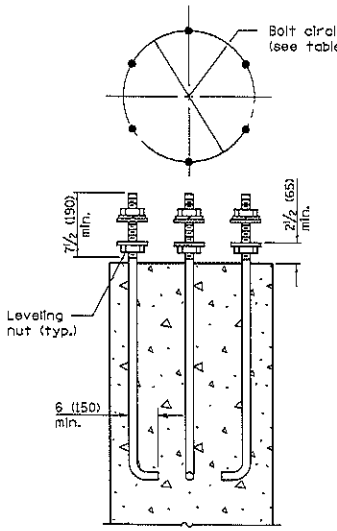
ISSUED 20-1-1

DATE	REVISIONS
1-1-12	Changed 2.5'x8' sign panel
	to 20 sq. ft. (1.86 sq. m)
	max.
1-1-09	Switched units to
	English (metric).

STEEL MAST ARM ASSEMBLY AND POLE 16' THROUGH 55'

STANDARD 877001-05





ANCHOR ROD DETAIL

MAST ARM LENGTH	BOLT CIRCLE	ANCHOR ROD SIZE
56' thru 64' (17.1 m thru 19.8 m)	24 (610)	1¾ x 7' (44 x 2.10 m)
65' thru 75' (20.1 m thru 22.9 m)	27 (686)	2 x 7'-6" (51 x 2.30 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).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2012
ENGINEER OF OPERATIONS

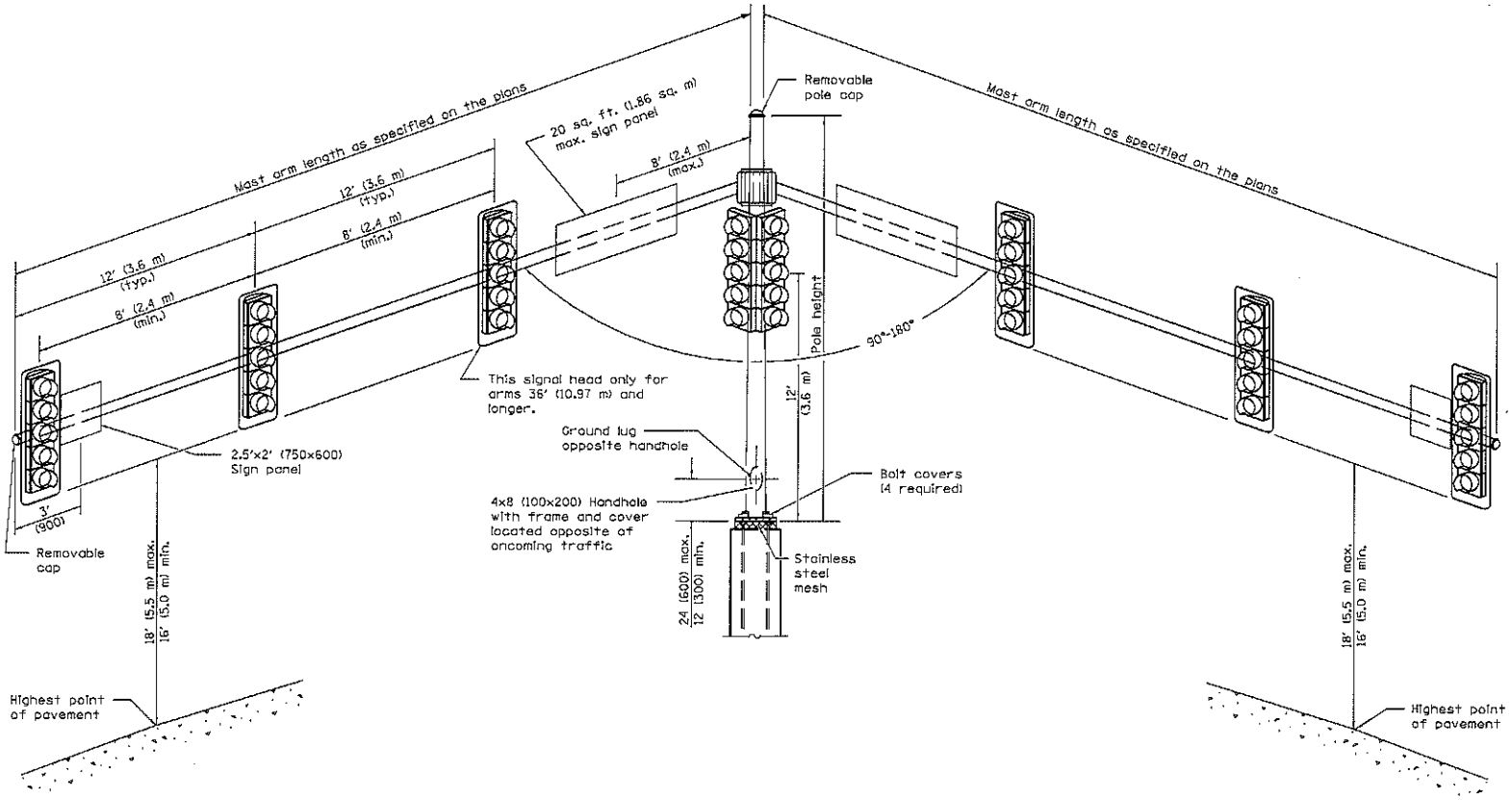
APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

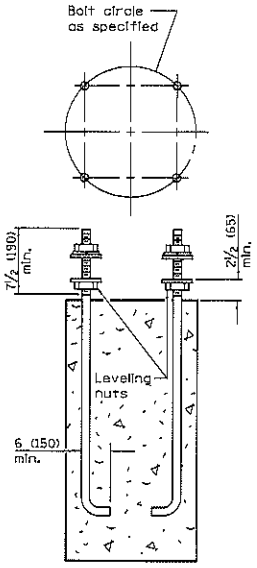
ISSUED 1-1-08

DATE	REVISIONS
1-1-12	Changed 2.5'x8' sign panel
	to 20 sq. ft. (1.86 sq. m)
	max.
1-1-09	Switched units to
	English (metric).

STEEL MAST ARM ASSEMBLY AND POLE 56' THROUGH 75'

STANDARD 877002-02





ANCHOR ROD DETAIL

MAST ARM LENGTH	BOLT CIRCLE	ANCHOR ROD SIZE
16' thru 20' (4.87 m thru 6.10 m)	18 (450)	1½ x 5' (38 x 1.5 m)
22' thru 30' (6.71 m thru 9.14 m)	18 (450)	1¾ x 7' (44 x 2.10 m)
32' thru 38' (9.75 m thru 11.60 m)	18 (450)	2 x 7'-6" (51 x 2.30 m)
40' thru 55' (12.20 m thru 16.80 m)	21 (535)	2 x 7'-6" (51 x 2.30 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).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2012
ENGINEER OF OPERATIONS

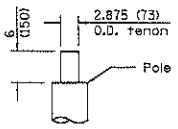
APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

1-1-12

DATE	REVISIONS
1-1-12	Changed 2.5'x8' sign panel
	to 20 sq. ft. (1.86 sq. m)
	max.
1-1-09	Switched units to
	English (metric).

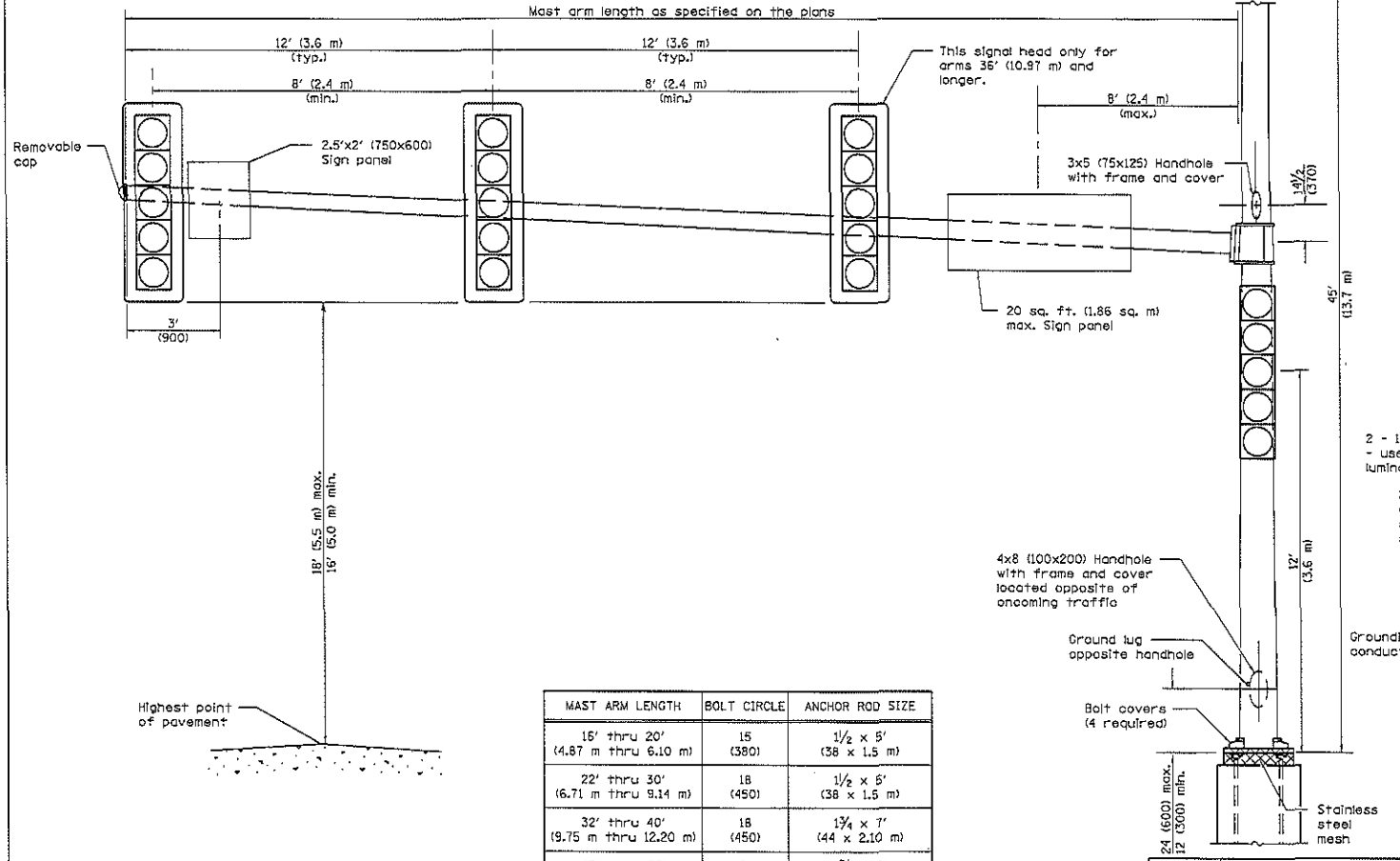
STEEL MAST ARM ASSEMBLY AND POLE WITH DUAL MAST ARMS

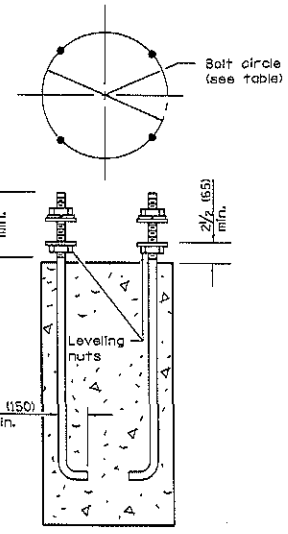
STANDARD 877006-04



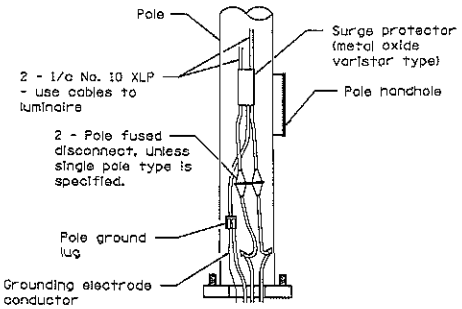
TENON TOP FOR VERTICAL MOUNTED LUMINAIRES

Note: The tenon top shall support a bullhorn fitting with two (twin) vertically mounted luminaires (clamp-mounted bullhorn assembly with removable pole cap acceptable). Each luminaire shall weigh 100 lb (45 kg) and have an effective projected (EPA) area of 3.85 sq. ft. (0.36 sq. m).





ANCHOR ROD DETAIL



POLE BASE DETAIL

MAST ARM LENGTH	BOLT CIRCLE	ANCHOR ROD SIZE
15' thru 20' (4.87 m thru 6.10 m)	15 (380)	1½ x 5' (38 x 1.5 m)
22' thru 30' (6.71 m thru 9.14 m)	18 (450)	1½ x 5' (38 x 1.5 m)
32' thru 40' (9.75 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 50 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2012
ENGINEER OF OPERATIONS

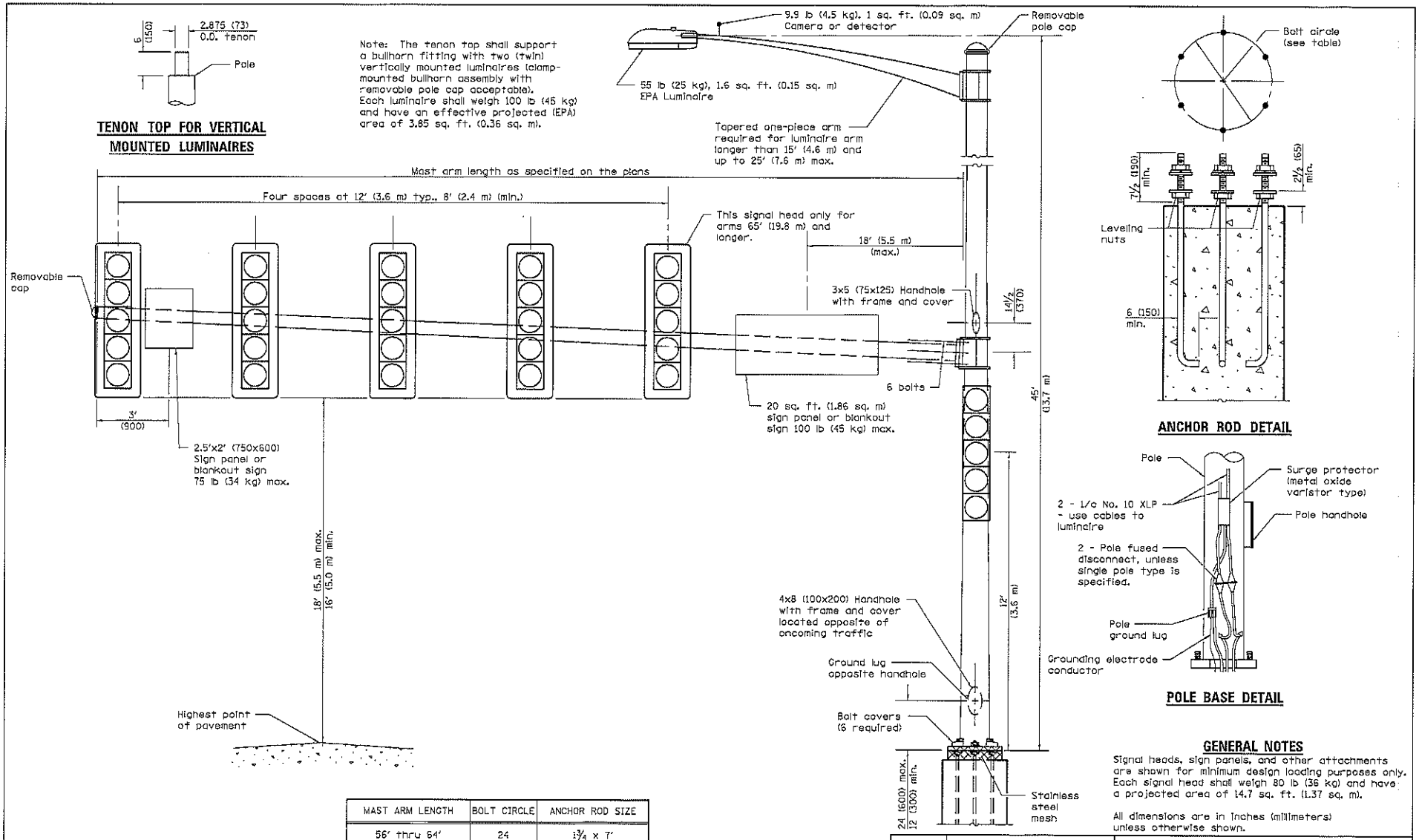
APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 20-1-1

DATE	REVISIONS
1-1-12	Changed 2.5'x8' sign panel
	to 20 sq. ft. (1.86 sq. m)
	max.
1-1-09	Switched units to
	English (metric).

STEEL COMB. MAST ARM ASSEMBLY AND POLE 16' THROUGH 55'

STANDARD 877011-05



MAST ARM LENGTH	BOLT CIRCLE	ANCHOR ROD SIZE
56' thru 64' (17.1 m thru 19.8 m)	24 (610)	1¾ x 7' (44 x 2.10 m)
65' thru 75' (20.1 thru 22.9 m)	27 (686)	2 x 7'-6" (51 x 2.30 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).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2012
ENGINEER OF OPERATIONS

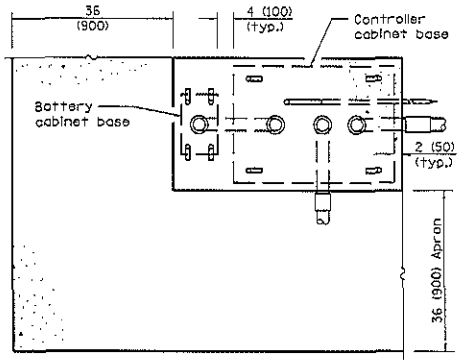
APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

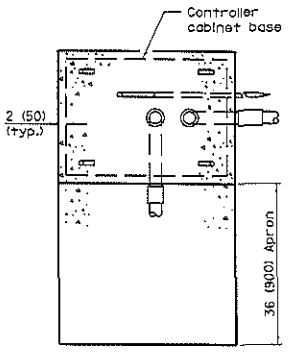
DATE	REVISIONS
1-1-12	Changed 2.5'x8' sign panel to 20 sq. ft. (1.86 sq. m) max.
1-1-09	Switched units to English (metric).

STEEL COMB. MAST ARM ASSEMBLY AND POLE 56' THROUGH 75'

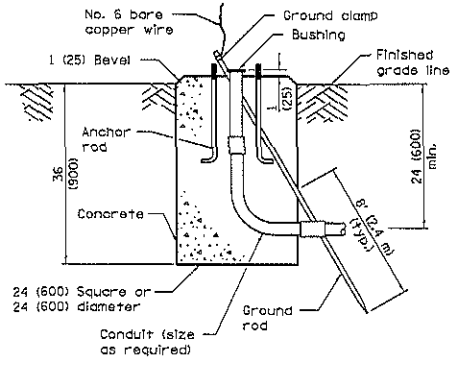
STANDARD 877012-02



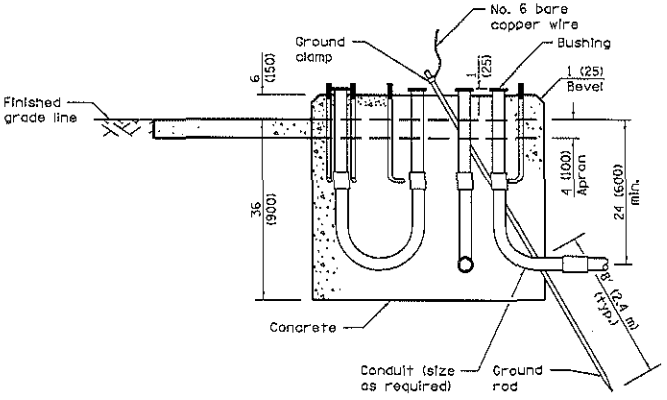
TOP VIEW



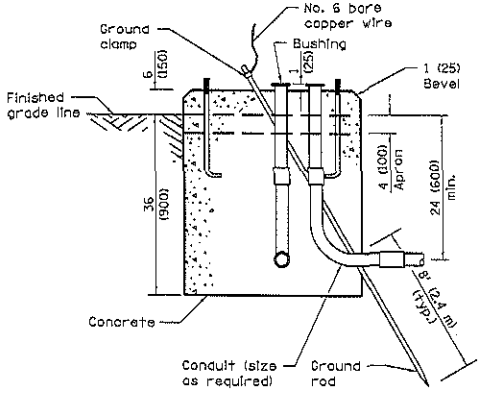
TOP VIEW



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.

DATE	REVISIONS
1-1-12	Replaced rebar No.'s
	with 'Vertical' for TYPE E
	foundation detail.
1-1-10	Revised note for
	foundation depth in tbl.
	Revised sizes of rebars.

CONCRETE FOUNDATION DETAILS

(Sheet 1 of 2)

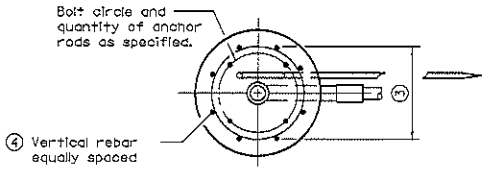
STANDARD 878001-09

Illinois Department of Transportation

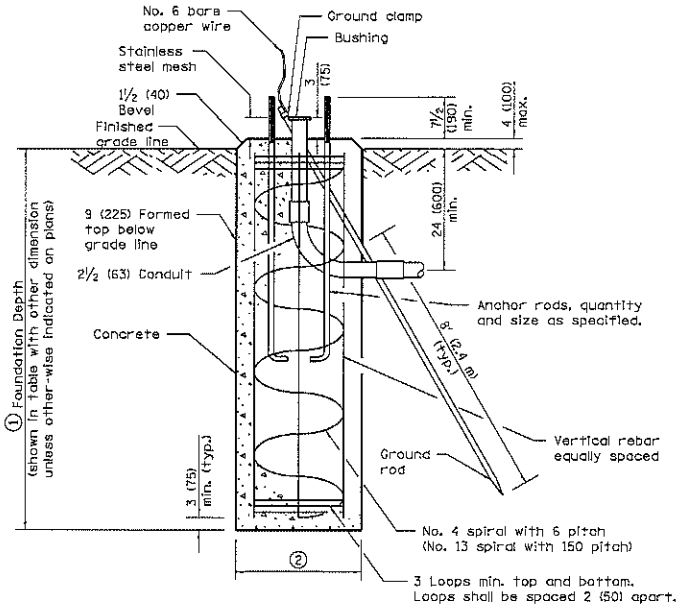
APPROVED January 1, 2012
ENGINEER OF OPERATIONS

APPROVED January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-02



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.

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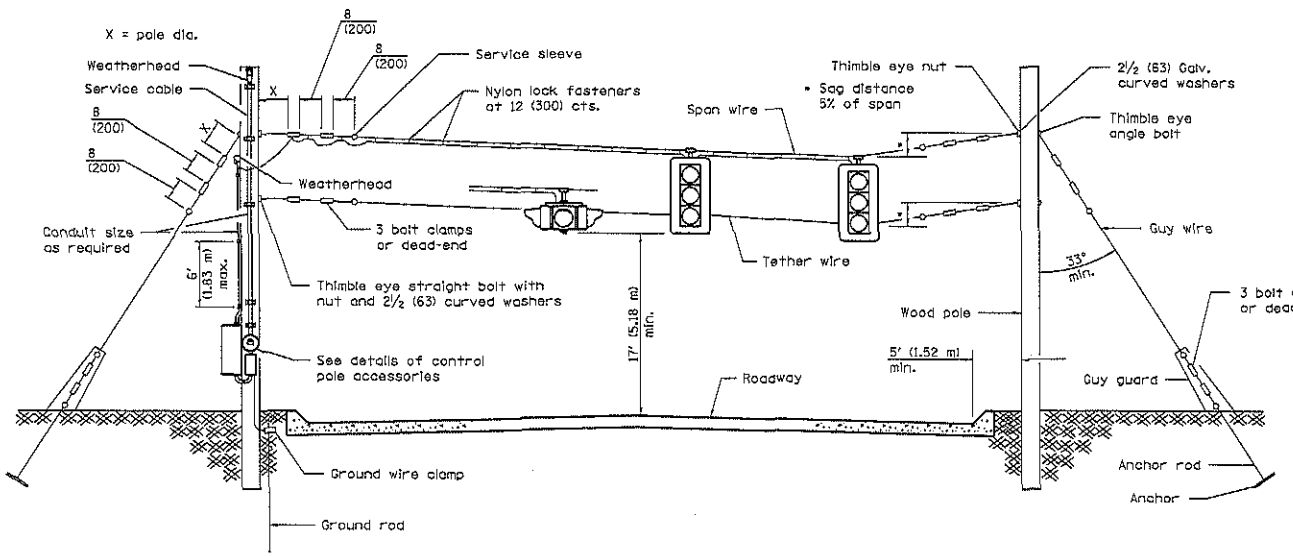
ISSUED 20-1-1

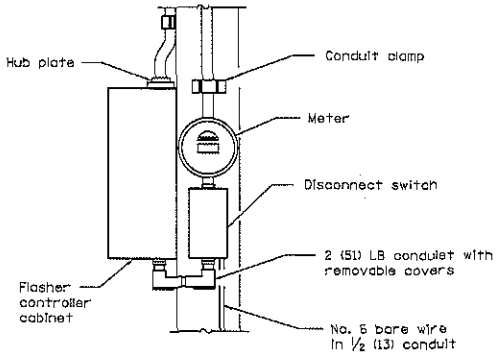
CONCRETE FOUNDATION DETAILS

(Sheet 2 of 2)

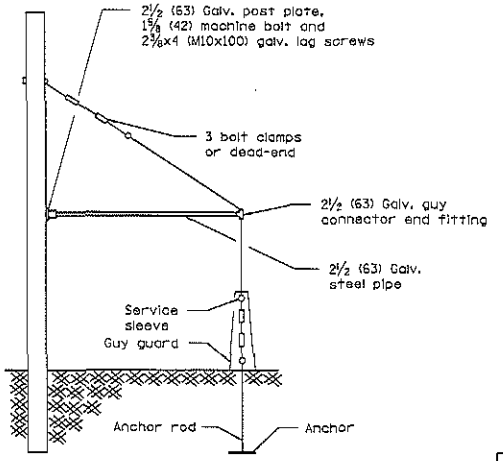
STANDARD 878001-09



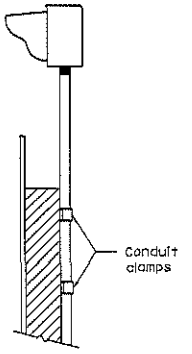
SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON



CONTROL POLE DETAIL



SIDEWALK GUY DETAIL



MOUNTING DETAIL

POST MOUNTED FLASHING BEACON

All dimensions are in inches (millimeters) unless otherwise shown.

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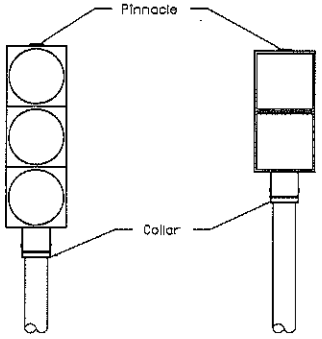
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Renum. Standard 840001.

SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON INSTALLATION

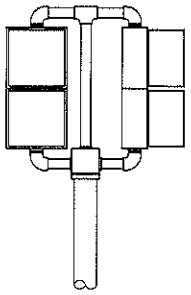
STANDARD 880001-01



POST MOUNTED TRAFFIC SIGNAL HEAD

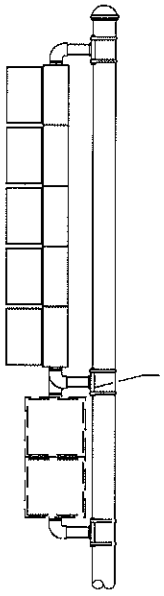
ONE WAY

POST MOUNTED PEDESTRIAN SIGNAL HEAD



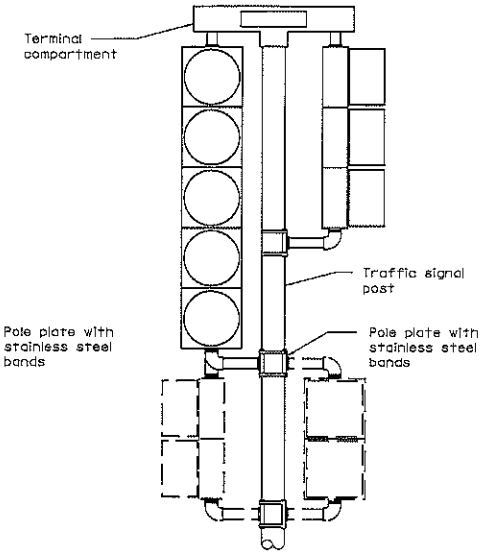
POST MOUNTED PEDESTRIAN SIGNAL HEAD

TWO WAY

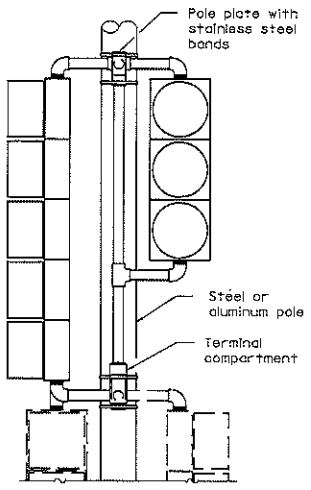


BRACKET MOUNTED TRAFFIC SIGNAL HEAD

ONE WAY

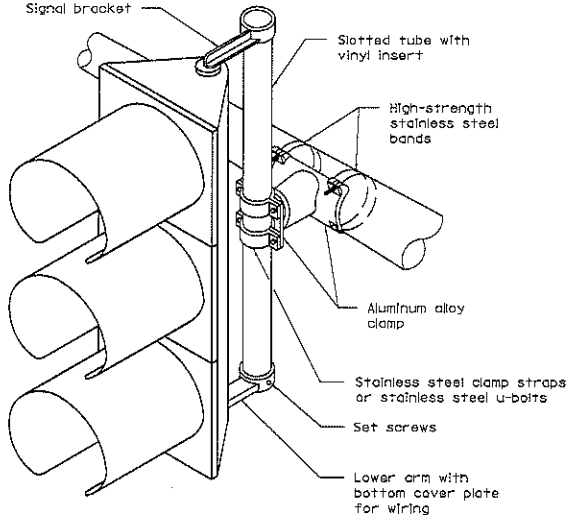


BRACKET MOUNTED TRAFFIC SIGNAL HEAD



BRACKET MOUNTED TRAFFIC SIGNAL HEAD

TWO WAY



STEEL MAST ARM MOUNTING

Illinois Department of Transportation

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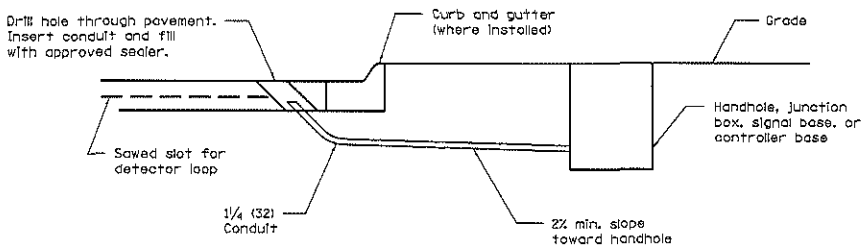
APPROVED January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

D-91551
20-1-1

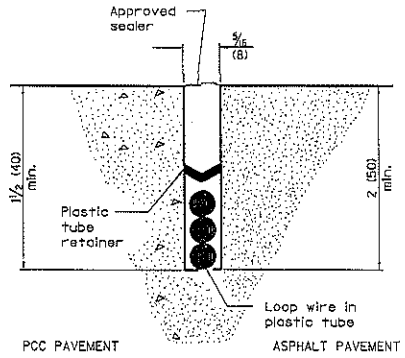
DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
1-1-02	Renum. Standard 840006.

TRAFFIC SIGNAL MOUNTING DETAILS

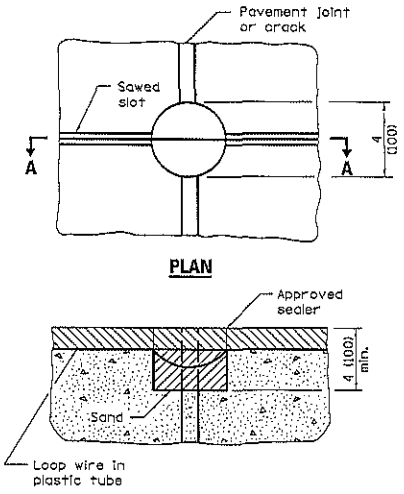
STANDARD 880006-01



DETECTOR LOOP LEAD–IN



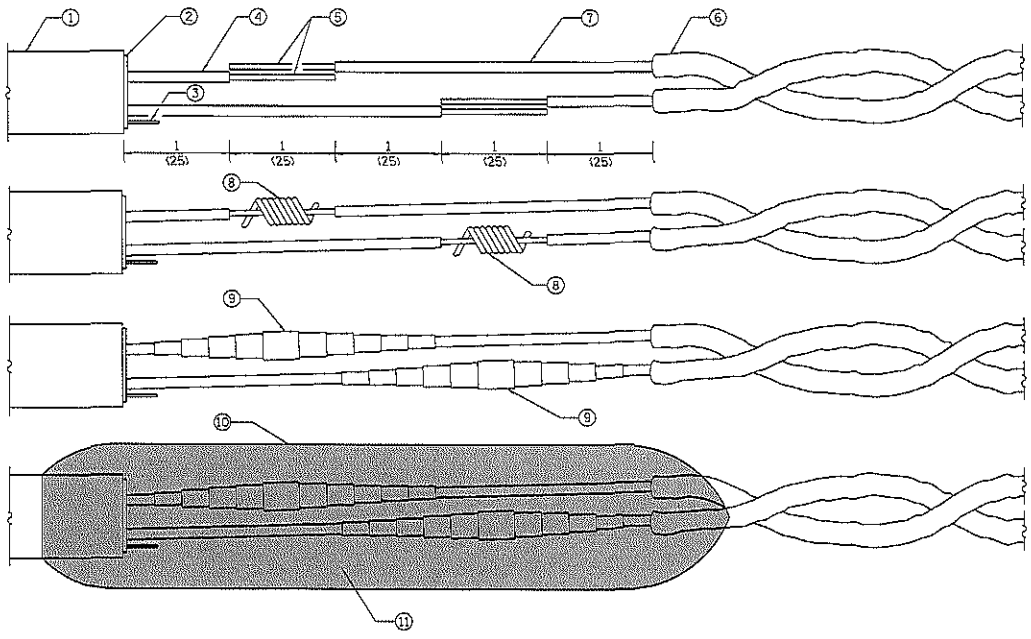
DETECTOR LOOP INSTALLATION



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 splice
⑩ = Rigid mold
⑪ = Waterproof and dielectric resin

All dimensions are in inches (millimeters) unless otherwise shown.

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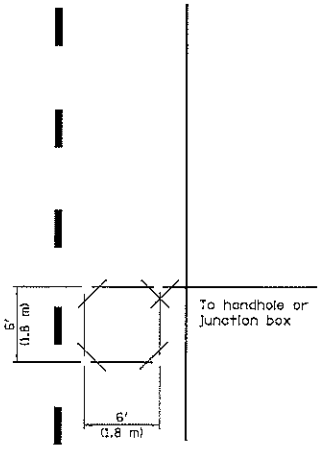
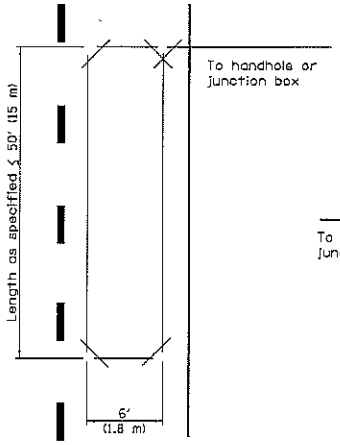
DATE	REVISIONS
1-1-09	Switched units to English (metric)
1-1-02	Renum. Standard 846001.

DETECTOR LOOP INSTALLATIONS

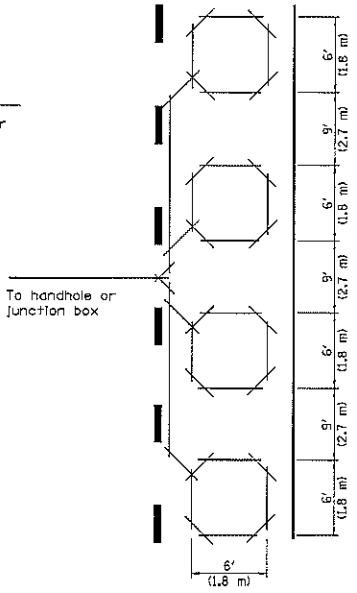
STANDARD 886001–01



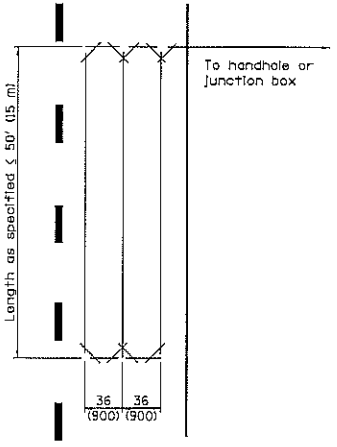
FOR POINT DETECTION
SHORT LOOP



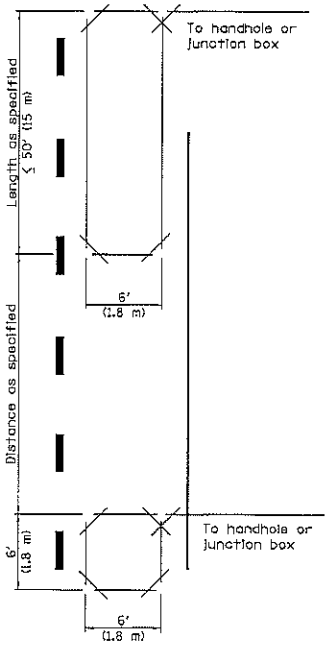
FOR PRESENCE DETECTION
LONG LOOP



FOR PRESENCE DETECTION
MULTIPLE LOOP IN SERIES

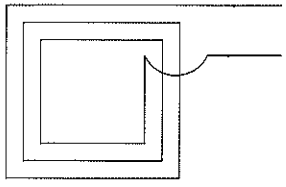


FOR PRESENCE DETECTION
QUADRUPOLE LOOP

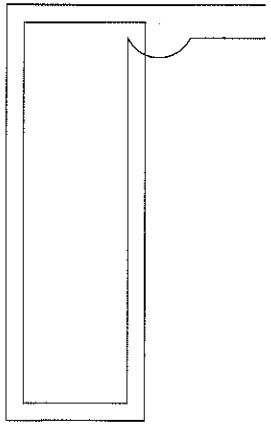


FOR EXTENDED-CALL DETECTION

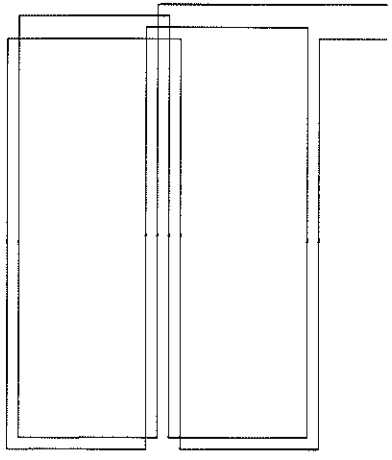
SLOT PLAN



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

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