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Letting March 10, 2023

Notice to Bidders, Specifications and Proposal

Illinois Department of Transportation

Contract No. 61H78
COOK County
Section 17-00034-00-BT (Rosemont)
Route DES PLAINES RIVER TRAIL
Project MC6P-813 ()
District 1 Construction Funds

Prepared by

Checked by

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(Printed by authority of the State of Illinois)

Illinois Department of Transportation

NOTICE TO BIDDERS

1. **TIME AND PLACE OF OPENING BIDS.** Electronic bids are to be submitted to the electronic bidding system (iCX-Integrated Contractors Exchange). All bids must be submitted to the iCX system prior to 12:00 p.m. March 10, 2023 at which time the bids will be publicly opened from the iCX SecureVault.

2. **DESCRIPTION OF WORK**. The proposed improvement is identified and advertised for bids in the Invitation for Bids as:

   Contract No. 61H78
   COOK County
   Section 17-00034-00-BT (Rosemont)
   Project MC6P-813 ()
   Route DES PLAINES RIVER TRAIL
   District 1 Construction Funds

Construct an aggregate and PCC shared-use path, inlcudes curb & gutter, traffic signal enhancements, pavement markings and signing on the west side of East River Road at the intersection with Bryn Mawr Avenue to Devon Avenue in Chicago and Park Ridge.

3. **INSTRUCTIONS TO BIDDERS**. (a) This Notice, the invitation for bids, proposal and letter of award shall, together with all other documents in accordance with Article 101.09 of the Standard Specifications for Road and Bridge Construction, become part of the contract. Bidders are cautioned to read and examine carefully all documents, to make all required inspections, and to inquire or seek explanation of the same prior to submission of a bid.

   (b) State law, and, if the work is to be paid wholly or in part with Federal-aid funds, Federal law requires the bidder to make various certifications as a part of the proposal and contract. By execution and submission of the proposal, the bidder makes the certification contained therein. A false or fraudulent certification shall, in addition to all other remedies provided by law, be a breach of contract and may result in termination of the contract.

4. **AWARD CRITERIA AND REJECTION OF BIDS**. This contract will be awarded to the lowest responsive and responsible bidder considering conformity with the terms and conditions established by the Department in the rules, Invitation for Bids and contract documents. The issuance of plans and proposal forms for bidding based upon a prequalification rating shall not be the sole determinant of responsibility. The Department reserves the right to determine responsibility at the time of award, to reject any or all proposals, to re-advertise the proposed improvement, and to waive technicalities.

By Order of the
Illinois Department of Transportation

Omer Osman,
Secretary

CONTRACT 61H78

INDEX
FOR
SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2023

This index contains a listing of SUPPLEMENTAL SPECIFICATIONS, frequently used RECURRING SPECIAL PROVISIONS, and LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS.

ERRATA Standard Specifications for Road and Bridge Construction (Adopted 1-1-22) (Revised 1-1-23)

SUPPLEMENTAL SPECIFICATIONS

RECURRING SPECIAL PROVISIONS

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

LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS

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SPEICAL PROVISIONS
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BDE SPECIAL PROVISIONS

The following special provisions indicated by an "X" are applicable to this contract. An * indicates a new or revised special provision for the letting.

	File Name	Pg.		Special Provision Title	Effective	Revised
	80099	362	☒	Accessible Pedestrian Signals (APS)	April 1, 2003	Jan. 1, 2022
	80274	364	☒	Aggregate Subgrade Improvement	April 1, 2012	April 1, 2022
	80192		☐	Automated Flagger Assistance Device	Jan. 1, 2008	
	80173		☐	Bituminous Materials Cost Adjustments	Nov. 2, 2006	Aug. 1, 2017
	80426		☐	Bituminous Surface Treatment with Fog Seal	Jan. 1, 2020	Jan. 1, 2022
	80436	367	☒	Blended Finely Divided Minerals	April 1, 2021	
	80241		☐	Bridge Demolition Debris	July 1, 2009	
	5053I		☐	Building Removal	Sept. 1, 1990	Aug. 1, 2022
	5026I		☐	Building Removal with Asbestos Abatement	Sept. 1, 1990	Aug. 1, 2022
	80384	368	☒	Compensable Delay Costs	June 2, 2017	April 1, 2019
	80198		☐	Completion Date (via calendar days)	April 1, 2008	
	80199		☐	Completion Date (via calendar days) Plus Working Days	April 1, 2008	
	80261	372	☒	Construction Air Quality – Diesel Retrofit	June 1, 2010	Nov. 1, 2014
	80434		☐	Corrugated Plastic Pipe (Culvert and Storm Sewer)	Jan. 1, 2021	
	80029	375	☒	Disadvantaged Business Enterprise Participation	Sept. 1, 2000	Mar. 2, 2019
	80229		☐	Fuel Cost Adjustment	April 1, 2009	Aug. 1, 2017
*	80447		☐	Grading and Shaping Ditches	Jan 1, 2023	
	80433		☐	Green Preformed Thermoplastic Pavement Markings	Jan. 1, 2021	Jan. 1, 2022
	80443		☐	High Tension Cable Median Barrier Removal	April 1, 2022	
	80446		☐	Hot-Mix Asphalt – Longitudinal Joint Sealant	Nov. 1, 2022	
	80438		☐	Illinois Works Apprenticeship Initiative – State Funded Contracts	June 2, 2021	Sept. 2, 2021
	80045		☐	Material Transfer Device	June 15, 1999	Jan. 1, 2022
*	80441	385	☒	Performance Graded Asphalt Binder	Jan 1, 2023	
	3426I		☐	Railroad Protective Liability Insurance	Dec. 1, 1986	Jan. 1, 2022
	80445	390	☒	Seeding	Nov. 1, 2022	
*	80448	396	☒	Source of Supply and Quality Requirements	Jan. 2, 2023	
	80340		☐	Speed Display Trailer	April 2, 2014	Jan. 1, 2022
	80127		☐	Steel Cost Adjustment	April 2, 2014	Jan. 1, 2022
	80397	397	☒	Subcontractor and DBE Payment Reporting	April 2, 2018	
	80391	398	☒	Subcontractor Mobilization Payments	Nov. 2, 2017	April 1, 2019
	80437	399	☒	Submission of Payroll Records	April 1, 2021	Nov. 1, 2022
*	80435		☐	Surface Testing of Pavements – IRI	Jan. 1, 2021	Jan. 1, 2023
	80410		☐	Traffic Spotters	Jan. 1, 2019	
	20338	401	☒	Training Special Provisions	Oct. 15, 1975	Sept. 2, 2021
	80429		☐	Ultra-Thin Bonded Wearing Course	April 1, 2020	Jan. 1, 2022
	80439	404	☒	Vehicle and Equipment Warning Lights	Nov. 1, 2021	Nov. 1, 2022
	80440		☐	Waterproofing Membrane System	Nov. 1, 2021	
	80302	405	☒	Weekly DBE Trucking Reports	June 2, 2012	Nov. 1, 2021
	80427	406	☒	Work Zone Traffic Control Devices	Mar. 2, 2020	
	80071	408	☒	Working Days	Jan. 1, 2002	

STATE OF ILLINOIS

SPECIAL PROVISIONS

The following Special Provisions supplement the specifications listed in the table below which apply to and govern the proposed improvement designated as Section 17-00034-00-BT, Contract Number 61H78 and in case of conflict with any part or parts of said specifications, the said Special Provisions shall take precedence and govern.

SPECIFICATION	ADOPTED/DATED
Standard Specifications for Road and Bridge Construction	January 1, 2022
Manual on Uniform Traffic Control Devices for Streets and Highways	2009 Edition with Revisions 1 and 2
Illinois Manual on Uniform Traffic Control Devices for Streets and Highways" (ILMUTCD)	Current Edition
Supplemental Specifications and Recurring Special Provisions (indicated on the Check Sheet included herein)	January 1, 2023
Manual of Test Procedure of Materials	Current
Standard Specifications for Water & Sewer Main Construction in Illinois	8th Edition, 2020

LOCATION OF IMPROVEMENT

Segment 2 of the Des Plaines River Trail is located in the City of Chicago and the Village of Park Ridge, Cook County. The improvement on Des Plaines River Trail begins on the west side of East River Road at the intersection with Bryn Mawr Avenue. The improvement ends on the west side of Dee Road 235 feet south of Devon Avenue. There is a 377-foot omission at the bridge where East River Road crosses over the Kennedy Expressway (I-90). Total gross length is 6,453 feet (1.22 miles), and total net length is 6,076 feet (1.15 miles).

DESCRIPTION OF IMPROVEMENT

The work consists of the construction of an aggregate shared-use path, Portland cement concrete sidewalk, earth excavation, Portland cement concrete curb and gutter, seeding, sodding, topsoil, landscaping, and traffic signal enhancements, as well as all incidental and collateral work necessary to complete the project as shown on the plans and as described herein.

AVAILABLE REPORTS

☐ No project specific reports were prepared.

When applicable, the following checked reports and record information is available for Bidders' reference upon request:

☐ Record structural plans

☐ Preliminary Site Investigation (IDOT PSI)

☒ Preliminary Environmental Site Assessment (IDOT PESA)

☐ Preliminary Site Investigation (PSI) – Local

☐ Preliminary Environmental Site Assessment (PESA) – Local

☒ Soils/Geotechnical Report

☒ Boring Logs

☐ Pavement Cores

☐ Location Drainage Study (LDS)

☐ Hydraulic Report

☐ Noise Analysis

☒ Other: IDOT Risk Managed Project Memorandum
Potentially Impacted Property Evaluation for LPC-663 Form
FPDCC Tree Protection and Preservation Manual
FPDCC Tree Mitigation Plan

Those seeking these reports should request access from:

Mark Thomas, PE
Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600
Rosemont, IL 60018
(847) 823-0500
mthomas@cbbel.com

AGGREGATE SURFACE COURSE, TYPE B 3" (SPECIAL)

General: This work shall consist of all materials, tools, equipment, and labor necessary to provide a trail surface, suitable for multiple uses. This work shall consist of surfacing new trails or refurbishing the surfaces of existing trails that may be damaged during the course of construction, by furnishing, placing, shaping, and compacting limestone screenings, conforming to the applicable Articles of Section 402 of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction. Exceptions are that the additions of moisture at the point of production of the aggregate surface may be required to obtain maximum density of the aggregate surface. This shall be at the direction of the Owner's Project Representative. The Limestone Trail Screenings shall be compacted as required by the Owner's Project Representative. No extra payment shall be due the Contractor for complying with the aforementioned requirements.

Materials: The crushed limestone screenings shall conform to IDOT gradation FA-21 and meet requirements of section 1003 of the Standard Specifications.

Construction Requirements: Before the aggregate surface is placed on the trail, any ruts, caked earth, or other undesirable surface matter will be removed with the blade of a motor grader. Before the aggregate surface is deposited on the prepared trail, it shall contain sufficient moisture to provide satisfactory compaction. The aggregate surface shall be placed with a spreading and finishing machine meeting the requirements of Section 1102.03. The aggregate surface shall be compacted with a roller to the specified thickness, to the satisfaction of the Owner's Project Representative. If the moisture content of the material is not such as to permit satisfactory compaction, water shall be added in such a quantity so that satisfactory compaction can be obtained. If any subgrade material is worked into the surface aggregate during the finishing operation, all granular material within the affected areas shall be removed and replaced with new aggregate. The limestone screenings shall be placed to the depth and design grade shown on the Plans and sloped at a cross slope meeting ADA requirements and providing positive drainage.

Method of Measurement and Payment: This work shall be measured for payment in square yards and paid for at the contract unit price per SQUARE YARDS for AGGREGATE SURFACE COURSE, TYPE B 3" (SPECIAL), for material satisfactorily installed and accepted, which price shall include trail preparation and furnishing, placing, shaping and compacting the aggregate surface. Water required to be added for compaction will not be measured for payment but shall be considered included in the cost of the item of work being constructed. In the case that additional repair is needed for the trail base, AGGREGATE BASE COURSE, TYPE B shall be paid for separately.

CHANGEABLE MESSAGE SIGN

The Contractor shall provide portable message signs in accordance with Articles 701.15(j) and 1106.02(i) of the Standard Specifications. The message signs shall be used as directed by the Engineer. It is anticipated that the message boards will be displayed for one week before construction begins at locations as directed by the Engineer:

Basis of Payment. Changeable message signs will be paid for at the contract unit price per calendar day.

CHAIN LINK FENCE REMOVAL

Description. This item consists of removing and disposing of existing fence at locations as shown on the plans and where directed by the Engineer. This work shall also include the removal and disposal of gates. The Contractor shall exercise care so as not to damage fence and gates that are to remain. Existing posts shall be pulled and the resulting hole backfilled with sand. Concrete foundations shall also be disposed of off-site.

Basis of Payment. This work will be paid for at the contract unit price per foot for CHAIN LINK FENCE REMOVAL.

CITY OF CHICAGO PERMITS AND LICENSES

For the portion of the work which occurs in the City of Chicago as shown in the plans, coordination with City Departments will be necessary for permits and licenses and as stated below.

OBTAINING PERMITS AND ASSOCIATED FEES

A. Contractor Obtains Permits

The Contractor must obtain all permits wherever the Work under this Contract requires them, including from the City of Chicago or other public authorities. You must furnish triplicate copies of the permits to the City of Chicago before the Work covered by them is started. NO WORK IS ALLOWED TO PROCEED BEFORE SUCH PERMITS ARE OBTAINED.

B. Contractor Pays Permit Fees

The special use of, or removal, alteration or replacement of certain City-owned facilities and appurtenances such as traffic signals signs, lighting, parking meters, trees, sewers, hydrants, bridges and viaducts which are required for the Contractor to perform the Work are subject to all applicable Municipal Ordinances. It is the Contractor's responsibility to obtain all the necessary permits and pay the associated fees. Cost associated with these permits are include in the cost of the work being performed. The Contractor must furnish copies of the permits to the City of Chicago before the Work covered is started. Information with regard to the above may be obtained by contacting the appropriate City of Chicago Departments.

COORDINATION WITH OTHER CITY OF CHICAGO DEPARTMENTS

A. Water System Work and Usage (if necessary)

If water from a City hydrant is necessary for the execution of the Work, you must obtain a hydrant permit from the City's Department of Water Management. You must obtain a permit from that department also for any construction, repair or adjustment of any water main, branch or service connection. Requests for permits must be made at the Department of Water Management, City Hall, 121 North LaSalle Street, Room 906, Chicago, Illinois 60602; 312/744-7060.

B. Sewer System Work (if necessary)

If you will be constructing, repairing, adjusting or cleaning any subsurface structure designed to collect or transport storm and/or sanitary waste water, either in private property or in the public way you, through a licensed drainlayer, must obtain a permit issued under this Section X.B. (A licensed drainlayer is person possessing a current sewer and drain license issued by the Department of Water Management.) Requests for permits must be made at the Department of Water Management (Sewers and Drains), 333 S. State Street, Room 410, Chicago, IL 60604-3971; 312/747-8117.

Project plans must be submitted to the Department of Water Management (Sewers and Drains) sufficiently in advance for examination and review. Plans meeting the

department's requirements must be submitted with the application for permit at least four days before the issuance of permit. When applying for a permit, you must submit three sets of plans that show all new underground sewer Work inside and around the project with a clear site or location plan together with the estimate of quantities for sewer sizes and sewer structures to be installed.

A copy of the permit must be on the Work site before the start of construction. Failure to obtain a permit before the start of construction will result in a penalty and could result in the revocation of the drainlayer's license.

You must arrange for sewer inspections at least 48 hours before the start of Work. Inspections may be requested by calling (312)744-7501 for Plumbing Inspections and (312) 747-7892 for Mason Inspections.

C. Traffic and Parking Sign Removal and Replacement (if necessary)

The City will remove and re-install any traffic and parking sign(s) as may be required, however, you will be responsible for all fees relative to the removal and replacement of all of the City's traffic and parking signs. You must inform the Bureau of Signs and Markings, in writing, of the location of each sign to be removed and specify its distance from the property line of the nearest cross street. Each sign legend must also be stated. This information must be provided at least five days before removal. You must also inform the Bureau of Signs and Markings, in writing, of when signs may be reinstalled as soon as this date is known. Contact the Bureau of Signs and Markings, 3458 S. Lawndale, Chicago, Illinois, 60623, Attn.: Deputy Commissioner, (312)747-2210.

D. Trees (if necessary)

In accordance with § 10-32-060 et seq. of the Municipal Code, you must obtain a permit from the Bureau of Forestry when removing planting, trimming, spraying, or in anyway affecting the general health or structure of trees in the public way. There is no fee for this permit. The permit must be obtained from the Bureau of Forestry Permits Division; 3200 S. Kedzie, Chicago, Illinois 60623; (312/747-2098), fax (312) 747-2178.

The Bureau of Forestry requires 48 hours' notice before starting Work for all activities with the exception of tree planting, which requires two weeks' prior notice. To obtain tree planting permits, two copies of the site plan must be presented to the Bureau for its review and approval. A Bureau representative must also assist in the selection of those trees to be planted in the public way. Tree planting standards and specifications are outlined in the Bureau of Forestry's "Manual of Tree Planting Standards," which is available upon request from the Bureau of Forestry.

CONSTRUCTION STAGING THROUGH THE FOREST PRESERVE

The Contractor shall Stage construction of the path through the Forest Preserve as defined in the EROSION CONTROL STAGING DETAIL sheet in the plans. Perimeter erosion barrier will be installed per plan and vehicles, equipment, or materials shall not be allowed outside of the work zone defined by the perimeter erosion barrier. The Contractor shall inform all crews daily of this requirement.

In Stage 3, the perimeter erosion barrier can be removed after temporary seeding and temporary erosion control blanket has been installed.

The placement of final topsoil will be placed in Stage 4 using the aggregate base course placed in Stage 2 as a working platform. The final aggregate surface will be constructed after the final topsoil has been placed. Vehicles, equipment, or materials shall not be allowed beyond the final limits of construction. Should the Contractor violate this requirement as determined by the Forest Preserve District of Cook County (FPDCC) with evidence of vehicles, equipment, or materials having been outside of the final construction limits, the Contractor shall be liable to the FPDCC as defined in the FPDCC Tree Protection and Preservation Manual, Section II: Construction, Remedies, not as a penalty but as liquidated and ascertained damages. Such damages may be deducted by the Department from any monies due the Contractor and paid to the Forest Preserve District of Cook County. These damages shall apply during the contract time and during any extensions of the contract time.

The FPDCC has tentatively identified areas that could be used by the Contractor as turnaround locations. These areas have been marked in the plans. Turnaround areas must be approved by the FPDCC representative before any disturbance beyond the proposed perimeter erosion barrier can commence. If the Contractor desires to utilize these areas, the ground beyond the limits of the proposed perimeter erosion barrier will be protected by geotextile fabric covered by 4” of mulch and a timber mat cabled together as shown in the Temporary Wetland Crossing detail in the plans. The turnaround area will be surrounded by perimeter erosion barrier, and high visibility temporary fence. Once work is completed, all items identified here will be removed and the area will be seeded. This work will not be paid for separately but will be included in the cost of the adjacent path pay items.

EROSION CONTROL BLANKET, SPECIAL

This Special Provision revises Section 251 of the Standard Specifications for Road and Bridge Construction to eliminate the use of Excelsior Blanket for Erosion Control Blanket. This work shall consist of furnishing, transporting, and placing 100 % biodegradable erosion control blanket over seeded areas as detailed on the plans, according to Section 251 except as modified herein.

Delete Article 251.04(a) Excelsior Blanket.

Delete the first paragraph of Article 1081.10 (b) Knitted Straw Mat and substitute the following:

> Knitted Straw Mat. Knitted straw mat shall be a machine-produced mat of 100% clean, weed free agricultural straw. The blanket shall be of consistent thickness with the straw evenly distributed over the entire area of the blanket with a functional longevity of up to 12 months. The blanket shall be covered on top and bottom sides with a 100% biodegradable woven natural organic fiber netting. No plastic netting will be allowed. Netting shall be “leno-weave” with movable joints (not fixed or welded). The netting consists of machine directional strands formed from two intertwined yarns with cross directional strands interwoven through the twisted machine strands to form an approximate 0.50 x 1.0 - inch (1.27 x 2.54 cm) mesh. The blanket shall be sewn together with flexible joints on 1.50 - inch (3.81 cm) centers with biodegradable thread. The blanket shall be manufactured with a colored thread stitched along both outer edges (approximately 2 - 5 inches (5 - 12.5cm) from the edge) as an overlap guide for adjacent mats.

Delete the first paragraph of Article 1081.10 (c) (2) Knitted Straw Mat and substitute the following:

> Knitted Straw Mat. The blanket shall be machine-produced 100% biodegradable blanket, which contains 70% agricultural straw and 30% coconut fiber with a functional longevity of up to 18 months. The blanket shall be of consistent thickness with the straw and coconut evenly distributed over the entire area of the mat. The blanket shall be covered on the top and bottom sides with 100% biodegradable woven natural organic fiber netting. The top netting shall be “leno-weave,” with movable joints (not fixed or welded). The netting consists of machine directional strands formed from two intertwined yarns with cross directional strands interwoven through the twisted machine strands to form an approximate 0.50 x 1.0 - inch(1.27 x 2.54 cm) mesh. The blanket shall be sewn together on 1.50 - inch (3.81 cm) centers with degradable thread. The blanket shall be manufactured with a colored thread stitched along both outer edges (approximately 2 - 5 inches (5 - 12.5cm) from the edge) as an overlap guide for adjacent mats.

Delete Article 1081.10(d) Wire Staples.

Add the following to Article 1081.10 (e) Wood Stakes:

Biodegradable plastic stakes will be allowed. The biodegradable plastic anchor shall be approximately 6 - inches (15.24 cm) in length. No metal wire stakes will be allowed.

Delete 251.06 Method of Measurement (b) Measured Quantities and replace with

> Measured Quantities. Mulch Methods 1, 2, 3, 3A, and 4 will be measured for payment in place in acres (hectares) of surface area mulched. Erosion control blanket, heavy duty erosion control blanket, turf reinforcement mat, and erosion control blanket, special (Wildlife Safe) will be measured for payment in square yards (square meters).

Delete Article 251.07 Basis of Payment and substitute the following:

Basis of Payment. This work will be paid for at the contract unit price per acre (hectare) for MULCH, METHOD 1; MULCH, METHOD 2; MULCH, METHOD 3; MULCH METHOD 3A; MULCH, METHOD 4; and at the contract unit price per square yard (square meter) for EROSION CONTROL BLANKET, HEAVY DUTY EROSION CONTROL BLANKET, TURF REINFORCEMENT MAT, or EROSION CONTROL BLANKET, SPECIAL.

HIGH VISIBILITY TEMPORARY FENCE

Description. This work consists of furnishing, installing, maintaining, and removing from the site high visibility temporary fences erected for protection of the wetlands identified in the plans. This work will be performed in accordance with the applicable portions of Section 201 of the Standard Specifications except as modified herein and as directed by the Engineer.

Materials. High visibility temporary fence shall be orange plastic poly type snow fence installed on steel posts. Wood lath fence or other types that do not provide a highly visible barrier will not be approved.

Construction Requirements. The Contractor shall erect high visibility temporary fence at the locations shown on the plans or as directed by the Engineer. The Contractor is prohibited from entering the wetland site bounded by high visibility temporary fence. High visibility temporary fence shall be properly maintained and shall be removed by the Contractor at the time of final restoration, unless removal is directed by Engineer. All temporary fence materials shall be legally disposed of at a location off-site.

Method of Measurement. This work will be measured for payment in feet of HIGH VISIBILITY TEMPORARY FENCE installed in accordance with these requirements. Measurement will be made along the top of fence in a straight line from one post to the next.

Basis of Payment. This work will be paid for at the contract unit price per foot for HIGH VISIBILITY TEMPORARY FENCE, which price shall constitute payment in full for furnishing, placing, repairing, removing and disposing of the temporary fence and for all labor, materials, equipment and incidentals required to complete the work as specified herein.

KEEPING ARTERIAL ROADWAYS OPEN TO TRAFFIC (LANE CLOSURES ONLY)

Effective: January 22, 2003
Revised: August 10, 2017

The Contractor shall provide the necessary traffic control devices to warn the public and to delineate the work zone as required in these Special Provisions, the Standard Specifications, the State Standards, and the District Details.

Arterial lane closures shall be in accordance with the Standard Specifications, Highway Standards, District Details, and the direction of the Engineer. The Contractor shall request and gain approval from the Engineer seventy–two (72) hours in advance of all long-term (24 hrs. or longer) lane closures.

Arterial lane closures not shown in the staging plans will not be permitted during **peak traffic volume hours**.

Peak traffic volume hours are defined as weekdays (Monday through Friday) from **6:00 AM to 8:30 AM and 4:30 PM to 6:00 PM.**

Private vehicles shall not be parked in the work zone. Contractor's equipment and/or vehicles shall not be parked on the shoulders or in the median during non-working hours. The parking of equipment and/or vehicles on State right-of-way will only be permitted at locations approved by the Engineer in accordance with Articles 701.08 and 701.11 of the Standard Specifications.

Should the Contractor fail to completely open and keep open all the traffic lanes to traffic in accordance with the limitations specified above, the Contractor shall be liable to the Department for the amount of:

One lane or ramp blocked = $1,000

Two lanes blocked = $2,500

Not as a penalty but as liquidated and ascertained damages for each and every 15 minute interval or a portion thereof that a lane is blocked outside the allowable time limitations. Such damages may be deducted by the Department from any monies due the Contractor. These damages shall apply during the contract time and during any extensions of the contract time.

MAINTENANCE OF ROADWAYS (D1)

Effective: September 30, 1985
Revised: November 1, 1996

Beginning on the date that work begins on this project, the Contractor shall assume responsibility for normal maintenance of all existing roadways within the limits of the improvement. This normal maintenance shall include all repair work deemed necessary by the Engineer but shall not include snow removal operations. Traffic control and protection for maintenance of roadways will be provided by the Contractor as required by the Engineer.

If items of work have not been provided in the contract, or otherwise specified for payment, such items, including the accompanying traffic control and protection required by the Engineer, will be paid for in accordance with Article 109.04 of the Standard Specifications.

PROJECT PHASING

The construction for Phase I includes the work through the Forest Preserve District of Cook County. The construction for Phase II includes work along East River Road and at the intersection of East River Road and West Higgins Road. Phase II will begin immediately following substantial completion of Phase I. Substantial completion includes all multi-use path construction and final seeding through the Forest Preserve.

TREE REMOVAL

All required tree removal to construct the project will be completed by the Forest Preserve District of Cook County prior to April 1, 2023. The tree trunks shall be completely removed, but the stumps will be left in the ground. Information about the tree removal schedule can be obtained by contacting Pam Sielski, Landscape Architect at 708-771-1355 or pamela.sielski@cookcountyil.gov. The Contractor shall be responsible for removal of the stumps left behind after the tree removal. See STUMP REMOVAL ONLY special provision for more information.

STUMP REMOVAL ONLY

Description. This item shall consist of the removal and disposal of existing stumps.

Requirements. All stumps marked for removal by the Engineer shall be removed to a depth of not less than 12 inches below the elevation of the subgrade, the finished earth surface, or the ground line. Removed stumps shall be disposed of in accordance with Article 202.03 of the Standard Specifications.

Method of Measurement. This work will be measured for payment in units as defined in Article 201.10 (b) (1) of the Standard Specifications.

Basis of Payment. This item will be paid for at the contract unit price per unit for STUMP REMOVAL ONLY.

PUBLIC CONVENIENCE AND SAFETY (D1)

Effective: May 1, 2012
Revised: July 15, 2012

Add the following to the end of the fourth paragraph of Article 107.09:

> "If the holiday is on a Saturday or Sunday, and is legally observed on a Friday or Monday, the length of Holiday Period for Monday or Friday shall apply."

Add the following sentence after the Holiday Period table in the fourth paragraph of Article 107.09:

> "The Length of Holiday Period for Thanksgiving shall be from 5:00 AM the Wednesday prior to 11:59 PM the Sunday After"

Delete the fifth paragraph of Article 107.09 of the Standard Specifications:

> "On weekends, excluding holidays, roadways with Average Daily Traffic of 25,000 or greater, all lanes shall be open to traffic from 3:00 P.M. Friday to midnight Sunday except where structure construction or major rehabilitation makes it impractical."

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES (project specific)

Description. This work shall consist of the removal and disposal of regulated substances according to Section 669 of the Standard Specifications as revised below.

Contract Specific Sites. The excavated soil and groundwater within the areas listed below shall be managed as either "uncontaminated soil", hazardous waste, special waste or non-special waste. For stationing, the lateral distance is measured from centerline and the farthest distance is the offset distance or construction limit, whichever is less.

Soil Disposal Analysis. When the waste material requires sampling for landfill disposal acceptance, the Contractor shall secure a written list of the specific analytical parameters and analytical methods required by the landfill. The Contractor shall collect and analyze the required number of samples for the parameters required by the landfill using the appropriate analytical procedures. A copy of the required parameters and analytical methods (from landfill email or on landfill letterhead) shall be provided as Attachment 4A of the BDE 2733 (Regulated Substances Final Construction Report). The price shall include all sampling materials and effort necessary for collection and management of the samples, including transportation of samples from the job site to the laboratory. The Contractor shall be responsible for determining the specific disposal facilities to be utilized; and collect and analyze any samples required for disposal facility acceptance using a NELAP certified analytical laboratory registered with the State of Illinois.

Intersection of Higgins Road (IL 72) and Dee Road/East River Road, Rosemont, Cook County

- All excavation planned at the southeast quadrant at the intersection of Higgins Road (IL 72) and Dee Road/East River Road. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(5). Potential contaminants of concern sampling parameters: VOCs, SVOCs and Metals.
- All excavation planned at the northwest quadrant, northeast quadrant, and southwest quadrant at the intersection of Higgins Road (IL 72) and Dee Road/East River Road. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(1). Potential contaminants of concern sampling parameters: VOCs, SVOCs and Metals.

Work Zones

Three distinct OSHA HAZWOPER work zones (exclusion, decontamination, and support) shall apply to projects adjacent to or within sites with documented leaking underground storage tank (LUST) incidents, or sites under management in accordance with the requirements of the Site Remediation Program (SRP), Resource Conservation and Recovery Act (RCRA), or Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or as deemed necessary. For this project, the work zones apply for the following ISGS PESA Sites**:** **None**

SAFETY FENCE

Description**.** This work shall consist of constructing a SAFETY FENCE in accordance with applicable portions of Sections 507 and 641, as detailed in the plans, as directed by the Engineer, and as specified herein**.**

Materials. The posts and rails shall comply with the requirements of Section 1007 for No. 1 Dense SR 1550 F for southern pine or No. 1 Dense 1400 F for Douglas fir. All lumber shall be sound and free from excessive splitting or deterioration. Dimensions shown on the plans are surfaced (S4S) lumber. After erection of the fence, the contractor shall apply two coats of a commercially available water seal for treated lumber meeting the approval of the Engineer.

Hardware shall include all necessary fasteners and appurtenances for construction of the fence and shall be according to Article 1006.17.

Construction Requirements. Wood fence construction shall conform to the applicable portions of Sections 507 and 641. the backfill for the posts shall be CA 6, CA 10, or CA 12 aggregate according to Article 1004.01. Backfill shall be thoroughly compacted, meeting the approval of the Engineer.

Method of Measurement. The safety fence will be measured for payment along the top of the fence from center to center of end posts.

Basis of Payment. This work will be measured and paid for at the contract unit price per linear foot for SAFETY FENCE, which price shall be payment in full for all material, labor and any other items required to complete the work.

STABILIZED CONSTRUCTION ENTRANCE

Description. This work consists of the construction and maintenance of an aggregate stabilized construction entrance for accessing the construction zone. The entrances shall be placed at locations as shown on the plans or as directed by the Engineer.

Construction Requirements. Stabilized construction entrances shall consist of 12 inches of CA-1 Aggregate placed over filter fabric. The filter fabric shall be included with this pay item. The aggregate shall be crushed stone or crushed gravel.

All surface water flowing or diverted toward the construction entrance shall be piped across the entrance. Pipe used for this will not be paid for, but shall be included in the work. The stabilized construction entrance will have positive drainage away from the roadway.

Maintenance shall consist of placing additional aggregate of the same type and gradation as the base aggregate. Additional aggregate will not be paid for, but shall be included in the work.

After the stabilized construction entrances have served their purpose, the suitable aggregate shall be removed, and, at the direction and approval of the Engineer, utilized for embankment construction or otherwise disposed of as specified in Article 202.03 of the Standard Specifications.

Method of Measurement. Stabilized construction entrances will be measured for payment in place and the area computed in square yards.

Basis of Payment. This work will be paid for at the contract unit price per square yard for STABILIZED CONSTRUCTION ENTRANCE.

STATUS OF UTILITIES (D-1)

Effective: June 1, 2016
Revised: January 1, 2020

Utility companies and/or municipal owners located within the construction limits of this project have provided the following information regarding their facilities and the proposed improvements. The tables below contain a description of specific conflicts to be resolved and/or facilities which will require some action on the part of the Department's contractor to proceed with work. Each table entry includes an identification of the action necessary and, if applicable, the estimated duration required for the resolution.

UTILITIES TO BE ADJUSTED

Conflicts noted below have been identified by following the suggested staging plan included in the contract. The company has been notified of all conflicts and will be required to obtain the necessary permits to complete their work; in some instances, resolution will be a function of the construction staging. The responsible agency must relocate, or complete new installations as noted below; this work has been deemed necessary to be complete for the Department's contractor to then work in the stage under which the item has been listed.

Pre-Stage

No relocations have been identified.

The following contact information is what was used during the preparation of the plans as provided by the Agency/Company responsible for resolution of the conflict.

Agency/Company Responsible to Resolve Conflict	Name of contact	Phone	E-mail address
AT&T (Distribution)	Jamel McGinnis		jm548w@att.com
ATT - Illinois SBC - Secondary	Chris Cass		cc4361@att.com
AT&T C&E	Bobby Akhter	(630) 810-6274	Ba3817@att.com
ATT - Local Network Services	Timothy Lapointe		tl0695@att.com
ATT - Illinois SBC	Phyllis August		Pa6471@att.com
Century Link (Level III)	Ben Pacocha	(877) 253-8353	ben.pacocha@lumen.com
Level 3 Communications - CenturyLink	Alexa Villasenor		avillasenor@hbkengineering.com
Comcast	Martha Gieras	(224) 229-5862	martha_gieras@cable.comcast.com
ComCast	Jack Johnson		Jack_JohnsonIII@cable.comcast.com
ComEd	Lisa Ragas	(630) 576-7094	PlanSubmittalsandMapRequests@exeloncorp.com
ComEd - Distribution	Arturo Salinas		arturo.salinas@comed.com
ComEd - Transmission	Leslie Paschal		Leslie.paschal@comed.com
MCI-Verizon Business Team, Investigation	Joe Chaney		ASG.Investigationsteam@ASGInc.us
MCI	Leotis Anderson		landerson@telecom-eng.com
M W R D	Marcella Landis	(312) 751-3236	
M W R D	Khaja Moinuddin		moinuddink@mwrd.org
Nicor Gas	Sakibul Forah	(630) 388-3319	gasmaps@aglresources.com
City of Park Ridge	Sarah Mitchell	(847) 318-5455	smitchell@parkridge.us
CDOT - Division of Electrical Operations	Barney Hunt		Barney.hunt@cityofchicago.org
Peoples Gas - Secondary	Cezar Papa		Cezar.Papa@peoplesgasdelivery.com
Crowncastle	Joseph Mellenthin		joseph.mellenthin@crowncastle.com
CDOT - DWM - Sewer Section - 2	Conghui Ge		conghui.ge@cityofchicago.org
CDOT - DWM - Water Section - 3	Katherine Nguyen		katherine.nguyen@ctrwater.net
Netsync	David Irek		direk@netsync.com
Peoples Gas	Tony Godek		Anthony.Godek@peoplesgasdelivery.com
Wide Open West LLC	Jack Kotowski		wowouc@talmanconsultants.com

CDOT - Division of Electrical Operations - 2	Anthony Vieu		Anthony.Vieu@cityofchicago.org
Mobilitie LLC	Glenn Zebrowski		mobilitiechicago@gprsinc.com
CDOT - Red Light Cameras Section	Tiffany Blake		tiffany.blake@conduent.com
JC Decaux North America	Miguel Mejia		miguel.mejia@jcdecaux.com
RCN	Alexa Villasenor		avillasenor@hbkengineering.com
Abovenet - Zayo Communications Inc	Alexa Villasenor		avillasenor@hbkengineering.com
Enwave Chicago	Alexa Villasenor		avillasenor@hbkengineering.com

UTILITIES TO BE WATCHED AND PROTECTED

The areas of concern noted below have been identified by following the suggested staging plan included for the contract. The information provided is not a comprehensive list of all remaining utilities, but those which during coordination were identified as ones which might require the Department's contractor to take into consideration when making the determination of the means and methods that would be required to construct the proposed improvement. In some instances, the contractor will be responsible to notify the owner in advance of the work to take place so necessary staffing on the owner's part can be secured.

STAGE / LOCATION	TYPE	DESCRIPTION	OWNER
West side of E River Road	Buried electric	Underground High Voltage Transmission	ComEd
Intersection of E River Rd and Bryn Mawr Ave	Underground Communication	Use extreme caution near all Level 3 facilities. Hand excavation is required to locate and expose fiber optic facilities prior to crossing and when working within 3 feet of all Level 3 facilities. Contact DIGGER for locates a minimum of 48 hours prior to start of construction.	Level 3 Communications - CenturyLink
Intersection of E River Rd and Bryn Mawr Ave	Gas	Use EXTREME CAUTION near all gas facilities during construction and related excavation activities. Hand dig or non-invasive excavation is required to field verify the horizontal and vertical location of gas facilities prior to crossing and working within 3 feet of all gas facilities. A minimum of 3' horizontal edge to edge clearance is required for gas facilities with diameters of 16" or smaller, and 5' edge to edge clearance for gas facilities with diameters 18" and larger. Maintain a minimum of 18" edge to edge vertical clearance when crossing gas facilities 16" or less in diameter, and 24" edge to edge vertical clearance when crossing 18" and larger diameter gas facilities. Contact 811 Chicago/DIGGER 312-744-7000 for locates 48 hours prior to start of construction. The use of concrete, flow fill, or the like is prohibited within 24 inches of all gas facilities, nor shall it encase any gas facility. A buffer of 24" sand is to be used between flow fill and all gas facilities. A minimum of 6" FA-02 or FM-02 sand shall be used when backfilling other materials around any exposed gas facility. Contractor exposing gas facility is responsible for providing the sand. Vertical adjustments required for valve basin frames, covers, gas shut-off valves, roadway boxes shall be communicated to Jacie Spudic, Planning-Permit Group, jacie.spudic@peoplesgasdelivery.com, 4 weeks prior to the start of restoration for planning & scheduling. All gas facilities are to be maintained.	Peoples Gas - Secondary

Intersection of E River Rd and Bryn Mawr Ave	Underground Electric	The contractor is directed to exercise caution during construction and/ or excavation. The contractor assumes all liability for any damages to Division of Electrical Operations facilities. It is the contractor's responsibility to contact Mr. Jose Vasquez at 312-744-4713 with a minimum of (3) weeks in advance notice. It is the contractor's responsibility to coordinate with Division of Electrical Operations for maintenance transfers. Contact "DIGGER" at 8-1-1 a minimum of 48 hours prior to any excavation. The contractor is to hand dig around and support in place any Division of Electrical facilities encountered.	CDOT - Division of Electrical Operations - 2
Intersection of E River Rd and Bryn Mawr Ave	Cable/ Communications	MCI/WOW facilities are present in the proposed area of construction. Use extreme caution near all MCI/WOW facilities. Hand excavation is required to locate and expose fiber optic facilities prior to crossing and when working within 3 feet of all MCI/WOW facilities. Contact DIGGER for locates a minimum of 48 hours prior to start of construction.	MCI
Intersection of E River Rd and Bryn Mawr Ave	Underground Communication	Use extreme caution near all Zayo facilities. Hand excavation is required to locate and expose fiber optic facilities prior to crossing and when working within 3 feet of all Zayo facilities. Contact DIGGER for locates a minimum of 48 hours prior to start of construction.	Abovenet - Zayo Communications Inc

The following contact information is what was used during the preparation of the plans as provided by the owner of the facility.

Agency/Company Responsible to Resolve Conflict	Name of contact	Phone	E-mail address
AT&T (Distribution)	Jamel McGinnis		jm548w@att.com
ATT - Illinois SBC - Secondary	Chris Cass		cc4361@att.com
AT&T C&E	Bobby Akhter	(630) 810-6274	Ba3817@att.com
ATT - Local Network Services	Timothy Lapointe		tl0695@att.com
ATT - Illinois SBC	Phyllis August		Pa6471@att.com
Century Link (Level III)	Ben Pacocha	(877) 253-8353	ben.pacocha@lumen.com
Level 3 Communications - CenturyLink	Alexa Villasenor		avillasenor@hbkengineering.com
Comcast	Martha Gieras	(224) 229-5862	martha_gieras@cable.comcast.com
ComCast	Jack Johnson		Jack_JohnsonIII@cable.comcast.com
ComEd	Lisa Ragas	(630) 576-7094	PlanSubmittalsandMapRequests@exeloncorp.com
ComEd - Distribution	Arturo Salinas		arturo.salinas@comed.com
ComEd - Transmission	Leslie Paschal		Leslie.paschal@comed.com
MCI-Verizon Business Team, Investigation	Joe Chaney		ASG.Investigationsteam@ASGInc.us
MCI	Leotis Anderson		landerson@telecom-eng.com
M W R D	Marcella Landis	(312) 751-3236	
M W R D	Khaja Moinuddin		moinuddink@mwrd.org
Nicor Gas	Sakibul Forah	(630) 388-3319	gasmaps@aglresources.com
City of Park Ridge	Sarah Mitchell	(847) 318-5455	smitchell@parkridge.us
CDOT - Division of Electrical Operations	Barney Hunt		Barney.hunt@cityofchicago.org
Peoples Gas - Secondary	Cezar Papa		Cezar.Papa@peoplesgasdelivery.com
Crowncastle	Joseph Mellenthin		joseph.mellenthin@crowncastle.com
CDOT - DWM - Sewer Section - 2	Conghui Ge		conghui.ge@cityofchicago.org
CDOT - DWM - Water Section - 3	Katherine Nguyen		katherine.nguyen@ctrwater.net
Netsync	David Irek		direk@netsync.com
Peoples Gas	Tony Godek		Anthony.Godek@peoplesgasdelivery.com
Wide Open West LLC	Jack Kotowski		wowouc@talmanconsultants.com

CDOT - Division of Electrical Operations - 2	Anthony Vieu		Anthony.Vieu@cityofchicago.org
Mobilitie LLC	Glenn Zebrowski		mobilitiechicago@gprsinc.com
CDOT - Red Light Cameras Section	Tiffany Blake		tiffany.blake@conduent.com
JC Decaux North America	Miguel Mejia		miguel.mejia@jcdecaux.com
RCN	Alexa Villasenor		avillasenor@hbkengineering.com
Abovenet - Zayo Communications Inc	Alexa Villasenor		avillasenor@hbkengineering.com
Enwave Chicago	Alexa Villasenor		avillasenor@hbkengineering.com

The above represents the best information available to the Department and is included for the convenience of the bidder. The days required for conflict resolution should be considered in the bid as this information has also been factored into the timeline identified for the project when setting the completion date. The applicable portions of the Standard Specifications for Road and Bridge Construction shall apply.

Estimated duration of time provided above for the first conflicts identified will begin on the date of the executed contract regardless of the status of the utility relocations. The responsible agencies will be working toward resolving subsequent conflicts in conjunction with contractor activities in the number of days noted.

The estimated relocation duration must be part of the progress schedule submitted by the contractor. A utility kickoff meeting will be scheduled between the Department, the Department's contractor and the utility companies when necessary. The Department's contractor is responsible for contacting J.U.L.I.E. prior to all excavation work.

SUBBASE GRANULAR MATERIAL, TYPE B 6"

Description. This work shall consist of constructing a subbase granular material.

Materials. Material shall satisfy the requirements of Section 1004 of the Standard Specifications. Gradation number CA 1 shall be used.

Finishing and Maintenance of Subbase Granular Material. The subbase granular material shall be finished to the lines, grades, and cross sections shown on the plans, or as directed by the Engineer. The subbase aggregate material shall be maintained in a smooth and compacted condition.

Method of Measurement. This work will be measured for payment according to Article 311.08.

Basis of Payment. This work will be paid for at the contract unit price per square yard for SUBBASE GRANULAR MATERIAL, TYPE B 6".

Add the following to Section 1004 of the Standard Specifications:

1004.07 Coarse Aggregate for Subbase Granular Material, Type B 6". The aggregate shall be according to Article 1004.01 and the following.

(a) Description. The coarse aggregate shall be crushed gravel, crushed stone, or crushed concrete.

(b) Quality. The coarse aggregate shall consist of sound durable particles reasonably free of deleterious materials. Non-mechanically blended RAP may be allowed up to a maximum of 5.0 percent.

TELEVISION INSPECTION OF SEWER, SPECIAL

Description. All sewers and sewer structures must be inspected by the Engineer in coordination with the Department of Sewers prior to the final payment to the Contractor. In conjunction with sewer inspection(s), the Contractor must furnish a videotape of a televised inspection of the interior of all existing main sewers being crossed both before and after construction.

Construction Requirements. The Contractor must televise the specified sewers and sewer structures in the presence of Engineer and the Department of Sewers' personnel. The Contractor must provide a videotape copy of this inspection to the Department of Sewers to assist department personnel in the evaluation of sewers and sewer structures. Arrangements must be made by the Contractor for video taping in conformance with the following:

(a) The video operator must have substantial years of experience in televising sewer mains.
(b) The entire televised inspection process must be done in the presence of the Engineer in coordination with Commissioner.
(c) Videotapes must be high quality color in VHS format and recorded in either SP or LP modes. Recordings made in SLP or EP modes are not acceptable. Any out-of-focus video recordings or portions thereof, must be cause for rejection of the video recording and will necessitate re-televising at the Contractor's expense.
(d) The Contractor must turn over original VHS videotape to the Commissioner immediately after taping with the tab removed so as to prevent accidental erasure.
(e) Televising must be done one section at a time, each section isolated from the remainder of the sewer line as required. Sufficient water must be supplied to cause drainage within the isolated section prior to televising.
(f) The Contractor will not be entitled to any additional working days due to delays in securing the video taping services of a private vendor.

Televising equipment must include the television camera, television monitor, cables, power source, lights and other equipment necessary to the televising operation. The camera must be specifically designed and constructed for operation in connection with sewer inspection. The color camera must have a high-resolution lens, and must be operative in 100 percent humidity conditions. The camera must be capable of spanning 360-degrees circumference and 270-degrees on the horizontal axis, so that all service connections can be properly inspected. Focal distance must be adjustable through a range of from 25mm (1-inch) to infinity. The camera must be mounted on skids suitably sized for each pipe diameter to be investigated. Lighting for the camera must minimize reflective glare. Camera and lighting quality must be suitable to provide a clear, continuously in-focus picture of the entire inside periphery of the sewer pipe for all conditions encountered during the work. The remote reading footage counter must be accurate to 60 mm (0.20') over the length of the particular section being inspected and must be mounted over the television monitor. The

camera television monitor and other components of the video system must be capable of producing a minimum 350-line resolution color video picture.

The camera must be moved through the line in either direction at a uniform rate, stopping when necessary to ensure proper documentation of the condition of the sewer line but in no case must the television camera be pulled at a speed greater than 9 m/min (30 feet/min). Manual winches, power winches, TV cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer line conditions must be used to move the camera through the sewer line.

If during the televising operations, the television camera will not pass through an entire sewer section, the Contractor must re-set its equipment in a manner so that the inspection can continue opposite the obstruction.

Whenever non-remote powered and controlled winches are used to pull the television camera through the line, telephones, radios, or other suitable means of communications must be set up between the manholes of the section being inspected to ensure that adequate communications exist between members of the crew. The importance of accurate distance measurement is emphasized. Measurements for location of defects must be above ground by means of a meter device. Marking on the cable, or similar, which would require interpolation for depth of manhole will not be acceptable. The accuracy of the measurement meters must be checked daily by use of a walking meter, roll-a-tape, or other suitable device. Metric measurements must begin at the centerline of the upstream manhole, unless permission is given by the Commissioner to do otherwise. English measurements must be shown on the video data view at all times.

Audio and written documentation must accompany all videotapes submitted to the Engineer for coordination with Commissioner. The voice recording on the videotapes must make brief but informative comments on data of significance, including but not limited to, the locations of unusual conditions, storm sewer connections, collapse sections, the presence of scale and corrosion, and other discernible features.

The video tape(s) must include the following:

a. DATA VIEW:
    1. Report No.
    2. Date of TV Inspection
    3. Upstream and Downstream manhole or station numbers
    4. Current distance along reach (tape counter meters)
    5. Printed labels on tape container and tape cartridge with location information, date, format, and other descriptive information.

The Contractor to the approval of the Engineer in coordination with the Commissioner must immediately correct defects or deficiencies determined by these inspections. The Engineer in coordination with the Commissioner must approve the manner and methods of repair. If, in the judgment of the Engineer in coordination with the Commissioner, the defective portions of the sewer or sewer structure cannot be repaired, the Contractor must remove and reconstruct as much of the original work as necessary to obtain a sewer or sewer structure that is satisfactory to the Engineer in coordination with the Commissioner.

Method of Measurement. This work will be measured for payment in feet of TELEVISION INSPECTION OF SEWER, SPECIAL. Measurement will be made for preconstruction video taping and post construction video taping.

Basis of Payment. Video taping will be paid for at the contract unit price per FOOT for TELEVISION INSPECTION OF SEWER, SPECIAL.

TEMPORARY INFORMATION SIGNING

Effective: November 13, 1996
Revised: January 29, 2020

Description.
This work shall consist of furnishing, installing, maintaining, relocating for various states of construction and eventually removing temporary informational signs. Included in this item may be ground mount signs, skid mount signs, truss mount signs, bridge mount signs, and overlay sign panels which cover portions of existing signs.

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

	Item	Article/Section
a.)	Sign Base (Note 1)	1090
b.)	Sign Face (Note 2)	1091
c.)	Sign Legends	1091
d.)	Sign Supports	1093
e.)	Overlay Panels (Note 3)	1090.02

Note 1. The Contractor may use 5/8 inch (16 mm) instead of 3/4 inch (19 mm) thick plywood.
Note 2. The sign face material shall be in accordance with the Department's Fabrication of Highway Signs Policy.
Note 3. The overlay panels shall be 0.08 inch (2 mm) thick.

GENERAL CONSTRUCTION REQUIREMENTS

Installation.
The sign sizes and legend sizes shall be verified by the Contractor prior to fabrication.

Signs which are placed along the roadway and/or within the construction zone shall be installed according to the requirements of Article 701.14 and Article 720.04. The signs shall be 7 ft (2.1 m) above the near edge of the pavement and shall be a minimum of 2 ft (600 mm) beyond the edge of the paved shoulder. A minimum of two (2) posts shall be used.

The attachment of temporary signs to existing bridges, sign structures or sign panels shall be approved by the Engineer. Any damage to the existing signs and/or structures due to the Contractor's operations shall be repaired or signs replaced, as determined by the Engineer, at the Contractor's expense.

Method of Measurement.

This work shall be measured for payment in square feet (square meters) edge to edge (horizontally and vertically).

All hardware, posts or skids, supports, bases for ground mounted signs, connections, which are required for mounting these signs will be included as part of this pay item.

Basis Of Payment.
This work shall be paid for at the contract unit price per square foot (square meter) for TEMPORARY INFORMATION SIGNING.

TOPSOIL FUNISH AND PLACE, SPECIAL

Description. This work shall consist of furnishing and placing topsoil. Minimum depth of topsoil shall be four inches.

General. This work shall be completed in accordance with Section 211 of the Standard Specifications.

Basis of Payment. This work shall be paid for at the contract unit price per cubic yard for TOPSOIL FURNISH AND PLACE, SPECIAL.

TRAFFIC CONTROL AND PROTECTION (ARTERIALS) (D1)

Effective: February 1, 1996
Revised: March 1, 2011

Specific traffic control plan details and Special Provisions have been prepared for this contract. This work shall include all labor, materials, transportation, handling and incidental work necessary to furnish, install, maintain and remove all traffic control devices required as indicated in the plans and as approved by the Engineer.

When traffic is to be directed over a detour route, the Contractor shall furnish, erect, maintain and remove all applicable traffic control devices along the detour route according to the details shown in the plans.

Method of Measurement: All traffic control (except “Traffic Control and Protection (Expressways)” and temporary pavement markings) indicated on the traffic control plan details and specified in the Special Provisions will be measured for payment on a lump sum basis.

Basis of Payment: All traffic control and protection will be paid for at the contract lump sum price for TRAFFIC CONTROL AND PROTECTION (SPECIAL).

Temporary pavement markings will be paid for separately unless shown on a Standard.

TRAFFIC CONTROL PLAN (D1)

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

Special attention is called to Article 107.09 of the Standard Specifications and the following Highway Standards, Details, Quality Standard for Work Zone Traffic Control Devices, Recurring Special Provisions and Special Provisions contained herein, relating to traffic control.

The Contractor shall contact the District One Bureau of Traffic at least 72 hours in advance of beginning work.

STANDARDS: 701101-05, 701106-02, 701427-05, 701601-09, 701701-10, 701801-06, 701901-08

DETAILS:
TC-13 – DISTRICT ONE TYPICAL PAVEMENT MARKINGS
TC-22 – ARTERIAL ROAD INFORMATION SIGN

SPECIAL PROVISIONS:
CHANGEABLE MESSAGE SIGN
KEEPING ARTERIAL ROADWAYS OPEN TO TRAFFIC (LANE CLOSURES ONLY)
MAINTENANCE OF ROADWAYS (D1)
PUBLIC CONVENIENCE AND SAFETY (D1)
TEMPORARY INFORMATION SIGNING
TRAFFIC CONTROL AND PROTECTION (ARTERIALS) (D1)
WORK ZONE TRAFFIC CONTROL DEVICES (BDE)

Maintenance of Traffic. If the Contractor requests, single block road closure **may** be allowed by the Engineer during normal working hours provided that it is accomplished in the manner approved by the Engineer, including all required signing and detours. **NO OVERNIGHT CLOSURES OF ANY STREET WILL BE ALLOWED**, unless specifically provided for in the plans and Contract Documents or approved by the Engineer in writing 72 hours before the scheduled closure. The Contractor shall plan his/her work so that all driveways and fire hydrants are accessible at the end of the working day. Traffic control shall be in accordance with the applicable sections of the SSRB, the applicable guidelines contained in the MUTCD, any Special Provisions, any details and Highway Standards contained herein.

At the Pre-Construction Meeting, the Contractor shall furnish the name, and a 24-hour phone number of the individual in his direct employ, who is responsible for the

installation and maintenance of the traffic control for the project. In accordance with Art 108.01, if a Subcontractor is to provide this aspect of the work, consent of the Engineer is required. This shall not relieve the Contractor of the foregoing requirement for an individual in his direct employ to superintend the implementation and maintenance of the traffic control.

The Contractor shall furnish, install, maintain, relocate, and remove all traffic cones, signs, barricades, warning lights and other devices that are to be used for the purpose of controlling traffic. The Contractor shall furnish certified flaggers upon request of the Engineer or when required for safe operations. The Contractor is responsible to ensure that all barricades, warning signs, lights and other devices installed for traffic control are in place and operating 24 hours Each calendar day this Contract is in effect. As a minimum, all areas of work shall be protected each night by Type II barricades at maximum 50-foot centers equipped with working flashing lights. Type III barricades shall be placed at all project limits.

HOT-MIX ASPHALT – MIXTURE DESIGN VERIFICATION AND PRODUCTION (D1)

Effective: January 1, 2019
Revised: December 1, 2021

Add to Article 1030.05 (d)(3) of the Standard Specifications to read:

" During mixture design, prepared samples shall be submitted to the District laboratory by the Contractor for verification testing. The required testing, and number and size of prepared samples submitted, shall be according to the following tables.

High ESAL – Required Samples for Verification Testing	
Mixture	Hamburg Wheel and I-FIT Testing 1/ 2/
Binder	total of 3 - 160 mm tall bricks
Surface	total of 4 - 160 mm tall bricks

Low ESAL – Required Samples for Verification Testing	
Mixture	I-FIT Testing 1/ 2/
Binder	1 - 160 mm tall brick
Surface	2 - 160 mm tall bricks

1/ The compacted gyratory bricks for Hamburg wheel and I-FIT testing shall be 7.5 ± 0.5 percent air voids.

2/ If the Contractor does not possess the equipment to prepare the 160 mm tall brick(s), twice as many 115 mm tall compacted gyratory bricks will be acceptable.

Revise the fourth paragraph of Article 1030.10 of the Standard Specifications to read:

"When a test strip is not required, each HMA mixture shall still be sampled on the first day of production: I-FIT and Hamburg wheel testing for High ESAL; I-FIT testing for Low ESAL. Within two working days after sampling the mixture, the Contractor shall deliver gyratory cylinders to the District laboratory for Department verification testing. The High ESAL mixture test results shall meet the requirements of Articles 1030.05(d)(3) and 1030.05(d)(4). The Low ESAL mixture test results shall meet the requirements of Article 1030.05(d)(4). The required number and size of prepared

samples submitted for the Hamburg wheel and I-FIT testing shall be according to the "High ESAL - Required Samples for Verification Testing" table in Article 1030.05(d)(3) above."

Add the following to the end of Article 1030.10 of the Standard Specifications to read:

> "Mixture sampled during first day of production shall include approximately 60 lb (27 kg) of additional material for the Department to conduct Hamburg wheel testing and approximately 80 lb (36 kg) of additional material for the Department to conduct I-FIT testing. Within two working days after sampling, the Contractor shall deliver prepared samples to the District laboratory for verification testing. The required number and size of prepared samples submitted for the Hamburg wheel and I-FIT testing shall be according to the "High ESAL - Required Samples for Verification Testing" table in Article 1030.05(d)(3) above."

HOT-MIX ASPHALT BINDER AND SURFACE COURSE (D1)

Effective: November 1, 2019
Revised: December 1, 2021

Revise Article 1004.03(c) to read:

"(c) Gradation. The coarse aggregate gradations shall be as listed in the following table.

Use	Size/Application	Gradation No.
Class A-1, A-2, & A-3	3/8 in. (10 mm) Seal	CA 16 or CA 20
Class A-1	1/2 in. (13 mm) Seal	CA 15
Class A-2 & A-3	Cover Coat	CA 14
HMA High ESAL	IL-19.0; Stabilized Subbase IL-19.0	CA 11 1/
	SMA 12.5 2/	CA 13 4/, CA 14, or CA 16
	SMA 9.5 2/	CA 13 3/4/ or CA 16 3/
	IL-9.5	CA 16, CM 13 4/
	IL-9.5FG	CA 16
HMA Low ESAL	IL-19.0L	CA 11 1/
	IL-9.5L	CA 16

1/ CA 16 or CA 13 may be blended with the CA 11.

2/ The coarse aggregates used shall be capable of being combined with the fine aggregates and mineral filler to meet the approved mix design and the mix requirements noted herein.

3/ The specified coarse aggregate gradations may be blended.

4/ CA 13 shall be 100 percent passing the 1/2 in. (12.5mm) sieve."

Revise Article 1004.03(e) of the Supplemental Specifications to read:

"(e) Absorption. For SMA the coarse aggregate shall also have water absorption
≤ 2.0 percent."

Revise the “High ESAL” portion of the table in Article 1030.01 to read:

“High ESAL	Binder Courses	IL-19.0, IL-9.5, IL-9.5FG, IL-4.75, SMA 12.5, Stabilized Subbase IL-19.0
	Surface Courses	IL-9.5, IL-9.5FG, SMA 12.5, SMA 9.5”

Revise Note 2. and add Note 6 to Article 1030.02 of the Standard Specifications to read:

“Item Article/Section

(g) Performance Graded Asphalt Binder (Note 6) 1032
(h) Fibers (Note 2)

Note 2. A stabilizing additive such as cellulose or mineral fiber shall be added to the SMA mixture according to Illinois Modified AASHTO M 325. The stabilizing additive shall meet the Fiber Quality Requirements listed in Illinois Modified AASHTO M 325. Prior to approval and use of fibers, the Contractor shall submit a notarized certification by the producer of these materials stating they meet these requirements. Reclaimed Asphalt Shingles (RAS) may be used in Stone Matrix Asphalt (SMA) mixtures designed with an SBA polymer modifier as a fiber additive if the mix design with RAS included meets AASHTO T305 requirements. The RAS shall be from a certified source that produces either Type I or Type 2. Material shall meet requirements noted herein and the actual dosage rate will be determined by the Engineer.

Note 6. The asphalt binder shall be an SBS PG 76-28 when the SMA is used on a full-depth asphalt pavement and SBS PG 76-22 when used as an overlay, except where modified herein. The asphalt binder shall be a SBS PG 76-22 for IL-4.75, except where modified herein..”

Revise table in Article 1030.05(a) of the Standard Specifications to read:

“MIXTURE COMPOSITION (% PASSING) [1/]												
Sieve Size	IL-19.0 mm		SMA 12.5		SMA 9.5		IL-9.5mm		IL-9.5FG		IL-4.75 mm	
	min	max	min	max	min	max	min	max	min	max	min	max

1 1/2 in (37.5 mm)												
1 in. (25 mm)		100										
3/4 in. (19 mm)	90	100		100								
1/2 in. (12.5 mm)	75	89	80	100		100		100		100		100
3/8 in. (9.5 mm)				65	90	100	90	100	90	100		100
#4 (4.75 mm)	40	60	20	30	36	50	34	69	60	75[6/]	90	100
#8 (2.36 mm)	20	42	16	24 [4/]	16	32[4/]	34 [5/]	52 [2/]	45	60[6/]	70	90
#16 (1.18 mm)	15	30					10	32	25	40	50	65
#30 (600 μm)			12	16	12	18			15	30		
#50 (300 μm)	6	15					4	15	8	15	15	30
#100 (150 μm)	4	9					3	10	6	10	10	18
#200 (75 μm)	3.0	6.0	7.0	9.0 [3/]	7.5	9.5 [3/]	4.0	6.0	4.0	6.5	7.0	9.0 [3/]
#635 (20 μm)			≤ 3.0		≤ 3.0							
Ratio Dust/Asphalt Binder		1.0		1.5		1.5		1.0		1.0		1.0

1/ Based on percent of total aggregate weight.

2/ The mixture composition shall not exceed 44 percent passing the #8 (2.36 mm) sieve for surface courses with Ndesign = 90.

3/ Additional minus No. 200 (0.075 mm) material required by the mix design shall be mineral filler, unless otherwise approved by the Engineer.

4/ When establishing the Adjusted Job Mix Formula (AJMF) the percent passing the #8 (2.36 mm) sieve shall not be adjusted above the percentage stated on the table.

5/ When establishing the Adjusted Job Mix Formula (AJMF) the percent passing the #8 (2.36 mm) sieve shall not be adjusted below 34 percent.

6/ When the mixture is used as a binder, the maximum shall be increased by 0.5 percent passing."

Revise Article 1030.05(b) of the Standard Specifications to read:

(b) Volumetric Requirements. The target value for the air voids of the HMA shall be 4.0 percent, for IL-4.75 and SMA mixtures it shall be 3.5 percent and for Stabilized Subbase it shall be 3.0 percent at the design number of gyrations. The voids in the mineral aggregate (VMA) and voids filled with asphalt binder (VFA) of the HMA design shall be based on the nominal maximum size of the aggregate in the mix and shall conform to the following requirements.

	Voids in the Mineral Aggregate (VMA), % Minimum for Ndesign				
Mix Design	30	50	70	80	90
IL-19.0		13.5	13.5		13.5
IL-9.5		15.0	15.0		
IL-9.5FG		15.0	15.0		
IL-4.75[1/]		18.5			
SMA-12.5[1/2/5/]				17.0[3/]/16.0[4/]	
SMA-9.5[1/2/5/]				17.0[3/]/16.0[4/]	
IL-19.0L	13.5				
IL-9.5L	15.0				

1/ Maximum draindown shall be 0.3 percent according to Illinois Modified AASHTO T 305.

2/ The draindown shall be determined at the JMF asphalt binder content at the mixing temperature plus 30°F.

3/ Applies when specific gravity of coarse aggregate is ≥ 2.760.

4/ Applies when specific gravity of coarse aggregate is < 2.760.

5/ For surface course, the coarse aggregate can be crushed steel slag, crystalline crushed stone or crushed sandstone. For binder course, coarse aggregate shall be crushed stone (dolomite), crushed gravel, crystalline crushed stone, or crushed sandstone”

Revise the last paragraph of Article 1102.01 (a) (5) of the Standard Specifications to read:

"IL-4.75 and Stone Matrix Asphalt (SMA) mixtures which contain aggregate having absorptions greater than or equal to 2.0 percent, or which contain steal slag sand, shall have minimum surge bin storage plus haul time of 1.5 hours."

Add after third sentence of Article 1030.09(b) to read:

"If the Contractor and Engineer agree the nuclear density test method is not appropriate for the mixture, cores shall be taken at random locations determined according to the QC/QA document "Determination of Random Density Test Site Locations". Core densities shall be determined using the Illinois Modified AASHTO T 166 or T 275 procedure."

Revise Table 1 and Note 4/ of Table 1 in Article 406.07(a) of the Standard Specifications to read:

	Breakdown/Intermediate Roller (one of the following)	Final Roller (one or more of the following)	Density Requirement
IL-9.5, IL-9.5FG, IL-19.0 1/	V_D, P , T_B, 3W, O_T, O_B	V_S, T_B, T_F, O_T	As specified in Section 1030
IL-4.75 and SMA 3/ 4/	T_B, 3W, O_T	T_F, 3W	As specified in Section 1030
Mixtures on Bridge Decks 2/	T_B	T_F	As specified in Articles 582.05 and 582.06.

"4/ The Contractor shall provide a minimum of two steel-wheeled tandem rollers (T_B), and/or three-wheel (3W) rollers for breakdown, except one of the (T_B) or (3W) rollers shall be 84 inches (2.14 m) wide and a weight of 315 pound per linear inch (PLI) (5.63 kg/mm) and one of the (T_B) or (3W) rollers can be substituted for an oscillatory roller (O_T). T_F rollers shall be a minimum of 280 lb/in. (50 N/mm). The 3W and T_B rollers shall be operated at a uniform speed not to exceed 3 mph (5 km/h), with the drive roll for T_B rollers nearest the paver and maintain an effective rolling distance of not more than 150 ft (45 m) behind the paver."

Add the following after the fourth paragraph of Article 406.13 (b):

"The plan quantities of SMA mixtures shall be adjusted using the actual approved binder and surface Mix Design's G_{mb}."

Revise first paragraph of Article 1030.10 of the Standard Specifications to read:

"A test strip of 300 ton (275 metric tons), except for SMA mixtures it will be 400 ton (363 metric ton), will be required for each mixture on each contract at the beginning of HMA production for each construction year according to the Manual of Test Procedures for Materials "Hot Mix Asphalt Test Strip Procedures". At the request of the Producer, the Engineer may waive the test strip if previous construction during the current construction year has demonstrated the constructability of the mix using Department test results."

Revise third paragraph of Article 1030.10 of the Standard Specifications to read:

"When a test strip is constructed, the Contractor shall collect and split the mixture according to the document "Hot-Mix Asphalt Test Strip Procedures". The Engineer, or a representative, shall deliver split sample to the District Laboratory for verification testing. The Contractor shall complete mixture tests stated in Article 1030.09(a). Mixture sampled shall include enough material for the Department to conduct mixture tests detailed in Article 1030.09(a) and in the document "Hot-Mix Asphalt Mixture Design Verification Procedure" Section 3.3. The mixture test results shall meet the requirements of Articles 1030.05(b) and 1030.05(d), except Hamburg wheel tests will only be conducted on High ESAL mixtures during production."

FRICTION AGGREGATE (D1)

Effective: January 1, 2011
Revised: December 1, 2021

Revise Article 1004.03(a) of the Standard Specifications to read:

"**1004.03 Coarse Aggregate for Hot-Mix Asphalt (HMA).** The aggregate shall be according to Article 1004.01 and the following.

(a) Description. The coarse aggregate for HMA shall be according to the following table.

Use	Mixture	Aggregates Allowed
Class A	Seal or Cover	Allowed Alone or in Combination [5/]: Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag Crushed Concrete
HMA Low ESAL	Stabilized Subbase or Shoulders	Allowed Alone or in Combination [5/]: Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag[1/] Crushed Concrete
HMA High ESAL Low ESAL	Binder IL-19.0 or IL-19.0L SMA Binder	Allowed Alone or in Combination [5/ 6/]: Crushed Gravel Carbonate Crushed Stone[2/] Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Concrete[3/]

<table>
<tr><th>Use</th><th>Mixture</th><th colspan="2">Aggregates Allowed</th></tr>
<tr><td>HMA
High ESAL
Low ESAL</td><td>C Surface and Binder
IL-9.5
IL-9.5FG
or IL-9.5L</td><td colspan="2"><u>Allowed Alone or in Combination</u> [5/]:

Crushed Gravel
Carbonate Crushed Stone[2/]
Crystalline Crushed Stone
Crushed Sandstone
Crushed Slag (ACBF)
Crushed Steel Slag[4/]
Crushed Concrete[3/]</td></tr>
<tr><td rowspan="5">HMA
High ESAL</td><td rowspan="5">D Surface and Binder
IL-9.5
or IL-9.5FG</td><td colspan="2"><u>Allowed Alone or in Combination</u> [5/]:

Crushed Gravel
Carbonate Crushed Stone (other than Limestone)[2/]
Crystalline Crushed Stone
Crushed Sandstone
Crushed Slag (ACBF)
Crushed Steel Slag[4/]</td></tr>
<tr><td colspan="2"><u>Other Combinations Allowed:</u></td></tr>
<tr><td>Up to...</td><td>With...</td></tr>
<tr><td>25% Limestone</td><td>Dolomite</td></tr>
<tr><td>50% Limestone</td><td>Any Mixture D aggregate other than Dolomite</td></tr>
<tr><td>75% Limestone</td><td>Crushed Slag (ACBF) or Crushed Sandstone</td></tr>
<tr><td rowspan="2">HMA
High ESAL</td><td rowspan="2">E Surface
IL-9.5

SMA
Ndesign 80
Surface</td><td colspan="2"><u>Allowed Alone or in Combination</u> [5/ 6/]:

Crushed Gravel
Crystalline Crushed Stone
Crushed Sandstone
Crushed Slag (ACBF)
Crushed Steel Slag

No Limestone.</td></tr>
<tr><td colspan="2"><u>Other Combinations Allowed:</u></td></tr>
</table>

Use	Mixture	Aggregates Allowed	
		Up to...	*With...*
		50% Dolomite[2/]	Any Mixture E aggregate
		75% Dolomite[2/]	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone
		75% Crushed Gravel[2/]	Crushed Sandstone, Crystalline Crushed Stone, Crushed Slag (ACBF), or Crushed Steel Slag
HMA High ESAL	F Surface IL-9.5 SMA Ndesign 80 Surface	<u>Allowed Alone or in Combination</u> [5/ 6/]: Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag No Limestone.	
		<u>Other Combinations Allowed</u>:	
		Up to...	*With...*
		50% Crushed Gravel[2/] or Dolomite[2/]	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone

1/ Crushed steel slag allowed in shoulder surface only.
2/ Carbonate crushed stone (limestone) and/or crushed gravel shall not be used in SMA Ndesign 80.
3/ Crushed concrete will not be permitted in SMA mixes.
4/ Crushed steel slag shall not be used as binder.
5/ When combinations of aggregates are used, the blend percent measurements shall be by volume."
6/ Combining different types of aggregate will not be permitted in SMA Ndesign 80."

TREE ROOT PRESERVATION

Description. This work shall consist of performing supersonic air excavation, examination and selective pruning of root structure, furnishing and placing CA-7, furnishing and placing root aeration matting, and furnishing and placing turf nails.

Work shall be performed by a qualified contractor who has three (3) years of experience performing supersonic air excavation and installing root aeration matting.

All Engineered Barrier work must be done under the direction of a certified arborist with three (3) years of experience with tree root protection projects.

Materials. CA-7 A sample with an indicated source must be supplied to the Engineer for approval prior to its installation. This material shall conform to the standards established in Article 1004.01 of the Standard Specifications, except that the word "limestone" shall be deleted from the first sentence of the (4) Crushed Stone paragraph of Article 1004.01. The use of limestone based coarse aggregates will not be allowed.

Root Aeration Matting (Geocomposite 70-2)
Shall meet the following American Society for Testing and Materials (ASTM) referenced standards;

PROPERTY	TEST METHODS	UNITS	VALUE	QUALIFIER	TEST FREQUENCY
Resin					
•Density	ASTM D 1505	g/cm^3	0.94	MAV	lot
•Melt Flow Index	ASTM D 1238	g/10min	1.0	MAX	lot
Geonet Core					
•Thickness	ASTM D 5199	mil	200	±10%	50,000 sf
•Carbon Black	ASTM D 4218	%	2-3	range	50,000 sf
•Tensile Strength - MD	ASTM D 4595	Lb/ft (kN/m)	40	±10%	50,000 sf
Geotextile					
•U.V. Resistance (500 hrs)	ASTM D 4335	%	70		Per formula
•Serviceability Class	AASHTO M-288		Class 2		
•Grab Tensile	ASTM D 4632	lbs (N)	160 (712)	MARV	100,000 sf
•Grab Elongation	ASTM D 4632	%	50	MARV	100,000 sf
•Tear Strength	ASTM D 4533	lbs (N)	60 (267)	MARV	100,000 sf
•Puncture Resistance	ASTM D 4833	lbs (N)	90 (400)	MARV	100,000 sf
•AOS	ASTM D 4751	US Sieve (mm)	70 (0.212)	Max ARV	500,000 sf
•Permittivity	ASTM D 4491	Sec	1.1	MARV	500,000 sf
Geocomposite					
•Peel Adhesion - MD	ASTM D7005	lb/in (g/in)	1	MAV	100,000 sf

Hydraulic Behavior of Geocomposite

Gradient Load	ASTM D 4716	m^2/sec	10,000 psf	MAV	200,000 sf
0.1			2*10		

Execution.

Supersonic Air Tool (SSAT) Excavation: Shall be performed under the supervision of a certified arborist. The arborist shall inspect the exposed roots and determine and direct which roots should be pruned.

Roots must not be exposed for longer than 6 hours. Contractor is responsible for preventing roots from desiccating.

Placing CA-7 below Root Aeration Mat: Hand place CA-7 between exposed roots. Fill in all voids and hand tamp.

Installation of Geocomposite (Root Aeration Matting): Install root aeration matting as indicated on the details. Extend root aeration matting beyond edges of paved areas and aggregate shoulders to allow for venting.

1. Material Placement

A. The geocomposite roll should be installed in the direction of the slope and in the intended direction of path unless otherwise specified by the ENGINEER.
B. In the presence of wind, the geocomposite shall be weighted down with sandbags or the equivalent. Such sandbags shall be used during placement and remain until replaced with cover material.
C. When applying fill material, no equipment can drive directly across the geocomposite.
D. The specified fill material shall be placed and spread utilizing vehicles with a low ground pressure.
E. The cover material shall be placed in the geocomposite in a manner that prevents damage to the geocomposite. Placement of the cover material shall proceed immediately following the placement and inspection of the geocomposite.

1. Seams and Placement

A. Each component of the geocomposite will be secured or seamed to the like
B. component at overlaps.
C. Geonet Components

i. Adjacent edges of the geonet along the length of the geocomposite roll shall be placed with the edges of each geonet butted against each other.
ii. The overlaps shall be joined by tying the geonet structure with cable ties.
iii. These ties shall be spaced every 5 feet along the roll length.
iv. Adjoining geocomposite rolls (end to end) across the roll width should be shingled down in the direction of the slope, with the geonet portion of the top overlapping the geonet portion of the bottom geocomposite a minimum of 12 inches across the roll width.
v. The geonet core portion should be tied every 6 inches or as specified by the ENGINEER.
vi. Anchor the geocomposite in place using 12-inch turf nails with 1-1/2" washers placed on 3' centers, staggered.

1. Repair

A. Prior to covering the deployed geocomposite, each roll shall be inspected for damage resulting from construction.
B. Any rips, tears, or damaged areas on the deployed geocomposite shall be removed and patched. The patch shall be secured to the original geonet by tying every 6 inches with the approved tying devices. If the area to be repaired is more than 50 percent of the width of the panel, the damaged area shall be cut out and the two portions of the geonet shall be cut out and the two portions of the geonet shall be joined.

Clearing Area and Disposal of Surplus Material. Upon completion of the work, all areas shall be cleared of equipment, debris, and excess material. Surplus or waste material resulting from construction operations shall be disposed of according to Article 202.03 of the Standard Specifications.

Measurement and Payment. This work shall be paid for at the contract price per square yard for TREE ROOT PRESERVATION.

TREE ROOT PRUNING (SPECIAL)

This work shall consist of pruning the tree roots in accordance with Section 201 of the Standard Specifications, with the following modifications:

Description. If construction is to occur within the tree protection zone as defined by the FPDCC Tree Protection and Preservation Manual (TPMM), root pruning will be required. All pruning shall be performed by a professional arborist.

Schedule. When possible, root pruning shall occur in the dormant season. Pruning of Oaks in the growing season is prohibited. Any pruning during the growing season shall require the cut surfaces to be painted with latex paint to prevent the spread of disease. Trees that are indicated for root pruning shall be irrigated prior to, during, and after root pruning.

Inspection. The site shall be inspected for visible aboveground hazards prior to beginning any root management procedure. The location of utilities and other obstructions both below and above ground shall be considered prior to root management operations. Utilities and other obstructions include but are not limited to: gas; electric; communications; sewer; drainage; and, irrigation. Conditions identified that would affect the operation, or are outside of, the scope of work should be reported to the project engineer.

Practices. Root pruning using an approved mechanical root pruning saw or air excavator with a handsaw or chainsaw shall be performed prior to digging where noted on the plans or directed by the Engineer. Whenever roots of plant material to remain are exposed during construction, the damaged root ends are to be removed by cutting them off cleanly with a handsaw, reciprocating saw or chainsaw. Pruning shall be done in the presence of the Engineer.

Roots should be cut with equipment that minimizes cracking the wood and tearing the bark. Root pruning tools shall be selected to meet the objective while minimizing damage to the plant. Wounds to the tree should not be covered, except to manage desiccation or pests. Cuts should result in a smooth surface whenever possible. When treating injured roots, only loose or damaged tissue should be removed.

Heavy equipment should be located outside the root cut line or remain on existing pavement or on a soil-protecting surface.

Temporary staging areas for excavated soil should be located at a safe distance on the side of the trench furthest from the trunk.

Process. Within the tree protection zone remove any sod, coarse woody debris or fresh mulch away from the root collar area. Select tools to avoid root and trunk damage. Repeat until trunk and flare are clear, out to the root collar, where buttress roots divide. Use smaller hand tools, vacuum, or compressed water or air, to complete the excavation for the area that is to be root pruned.

For root cuts on only one side of a tree, the root cut distance shall be no less three times the diameter at breast height.

Roots should be exposed using minimally damaging excavation method prior to pruning. The final cut should result in a flat surface with adjacent bark firmly attached.

Exposed fine roots (2mm or less) that due to the construction activities will remain exposed for periods longer than 24 hours shall be covered with burlap and repeatedly sprayed with water until the landscape restoration occurs.

When the construction process permits and within 24 hours that root pruning operation occurs backfill the root pruning trench with material excavated from the trench or loose screened topsoil and top with 3-4" shredded hardwood bark mulch.

Pruning shall be done in the presence of the Engineer and in such a manner as to preserve the natural growth habit of each plant.

Fertilizing and watering after root pruning shall be as follows.

(1) Fertilizer Nutrients. Fertilizer nutrients shall be applied within 48 hours after root damage occurs. A three (3) month slow-release fertilizer with a 1:1:1 ratio shall be applied at the rate of 5 lb (2 kg) of nutrients per 1000 sq ft (90 sq m).

Application shall be accomplished by placing dry fertilizer in holes in the soil. The holes shall be 8 to 12 in. (200 to 300 mm) deep and spaced 2 ft (600 mm) apart in an area beginning 30 in. (750 mm) from the base of the plant. Holes shall be punched with a punch bar, dug with a spade, drilled with an auger, or any other method approved by the Engineer. Approximately 0.02 lb (10 g) of fertilizer nutrients shall be placed in each hole [250 holes/1000 sq ft (250 holes/90 sq m)].

If the Engineer determines that the hole method of fertilizer placement is not practical or desirable, an approved method of uniform surface application will be allowed.

(2) Supplemental Watering. If there has been less than 0.5" of total rainfall within the two weeks prior to root pruning, supplemental water shall be applied within 48 hours of any root damage. The water shall be applied at the rate of 2 gal/sq yd (9 L/sq m) of surface area within the root zone of plant material having sustained damage to the root zone. Subsequent weekly waterings shall be applied if deemed necessary by the Engineer.

The area within the tree protection zone shall be covered with a 2" layer of shredded hardwood bark mulch. This material will remain place until landscape restoration occurs.

Measurement and Payment. This work will be paid for at the contract unit price per lineal foot for TREE ROOT PRUNING (SPECIAL) which price shall be payment in full for all labor, material, and equipment necessary for the supply, and installation of the planting soil and all incidental work and materials herein specified.

UNAUTHORIZED TREE REMOVAL

The Contractor shall only remove trees approved by the representative from the Forest Preserve District of Cook County (FPDCC).

Should the Contractor remove any tree without the prior approval of FPDCC, the Contractor shall be liable to the FPDCC as defined in the FPDCC Tree Mitigation Plan, not as a penalty but as liquidated and ascertained damages. Such damages may be deducted by the Department from any monies due the Contractor and paid to the Forest Preserve District of Cook County. These damages shall apply during the contract time and during any extensions of the contract time.

WASHOUT BASIN

Description. This item shall consist of constructing and maintaining a washout basin for concrete trucks and other construction vehicles.

Requirements. The work shall include general maintenance and removal of all construction debris.

Basis of Payment. This item will be paid for at the contract unit price per lump sum for WASHOUT BASIN.

WAYFINDING SIGN

Description**.** This work shall consist of constructing a WAYFINDING SIGN as detailed in the plans, as directed by the Engineer, and as specified herein**.**

Requirements. The work shall include the HDPE extruded posts, 1/8" thick aluminum sign panel digitally printed with graffiti guard on both sides, post hole backfilling, limestone screening sign pad, aluminum tee mounting extrusion, and all necessary hardware.

Basis of Payment. This work will be measured and paid for at the contract unit price per each for WAYFINDING SIGN, which price shall be payment in full for all material, labor and any other items required to complete the work.

TRAFFIC SIGNAL GENERAL REQUIREMENTS

Effective: May 22, 2002
Revised: March 25, 2016
800.01TS

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

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

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

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

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

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

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

All material approval requests shall be submitted electronically through the District's SharePoint System unless directed otherwise by the Engineer. Electronic material

submittals shall follow the District's Traffic Operations Construction Submittals guidelines. General requirements include:

1. All material approval requests shall be made prior to or no later than the date of the preconstruction meeting. A list of major traffic signal items can be found in Article 801.05. Material or equipment which is similar or identical shall be the product of the same manufacturer, unless necessary for system continuity. Traffic signal materials and equipment shall bear the U.L. label whenever such labeling is available.
2. Product data and shop drawings shall be assembled by pay item. Only the top sheet of each pay item submittal will be stamped by the Department with the review status, except shop drawings for mast arm pole assemblies and the like will be stamped with the review status on each sheet.
3. Original manufacturer published product data and shop drawing sheets with legible dimensions and details shall be submitted for review.
4. When hard copy submittals are necessary, four complete copies of the manufacturer's descriptive literatures and technical data for the traffic signal materials shall be submitted. For hard copy or electronic submittals, the descriptive literature and technical data shall be adequate for determining whether the materials meet the requirements of the plans and specifications. If the literature contains more than one item, the Contractor shall indicate which item or items will be furnished.
5. When hard copy submittals are necessary for structural elements, four complete copies of the shop drawings for the mast arm assemblies and poles, and the combination mast arm assemblies and poles showing, in detail, the fabrication thereof and the certified mill analyses of the materials used in the fabrication, anchor rods, and reinforcing materials shall be submitted.
6. Partial or incomplete submittals will be returned without review.
7. Certain non-standard mast arm poles and special structural elements will require additional review from IDOT's Central Office. Examples include ornamental/decorative, non-standard length mast arm pole assemblies and monotube structures. The Contractor shall account for the additional review time in his schedule.
8. The contract number or permit number, project location/limits and corresponding pay code number must be on each sheet of correspondence, catalog cuts and mast arm poles and assemblies drawings.
9. Where certifications and/or warranties are specified, the information submitted for approval shall include certifications and warranties. Certifications involving inspections, and/or tests of material shall be complete with all test data, dates, and times.
10. After the Engineer reviews the submittals for conformance with the design concept of the project, the Engineer will stamp the drawings indicating their status as 'Approved', 'Approved-As-Noted', 'Disapproved', or 'Incomplete'. Since the Engineer's review is for conformance with the design concept only, it is the Contractor's responsibility to coordinate the various items into a working

system as specified. The Contractor shall not be relieved from responsibility for errors or omissions in the shop, working, layout drawings, or other documents by the Department's approval thereof. The Contractor must still be in full compliance with contract and specification requirements.

11. The Contractor shall secure approved materials in a timely manner to assure construction schedules are not delayed.
12. All submitted items reviewed and marked 'APPROVED AS NOTED', 'DISAPPROVED', or 'INCOMPLETE' are to be resubmitted in their entirety, unless otherwise indicated within the submittal comments, with a disposition of previous comments to verify contract compliance at no additional cost to the contract.
13. Exceptions to and deviations from the requirements of the Contract Documents will not be allowed. It is the Contractor's responsibility to note any deviations from Contract requirements at the time of submittal and to make any requests for deviations in writing to the Engineer. In general, substitutions will not be acceptable. Requests for substitutions must demonstrate that the proposed substitution is superior to the material or equipment required by the Contract Documents. No exceptions, deviations or substitutions will be permitted without the approval of the Engineer.
14. Contractor shall not order major equipment such as mast arm assemblies prior to Engineer approval of the Contractor marked proposed traffic signal equipment locations to assure proper placement of contract required traffic signal displays, push buttons and other facilities. Field adjustments may require changes in proposed mast arm length and other coordination.

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

Add the following to Article 801.09 of the Standard Specifications:

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

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

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

Maintenance and Responsibility.

Revise Article 801.11 of the Standard Specifications to read:

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

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

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

d. When the project has a pay item for "Maintenance of Existing Traffic Signal Installation," "Temporary Traffic Signal Installation(s)" and/or "Maintenance of Existing Flashing Beacon Installation," the Contractor must notify both the Area Traffic Signal Maintenance and Operations Engineer at (847) 705-4424 and the Department's Electrical Maintenance Contractor, of their intent to begin any physical construction work on the Contract or any portion thereof. This notification must be made a minimum of seven (7) working days prior to the start of construction to allow sufficient time for inspection of the existing traffic signal installation(s) and transfer of maintenance to the Contractor. The Department will attempt to full-fill the Contractor's inspection date request(s), however workload and other conditions may prevent the Department from accommodating specific dates or times. The Contractor shall not be entitled to any other compensation if the requested inspection date(s) cannot be scheduled by the Department.

If work is started prior to an inspection, maintenance of the traffic signal installation(s) will be transferred to the Contractor without an inspection. The Contractor will become responsible for repairing or replacing all equipment that is not operating properly or is damaged at no cost to the owner of the traffic signal. Final repairs or replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection otherwise the traffic signal installation will not be accepted.

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

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

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

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

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

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

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

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

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

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

It is the intent to have all electric work completed and equipment field tested by the Equipment Supplier prior to the Department's "turn-on" field inspection. If in the event the Engineer determines work is not complete and the inspection will require

more than two (2) hours to complete, the inspection shall be canceled and the Contractor will be required to reschedule at another date. The maintenance of the traffic signals will not be accepted until all punch list work is corrected and re-inspected.

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

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

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

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

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

Approvals shall be submitted prior to traffic signal turn-on for review by the Department as described here-in.

Final Project Documentation:

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

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

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

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

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

Record Drawings.

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

> “When the work is complete, and seven days before the request for a final inspection, the reduced-size set of contract drawings, stamped “RECORD DRAWINGS”, shall be submitted to the Engineer for review and approval and shall be stamped with the date and the signature of the Contractor’s supervising Engineer or electrician. The record drawings shall be submitted in PDF format on CDROM as well as hardcopy for review and approval. If the contract consists of multiple intersections, each intersection shall be saved as an individual PDF file with TS# and location name in its file name.
>
> In addition to the record drawings, copies of the final catalog cuts which have been Approved or Approved as Noted shall be submitted in PDF format along with the record drawings. The PDF files shall clearly indicate the pay item either by filename or PDF Table of Contents referencing the respective pay item number for multi-item PDF files. Specific part or model numbers of items which have been selected shall be clearly visible.”

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

Add the following to Article 801.16 of the Standard Specifications:

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

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

Datum to be used shall be North American 1983.

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

- File shall be named: TSXXX-YY-MM-DD (i.e. TS22157_15-01-01)
- Each intersection shall have its own file
- Row 1 should have the location name (i.e. IL 31 @ Klausen)
- Row 2 is blank
- Row 3 is the headers for the columns
- Row 4 starts the data
- Column A (Date) – should be in the following format: MM/DD/YYYY
- Column B (Item) – as shown in the table below
- Column C (Description) – as shown in the table below
- Column D and E (GPS Data) – should be in decimal form, per the IDOT special provisions

Examples:

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

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

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

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

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

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

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

IDOT traffic signal facilities are not part of any of the one-call locating service such as J.U.L.I.E or Digger. If this Contract requires the services of an Electrical

Contractor, the Contractor shall be responsible at his/her own expense for locating existing IDOT electrical facilities prior to performing any work. If this Contract does not require the services of an Electrical Contractor, the Contractor may request one free locate for existing IDOT electrical facilities from the District One Electrical Maintenance Contractor prior to the start of any work. Additional requests may be at the expense of the Contractor. The location of underground traffic facilities does not relieve the Contractor of their responsibility to repair any facilities damaged during construction at their expense.

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

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

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

Bagging Signal Heads.

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

RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM

Effective: May 22, 2002
Revised: July 1, 2015
800.03TS

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

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

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

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

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

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

instructed to wait until the conditions return to normal or to follow specific instructions regarding the optimization.

(a) LEVEL I Re-Optimization

1. The following tasks are associated with LEVEL I Re-Optimization.
   a. Appropriate signal timings shall be developed for the subject intersection and existing timings shall be utilized for the rest of the intersections in the system.
   b. Proposed signal timing plan for the modified intersection(s) shall be forwarded to IDOT for review prior to implementation.
   c. Consultant shall conduct on-site implementation of the timings at the turn-on and make fine-tuning adjustments to the timings of the subject intersection in the field to alleviate observed adverse operating conditions and to enhance operations. The consultant shall respond to IDOT comments and public complaints for a minimum period of 60 days from date of timing plan implementation.

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

(b) LEVEL II Re-Optimization

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

2. The following deliverables shall be provided for LEVEL II Re-Optimization.

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

Basis of Payment.

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

GROUNDING OF IDOT 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. This work shall be in accordance with IDOT's District One Traffic Signal Design Details.

The grounding electrode system shall include a ground rod installed with each traffic signal controller concrete foundation and all mast arm and post concrete foundations. An additional ground rod will be required at locations were measured resistance exceeds 25 ohms. Ground rods are included in the applicable concrete foundation or service installation pay item and will not be paid for separately.

Testing shall be according to Article 801.13 (a) (4) and (5).

(a) The grounded conductor (neutral conductor) shall be white color coded. This conductor shall be bonded to the equipment grounding conductor only at the Electric Service Installation. All power cables shall include one neutral conductor of the same size.

(b) The equipment grounding conductor shall be green color coded. The following is in addition to Article 801.04 of the Standard Specifications.

1. Equipment grounding conductors shall be bonded to the grounded conductor (neutral conductor) only at the Electric Service Installation. The equipment grounding conductor is paid for separately and shall be continuous. The Earth shall not be used as the equipment grounding conductor.

2. Equipment grounding conductors shall be bonded, using a UL Listed grounding connector, to all traffic signal mast arm poles, traffic signal posts, pedestrian posts, pull boxes, handhole frames and covers, conduits, and other metallic enclosures throughout the traffic signal wiring system, except where noted herein. Bonding shall be made with a splice and pigtail connection, using a sized compression type copper sleeve, sealant tape, and heat-shrinkable cap. A UL listed electrical joint compound shall be applied to all conductors' terminations, connector threads and contact points. Conduit grounding bushings shall be installed at all conduit terminations including spare or empty conduits.

3. All metallic and non-metallic raceways shall have a continuous equipment grounding conductor, except raceways containing only detector loop lead-in

circuits, circuits under 50 volts and/or fiber optic cable will not be required to include an equipment grounding conductor.

4. Individual conductor splices in handholes shall be soldered and sealed with heat shrink. When necessary to maintain effective equipment grounding, a full cable heat shrink shall be provided over individual conductor heat shrinks.

(c) The grounding electrode conductor shall be similar to the equipment grounding conductor in color coding (green) and size. The grounding electrode conductor is used to connect the ground rod to the equipment grounding conductor and is bonded to ground rods via exothermic welding, UL listed pressure connectors, and UL listed clamps .

UNDERGROUND CONDUIT, GALVANIZED STEEL

Revise Article 810.04 of the Standard Specifications to read:

> "Installation. All underground conduits shall have a minimum depth of 30-inches (700 mm) below the finished grade."

Add the following to Article 810.04 of the Standard Specifications:

> "All metal conduit installed underground shall be Rigid Steel Conduit unless otherwise indicated on the plans."

Add the following to Article 810.04 of the Standard Specifications:

> "All raceways which extend outside of a structure or duct bank but are not terminated in a cabinet, junction box, pull box, handhole, post, pole, or pedestal shall extend a minimum or 300 mm (12") or the length shown on the plans beyond the structure or duct bank. The end of this extension shall be capped and sealed with a cap designed for the conduit to be capped.
>
> The ends of rigid metal conduit to be capped shall be threaded, the threads protected with full galvanizing, and capped with a threaded galvanized steel cap.
>
> The ends of rigid nonmetallic conduit and coilable nonmetallic conduit shall be capped with a rigid PVC cap of not less than 3 mm (0.125") thick. The cap shall be sealed to the conduit using a room-temperature-vulcanizing (RTV) sealant compatible with the material of both the cap and the conduit. A washer or similar metal ring shall be glued to the inside center of the cap with epoxy, and the pull cord shall be tied to this ring."

MAINTENANCE OF EXISTING TRAFFIC SIGNAL and flashing beacon INSTALLATION

Effective: May 22, 2002
Revised: July 1, 2015
850.01TS

General.

1. Full maintenance responsibility shall start as soon as the Contractor begins any physical work on the Contract or any portion thereof. If Contract work is started prior to a traffic signal inspection, maintenance of the traffic signal installation(s) will be transferred to the Contractor without an inspection.

2. The Contractor shall have electricians with IMSA Level II certification on staff to provide signal maintenance. A copy of the certification shall be immediately available upon request of the Engineer.

3. This item shall include maintenance of all traffic signal equipment and other connected and related equipment such as flashing beacons, emergency vehicle pre-emption equipment, master controllers, uninterruptable power supply (UPS and batteries), PTZ cameras, vehicle detection, handholes, lighted signs, telephone service installations, communication cables, conduits to adjacent intersections, and other traffic signal equipment.

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

5. Maintenance shall not include Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, or peripheral equipment. This equipment is operated and maintained by the local municipality and should be de-activated while on contractor maintenance.

6. The energy charges for the operation of the traffic signal installation shall be paid for by the Contractor.

Maintenance.

1. The Contractor shall check all controllers every two (2) weeks, which will include visually inspecting all timing intervals, relays, detectors, and pre-emption equipment to ensure that they are functioning properly. The Contractor shall check signal system communications and phone lines to assure proper operation. This item includes, as routine maintenance, all portions of emergency vehicle pre-emption equipment. The Contractor shall maintain in stock at all times a sufficient amount of materials and equipment to

provide effective temporary and permanent repairs. Prior to the traffic signal maintenance transfer, the contractor shall supply a detailed maintenance schedule that includes dates, locations, names of electricians providing the required checks and inspections along with any other information requested by the Engineer.

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

3. The Contractor shall provide immediate corrective action when any part or parts of the system fail to function properly. Two far side heads facing each approach shall be considered the minimum acceptable signal operation pending permanent repairs. When repairs at a signalized intersection require that the controller be disconnected or otherwise removed from normal operation, and power is available, the Contractor shall place the traffic signal installation on flashing operation. The signals shall flash RED for all directions unless a different indication has been specified by the Engineer. The Contractor shall be required to place stop signs (R1-1-36) at each approach of the intersection as a temporary means of regulating traffic. When the signals operate in flash, the Contractor shall furnish and equip all their vehicles assigned to the maintenance of traffic signal installations with a sufficient number of stop signs as specified herein. The Contractor shall maintain a sufficient number of spare stop signs in stock at all times to replace stop signs which may be damaged or stolen.

4. The Contractor shall provide the Engineer with 2 (two) 24 hour telephone numbers for the maintenance of the traffic signal installation and for emergency calls by the Engineer.

5. Traffic signal equipment which is lost or not returned to the Department for any reason shall be replaced with new equipment meeting the requirements of the Standard Specifications and these special provisions.

6. The Contractor shall respond to all emergency calls from the Department or others within one (1) hour after notification and provide immediate corrective action. When equipment has been damaged or becomes faulty beyond repair, the Contractor shall replace it with new and identical equipment. The cost of furnishing and installing the replaced equipment shall be borne by the Contractor at no additional charge to the contract. The Contractor may institute action to recover damages from a responsible third party. If at any time the

Contractor fails to perform all work as specified herein to keep the traffic signal installation in proper operating condition or if the Engineer cannot contact the Contractor's designated personnel, the Engineer shall have the State's Electrical Maintenance Contractor perform the maintenance work. The Contractor shall be responsible for all of the State's Electrical Maintenance Contractor's costs and liquidated damages of $1000 per day per occurrence. The State's Electrical Maintenance Contractor shall bill the Contractor for the total cost of the work. The Contractor shall pay this bill within thirty (30) days of the date of receipt of the invoice or the cost of such work will be deducted from the amount due the Contractor. The Contractor shall allow the Electrical Maintenance Contractor to make reviews of the Existing Traffic Signal Installation that has been transferred to the Contractor for Maintenance.

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

8. Equipment included in this item that is damaged or not operating properly from any cause shall be replaced with new equipment meeting current District One traffic signal specifications and provided by the Contractor at no additional cost to the Contract and/or owner of the traffic signal system, all as approved by the Engineer. Final replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection otherwise the traffic signal installation will not be accepted. Cable splices outside the controller cabinet shall not be allowed.

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

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

11. The Contractor shall maintain the traffic signal in normal operation during short or long term loss of utility or battery back-up power at critical locations designated by the Engineer. Critical locations may include traffic signals interconnected to railroad warning devices, expressway ramps, intersection

with an SRA route, critical corridors or other locations identified by the Engineer. Temporary power to the traffic signal must meet applicable NEC and OSHA guidelines and may include portable generators and/or replacement batteries. Temporary power to critical locations shall not be paid for separately but shall be included in the contract.

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

Basis of Payment.

This work will be paid for at the contract unit price per each for MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION. Each intersection will be paid for separately. Maintenance of a standalone and or not connected flashing beacon shall be paid for at the contract unit price for MAINTENANCE OF EXISITNG FLASHING BEACON INSTALLATION. Each flashing beacon will be paid for separately.

PEDESTRIAN SIGNAL POST

Effective: January 1, 2020
Revised:
875.02TS

Description.

This work shall consist of furnishing and installing a metal pedestrian signal post. All installations shall meet the requirements of the "District One Standard Traffic Signal Design Details".

Materials.

a. General. The pedestrian signal post shall be designed to support the traffic signal loading shown on the plans. The design and fabrication shall be according to the Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, as published by AASHTO.

b. Post. The post shall be made of steel or aluminum and have an outside diameter of 4 1/2 in. The post shall be threaded for assembly to the base. Aluminum posts shall be according to the specifications for Schedule 80 aluminum pipe. Steel posts shall be according to the specifications for Schedule 40 steel pipe.

c. Base. The base of a steel post shall be cast iron. The base of an aluminum post shall be aluminum. The base shall be threaded for the attachment to the threaded post. The base shall be approximately 10 in. high and 6 3/4 in. square at the bottom. The bottom of the base shall be designed to accept four 5/8 in. diameter anchor rods evenly spaced in a 6 in. diameter circle. The base shall be true to pattern, with sharp clean cutting ornamentation, and equipped with access doors for cable handling. The door shall be fastened to the base with stainless steel screws. A grounding lug shall be provided inside the base.

d. Anchor Rods. The anchor rods shall be 5/8 in. in diameter and 16 in. long and shall be according to Article 1006.09. The anchor rods shall be threaded approximately 6 in. at one end and have a bend at the other end. The first 12 in. at the threaded end shall be galvanized. One each galvanized nut and trapezoidal washer shall be furnished with each anchor rod. The washer shall be properly sized to fully engage and sit flush on all sides of the slot of the base plate.

   The aluminum post and base shall be drilled at the third points around the diameter and 1/4 in. by 2 in. stainless steel bolts shall be inserted to prevent the post from turning and wobbling.

e. Finish. The steel post, steel post cap and the cast iron base shall be hot-dipped galvanized according to AASHTO M 111. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with 851.01TS TRAFFIC SIGNAL PAINTING Special Provisions. If the post and the base are threaded after the galvanization, the bare exposed metal shall be

immediately cleaned to remove all cutting solvents and oils, and then spray painted with two coats of an approved galvanized paint.

The aluminum post shall have a natural finish, 100 grit or finer.

Installation.

The pedestrian signal post shall be erected plumb, securely bolted to a concrete foundation, and grounded to a ground rod according to the details shown on the plans. No more than 3/4 in. of the post threads shall protrude above the base.

A post cap shall be furnished and installed on the top of the post. The post cap shall match the material of the post. The Contractor shall apply an anti-seize paste compound on all nuts and bolts prior to assembly.

Prior to the assembly, the Contractor shall apply two additional coats of galvanized paint on the threads of the post and the base. The Contractor shall use a fabric post tightener to screw the post to the base.

Basis of Payment.

This work will be paid for at the contract unit price per each for PEDESTRIAN SIGNAL POST, of the length specified.

CONCRETE FOUNDATION, TYPE A

Add the following to Article 878.03 of the Standard Specifications:

All anchor bolts shall be according to Article 1006.09, with all anchor bolts hot dipped galvanized a minimum of 12 in. at the threaded end.

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

Add the following to the first paragraph of Article 878.05 of the Standard Specifications:

The concrete apron in front of the cabinet and UPS shall be included in this pay item.

CONCRETE FOUNDATION, PEDESTRIAN POST

Effective: April 1, 2019
Revised: November 1, 2020
878.03TS

This item shall follow Section 878. Traffic Signal Concrete Foundation of the Standard Specifications.

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

Basis of Payment.
This work will be paid for at the contract unit price per foot of depth of CONCRETE FOUNDATION, TYPE A 12-INCH DIAMETER.

LIGHT EMITTING DIODE (LED) PEDESTRIAN SIGNAL HEAD

Effective: May 22, 2002
Revised: July 1, 2015
881.01TS

Add the following to the third paragraph of Article 881.03 of the Standard Specifications:

No mixing of different types of pedestrian traffic signals or displays will be permitted.

Add the following to Article 881.03 of the Standard Specifications:

(a) Pedestrian Countdown Signal Heads.

(1) Pedestrian Countdown Signal Heads shall not be installed at signalized intersections where traffic signals and railroad warning devices are interconnected.

(2) Pedestrian Countdown Signal Heads shall be 16 inch (406mm) x 18 inch (457mm), for single units with glossy yellow or black polycarbonate housings. All pedestrian head housings shall be the same color (yellow or black) at the intersection. For new signalized intersections and existing signalized intersections where all pedestrian heads are being replaced, the proposed head housings shall be black. Where only selected heads are being replaced, the proposed head housing color (yellow or black) shall match existing head housings. Connecting hardware and mounting brackets shall be polycarbonate (black). A corrosion resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints, and shall be visible to the inspector at the signal turn-on.

(3) Each pedestrian signal LED module shall be fully MUTCD compliant and shall consist of double overlay message combining full LED symbols of an Upraised Hand and a Walking Person. “Egg Crate” type sun shields are not permitted. Numerals shall measure 9 inches (229mm) in height and easily identified from a distance of 120 feet (36.6m).

Materials.
Add the following to Article 1078.02 of the Standard Specifications:

General.

1. The module shall operate in one mode: Clearance Cycle Countdown Mode Only. The countdown module shall display actual controller programmed clearance cycle and shall start counting when the flashing clearance signal turns on and shall countdown to “0” and turn off when the steady Upraised Hand (symbolizing Don’t

Walk) signal turns on. Module shall not have user accessible switches or controls for modification of cycle.

2. At power on, the module shall enter a single automatic learning cycle. During the automatic learning cycle, the countdown display shall remain dark.

3. The module shall re-program itself if it detects any increase or decrease of Pedestrian Timing. The counting unit will go blank once a change is detected and then take one complete pedestrian cycle (with no counter during this cycle) to adjust its buffer timer.

4. If the controller preempts during the Walking Person (symbolizing Walk), the countdown will follow the controller's directions and will adjust from Walking Person to flashing Upraised Hand. It will start to count down during the flashing Upraised Hand.

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

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

7. If the controller output displays Upraised Hand steady condition and the unit has not arrived to zero or if both the Upraised Hand and Walking Person are dark for some reason, the unit suspends any timing and the digits will go dark.

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

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

10. The LED module shall meet the requirements of the Institute of Transportation Engineers (ITE) LED purchase specification, “Pedestrian Traffic Control Signal Indications - Part 2: LED Pedestrian Traffic Signal Modules,” or applicable successor ITE specifications, except as modified herein.

11. The LED modules shall provide constant light output under power. Modules with dimming capabilities shall have the option disabled or set on a non-dimming operation.

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

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

14. The individual LEDs shall be wired such that a catastrophic loss or the failure of one or more LED will not result in the loss of the entire module.

Basis of Payment.
Add the following to the first paragraph of Article 881.04 of the Standard Specifications:

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

Add the following to Article 881.04 of the Standard Specifications:

If the work consists of retrofitting an existing polycarbonate pedestrian signal head and pedestrian countdown signal head with light emitting diodes (LEDs), it will be paid for as a PEDESTRIAN SIGNAL HEAD, LED, RETROFIT, of the type specified, and of the particular kind of material, when specified. Price shall be payment in full for furnishing the equipment described above including LED modules, all mounting hardware, and installing them in satisfactory operating condition.

REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT

Effective: May 22, 2002
Revised: July 1, 2015
895.02TS

Add the following to Article 895.05 of the Standard Specifications:

The traffic signal equipment which is to be removed and is to become the property of the Contractor shall be disposed of outside the right-of-way at the Contractor's expense.

All equipment to be returned to the State shall be delivered by the Contractor to the State's Traffic Signal Maintenance Contractor's main facility. The Contractor shall contact the State's Electrical Maintenance Contractor to schedule an appointment to deliver the equipment. No equipment will be accepted without a prior appointment. All equipment shall be delivered within 30 days of removing it from the traffic signal installation. The Contractor shall provide one hard copy and one electronic file of a list of equipment that is to remain the property of the State, including model and serial numbers, where applicable. The Contractor shall also provide a copy of the Contract plan or special provision showing the quantities and type of equipment. Controllers and peripheral equipment from the same location shall be boxed together (equipment from different locations may not be mixed) and all boxes and controller cabinets shall be clearly marked or labeled with the location from which they were removed. If equipment is not returned according to these requirements, it will be rejected by the State's Electrical Maintenance Contractor. The Contractor shall be responsible for the condition of the traffic signal equipment from the time Contractor takes maintenance of the signal installation until the acceptance of a receipt drawn by the State's Electrical Maintenance Contractor indicating the items have been returned in good condition.

The Contractor shall safely store and arrange for pick up or delivery of all equipment to be returned to agencies other than the State. The Contractor shall package the equipment and provide all necessary documentation as stated above.

Traffic signal equipment which is lost or not returned to the Department for any reason shall be replaced with new equipment meeting the requirements of these Specifications at no cost to the contract.

DRILL EXISTING HANDHOLE

1. **DESCRIPTION.** This work will consist of drilling a hole in an existing handhole or manhole for the installation of a new conduit. This item must meet the requirements of Article 879 of the Standard Specifications.

2. **CONSTRUCTION.** The size of the hole must be as close as possible to the size of the conduit to be installed. The conduit must be installed in the drilled hole with a bushing before the hole is grouted. The conduit will be covered by a separate item. The space between the conduit and the handhole or manhole wall must be caulked with a waterproof grout. Drawing 814 provides additional information.

3. **METHOD OF MEASUREMENT.** This work will be measured per each hole drilled.

4. **BASIS OF PAYMENT.** This work will be paid for at the contract unit price each for DRILL EXISTING HANDHOLE, which price will be payment in full for drilling the hole, grouting, and any additional work required to accomplish this task.

DRAWING 814

HEAVY-DUTY HANDHOLE (SPECIAL)

DESCRIPTION. This item is for supplying and installing an electrical handhole 36" in diameter with a 24" frame and lid in a parkway or sidewalk.

MATERIAL. The frame and lid must meet the requirements of Material Specification 1458. The handhole must meet the requirements of Material Specification 1528. A 24" frame and lid must also meet the requirements of Standard Drawing 872. Bricks must meet the requirements of Article 1041 of the Standard Specifications. All other materials used must meet the appropriate material requirements of the Standard Specifications.

METHOD OF CONSTRUCTION. The handhole will be a precast concrete structure, or, if conditions merit, a cast in place concrete structure, complete with cast iron frame and cover, and conforming in detail with either Drawing Number 867, Drawing Number 866, or Drawing 871, except that the number of conduit openings must be as shown on the construction plans.

Each handhole must be installed at the location specified on the plans or at the location identified by the Resident Engineer.

The area where the handhole is to be placed must be properly excavated. All disposable material must be properly disposed of per Section 202.03 of the Standard Specifications. Each handhole must be set or constructed on a foundation of loose stone not less than eight inches (8") deep. The frame casting must be accurately set on a full bed of mortar to the finished elevation so that no subsequent adjustment will be necessary. It is desirable not to use a neck for the frame. However, if approved by the Resident Engineer, mortar and brick, or mortar and concrete rings, may be used to adjust to the proper grade. Adjustment rings, bricks, and frames must be set in a full mortar bed. Use of partial bricks will not be allowed. Bricks must be laid in full header courses only. Mortar must be mixed in a proportion of one (1) part of cement to three (3) parts sand by volume of dry materials. After entering laterals have been installed in place in the handhole, the openings in the wall must be plugged in an approved manner flush with the inner surface. If backfill is required, screenings must be used and properly compacted. Parkway must be restored to the proper grade. Pavement must be properly restored to the correct grade. Patching of the pavement must be done with high early strength concrete meeting the requirements of Articles 1001 and 1020 of the Standard Specifications. Sidewalks must be restored to the proper grade using a 5 inch thickness of concrete. The inside of the handhole must be clean of all debris.

METHOD OF MEASUREMENT. This item will be paid for at the contract unit price per each unit installed.

BASIS OF PAYMENT. The necessary excavation, backfilling and restoration of parkway and pavement must be made in accordance with the foregoing specifications, and the cost thereof must be included in the unit price each for installing HEAVY-DUTY HANDHOLE (SPECIAL). No additional payment will be allowed for restoring parkway or sidewalk.

MATERIAL SPECIFICATION	DRAWING
1458	866 872
1528	

MANHOLE, ELECTRIC, 3'X4'X4' WITH 24" FRAME AND LID

DESCRIPTION. This item will consist of furnishing and installing an electrical manhole of the dimensions indicated with a 24" frame and lid.

MATERIAL. The concrete manhole must meet the applicable requirements of Material Specification 1528. The frame and lid must meet the requirements of Material Specification 1458. A 24" frame and lid must meet the requirements of Standard Drawing 872. Bricks must meet the requirements of Article 1041 of the Standard Specifications. All other materials used must meet the appropriate material requirements of the Standard Specifications.

METHOD OF CONSTRUCTION. The manhole will be a precast concrete structure, or, if conditions merit, a cast in place concrete structure, complete with cast iron frame and lid. A 3'X4'X4' manhole with a 24" frame and lid must conform to the requirements of Drawing 730. The number and size of conduit openings will be as shown on the construction plans.

Each manhole will be installed in paved sidewalk, earth parkway, or in pavement at the location specified on the construction plans or at a location as directed by the Resident Engineer.

The area where the manhole is to be placed must be properly excavated. All disposable material will be properly disposed of per Section 202.03 of the Standard Specifications. Each manhole must be set or constructed to conform with the appropriate City of Chicago drawings, except that the number and size of conduit openings will be in accordance with the construction plans. The frame casting must be accurately set on a full bed of mortar to the finished elevation so that no subsequent adjustment will be necessary. Mortar and brick, or mortar and concrete rings, may be used to adjust to the proper grade. Adjustment rings, bricks, and frames must be set in a full mortar bed. Use of partial bricks will not be allowed. Bricks must be laid in full header courses only. In no instance will the neck of the manhole exceed two (2) feet in height. Mortar will be mixed in a proportion of one (1) part cement to three (3) parts sand by volume of dry materials. After entering laterals have been installed in place in the manhole, the openings in the wall must be plugged in an approved manner flush with the inner surface. If backfill is required, screenings must be used and properly compacted. Parkway must be restored to the proper grade. Pavement must be restored to the correct grade. Patching of the pavement must be done with high early strength concrete meeting the requirements of Articles 1001 and 1020 of the Standard Specifications. Sidewalks must be restored to the proper grade using a 5 inch thickness of concrete. The inside of the manhole must be clean of all debris.

Replacing Handhole with Manhole. When a present handhole is to be replaced with a new manhole, the handhole must be broken down and all debris removed. This will be paid for as a separate pay item. The present laterals and cables must be maintained during breakdown of a present handhole and construction of a new manhole. Present laterals must be cut back to terminate at a distance from the inner face of the new manhole wall, as directed by the Resident Engineer. The cost of cutting back the present laterals will be included in the cost of the new manhole. New laterals terminating in the manhole must be included in the cost of installing new lateral. The new manhole must be installed in accordance with the appropriate City of Chicago drawings. All other work associated with this replacement will be considered incidental to this pay item.

METHOD OF MEASUREMENT. This item will be measured per each unit installed.

BASIS OF PAYMENT. The unit price for installing manholes will include necessary excavation, backfilling and restoration of parkway and pavement in accordance with the foregoing specifications. No additional payment will be allowed for restoring parkway or the restoration of sidewalk or pavement. Removal of sidewalk or pavement will be covered by separate pay items. New conduit, if necessary, will also be paid for separately. The unit cost will be for complete installation for each unit for MANHOLE, ELECTRIC 3'X 4'X 4' WITH 24" FRAME AND LID.

MATERIAL SPECIFICATION		DRAWING	
1458	1528	730	872

CONCRETE FOUNDATION (SPECIAL)

DESCRIPTION. This item will be for all work necessary for installing a foundation for a “Super P” cabinet.

MATERIAL. Concrete will be Portland cement concrete, SI Class, meeting the requirements of Article 1020 of the Standard Specifications. Ground rods will meet the requirements of Material Specification 1465. Conduit will be PVC meeting the requirements of Material Specification 1533. Anchor rods will meet the applicable requirements of Material Specification 1467.

CONSTRUCTION. The Contractor will install a concrete foundation for a base mounted traffic signal controller cabinet, as shown on City of Chicago Drawing Number 888 for a “P” cabinet, or as shown on Drawing 888A for a “Super P” cabinet. Work under this item will be performed in accordance with Article 800 of the Standard Specifications.

The foundation will have a minimum depth of at least forty inches (40") below grade and must have large radius conduit elbows in quantity, size and type shown. The elbow ends above ground will be capped with standard conduit bushings. The ground rod will be installed adjacent to the foundation, and will be driven straight down with the top to be no higher than 30 inches below finished grade. The Contractor will furnish anchor bolts, hardware, conduit elbows, and all other material shown on the foundation construction drawing.

All excavation and restoration of parkway will be considered as part of this item. If the foundation is in sidewalk, an expansion joint will be required between the sidewalk and the foundation.

METHOD OF MEASUREMENT. This work will be measured PER FOOT for each foundation installed.

BASIS OF PAYMENT. Unit price will include cost of all material and labor required to install this foundation, as per applicable construction plans and these specifications. The conduit elbows will be considered as part of the foundation and will not be paid for as a separate item or as part of the conduit laterals leading to the foundation. All necessary excavation and restoration of parkway to the original condition will be included in the unit price. However, any restoration of sidewalk will be considered as part of this item, including any expansion joint between the sidewalk and the foundation. This work will be paid for at the Contract Unit Price PER FOOT for CONCRETE FOUNDATION (SPECIAL).

MATERIAL SPECIFICATION	DRAWING
1465	888
1467	888A
1533	

CONCRETE FOUNDATION, 20" DIAMETER

DESCRIPTION. This foundation will be for structural support of a traffic signal post, or other pedestal mounted equipment. The foundation must be poured in place and must be 20" in diameter, with a 13" bolt circle, 3/4" diameter anchor rods, and must be 5 feet in depth.

MATERIAL. Concrete must be Portland cement concrete meeting the requirements of Article 1020 of the Standard Specifications for SI Class concrete. Anchor rods must meet the requirements of Material Specification 1467 and the ground rod must meet the requirements of Material Specification 1465. Conduit must be PVC meeting the requirements of Material Specification 1533.

CONSTRUCTION. Foundations must conform to Drawing Number 709. Top surface of these foundations will be at an elevation of two inches (2") above grade or as required by the Resident Engineer. Care must be taken to install a level foundation and to ensure adequate anchor rod projections for double-nut installation. The foundation top must be chamfered 3/4 of an inch. The foundation must be centered back from the face of the curb in accordance with dimensions shown on the construction plans. When the foundation is in a solid sidewalk area, the foundation must be installed level, with the height of the foundation as close to the height of the sidewalk as possible, or as directed by the Engineer. A proper expansion joint must be installed between the sidewalk and the foundation.

Foundation raceways must consist of large radius conduit elbow(s) in quantity, size and type specified on Drawing 709 or as indicated on the construction plans. Elbows, in excess of those shown on Drawing 709, will be paid for separately under an additional pay item. The elbow ends above ground must be capped with standard conduit bushings. The Contractor must furnish anchor rods, hardware, conduit elbow(s) and all other material shown on applicable foundation construction drawings. Depth of foundation will be as noted on Drawing 709.

The anchor rods will be set by means of a metal template which must be submitted for approval before any foundation work is begun. The template must hold the rods vertical, and in proper position.

All excavation and restoration of parkway will be considered as part of this item. If the foundation is in sidewalk, an expansion joint will be required between the sidewalk and the foundation.

METHOD OF MEASUREMENT. The measurement will be based on each foundation installed complete.

BASIS OF PAYMENT. Payment will be made for foundations installed in place including an elbow in accordance with construction plans and these specifications. All necessary excavation and restoration of parkway, or sidewalk and expansion joint will be included in the unit price. This work will be paid for at the contract unit price per lineal foot, as designated in the contract, for CONCRETE FOUNDATION, 20" DIAMETER.

MATERIAL SPECIFICATION			DRAWING		
1465	1467	1533	709	844	11825

CONCRETE FOUNDATION, 24" DIAMETER, 1 1/4" ANCHOR RODS, 15" BOLT CIRCLE, 9 FEET

DESCRIPTION. The foundation will be a poured in place concrete structure used for structurally supporting traffic signal poles.

MATERIAL. Concrete must be Portland cement concrete meeting the requirements of Article 1020 of the Standard Specifications for SI Class concrete. Reinforcement bars must meet the requirements of Section 1006.10 of the Standard Specifications. Anchor rods must meet the requirements of Material Specification 1467 and the ground rod must meet the requirements of Material Specification 1465. Conduit elbows must be PVC conduit meeting the requirements of Material Specification 1533.

CONSTRUCTION. Every foundation will be installed at the location designated and in the manner herein specified or in special cases as specifically directed. The contractor will locate foundations as per plan or as directed by the Resident Engineer. A hole must be augured for placement of the concrete form.

This item is a foundation for a traffic pole which can accommodate a 16, 20, or 26 foot monotube arm (Standard Drawing 818).

Top surface of these foundations in parkway will be at an elevation of two inches (2") above grade or as required by the Engineer. Care must be taken to install a level foundation and to ensure adequate anchor rod projections for double-nut installation. The foundations must be centered back from the face of the curb in accordance with dimensions shown on the construction plans. Foundation raceways must consist of large radius conduit elbow(s) in quantity, size and type as specified on the corresponding standard drawing or in the construction plans. Any number of elbows in excess of the number shown on the standard drawing must be paid for under a separate pay item. The elbow ends above ground will be capped with standard conduit bushings. The Contractor must furnish anchor rods, a ground rod, hardware, conduit elbow(s) and all other material shown on applicable foundation construction drawings. Depth of foundation will be as shown on the appropriate drawing. The foundation top must be chamfered 3/4 of an inch. When the foundation is installed in a sidewalk, the foundation must be installed level, with the height of the foundation as close to the height of the sidewalk as possible, or as directed by the Engineer. A proper expansion joint will be installed between the sidewalk and the foundation.

Anchor rods must be set in accordance with applicable construction plans so that when poles are mounted on the foundations, the street lighting mast arm will be properly oriented as indicated on the construction plans. The anchor rods will be set by means of a metal template which shall be submitted for approval before any

foundation work is begun. The template must hold the rods vertical, and in proper position. Anchor rods must conform in all respects to the appropriate City drawing.

METHOD OF MEASUREMENT. This item will be measured per each foundation installed complete.

BASIS OF PAYMENT. Payment will be made for foundations installed in place, including elbows, in accordance with construction drawings, constructions plans and these specifications. All necessary excavation and restoration of pavement, sidewalk and fill to their original conditions will be included in the unit price. This work will be paid for at the contract unit price per EACH for CONCRETE FOUNDATION, 24" DIAMETER, 1 ¼" ANCHOR RODS, 15" BOLT CIRCLE, 9 FEET.

MATERIAL SPECIFICATION	DRAWING		
1465	806	837	818
1467	811	937	11825
1533	817	844	

CONCRETE FOUNDATION, 30" DIAMETER

DESCRIPTION. The foundation will be a poured in place concrete structure used for structurally supporting traffic signal poles.

MATERIAL. Concrete must be Portland cement concrete meeting the requirements of Article 1020 of the Standard Specifications for SI Class concrete. Reinforcement bars must meet the requirements of Section 1006.10 of the Standard Specifications. Anchor rods must meet the requirements of Material Specification 1467 and the ground rod must meet the requirements of Material Specification 1465. Conduit elbows must be PVC conduit meeting the requirements of Material Specification 1533.

CONSTRUCTION. Every foundation will be installed at the location designated and in the manner herein specified or in special cases as specifically directed. The contractor will locate foundations as per plan or as directed by the Resident Engineer. A hole must be augured for placement of the concrete form.

This item is a foundation for a traffic pole which can accommodate a 35, 40, or 44 foot monotube arm (Standard Drawing 817).

Top surface of these foundations in parkway will be at an elevation of two inches (2") above grade or as required by the Engineer. Care must be taken to install a level foundation and to ensure adequate anchor rod projections for double-nut installation. The foundations must be centered back from the face of the curb in accordance with dimensions shown on the construction plans. Foundation raceways must consist of large radius conduit elbow(s) in quantity, size and type as specified on the corresponding standard drawing or in the construction plans. Any number of elbows in excess of the number shown on the standard drawing must be paid for under a separate pay item. The elbow ends above ground will be capped with standard conduit bushings. The Contractor must furnish anchor rods, a ground rod, hardware, conduit elbow(s) and all other material shown on applicable foundation construction drawings. Depth of foundation will be as shown on the appropriate drawing. The foundation top must be chamfered 3/4 of an inch. When the foundation is installed in a sidewalk, the foundation must be installed level, with the height of the foundation as close to the height of the sidewalk as possible, or as directed by the Engineer. A proper expansion joint will be installed between the sidewalk and the foundation.

Anchor rods must be set in accordance with applicable construction plans so that when poles are mounted on the foundations, the street lighting mast arm will be properly oriented as indicated on the construction plans. The anchor rods will be set by means of a metal template which shall be submitted for approval before any foundation work is begun. The template must hold the rods vertical, and in proper position. Anchor rods must conform in all respects to the appropriate City drawing.

METHOD OF MEASUREMENT. This item will be measured per FOOT of foundation installed complete.

BASIS OF PAYMENT. Payment will be made for foundations installed in place, including elbows, in accordance with construction drawings, constructions plans and these specifications. All necessary excavation and restoration of pavement, sidewalk and fill to their original conditions will be included in the unit price. This work will be paid for at the contract unit price per lineal foot for CONCRETE FOUNDATION, 30" DIAMETER.

MATERIAL SPECIFICATION	DRAWING		
1465	806	837	818
1467	811	937	11825
1533	817	844	

STEEL POLE, TYPE 1

DESCRIPTION. This item will consist of furnishing, installing, and setting plumb a steel anchor base pole to which equipment may be attached for the extension of the City street light and traffic signal systems. This item will be a steel pole, anchor base, 34'-6" height, 3 gage, 10" diameter and 15" bolt circle suitable for attaching mast arms of 16 ft, 20 ft, or 26 ft per CDOT drawing 808.

MATERIAL. The material of the pole must meet the requirements of Material Specification 1447.

INSTALLATION. The pole must be installed on the concrete foundation designed for the particular pole usage as indicated on the plans or as directed by the Engineer. Double nut construction must be used as shown on Drawing 837. Double nut construction provides the proper ventilation, as well as providing a way to plumb the pole. Any exposed portions of anchor rods extending above the nuts which interfere with the installation of the bolt covers must be cut off to provide the necessary clearance. The excess must not be burned off. The pole must be set secure, properly orientated, and plumb using the nuts and washers provided with the anchor bolts. The bolt covers, handhole cover, and pole cap must be securely attached.

The contractor will utilize non-abrasive slinging materials and will otherwise exercise due care in erecting the pole and mast arm to minimize any possible damage to the finish. When necessary, the contractor will utilize, at his own expense, factory approved touch-up materials and methods to restore the finish to like new appearance and durability.

METHOD OF MEASUREMENT. This item will be measured per each unit installed, complete with anchor bolt covers, pole cap, and handhole cover.

BASIS OF PAYMENT. This work will be paid for at the Contract unit price each for a STEEL POLE, TYPE 1, which will be payment in full for furnishing and installing the pole complete in place. Light standard foundations, mast arms, and luminaires will not be included in this pay item but will be paid for separately.

MATERIAL SPECIFICATION	DRAWING
1447	837 827
	808

STEEL POLE, TYPE 2

DESCRIPTION. This item will consist of furnishing, installing, and setting plumb a steel anchor base pole to which equipment may be attached for the extension of the City street light and traffic signal systems. This item will be a steel pole, anchor base, 34'-6" height, 3 gage, 12 ½" diameter and 16 ½ " bolt circle suitable for attaching mast arms of 35 ft, 40 ft, or 44 ft per CDOT drawing 827.

MATERIAL. The material of the pole must meet the requirements of Material Specification 1447.

INSTALLATION. The pole must be installed on the concrete foundation designed for the particular pole usage as indicated on the plans or as directed by the Engineer. Double nut construction must be used as shown on Drawing 837. Double nut construction provides the proper ventilation, as well as providing a way to plumb the pole. Any exposed portions of anchor rods extending above the nuts which interfere with the installation of the bolt covers must be cut off to provide the necessary clearance. The excess must not be burned off. The pole must be set secure, properly orientated, and plumb using the nuts and washers provided with the anchor bolts. The bolt covers, handhole cover, and pole cap must be securely attached.

The contractor will utilize non-abrasive slinging materials and will otherwise exercise due care in erecting the pole and mast arm to minimize any possible damage to the finish. When necessary, the contractor will utilize, at his own expense, factory approved touch-up materials and methods to restore the finish to like new appearance and durability.

METHOD OF MEASUREMENT. This item will be measured per each unit installed, complete with anchor bolt covers, pole cap, and handhole cover.

BASIS OF PAYMENT. This work will be paid for at the Contract unit price each for a STEEL POLE, TYPE 2, which will be payment in full for furnishing and installing the pole complete in place. Light standard foundations, mast arms, and luminaires will not be included in this pay item but will be paid for separately.

MATERIAL SPECIFICATION	DRAWING
1447	837 827 808

SERVICE CONNECTION TO CECO LINE

DESCRIPTION. This work will consist of providing a service connection from City cable to a Commonwealth Edison secondary cable. For an aerial service, this will be on a wood pole. For an underground service, this will be in a CECO manhole.

INSTALLATION. This work will consist of splicing or terminating City service cable to a Commonwealth Edison secondary cable, as directed by the Engineer. The contractor must obtain permission from Edison for the service at the required location. The contractor will inform Edison of the load required. Edison will make the connections, unless Edison gives the contractor permission to make the connections. Any costs associated with the connection will be borne by the contractor.

METHOD OF MEASUREMENT. The service connection will be counted as one unit, and will include all labor and material needed to make a successful service connection.

BASIS OF PAYMENT. This work will be paid for at the contract unit price for each SERVICE CONNECTION TO CECO LINE, which payment will be in full for providing all material and labor to make the necessary connections.

DRAWING
11925

SIGNAL HEAD, POLYCARBONATE, LED, 1-FACE, 3-SECTION, BRACKET MOUNTED

SIGNAL HEAD, POLYCARBONATE, LED, 1-FACE, 5-SECTION, BRACKET MOUNTED

DESCRIPTION. This item will consist of furnishing and installing a traffic signal head or combination of heads on a street light pole, a traffic signal pole, or a traffic signal post as shown on the plans, as specified herein, or as directed by the Engineer. Specific installations and configurations are shown on Drawing Numbers 834 and 835, entitled "Standard Traffic Signal Mounting Details".

The type of installation will be as indicated on the plans. The number of signal faces, the number of signal sections in each signal face, any dual-indication sections, and the method of mounting will be as indicated in the plans and in the standard drawings.

Each signal face must be pointed in the direction of the approaching traffic that it is to control and must be aimed to have maximum effectiveness for an approaching driver located at a distance from the stop line equal to the normal distance traversed while stopping.

During construction and until the installation is placed in operation, all signal faces must be hooded. The hooding material must be securely fastened so it will not be disturbed by normal inclement weather or wind.

MATERIAL. The traffic signal must meet the requirements of Material Specification 1493 for LED signals. The mounting brackets must meet the requirements of Material Specification 1495.

INSTALLATION. The signals must be mounted using pole mounting brackets banded to the pole with two strips of 3/4" stainless steel banding single wrapped, one at the top and one at the bottom of the brackets, each secured with a stainless steel banding clip. The banding and clips will be coated with a baked-on black finish. The mounting configuration connecting the signals to the mounting bracket must consist polycarbonate brackets specifically made for mounting signal heads to the side of poles, to create the designated structure. When the signals are to be mounted on a square pole or flat surface, the bracket used will be bolted to the flat pole or surface using 3/8" drive studs where permissible or using a 3/8" studs in a tapped hole.

The bottom mounting bracket must be accurately located to cover an opening 1" in diameter, for cable entrance, drilled into the pole or standard at a calculated height to position the bottom signal face at a standard height of 10 feet, or a height indicated on the plans. The opening must be reamed or filed to remove all sharp edges or burrs which might damage cable during installation, or through vibration when the signals are in operation.

Cable. The Contractor must provide and install a length of 8/C #16 AWG, as per Specification 1475, flexible electrical cord, medium duty, of sufficient length to extend without strain or stress from the terminal strip in the "Green" section of the signal head to the terminal strip in the junction box mounted on the pole. The number of conductors in the cord, and the color coding of the conductors, must be sufficient to match the requirements of the signal head being installed, and must be connected in accordance with Specification 1493. Both ends of the cable length must be carefully stripped of six inches (6") of jacket and one inch (1") of insulation, and each conductor properly tinned. The service cable from the signal heads must enter the pole through the bottom mounting bracket and enter the long sweep elbow to terminate by attachment to the terminal strip in the junction box in accordance with connector schematic, Bureau of Electricity Drawing Number 12268-A

METHOD OF MEASUREMENT. This work will be measured per each unit installed, complete.

BASIS OF PAYMENT. This work will be paid for at the contract unit price for each for SIGNAL HEAD, POLYCARBONATE, LED, 1-FACE, X-SECTION, BRACKET MOUNTED, which price will be payment in full for furnishing and installing the signal head complete, including all necessary wiring.

MATERIAL SPECIFICATION	DRAWING
1475	834 12268a
1493	835 740
1495	741

SIGNAL HEAD, POLYCARBONATE, LED, 1-FACE, 3-SECTION, MAST ARM MOUNTED

SIGNAL HEAD, POLYCARBONATE, LED, 1-FACE, 5-SECTION, MAST ARM MOUNTED

DESCRIPTION. This item will consist of furnishing and installing a traffic signal head on a traffic signal monotube mast arm, as shown on the plans, as specified herein, or as directed by the Engineer. Specific installations and configurations are shown on Drawing 834 entitled "Standard Traffic Signal Mounting Details".

Each signal face must be pointed in the direction of the approaching traffic that it is to control and must be aimed to have maximum effectiveness for an approaching driver at a distance from the stop equal line to the normal distance traversed while stopping. The optically programmed signal face must be programmed in accordance with the visibility requirements of the Traffic Engineer.

During construction, and until the installation is placed in operation, all signal faces must be hooded. The hooding material must be securely fastened so it will not be disturbed by normal inclement weather or wind.

MATERIAL. The traffic signal head construction must meet the requirements of Material Specification 1493 for LED traffic signals. The material for a programmed LED traffic signal head must meet the Material Specification 1543. The mast arm bracket must meet the requirements of Material Specification 1463. The cable must meet the requirements of Material Specification 1475.

INSTALLATION. The signal must be mounted on the mast arm at the position indicated on the drawing in the manner shown on Drawing 834. The bracket must be banded to the mast arm with the 5/8" banding as shown on Drawing Number 834. The banding and clips must have a baked-on black finish. The bracket must be located over a hole drilled into the mast arm for the installation of cable. The hole must be reamed or filed to remove any sharp edges or burrs which might damage cable during installation, or through vibration when the signals are in operation.

Cable. The contractor must provide and install a length of 8/C #16 flexible electrical cord, of sufficient length to extend without strain or stress from the terminal strip in the "Green" section of the signal head to the terminal strip in the junction box mounted on the pole. The number of conductors in the cord, and the color coding of the conductors, must be sufficient to match the requirements of the signal head being installed, and must be connected in accordance with Material Specification 1493 for LED traffic signals, or

Material Specification 1543 for optically programmed LED traffic signals. Both ends of the cable length must be carefully stripped of six inches (6") of jacket and one inch (1") of insulation, and each conductor properly tinned. The service cable from the signal heads must enter the traffic signal mast arm through the hole from the mounting bracket, whence it will continue and enter the pole through the hole for mast arm wiring, then extend downward through the pole to enter the long sweep elbow to terminate by attachment to the terminal strip in the junction box in accordance with the terminal strip connector schematic, Bureau of Electricity Drawing Number 12268-A.

The mast arm brackets must be painted gloss black or another color as indicated in the plans.

METHOD OF MEASMUREMENT. This work will be measured per each signal unit installed, completely wired and operational.

BASIS OF PAYMENT. This work will be paid for at the contract unit price each for SIGNAL HEAD, POLYCARBONATE, LED, 1-FACE, X-SECTION, MAST ARM MOUNTED of the type specified which price will be payment in full for furnishing and installing the signal head complete.

MATERIAL SPECIFICATION		DRAWING
1463	1543	834
1475		12268A
1493		

PEDESTRIAN SIGNAL HEAD, POLYCARBONATE, LED, 1-FACE, BRACKET MOUNTED WITH COUNT DOWN TIMER

DESCRIPTION. This item will consist of furnishing and installing a pedestrian signal on a street light pole, a traffic signal pole or a traffic signal post as shown on the plans, as specified herein, or as directed by the Engineer. The signal may be installed as a single unit on a pole or in combination with other pedestrian signals or with traffic signals of various types and sizes. Specific installations and configurations are shown on Drawing Numbers 834 and 835 entitled "Standard Traffic Signal Mounting Details".

The method of mounting will be indicated on the plans, or as directed by the engineer. Each signal face must be pointed in the direction of the marked cross-walk area for the pedestrians it is intended to control.

MATERIAL. The pedestrian signal head material must be consistent with the requirements of Bureau of Electricity Material Specification 1494. The countdown pedestrian signal must meet the requirements of Material Specification 1545. All housing units must be made of polycarbonate. The light source must be LED. Mounting hardware must meet the requirements of Material Specification 1495. Cable must meet the requirements of Material Specification 1475.

INSTALLATION. The signal must be mounted using pole mounting brackets banded to the pole with two strips of 3/4" stainless steel banding, single wrapped, one at the top and one at the bottom of the bracket, each secured with a stainless steel banding clip. The banding and clips must have a baked-on black finish. The mounting configuration connecting the signals to the mounting bracket must consist of polycarbonate brackets specifically made for mounting signal heads to the side of poles, to create the designated structure.

The bottom mounting bracket must be accurately located to cover a hole 1" in diameter for the cable entrance drilled into the pole at a height calculated to position the bottom signal face at a standard height of 10 feet, or a height indicated on the plans. The hole must be reamed or filed to remove all sharp edges or burrs which might damage cable during installation, or through vibration when the signals are in operation.

When the pedestrian signal is attached below a traffic signal head, the separate opening for cable may be omitted to eliminate additional weakening of the pole and the pedestrian signal cord will be installed using the same opening as the traffic signal cord.

Cable. The Contractor must provide and install a length of 8/C #16 AWG flexible electric cord, of sufficient length to extend without strain or stress from the terminal strip in the signal head to the terminal strip in the junction box mounted on the pole. The number of conductors in the cord, and the color coding of the conductors, must be sufficient to match the requirements of the signal head being installed, and must be so connected in accordance with Material Specification 1494. Both ends of the cable must be carefully stripped of six inches (6") of jacket and one inch (1") of insulation, and each conductor properly tinned. The service cord from the signal head must enter the pole through the bottom mounting bracket and enter the long sweep elbow to terminate by attachment to the terminal strip in accordance with the terminal strip connector schematic, Bureau of Electricity Drawing Number 12268-A.

During construction and until the installation is placed in operation, all signal faces must be hooded. The hooding material must be securely fastened so it will not be disturbed by inclement weather or wind

METHOD OF MEASUREMENT. This work will be measured per each signal unit installed, completely wired and operational.

BASIS OF PAYMENT. This work will be paid for at the contract unit price each for PEDESTRIAN SIGNAL HEAD, POLYCARBONATE, LED, 1 FACE, BRACKET MOUNTED WITH COUNT DOWN TIMER, which price will be payment in full for furnishing and installing the signal head complete.

MATERIAL SPECIFICATION		DRAWING	
1494	1545	12268-A	
1495		740	834
1475		741	835

ACCESSIBLE PEDESTRIAN SIGNALS (SPECIAL)

Revised: 5/25/2019
Material Specifications: 1617, 1618
Standard Drawings: none

DESCRIPTION. This work shall consist of furnishing and installing an accessible pedestrian signal (APS) to be mounted on a traffic signal pole or post.

MATERIAL. The APS must meet the requirements of Material Specification 1617. Cable for the APS must meet the requirements of Material Specification 1618.

INSTALLATION. The location of the APS shall be as shown on the plans or as directed by the Engineer and shall meet the requirements of the MUTCD Chapter 4, Sections 4E.08 to 4E.10.

The power supply shall be installed in the associated WALK/DONT WALK signal head compartment and be securely attached. The input wires to the power supply must be terminated to the correct terminals in the signal head. The output wires of the power supply shall be connected to the APS cable with quick disconnect plugs. The APS cable shall be properly terminated at the APS.

The APS cable is the four-conductor cable that will connect the power supply to the APS. The cable length will vary depending upon the relative location of the APS to its associated WALK/DONT WALK signal head. Care must be taken to ensure the correct wires are connected to the correct terminals. In all cases, the white wire will be the neutral and the green wire will be the ground. The cable should have sufficient slack so that there is no tension in the cable and there is enough extra cable to make or break connections easily. If the cable goes through a manhole/handhole, it must be trained along the sides.

The APS shall be located as indicated on the plans. A three-quarter inch (3/4”) to one inch (1”) diameter hole must be drilled into the pole at the proper height for the cable entrance. The size of the hole will be as directed by the Engineer. The hole must be reamed or filed to remove all sharp edges or burrs which might damage the cable. A weatherproof flexible caulking must be applied between the hole in the pole and the APS housing to protect the cable. The APS bracket shall be attached to the pole with 3/4" steel banding or with two stainless steel screws. The APS shall be attached to the bracket with two stainless steel screws. The height of the push-button shall be 42" above the sidewalk grade where the pedestrian will be located when at the APS, according to ADA requirements. The front face of the APS shall be parallel to the associated crosswalk. The tactile arrow shall be positioned to point toward the crosswalk.

The APS shall be programmed following the manufacturer's instructions. The sound levels and any vocal messages must be programmed as indicated on the plans or as directed by the Engineer.

A sign shall be mounted to the back-plate of the APS. The sign size and message shall be as indicated on the plans or as directed by the Engineer.

METHOD OF MEASUREMENT. This work shall be measured per unit for each APS installed. This shall include the installation of the power supply, the installation of the APS, all wiring, providing and installing the sign, all programming, and any other necessary items and labor necessary to make the APS operational.

BASIS OF PAYMENT. This work shall be paid for at the contract unit price each for ACCESSIBLE PEDESTRIAN SIGNALS (SPECIAL) of the type specified, which price will be payment in full for furnishing and installing the unit complete and operational.

JUNCTION BOX, POLE OR POST MOUNTED

DESCRIPTION. This item will consist of furnishing and installing a Junction Box on each traffic signal post, traffic signal pole, or street light pole on which a signal head is mounted, as shown on the plans, specified herein, or directed by the Engineer.

MATERIAL. The Junction Box must conform to the requirements of Material Specification Number 1407 and to Drawing Number 954. The box will contain a 20 conductor terminal strip, securely fastened to an aluminum channel. Two Number 10 stainless steel machine screws will be used to mount the channel to the junction box.

INSTALLATION. The junction box must be mounted to the side of the pole away from the roadway, or as directed by the Engineer. The center of the box must be located approximately fifty-eight inches (58") above the adjacent sidewalk. Two long sweep elbows must be attached to the box, one to the top and one to the bottom, unless otherwise directed by the Engineer. Each will be attached with four (4) #10-24x3/4" stainless steel screws. The lower long sweep elbow will be properly positioned over a hole 1 1/2 inches in diameter drilled in the pole approximately 48" above the sidewalk, for the installation of cable. Another 1 1/2 inch hole must be drilled for the upper elbow. The holes must be reamed or filed to remove all sharp edges or burrs which might damage cable during installation, or through vibration when the signals are in operation. A stainless steel, banding bracket, Drawing Number 11984, must be attached to the center of the back of the box with a 5/16"-18 x 1" stainless steel machine screw. The entire unit must be banded to the pole with five (5) 3/4" stainless steel bands, one through the banding bracket and one each at the top and bottom of each elbow. The banding and clips must have a baked-on black finish.

METHOD OF MEASUREMENT. This work will be measured per each junction box unit installed, complete with elbow(s).

BASIS OF PAYMENT. This work will be paid for at the contract unit price each for a JUNCTION BOX, POLE OR POST MOUNTED, which price will be payment in full for furnishing and installing the junction box complete with its component parts and appurtenances. Connection of cables and wires to the terminal strip will not be part of the cost of the junction box but will be considered part of the installation of the underground cable and the installation of signal heads.

MATERIAL SPECIFICATION	DRAWING
1407	954 834
	11984

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MAST ARM, STEEL, MONOTUBE, 35 FOOT

MAST ARM, STEEL, MONOTUBE, 40 FOOT

DESCRIPTION. This item will consist of furnishing and installing a steel, monotube, mast arm for the purpose of supporting traffic signals, and/or illuminated signs on an anchor base pole at the locations shown on the plans, or as specified or directed by the Commissioner. The length of the mast arm and the angular orientation of the arm relative to the centerline of the roadway will be as indicated on the plans.

A mast arm must be installed only on a 3 gauge pole, and the length of the mast arm will govern the minimum base diameter of the pole on which the arm is to be installed, in accordance with the following chart:

MAST ARM LENGTH (feet)	POLE BASE DIAMETER (inches)
35	12.5
40	12.5

MATERIAL. The mast arm must be 7gauge steel meeting the requirements of Standard Drawing 870 and Material Specification 1454.

INSTALLATION. The mast arm must be mounted on the pole at the height specified on Drawing 834, or at a different height if specified on the plans, or as directed by the Engineer. A one inch (1") diameter opening for the installation of cable must be field drilled in the pole in line with the orientation of the mast arm. The hole must be reamed or filed to remove all sharp edges or burrs which might damage cable during installation, or through vibration when the signals are in operation. A neoprene grommet must be inserted into the finished hole prior to the installation of the cable.

Two holes must be field drilled in the pole at 180 degrees relative to the orientation of the pole for installation of locator shear pins, provided with the back plate, to prevent rotation of the mast arm. These holes must be drilled after the mast arm is in place in order that the position of the holes will match the location of the locator bushings attached to the back half of the clamp.
RE
All signals, signs, and electrical equipment must be attached in the correct relative position to the mast arm, with service cord in place, prepared to be installed on the pole, prior to the attachment of the mast arm to the pole. The installation of the cord in the pole must be coordinated with the attachment of the mast arm to the pole. The clamp bolts must be

tightened securely so that there is no slippage of the mast arm either upward or downward to exert a vertical force on the shear pins. The end cap must be secured in place with the attachment screws provided.

The mast arm must be delivered completely finished with a factory applied black powder coat per Material Specification 1454. The contractor must utilize non-abrasive slinging materials and must otherwise exercise due care in erecting the pole and mast arm to prevent any damage to the finish.

METHOD OF MEASUREMENT. This work will be measured per each monotube arm installed on a traffic pole.

BASIS OF PAYMENT. This work will be paid for at the contract unit price for each MAST ARM, STEEL, MONOTUBE of the length indicated, and will be payment in full for furnishing and installing a steel mast arm in place, complete. Attachment of signals and signs will not be part of this pay item.

MATERIAL	DRAWING
1454	870
	834

TRAFFIC SIGNAL POST, ALUMINUM 17 FT

DESCRIPTION. This item will consist of furnishing and installing an aluminum post, for supporting a traffic signal, upon a concrete foundation, at the location shown on the plans, as specified herein, or as directed by the Engineer. The post installation itself must be consistent in construction to the post shown on Drawing Number 526 for the installation of a post for a traffic signal.

MATERIALS. The material of the post must meet the requirements of Material Specification 1385 and of Standard Drawing Number 526.

INSTALLATION. The post and base must be mounted on the foundation so that the handhole faces away from the curb. The nuts on the foundation must be tightened to secure the post to the foundation such that there is no space separating the post from the foundation. There must be no double nutting. The post must be plumb; the use of shims will not be permitted. The post cap must be secured by three 5/16-18 X3/4" hex head stainless steel set screws.

The height of the post will be as indicated on the plans.

METHOD OF MEASUREMENT. This work will be measured per each unit installed on a foundation, complete with bolt covers, handhole door, base casting, aluminum pipe, and post cap.

BASIS OF PAYMENT. This work will be paid for at the contract unit price each for a TRAFFIC SIGNAL POST, ALUMINUM 17 FT. which will be payment in full for furnishing and installing the post complete in place.

MATERIAL SPECIFICATION	DRAWING
1385	526

ELECTRIC CABLE IN CONDUIT, SERVICE, NO. 4, 2/C

ELECTRIC CABLE IN CONDUIT, SIGNAL, NO. 14 19/C

ELECTRIC CABLE IN CONDUIT, SIGNAL NO.18 4C

DESCRIPTION.

This work will consist of furnishing and installing electric cable for traffic signals of the type, size and number of conductors as specified on the plans. The cable will be rated 600 volts and comply with the following requirements.

TRAFFIC SIGNAL CABLE.

All cable must conform to the requirements of Material Specification number 1537, for Traffic Signal Cable.

INSTALLATION.

All cable must be installed in conduit, as indicated on the plans, with care to prevent damage to the insulation or cable. Suitable devices must be used in pulling the cable, and only approved lubricants should be used. All cables installed in conduit will be from the power source to the traffic signal controller cabinet, from the traffic controller cabinet to the traffic signal junction box, or from junction box to junction box. For cable terminating in a traffic signal controller cabinet or traffic signal junction box the following procedures must be followed:

a. Controllers.

1. Remove thirty six inches (36") of neoprene jacket.

2. Wrap vinyl electrical tape on two inches (2") of the neoprene jacket and two inches (2") on the exposed conductors.

3. Remove one inch (1") of insulation and scrape copper conductor.

4. Train cables neatly along the base and back of cabinet.

5. Connect conductors to proper terminal lugs.

b. Traffic Signal Junction Box.

1. Remove twenty four inches (24") of neoprene jacket.

2. Wrap vinyl electrical tape on two inches (2") of neoprene jacket and two inches (2") on the exposed conductors.

3. Remove one inch (1") of insulation and scrape copper conductor.

4. Train cables neatly along the side and back of the box.

5. Connect all conductors to terminal strip.

CABLE SLACK.

The length of cable slack that must be provided will be in accordance with the following schedule:

Location	Length of Slack Cable (feet)
Base of Controller	7
Detector, Junction Box	1
Base of Traffic Signal Post or Traffic Signal Pole	4
City Handhole	6
City Manhole	12
Commonwealth Edison Manhole	25

Cable slack in manholes/handholes must be trained and racked in the holes. If racks are non-existent, racks must be provided, and considered incidental and a part of this pay item.

No cable splices will be allowed for traffic signal cable, with the exception of 7 conductor interconnect cable. These splices must be indicated on the plans.

METHOD OF MEASUREMENT.

The length of measurement must be the distance horizontally measured between changes in direction, and will include cable slack. All vertical cables will not be measured for payment.

BASIS OF PAYMENT.

This work will be paid for at the contract unit price per lineal foot for ELECTRIC CABLE IN CONDUIT, SERVICE, NO. 4 2 C, ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 14 19/C, or ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 18 4C. This price will be payment in full for furnishing, installing, connecting, splicing, and testing of cable, and will include all labor, materials, equipment, tools, and incidentals necessary to complete the work, as specified herein, and as shown on the plans.

MATERIAL SPECIFICATION
1537

REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT, SPECIAL

_____

DESCRIPTION. This work will consist of removing all the existing traffic signal equipment at the intersections listed on the plans.

REMOVAL. The items to be removed will include traffic signal arms, traffic signal poles, traffic signal heads, traffic signal controllers, and all associated equipment and cable.

The traffic signal items, except for traffic signal cable, are to remain the property of the City of Chicago. The Contractor must deliver the obsolete traffic signal equipment to Division of Electrical Operations (DEO) yard at 2451 South Ashland Avenue, or as directed by the Engineer. Twenty-four-hour advance notice is necessary before delivery. The traffic signal cable must be removed and become the property of the Contractor and must be disposed of by him, outside the right of way, at his sole expense.

The Contractor must provide three (3) copies of a list of equipment that is to remain the property of the City, including model and serial numbers where applicable. He must also provide a copy of the contract plan, or special provisions, showing the quantities and type of equipment. The Contractor will be responsible for the condition of the traffic control equipment from the time of removal until its acceptance by a receipt drawn by the City indicating that the items have been returned.

METHOD OF MEASUREMENT. This item will be measured as one unit per project contract, or per signalized intersection, depending upon the contract conditions. The breaking down of foundations and manholes will not be considered part of this item.

BASIS OF PAYMENT. This work will be paid for at the contract lump sum price for REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT, or lump sum per intersection depending upon the contract conditions. This price will be payment in full for removing the equipment and disposing of it as required. The salvage value of the cable retained by the Contractor must be reflected in this contract lump sum price.

October 19, 2020

CABLE, SPECIAL

DESCRIPTION. This item will consist of furnishing and installing traffic signal harness cable, #16 8/C in traffic signal poles to connect traffic signals or illuminated signs to a junction box on the pole.

MATERIAL. The cable must meet the requirements of Material Specification 1475.

INSTALLATION. The contractor must install the cable from the required signal or sign terminal strip through the pole and mast arm to the terminal strip in the junction box. The contractor must properly terminate the cable at the terminal strips as directed by the Engineer. Sufficient cable will be provided so as not to unduly strain the cable during installation, and to provide sufficient cable for easy termination.

METHOD OF MEASUREMENT. This work will be measured per lineal foot of cable installed. Cable terminations will be considered incidental to this pay item.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per lineal foot for CABLE SPECIAL, which payment will be in full for furnishing and installing the cable.

FULL ACTUATED CONTROLLER AND TYPE SUPER P CABINET (SPECIAL)

DESCRIPTION. This work will consist of furnishing and installing an Advanced Transportation Controller (ATC) with a battery powered back-up system and associated equipment in a cabinet onto a foundation and making all necessary connections.

MATERIAL. The material must meet the requirements of Material Specification 1560, "Advanced Transportation Controller and Cabinet with Uninterruptible Power Supply". The cabinet will be a Super P cabinet 16 load bays. Each load bay must include a load switch. A battery powered uninterruptible power supply (UPS) system must be included. Communications interface equipment, if required, will be included under a separate item.

PROCUREMENT. The contractor must provide Request for Inspection of Material forms for traffic signal controllers and cabinets as requested for specific projects. The Division of Electrical Operations will review and comment on the submitted material. The Division of Electrical Operations will approve the purchase of the material from a supplier. Final material approval will be made in accordance with Chicago Department of Transportation specifications. The Contractor must provide proof of purchase to the Resident Engineer within seven (7) days following approval by the Division of Electrical Operations. Payment will be withheld in accordance with the terms and conditions of this contract, until such time that the Commissioner determines the requirements are met.

The controllers and cabinets are to be delivered to the Division of Electrical Operations within ninety (90) days of purchase. If the controllers and cabinets are not delivered, payment will be withheld until such time that the controllers and cabinets are delivered.

The Division of Electrical Operations will notify the Contractor when the material has been inspected and approved. If a railroad interconnect is involved, a representative from the Illinois Commerce Commission will also need to review and inspect the controller at the Division's facilities. Within forty-eight (48) hours of notification, the Contractor must pick-up the controllers and cabinets from the Division. The controllers and cabinets will be stored at a facility, approved by the Commissioner, at the contractor's expense.

INSTALLATION. The controller will be programmed to provide the sequencing and timing of operation as shown on the plans. The controller must be enclosed in a housing and installed in a completely wired cabinet. The model and serial numbers of the controller must be affixed on the front of the controller housing and be readily visible.

The cabinet must be set onto a pad foundation designed specifically for the cabinet, and affixed with bolts provided with the foundation. Electric cables inside the cabinet must be neatly trained along the base and back of the cabinet. Each conductor used must be connected individually to the proper terminal, and the spare conductors must be insulated and bound into a neat bundle. Each cable must be marked with suitable identification and recorded on a copy of the plans for the intersection and submitted to the Engineer. Signal indications for each direction must be wired to a separate circuit whether or not the signal plans call for a split movement. The absolute zero for time coordination will be set in the field by City personnel after obtaining the appropriate City time-tone reference.

When properly installed, all signals will be connected and controlled by the controller, and the sequencing and timing of the signals will be as set forth in the plans.

All conduit entrances into the cabinet must be sealed with a pliable waterproof material to restrict moisture entrance into the cabinet.

Division of Electrical Operations and Division of Safety personnel from the Chicago Department of Transportation must be present during the cutover to the new control equipment. If a railroad interconnect is part of the signal project, a representative from the Illinois Commerce Commission must be invited to be present for the cutover.

BASIS OF PAYMENT. This work will be paid for at the contract unit price for each FULL-ACTUATED CONTROLLER AND TYPE SUPER P CABINET (SPECIAL), which price will be payment in full for furnishing and installing the controller cabinet and UPS system complete and operational, with all wiring and connections as specified.

MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION (SPECIAL)

DESCRIPTION. This work will consist of maintaining an existing traffic signal installation that has been designated to remain in operation during construction of the new traffic signals. If during the course of construction it becomes necessary to use temporary aerial cable to keep the intersection functioning, this work will be performed at no additional cost. However, the need for temporary traffic signals and controllers will be paid for under separate items, as shown on the plans or as directed by the Engineer.

MAINTENANCE PROCEDURES. Before taking over maintenance of the existing traffic signal installation, the Contractor must arrange to make an inspection with the Engineer to determine if any corrective action needs to be done, and to mutually agree on a date for transferring maintenance. The contractor should normally begin maintaining the existing traffic signals as soon as he begins any work at the site.

The contractor will be responsible for maintaining the traffic signal installation in proper operating condition. The contractor must perform the maintenance procedures as outlined in Section 802.07 of the Standard Specifications.

The traffic controller must be maintained as outlined in Section 850.03 of the Standard Specifications.

METHOD OF MEASUREMENT. This work will be measured by EACH intersection. The time frame will begin at the mutually agreed date for taking over maintenance. The time frame will end upon the issuance of a Signal Acceptance Notice from the Engineer. Before such notice is given, a final inspection must be performed with the contractor, the Engineer, and a representative from the Chicago Department of Transportation.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per intersection for MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION (SPECIAL), which payment will be in full for maintaining the traffic signals during construction activities. If for any reason the contractor fails to properly maintain the traffic installation, leading to and requiring a response from the City maintenance forces, the cost of such a response will be charged to the contractor.

STREET SIGN COMPLETE

DESCRIPTION. This item will consist of furnishing, fabricating, and installing a street name sign on a traffic pole with a monotube arm as indicated on the plans, or as directed by the Engineer. The plans will indicate the location of the sign and the sign legend. The sign panel and associated hardware must meet the specifications of Section 720 - SIGN PANELS AND APPURTENANCES of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction. The signs must meet the requirements as to size, mounting hardware, and mounting location per City of Chicago Department of Transportation standard drawings for D3-1 Street Name Sign Installation, Regulatory Sign Installation on Traffic Signals and D3-1 Sign and Bracket Specs.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per each for STREET SIGN COMPLETE and must include all necessary hardware and labor to erect the sign.

DRAWINGS:
D3-1 Street Name Sign Installation
Regulatory Sign Installation on Traffic Signals
D3-1 Sign and Bracket Specs

FILLING EXISTING HANDHOLES

REMOVING MANHOLES, SPECIAL

DESCRIPTION. Work under this item will include breaking down an existing handhole or manhole and filling in the affected area to grade.

DEMOLITION. This work will consist of removing the frame and cover of an existing handhole or manhole, breaking down the handhole/manhole walls, removing large debris, and backfilling the hole with screenings or other approved material. Backfill must be installed in 6 inch layers and tamped. If the handhole/manhole is in a parkway, the hole must be filled level to the existing grade. The top six inches of fill must be of an approved soil mixture. If the handhole/manhole is in sidewalk or in pavement, the sidewalk or pavement must be restored under a different pay item. If the frame or cover is deemed re-useable by the Engineer, the frame and/or cover must be delivered to the Bureau of Electricity at a location identified by the Engineer. Any debris, including the frame and cover must be disposed of off-sight in an approved manner. The contractor will pay for all disposal fees.

METHOD OF MEASUREMENT. This work will be paid for per each manhole or handhole removed. All backfill will be considered as part of the breakdown pay item.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per each for FILLING EXISTING HANDHOLES, or REMOVING MANHOLES, SPECIAL, which price will be payment in full for all labor and materials necessary to complete the work as described. Salvaging of the frame and cover will be considered incidental to this item.

REMOVE CONCRETE FOUNDATION (ELECTRICAL)

REMOVAL OF POLE FOUNDATION

DESCRIPTION. The work will consist of removing a concrete foundation for the existing controller cabinet foundation or traffic signal pole/post foundation. The foundation must be completely removed or broken down to a point three feet below grade, disposing of the debris off-sight in an approved manner, backfilling the excavation with screenings or other approved backfill material, and reconstructing the surface area. If the foundation is in a parkway, the parkway must be properly restored with dirt and sod to the existing level. Debris must be disposed of according to Section 202.03 of the Standard Specifications. Backfill must meet the requirements of Section 1003.04 of the Standard Specifications.

METHOD OF MEASUREMENT. This work will be measured per each foundation removed, which will also include proper disposal and backfill.

BASIS OF PAYMENT. This work will be paid for at the contract unit price each for REMOVE CONCRETE FOUNDATION (ELECTRICAL) for breaking down controller cabinet foundations and REMOVAL OF POLE FOUNDATION for breaking down traffic signal pole and post foundations, which price will be payment in full for all labor and materials necessary to complete the work and restore the area with in-kind materials as described above. No additional payment will be made for backfill or disposal of debris.

MODIFY EXISTING CONTROLLER

Description: This work shall consist of programming the existing controller to alter the existing signal controller sequence to match the proposed sequence of operation. This includes making all necessary modifications to the controller to achieve the proposed signal controller sequence, phasing operation, and pedestrian actuations as shown on the plans.

General: The work shall be in accordance with Sections 857, 863, 873, and 895 of the Standard Specifications and shall include modifications in controller programming and all necessary wiring, hardware, and modifications to the existing controller, to implement the proposed signal phasing at the intersection as shown on the plans. All necessary materials, parts, controller software upgrades, and labor required for modifying the controller to accommodate proposed signal phasing shall be considered included in this pay item.

Basis of Payment: This work will be paid for at the contract unit price EACH for MODIFY EXISTING CONTROLLER, which price shall be payment in full for furnishing all materials, hardware, wiring, controller software upgrades, and labor required to modify the existing controller as necessary for proper operation of the proposed sequence of operations to the satisfaction of the Engineer.

MODIFY EXISTING CONTROLLER CABINET

Description: This work shall consist of modifying the existing controller cabinet to change the existing signal controller sequence to the proposed sequence of operation. This includes making all necessary modifications to the controller cabinet to achieve the proposed signal controller sequence, phasing operation, and pedestrian actuations shown on the plans.

General: The work shall be in accordance with Sections 857, 863, 873, and 895 of the Standard Specifications and shall include all necessary wiring, hardware, and modifications to the existing controller cabinet to implement the proposed signal phasing at the intersection as shown on the plans. All necessary materials, parts, and labor required for modifying the controller cabinet to accommodate proposed signal phasing including load switches, field wiring, shall be considered included in this pay item.

Basis of Payment: This work will be paid for at the contract unit price EACH for MODIFY EXISTING CONTROLLER CABINET, which price shall be payment in full for furnishing all materials, hardware, wiring, and labor required to modify the existing controller cabinet necessary for proper operation of the proposed sequence of operations to the satisfaction of the Engineer.

WIDE AREA VIDEO DETECTION SYSTEM COMPLETE

Revised: 5/27/2022
Material Specifications: 1620
Standard Drawings: none

DESCRIPTION. This work consists of furnishing, installing, integration and testing a set of environmentally hardened communications node equipment at a signalized intersection. The equipment shall collectively interface with the existing traffic signal controller, enable remote monitoring of the traffic and signal operations, and provide network connectivity.

MATERIALS. Managed ethernet switches shall meet the requirements of Material Specification 1621. Cellular modems shall meet the requirements of Material Specification 1622. The hemispherical video detection camera system shall meet the requirements of Material Specification 1623.

GENERAL REQUIREMENTS. The intersection technology enhancements shall have video detection, web portal interface, and intersection communications node. The intersection communications node shall include multiple backhaul communications options including Ethernet over hardwired copper or fiber cabling and cellular communications backhaul. The node shall support full control of the intersection hardware including the remote management and control of the traffic signal controller.

Fiber backhaul requires coordination with the Chicago Office of Emergency Management and Communications (OEMC) to complete an end-to-end communications link between field device locations and the Chicago Traffic Management Center (TMC).

Cellular backhaul requires service coordination with the Chicago Department of Innovation and Technology (DolT) to complete an end-to-end, broadband cellular communications link between field device locations and the Chicago TMC. The cellular modem may be a separate unit or integrated into the intersection communications node. In either case, the cellular modem, establishing cellular service in DolT's name, installation, and coordination requirements shall be as required in the special provision for Cellular Modem.

The communications node shall be provided with all required components, including power supply, cables, mounting hardware, and all accessories required to make the system fully operational in accordance with these specifications. The camera shall be mounted at a height that allows full visibility of the intersection as required to achieve the performance requirements of this special provision. If additional cameras, mounting arms, or cabling are required to achieve the

detection accuracy requirements specified herein, they shall be furnished and installed at no additional cost beyond the original bid price.

Shall be forward compatible to support connected vehicles technology including but not limited to DSRC.

Final equipment selection, procurement, and provisioning shall be coordinated with DoIT and COOT.

Identical and completely interchangeable equipment shall be used at each field location.

All equipment shall include the manufacturer's installation and operations manuals in hardcopy and electronic PDF formats.

Contractor shall provide documentation of exact equipment model and serial numbers in hardcopy and electronic PDF formats.

CONSTRUCTION REQUIREMENTS

General.

1.) Installation shall be done in accordance with manufacturer recommendations.

2.) Contractor shall securely mount the intersection communications node equipment inside the signal cabinet in designated locations as shown on the plans.

3.) Contractor shall securely mount the video detection camera(s) to the designated city infrastructure and route cabling with city raceways as shown on the plans. Drip loops shall be used for all exposed cabling.

4.) Cabling length shall remain within required Ethernet and serial communications limits. Cable slack shall be provided at pull points and at the cabinet for maintenance access of equipment.

5.) If an integrated cellular modem is used, the Contractor shall perform the associated survey and installation work as specified in the Cellular Modem special provision. Contractor shall neatly route and secure all cabling with the cabinet.

6.) Contractor shall configure the communications node equipment with enabled security and interoperability with the existing City network as directed by the Engineer, including VPN settings and local IP address. Administrative account login credentials shall be provided to the Engineer.

7.) Contractor shall provide field troubleshooting support during integration and testing by CDOT Advanced Traffic Management System (ATMS) administrator.

Integration.

1.) Contractor shall develop a Device Integration Plan (DIP) and submit it to the Engineer for approval at least 14 days prior to field installation. Equipment shop drawing approvals shall be obtained prior to submitting the DIP.

2.) The Contractor shall contact the equipment manufacturer and the CDOT ATMS administrator to facilitate the sharing of device information. Contractor shall obtain recommendations and support services from these parties and incorporate them into the DIP.

3.) Contractor shall set up a bench test if recommended by the equipment manufacturer or CDOT ATMS administrator. Configuration support is to be provided by the equipment manufacturer and CDOT ATMS administrator as obtain by the Contractor. Location of the bench test shall be proposed by the Contractor for approval by the Engineer.

4.) Contractor shall coordinate with CDOT Division of Electrical Operations (DEO) for all work affecting existing city infrastructure and equipment.

5.) The DIP shall include the following:

a. Updated communications node locations and layouts inside cabinets
b. Current device communications interconnect schematics
c. Proposed technical steps for integration and validation
d. Configuration settings for each communications interface for each equipment

6.) Support from the equipment manufacturer shall include on-site installation guidance, equipment configuration settings, and troubleshooting. Physical installation work shall be performed by the Contractor.

7.) Support from the CDOT ATMS administrator shall include modifications and software programming necessary to integrate the data from the intersection communications node equipment.

8.) Contractor shall provide field support for equipment at the intersection and shall coordinate with the CDOT traffic signal management software vendor, Kapsch, and the CDOT ATMS administrator to assist with integration.

Acceptance Testing.

1.) Contractor shall develop an Acceptance Test Plan (ATP) and submit it to the Engineer for approval. The Contractor shall obtain the recommendations from the equipment manufacturer and CDOT ATMS administrator and incorporate them in the ATP.

2.) The ATP shall document detailed steps to verify each required functional performance of the equipment.

3.) The ATP shall include checklists for each test. Each checklist item shall have defined pass/fail criteria with a reserved space to record the results.

4.) Corrective actions shall be documented in detail on checklist forms.

5.) Testing shall be witnessed by representatives of the Contractor and the Engineer.

6.) Each checklist shall include areas for signatures by representatives of the Contractor's representative and the Engineer's representative. Completed checklists shall be provided to the Engineer in hardcopy and electronic PDF formats.

7.) The ATP shall include three levels of testing:

a. Local – Verification that each individual equipment of the intersection communications node is installed and functioning properly
b. Subsystem – Verification that connected field devices are properly communicating with the intersection communications node
c. System – Verification that the connected field devices are properly configured and communicating with the Chicago ATMS central management software through the intersection communications node equipment

8.) The Contractor shall submit to the Engineer a proposed schedule for conducting the approved ATP.

9.) The Contractor shall conduct pre-testing to confirm equipment readiness before the formal acceptance testing takes place.

10.) After all levels of testing are successfully completed and accepted by the Engineer, there shall be a 60-day burn-in period to verify the continuous and stable operation of the intersection communications node and continued achievement of accuracy requirements.

a. The Contractor shall document all failures, including description, date, time, and location of each occurrence. The written documentation shall be provided to the Engineer.
b. Major failures shall require the restarting of the 60-day burn-in period following the correction of the issue. Major failures shall include those that involve more than 48 hours to resolve the issue or frequent recurrence of minor failures as determined by the Engineer.
c. Minor failures shall require the pausing of the 60-day burn-in period until the issue is resolved; then resuming the 60-day burn-in period. The intersection technology enhancements shall have video detection, web portal interface, and intersection

BASIS OF PAYMENT. This work will be paid for at the contract unit price per each for WIDE AREA VIDEO DETECTION SYSTEM COMPLETE, which price will be payment in full for furnishing and installing the communications node equipment complete and fully operational for three years with all necessary cameras, cables, modems, hardware, accessories, components, coordination with and payments to cellular service provider as applicable, with all wiring and connections as specified herein.

REMOVE EXISTING STREET LIGHTING EQUIPMENT

Description. This work will consist of removing all obsolete street lighting equipment at various locations shown on the plans.

Removal. Street lighting poles (anchor base or embedded), ballast housing bases, mast arms, luminaires, controllers, secondary racks, cable and all related equipment are to be removed as indicated on the plans. Embedded poles will be removed by means other than burning where possible. Embedded CTA poles must be burned off at a minimum of eighteen inches below ground level.

All equipment, with the exception of the cable, will remain the property of the City of Chicago. The Contractor shall deliver the equipment to the Division of Electrical Operations facility at 24th Street and Ashland Avenue. Cable shall become the property of the Contractor and be disposed of outside the right-of-way. Twenty-four hours advance notice is necessary before delivery. Street lighting cable must be removed as indicated on the plans and become the property of the Contractor to be disposed of by him, outside the right of way, at his sole expense.

The Contractor must provide three (3) copies of a list of equipment that is to remain the property of the City, including model and serial numbers where applicable. He must also provide a copy of the contract plan or special provisions showing the quantities and type of equipment. The Contractor will be responsible for the condition of the street lighting equipment from the time of removal until the acceptance of a receipt drawn by the City indicating that the items have been returned.

Method of Measurement. This work will be measured per each at every location shown on the plans. Removal of manholes, foundations, and conduit will not be part of this item.

Basis of Payment. This work will be paid for at the contract unit price per each for REMOVE EXISTING STREET LIGHTING EQUIPMENT at the various locations shown on the plans. This price will be payment in full for removing the equipment and disposing of it as required. The salvage value of the cable retained by the Contractor must be reflected in the unit price.

CABLE IN CONDUIT, TRIPLEX, 2-1/C NO. 6 AND 1-1/C NO. 8 GROUND

Description. This work shall consist of furnishing and installing electric conductors that are in a triplex cable assemblies. The conductors shall be rated at 600 volts and must consist of two #6 AWG conductors and one #8 AWG conductor for the triplex cable assembly. The cable will be installed underground in conduit between CDOT owned and maintained light poles as indicated on the plans.

Material. The cable shall meet all requirements of Material Specification 1534 of the Division of Engineering - Electrical Section. Cable splices shall meet the requirements of Section 800 and Section 1066.06 of the Standard Specifications. All materials shall be approved by the Engineer before implementation.

Construction Method. All cables shall be installed with care to prevent damage to the cable. Any defects found in the cable shall be reported to the resident engineer. Damaged cable shall be replaced.

The cable shall be pulled into the conduit with a minimum of dragging on the ground or pavement. This shall be accomplished by means of reels mounted on jacks or other suitable devices located for unreeling cable directly into duct. Lubricants shall be used to facilitate installation if deemed necessary by the Contractor.

Bends in the cable shall conform to the recommended minimum radii as outlined in the National Electric Code.

Cable passing through manholes shall be trained and racked around the sides of the manhole into a permanent position. If are no existing racks or if the existing are in poor condition, the Contractor shall install new racks. The material shall be approved by the resident engineer. Any material and labor involved in training and racking the cable shall be considered incidental to the cost of this pay item.

Where cable runs continue from manhole to manhole without tapping within a light pole, they shall be continuous without splices unless authorized by the resident engineer.

The cable installation shall be color coded so that each lead of all circuits may be easily identified and are connected to the proper leg of the luminaires circuits. The lighting triplex cable assembly shall have one phase conductor color coded black and the other color coded red. The equipment grounding conductor (#8) shall be color coded green, and neutral conductors shall be color coded white or grey as indicated on the plans.

All wire or cable in the distribution panels and control cabinets shall be properly trained and shall have sufficient slack provided for any rearrangement of equipment or future additions.

Splices shall be located in light pole base. Splices shall be made with materials that are compatible with conductors and insulation. The connectors shall be UL listed, and sized properly for the quantity and size of the conductors to be spliced. Splices shall be as shown on the plans.

The Contractor shall label all wires with wire markers indicating the circuit identifier in every controller, pole base, manhole, handhole and splice/connection point.

Method of Measurement. The length of triplex cable installed in place. Measurements will be made in straight lines between changes in direction and to the center of equipment and boxes. 3 feet of extra cable will be allowed when terminating at a controller or light pole, 5 feet of extra cable will be allowed at handholes, and 10 feet of extra cable will be allowed at manholes.

The vertical distance of cable will be measure in feet. Changes in direction shall assume perfect straight line runs, ignoring actual raceway sweeps.

Basis of Payment. This work will be paid for at the contract unit price per lineal foot for CABLE IN CONDUIT, TRIPLEX, 2-1/C NO. 6 AND 1-1/C NO. 8 GROUND, which shall include all material, labor, splices, terminations, and incidentals necessary to complete the work as described herein.

MATERIAL SPECIFICATION
1534

ROD AND CLEAN DUCT IN EXISTING CONDUIT SYSTEM

Description and Scope. This work shall consist of inserting a duct rod or electrical fish rod or tape of sufficient length and rigidity into an electrical conduit opening in one electrical manhole or handhole and pushing the said rod through the conduit to emerge at the next or a subsequent manhole in the conduit system at the location shown on the plans. The duct rod may be inserted and removed by any standard construction method which causes no damage to the conduit system. The size of the conduit may vary from two inch (2") to four inch (4"), but there shall be no differentiation in cost for the size of the conduit.

The conduit system which is to be rodded and cleaned may exist with various amounts of standing water in the manholes. The Contractor shall pump the water or sufficient water from the manholes to drain the conduit and to afford compatible working conditions for the installation of the duct rods and/or cables. The pumping of the manholes shall be included in the cost of rodding and cleaning of the conduit and shall not become a separate pay item.

Any manhole which, in the opinion of the Engineer contains excessive debris, dirt or other materials to the extent that conduit rodding and cleaning is not feasible, shall be cleaned and paid for as directed by the Engineer.

Prior to removal of the duct rod, a duct cleaning attachment such as a properly sized wire brush or cleaning mandrel shall be attached to the duct rod, which by removal of the duct rod shall be pulled through the conduit to remove sand, grit, or other light obstructions from the duct to provide a clean, clear passage for the installation of cable. Whenever the installation of cables is not performed immediately after the cleaning of the existing conduit, a light weight pulling line such as a 1/8" polyethylene line or conduit measuring tape shall be placed and shall remain in the conduit to facilitate future work. When great difficulty of either inserting the duct rod or removal of the cleaning mandrel is encountered, the duct may require further cleaning by use of a compressed air gun, or a low pressure water hose. In the case of a broken duct line, the conduit shall be excavated and repaired. The existence and location of breaks in the duct line may be determined by rodding, but the excavation and repair work required shall not be a part of this construction specification.

Method of Measurement. This work shall not be measured separately for payment.

Basis of Payment. This work shall be included in the contract unit price per lineal foot for ELECTRIC CABLE IN CONDUIT INSTALLED (OF THE SIZE SPECIFIED) installed in existing conduit. Such price shall include furnishing all necessary tools, equipment, and polyethylene line as required to prepare a conduit for installation of cable. When the number of cables to be installed require the use of more than one conduit in the same run, each additional conduit required shall be rodded and

cleaned. Conduit which is not intended to be utilized in the specific installation shall not be rodded and cleaned as spares.

MAST ARM, STREET LIGHTING, 15'

Description. This work shall consist of furnishing and installing a steel pipe mast arm to a light pole or combination traffic signal light pole at locations indicated on the plans.

Material. The luminaire arm shall meet all requirements of Material Specification 1450 and Standard Drawing 839 of the Division of Engineering - Electrical Section.

Bolts shall be supplied with the arm and meet all requirements of Material Specification 1450.

Construction Method. Luminaire arms shall be installed with two bolts to mount to the mast arm attachment on the pole (as shown on Standard Drawing 659), typical of two per pole. Luminaire attachments shall be included and paid for under the light pole pay item.

Luminaire arms shall be set at right angles to the centerline of the pavement, or at the orientation specified on the plans. Poles shall not be left in place without arm(s) and luminaire(s).

Method of Measurement. Luminaire arms will be measured for payment per each. Where multiple arms are mounted to a pole, each luminaire arm shall be paid for separately.

Basis of Payment. This work shall be paid for at the contract unit price each for the MAST ARM, STREET LIGHTING, 15', which shall include luminaire arm, bolts, and all necessary labor and materials to complete the work as described herein.

MATERIAL SPECIFICATIONS	STANDARD DRAWING
1450	840

REMOVAL OF LIGHTING LUMINAIRE, SALVAGE

Description. This work shall consist of the removal, salvage, and delivery of existing luminaires and nodes at locations indicated on the plans, or as directed by the Engineer.

General Requirements. Luminaires shall be inspected by the Engineer. Non-operating and/or damaged luminaires, or as directed by the Engineer, shall be disposed of in accordance with Article 202.03 of the Standard Specifications.

Luminaires shall be disconnected, removed, and boxed in new containers approved by the Engineer. All work shall be performed in accordance with Standard Specifications Section 841, or as otherwise directed by the Engineer.

CDOT luminaires to be salvaged shall be delivered CDOT's yard at 2451 South Ashland Avenue, or as directed by the Engineer. This item shall include the unloading of the luminaire(s).

Method of Measurement. Luminaires shall be measured per each unit removed.

Basis of Payment. This work shall be paid for at the contract unit price each for the REMOVAL OF LIGHTING LUMINAIRE, SALVAGE, which shall include work necessary for the complete removal, salvage, transportation and unloading necessary to complete the work as described herein.

Disposal, if necessary, and disposal fees will be included in the cost of this work and shall not be paid for separately.

LUMINAIRE, LED, SPECIAL

Description. This item shall consist of furnishing and installing a LED street light luminaire of the output noted on the plans with external smart node.

Materials. Luminaires shall meet the requirements of Material Specification 1609. External smart lighting nodes shall meet the requirements of Material Specification 1608. Pole wire shall meet the requirements of Material Specification 1351.

Installation. This work shall meet the applicable requirements of Sections 801 and 821.03 of the Standard Specifications. Each luminaire shall be installed per the manufacturer's instructions. Luminaires shall be securely attached to the end of a two-inch diameter pipe arm and leveled to provide proper illumination.

Pole wiring shall be connected to the luminaire terminal block, or quick disconnect, in accordance with the Material Specifications and the manufacturer's recommendation. Pole wires shall be spliced to the field wires at the base of the pole using splicing methods approved by the Engineer, and as detailed under related special provisions. The pole wires shall be of sufficient length to connect the luminaire to the field wires at the base of the pole.

Basis of Payment. This work shall be paid for at the contract unit price per each LUMINAIRE, LED, SPECIAL, which shall include all work as described herein.

MATERIAL SPECIFICATIONS
1351 1608 1609

TRENCH BACKFILL, SPECIAL

Description. This work shall consist of excavating a trench for the installation of conduit and backfilling with limestone screenings as a portion of the total backfill of the trench, all as shown in Division of Electrical Operations Standard Drawings No. 579 and No. 813. This work shall meet all applicable requirements of Article 819 of the Standard Specifications.

Material. Underground Cable Marking Tape shall meet the requirements of Section 1066.05 of the Standard Specifications. Backfill shall meet the requirements of Section 1003.04 of the Standard Specifications.

Construction Requirements. The trench shall be deep enough to provide thirty inches (30") of cover over the conduit to be installed. The trench shall not exceed twelve inches (12") in width unless approved by the Engineer. The bottom of the trench shall be tamped, and the trench inspected by the Engineer before conduit is installed. All trenches shall be backfilled as soon as possible after the installation of the conduit or cable. Any material excavated from the trenches that in the opinion of the Engineer is satisfactory backfill, may be used for backfill above the layer of screenings. The limestone screenings shall be used to fill the bottom of the trench to a depth of one foot above the top of the conduit or duct encasement. Cinders, rocks, or other inappropriate materials shall not be permitted to be used as backfilling material. Backfilling material, beginning with limestone screenings shall be deposited in the trench in layers not to exceed six inches (6") in depth, and shall be thoroughly compacted with a mechanical tamper before the next layer is deposited in the trench. All trenches for conduit shall be backfilled as per this specification. Unsuitable material shall be disposed of according to the requirements of Section 202.03 of the Standard Specifications. Underground cable marking tape shall be installed twelve inches (12") below the finished grade for all conduit runs.

Method of Measurement. This work will be measured in feet along the centerline of the trench. Trench and backfill will not be measured for payment for conduit which is installed by pushing or by directional boring. Where more than one (1) conduit is installed in a single trench, only one run will be measured for payment.

Basis of Payment. This work will be paid for at the contract unit price per cubic yard for TRENCH BACKFILL, SPECIAL, which shall include excavation, furnishing and placing backfill material, and disposal of all surplus excavated material.

Removal and replacement of sidewalk, driveway pavement or pavement shall be paid for separately.

STANDARD DRAWINGS
579 813

CONDUIT SPLICE

Description. This item shall consist of splicing a proposed conduit to an existing conduit at the location shown on the plans.

Materials. Coupler shall be rated for joining the conduit(s) material types and be UL listed.

Installation. Prior to splicing, the ends of the conduits shall be beveled, and the coupler shall be installed per the manufacturer's installation requirements.

The Contractor shall record location of the conduit splice and detail the location on the Record Drawings.

Method of Measurement. This item shall be measured per each conduit splice installed.

Basis of Payment. This work shall be paid for at the contract unit price per each CONDUIT SPLICE, which shall include all work as described herein.

CONDUIT IN GROUND, 2" DIA., GALVANIZED STEEL

CONDUIT IN GROUND, 3" DIA., GALVANIZED STEEL

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1. **DESCRIPTION** - this work will consist of furnishing and installing a conduit lateral of the type and size specified.

2. MATERIALS

Galvanized rigid steel conduit and PVC coated steel conduit must conform to the requirements of Material Specification 1462.

3. CONSTRUCTION.

DEFINITION OF LATERALS . A lateral will mean a conduit raceway extending from one sub-surface location to another sub-surface location, and in every case intended to encase electric circuit cable under paved surfaces, or in unpaved parkway, street or alley, where specifically designated.

LOCATIONS - Laterals must be installed at the locations shown on the construction plans. Laterals must be installed in the shortest practicable line between points of termination, or under adverse conditions, as directed by the Resident Engineer. Laterals not shown on the drawing, but necessary to be installed will be paid for at the unit price bid for laterals as additional units of construction.

INSTALLATION REQUIREMENTS - Galvanized rigid steel conduit may be installed in a trench, pushed underground, or attached to a structure. PVC conduit will normally be installed in a trench or attached to a structure. Coilable conduit will be installed in a trench for short distances only. The normal installation method for coilable conduit is directional boring. The Contractor must exercise care in installing the conduit to ensure that it is smooth, free from sharp bends or kinks, and has the minimum practicable number of bends. Crushed or deformed conduit will not be accepted. All conduit and fittings must have the burrs and rough places smoothed, and all conduit runs must be cleaned and swabbed before installation of electric cables. If cable is not to be installed immediately after cleaning of the conduit, a light weight pulling line such as 1/8" polyethylene line must be placed in the conduit and will remain in the conduit for future work. The excavation for pushing conduit must be located at least two feet (2') from the

edge of pavement. All underground conduits must have a minimum cover of thirty inches (30") below grade. If conduit cannot be installed with a minimum cover of thirty inches (30"), the conduit must be encased in concrete for protection. The method of encasement and protection must be approved by the engineer. Concrete encasement will be paid for as a separate pay item.

When multiple laterals in a common trench are required, no more than three (3) three inch (3") or smaller conduit laterals can be laid on a single, horizontal level. Four or more conduit laterals must be installed on two (2) levels in accordance with instructions of the Resident Engineer.

Conduit laterals attached to a structure must be flush to the structure where possible. Clamps or hangers must be used at a maximum interval of five feet (5') to hold the conduit rigidly in place. Fittings must be supplied and installed that are compatible with the conduit in use. Expansion couplings must be used at locations where the conduit crosses expansion joints in the structure.

Conduit laterals installed under vaulted walks must be securely attached to the retaining wall by means of galvanized clamps and clamp backs held in place by anchor bolts. Laterals will be fastened as close to the underside of the sidewalk as possible, and securing clamps installed every five feet (5'). Laterals must be continuous through party walls.

Threaded fittings and bends of the same material as conduit must be furnished and installed as required. Threadless couplings may be used only for splicing existing conduit. All conduit splices, where required, will be considered incidental to this pay item.

4. **METHOD OF MEASUREMENT** . The length measured will be the number of lineal feet of conduit installed and accepted, measured in place. Each conduit will be measured separately even if in a single trench. The length for measurement will be the distance horizontally between changes in the direction of the conduit plus the conduit vertically attached to structures. All conduit on structures will be measured from point to point, whether vertical or horizontal.

5. **BASIS OF PAYMENT** - This work will be paid for at the contract unit price per lineal foot for Conduit of the type and size as specified, which price will be payment in full for furnishing and installing the conduit and fittings complete. Cleaning, swabbing, and p-lining of new conduit will be incidental to this pay item. Hangers, clamps, and fittings for conduit attached to structure will be incidental to this item. Trench and backfill will be paid for separately. Concrete encasement, if required, will be paid for separately. No additional

payment will be allowed for pushing under pavements or for jackholes for conduit laterals.

MATERIAL SPECIFICATIONS	DRAWINGS
1462 1533	579 813

MAINTENANCE OF EXISTING LIGHTING SYSTEM COMPLETE

Description. This work consists of furnishing all labor, equipment, and incidental materials for maintaining existing street lighting systems owned by the CDOT until the proposed new equipment is installed, energized, tested, and accepted for operation by CDOT.

The work shall include any necessary temporary devices to maintain existing illumination. The location and protection of devices necessary to comply with these requirements shall be subject to the approval of the Engineer. The Engineer will be the sole judge of satisfying existing illumination levels.

Any temporary wire or cable which may be required to be installed overhead between existing poles or temporary devices shall be furnished, installed, terminated, and maintained in service until the proposed lighting equipment is installed, tested and accepted for operation by the Engineer.

Existing Lighting Systems to be Maintained:

Com Ed Atlas T-6, Group 1:
- Lighting Controller located along East River Road, south of Catalpa Avenue
- Twenty-five arterial roadway light poles
- Two roadway luminaires mounted to combination light poles at East River Road and Bryn Mawr Avenue

Com Ed Atlas T-8, Group 2:
- Lighting Controller located along East River Road, north of Bryn Mawr Avenue
- Twenty-six arterial roadway light poles

Materials. Materials shall be according to the following CDOT Division of Electrical Operations (DEO) Specifications and Articles of Standard Specifications Section 1000 – Materials:

Item	Requirement
(a) Cable Splicing and Termination	Standard Specifications Article 1066.06
(b) Fuse holders and Fuses	Standard Specifications Article 1065.01
(c) Pole Wire	Material Specification 1351
(d) Aerial Cable Assembly	Material Specification 1601
(e) Thermal Magnetic Circuit Breaker	Material Specification 1428
(f) Metal Light Poles	Material Specification 1447
(g) Luminaires	Standard Specifications Article 1067

Temporary light poles when used shall consist of:

(h) Metal poles in accordance with Article 1069.01 of the Standard Specifications. Metal poles shall be similar in type, size and finish.

(i) Steel poles that comply with Division of Electrical Operations Specification Number 1447 if already owned by the Contractor and in stock.

Material Acceptance. The Contractor shall provide a Manufacturer's written certification that the materials comply with these specifications.

Preconstruction Inspection. Before performing any excavation, removal, or installation work (electrical or otherwise) at the site, the Contractor shall initiate a request for preconstruction inspection, to be held in the presence of the Engineer and a representative of DEO. The request for the maintenance preconstruction shall be made no less than seven (7) calendar days prior to the desired inspection date. The maintenance preconstruction inspection shall:

- Establish details of any formal transfers of maintenance responsibility required for the construction period.

- Establish approximate locations of known lighting and/or traffic control systems, which may be affected by the work.

- Establish the condition of lighting and/or traffic control systems which may be affected by the work.

General Requirements. General requirements shall be in accordance with Section 801 of the Standard Specifications, and in accordance with DEO Standards and the City of Chicago Electrical Code, except as herein modified.

The Contractor shall maintain existing lighting systems (temporary and permanent) and proposed lighting systems, as well as receptacles and other ancillary devices connected to the applicable street lighting controllers. Effective the day the Contractor starts work (including non-electrical work), the Contractor shall maintain the existing lighting equipment located within the project limits as it then exists. The Contractor shall also maintain any street lighting equipment outside of the project limits that is connected to a controller situated within the project limits. The Contractor shall also maintain any street lighting equipment inside of the project limits but connected to a controller located outside the project limits.

The Scope of Work shall include the assumption of responsibility for the continuing operation of existing, temporary, or other lighting-systems affected by the work as may be specified elsewhere herein. Existing lighting systems, where depicted on the plans, are intended to only indicate the general nature of the systems involved and shall not be construed as an exact representation of the field conditions. It remains

the Contractor's responsibility to visit the site to confirm and ascertain the exact nature of systems to be maintained.

Lighting System Maintenance Operations. The Contractor's responsibility shall include all applicable responsibilities of the Electrical Maintenance Contract, DEO, and State of IDOT, Division of Highways, District One. These responsibilities shall include the maintenance of lighting units, conduit/cables and lighting controllers. In the case of a light pole knockdown or damage caused by normal vehicular traffic, the Contractor shall promptly clear the lighting unit, disconnect the light pole and/or any damaged cables from the branch circuit, and restore the system to service. Responsibilities shall also include weekly night-time patrol of the lighting system, with patrol reports filed immediately with the Engineer and with deficiencies corrected within 24 hours of the patrol. Patrol reports shall be presented on standard forms as designated by the Engineer. Uncorrected deficiencies may be designated by the Engineer as necessitating emergency repairs as described elsewhere herein.

The following chart lists the maximum response, service restoration, and permanent repair time the Contractor shall be allowed to perform corrective action on specific lighting system equipment.

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
Radio problem	1 hour	4 hours	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 75% of lights on one tower	1 hour	4 hours	na

Outage of light nearest RR crossing approach, Islands and gores	1 hour	4 hours	na
Outage (single or multiple) found on night outage survey or reported to EMC	na	na	7 Calendar days
Navigation light outage	na	na	24 hours

- **Service Response Time** -- amount of time from the initial notification to the Contractor until a patrolman physically arrives at the location.

- **Service Restoration Time** – amount of time from the initial notification to the Contractor until the time the system is fully operational again (In cases of motorist caused damage the undamaged portions of the system are operational.)

- **Permanent Repair Time** – amount of time from initial notification to the Contractor until the time permanent repairs are made if the Contractor was required to make temporary repairs to meet the service restoration requirement.

Failure to provide this service shall result in liquidated damages of $500 per day per occurrence. In addition, CDOT reserves the right to assign any work not completed within this timeframe to an Electrical Maintenance Contractor of their choice. All costs associated to repair this uncompleted work shall be the responsibility of the Contractor. Failure to pay these costs to this electrical maintenance Contractor within one month after the incident shall result in additional liquidated damages of $500 per month per occurrence. Unpaid bills shall be deducted from the cost of the Contract. Repeated failures and/or a gross failure of maintenance shall result in the CDOT's Electrical Maintenance Contractor being directed to correct all deficiencies and the resulting costs deducted from any monies owed the Contractor.

Damage caused by the Contractor's operations shall be repaired at no additional cost to the Contract.

Operation of Lighting. The lighting shall be operational every night, from dusk to dawn. Duplicate lighting systems (such as temporary lighting and proposed new lighting) shall not be operated simultaneously. Lighting systems shall not be kept in operation during long daytime periods. The Contractor shall demonstrate to the satisfaction of the Engineer that the lighting system is fully operational prior to submitting a pay request. Failure to do so shall be grounds for denying the pay request.

Installation Requirements for Temporary Lighting Units. The Contractor shall furnish and install a temporary lighting unit to replace any existing lighting unit that is

removed prior to the new lighting system being operational.

Temporary lighting unit shall include pole, mast arm, luminaire, and temporary wiring connections. The Contractor shall furnish and install temporary lighting units and all associated electrical equipment to ensure compliance with the applicable codes, standards, and Specifications.

The Contractor shall coordinate temporary lighting with the sequence of construction and maintenance of traffic for this Project.

The wiring on the pole shall consist of aerial electric cables and waterproof splices at each light pole.

All equipment furnished shall be functional and new in appearance and shall be maintained. The Contractor shall own all the temporary lighting equipment furnished and installed.

The Contractor shall disconnect and remove temporary lighting and all associated electrical equipment upon energizing and acceptance of the permanent lighting system.

Temporary Wiring. The Contractor shall furnish and install aerial electric cable, including messenger wire, in accordance with Section 818 of the Standard Specifications. The conductor size shall be a 6 AWG minimum. The messenger wire shall be steel and of adequate size to support the cables from structure to structure under normal and adverse weather conditions.

The electric cables shall be secured to the steel messenger wire with binding strips continuous throughout each span of cable and shall be of adequate strength to support the size of electric cables required.

Temporary Poles. Temporary light poles may be used (see material section for allowable temporary light pole material details).

The Contractor shall provide metal poles that will be adequate to support the poles during normal and adverse weather conditions, and as directed by the Engineer. Include in this work shall be the removal of temporary light pole foundations.

Temporary Luminaire. Each luminaire shall be a high pressure sodium vapor (HPS), Crime Fighter type. Each luminaire shall be mast arm or bracket arm mounted on the top of the pole. Each luminaire shall be provided with a leveling surface and a leveling device and shall be capable of being tilted by plus or minus 30 degrees and rotated to any degree with respect to the supporting bracket. Each luminaire shall have a pipe arm barrier to limit the amount of inflection.

If HPS luminaires are not available, the Contractor shall contact the Engineer for allowable LED options.

Installation. Location of cables and fixtures for temporary lighting shall be adjusted and supported to accommodate field conditions encountered, including any potential interferences with other construction or equipment to be installed.

The Contractor shall determine the exact route and location of each temporary lighting fixture and associated wiring, prior to installation.

Temporary lighting shall be installed to permit removal (without damage to other parts) of parts requiring periodic replacement or maintenance.

Temporary wiring/lighting shall be removed immediately upon acceptance of permanent lighting.

Basis of Payment. This work shall be paid for at the contract lump sum price for MAINTENANCE OF EXISTING LIGHTING SYSTEM COMPLETE, which shall include all work as described herein.

CDOT MATERIAL SPECIAL PROVISIONS

ELECTRICAL SPECIFICATION 1351
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED AUGUST 27, 2013

WIRE: SINGLE CONDUCTOR NO. 12 COPPER WITH CROSS LINKED POLYETHYLENE INSULATION

SUBJECT

1. This specification states the requirements for insulated wire intended for use as a conductor to connect street light luminaires to aerial distribution wires or underground distribution cables in a street lighting circuit. This wire is also known as pole wire.

GENERAL

2. (a) Specifications. The cable shall conform in detail to the requirements herein stated and to the latest referenced specifications of the following organizations:

American Society for Testing and Materials (ASTM)
Insulated Cable Engineers Association (ICEA)
National Electric Code (NEC)
National Electrical Manufacturers Association (NEMA)
Underwriters Laboratories (UL)

(b) Acceptance. Cable not conforming to this specification will not be accepted.

(c) Sample. If requested by the Chief Procurement Officer, a three (3) foot sample of the cable intended to be provided under this specification, shall be submitted to the Engineer of Electricity within fifteen (15) business days after receipt of the request.

(d) Warranty. The manufacturer shall warrant the cable to be first class material throughout. The manufacturer will be responsible for any cable failing during normal and proper use within one (1) year after the date of installation. The manufacturer will provide replacement of any failed cable segment, from the point of normal termination to the next point of normal termination. There will be no cost to the City.

CABLE

3. (a) Construction. The cable shall consist of an uncoated copper conductor concentrically encased in a moisture resistant thermosetting plastic of cross linked polyethylene. The cable shall be listed with UL as Type RHW-2 or Type USE-2, and shall meet the NEC's requirements for these types of cable up to 90º C in wet or dry locations.

(b) Color. Cable will be either black, red, or green.

(c) Marking. The cable must be identified by a permanently inscribed legend in white lettering. The legend must have the following information at a minimum: 1/C #12AWG, 600V, XLPE, 90º, RHW-2 orUSE-2, manufacturer's name, date of manufacture. The legend must be repeated at approximately eighteen inch (18") intervals parallel to the longitudinal axis of the cable.

(d) Overall cable diameter shall be approximately 0.19 inches.

CONDUCTOR

4. (a) Material. Conductor shall be Number 12 AWG consisting of seven (7) strands of uncoated copper wires (.0305 inch diameter) per ASTM-B3.

(b) Resistivity. Conductor shall conform to the requirements of ASTM B-33.

INSULATION

5. (a) Type. The insulation shall be a cross linked polyethylene compound meeting the physical and electrical requirements herein specified and the requirements of NEMA WC-70 (ICEA S-95-658).

(b) Thickness. The insulation must be circular in cross section and have an average thickness of 45 mils. The thickness must not vary by more than plus or minus five percent (+/-5%).

TESTS

6. (a) General. The tests required to determine compliance with this specification must be certified by the manufacturer or an independent testing facility. Before shipment, copies of the test reports must be forwarded to the Division of Engineering for approval. The City reserves the right to reject any cable failing to meet the requirements of the tests. Tests must be made in accordance with methods in ASTM D-470.

(b) Physical Properties

Initial Values:

Tensile strength, minimum psi	2000
Elongation at rupture, minimum %	250

After Aging:

After 168 hours in an air oven at 121º +/-1ºC:

Tensile strength, minimum % of initial value	80
Elongation at rupture, minimum % of initial value	80

(c) Modulus Test. After initial conditioning period of four (4) minutes at a temperature of 150º C and at 100% elongation, the modulus must not be less than 110 pounds per square inch.

(d) Accelerated Water Absorption Characteristics.

1. Electrical Method. After twenty-four (24) hours immersion in tap water at 75º +/- 1º C, the specific inductive capacity of the insulation must not be more than 7. After a continued fourteen (14) day immersion, the specific inductive capacity must not be more than three percent (3%) higher than the value determined at the end of the first day, nor more than two percent (2%) higher than the value determined at the end of the seventh day.

2. Gravimetric Method. The insulation must not absorb more than five (5) milligrams of water per square inch of exposed surface area after immersion in distilled water at 70º C for a period of seven (7) days.

(e) Electrical Characteristics. Each completed length of insulated conductor must withstand a test voltage of 3000 volts AC for a period of five (5) minutes after immersion in water for not less than six (6) hours and while still immersed. After withstanding this dielectric test, the cable must have an insulation resistance constant of not less than 25,000.

(f) Cold Bend Test. The cable must pass the cold bend, long-time voltage test on short specimens as outlined in ASTM D-470.

PACKING

7. (a) Sealing. Both ends of each length of cable must be thoroughly sealed to prevent the entrance of moisture and other foreign matter.

(b) The cable must be delivered in coils containing five hundred (500) feet each. Each coil must be packed in individual dispenser cartons. Each carton must be labeled, identifying the cable type and size, manufacturer, and date of manufacture.

ELECTRICAL SPECIFICATION 1385
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED AUGUST 12, 2013

PEDESTAL WITH BASE: ALUMINUM, FOR TRAFFIC SIGNALS

SUBJECT

1. The specification states the requirements of an aluminum pedestal and base with handhole and door for supporting a traffic signal.

GENERAL

2. (a) Specifications. The pedestal base shall conform to the requirements herein stated, to the specifications and methods of test of the American Society for Testing and Materials (ASTM), to the requirements of the Society of Protective Coatings (SSPC), and to the requirements of the American Welding Society (AWS), of which the most recently published revisions will govern.

(b) Acceptance. Pedestal bases not conforming to this specification will not be accepted.

(c) Drawing. The drawing mentioned herein is a drawing of the Department of Transportation. It is an integral part of this specification cooperating to state the necessary requirements.

(d) Workmanship. All pedestal bases must be free of casting flaws and must have neat, smooth exterior surfaces. All holes must be accurately located and drilled. The bottom surface of the base must be ground smooth.

(e) Sample. One complete pedestal of the manufacture intended to be furnished must be submitted within fifteen (15) business days upon receipt of a request from the Chief Procurement Officer.

(f) Warranty. The manufacturer shall warrant the performance and construction of the traffic pedestal to meet the requirements of this specification and shall warrant all parts, components, and appurtenances against defects due to design, workmanship, or material developing within a period of five years after the traffic pedestals have been delivered. This will be interpreted particularly to mean structural or mechanical failure of any element or weld,

or failure of any portion of the painting system. The warranty must be furnished in writing guaranteeing material replacement including shipment, free of charge to the City. The Commissioner will be the sole judge in determining which replacements are to be made and the Commissioner's decision will be final.

DETAIL REQUIREMENTS

3. (a) Design. The pedestal base must conform to the design shown on Drawing Number 526. All bases must be of the same dimensions, and all doors must be interchangeable.

(b) Base. The base must be cast of aluminum alloy 319 meeting the requirements of ASTM B26 with a minimum wall thickness of 9/32". The handhole opening must have a recessed lip along the entire length of both sides and the bottom such that with the door in place the exterior surface of the door is flush with the exterior surface of the base. The door must have the same curvature as the base. The door must be locked in place by means of two fingers located on its top edge which bear against the inside surface of the base, and a stainless steel Allen head locking screw which fastens to the base. The locking screw must be protected by a C-shaped drip edge protruding approximately 5/8" and concentrically encircling the screw head. The clearance between the inner surface of the drip edge and the outer surface of the screw head must be no greater than 1/8". The drip edge must encircle the screw head by a minimum of 300° with the opening in the drip edge centered at the bottom of the screw head. A continuous pipe stop must be integrally cast along the inside of the base 2.5" below the top edge.

(c) Pedestal. The pedestal must be aluminum-alloy extruded round tube conforming to the requirements of ASTM B221, alloy 6063-T6. Its outside diameter must be 5.563"; its wall thickness must be not less than 0.187", and its length must be as required to furnish the overall height specified in the order. The round tube must be inserted not less than two and one-half inches (2.5") into the base and welded with four (4) butt welds each not less than one (1) inch long on the inside and a continuous seam weld around the outside. Aluminum alloy pipe in lieu of aluminum alloy tube is acceptable.

(d) The pedestal cap must be of the same cast aluminum as the base. The pedestal cap shall be essentially conical with a globe-shaped upper-end and having a minimum wall thickness throughout of not less than 1/4 inch. The cone portion must meet the skirted portion of the top in a smooth filet. The skirt must enclose the top 7/8" inches of the pedestal. Three stainless steel, or other similar approved material, set screws not less than 3/4 inches long must be equally spaced in tapped holes around the skirt and must hold the cap securely in place atop the pedestal. The set screw size must be 5/16 – 18 hex head.

(e) Welding. The welds shall be made by the inert gas metal welding process. Filler wire shall conform to chemical composition requirements of AWS Alloy Number A5.10-69.

PAINTING

4. (a) Oil and Grease Removal. All metal surfaces shall be washed with an alkaline detergent to remove any oils or grease.

(b) Chemical Pretreatment. The cleaned metal surfaces must then be treated with a hot, pressurized phosphate wash and must be dried by convection heat.

(c) Coat. A thermosetting, weathering, polyester powder coat shall be applied electrostatically to all cleaned and treated exterior surfaces to a uniform four mil (4) thickness in a one coat application. This powder coat must be cured in a convection oven at a minimum temperature of 400º Fahrenheit to form a high molecular weight fusion bonded finish.

(d) Alternate Methods. Alternate powder coat methods may be reviewed and tested on a case-by-case basis. However, no coating method will be accepted unless the Commissioner judges such alternate to be equal to the coating herein specified.

(e) Durability. The coating shall be capable of passing 1,000 hours of salt spray exposure as per ASTM B117 in a 5% NaCl (by weight) solution at 95º Fahrenheit and 95% relative humidity without blistering. Before testing, the test panel must be scribed with an "X" down to bare metal.

(f) Coating Measurement. Measurement of coating thickness shall be done in accordance with SSPC-PA 2-73T, "Measurement of Dry Paint Thickness with Magnetic Gauges", except that the lowest single spot measurement in an area of two (2) square inches must not be less than 3 mils.

(g) Color. Color shall be gloss black unless identified otherwise in the order. A color sample must be submitted for approval prior to fabrication. This color sample must include the manufacturer's name and the manufacturer's color name.

PACKING

5. Each pedestal shall be individually wrapped to prevent damage to the surface. Each pedestal shall be suitably packed or blocked to prevent damage during

shipment and handling.

ELECTRICAL SPECIFICATION 1407
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED APRIL 2, 2009

POLE MOUNTED CAST ALUMINUM JUNCTION BOX FOR TRAFFIC SIGNALS

SCOPE

1. This specification states the requirements for pole mounted, cast aluminum junction boxes, with terminal strips, to be used for traffic signal multiple cable terminations.

GENERAL

2. (a) Specifications. The junction boxes shall conform in detail to the requirements herein stated, and to the specifications and methods of test of the American Society for Testing and Materials cited by ASTM Designation Number, of which the most recently published revisions will govern. The terminal strip shall meet the applicable sections of NEMA ICS 4-2005, as well as the requirements herein stated.

(b) Drawing. The drawing mentioned herein is a drawing of the Department of Transportation, and will be interpreted as part of these specifications.

(c) Acceptance. Junction boxes not conforming to this specification will not be accepted.

(d) Sample. One complete junction box with terminal strip of the manufacture intended to be furnished shall be submitted within fifteen (15) business days after receipt of a request from the Chief Procurement Officer. The box must be delivered to the Division of Electrical Operations at 2451 South Ashland.

(e) Workmanship. All junction boxes shall be free of casting flaws and must have neat, smooth exterior surfaces. All holes must be accurately located and drilled to ensure interchangeability of all components.

DESIGN

3. (a) Drawing. The junction box must conform in detail to the dimensions and requirements shown on Drawing Number 954.

(b) Material. The body door and plate must be castings of non-heat treated

aluminum silicon alloy conforming to ANSI alloy 443.0 of ASTM B26.

DETAIL REQUIREMENTS

4. (a) Assembly. Each junction box shall consist of the body, door with its gasket, two cast elbows with gaskets at either end of the box, terminal block mounting bracket, and terminal strip on channel mounted to bracket. All must be completely assembled, painted and ready for installation. A flat plate with gasket shall also be provided so that the City can use the junction box with only one elbow if desired.

(b) Body. The body shall be cast as shown in Drawing Number 954. The top and bottom sides of the box where flat plates, or other fittings, will be attached, must be identically cast, machined flat, and drilled and tapped in accordance with dimensions shown. All fittings which fit on the top side must fit on the bottom side.

(c) Door. The door shall be cast as shown in Drawing Number 954. The door must be hinged at the left with stainless steel hinge pins and must open not less than 180º to permit complete access to the interior of the junction box. Two stainless steel Allen head machine screws, undercut and held captive, shall hold the door closed and maintain positive pressure against a sponge neoprene gasket cemented in place completely around the door jamb. The door shall be finished and painted prior to cementing the gasket into its groove in the door.

(d) Elbow sweep. Two elbows must be provided for cable entry and exit into the box. The elbows shall be cast of the same alloy as the box. The dimensions will be as indicated on Standard Drawing 954.

(e) End Plate. A flat end plate shall be furnished with each body casting. The plate must be drilled to align with tapped holes in the body casting and have a flush match with the periphery of the top and bottom body casting pads. The plate must have a properly fitted gasket.

(f) Gaskets. The gasketing between the body and the door shall be of sponge neoprene and must be cemented in place after painting of the door. A cork gasket, 1/8 inch thick, shall be used between the elbow or end plate and the body of the junction box on the top end and bottom end and held in place by four (4) stainless steel screws.

(g) Mounting Bracket. A terminal block mounting bracket, as shown on Drawing Number 954, shall be furnished and installed in each junction box. The bracket must be cast from ANSI alloy 443.0 per ASTM B26.

(h) Terminal Strip. The terminal strip will consist of modular blocks. Each block

will consist of two terminals to handle one circuit. The strip will consist of twenty blocks to handle twenty circuits. The terminal strip will be mounted to an aluminum channel. The channel will have pre-punched holes for mounting to the junction box. The channel will be mounted to the box with two #10 screws.

Each block housing shall be constructed of nylon, polypropylene, or another approved material of equal properties. The bottom of the block housing will be dovetailed to fit into the aluminum channel. Overall dimensions of each block will be approximately 1.2 inches wide by 1.5 inches high. Center-to-center spacing between contacts (blocks) must be at least .375 inches.

The terminals shall accommodate AWG wire sizes 8 to 22. The contact type will be tubular clamp, with electroplated tubular copper contact. The screw type will be a steel electroplated number 10-32, slotted pan head. The terminals will be rated at 30 amps and 600 volts.

Maximum service temperature for the terminal strip will be 150° Celsius. The flammability rating must meet UL 94V-0.

(i) Hardware. The hinge pins and all screws required for assembly of this junction box must be of stainless steel.

(j) Painting. The exterior surfaces of the junction box shall be properly cleaned and given one (1) coat of zinc chromate primer containing ten percent (10%) iron oxide and one (1) coat of enamel. The color of the enamel must be gloss black or as ordered. A color sample must be submitted and approved before manufacturing commences. The primer and enamel shall be of an approved grade and quality.

(k) Packing. After the paint is completely dry, and the junction boxes have been assembled, they shall be suitably packed to prevent damage to painted surfaces during shipping and handling. All shipments must be fastened to, and shipped on, 48" x 48" hardwood, 4 way, non-returnable pallets. Total height must not exceed 64" and total weight must not exceed 2,000 pounds.

ELECTRICAL SPECIFICATION 1447
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED JANUARY 22, 2020

POLE: ANCHOR BASE, 3 AND 7 GAUGE, TAPERED TUBULAR STEEL, WITH HANDHOLE ENTRY

SUBJECT

1. This specification states the requirements for tapered, tubular, 3 gauge and 7 gauge steel anchor base poles with mast arm supports. They will support street light luminaires and/or traffic signal mast arms and will be served by underground cables.

GENERAL

2. (a) Specifications. The poles shall conform in detail to the requirements herein stated, and to the requirements of the following organizations cited herein, of which the most recent revisions shall govern:

American Association of State Highway and Transportation Officials (AASTHO)
American National Standards Institute (ANSI)
American Society for Testing and Materials (ASTM)
American Welding Society (AWS)
Society for Protective Coatings (SSPC)

(b) Acceptance. Poles not conforming to this specification will not be accepted.

(c) Bidders Drawings. Bidders shall submit with their bids detailed scale drawings of the mast showing actual dimensions, details, and welds. Shop drawings must be original engineering drawings created by the manufacturer. The drawings must show every dimension necessary to show how all parts will fit each other and be properly held in assembly. These drawings must also be submitted in electronic format, preferably MicroStation, if requested by the City.

(d) Drawings. The drawings mentioned herein are drawings of the Department of Transportation being an integral part of this specification cooperating to state necessary requirements.

(e) Sample. If requested by the Chief Procurement Officer, one completely

assembled anchor-base pole of the manufacture intended to be furnished, must be submitted for review within fifteen (15) business days of receiving the request.

(f) Warranty. The manufacturer shall warrant the performance and construction of the light poles to meet the requirements of this Specification and must warrant all parts, components, and appurtenances against defects due to design, workmanship, or material developing within a period of five years after the light poles have been delivered. This will be interpreted particularly to mean structural or mechanical failure of any element or weld, or failure of any portion of the painting system. The warranty must be furnished in writing guaranteeing material replacement including shipment, free of charge to the City. The Commissioner will be the sole judge in determining which replacements are to be made and the Commissioner's decision will be final.

STANDARDS

3. (a) Assembly. Each anchor base pole shall consist of a steel mast with handhole entry, entry door with machine screws, grounding nut, mast base plate, top cap for mast, two (2) mast arm supports, bolt covers, and all necessary hardware required for complete assembly of these parts, ready for assembly, without special tools.

(b) Interchangeability. Members of each pole type shall be mutually interchangeable for assembly, so that no reworking will be required to make any member fit properly in the place of any other similar member of any other similar pole.

(c) Design. Each pole type shall conform in design and dimensions to the pertinent drawing(s) listed in Table "A".

MASTS

4. (a) Mast Size. The outside diameters of the mast of each pole type shall be as listed in Table A. The mast must be tapered at 0.14 inches per foot.

(b) Material. The mast must be fabricated from one length of No. 3, No. 7, or No. 11 Standard gauge steel meeting the material requirements of ASTM A606 for low alloy high strength coil steel, which, after fabrication, must possess an ultimate tensile strength of not less than 70,000 psi and a yield strength of not less than 60,000 psi, in accordance with ASTM A595, Grade C. Chemistry of the steel must be such as to insure resistance to atmospheric corrosion superior to that of ordinary copper bearing steel. Material certification is required. Manufacturer's steel meeting the specified physical and chemical requirements, and approved by the Commissioner, will be

accepted.

(c) Fabrication. The mast must be fabricated with not more than one (1) longitudinal weld. The weld shall be ground smooth so that it is virtually invisible. There shall be no lateral welds in the masts other than where the masts are welded to the steel bases. Each mast must be straight and centered on its longitudinal axis. Each mast must be formed on a mandrel and worked to form a round cross-section. The completed, unpainted masts shall have smooth external surfaces free from protuberances, dents, cracks or other imperfections marring their appearance.

(d) Base. The mast base shall be a steel plate, of low alloy, high strength steel as noted in Par. 4 (b).

Plate Base. The base plate for each pole type shall be as listed in Table "A". It must be fabricated from the same ASTM A606 low alloy, high strength steel as is used for the mast. After fabrication the steel must meet the requirements of ASTM A588. The mast must be inserted into the base to a maximum depth which will still allow for an adequate weld to be made between the bottom of the mast and the plate. A circumferential weld must be made between the mast and the base at both the top and underside of the plate. Non-metallic removable bolt covers which completely cover the anchor bolts and nuts shall be provided. The covers must be attached with stainless steel screws coated with a non-seizing compound, or another type of non-seizing fastener, as approved by the Commissioner. The covers shall enclose the anchor bolts and be secured in an approved manner. The base shall be attached to the mast so that the bearing surface of the base is at right angles to the longitudinal axis of the mast. The vertical center line of the seam must be positioned so that no welds for the simplex attachments or the handhole opening will go through the seam.

Anchor Rod Openings. All anchor rod openings for each pole type shall have a width as listed in Table "A". Each opening must be sized to have a circumferential slot length equal to 15˚ of the circumference.

(e) Mast Arm Support Plates. The mast arm support plates will be made of cast steel conforming to the requirements for Grade 65-35 cast steel of ASTM A27, or equivalent, subject to approval. They shall neatly fit the external surface of the mast. The upper mast arm support plate must have a hollow protuberance, the hole of which must be approximately equivalent to two (2) inches in diameter, extending into the interior of the pole providing a smooth surface for the lamp cables to rest upon. The mast arm support plates shall be designed so that they will carry the mast arm and hold it in the proper position for fastening the mast arm to the mast. The design of the mast arm support plates must be a two (2) bolt type as shown on Drawing No. 659.

(f) Provision for Ground. A 1/2-13 UNC (unified thread – course ANSI B1.1) square nut must be welded to the inside of the mast on the handhole entry frame for a ground connection.

(g) Entry. A vertical doorframe carrying a removable door providing access to the interior of the mast must be welded into a close fitting opening centered approximately 15 inches above the bottom of the base. The doorframe must be formed and welded of steel with a cross section of two and one-quarter (2-1/4) inches wide by one-quarter (1/4) inch thick to adequately reinforce the opening of the mast. The internal horizontal clearance of the doorframe must be four and three-quarter (4-3/4) inches; its internal vertical clearance must be seven (7) inches. Its upper and lower ends must be semi-circular meeting its straight sides tangentially. The radius of this opening must be two and three-eighths (2-3/8) inches. The vertical center line of the entry must be at a right angle clockwise from the vertical center line of the mast arm supports. The frame must have two welded tabs; one at the top and one at the bottom of the door frame. These tabs must be drilled and tapped to accept a 1/4-20 UNC screw. The top hole must be located 13/16 of an inch from the top of the opening. The bottom hole must be located 13/16 of an inch from the bottom of the opening. The 1/4-20 UNC machine screws must be stainless steel with hex heads, meeting the requirements of ASTM A193. The screws shall be treated with a compound to prevent seizing. Other non-seizing types of screws and fasteners may be considered. An alternate method of attachment consisting of a removable hinge on the bottom with a screw connection at the top may be considered. (The above requirements apply to all pole masts except those with a 10 inch bolt circle. Poles with 10 inch bolt circles must have handhole openings of 3" by 5". All other requirements apply.)

(h) Door. The removable door must be formed of sheet steel approximately one-eight (1/8) inch thick. It shall be flat or dished depending upon the pole type, and fit the doorframe closely so that it will stay in proper position even if its locking screws are slightly loosened. The door must be drilled top and bottom to accept the 1/4-20 UNC hex head machine screws which will fasten the door to the doorframe. A half-circle piece of steel must be welded by the screw opening, to allow only a socket wrench to be used. All doors shall be interchangeable. An alternate method of attachment using an internal hinge at the bottom of the door with a screw at the top of the door will be considered. Any alternate method will be subject to approval by the Commissioner or his duly authorized representative.

(i) Locking Device. Any other door locking device, other than the one outlined above in (g) and (h), must be approved by the Commissioner or his duly authorized representative.

(j) Tag. To each pole must be attached immediately below the handhole, by

mechanical means and not by adhesive, a stainless steel tag with a stamped or embossed legend which must include the pole outside diameter at the base, the overall length, and the gauge; i.e., 12.5" X 34'-6" X 3 gauge.

(k) Structural Requirements. The mast shall be manufactured in accordance with AASTHO's 1994 version of the "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals". The shaft and base assembly must be designed to meet AASTHO's 1994 criteria for 80 MPH wind loading with a 30% gust factor. The poles shall be designed appropriately for Chicago applications for both street lighting and traffic signal applications, including signal mast arms.

TOP

5. (a) Design. The mast top shall be essentially conical with a globe-shaped upper-end and having a minimum wall thickness throughout of not less than 1/4 inch. The cone portion must meet the skirted portion of the top in a smooth filet, the skirt must enclose the top 7/8" inches of the mast. Three stainless steel, or other similar approved material, set screws not less than 3/4 inches long must be equally spaced in tapped holes around the skirt and must hold the top securely in place atop the mast. The design of the top shall be similar to the one shown on Drawing #11420A.

(b) Material. The top must be aluminum alloy 356-F per ASTM B108. It shall have smooth surfaces, neat edges and corners and be free from fins, holes or other casting flaws. Non-metallic tops may be substituted if approved by the Commissioner.

(c) Finish. Tops shall be painted as herein specified.

HARDWARE

6. All the hardware necessary to complete the assembly of the pole shall be furnished. All hardware will be as specified elsewhere in these specifications. Hardware not specified elsewhere must be stainless steel meeting the requirements of ASTM A193, or equal corrosion-resistant non-seizing metal, or a non-metallic material subject to approval by the Commissioner.

WELDING

7. (a) General. Every welded joint shall be made in conformity with the proper interpretation of the standard welding symbols of the American Welding Society as indicated on the drawings; however, each bidder must submit with his proposal a drawing showing the sizes and types of welds, must state the type of electrode, and must describe the welding methods, he proposes to use in fabricating the pole.

(b) Testing. Welds shall be inspected for penetration and soundness of the welds by the magnetic particle inspection method or by radiography. Acceptance or rejection will be governed by the same conditions as in Section 9. If the magnetic inspection process is to be used, the dry method with the direct current must be employed. All transverse welds must be magnetized by the "prod" (Circular magnetization) method. Longitudinal welds may be magnetized by either circular or longitudinal magnetization.

PAINTING

8. (a) Oil and Grease Removal. All metal surfaces shall be washed with an alkaline detergent to remove any oils or grease.

(b) Metal Cleaning. All exterior metal surfaces shall be cleaned by blasting with a combination of shot and grit to remove all dirt, mill scale, rust, corrosion, oxides and foreign matter and provide a "near white" surface in accordance with SSPC-SP10. Included in this process will be the interior base section of the mast to a minimum height of twelve (12) inches.

(c) Chemical Pretreatment. The cleaned metal surfaces shall then be treated with a hot, pressurized iron phosphate wash and shall be dried by convection heat.

(d) Primer Coat. All exterior surfaces are to be coated with corrosion-inhibiting zinc-rich aromatic urethane conforming to SSPC Paint 20, Type II. Dry film thickness shall be a minimum of 2.5 mils (.0025”). The aromatic urethane shall consist of a zinc dust content not less than 83% by weight in dried film. The coating shall be airless-spray applied and moisture cured.

(e) Finish Coat. All exterior surfaces are to be subsequently coated with aliphatic acrylic polyurethane paint, conforming to SSPC-36, to a minimum dry film thickness of 3.0 mils (.003”). The coating shall be airless-spray applied and cured in a gas-fired convection oven by heating the steel substrate to between 150° Fahrenheit and 220° Fahrenheit.

(f) Interior Coat. Interior surfaces are to be coated with red oxide rust inhibitive alkyd primer to a dry film thickness of 1.5 mils.

(g) Durability. Both the exterior and interior coats must be capable of passing 1,000 hours of salt spray exposure as per ASTM B117 in a 5% NaCl (by weight) solution at 95^{o}F and 95% relative humidity without blistering. Before testing, the panel must be scribed with an "X" down to bare metal.

(h) Coating Measurement. Measurement of coating thickness must be done in accordance with SSPC-Pa 2-73T, "Measurement of Dry Paint Thickness with Magnetic Gauges," except that the lowest "single spot measurement" in an

area of two square inches must be not less than 5.5 mils.

(i) Color. Color must be gloss black unless otherwise noted in the order. A color sample must be submitted for approval prior to fabrication.

(j) Alternate Methods. Alternate painting methods may be reviewed and tested on a case by case basis. However, no coating method will be accepted unless the Commissioner judges such alternate to be equal to the coating herein specified.

MAST TEST

9. (a) General. All completed masts shall be available for testing for maximum deflection and set. The masts shall meet the structural requirements of Section 4(k). Unless specifically authorized in writing, all tests shall be made at the works of the manufacturer. A record of every test must be made and a certified copy of the test record must be submitted to the Commissioner before the masts are shipped.

(b) Lot. Tests for welds, deflection and set of the mast and of the mast arm supports shall be made upon three (3) masts of the first fifty (50) in every order. An additional one (1) mast shall be tested for each additional fifty (50) masts in the order. The selection of masts for testing shall be random from the entire completed lot. If any of the masts in any lot fail to meet the test, an additional three (3) masts of the same lot must be tested. If any of these masts fail to meet the test requirements, the entire lot will be subject to rejection, except that the manufacturer may subject each mast in the lot to the test, and those which fulfill the requirement will be accepted. After testing, each base weld must be inspected by the magnetic particle method to determine that the welds have not been affected.

(c) Mast Requirements. With base rigidly anchored, a test load as indicated in Table A must be applied at a point approximately two feet (2'0") from the free end. The load must be applied at right angles to the center line of the mast and in the same vertical plane. The deflection must not be greater than that indicated in Table A. Within one (1) minute after the test load is released, measurement must be made of the set taken by the mast. This set must not be greater than that indicated in Table A. The deflection measurement device must be reset to zero and the test load must be reapplied. The deflection must not change from the deflection noted in the first test by more than ±5%. No measurable set must be noted within one (1) minute after test load is released.

(d) Mast Arm Support (simplex) Requirements. With an appropriate mast arm firmly attached to the mast, a test load of 300 pounds must be applied to the mast arm as a side pull at a point seven (7) feet from the mast. After the test,

the mast arm support welds on the mast must be tested by the magnetic particle method to determine that they have not been affected.

PACKAGING

10. (a) General. The poles must be shipped in twelve (12) pole bundles. Each pole must be individually wrapped so that the pole can be bundled for shipping and unbundled for delivery to the City without damaging the pole or its finish.

(b) Bundles. The bundles shall consist of twelve (12) poles laid base to top to form an approximately rectangular cylinder. Materials such as lumber (2" x 4" min.), non-marring banding, and other appropriate bundling materials must be used to make a rigid, long lasting, bundle capable of being handled, shipped and stored without shifting of contents or breaking, subject to approval. Any bundles, in which either poles or packaging is received broken, damaged or with contents shifted, will not be accepted and it will be the responsibility of the supplier to return the bundle to its original destination at no cost to the City of Chicago. The bundles should be capable of being stacked two (2) high without breaking or shifting of the contents. Each bundle must be capable of being lifted by a forklift truck or crane and the bundles must be shipped on a flat bed truck to facilitate unloading. Each pole wrapping must be clearly labeled indicating the pole size, i.e. 34'6", 7 GAUGE, STEEL POLE, 15" B.C.

(c) Hardware. The bolt covers and their attachment devices must be shipped with each bundle and packaged in twelve (12) sets of four (4) each. The package must be labeled and placed in a prominent position to facilitate accessibility, and must be attached to, or within, the bundle in such a manner as to assure safe delivery. Payment will be withheld for any bundle delivered without the accompanying hardware. Pole caps must be attached at the manufacturer's facilities or be packed separately in a manner similar to the bolt covers, and the same payment conditions will prevail. Cracked, broken or chipped parts will be considered as an incomplete delivery as regards payment.

TABLE A

POLE	GAUGE	BOLT CIRCLE	ANCHOR ROD	BASE PLATE	TEST LOAD	MAX. DEF	MAX. SET	DRAWING
7.67"x12.5" x34'6"	3	16.5"	1.5"	1.75"	3200#	22"	2.5"	827
6.17"x11"x 34'6"	3	17.25"	1.25"	1.5"	2500#	26"	2.5"	824
5.17"x10.0" x34'6"	3	15.0"	1.25"	1.5"	2000#	30"	2.5"	808
5.17"x10.0" x34'6"	7	15.0"	1.25"	1.5"	1500#	30"	2.5"	808
3.95"x8.5"x 32'6"	3	11.5"	1.25"	1.5"	1500#	33"	2.5"	763
3.95"x8.5"x 32'6"	7	11.5"	1.0"	1.25"	1200#	33"	2.5"	762
3.87"x8.0"x 29'6"	3	10.0"	1.0"	1.5"	1500#	28"	1.0"	657
3.87"x8.0"x 29'6"	7	10.0"	1.0"	1.25"	1200#	28"	1.0"	656
4.15"x8.0"x 27'6"	3	10.0"	1.0"	1.5"	1500#	23"	1.0"	655
4.15"x8.0"x 27'6"	7	10.0"	1.0"	1.25	1200#	23"	1.0"	654
4.20"x7.0"x 20'0"	3	10.0"	1.0"	1.0"	1500#	13"	1.0"	653
3.70"x6.5"x 20'0"	11	10.0"	1.0"	1.0"	800#	14"	1.0"	652

ELECTRICAL SPECIFICATION 1450
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED APRIL 20, 2007

MAST ARMS: 4-, 8-, 12-, AND 15-FOOT: STEEL

SUBJECT

1. This specification covers the requirements for 4-, 8-, 12-, and 15-foot steel mast arms for supporting street light luminaires.

GENERAL

2. (a) Specifications. The mast arms shall conform in detail to the requirements herein stated, and to the requirements of the following organizations cited herein, of which the most recently published revision will govern:

American National Standards Institute (ANSI)
American Society for Testing and Materials (ASTM)
American Welding Society (AWS)
Society for Protective Coatings (SSPC)

(b) Acceptance. Mast arms not conforming to this specification will not be accepted.

(c) Drawings. The drawings mentioned herein are drawings of the Department of Transportation. They are integral parts of this specification cooperating to state necessary requirements.

(d) Bidders Drawings. Bidders shall submit with their bids detailed scale drawings of the mast arms and attachments showing actual dimensions, details, and welds. Shop drawings must be original engineering drawings created by the manufacturer. The drawings must give every dimension necessary to show how the parts will fit each other and be properly held in assembly. These drawings shall be submitted in electronic format, preferably Microstation 95, if so requested by the City.

(e) Sample. One complete mast arm of each size and of the manufacture intended to be furnished must be submitted within fifteen (15) business days upon request of the Chief Procurement Officer.

(f) Warranty. The manufacturer shall warrant the performance and construction of the mast arms to meet the requirements of this specification and must warrant all parts, components, and appurtenances against defects due to design, workmanship, or material developing within a period of five years after the mast arms have been delivered. This will be interpreted particularly to mean structural or mechanical failure of any element or weld, or failure of any portion of the painting system. The warranty must be furnished in writing guaranteeing material replacement including shipment, free of charge to the City. The Commissioner will be the sole judge in determining which replacements are to be made and the Commissioner's decision will be final.

DESIGN

3. (a) 4-Foot Mast Arm. Each 4-foot mast arm must be fabricated from a continuous, single piece, two (2) inch "extra strong" steel pipe conforming to the requirements of ASTM A53, Table X2. It must conform in detail with the mast arm shown on Drawing Number 661.

(b) 8-Foot Mast Arm. Each 8-foot mast arm must be fabricated from a continuous, single piece, two (2) inch "extra strong" steel pipe conforming to the requirements of ASTM A53, Table X2. It must conform in detail with the mast arm shown on Drawing Number 620.

(c) 12-Foot Mast Arm. Each 12-foot mast arm must be fabricated from two (2) continuous, single piece, two (2) inch "standard" steel pipes conforming to the requirements of ASTM A53, Table X2. It must conform in detail with the mast arm shown on Drawing Number 839.

(d) 15-Foot Mast Arm. Each 15-foot mast arm must be fabricated from two (2) continuous, single piece, two (2) inch "standard" steel pipes conforming to the requirements of ASTM A53, Table X2. It must conform in detail with the mast arm shown on Drawing Number 840.

(e) Mast Arm Attachment. The mast arm attachment to be welded to all mast arms will be a steel forging per ASTM A668, Class D, or cast steel conforming to the requirements for Grade 65-35 cast steel of ASTM A27, or can be fabricated from corrosion resistant steel plate such as "Cor-Ten" or approved equal. It shall be so designed that it may be fitted over the mast arm supports on the pole and be held by the mast arm supports in proper position without other support. The attachment must conform to the details shown on Standard Drawing 724. Provision must be made for fastening the attachment to each mast arm support by two special screws and washers as noted in Section 6.

(f) Entryway for Wires. A drilled opening lined with a neoprene grommet

having inserted therein a neoprene plug must be provided on the underside of the upper member of all arms approximately three (3) inches from the point of attachment. The clear opening must not be less than five-eights (5/8) inch in diameter. Its design must be submitted for approval by the Commissioner or his authorized representative.

(g) Mast Arm Members. All mast arm members shall conform with the type of steel required for the arm specified. The members must be continuous lengths of pipe cut to the proper size to fabricate the mast arm lengths requested. No butt welded, swaged and welded or other pieced together configurations of pipe lengths will be accepted. The outer and inner surfaces of the pipes shall be smooth and even without protrusions, nicks, holes or other imperfections.

PAINTING

4. (a) Oil and Grease Removal. All metal surfaces shall be washed with an alkaline detergent to remove any oils or grease.

(b) Metal Cleaning. All exterior metal surfaces shall be cleaned by blasting with a combination of shot and grit to remove all dirt, mill scale, rust, corrosion, oxides and foreign matter and provide a "near white" surface in accordance with SSPC-SP10. Included in this process shall be one to two inches of the interior section of the mast arm.

(c) Chemical Pretreatment. The cleaned metal surfaces shall be treated with a hot, pressurized iron phosphate wash and shall be dried by convection heat.

(d) Exterior Coat. A Thermosetting, polyester powder coat must be applied electrostatically to all cleaned and treated surfaces to a uniform eight (8) mil thickness in a one coat application. This powder coat must be cured in a convection oven at a minimum temperature of 400ºF to form a high molecular weight fusion bonded finish.

(e) Alternate Methods. Alternate powder coat methods may be reviewed and tested on a case by case basis. However, no coating method will be accepted unless the Commissioner judges such alternate to be equal to the coating herein specified.

(f) Interior Coat. The interior metal surfaces must be powder coated with a thermoplastic hydrocarbon resin containing corrosion inhibitors. The resin shall be formulated for application over untreated metal surfaces. The resin must be applied at a temperature of approximately 200ºF to a minimum thickness of three (3) mils. The interior thermoplastic coat must overlap the interior, thermosetting base coat by approximately one (1) inch. Alternate interior coatings may be used subject to prior approval of the Commissioner.

(g) Durability. Both the exterior and interior coats must be capable of passing 1,000 hours of salt spray exposure as per ASTM B117 in a 5% NaC1 solution at 95ºF and 95% relative humidity without blistering.

(h) Coating Measurement. Measurement of coating thickness must be done in accordance with SSPC-PA 2-73T, "Measurement of Dry Paint Thickness with Magnetic Gauges," except that the lowest "Single spot measurement" in an area of two square inches must be not less than 7.0 mils.

(i) Color. Color must be gloss black, unless otherwise specified in the order. A color chip sample must be submitted for approval prior to fabrication.

WELDING

5. (a) Standards. Every weld shall be made in conformity with the proper interpretation of the standard welding symbols of the American Welding Society as indicated on the drawings; however, each bidder must submit with his proposal a drawing showing the sizes and types of welds, must state the type of electrode, and must describe the welding methods he proposes to employ in fabricating the mast arm.

(b) Testing. The welds shall be inspected for penetration and soundness by the magnetic particle inspection method or by radiography. If the magnetic inspection process is used, the dry method with direct current must be employed.

SCREWS

6. Two (2) special 1/2" - 13 NC x 1-1/2" long stainless steel cap screws, and two (2) stainless steel flat washers, must be provided for each mast arm attachment.

MAST ARM TESTS

7. (a) General. Tests must be made upon three (3) of the first fifty (50) arms in any order. An additional one (1) arm must be tested for each additional fifty (50) arms in the order.

(b) 4-Foot Mast Arm. The 4-foot mast arm, when securely attached to a suitable and proper supporting structure, must withstand a side pull of not less than three hundred (300) pounds applied at a point three feet six inches (3'-6") from the connection to the supporting structure without failure of welds.

(c) 8-Foot Mast Arms. The 8-foot mast arm, when securely attached to a suitable and proper supporting structure, must withstand a side pull of not

less than three hundred (300) pounds applied at a point seven (7) feet from the connection to the supporting structure without failure of the welds.

(d) 12-Foot and 15-Foot Mast Arms. The 12-foot mast arm and the 15-foot mast arm, when securely attached to a suitable and proper supporting structure, must withstand a side pull of 300 pounds applied at a point seven (7) feet from the connection to the supporting structure without failure of the welds.

(e) Rejection. If any of the mast arms in any lot fail to meet the test, an additional three (3) arms in the same lot must be tested. If any of these mast arms fail to meet the test requirements the entire lot will be subject to rejection, except that the manufacturer may subject each mast arm in the lot to the test, and those which meet the requirements will be accepted.

(f) All test results must be certified by the manufacturer. Documentation must be available for the City to approve.

PACKAGING

8. (a) General. The arms shall be shipped in bundles. Each arm must be individually wrapped so that the arm can be bundled for shipping and unbundled for delivery without damage to the arm or its finish. Materials such as lumber (2"x4" min.), non-marring banding, and other appropriate bundling materials must be used to make a rigid, long lasting, bundle capable of being handled , shipped and stored without shifting or breaking of the contents. Any bundles, in which either the mast arms or packaging is received broken, damaged or with contents shifted, will not be accepted and it will be the responsibility of the supplier to return the bundle at no cost to the City. Each bundle must be capable of being lifted by a fork lift truck or crane and the bundles must be shipped in a flat bed truck to facilitate unloading. Each arm wrapping must be clearly labeled indicating the arm size, i.e. “8' STEEL LUMINAIRE MAST ARM”.

(b) The hardware must be shipped with each bundle. The package must be labeled and placed in a prominent position to facilitate accessibility, and must be attached to, or within, the bundle in such a manner as to assure safe delivery.

ELECTRICAL SPECIFICATION 1454
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED SEPTEMBER 25, 2020

MAST ARM: TRAFFIC SIGNAL MONO-TUBE

SUBJECT

1. This specification states the requirements for a tapered, tubular, 7 gauge steel mono-tube arm with mounting brackets. The arm will support traffic signals and signs.

GENERAL

2. (a) Specifications. The arms shall conform in detail to the requirements herein stated, and to the requirements of the following organizations cited herein:

American Association of State Highway and Transportation Officials (AASTHO)
American National Standards Institute (ANSI)
American Society for Testing and Materials (ASTM)
American Welding Society (AWS)
Society for Protective Coatings (SSPC)

(b) Acceptance. Arms not conforming to this specification will not be accepted.

(c) Bidders Drawings. Bidders must submit with their bids detailed scale drawings of the mast arm showing actual dimensions, details, and welds. Shop drawings must be original engineering drawings created by the manufacturer. The drawings must show every dimension necessary to show how all parts will fit each other and be properly held in assembly. These drawings shall also be submitted in electronic format, preferably MicroStation dgn format, if requested by the City.

(d) Drawings. The drawings mentioned herein are drawings of the Department of Transportation being an integral part of this specification cooperating to state necessary requirements.

(e) Sample. If requested by the Chief Procurement Officer, one complete mast arm of the manufacture intended to be furnished must be submitted for review by the Commissioner within fifteen (15) business days of receiving

such request.

(f) Warranty. The manufacturer shall warrant the performance and construction of the mast arms to meet the requirements of this specification and shall warrant all parts, components, and appurtenances against defects due to design, workmanship, or material developing within a period of five years after the mast arms have been delivered. This will be interpreted particularly to mean structural or mechanical failure of any element or weld, or failure of any portion of the painting system. The warranty must be furnished in writing guaranteeing material replacement including shipment, free of charge to the City. The Commissioner will be the sole judge in determining which replacements are to be made and the Commissioner's decision will be final.

STANDARDS

3. (a) Assembly. Each arm shall consist of a tubular tapered steel shaft, mounting brackets, an aluminum cap, and all mounting hardware.

(b) Interchangeability. Members of each arm type must be mutually interchangeable for assembly, so that no reworking will be required to make any member fit properly in the place of any other similar member of any other similar arm.

(c) Design. Each arm must meet the requirements as shown on Standard Drawing 870.

ARMS

4. (a) Arm Size. The outside diameters of the arm of each size shall be as listed in Standard Drawing 870.

(b) Material. The arm must be fabricated from one length of No. 7 Standard gauge steel meeting the requirements of ASTM A606 for low alloy high strength coil steel, which, after fabrication, must possess an ultimate tensile strength of not less than 70,000 psi and a yield strength of not less than 60,000 psi, in accordance with ASTM A595, Grade C. Chemistry of the steel shall be such as to insure resistance to atmospheric corrosion superior to that of ordinary copper bearing steel. Material certification is required. Manufacturer's steel meeting the specified physical and chemical requirements, and approved by the Commissioner, will be accepted.

(c) Fabrication. The arm must be fabricated with not more than one (1) longitudinal weld. The weld must be ground smooth so that it is virtually invisible. There must be no lateral welds in the arms other than where the arms are welded to the steel clamp. Each arm must be straight and centered on its longitudinal axis. Each arm must be formed on a mandrel and worked

to form a round cross-section. The completed, unpainted arms shall have smooth external surfaces free from protuberances, dents, cracks, or other imperfections marring their appearance.

(d) Clamp. The arm clamp must be of low alloy, high strength steel as noted in Section 4 (b). The clamp must be constructed as shown on Standard Drawing 870.

(e) Structural Requirements. The mast arm must be manufactured in accordance with AASTHO's 1994 version of the Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. The arm assembly must be designed to meet AASTHO's 1994 criteria for 80 MPH wind loading with a 30% gust factor. The arms shall be designed appropriately for traffic signal applications within the City of Chicago.

CAP

5. (a) Design. The arm cap shall be essentially conical with a globe-shaped upper-end and having a minimum wall thickness throughout of not less than 5/32 inches. The cone portion must meet the skirted portion of the arm in a smooth filet, the skirt must enclose the top 7/8" inches of the arm. Three stainless steel, or other similar approved material, set screws not less than 3/4 inches long must be equally spaced in tapped holes around the skirt and must hold the cap securely in place on the arm.

(b) Material. The cap must be of aluminum alloy 356-F per ASTM B108. It shall have smooth surfaces, neat edges and corners and be free from fins, holes, or other casting flaws.

(c) Finish. Tops shall be painted as herein specified.

HARDWARE

6. All the hardware necessary to complete the assembly of the arm must be furnished. All hardware shall be stainless steel, or equal corrosion-resistant non-seizing metal, subject to approval.

WELDING

7. (a) General. Every welded joint shall be made in conformity with the proper interpretation of the standard welding symbols of the American Welding Society as indicated on the drawings; however, each bidder must submit with his proposal a drawing showing the sizes and types of welds, must state the type of electrode, and must describe the welding methods, he proposes to use in fabricating the arm.

(b) Testing. All welds of the first three (3) arms of the first fifty (50) arms in every lot must be inspected for penetration and soundness of the welds by the magnetic particle inspection method or by radiography. Acceptance or rejection must be governed by the same conditions as in Section 9. If the magnetic inspection process is used, the dry method with the direct current shall be employed. All transverse welds must be magnetized by the "prod" (circular magnetization) method. Longitudinal welds may be magnetized by either circular or longitudinal magnetization.

PAINTING

8. (a) Oil and Grease Removal. All metal surfaces must be washed with an alkaline detergent to remove any oils or grease.

(b) Metal Cleaning. All exterior metal surfaces must be cleaned by blasting with a combination of shot and grit to remove all dirt, mill scale, rust, corrosion, oxides, and foreign matter and provide a "near white" surface in accordance with SSPC-SP 10.

(c) Chemical Pretreatment. The cleaned metal surfaces must then be treated with a hot, pressurized iron phosphate wash and must be dried by convection heat.

(d) Primer Coat. All exterior surfaces are to be coated with corrosion-inhibiting zinc-rich aromatic urethane conforming to SSPC Paint 20, Type II. Dry film thickness shall be a minimum of 2.5 mils (.0025”). The aromatic urethane shall consist of a zinc dust content not less than 83% by weight in dried film. The coating shall be airless-spray applied and moisture cured.

(e) Finish Coat. All exterior surfaces are to be subsequently coated with aliphatic acrylic polyurethane paint, conforming to SSPC-36, to a minimum dry film thickness of 3.0 mils (.003”). The coating shall be airless-spray applied and cured in a gas-fired convection oven by heating the steel substrate to between 150° Fahrenheit and 220° Fahrenheit.

(f) Interior Coat. Interior surfaces are to be coated with red oxide rust inhibitive alkyd primer to a dry film thickness of 1.5 mils.

(g) Durability. Both the exterior and interior coats must be capable of passing 1,000 hours of salt spray exposure as per ASTM B117 in a 5% Na Cl (by weight) solution at 95^{o}F and 95% relative humidity without blistering. Before testing, the panel must be scribed with an "X" down to bare metal.

(h) Coating Measurement. Measurement of coating thickness must be done in accordance with SSPC-Pa 2-73T, "Measurement of Dry Paint Thickness with Magnetic Gauges," except that the lowest "single spot measurement" in an area of two square inches must not be less than 5.5 mils.

(i) Color. Color must be gloss black unless noted otherwise in the order. A paint chip must be submitted for approval prior to fabrication.

(j) Alternate Methods. Alternate coating methods may be reviewed and tested on a case by case basis. However, no coating method will be accepted unless the Commissioner judges such alternate to be equal to the coating herein specified.

ARM TEST

9. (a) General. All completed arms shall be available for testing for maximum deflection and set. Unless specifically authorized in writing, all tests must be made at the works of the manufacturer. A record of every test must be made and a certified copy of the test record must be submitted to the Engineer of Electricity before the arms are shipped.

(b) Lot. Tests for deflection and set must be made upon the first three (3) arms in the first fifty (50) arms in the lot. An additional one (1) arm must be tested for each additional fifty (50) arms. If any of the arms in any lot fail to meet the test, an additional three (3) arms of the same lot must be tested. If any of these arms fail to meet the test requirements, the entire lot will be subject to rejection, except that the manufacturer may subject each arm in the lot to the test, and those which fulfill the requirement will be accepted. After testing, each weld must be inspected by the magnetic particle method to determine that the welds have not been affected.

(c) Requirements. With arm rigidly anchored, a test load as indicated in the table in Standard Drawing 870 must be applied at a point approximately two feet (2'0") from the free end. The load must be applied at right angles to the center line of the arm and in the same vertical plane. The deflection must not be greater than that indicated. Within one (1) minute after the test load is released, measurement must be made of the set taken by the arm. The deflection measurement device must be reset to zero and the test load must be reapplied. The deflection must not change from the deflection noted in the first test by more than ±5%. No measurable set must be noted within one (1) minute after test load is released.

PACKAGING

10. (a) General. The arms shall be shipped in twelve (12) arm bundles. Each arm must be individually wrapped so that the arm can be bundled for shipping

and unbundled for delivery to the job site without damaging the arm or its finish.

(b) Bundles. The bundles shall consist of twelve (12) arms laid base to top to form an approximately rectangular cylinder. Materials such as lumber (2" x 4" min.), non-marring banding, and other appropriate bundling materials must be used to make a rigid, long lasting, bundle capable of being handled, shipped, and stored without shifting of contents or breaking, subject to approval. Any bundles, in which either arms or packaging is received broken, damaged or with contents shifted, will not be accepted and it will be the responsibility of the supplier to return the bundle to its original destination at no cost to the City of Chicago. The bundles should be capable of being stacked two (2) high without breaking or shifting of the contents. Each bundle must be capable of being lifted by a fork lift truck or crane and the bundles must be shipped on a flat bed truck to facilitate unloading. Each arm wrapping must be clearly labeled indicating the mast size, i.e. “30' SIGNAL MAST ARM”.

(c) Hardware. The hardware must be shipped with each bundle and packaged in twelve (12) sets of four (4) each. The package shall be placed in a prominent position to facilitate accessibility, and must be attached to, or within, the bundle in such a manner as to assure safe delivery. Payment will be withheld for any bundle delivered without the accompanying hardware. Arm caps must be attached at the manufacturer's facilities or be packed separately in a manner similar to the other hardware, and the same payment conditions will prevail. Cracked, broken or chipped parts will be considered as an incomplete delivery as regards payment.

ELECTRICAL SPECIFICATION 1458
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED MARCH 4, 2014

ELECTRICAL MANHOLE FRAMES AND COVERS 24 INCH AND 30 INCH DIAMETER

SCOPE

1. This specification describes the requirements for both 24 inch and 30 inch round frames and covers. These frames and covers will be used for electrical manholes and handholes and will provide access to the interior of the manholes and handholes. The 24 inch frames and covers will be used in parkway and sidewalk areas. The 30 inch frames and covers will be used in streets and in driveways and will provide sufficient strength to withstand normal traffic conditions.

GENERAL REQUIREMENTS

2. (a) Conformance. The manhole frames and covers shall conform with every detail of the requirements herein stated and to the specifications and methods of test of the American Society for Testing and Materials cited by ASTM Designation Number in which the most recently published revision will govern.

(b) Acceptance. Frames and covers not conforming to this specification will not be accepted. The Commissioner of Transportation will have the final say as to whether or not the frames and covers meet specifications.

(c) Drawings. The drawings mentioned herein are drawings of the Department of Transportation, Division of Engineering, and must be interpreted as part of these specifications.

(d) Sample. Upon request, one complete manhole frame and cover of the manufacture intended to be furnished must be submitted within fifteen (15) business days after receipt of such a request from the Chief Procurement Officer. The samples must be delivered to the Division of Electrical Operations, 2451 South Ashland Avenue, Chicago, Illinois.

(e) Warranty. The manufacturer shall warrant that the frames and covers meet the specifications and warrant the frames and covers for a period of one (1)

year from the date of delivery against defects which may occur during that period from normal and customary use. Any frame or cover which fails during this period must be replaced by the manufacturer at no cost to the City.

DESIGN

3. (a) The frames and covers shall each conform in detail to the designs shown on Drawings 872, 874 and 10927.

(b) Each frame and cover shall weigh approximately as shown on the drawings.

(c) Machining. The bearing surfaces of both the cover and the frame shall be machine finished as indicated on the drawings.

(d) Workmanship. The frames and covers must be mutually interchangeable size for size, so that each lid will fit every frame neatly without jamming and with only such clearance as the drawings indicate. In addition, 24" & 30" covers must fit existing 24" & 30" frames, as shown on drawings 872, 874 and 10927. The castings shall be neat, true to pattern and free from cracks and casting flaws. No welding of defective castings will be permitted nor must the castings be painted.

(e) Material. The frames and covers must be made of Class 30 Cast Iron described in the specifications for Gray Iron Castings of ASTM A48. No plugging of defective castings will be permitted.

TESTS

4. (a) Test bars of the metal used for the castings shall be made and tested for tensile and transverse strength in accordance with ASTM A48. The metal must be tested at the works of the manufacturer. The manufacturer must furnish a certified copy of all test data sheets to the City prior to delivery of the castings. Frames and covers shall each be considered a separate casting for determining the requirement of testing.

ELECTRICAL SPECIFICATION 1462
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED NOVEMBER 21, 2014

RIGID STEEL CONDUIT (HOT DIPPED GALVANIZED)

SCOPE

1. This specification describes rigid steel conduit, zinc coated. This specification also describes rigid steel conduit that is both zinc and PVC coated. The conduit will be used underground or on structure as a raceway for electrical cables.

GENERAL REQUIREMENTS

2. (a) Rigid steel conduit must be zinc coated by the hot-dip process. Conduit must be furnished in 10 foot lengths, threaded on each end and with one coupling attached to one end and a protective cap at the other end.

(b) The conduit shall be manufactured according to Underwriters Laboratories Standard U.L. - 6 and must meet ANSI Standard C 80.1 and the requirements of NEC Article 344. In addition, conduit must be recognized as an equipment grounding conductor as per NEC Article 250. There will be no exceptions to meeting these standards.

(c) Acceptance. Conduit not conforming to this specification will be rejected. The Commissioner will be the final judge in determining if the conduit meets the specification.

(d) Sample. If requested by the Chief Procurement Officer, a sample of conduit must be submitted to the Engineer of Electricity within fifteen (15) business days of receipt of such a request.

(e) Warranty. The manufacturer shall warrant the construction and performance of the conduit to meet the requirements of this specification and shall warrant all parts and components against defects due to design, workmanship, or material developing within a period of one (1) year after the conduit has been delivered.

STEEL

3. Conduit shall be formed from steel suitable for use as an electrical raceway. It shall be structurally sound so that it will hang straight and true when supported by hangers in accordance with Chicago electrical code requirements and shall be capable of being field bent without deformation of the walls.

Conduit shall have a circular cross section sufficiently accurate to permit the cutting of threads in accordance with Table 2 and shall provide a uniform wall thickness throughout. All surfaces shall be smooth and free of injurious defects. The dimensions and weights of rigid steel conduit must be in accordance with Table 1.

THREADING AND CHAMFERING

4. Each length of conduit, and each nipple, elbow and bend must be threaded on both ends, and each end must be chamfered to remove burrs and sharp edges.

The number of threads per inch, and the length of the threaded portion at each end of each length of conduit, nipple and elbow must be as indicated in Table 2. The perfect thread must be tapered for its entire length, and the taper must be 3/4 inch per foot.

ZINC COATING

5. After all cutting, threading, and chamfering all conduit surfaces shall be thoroughly cleaned before application of zinc. The cleaning process shall leave the interior and exterior surfaces of the conduit in such a condition that the zinc will be firmly adherent and smooth.

The conduit must be hot dipped galvanized both inside and out to provide approximately two (2) ounces of zinc per square foot. This is equivalent to 3.4 mils of zinc coating. An additional interior coating to aid in the installation of wires is required.

COUPLINGS

6. (a) The outside surface of couplings shall be protected by means of a zinc coating. The zinc content of the coating on the outside surface must be equivalent to a minimum thickness of 3.4 mils.

(b) Couplings shall be so made that all threads will be covered when the coupling is pulled tight on standard conduit threads.

(c) Both ends of the coupling must be chamfered to prevent damage to the

starting threads.

(d) The outside diameter, length and weight of coupling must be as indicated in Table 3.

(e) Couplings must be straight tapped, except that the 2 1/2 inch and larger sizes may be taper-tapped.

PVC COATED (WHEN SPECIFIED)

7. (a) Only hot dipped galvanized conduit, couplings, and fittings may be polyvinylchloride (PVC) coated.

(b) All conduit, couplings, and fittings must be cleaned before being coated.

(c) All conduit, couplings, and fittings must have a PVC coating applied to the exterior by dipping in liquid plastisol. The coating thickness must be a nominal 40 mils.

(d) All coated conduit, couplings, and fittings must conform to the requirements of NEMA Standard RN1- Section 3 , "External Coatings". The latest revision will apply.

PACKING AND IDENTIFICATION

8. The pipe shall be delivered in bundles. Each length of conduit must be marked with the manufacturer's name or trademark. Securely attached to each bundle at two (2) locations on the bundle must be a weather resistant tag containing the following information:

a. conduit size
b. footage of bundle
c. gross weight of bundle
d. manufacturer's name

Precaution will be taken by the contractor in handling during shipment or delivery of conduit, and any conduit found to be damaged will not be accepted.

TEST AND INSPECTION

9. Galvanized rigid conduit must be capable of being bent cold into a quarter of a circle around a mandrel, the radius of which is four times the nominal size of the conduit, without developing cracks at any portion and without opening the weld.

The protective coatings used on the outside and inside surfaces of rigid steel conduit must be sufficiently elastic to prevent their cracking or flaking off when a finished sample of 2 inch conduit is tested within one year after the time of manufacture, by bending it into a half of a circle around a mandrel, the radius of which is 3 1/2 inches.

Tests on sizes other than 1/2 inch may be conducted within one year after the time of manufacture. If such tests are conducted, the conduit must be bent into a quarter of a circle around a mandrel, the radius of which is six times the nominal size of the conduit.

One of the following three test methods shall be employed for measuring the thickness or extent of the external zinc coating on conduit:

(a) Magnetic test.
(b) Dropping test.
(c) Preece test (Material which will withstand four 1-minute immersions will be considered as meeting requirements as follows; the zinc content of the coating on the outside surface must be equivalent to a minimum thickness of 3.4 mils).

All tests and inspections must be made at the place of manufacture prior to shipment unless otherwise specified, and shall be so conducted as not to interfere with normal manufacturing processes.

Each length of conduit shall be examined visually both on the outside and inside to determine if the product is free from slivers, burrs, scale or other similar injurious defects (or a combination thereof), and if coverage of the coating is complete.

If any samples of rigid steel conduit tested as prescribed in this specification should fail, two additional samples must be tested, both of which must comply with the requirements of the specification.

All pipe which may develop any defect under tests, or which may before testing or on delivery be found defective, or not in accordance with these specifications, must be removed by the Contractor at his own expense; and such pipe so removed by the Contractor must be replaced by him within ten (10) days of such rejection with other pipe which will conform to these specifications.

TABLE 1

Design Dimension and Weights of Rigid Steel Conduit

Nominal or Trade Size of Conduit	Inside Diameter	Outside Diameter	Wall Thickness	Length Without Coupling	Minimum Weight of Ten Unit Length w/couplings
(Inches)	(Inches)	(Inches)	(Inches)	(Feet/Inches)	(Pounds)
1/2	0.622	0.840	0.109	9-11 1/4	79.00
3/4	0.824	1.050	0.113	9-11 1/4	105.0
1	1.049	1.315	0.133	9-11	153.0
1 1/4	1.380	1.660	0.140	9-11	201.0
1 1/2	1.610	1.900	0.145	9-11	249.0
2	2.067	2.375	0.154	9-11	334.0
2 1/2	2.469	2.875	0.203	9-10 1/2	527.0
3	3.068	3.500	0.216	9-10 1/2	690.0
3 1/2	3.548	4.000	0.226	9-10 1/4	831.0
4	4.026	4.500	0.237	9-10 1/4	982.0

NOTE: The applicable tolerances are:

Length: + 1/4 inch (without coupling)

Outside diameter: + 1/64 inch or -1/32 inch for the 1 1/2 inch and smaller sizes, ± 1 % for the 2 inch and larger sizes.

Wall thickness: - 12 1/2 %

TABLE 2

Dimensions of Threads

Nominal or Trade Size of Conduit (Inches)	Threads per Inch	Pitch Diameter at end of Thread (Inches) Tapered 3/4 Inch per foot	Length of Thread (Inches)	
			Effective L2	Overall L4
1/2	14	0.7584	0.53	0.78
3/4	14	0.9677	0.55	0.79
1	11 1/2	1.2136	0.68	0.98
1 1/4	11 1/2	1.5571	0.71	1.01
1 1/2	11 1/2	1.7961	0.72	1.03
2	11 1/2	2.2690	0.76	1.06
2 1/2	8	2.7195	1.14	1.57
3	8	3.3406	1.20	1.63
3 1/2	8	3.8375	1.25	1.68
4	8	4.3344	1.30	1.73

NOTE: The applicable tolerances are:

Threaded Length (L4 Col 5): Plus or minus one thread

Pitch Diameter (Col 3): Plus or minus one turn is the maximum variation permitted from the gaging face of the working thread gages. This is equivalent to plus or minus one and one half turns from basic dimensions, since a variation of plus or minus one half turn from basic dimensions is permitted in working gages.

TABLE 3

Designed Dimensions and Weights of Couplings

Nominal or Trade Size of Conduit (INCHES)	Outside Diameter (INCHES)	Minimum Length (INCHES)	Minimum Weight (POUNDS)
1/2	1.010	1-9/16	0.115
3/4	1.250	1-5/8	0.170
1	1.525	2	0.300
1 1/4	1.869	2-1/16	0.370
1 1/2	2.155	2-1/16	0.515
2	2.650	2 1/8	0.671
2 1/2	3.250	3-1/8	1.675
3	3.870	3-1/4	2.085
3 1/2	4.500	3-3/8	2.400
4	4.875	3-1/2	2.839

ELECTRICAL SPECIFICATION 1463
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED FEBRUARY 7, 2014

TRAFFIC SIGNAL MOUNTING BRACKETS FOR MONOTUBE ARMS

SUBJECT

1. This specification states the requirements for mounting brackets which will be used to secure traffic signals and illuminated signs to steel monotube mast arms.

GENERAL

2. (a) Specifications. The mounting brackets shall conform in detail to the requirements herein stated and to the specifications and methods of test of the American Society for Testing and Materials cited by ASTM Designation number of which the most recently published revision will govern.

(b) Acceptance. Mounting brackets not conforming to these specifications will not be accepted.

(c) Sample. If requested by the Chief Procurement Officer, one complete mounting bracket must be submitted within 15 business days upon receipt of such a request. It must be delivered to the Division of Electrical Operations, 2451 South Ashland Avenue, Chicago, Illinois 60608.

(d) Warranty. Bracket must have a minimum 3 year warranty. The warranty must cover the material and workmanship. Any structural flaws or inability to maintain alignment will be deemed a failure and result in the warranty being invoked. The manufacturer will supply a new bracket for each failed bracket, at no cost to the City. The warranty will start from the date of delivery [date of acceptance for contract construction].

DESIGN

3. (a) General. The mounting bracket shall be designed such that no portion of the bracket is put into tension when it is attached to the mast arm with banding. The signal support tube will be attached to the bracket using compression type attachments. All materials must be corrosion resistant and designed to

be structurally sound. The signal support tube will be a slotted aluminum pipe of sufficient length to hold either 3, 4, or 5 section signal heads, or an illuminated sign. The slot must have a neoprene gasket to protect the cable. There must also be top and bottom brackets that hold the signal head assembly at each end to the tube. The bottom bracket will also be used as a cable runway.

(b) Hardware. All components of the mounting brackets must be held firmly in place with stainless steel hardware.

(c) Adjustments. Bracket shall allow for mounting and adjustment of signal faces in any direction desired on a fixed mast arm. Adjustments shall be made using standard hand tools. Neither mounting nor adjusting the bracket should require the use of a torque wrench.

(d) Signal Mounting. Mounting hardware shall be available for use with standard 2, 3, and 5 signal head configurations; for use with optically programmed signal heads; and for use with illuminated signs.

(e) Wiring. Bracket design shall allow for ease of installation of components and wiring. All wiring troughs and nipples must provide smooth, burr-free surfaces and adequate space for facile movement of nominal .5 inch diameter cable between the mast arm and the signal face.

(f) Banding. Where banding is used to attach the mounting bracket to the mast arm, the banding must be .75 inch wide stainless steel.

(g) Castings. Where castings are used for the brackets, they shall be smooth and free of defects.

TESTING

4. (a) General. At least 1% of the traffic signal mounting brackets in each order or contract shall be tested for rigidity and structural integrity.

(b) Re-testing. If any mounting bracket fails any portion of the test, an additional 3% of the brackets must be tested. If an additional bracket fails, the entire lot will be rejected.

(c) Tests.

1. With five 12" signal head sections attached to the bracket, the assembly shall be mounted to a suitable and proper supporting structure.

2. Using a calibrated dynamometer, a 100 pound force must be applied

for 60 seconds at the center of the bracket in the horizontal plane. At the completion of the test, there must be no movement of the assembly or deterioration of the bracket or appurtenant hardware.

3. Using a calibrated dynamometer, a 100 pound force must be applied to the top signal head section for 60 seconds in a direction which will pull the head away from the mounting post in the mounting post plane. During this time period, the mounting bracket castings must be struck 10 times with an 8 ounce flat head hammer at the point(s) which appear to be most vulnerable to stress. At the completion of the test, no movement of the assembly must have been observed and there must be no cracking of the castings or deterioration of the appurtenant hardware.

4. The above test must be repeated except that the force must be applied in a plane which is perpendicular to the mounting post plane.

PACKAGING

5. (a) Packing. Each bracket shall be packed in a suitable carton so secured that the bracket and parts will not be damaged during shipment, handling or storage.

(b) Marking. Each carton containing the bracket and parts shall be clearly marked on the outside in letters not less than 3/8 inches tall with the legend: "TRAFFIC SIGNAL MONOTUBE BRACKET", the name of the manufacturer, the date of manufacture, the contract number, and the City commodity code.

ELECTRICAL SPECIFICATION 1465
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED JULY 12, 2006

GROUND RODS

SUBJECT

1. This specification states requirements for ground rods and clamps to be used for ground electrodes in street lighting, traffic signal, and miscellaneous electrical circuits.

GENERAL

2. (a) Ground rods must be copper clad, steel rods suitable for driving into the ground without deformation of the rod or scoring, separation or other deterioration of the copper cladding.

(b) Sample. If requested by the Chief Procurement Officer, the contractor must furnish one sample of the ground rod proposed to be furnished within fifteen (15) business days from receipt of such request. The sample ground rod must be delivered to the Division of Electrical Operations, 2451 S. Ashland Avenue, Chicago, Illinois 60608.

(c) Warranty. The manufacturer shall warrant every ground rod against defects due to design, workmanship, or material developing within a period of one (1) year after the ground rod has been accepted. Any ground rod which fails during this period must be replaced by the contractor without expense to the City. The Commissioner of Transportation or his duly authorized representative will be the sole judge in determining which replacements are to be made.

(d) The Commissioner will be the sole judge in determining whether the submitted ground rods meet the requirements of this specification. Ground rods not accepted must be removed at the sole expense of the contractor.

DESIGN

3. (a) The ground rods and couplings must meet the latest requirements of (National Electrical Manufacturer's Association) NEMA Standard GR-1, for copper bonded ground rod electrodes and couplings. The ground rods must also meet the requirements of (Underwriter's Laboratories) UL 467.

   (b) Ground rods shall be made of steel core suitable for driving into the earth without deformation.

   (c) A uniform covering of electrolytic copper, 10 mils in thickness, shall be metallically bonded to the steel core to provide a corrosion resistant, inseparable bond between the steel core and the copper overlay.

   (d) The finished rod must be of uniform cross-section; straight, and free of nicks, cuts or protuberances.

   (e) The rod must be pointed at one end and chamfered at the other.

   (f) All ground rods must be three-quarter inches (3/4") in diameter. The length shall be as specified in the order or in the plans. The length and diameter of the rod and the manufacturer must be clearly and permanently marked near the top of the rod (chamfered end).

   (g) All ground rods must have a ground clamp capable of accommodating a No. 6 AWG Copper Wire.

PACKING

4. (a) Ground rods must be packed in bundles with reinforced tape or plastic banding that will not damage the rods. Small bundles may then be bound in larger bundles held together with steel banding.

   (b) Ground clamps must be packed in a suitable carton. The carton must be labeled to indicate the contents.

SPECIFICATION 1467
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED JUNE 28, 2012

ROD: ANCHOR, STEEL, WITH HARDWARE

SUBJECT

1. This specification states the requirements for steel anchor rods with hardware for street light pole foundations.

GENERAL

2. (a) Specifications. The anchor rods shall conform in detail to the requirements herein stated, and to the specifications of the American Society for Testing and Materials cited by ASTM Designation Number, of which the most recently published revision will govern.

(b) Drawing. The drawings mentioned herein are issued by the Department of Transportation, Division of Engineering, and are an integral part of this specification.

ANCHOR ROD

3. (a) Fabrication. Each anchor rod must be fabricated in conformity with City of Chicago drawings numbered 806, 811, 830 and 844.

(b) Material. The rods must be fabricated from cold rolled carbon steel bar meeting the requirements of ASTM Specification A-36, except that the Specification must be modified to provide a minimum yield point of 55,000 psi (379 MPa).

(c) Thread. The straight end of each rod must be threaded as shown on City of Chicago drawing for that size rod, and must be American Standard, National Coarse.

HARDWARE

4. Hardware furnished with the anchor rod shall be as shown on the applicable drawing. It must include two (2) hexagonal nuts, American Standard Regular, two (2) flat washers, type B, series W, and one (1) lock washer, steel, helical spring. The nuts must have a Class 2 or 3 fit.

FINISH

5. Galvanizing. The threaded end of each rod must be hot dipped galvanized for the distance shown on the applicable drawing. The thickness of the galvanized coating must not be less than 0.0021 inches. Each hexagonal nut and washer must be galvanized to the minimum thickness required by ASTM A-153, Class C, or ASTM B-454, Class 50. After galvanization, each anchor rod and nut must have a mating fit equivalent to the American Standard Class 2 or 3 fit for nuts and bolts.

TESTS

6. At the discretion of the Commissioner, anchor rods and hardware furnished under this specification will be subject to testing to determine compliance with the materials physical requirements.

INSPECTION

7. Final inspection must be made at point of delivery. Any anchor rods and hardware rejected must be removed by the Contractor at his sole expense.

ELECTRICAL SPECIFICATION 1473
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED FEBRUARY 12, 2010

POLE MOUNTED CAST ALUMINUM BOX FOR MAIN SERVICE DISCONNECT

SCOPE

1. This specification states the requirements for a pole mounted, cast aluminum box intended for outdoor use on the City's Street Light and/or Traffic Control Systems as a main service disconnect. The box will be mounted on a Commonwealth Edison pole and will feed a separately mounted street light controller or traffic signal controller.

GENERAL

2. (a) Specification. The junction box shall conform in detail to the requirements stated herein, and to the specifications and methods of test of the American Society for Testing and Materials cited by ASTM Designation Number, of which the most recently published revisions will govern.

(b) Drawing. The drawing mentioned herein is a drawing of the Department of Transportation, Division of Engineering, and must be interpreted as part of these specifications.

(c) Acceptance. Junction boxes not conforming to this specification will not be accepted.

(d) Sample. One complete junction box of the manufacture intended to be furnished, must be submitted within fifteen (15) business days after receipt of a request from the Chief Procurement Officer.

DESIGN

3. (a) Drawing. The junction box must conform in detail to the dimensions and requirements shown on Standard Drawing Number 893.

(b) Material. The body and door must be castings of non-heat-treated aluminum silicon alloy conforming to ANSI alloy 443.0 of ASTM B26.

(c) Assembly. Each junction box must consist of the body, door, gaskets, bronze eye-head bolts, bronze wing nuts and stainless-steel knurled pins furnished as described below, all completely assembled, painted and ready for installation.

(d) Body. The body must be cast as shown in Drawing Number 893. The body must be complete with all drilled and tapped holes required for the mounting of any hardware required to make the box fully functional for a service disconnect.

(e) Door. The door must be cast as in Drawing Number 893. The door must be furnished with a 1/2@ x 3/16" sponge neoprene gasket cemented in place completely around the door jam. The door must be painted prior to cementing the gasket into its groove on the door.

(f) Hardware. The hinge pins must be stainless steel. The eye-head bolts and wing nuts must be bronze.

(g) Painting. The exterior surfaces of the junction box must be properly cleaned and given one (1) coat of an approved zinc chromate primer containing a minimum of ten percent (10%) iron oxide, and one (1) coat of black enamel. The paint must be approved prior to production.

(h) Packing. Assembled junction boxes shall be suitably packed to prevent damage to painted surfaces during shipping and handling. All shipments must be fastened to and shipped on 48" x 48" hardwood, 4-way, non-returnable pallets. Total height must not exceed 64" and total weight must not exceed 2,000 pounds.

ELECTRICAL SPECIFICATION 1475
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED SEPTEMBER 26, 2006

CORD: TRAFFIC SIGNAL, EIGHT CONDUCTOR NO. 16 AWG, 600 VOLT

SUBJECT

1. This specification states the requirements for an eight (8) conductor number 16 AWG, electrical cable, to be installed in poles and conduit and used to electrically energize traffic signal faces at street intersections within the City of Chicago. The cable shall be flame retardant, have low acid gas content, good resistance to oil, moisture and mechanical abuse, and exhibit excellent heat aging and electrical characteristics.

GENERAL

2. (a) Specifications. The cable shall conform in detail to the requirements herein stated, and to the specifications and methods of test of the American Society for Testing and Materials cited by ASTM Designation Number, the Underwriters Laboratories, Inc. Standard or Style number and any other recognized standardization group=s specifications referred to by the appropriate designation, of which the most recently published revision will govern.

(b) Acceptance. Cable not conforming to this specification will not be accepted.

(c) Warranty. The manufacturer shall warrant the cable to be first class material throughout. In addition to any other claims against them, if the cable is installed within six months of date of shipment, the manufacturer must replace any cable failing during normal and proper use within two years of date of installation. All replacements under this warranty must be made free of charge F.O.B. delivery point of the original contract.

(d) Sample. If requested by the Chief Procurement Officer, a three (3) foot sample of the cable intended to be provided under this specification must be submitted to the attention of the Engineer of Electricity within fifteen (15) business days after receipt of such request.

CABLE

3. (a) Construction. This cable shall consist of stranded, coated, conductors each concentrically encased with a "free stripping," ethylene propylene rubber insulation. Suitable fillers shall be used to produce an essentially round cross-section. The insulated conductors and the fillers must be cabled with a suitable left-hand lay as close together as is consistent with forming a core of minimum diameter. A Mylar tape must be wrapped over the conductor assembly, and a jacket applied overall.

(b) Outer Diameter**.** The maximum allowable outer diameter must be one-half (0.50) inch.

(c) Sealing. Both ends of each length of cable must be thoroughly sealed to prevent the entrance of moisture or other foreign matter.

MARKING

4. (a) Conductors. Identification must be provided by colors in accordance with I.M.S.A. Standards.

(b) Jacket. The outer jacket must be marked as follows: "8/C 16 AWG 600V 90ºC LSZH, name of manufacturer and date of manufacture. The height of letters must not be less than 1/8 inch in height and the message must repeat at approximately two (2) foot intervals. A sequential footage marking must be located on the opposite side of the jacket. All marking must be perfectly legible with permanent white ink.

CONDUCTOR

5. (a) Material. Round, Soft or annealed, stranded copper wire in accordance with ASTM B-3 and B-8, and coated in accordance with ASTM B33 (tin coated) , must be furnished.

(b) Size. The stranded conductor must consist of stranded wires twisted with an appropriate lay to form a No. 16 AWG conductor with an approximate diameter of 0.048 inches.

INSULATION

6. (a) Type. The insulation must be an easily strippable low smoke zero halogen (LSZH) thermosetting polyolefin compound or ethylene propylene rubber (EPR), or equal meeting or exceeding the requirements of ICEA S-95-658 and the additional requirements of this specification.

(b) Rating. The insulation must be rated for continuous duty at 90ºC in

accordance with U.L. AWM Style 3400.

(c) Thickness. The insulated conductor must be circular in cross-section, concentric to the conductor, with a nominal insulation thickness of 0.031 inches (2/64") and a minimum spot thickness of 90% of the nominal thickness.

(d) Initial Physical Requirements:

1. Tensile strength, min., PSI	1,600
2. Elongation at rupture, min. %	250

(e) Air Oven Exposure Test. After conditioning in an air oven at 158 ± 1ºC for 168 hours using methods of test described in ASTM-D 573:

Tensile strength, minimum percent of unaged value 85

Elongation at rupture, minimum percent of unaged value . . . .. .65

(f) Mechanicl Water Absorption:

1. Gravimetric Method. After 168 hours in water at 70± 1ºC:

Water absorption, maximum, milligrams per square inch . . .5.0

(g) Cold Bend Test Requirements. The completed cable must pass the "Cold-Bend," Long-Time Voltage Test on Short Specimens of ASTM D-470 except that the test temperature must be minus (-) 25ºC.

(h) Electrical Requirements:

1. Voltage Test. The completed cable must meet an A.C. and D.C. voltage test in accordance with ASTM D-470 and D-2655.

2. Insulation Resistance. The completed cable must have an insulation resistance constant of not less than 20,000 when tested in accordance with methods shown in ASTM D-470.

(i) Flexibility Tests. A sample length of insulated conductor must be formed in a loose coil, placed in a circulating air oven, and aged for 168 hours at 158º C ± 1ºC. The sample must then be allowed to cool to room temperature for one (1) hour and tightly wrapped around a 3X metal mandrel. The sample must show no cracks and must pass the same voltage test specified for the "Cold-Bend Test."

JACKET

7. (a) Type. The jacket must be a thermosetting low smoke zero halogen (LSZH) polyolefin compound or chlorinated polyethylene (CPE), or equal meeting the physical and electrical requirements specified herein.

(b) Rating. The jacket must be rated for continuous duty at 90º C.

(c) Thickness. The jacket must be circular in cross-section, concentric with the insulation, must have an average thickness not less than 45 mils and a spot thickness not less than ninety percent (90%) of the average thickness.

(d) Initial Physical Requirements:

1.	Tensile strength minimum PSI	1800
2.	Elongation at rupture, minimum percent	300

(e) Air Oven Exposure Test. After conditioning in an air oven at 121 ± 1ºC for 168 hours for LSZH or 136 ± 1ºC for CPE:

1.	Tensile strength, minimum percent of unused value	75
2.	Elongation at rupture, minimum percent of unaged valued	55

(f) Mechanical Water Absorption. After 168 hours at 70 ± 1º C:

1.	Milligrams per square inch, maximum	20

TESTING

8. (a) General. Tests shall be performed on insulation, jacket and completed cables in accordance with applicable standards as listed in this specification. Where standards are at variance with each other or with other portions of this specification, the most stringent requirements, as determined by the Engineer of Electricity will apply.

All tests must be conducted on cable produced for this order. Where cable insulation and/or jacket thickness preclude obtaining samples of sufficient size for testing, special arrangements must be made with the engineer to obtain samples of unprocessed materials directly from the extrusion feed bins which will be separately processed and prepared for tests.

(b) Number of Tests. Insulation and jacket tests must be conducted on samples taken every 25,000 feet or fraction thereof of each conductor size. In no case must samples be taken closer than 15,000 feet apart.

(c) Test Reports. No cable shall be shipped until certified copies of all factory tests have been reviewed and approved by the engineer.

(d) Acceptance. Samples shall be taken from each reel and must successfully conform to all tests specified herein. Reels from which samples fail to conform, will be rejected.

PACKAGING

9. (a) Reels. The completed cord shall be delivered on sound, substantial reels. The ends of the cable must be securely fastened so that they will not become loose during shipment and handling.

(b) Footage. The number of feet per reel must be five hundred (500) feet plus or minus ten percent ($\pm$10%).

(c) Marking. A metal tag, or an approved indelible marking material such as alkyd enamel paint, must be used to mark the reel. The marking information must include, but not be limited to, the following: reel number, contract number, a description of the cord, and the footage of that particular reel.

ELECTRICAL SPECIFICATION 1493
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED FEBRUARY 6, 2014

TRAFFIC SIGNAL: VEHICULAR, TWELVE-INCH SINGLE FACE, SINGLE OR MULTIPLE-SECTION, POLYCARBONATE, LED OR INCANDESCENT

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1. GENERAL REQUIREMENTS

1.1 This specification states the requirements for twelve-inch, single face, single and multiple-section, traffic signals with polycarbonate housings, using LED or incandescent light source, for use in the traffic control system of the City of Chicago. Units include red ball, yellow ball, green ball, red arrow, yellow arrow, green arrow, red bicycle, yellow bicycle, green bicycle, white vertical bar, and white horizontal bar.

1.2 Sample and Certified Test Reports. One complete signal, fully assembled and wired, of the manufacture proposed to be furnished, must be submitted along with the required certified test reports, within 15 business days upon request of the Chief Procurement Officer. The sample must be delivered to the Division of Electrical Operations, 2451 South Ashland Avenue, Chicago, Illinois 60608.

1.3 Standards. Equipment furnished under this specification shall meet the appropriate requirements of the following standards, as required within the body of this specification:

American Association of State Highway and Transportation Officials (AASHTO)
American Iron and Steel Institute (AISI)
American Society for Testing and Materials (ASTM)
Institute of Transportation Engineers (ITE)
National Electrical Manufacturers Association (NEMA)
Underwriters Laboratories (UL)

1.4 Approval. Approval will mean approval in writing by the Commissioner or his duly authorized representative.

1.5 Warranty. The manufacturer shall warrant the signals to meet the requirements of this specification, and shall warrant all equipment, components, parts and appurtenances against defective design, material and workmanship for a period of 3

years from date of delivery [date of acceptance for contract construction]. In addition, LED optical modules must carry a 7 year warranty against failure or loss of color (chromaticity) and signal brightness (luminance) below minimum acceptable ITE standard levels from date of delivery [date of acceptance for contract construction]. In the event defects or failures occur in the units during the warranty period, the manufacturer must replace all defective units, at no expense to the City. This warranty shall be evidenced by a letter or certificate of warranty submitted to the City at the time delivery is made. The warranty must cover all units delivered in an order or installed by contract, and must include unit serial numbers. The warranty must be signed and dated by an official of the manufacturer who is empowered by the manufacturer to enter into such a warranty.

2. MATERIALS AND EQUIPMENT REQUIREMENTS

2.1 The traffic signal heads shall conform to ITE Standard "Vehicle Traffic Control Signal Heads" (VTCSH), in which the most recently published revision will govern.

2.2 Housing. The housing of each section must be one piece, ultraviolet stabilized polycarbonate resin of the specified color, injection molded complete with integral top, bottom, and sides, having a minimum thickness of 0.1 inch.

(a) The polycarbonate shall meet or exceed the following tests:

TEST	REQUIRED	METHOD
Specific gravity	1.17 minimum	ASTM D 792
Vicat Softening temp	310-320º F	ASTM D 1525
Brittleness temp.	-200º F	ASTM D 746
Flammability	Self-extinguishing	ASTM D 635
Tensile strength, yield	8,500 PSI	ASTM D 638
Elongation at yield	5.5-8.5%	ASTM D 638
Shear strength, yield	5,500 PSI min.	ASTM D 732
Izod impact strength (notched, .125" thick)	12-16 ft-lbs/in.	ASTM D 256
Fatigue strength (at 2.5 mm cycles)	950 PSI min.	ASTM D 671

(b) Assembly. A traffic signal section shall be comprised of, but not limited to, the housing, hinged door, visor, optical unit and all necessary gaskets and hardware. The multi-section, single face, traffic signal shall be comprised of single face single sections assembled together, containing an internally mounted terminal block. Arrow indications must be shipped as single sections. The traffic signals shall be designed and constructed to permit sections to be assembled together, one above the other, forming a weatherproof and dust-tight unit.

(c) Individual sections shall be fastened together with a coupling washer

assembly composed of 2 washers, 3 zinc plated bolts, nuts, and lock washers which lock the individual sections together. As an alternative, individual sections may be fastened together with 4 cadmium plated bolts, lock washers, and nuts.

(d) Height. The overall height of an assembled traffic signal must be 14 inches ±1 inch for a single-section signal, 42 inches ±3 inches for a three-section signal, and 70 inches ±5 inches for a five-section signal.

(e) Mounting. The traffic signal shall be designed for mounting with standard traffic signal brackets using 1.5 inch pipe size fittings.

(f) Positioning Device. The top and bottom opening of each housing must have integral serrated bosses that will provide positive positioning of the signal head in 5˚ increments. A total of 72 teeth must be provided in the serrated bosses to allow the signal face to be rotated 360˚ about its axis. The teeth shall be clean and well defined to provide positive positioning.

(g) Hinges. The signal housing shall be sectional; one section for each optical unit. Each housing must have 4 integral hinge lugs, with stainless steel hinge pins (AISI 304 or equivalent), located on the left side for mounting the door. The hinge pins shall be straight and not protrude past the outside of the housing lugs. The housing must have 2 integral latching bolt lugs on the right side each with a stainless steel hinge pin to which a latching bolt (AISI 304 or equivalent), washer, and wing nut will be attached. The wing nuts must be captive. Each housing must be equipped with holes to be used for mounting backplates.

(h) Door. The door shall be a one piece ultraviolet stabilized polycarbonate resin of the specified color, injection molded complete with a minimum thickness of 0.1 inch. Two hinge lugs on the left side and 2 sets of latch screw jaws centered on the right side, as viewed from the front of the signal, must be integrally cast with the housing door. The door must be hinged to the housing with 2 stainless steel hinge pins, drive fitted. Two stainless steel latch screws and wing nut and washer assemblies on the latch side of the housing body shall provide for opening and closing the door without the use of tools. The door must have holes with threaded metal inserts for stainless steel machine screws to secure the visor and the lens. The inside of the door must be grooved to accommodate a one piece, air-cored ethylene propylene diene monomer (EPDM) gasket to provide a weatherproof and dust proof seal when the door is closed. The inside of the door must have 4 equally spaced threaded metal inserts for the lens attachment. The outside of the door must have an integral rim completely encircling the lens opening to prevent leakage between the door and the lens. The rim must have 4 equally spaced tabs around the circumference with threaded metal inserts for the visor.

(i) Visor. Each traffic signal shall have a visor for each signal indication (section). The visor shall be the tunnel type, 9.25 inches long, fabricated of ultraviolet stabilized polycarbonate resin of the specified color, injection molded. The visor shall fit tightly against the door and not permit any light leakage between the door and visor. All hardware necessary for, but not limited to, attachment of the visor must be of stainless steel. The visor must have 4 mounting lugs for attaching the visor to the door. Screws must go through the visor lugs into the metal inserts in the door to secure the visor.

2.3 The traffic signal heads shall be provided with incandescent or LED optical modules as specified in the line item [or Contract Plans].

2.3.1 INCANDESCENT OPTICAL UNITS

(a) Incandescent Optical Unit. The incandescent optical unit consists of the lens, reflector and lamp holder. The optical unit and visor shall be designed as a whole so as to eliminate the return of outside rays entering the unit from above the horizontal (known as sun phantom). The optical unit shall be designed and assembled so that no light can escape from one indication to another.

(b) Lenses. The red, green, and yellow polycarbonate lenses must be round with a nominal 12 inch diameter and shall conform to all requirements set forth under the heading "Traffic Signal Lenses" in the ITE standard. The red, green, and yellow arrow lenses must be round with a nominal 12 inch diameter and the outside surface must be covered, except for the arrow, with a dull or dark grey opaque material of a thickness sufficient to totally hide the light from a 2000-lumen lamp placed behind it operating at rated voltage. The opaque material shall be hard and durable and shall be bonded such that it will not peel or flake when subject to the heat of a signal lamp or when the lens is washed. The shape and size of the arrow shall meet ITE standards. The arrow shall appear uniformly illuminated when viewed from angles usually encountered in service, whatever may be the angular position of the lens in the signal section. The lens must be enclosed by an air-cored EPDM gasket providing a weather proof and dust proof seal between the lens, door, and reflector assembly. The gasketed lens must be secured to the housing door by 4 stainless steel screws (AISI 304 or equivalent) and clamps equally spaced around the lens opening. The door must have threaded metal inserts to receive the screws.

(c) Reflector. The reflector shall be fabricated of high-purity, clad-type aluminum sheet formed to a parabolic shape and cut to fit in a circular polycarbonate, hinged frame for rigid mounting within the housing. The circular rim of the reflector shall be mounted in such a way as to seal the internal optical system by being compressed against the lens gasket when the signal door is closed. The reflecting surface must be an "ALZAK" class SI

specular finish having a minimum reflectivity of 82% and a protective oxide coating. The reflector must have an opening in the back to accommodate the lamp holder.

(d) Lamp Holder. The lamp holder must have a heat, moisture, and weatherproof molded phenolic housing designed to accommodate a standard 133 watt, 3 inch light center length, incandescent lamp. The lamp holder shall be so designed that it can be readily rotated and positively positioned to provide proper lamp filament orientation and focus. The inner brass shell, or ferrule, of the lamp holder must have a grip to prevent the lamp from working loose due to vibration. A gasket must be furnished at the junction of the lamp holder and the reflector.

2.3.2 LIGHT EMITTING DIODE (LED) OPTICAL MODULES

(a) Light emitting diode (LED) optical modules shall consist of an integral unit containing the following components: power leads, housing, matrix of light emitting diodes (LEDs) emitting monochromatic light of desired signal color, and electronic and electrical components necessary to permit operation at nominal 120 volt, 60 hertz power.

(b) The LED module shall be of such dimensions as to permit mounting in any standard traffic signal housing, be interchangeable with incandescent optical units, and must include appropriate gasket for this purpose. Gasketing provided must provide a watertight seal meeting existing ITE standard for signal heads, and exclude the infiltration of moisture into either the signal housing or into the LED optical unit case.

(c) The LED module shall meet the applicable requirements of the ITE standards for Vehicle Traffic Control Signal Heads (VTCSH) Part 2: LED Vehicle Signal Modules, for color (chromaticity), signal brightness (luminance), and beam spread (luminance at various vertical and horizontal angles).

(d) Minimum brightness of LED signal units shall be in accordance with the luminous requirements in a standard testing procedure as defined by Section 4 of the VTCSH Part 2: LED Vehicle Signal Modules. During the required operating life of LED signal units, the luminance output of the units must not be less than 60% of the values specified in the standard.

(e) The module indicator surface shall be constructed of ultraviolet (UV) stabilized, impact resistant polycarbonate, acrylic, or other approved material. The surface must be anti-glare, smooth texture, and clear.

(f) Modules shall consist of LEDs uniformly distributed to present a homogeneous appearance on the indicator face from a wide viewing angle.

(g) LEDs shall be wired so that the loss of a single LED or a string of LEDs will not reduce the luminescence below the minimum requirement.

(h) For purposes of this specification, failure of a single unit is defined as an occurrence where the luminescence of the signal measured in candela in standard test procedures is less than the required initial luminance or luminance at time points and conditions specified; or where minimum required brightness is achieved, but 2 or more series strings of LEDs or in excess of 20% of LEDs are not operable.

(i) Module power supply shall be constant current regulated and filtered to provide instant on indications, and to prevent momentary signal outages or flicker. Units must be fully operable over a range of 90 volts to 130 volts at 60 hertz ± 3 hertz.

(j) Surge protection: Each module must be provided with integral surge protection to withstand transient of 600 volt, 100 microsecond rise and 1 millisecond pulse width. The surge protector shall provide full electrical and physical protection to all unit components.

(k) Maximum permissible power consumption at ambient conditions (nominal 120 volts, 60 hertz, 70˚F.) must be 30 watts at a minimum 90% power factor. Power consumed must not vary by more than 10% from nominal power consumption over a voltage range of 105 volts to 125 volts, and over permissible environmental ranges.

(l) Modules must be fully operable at temperature ranges of -40˚F. (-40˚C.) to +165˚ F. (+74˚C.) at up to 100% relative humidity.

(m) Modules shall be clearly marked on the back surface of the unit in a permanent manner showing information required for warranty and long term performance. Information to be shown must include manufacturer name, date of manufacture, electric power requirements, signal model type including color and indication type, and signal serial number.

(n) The LED module shall be compatible with the traffic signal controller equipment currently in use by the City of Chicago, and meeting the City=s latest specifications for traffic signal control equipment. In particular the LED unit shall be compatible with the NEMA TS-1 and later traffic signal load switches and conflict monitors.

(o) Modules shall meet applicable sections of Title 47, Sub-Part B, Section 15 of the Federal Communications Commission (FCC) rules as applies to electronic noise limitation and electromagnetic interference.

(p) Total harmonic distortion (THD) induced into the voltage and current AC

power line sine waves must not exceed 20%.

(q) LED modules must meet the requirements of VTCSH Part 2: LED Vehicle Signal Modules Section 6.3.1 for signal burn-in.

2.4 Wiring. Each lamp holder must be furnished with two (2) leads color coded as follows:

First Lead Wire:

White	Common

Second Lead Wire:

Red	Red Section
Yellow	Yellow Section
Green	Green Section
Green with Black Tracer	Green Arrow Section
Yellow with Black Tracer	Yellow Arrow Section
Red with Black Tracer	Red Arrow Section
Green with White Tracer	Green Bicycle Section
Yellow with White Tracer	Yellow Bicycle Section
Red with White Tracer	Red Bicycle Section
Any Other Colors	Bus Sections

The leads must be No. 18 AWG stranded copper wire rated at 600 volt, 105˚ C., with thermo-plastic insulation. The leads must connect to the terminal strip without being spliced. The ends of the leads must be stripped of 0.5 inches of insulation and tinned.

2.5 Terminal Strip. A dual-point, barrier type terminal strip with a solid base and pressure plate type connectors shall be securely attached at both ends to the housing body inside the "Green" section of the signal head, or other approved section within a multiple section head.

2.6 Cable. One 11 foot length of flexible electric cord, medium duty, type SO, No. 16 AWG stranded copper conductor, color coded, rubber insulated, neoprene jacketed, must be furnished with each signal head. The number of conductors must include a neutral and one leg for each section. Both ends of each cable length must be carefully stripped of 6 inches of jacket and 1 inch of insulation, and each conductor properly tinned.

2.7 Gaskets. Wherever necessary to make a completely dustproof, moistureproof and weatherproof assembly of the housing and optical system, approved type gaskets of neoprene or silicone rubber shall be provided.

3. TESTING AND DOCUMENTATION REQUIREMENTS

3.1 Documentation. The contractor shall provide certified manufacturing and testing documentation to demonstrate that the traffic signals being supplied meet or exceed the specification requirements. All LED modules shall be tested by a nationally recognized testing laboratory (NRTL), such as Intertek (ETL division), to demonstrate compliance with the latest ITE VTCSH specification. All LED units shall have the testing laboratory's label attached.

3.2 Inspection. The signals shall be subject to inspection at the request of the Commissioner. Final inspection shall be made at point of delivery. Any signal rejected shall be removed, disposed of, and replaced by the contractor at his sole cost.

4. PACKAGING

4.1 Packing. Each traffic signal assembly shall be packed in a suitable carton so secured that the signal will not be damaged during shipment, handling or storage.

4.2 Marking. Each carton containing a traffic signal shall be clearly marked on the outside in letters not less than 3/8 inch tall with the legend: "TRAFFIC SIGNAL, TWELVE-INCH, POLYCARBONATE@ or ATRAFFIC SIGNAL, TWELVE INCH, POLYCARBONATE, LED OPTICS@and the number of Sections as required, the color and indication types, the name of the manufacturer, the date of manufacture, the pertinent Contract Number and the appropriate City Commodity Code Number.

ELECTRICAL SPECIFICATION 1495
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED FEBRUARY 7, 2014

TRAFFIC SIGNAL MOUNTING BRACKET POLYCARBONATE, SIDE OF POLE

SCOPE

1. This specification states the requirements for polycarbonate brackets designed for mounting traffic and pedestrian signal heads from the side of poles.

GENERAL REQUIREMENTS

2. (a) Sample and Certified Test Reports. One complete signal bracket of the manufacture proposed to be furnished, must be submitted along with the required certified test reports, within 15 business days upon request of the Chief Procurement Officer. The sample must be delivered to the Division of Electrical Operations, 2451 South Ashland Avenue, Chicago, Illinois 60608.

(b) Standards. Equipment furnished under this specification must meet the appropriate requirements of the following standards, as required within the body of this specification:

American Association of State Highway and Transportation Officials (AASHTO)
American Society for Testing and Materials (ASTM)
Institute of Transportation Engineers (ITE)
National Electrical Manufacturers Association (NEMA)

(c) Approval. Approval will mean approval in writing by the Commissioner or his/her duly authorized representative.

(d) Warranty. The manufacturer shall warrant the signal bracket to meet the requirements of this specification, and shall warrant all equipment, components, parts and appurtenances against defective design, material and workmanship for a period of 3 years from date of delivery [date of acceptance for contract construction]. In the event defects and failures

become apparent during this period, the manufacturer must replace the defective brackets at no expense to the City. This warranty must be evidenced by a letter or certificate of warranty submitted to the City at the time final delivery is made.

MATERIAL

3. (a) The bracket must be one piece, ultra violet stabilized polycarbonate resin of the specified color, injection molded complete with integral top, bottom, and sides.

(b) The polycarbonate formulation used must provide these physical properties (Tests may be performed on separately molded specimens).

TEST	REQUIRED	METHOD
Specific gravity	1.17 minimum	ASTM D 792
Vicat Softening temp	310-320° F	ASTM D 1525
Brittleness temp.	-200° F	ASTM D 746
Flammability	Self-extinguishing	ASTM D 635
Tensile strength, yield	8,500 PSI	ASTM D 638
Elongation at yield	5.5-8.5%	ASTM D 638
Shear strength, yield	5,500 PSI min.	ASTM D 732
Izod impact strength (notched, 1/8" thick)	12-16 ft-lb/in.	ASTM D 256
Fatigue strength (at 2.5 mm cycles)	950 PSI min.	ASTM D 671

(c) Glass. The polycarbonate may be glass impregnated to increase strength.

POSITIONING DEVICE

4. The top and bottom opening of the bracket must have integral serrated bosses that will provide positive positioning of the signal head in 5˚ increments to eliminate undesirable rotation or misalignment of the signal head between sections. A total of 72 teeth must be provided in the serrated bosses to allow the signal head to be rotated 360˚ about its axis. The teeth must be clean and sharp to provide positive positioning with the grooves of the signal head.

HARDWARE

5. The mounting brackets must be provided complete with 1 polycarbonate shim(.25 inches thick), one 1.5 inch chase nipple with rubber gasket, and 1 pinnacle cap with rubber gasket.

DIMENSIONS

6. The bracket must have nominal dimensions of 12 inches long, by 6 inches high, by 3 inches wide.

WIRING SPACE

7. The bracket must have an integral molded wireway with a minimum 1.5 inch diameter opening.

DESIGN STRENGTH

8. The bracket must be designed to support a 12 inch, single face, five-section, polycarbonate signal head.

TESTING AND DOCUMENTATION REQUIREMENTS

9. (a) Documentation. The contractor must provide certified manufacturing and testing documentation to demonstrate that the brackets being supplied meet or exceed the specification requirements.

(b) Inspection. The brackets will be subject to inspection at the request of the Commissioner. Final inspection must be made at point of delivery. Any bracket rejected must be removed, disposed of, and replaced by the contractor at his sole cost.

PACKAGING

10. (a) Each bracket must be packed in a suitable carton so secured that the bracket will not be damaged during shipment, handling, or storage.

(b) Marking. Each carton containing brackets must be clearly marked on the outside in letters not less than 3/8 inch tall with the legend: "POLYCARBONATE SIGNAL BRACKET, SIDE OF POLE" the appropriate City Commodity Code Number, the name of the manufacturer, the date of manufacture, and the pertinent contract number.

ELECTRICAL SPECIFICATION 1528
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED JUNE 6, 2014

PRECAST CONCRETE STRUCTURES

SUBJECT

1. This specification covers the requirements for precast concrete structures to be used for City of Chicago electrical facilities. The structures will include manholes, handholes, and street light pole foundations.

GENERAL

2. (a) Specifications. The precast structures must conform in detail to the requirements herein stated and to the specifications and methods of test of the American Society for Testing and Materials cited by ASTM Designation Number of which the most recently published revision will govern.

(b) Acceptance. Precast structures not conforming to this specification will not be accepted. The Commissioner of Transportation or his representative will be the sole judge in determining if the precast structures meet this specification. The Commissioner's decision will be final.

(c) Drawings. The drawings mentioned herein are drawings of the Department of Transportation. They are integral parts of this specification cooperating to state necessary requirements.

(d) Bidders Drawings. The apparent low bidder must submit detailed scale drawings of the precast structures showing actual dimensions and details, if so requested. Shop drawings must be original engineering drawings created by the manufacturer. The drawings must give every dimension necessary and show how the structure is assembled.

(e) Sample. One complete precast structure of each item must be submitted within fifteen (15) business days upon request of the Chief Procurement Officer.

(f) Warranty. The manufacturer must warrant the performance and construction of the precast structures to meet the requirements of this specification and must warrant all parts, components, and appurtenances against defects due to

design, workmanship, or material developing within a period of one (1) year after the precast structures have been delivered. This will be interpreted particularly to mean structural failure of any element. The warranty must be furnished in writing guaranteeing material replacement including shipment, free of charge to the City. The Commissioner will be the sole judge in determining which replacements are to be made. The Commissioner=s decision will be final.

DESIGN

3. (a) Material. Concrete must be Portland cement concrete, Class SI or PC, meeting current IDOT specifications. Pulling irons in manholes must meet or exceed the requirements of ASTM A36 steel. Pulling irons must be hot dipped galvanized. Steel reinforcing bars must meet or exceed the requirements of ASTM A615, Grade 60. Cable supports in manholes, including stanchions and racks, must be manufactured for that specific purpose. Stanchions must be non-metallic and must be capable of accommodating several different sizes of cable hooks at various elevations. A minimum of eight cable hooks, 4 inches in length, must be provided with each manhole, and should include any hardware necessary to affix the hooks to the racks. Cable hooks for handholes must be manufactured for that specific purpose. Cable hooks for handholes must be a minimum of 3 inches in length and 3 inches in depth. Anchor rods in foundations must meet the latest Electrical Material Specification 1467. Conduit elbows in foundations must meet the latest Electrical Material Specification 1462.

(b) Foundations must include conduit elbows, anchor rods, washers, and nuts. The 7 foot foundation must include a 6 foot re-bar cage. Handholes must include cable hooks. Manholes must include cable racks, pulling irons, and cable hooks. Each manhole and each handhole must have lifting anchors cast in the concrete to facilitate shipment and installation. If the manhole or handhole is in more than one piece, instructions for assembly must be provided. Also, a sufficient amount of bonding agent must be provided. The bonding agent must be approved material. Frames and covers, sump grates, clay tile, and ground rods are not included under this specification.

(c) Dimensions of Manholes and Handholes. Each manhole or handhole must be dimensioned as shown on the appropriate standard drawing. The 30 inch diameter handhole is Standard Drawing 867. The 36 inch diameter handhole for 24 inch frame and cover is Standard Drawing 866. The 36 inch diameter for 30 inch for frame and cover is Standard Drawing 871. The 3 foot by 4 foot by 4 foot manhole for a 24 inch diameter frame and cover is Standard Drawing 730. The 3 foot by 4 foot by 4 foot manhole for 30 inch frame and cover is Standard Drawing 729. The 4 foot by 6 foot by 6 foot manhole for 24 inch frame and cover is Standard Drawing 732. The four foot by 6 foot by 6 foot manhole for 30 inch frame and cover is Standard Drawing 733. The 5

foot 4 inch by 7 foot 4 inch manhole roof is Standard Drawing 733.

(c) Dimensions of Grade Rings. Grade rings shall be in four different dimensions. The 39 inch outside diameter ring shall have a 24 inch diameter opening and shall come in both 2 inch and 4 inch thicknesses. The 45 inch outside diameter ring shall have a 30 inch diameter opening and shall also come in both 2 inch and 4 inch thicknesses.

(d) Dimensions of foundations. The residential street light foundation shall be dimensioned as shown on standard drawing 565. The 7 foot arterial street light foundation shall be as shown on standard drawing 818.

DELIVERY

4. All manholes, handholes, and foundations will be delivered to the Division of Electrical Operations storage yard at 1539 South Ashland Avenue in Chicago, or to another location within the City as indicated on the order. Any manhole, handhole, or foundation deemed to be defective by the Commissioner or his representative must be removed and replaced at no cost to the City. The Commissioner=s decision will be final.

ELECTRICAL SPECIFICATION 1533
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED NOVEMBER 21, 2014

NON-METALLIC CONDUIT

SCOPE

1. This specification states the requirements for both rigid and coilable non-metallic conduit. The conduit will be used for low voltage (600 volt rated cables) electrical street lighting and traffic control systems. It may also be used for fiber-optic communications cables. This conduit will be installed underground. Rigid non-metallic conduit may be installed on structure.

GENERAL

2. (a) Standards. The following standards are referenced herein.

ASTM – American Society for Testing and Materials
NEC – National Electrical Code
NEMA – National Electrical Manufacturer's Association
UL – Underwriter's Laboratories

(b) Warranty. The manufacturer must warrant the conduit against defective workmanship and material for a period of one year from date of installation or date of delivery. Any conduit that is found to be defective must be replaced without cost to the City.

(c) Sample. If requested by the Chief Procurement Officer, a sample of the conduit intended to be furnished under this specification, must be submitted to the Engineer of Electricity within fifteen (15) business days upon receipt of such request.

MATERIAL

2. (a) Rigid non-metallic conduit will be made of polyvinyl chloride (PVC). All conduit and fittings must comply with ASTM D 1784 and with the applicable sections of NEMA TC2, UL standard 651, and NEC Article 352. Fittings must meet the standards of NEMA TC3 and TC6, as well as UL 514.

(b) Coilable non-metallic conduit will be made of high density polyethylene (HDPE). All conduit must comply with ASTM D3485 ,ASTM D 1248, and NEMA TC7.

(c) A tape must be installed in the HDPE conduit at the factory. The tape is for pulling cable through the conduit. The tape must be specifically manufactured for this purpose. The tape must have a tensile strength of at least 1000 pounds.

SIZES

3. (a) PVC and HDPE will come in two wall thicknesses; schedule 40 and schedule 80.

(b) PVC will come in ten foot sections. HDPE will come on reels.

(c) Nominal inside diameters (in inches) for non-metallic conduits will include the following: ½ , ¾ , 1, 1 ¼, 1 ½ , 2, 2 ½ , 3, 3 ½, 4.

PACKING

4. Rigid conduit must be shipped in bundles. Coilable conduit must come on wooden reels. Both bundles and reels must be tagged to indicate the size and diameter of the conduit, the quantity in feet, the weight, and the manufacturer's name. The conduit itself must be marked to indicate the type and size, as well as the manufacturer.

ELECTRICAL SPECIFICATION 1534
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED AUGUST 5, 2013

CABLE: SINGLE-CONDUCTOR, COPPER 600 VOLT

SUBJECT

1. This specification states the requirements for single conductor cables intended to be used in 240 VAC street lighting circuits. The cable will also be used as service cable for both street light controllers and traffic signal controllers. The cables will be installed in underground conduit and rated as 600 volt.

GENERAL

2. (a) Specifications. The cable must conform in detail to the requirements herein stated, and to the applicable portions of the latest revisions of the specifications and methods of test of the following agencies:

   (1) ASTM – American Society for Testing and Materials
   (2) ICEA – Insulated Cable Engineers Association
   (3) IEEE – Institute of Electrical and Electronics Engineers
   (4) UL – Underwriters Laboratories

   (b) Acceptance. Cable not in accordance with this specification will not be accepted.

   (c) Sample. If requested by the Chief Procurement Officer, a three (3) foot sample of the cable intended to be provided under this specification must be sent to the attention of the Engineer of Electricity within fifteen (15) days of receipt of such request.

   (d) Warranty. The manufacturer must warrant the cable to be first class material throughout. In lieu of other claims against them, if the cables are installed within twelve (12) months of date of shipment, the manufacturer must replace any cable failing during normal and proper use within two years of date of installation. All replacements under this warranty must be made free of charge F.O.B. delivery point of the original contract.

CABLES

3. (a) Construction. The cable must consist of an uncoated multiple strand copper conductor with a tight fitting thermoset, free stripping, concentric layer of ethylene propylene (EPR) insulation.

(b) The number of strands and the outer diameter of the cable shall be as noted in TABLE A.

(c) Cable shall be UL approved for sunlight resistance and for direct burial applications.

(d) Cable must meet IEEE 383 and UL 1581 70,000 BTUs per hour flame test requirements.

COLOR CODE

4. (a) Triplexed cable shall consist of a black cable, a red cable, and a green ground cable. Triplexed cable will have a 16" to 18" lay.

(b) Individual cables will be black, red, or white, depending upon the order.

CONDUCTOR

5. (a) Material. The conductors must be soft round copper strands.

(b) Specifications. The conductor must meet the requirements of ASTM B3 and ASTM B8.

(c) Sizes. The conductor sizes must be in accordance with all requirements in Table A of this specification.

(d) Stranding. The number of strands must be as indicted in Table A. Stranding must meet the requirements of ASTM B8, Class B.

INSULATION

6. (a) Type. The insulation must be ethylene propylene rubber compound (EPR) meeting the requirements of ICEA S-95-658 and UL 44 for RHW-2 cable and UL 854 for USE-2 cable.

(b) Thickness. The insulation must be circular in cross-section, concentric to the conductor, and must have an average thickness not less than that set forth in Table A of this specification, and a spot thickness not less than ninety percent (90%) of the average thickness.

(c) Cable Marking. The cable must be identified by a permanently inscribed legend in white lettering as follows:

1/C No. (conductor size) AWG-600V-90ºC-EPR-RHW-2

The legend must be repeated at approximately eighteen (18) inch intervals on the outside surface of the cable parallel to the longitudinal axis of the conductor. A sequential footage marking must be located on the opposite side from the legend.

TESTING

7. (a) Initial Physical Requirements.

1. Tensile strength, minimum, p.s.i.	1200
2. Elongation at rupture, minimum %	250

(b) Oven Exposure Test. After conditioning in an air oven at 121±1ºC for 168 hours using methods of test described in ASTM D 573:

1. Tensile strength, minimum % of initial value	75
2. Elongation at rupture, minimum percent of initial value	75

(c) Water Absorption Test. Gravimetric method: After 168 hours in water at 70±1ºC water absorption, at a maximum – 5 milligrams per square inch

(d) Cold Bend Test. The completed cable must pass the test requirements of ASTM D 470, except that the test temperature must be -25ºC.

(e) Electrical Tests.

1. Voltage. The completed cable must meet an A.C. and D.C. voltage test in accordance with ASTM D 470 and D 2655.
2. Insulation Resistance. The completed cable must have an insulation resistance constant of not less than 20,000 ohms when tested in accordance with ASTM D 470.

(f) Flame Tests. Cable must pass a 70,000 BTU flame test in accordance with IEEE 383.

(g) All of the above tests must be on cable produced for the order. Tests must be taken on samples taken every 25,000 feet, or fraction therof, of each conductor size.

(h) Test Reports. No cable shall be shipped until certified copies of all factory

tests have been reviewed and approved by the City. Cable that does not pass any one of the above tests will be rejected.

PACKAGING

8. (a) Reels. The completed cable must be delivered on sound substantial, non-returnable reels. Both ends of each length of cable must be properly sealed against the entrance of moisture and other foreign matter by the use of clamp-on cable caps. The ends must be securely fastened so as not to become loose in transit. Before shipment, complete 2 X 4 lagging must be applied to all reels.

(b) Footage. Each reel must contain the length of cable as set forth in Table A of this specification. Alternate lengths may be considered.

(c) Reel Marking. A metal tag must be securely attached to each reel indicating the reel number, contract number, date of shipment, gross and tare weights, the appropriate City commodity code if applicable, and a description of the cable. Also, each reel must have permanent marking on it indicating the total footage, and the beginning and ending sequential footage numbers. Directions for unrolling the cable must be placed on the reel with an approved permanent marking material such as oil-based paint or a securely attached metal tag.

TABLE A

CONDUCTOR		INSULATION THICKNESS	A-C TEST	REEL LENGTH	OVERALL DIAMETER
AWG	STRANDS	MILS	VOLTS	FEET	INCH
14	7	45	5500	2000	.133
12	7	45	5500	2000	.152
10	7	45	5500	2000	.176
8	7	60	5500	2000	.236
6	7	60	5500	2000	.274
4	7	60	5500	2000	.322
2	7	60	5500	1000	.382
1/0	19	80	7000	1000	.470
2/0	19	80	7000	1000	.514
3/0	19	80	7000	1000	.564
4/0	19	80	7000	1000	.620
250 MCM	37	95	8000	1000	.705

ELECTRICAL SPECIFICATION 1537
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED AUGUST 5, 2013

CABLE: TRAFFIC SIGNAL, MULTIPLE CONDUCTOR, COPPER WIRE, 600 VOLT

SUBJECT

1. This specification states the requirements for a multiple conductor cable to be installed in underground conduits and used to distribute electrical energy to operate automatic traffic control signals for both vehicular and pedestrian traffic at street intersections within the City of Chicago. The cable will be used between the traffic controller cabinet and the junction boxes on the traffic signal poles. The cable will be rated as 600 volt.

GENERAL

2. (a) Specification. The cable must conform in detail to the requirements herein stated, and to the specifications and methods of test of the following:

ASTM - American Society for Testing and Materials
ICEA - Insulated Cable Engineers Association
IEEE - Institute of Electrical and Electronic Engineers
UL - Underwriters Laboratories

(b) Acceptance. Cable not conforming to this specification will not be accepted.

(c) Sample. If requested by the Chief Procurement Officer, a three (3) foot sample of the cable intended to be furnished under this specification must be submitted to the attention of the Engineer of Electricity within fifteen (15) business days of receipt of such request.

(d) Warranty. The manufacturer must warrant the cable to be first class material throughout. In lieu of other claims against them, if the cable is installed within twelve (12) months of date of shipment, the manufacturer must replace any cable failing during normal and proper use within two years of date of installation. All replacements under this warranty must be made free of charge F.O.B. delivery point of the original contract.

CABLES

3. (a) Construction. The cable must consist of coated conductors each concentrically encased with a free- stripping, thermoset cross-linked polyethylene insulation. Suitable fillers must be used to produce an essentially round cross-section. A Mylar tape must be wrapped over the conductor assembly, and a thermoset low smoke zero halogen polyolefin (LSZH) jacket applied overall.

(b) Outer Diameter. The maximum allowable outer diameter for round cables must be as follows:

No. Of Conductors	Outer Diameter (inches)
Ten	0.69
Nineteen	0.90

(c) Cable shall be UL approved for sunlight resistance and for direct burial applications.

(d) Cable must meet IEEE 383 and UL 1581 and UL1202 70,000 BTUs per hour flame test requirements.

COLOR CODE

4. Conductor identification must be provided by color synthetic-resin coverings, or an approved equal. Table A sets forth the color code for the various conductor arrangements.

CONDUCTOR

5. (a) Material. Solid, soft or annealed, tinned copper wire, meeting the requirements of ASTM B-33 and B-258.

(b) Size. Cables must be made up of conductor sizes as set forth in this specification. The Number 14 AWG will be solid.

INSULATION

6. (a) Type. The insulation must be a thermoset cross-linked polyethylene compound meeting the requirements of ICEA S-73-532 and UL 44 for XHHW-2 cable.

(b) Thickness. The insulation must be circular in cross-section and have the following minimum thicknesses.

Conductor Size. AWG	stranding (No. Of Wires)	No. of Conductors	Insulation Thickness (mils)
#14	1	10	30
#14	1	19	30

CABLE TAPE

7. The assembled and cabled conductor core must be wrapped with a one mil (0.001 inch) thick Mylar tape allowing a minimum of ten percent (10%) overlap.

JACKET

8. (a) Material. The jacket must be a thermoset low smoke zero halogen (LSZH) polyolefin.

(b) Workmanship. The jacket must have a smooth exterior surface free from holes, cracks and splits, and must be tough, elastic, homogeneous in composition, and properly vulcanized.

(c) Thickness. Thickness of the jacket must be 4/64 inches. Minimum thickness must be not less than ninety percent (90%) of the average thickness.

(d) Cable Marking. Outer Jacket must be embossed or printed with the manufacturer's name, year of manufacture, insulation and jacket materials, conductor number, conductor size, at approximately 18" intervals. On the side opposite, the cable must be sequentially marked in one (1) foot increments. The jacket must be black.

TESTING

9. (a) Initial Physical Properties of Insulation.

1. Tensile Strength, minimum 1200psi
2. Elongation at Rupture, minimum 250%

(b) Physical Properties of Insulation After Aging. After 168 hours in air oven at 121º C.

1. Tensile Strength 75% of initial value
2. Elongation 75% of initial value

(c) Initial Physical Properties of Jacket.

1. Tensile Strength, minimum 1800psi
2. Elongation at Rupture, minimum 300%

(d) Physical Properties of Jacket After Aging. After 168 hours in air oven at 121º C.

1. Tensile Strength 75% of initial value
2. Elongation 65% of initial value

(e) Water Absorption. Tests must be made in accordance with ASTM D 470. After 168 hours in distilled water at 70º C., water absorption of the insulation material must not exceed 5 milligrams of water per square inch. For the jacket material the water absorption must not exceed 1 milligram per square inch under the same conditions.

(f) Cold-Bend Test. The completed cable must pass cold bend test of ASTM D 470, except that the test temperature must be minus(-)25ºC.

(g) Electrical Requirements.

1. Voltage. The completed cable must meet an A.C. and D.C. voltage test in accordance with ASTM D 470 and D 2655.
2. Insulation Resistance. The completed cable must have an insulation resistance of not less than 20,000 ohms when tested in accordance with methods in ASTM D 470.

(h) Flame Tests. Cable must pass a 70,000 BTU flame test in accordance with IEEE 383.

(i) Tests. The above tests must be performed on the insulation, the jacket, and the completed cable as required above. Tests must be performed on samples taken every 25,000 feet or fraction thereof of each cable size.

(j) Reports. No cable will be accepted until certified copies of the test reports have been reviewed and approved by the City. Cable that does not pass any of the above tests will be rejected.

PACKAGING

10. (a) Reels. The completed cable must be delivered on sound substantial, non-returnable reels. Both ends of each length of cable must be properly sealed against the entrance of moisture and other foreign matter by the use of clamp-on cable caps. The ends must be securely fastened so as not to become loose in transit. Before shipment, complete 2 x 4 lagging must be applied to all reels.

(b) Footage. Each reel must contain the length of cable as set forth below.

(1) Ten-Conductor	2000 feet
(2) Nineteen-Conductor	1000 feet

(c) Marking. A metal tag must be securely attached to each reel indicating the reel number, contract number, date of shipment, gross and tare weights, the appropriate City commodity Code Number if applicable, and a description of the cable. Also, each reel must have permanent marking on it indicating directions for unrolling the cable and the footage of cable contained in the reel. Indelible ink or other such material susceptible to washing off or fading will not be permitted; and approved permanent marking material such as paint or a securely attached metal tag is required.

TABLE A COLOR CODE CONDUCTOR IDENTIFICATION

Base Color	First Tracer	Second Tracer	10	19
White	Black	Red	--	14
White	Red	Green	--	14
Black	--	--	14	14
White	--	--	14	14
Red	--	--	14	14
Green	--	--	14	14
Orange	--	--	14	14
Blue	--	--	14	14
White	Black	--	--	--
Red	Black	--	14	14
Green	Black	--	14	14
Orange	Black	--	14	14
Blue	Black	--	14	--
Black	White	--	--	--
Red	White	--	--	14
Green	White	--	--	14
Blue	White	--	--	14
Orange	White	--	--	14
White	Red	--	--	--
Blue	Orange	--	--	14
Red	Blue	--	--	14
Green	Blue	--	--	14
Orange	Blue	--	--	14

ELECTRICAL SPECIFICATION 1541
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
SEPTEMBER 16, 2004

REINFORCING ROD FORMED STEEL CAGES

SUBJECT

1. This specification is for steel cages. The cages are to be used in street light pole foundations to provide the necessary strength to support street light poles.

DESCRIPTION

2. (a) The steel must conform to the requirements of the American Society for Testing and Materials cited by ASTM designation number, of which the latest revision will govern.

(b) The steel cages must conform to all the requirements shown on Electrical Standard Drawing 793A.

(c) The steel cages must be constructed of number 3 and number 6 reinforcing bars, as shown on Electrical Standard Drawing 793A. Reinforcing steel must conform to ASTM A615, Grade 60, with a yield strength of 60,000 psi. All joints must be welded according to the latest recommendations of the American Welding Society's (AWS) Document 1.4.

ACCEPTANCE

3. If so requested, a sample cage must be delivered to the City within fifteen (15) business days of such request by the Chief Procurement Officer. The contractor must present certification that the steel used meets this specification. The City reserves the right to reject any cages which do not completely meet this specification.

DELIVERY

4. The Contractor must furnish and deliver the steel cages to the City of Chicago, Department of Transportation, Division of Electrical Operations, 4101 South Cicero Avenue, Chicago, Illinois 60650, or to a location as directed in the contract. Any cages that do not meet the specification or are delivered damaged will be rejected.

ELECTRICAL SPECIFICATION 1543
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED FEBRUARY 7, 2014

TRAFFIC SIGNAL: OPTICALLY PROGRAMMED, TWELVE-INCH SINGLE FACE, SINGLE OR MULTIPLE-SECTION, LED

SUBJECT

1. This specification states the requirements for optically programmed, twelve-inch, single face, single and multiple-section, electric traffic signals with aluminum housings for use in the traffic control system of the City of Chicago. Indications shall include red, yellow, green, yellow arrow, and red arrow.

GENERAL REQUIREMENTS

2. (a) Sample and Certified Test Reports. One complete signal, fully assembled and wired, of the manufacture proposed to be furnished, must be submitted along with the required certified test reports, within 15 business days upon request of the Chief Procurement Officer. The sample must be delivered to the Division of Electrical Operations, 2451 South Ashland Avenue, Chicago, Illinois 60608.

(b) Standards. Equipment furnished under this specification shall meet the appropriate requirements of the following standards, as required within the body of this specification:

American Association of State Highway and Transportation Officials (AASHTO)
American Iron and Steel Institute (AISI)
American Society for Testing and Materials (ASTM)
Institute of Transportation Engineers (ITE)
National Electrical Manufacturers Association (NEMA)
Underwriters Laboratories (UL)

(c) The traffic signal heads shall conform to ITE Standard "Vehicle Traffic Control Signal Heads" (VTCSH), in which the most recently published revisions will govern.

(d) Approval. Approval will mean approval in writing by the Commissioner or

his duly authorized representative.

HOUSING REQUIREMENTS

3. (a) Housing. The housing of each section shall be one piece, cast aluminum, complete with integral top, bottom, and sides. The aluminum die casting material shall meet or exceed the ITE alloy composition and tensile strength requirements. The housing shall be prepared with chromate treatment primer and painted with two coats of enamel in color as specified in the line item or contract plans.

(b) Assembly. A traffic signal section shall be comprised of, but not limited to, the housing, hinged front and rear doors, visor, optical unit and all necessary gaskets and hardware. The multi-section, single face, traffic signal shall be comprised of single face single sections assembled together, containing an internally mounted terminal block. Arrow indications must be shipped as single sections. The traffic signals shall be designed and constructed to permit sections to be assembled together, one above the other, forming a weatherproof and dust-tight unit. Each housing must be equipped with holes to be used for mounting back-plates.

(c) Individual sections shall be fastened together with adjustable coupling assemblies which lock the individual sections together. The assembly must allow the incremental tilting of the signal faces ±10% from horizontal while maintaining a common vertical axis for the sections.

(d) Height. The overall height of an assembled traffic signal must be 14 inches ±1 inch for a single-section signal, 42inches ±3 inches for a three-section signal, and 70 inches ±5 inches for a five-section signal.

(e) Mounting. The traffic signal shall be designed for mounting with standard traffic signal brackets using 1.5 inch pipe size fittings.

(f) Positioning Device. The top and bottom opening of each housing must have integral serrated bosses that will provide positive positioning of the signal head in 5˚ increments. A total of 72 teeth must be provided in the serrated bosses to allow the signal face to be rotated 360˚ about its axis. The teeth shall be clean and well defined to provide positive positioning.

(g) Hinges. The signal housing shall be sectional; one section for each optical unit. Each housing must have 4 integral hinge lugs, with stainless steel hinge pins (AISI 304 or equivalent), located on the left side for mounting the front door and on the right side for the rear door. The hinge pins must be straight and not protrude past the outside of the housing lugs. The housing must have 2 integral latching bolt lugs on the right side of the front door and 1 bolt lug on the left side of the rear door. Each closure must consist of a stainless steel

hinge pin to which a latching bolt (AISI 304 or equivalent), washer, and wing nut will be attached. The wing nuts must be captive and must provide for opening and closing the door without the use of tools.

(h) Front and Rear Doors. The doors shall be one piece die cast aluminum construction. The front door shall house the objective lens and allow access to the optical-limiter diffuser. Two hinge lugs on the left side and 2 sets of latch screw jaws centered on the right side, as viewed from the front of the signal, must be integrally cast with the housing front door. The front door shall be prepared with chromate treatment primer and painted with 2 coats of flat black enamel. The rear door shall allow access to the lamp. Two hinge lugs on the right side and 1 set of latch screw jaws centered on the left side, as viewed from the rear of the signal, must be integrally cast with the housing rear door. The rear door shall be prepared with chromate treatment primer and painted with 2 coats of enamel in color matching the signal housing. The doors must be hinged to the housing with 2 stainless steel hinge pins, drive fitted. The inside of the doors must be grooved to accommodate a one piece, air-cored ethylene propylene diene monomer (EPDM) gasket to provide a weatherproof and dust proof seal when the door is closed.

(i) Gaskets. Wherever necessary to make a completely dust-proof, moisture-proof and weatherproof assembly of the housing and optical system, approved type gaskets of neoprene or silicone rubber shall be provided.

(j) Visor. Each traffic signal shall have a visor for each signal indication (section). The visor must be the cutaway type, a minimum 9 inches long, fabricated of sheet aluminum, prepared with chromate treatment primer and painted with 2 coats of flat black enamel. The visor shall fit tightly against the front door and not permit any light leakage between the door and visor. All hardware necessary for attachment of the visor must be of stainless steel. The visor must have four mounting lugs for attaching the visor to the door. Screws must go through the visor lugs into the metal door to secure the visor.

OPTICAL UNITS

4. (a) The traffic signal heads shall be provided with 12 inch acrylic Fresnel lenses colored to ITE specifications. A smaller clear objective lens shall be mounted behind the Fresnel lens. Masked off portions of the clear lens will control the direction of light. A masking kit shall be provided with each individual head section. Masking shall provide a selectively visible or veiled projected indication anywhere within 15˚ of the signal optical axis.

(b) An LED lamp shall be held in a 3-prong base by a wire ring and a spring load clip.

(c) Lamp Collar. The lamp housing must consist of an integral lamp support, indexed ceramic socket, and quick release self-aligning lamp retainer. The electrical connection between the lamp housing and signal case must be accomplished with an interlock assembly which disconnects the lamp housing when opened.

(d) Optical Limiter - Diffuser. The optical limiter-diffuser must provide an imaging surface at focus on the optical axis for objects 900 to 1,200 feet distance and permit an optical masking tape to be variously applied as determined by the desired visibility zone. The optical limiter-diffuser must be provided with positive indexing means and composed of heat-resistant glass.

(e) Objective Lens. The objective lens must be a high resolution planar incremental lens hermetically sealed with a flat laminate of weather-resistant acrylic. The lens must be symmetrical in outline and capable of being rotated to any 90˚ orientation about the optical axis. The projected signal indication must be capable of being veiled anywhere within 15˚ of the optical axis. The indication must not result from external illumination and must conform to ITE standards.

(f) The optical unit with lamp shall meet the applicable requirements of the ITE standards for Vehicle Traffic Control Signal Heads(VTCSH) Part 2: LED Vehicle Signal Modules, for signal brightness (luminance), and beam spread (luminance at various vertical and horizontal angles).

LED LAMPS

5. (a) LED lamp shall consist of an integral sealed unit containing the following components: housing, integral lens, matrix of light emitting diodes (LEDs) emitting white monochromatic light, and electronic and electrical components necessary to permit operation at nominal 120 volt, 60 Hertz power.

(b) LED lamp shall be of such dimensions as to permit mounting in the signal head, and be interchangeable with incandescent lamps manufactured for the same purpose.

(c) Minimum brightness of LED lamps shall be in accordance with the luminous requirements of ITE. During the required operating life of LED lamps, the luminance output of the lamps must not be less than 60% of the values specified in the standard.

(d) LED lamps shall be equivalent to an incandescent 150 watt PAR-46 lamp. The lamp shall have the same shape as a PAR-46 lamp and shall have a 3-prong base.

(e) LED lamp power supply shall be current regulated and filtered to provide instant on indications, and to prevent momentary signal outages or flicker. Units must be fully operable over a range of 90 volts to 130 volts at 60 Hertz ± 3 Hertz.

(f) Lamps must be fully operable at temperature ranges of -40º F. (-40º C.) to +165º F. (+74º C.) at up to 100% relative humidity.

(g) Lamps shall be clearly marked in a permanent manner showing information required for warranty and long term performance. Information to be shown must include manufacturer name, date of manufacture, and electric power requirements.

(h) The LED lamp shall be compatible with the traffic signal controller equipment currently in use by the City of Chicago, and meeting the City's latest specifications for traffic signal control equipment. In particular the LED unit shall be compatible with the NEMA TS-1 and later traffic signal load switches and conflict monitors.

(i) LED lamps shall meet applicable sections of Title 47, Sub-Part B, Section 15 of the Federal Communications Commission (FCC) rules as applies to electronic noise limitation and electromagnetic interference.

WIRING

6. (a) Wire Leads. Each lamp connector must be furnished with 2 wire leads color coded as follows:

First Wire:

White	Common

Second Wire:

Red	Red Section
Yellow	Yellow Section
Green	Green Section
Yellow with Black Tracer	Yellow Arrow Section
Green with Black Tracer	Green Arrow Section

The wires must be No. 18 AWG stranded copper wire rated at 600 volt, 105˚C., with thermo-plastic insulation. The leads must connect to the terminal strip without being spliced. The ends of the lamp leads must be stripped of 0.5 inches of insulation and tinned.

(b) Terminal Strip. A dual-point, barrier type, terminal strip with a solid base and pressure plate type connectors shall be securely attached at both ends to the housing body inside the "Green" section of the signal head. The number of terminal points shall be predicated upon the number of sections in the signal head. Single section, 2 section, 3 section and 4 section heads must have 5 point blocks, while 5 section heads must have 6 point blocks.

(c) Cable. One 11 foot length of flexible SO electric cord must be furnished with each signal head. The conductors must be No. 16 copper with color coded insulation. and an overall jacket. The number of conductors must include a neutral, a ground, and one leg for each section. Both ends of each cable length must be carefully stripped of 6 inches of jacket and 1 inch of insulation, with each conductor properly tinned.

TESTING AND DOCUMENTATION REQUIREMENTS

7. (a) Documentation. The contractor shall provide certified manufacturing and testing documentation to demonstrate that the traffic signals being supplied meet or exceed the specification requirements. All optical units shall be tested by a nationally recognized testing laboratory (NRTL), such as Intertek (ETL division), to demonstrate compliance with the latest ITE VTCSH specification. All LED units shall have the testing laboratory's label attached.

(b) Inspection. The signals will be subject to inspection at the request of the Commissioner. Final inspection shall be made at point of delivery. Any signal rejected must be removed, disposed of, and replaced by the contractor at his sole cost.

(c) Warranty. The manufacturer shall warrant the signals to meet the requirements of this specification, and must warrant all equipment, components, parts and appurtenances against defective design, material and workmanship for a period of 3 years from date of delivery [date of acceptance for contract construction]. In the event defects and failures occur during the warranty period, the manufacturer must replace such units at no expense to the City. This warranty shall be evidenced by a letter or certificate of warranty submitted to the City at the time delivery is made. The warranty must be signed and dated by an official of the manufacturer who is empowered by the manufacturer to enter into such a warranty.

PACKAGING

8. (a) Packing. Each traffic signal assembly shall be packed in a suitable carton so secured that the signal will not be damaged during shipment, handling or storage. Each section will include a lamp.

(b) Marking. Each carton containing a traffic signal shall be clearly marked on

the outside in letters not less than 3/8 inch tall with the legend: "TRAFFIC SIGNAL, OPTICALLY PROGRAMMED@, the number of Sections as required, the colors, the name of the manufacturer, the date of manufacture, the pertinent Contract Number and the appropriate City Commodity Code Number.

ELECTRICAL SPECIFICATION 1545
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED FEBTRUARY 7, 2014

PEDESTRIAN COUNTDOWN TRAFFIC SIGNAL LED, 16 INCH WITH SYMBOLIC WALK/DON'T WALK, POLYCARBONATE HOUSING

SUBJECT

1. This specification states the requirements for a single section pedestrian countdown signal with light emitting diode (LED) symbolic messages on a nominal sixteen inch by eighteen inch message surface and enclosed in a polycarbonate housing.

GENERAL REQUIREMENTS

2. (a) Sample and Certified Test Reports. One complete pedestrian countdown signal, fully assembled and wired, of the manufacture proposed to be furnished, must be submitted along with the required certified test reports, within 15 business days upon request of the Chief Procurement Officer. The sample must be delivered to the Division of Electrical Operations, 2451 South Ashland Avenue, Chicago, Illinois 60608.

(b) Standards. Equipment furnished under this specification shall meet the appropriate requirements of the following standards, as required within the body of this specification:

American Association of State Highway and Transportation Officials (AASHTO)
American Iron and Steel Institute (AISI)
American Society for Testing and Materials (ASTM)
Institute of Transportation Engineers (ITE)
National Electrical Manufacturers Association (NEMA)
Underwriters Laboratories (UL)

(c) Approval. Approval will mean approval in writing by the Commissioner or his duly authorized representative.

MATERIAL AND EQUIPMENT REQUIREMENTS

3. (a) The pedestrian signal heads must conform to ITE Standard "Pedestrian Traffic Control Signal Indications" (PTCSI), in which the most recently published revision will govern.

(b) Housing Design. The housing must be one piece, ultra violet stabilized polycarbonate resin of the specified color, injection molded complete with integral top, bottom, and sides, having a minimum thickness of 0.1 inches.

The polycarbonate formulation used must provide these physical properties in the housing (Tests may be performed on separately molded specimens).

TEST	REQUIRED	METHOD
Specific gravity	1.17 minimum	ASTM D 792
Vicat Softening temp	310-320º F	ASTM D 1525
Brittleness temp.	-200º F	ASTM D 746
FlammabilitySelf-extinguishing		ASTM D 635
Tensile strength, yield	8,500 PSI	ASTM D 638
Elongation at yield	5.5-8.5%	ASTM D 638
Shear strength, yield	5,500 PSI min.	ASTM D 732
Izod impact strength (notched, .125" thick)	12-16 ft. lbs./in.	ASTM D 256
Fatigue strength (at 2.5 mm cycles)	950 PSI min.	ASTM D 671

(c) Positioning Device. The top and bottom opening of each housing must have integral serrated bosses that will provide positive positioning of the signal head in 5˚ increments to eliminate undesirable rotation or misalignment of the signal head between sections. A total of 72 teeth must be provided in the serrated bosses to allow the signal face to be rotated 360˚ about its axis. The teeth shall be clean and sharp to provide positive positioning with the grooves of the mating section or framework. Each opening must accommodate standard 1.5 inch pipe fittings and brackets.

(d) Hinges. The housing must have 4 integral hinge lugs, with stainless steel hinge pins (AISI 304 or equivalent), located on the left side for mounting the door. The hinge pins must be straight and not protrude past the outside of the housing lugs. The housing must have 2 integral latching bolt lugs on the right side each with a stainless steel hinge pin to which a latching bolt (AISI 304 or equivalent), washer, and wing nut will be attached. The wing nuts must be captive.

(e) Door. The door must be a one piece ultraviolet stabilized polycarbonate resin of the specified color, injection molded complete with a minimum thickness of 0.1 inch. Two hinge lugs on the left side and 2 sets of latch screw jaws

centered on the right side, as viewed from the front of the signal, must be integrally cast with the housing door. The door must be hinged to the housing with 2 stainless steel hinge pins, drive fitted. Two stainless steel latch screws and wing nuts and washer assemblies on the latch side of the housing body must provide for opening and closing the door without the use of tools.

The inside of the door must be grooved to accommodate a one piece, air-cored ethylene propylene diene monomer(EPDM) gasket to provide a weatherproof and dust proof seal when the door is closed. The outside of the door must have an integral rim completely encircling the opening to prevent leakage between the door and the LED module. The rim must have equally spaced tabs around the circumference with threaded metal inserts for the visor attachment.

(f) Gaskets. Wherever necessary to make a completely dust-proof, moisture-proof and weatherproof assembly of the housing and optical system, approved type gaskets of neoprene or silicone rubber shall be provided.

LED OPTICAL MODULES

4. (a) Light emitting diode (LED) optical modules must consist of an integral unit containing the following components: power leads, housing, integral lens, matrix of light emitting diodes (LEDs) emitting monochromatic light of desired colors, and electronic and electrical components necessary to permit operation at nominal 120 volt, 60 hertz power. All units shall form a neat compact unit within the housing body with no light leakage between the door and the housing body.

(b) The LED unit shall meet the applicable requirements of ITE's LED Pedestrian Traffic Control Modules. During the required operating life of LED signal units, the luminance output of the units must not be less than 60% of the values specified in the standard.

(c) LED module power supply must be constant current regulated and filtered to provide instant on indications, and to prevent momentary signal outages or flicker.

(d) Modules shall consist of LEDs uniformly distributed to present a homogeneous appearance on the face of the lens from a wide viewing angle.

(e) LEDs shall be wired so that the loss of a single LED or a string of LEDs will not reduce the luminescence below the minimum requirement.

(f) For purposes of this specification, failure of a single unit is defined as an occurrence where the luminescence of the signal measured in candela in

standard test procedures is less than the required initial luminance or luminance at time points and conditions specified; or where minimum required brightness is achieved, but 2 or more series strings of LEDs or in excess of 20% of LEDs are not operable.

(g) LED modules must be fully operable over a range of 90 volts to 130 volts at 60 hertz ± 3 hertz.

(h) Surge protection. Each unit must be provided with integral surge protection to withstand a transient of 600 volt, 100 microsecond rise and 1 millisecond pulse width. The surge protector shall provide full electrical and physical protection to all unit components.

(i) Maximum permissible power consumption at ambient conditions (nominal 120 volts, 60 hertz, 70˚F.) must be 18 watts at a minimum 90% power factor. Power consumed must not vary by more than 10% from nominal power consumption over a voltage range of 105 volts to 125 volts, and over permissible environmental ranges.

(j) Modules must be fully operable at temperature ranges of -40˚F. (-40˚C.) to +165˚F. (+74˚C.) at up to 100% relative humidity.

(k) Modules shall be clearly marked on the back surface of the unit in a permanent manner showing information required for warranty and long term performance. Information to be shown must include manufacturer name, date of manufacture, electric power requirements, signal model type, and signal serial number.

(l) The LED module shall be compatible with all traffic signal controller equipment currently in use by the City of Chicago, and meeting the City's latest specifications for traffic signal control equipment. In particular the LED unit shall be compatible with the NEMA TS-1 and later traffic signal load switches and conflict monitors.

(m) Modules shall meet applicable sections of Title 47, Sub-Part B, Section 15 of the Federal Communications Commission (FCC) rules as applies to electronic noise limitation and electromagnetic interference.

(n) Total harmonic distortion (THD) induced into the voltage and current AC power line sine waves must not exceed 20%.

(o) Burn-in. LED Optical modules must be energized for a minimum 24 hour burn-in at 100% on-time duty cycle.

DISPLAY

5. (a) The message area shall be approximately 16 inches square and display the double overlay "Don't Walk" and "Walk" symbols immediately adjacent to the countdown digits. The symbols shall be applied in such a manner as to provide an opaque polycarbonate background and illuminated legends.

(b) Symbolic Messages. Symbols for "Walk" (Man) and "Don't Walk" (Hand) must conform in style and color to those of ITE. The symbols must not be less than 9.5 inches high with proportional width. The "Don't Walk" symbol must be Portland orange, and the "Walk" symbol must be of lunar white, conforming to the specifications of the ITE/PTCSI.

(c) Countdown Digits. Countdown digits must be Portland orange and not less than 9 inches high with proportional width and shall be compliant with latest ITE standards.

(d) The module message surface shall be constructed of ultraviolet (UV) stabilized, impact resistant polycarbonate, acrylic or other approved material. The surface must be anti-glare, smooth texture, and clear.

WIRING

6. (a) Wire Leads. Each module connector must be furnished with 3 wire leads color coded as follows:

White	-	Common
Red	-	"Don't Walk" Indication
Green	-	"Walk" Indication

The leads must be No.18 AWG, stranded copper wire rated at 600 volt and 105˚C., with thermoplastic insulation. The ends of the leads must be stripped of 0.5 inches of insulation and tinned. The leads must be splice-free and connected to one side of the terminal strip.

(b) Terminal Strip. A four terminal, eight point, barrier type terminal strip with solid base and pressure plate type connectors must be securely attached at each end to the housing body inside the walk section.

(c) Cable. One 11 foot length of flexible electric cord, medium duty, type SO, 3-conductor No. 16 AWG stranded copper, with color coded insulation, and an overall jacket, must be furnished with each pedestrian signal. Both ends of each cable length must be carefully stripped of 6 inches of jacket and 1inch of insulation, and each conductor properly tinned.

COUNTDOWN FUNCTIONALITY

7. (a) The countdown unit shall be compatible with all traffic signal controller

equipment currently in use by the City of Chicago, and meeting the City's latest specifications for traffic signal control equipment.

(b) The countdown timer must have a micro-processor capable of recording its own time when connected to a traffic controller.

(c) The countdown timer unit must continuously monitor the traffic controller for any changes to the pedestrian phase time and re-program itself automatically as needed.

(d) The countdown unit must register the time for the walk and clearance intervals individually and must begin counting down at the beginning of the pedestrian change interval (flashing hand).

(e) At the end of the pedestrian change interval, the unit must display A0" and the blank out. The display must remain dark until the beginning of the next countdown.

(f) In the event of a preemption sequence, the countdown unit must skip the pre-empted clearance time and reach “0” at the end of the pedestrian change interval.

(g) The countdown must remain synchronized with signal indications and always reach A0" at the end of the pedestrian change interval.

(h) The countdown must not display an erroneous or conflicting time when subjected to defective load switches.

TESTING AND DOCUMENTATION REQUIREMENTS

8. (a) Documentation. The contractor shall provide certified manufacturing and testing documentation to demonstrate that the traffic signals being supplied meet or exceed the specification requirements. All LED Optical modules shall be tested by a nationally recognized testing laboratory (NRTL), such as Intertek (ETL division), to demonstrate compliance with the latest ITE VTCSH specification. All LED modules shall have the testing laboratory’s label attached.

(b) Inspection. The signals will be subject to inspection at the discretion of the Commissioner. Final inspection shall be made at point of delivery. Any signal rejected must be removed, disposed of, and replaced by the contractor at his sole cost.

(c) Warranty. The manufacturer shall warrant the signals to meet the requirements of this specification, and must warrant all equipment, components, parts and appurtenances against defective design, material and

workmanship for a period of 3 years from date of delivery [date of acceptance for contract construction]. In addition, LED optical modules must carry a 7 year warranty against failure or loss of color (chromaticity) and signal brightness (luminance) below minimum acceptable PTCSI standard levels from date of delivery [date of acceptance for contract construction]. In the event defects and failures occur in the LED units during the warranty period, the manufacturer must replace such units at no expense to the City. This warranty shall be evidenced by a letter or certificate of warranty submitted to the City at the time delivery is made. The LED warranty must cover all units delivered in an order or installed by contract, and must include unit serial numbers. The warranty must be signed and dated by an official of the manufacturer who is empowered by the manufacturer to enter into such a warranty.

PACKAGING

9. (a) Packing. Each pedestrian signal assembly shall be packed in a suitable carton so secured that the signal will not be damaged during shipment, handling or storage.

(b) Marking. Each carton containing a pedestrian signal shall be clearly marked on the outside in letters not less than 3/8 inch tall with the legend: "PEDESTRIAN SIGNAL, COUNTDOWN, SIXTEEN-INCH, SYMBOLIC LED WALK-DON'T WALK@, the name of the manufacturer, the date of manufacture, the pertinent Contract Number and the appropriate City Commodity Code Number.

ELECTRICAL SPECIFICATION 1560
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED JANUARY 14, 2021

NEMA TS2-2 SUPER P CABINET WITH ADVANCED TRANSPORTATION CONTROLLER AND UNINTERRUPTIBLE POWER SUPPLY

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1. GENERAL REQUIREMENTS

1.1 This specification details the requirements for traffic signal control equipment for use in the City of Chicago. This equipment shall control traffic signal timing and sequencing at an intersection. The equipment shall include a battery back-up system which will maintain power to the signals during a power failure.

1.2 (For contract construction only) If requested by the City, the contractor shall provide a sample to the Division of Electrical Operations, 2451 South Ashland Avenue, Chicago, Illinois 60608. The sample shall consist of the controller, cabinet, load switches, conflict monitor and all appurtenant wiring and equipment completely assembled as a working unit. This sample will be regarded as a finished production sample and conformance or non-conformance to these specifications will be based on the sample submitted.

(For City commodity contract only) If requested by the Chief Procurement Officer, within thirty (30) days from the receipt of such request, the bidder shall provide a sample to the Division of Electrical Operations, 2451 South Ashland Avenue, Chicago, Illinois 60608. The sample shall consist of the controller, cabinet, load switches, conflict monitor and all appurtenant wiring and equipment completely assembled as a working unit. If the sample is acceptable and the bidder is awarded a contract, the sample will become the property of the City of Chicago with a suitable credit issued to the contract.

1.3 All tests as outlined herein shall be regarded as minimum requirements. The contractor shall submit his testing procedure for approval prior to performing any testing functions. Upon successful completion of all testing, certified test reports shall be submitted for each unit. Units not successfully passing these tests or lacking proper documentation will be rejected. The manufacturer, or manufacturer's representative, must be available for shop testing at the City's facilities.

1.4 Standards. Equipment furnished under this specification shall meet the appropriate requirements of the following standards, as required within the body of this specification:

American Association of State Highway and Transportation Officials (AASTHO)
American Society for Testing and Materials (ASTM)
Institute of Transportation Engineers (ITE)
Manual on Uniform Traffic Control Devices (MUTCD)
National Electrical Manufacturers Association (NEMA)
Occupational Safety and Health Administration (OSHA)
Underwriters Laboratories (UL)

1.5 Standard Drawings. The Electrical Standard Drawing 962 "Load Switch and Conflict Assignment", Electrical Standard Drawing 964 "Traffic Controller Cabinet Back Panel and Power Supply, 1 of 2", and Electrical Standard Drawing 965 "Traffic Controller Cabinet Back Panel and Power Supply, 2 of 2" are integral parts of this specification.

1.6 Warranty. The manufacturer(s) shall warranty the performance and construction of the traffic signal controller and other major components to meet the requirements of this specification, and must warranty all parts, components, and appurtenances against defects in design, material, and workmanship for a period of one (1) year after acceptance by the City. In the event of defects or failures during this period, the manufacturer(s) must repair and/or replace all defective or failed parts or appurtenances at no expense to the City.

1.7 Manufacturer. The manufacturer of the cabinet and controller and the manufacturer of the battery back-up system must demonstrate a knowledge of past production, or have been actively engaged in the sale and/or service of the equipment herein described, as demonstrated by a submitted list of comparable projects.

2. CONTROLLER REQUIREMENTS

2.1 ATC. The controller shall be an Advanced Transportation Controller (ATC) meeting the requirements of the specification "Advanced Transportation Controller (ATC) Standard Version 5.2b" dated June 26, 2006 and the requirements of NEMA TS2-2003. The referenced ATC specification is a joint effort of AASTHO, NEMA, and ITE. Since each user agency has different controller needs, for the City of Chicago, the controller shall meet the programming modifications and options listed in the ATC Matrix as indicated in Table A. All software necessary to make the controller operational shall be included.

2.2 Power. The controller shall operate on 120 volt, 60 cycle (± 3 Hertz), single phase, alternating current. The controller shalll function in the range from 89 to 135 Volts a.c. The power consumed must be under 50VA.

2.3 Packing. (For City commodity contracts only) Each controller, with all its component parts, shall be suitably packed in a single container in such a manner as to prevent damage to the contents in shipment and handling.

2.4 Instructions. One (1) complete set of up to date instructions providing complete information on installation, adjustment, operation and maintenance, including both up to date "Logic Schematics" and "Electronic Circuit" diagrams, of these controllers, shall be furnished to the Division of Electrical Operations for approval prior to the first shipment of controllers. All information, including photos and schematics, shall reference to the controller being furnished on this contract and must be a high quality, completely legible reproduction. Upon approval, one complete set of data must be furnished with each controller.

2.5 Training. If requested, the contractor shall provide training at the City's facilities. The training must be on the actual equipment provided under the contract, and must include, but not be limited to, programming all features, connecting and wiring, and troubleshooting. Training manuals are required (training manuals should include the instructions in a teaching-type format). Training shall be structured for both field personnel and shop personnel. The manufacturer shall provide all material and equipment necessary for the training.

2.6 Chassis. The chassis shall be aluminum with a powder coat finish. No plastic chassis or composite chassis will be allowed. The controller must physically fit into existing 'M', 'P', and 'SUPER P' cabinets configured for City of Chicago applications, so that retrofitting will not be a problem. The controller must not exceed the following dimensions: 10.5 inches high, 10.5 inches deep, and 15 inches wide.

2.7 Processor / Memory. At a minimum, the processor will be:

Clock speed - 300MHz
Non-volatile Memory - 32MB Flash
DRAM - 64MB
SRAM - 1MB
(All memory and firmware must be stored in flash memory. No EPROMS will be allowed.)

2.8 Display. The display shall be a 16 x 40 backlit LCD using a 6 x 8 character font. Display and keypad must be permanently attached to chassis. Detachable

keypads will not be allowed.

2.9 Environmental. The controller shall operate in the temperature range of -34˚ Celsius to +74˚ Celsius. The controller shall operate within the relative humidity of 5% to 95%.

2.10 All printed circuit boards shall be mounted vertically.

2.11 Encapsulation of 2 or more discrete components into circuit modules is prohibited except for transient suppression circuits, resistor networks, diode arrays, solid-state switches, optical isolators and transistor arrays. All encapsulated components must be second sourced and must be of such design, fabrication, nomenclature or other identification as to be purchased from a wholesale distributor or from the component's manufacturer as a standard product. Custom encapsulated components are not allowed.

2.12 Obsolete components, components no longer supported by the manufacturer, components not recommended for new designs, components which have been discontinued or which the contractor should have reasonably been expected to know were discontinued, or components which the vendor/manufacturer has announced plans to discontinue at the time of the bid/contract must not be used in the design of any subassemblies provided under this contract.

2.13 The controller shall meet the functional and environmental requirements of NEMA TS2 2003. The use of 2070s, 170s, BIUs, SIUs, or similar devices is not allowed.

2.14 As allowed by ATC v5.2b, Section 8.1.1, the controller will utilize NEMA 'A', 'B', and 'C' I/O connectors, except for the HMC-1000 and LMD40 I/O variants. Pin assignments for NEMA 'A','B', and 'C' connectors shall follow the NEMA TS2 2003 standards for I/O. Port 2 must be the ATC v5.2b pin-limited version of NEMA TS2 Port 2. Port 4 (C50S) must be a 9-pin connector with only limited signals being required.

Special function connector for the TS2-2 shall follow the CPC style "D" pin outs as follows:

CPC MSD Pin	Function
1	Flash
2	Offset 1
3	Interconnect Common
4	User defined input 6
5	Offset 2
6	Offset 3
7	Time Plan A
8	User defined input 7

9	User defined input 8
10	Call to Free
11	Call to week 10
12	Time Plan B
13	Time Plan C
14	Time Plan D
15	Alt Seq A
16	Alt Seq B
17	Alt Seq C
18	Dimming
19	Monitor status bit C
20	System Input
21	Alt Seq D
22	Monitor status bit A
23	Monitor status bit B
24	Veh Det 13
25	Veh Det 9
26	Veh Det 10
27	Veh Det 11
28	Polarizing Pin
29	Veh Det 12
30	Veh Det 14
31	Veh Det 15
32	Veh Det 16
33	SGO/Conditional Service
34	Preempt input 5
35	Preempt output 1
36	Preempt output 2
37	Interconnect inhibit
38	Time Clock sync
39	Sync inhibit
40	Preempt input 1
41	Preempt input 2
42	Preempt input 3
43	Preempt output 3
44	Polarizing Pin
45	Preempt output 4
46	Preempt output 5
47	System Out
48	Preempt output 6
49	Preempt input 4
50	Clock Ckt 9 (Aux 1)
51	Clock Ckt 10 (Aux 2)
52	Clock Ckt 11 (Aux 3)
53	Clock Ckt 12 (Aux 4)

54	Clock Ckt 13 (System)
55	Clock Ckt 8 (Flash)
56	Clock Ckt 3 (Offset 1)
57	Clock Ckt 4 (Offset 2)
58	Clock Ckt 5 (Offset 3)
59	Clock Ckt 1 (T/P A)
60	Clock Ckt 2 (T/P B)
61	Clock Ckt 6 (T/P C)
62	Clock Ckt 7 (T/P D)
63	Preempt input 6

2.15 Downward compatibility with existing City of Chicago cabinets.

(1) The controller shall be of a modular design allowing for the ability to exchange I/O modules to allow for use in existing City of Chicago HMC-1000, LMD40, and standard NEMA TS2-2 cabinets. This I/O module shall be "plug and play". The controller's firmware must detect the type of I/O installed (HMC-1000, LMD40 or NEMA TS2) and provide the proper user interface. Adapter harnesses for the HMC-1000, LMD40 and Setcon clock will not be allowed.

(2) The HMC-1000 I/O module shall be pinned as follows:

63 Pin Connector	**Function**
1	Output 20
2	Output 11
3	Manual Advance
4	Stop Time
5	Output 24
6	Offset 1
7	Offset 3
8	Output 15
9	Preempt 2
10	Advance
11	Output 23
12	Restart
13	Output 32
14	Offset 2
15	Output 16
16	Preempt 1
17	Output 25
18	Output 28

19	Spare 1
20	Spare 2
21	Output 7
22	Output 18
23	Output 21
24	Output 22
25	Dial 3
26	Dial 2
27	Output 1
28	Output 14
29	Output 4
30	Output 29
31	Output 27
32	Output 17
33	Output 9
34	Output 19
35	Dial 4
36	On-Line
37	Flashing Bus
38	Manual
39	Output 30
40	Output 31
41	Output 12
42	Output 10
43	Output 2
44	Output 3
45	Output 13
46	Output 8
47	Output 26
48	Logic Ground
49	Not Used
50	Not Used
51	Output 5
52	Output 6
53	Logic Ground
54	Logic Ground
55	Not Used
56	Not Used
57	Not Used
58	Not Used
59	24 V.D.C
60	Not Used
61	115 Volts AC
62	AC Neutral
63	Chassis Ground

(3) The LMD40 I/O module contains 4 I/O connectors, MSA, MSB, MSD, and communications connectors which shall be pinned as follows:

LMD40 MSA	**Pin**	**Voltage Level**
Actuation 3	A	DC
24 V.D.C	B	DC
Voltage Monitor	C	DC
Actuation 1	D	DC
Actuation 2	E	DC
Preemption 2	F	DC
Preemption 1	G	DC
Interval Advance	H	DC
Stop Time	J	DC
MCE (Manual Control)	K	DC
External C/S/O	L	DC
Signal Plan 2	M	DC
Signal Plan 3	N	DC
System Cont/AZ Reset	P	DC
External Start	R	DC
Remote Flash (AC)	S	120 VAC
Interconnect Common	T	120 VAC
AC – (Common)	U	AC
Chassis Ground	V	Earth Ground
Logic Ground	W	DC Reference
Output 1	X	DC
Output 2	Y	DC
Output 3	Z	DC
Output 4	a	DC
Output 5	b	DC
Output 6	c	DC
Output 7	d	DC
Output 8	e	DC
Output 9	f	DC
Output 10	g	DC
Output 11	h	DC
Output 12	i	DC
Output 13	j	DC
Output 14	k	DC
Output 15	m	DC
Output 16	n	DC
AC+ input	p	120 VAC
Output 17	q	DC
Output 18	r	DC

Output 19	s	DC
Output 20	t	DC
Output 21	u	DC
Spare Output	v	DC
Spare Output	w	DC
Spare Output	x	DC
Cycle 2 (User Defined)	y	120 VAC
Cycle 3 (User Defined)	z	120 VAC
Split 2	AA	120 VAC
Split 3	BB	120 VAC
Output 22	CC	120 VAC
Output 23	DD	120 VAC
Offset 1	EE	120 VAC
Offset 2	FF	120 VAC
Offset 3 (user def 1)	GG	120 VAC
Output 24	HH	DC

LMD40 MSB	**Pin**	**Voltage**
Output 25	A	DC
Output 26	B	DC
Output 27	C	DC
Output 28	D	DC
Output 29	E	DC
Output 30	F	DC
Output 31	G	DC
Output 32	H	DC
Output 33	J	DC
Output 34	K	DC
Output 35	L	DC
Output 36	M	DC
Output 37	N	DC
Output 38	P	DC
Output 39	R	DC
Output 40	S	DC
Actuation 4	T	DC
Hold	U	DC
Force Off	V	DC

LMD40 MSD	**Pin**	**Voltage**
Flash Monitor 1	1	120 VAC
Cycle 5	2	120 VAC
PE Clear 1	3	DC
PE Clear 3	4	DC

Flash Monitor 2	5	120 VAC
Spare Input 4	6	120 VAC
System Input	7	120 VAC
AZ Reset (Absolute Zero)	8	DC
PE Clear 2	9	DC
UD 6 Input	10	DC
Call to week 10	11	DC
Signal Plan 6	12	DC
Signal Plan 7	13	DC
Signal Plan 8	14	DC
Actuation 5	15	DC
Actuation 6	16	DC
Actuation 7	17	DC
Spare input 1	18	DC
UD 7 Input	19	DC
Actuation 8	20	DC
Actuation 9	21	DC
Actuation 10	22	DC
Spare input 2	23	DC
UD 8 input	24	DC
Sys Command (Ckt 13)	25	DC
Flash Attained	26	DC
PE Active	27	DC
Polarization	28	DC
System Out	29	DC
Preempt input 3	30	DC
Preempt input 4	31	DC
Preempt input 5	32	DC
Signal Plan 5 in	33	DC
Call to FREE op	34	DC
Output 41	35	DC
Output 42	36	DC
Interconnect Inhibit	37	DC
Spare input 3	38	DC
Sync Inhibit	39	DC
Dimming	40	DC
Added Time inhibit	41	DC
Time Clock Sync	42	DC
Output 43	43	DC
Polarization	44	DC
Output 44	45	DC
Output 45	46	DC
Output 46	47	DC
Output 47	48	DC
Signal Plan 4	49	DC

Aux 1 (Ckt 9)	50	DC
Aux 2 (Ckt 10)	51	DC
Aux 3 (Ckt 11)	52	DC
Aux 4 (Ckt 12)	53	DC
Output 48 (FF Enable)	54	DC
Flash Out (Ckt 8)	55	DC
Offset 1 (Ckt 3)	56	DC
Offset 2 (Ckt 4)	57	DC
Offset 3 (Ckt 5)	58	DC
Cycle 2 (Ckt 1)	59	DC
Cycle 3 (Ckt 2)	60	DC
Split 2 (Ckt 6)	61	DC
Split 3 (Ckt 7)	62	DC
Fast Flash Image	63	DC

LMD40 Communication Connector (15 pin sub-D	**PIN**	**Voltage**
System Detector 11	1	DC
System Detector 12	2	DC
System Detector 13	3	DC
System Detector 14	4	DC
System Detector 15	5	DC
System Detector 16	6	DC
System Detector 17	7	DC
System Detector 18	8	DC
Monitor Status bit B	9	DC
Monitor Status bit A	10	DC
Monitor Status bit C	11	DC
DC User Defined in #1	12	DC
Logic Ground	13	DC
DC User Defined in #2	14	DC
DC User Defined in #3	15	DC

(4) The Setcon I/O connector will be resident on the HMC1000 version of the ASTC I/O.

Setcon Clock Connector	**PIN**	**Voltage**
Output 1	1	DC
Output 2 (Dial 2)	2	DC
Output 3 (Dial 3)	3	DC
Output 4 (Dial 4)	4	DC

Output 5 (Offset 1)	5	DC
Output 6 (Offset 2)	6	DC
Output 7 (Offset 3)	7	DC
Output 8 (Flash)	8	DC
Sync Output	9	DC
Sync Input	10	DC
Not used	11	N/A
Logic Ground	12	DC
Not Used	13	N/A
Not Used	14	N/A
Not Used	15	N/A
Not Used	16	N/A

2.16 Communication.

(1) NTCIP (National Transportation Communications for ITS Protocol).

a. The controller shall be compliant with NTCIP Standards as outlined in NEMA TS2 – 2003 and must be tested and documented for compliance.

b. Global objects shall be compliant to NTCIP 1201 v2.26 or later.

c. Actuated Signal Controller objects shall be compliant to NTCIP 1202 v2.19f or later.

(2) Serial ports, one of which must be set as either RS-232 or RS-485.

(3) Ability to add an internal GPS module.

(4) Ethernet. The controller must be equipped with a minimum of two front panel mounted 10/100Mb Ethernet ports.

(5) A single port USB interface must be provided to facilitate database transfers, re-flashing of operation software and log transfer.

(6) The unit must be fully compatible with, and fully functional within, the City’s existing traffic signal management system. All available functions and capabilities that exist within existing controllers must be available within this unit, as well as compatible with the ATC LMD40 unit and the ATC NEMA unit. Any additional software or hardware necessary to fully integrate the controller into the City's traffic signal management system must be provided by the bidder/contractor and will be considered as part of the requirements of this specification.

(7) Windows based laptop utility software must be provided for data transfers and monitoring of controller operation.

(8) A fiber-optic modem shall be provided, if required. The modem must be compatible with existing City fiber interconnect systems. The modem may be internal or external to the controller.

2.17 Software operation.

(1) The controller shall have the ability to re-synch a minimum of 8 cycle lengths to an "absolute zero" reference point. It must be possible to set absolute zero by either global command or individual cycle length.

(2) In addition to hardwire input, it shall be possible to set Absolute Zero via keyboard command or fiber optic communication.

(3) The controller shall have the ability to operate in two modes of operation, selectable by time of day:

a. Actuated control per NEMA TS2 – 2003.

b. Pre-timed Interval based control per NEMA TS2 – 2003.

(4) The controller shall have the ability to transfer between actuated control and interval based control by time of day schedule.

(5) The controller will have 32 Pre-timed plans

a. Each plan will allow for up to 32 timing intervals

b. Each plan will allow for 64 circuit outputs. Each output must be individually programmable per interval.

(6) The controller shall have 100 coordination plans.

(7) The controller shall provide 6 preempts per NEMA TS2-2003.

(8) The controller shall offer security as follows:

a. Two 4 digit security codes can be programmed (one for timing data, one for signal plan data), which when activated, allow data changes. These codes must automatically de-activate 10 minutes after the last user keystroke. It will be possible to re-program the security codes if the previous security code is known or has been defeated.

b. It must not be possible to read the security code from the controller's display.

c. It must be possible to access the controller in the case of a lost security code through a "back door" which is provided only by the controller manufacturer. This "back door" security code must change based upon the controller's internal calendar.

3. CONFLICT MONITOR

3.1 General. Each controller shall be furnished with a NEMA conflict monitor unit for checking for conflicts in the signal output circuits. The conflict monitor shall be capable of monitoring a minimum of twelve (12) distinct channels. It must be a self-contained unit with its own power supply and not be located within the timer housing.

3.2 Programming Board. A removable programming board shall be supplied with the monitor for programming signal compatibility. The circuits for programming must be composed of soldered jumper wires. Diode or dip switch type programming will not be acceptable. The programming board must contain no circuitry or components other than the wire jumpers and the wire jumper soldering devices.

3.3 Flashing Circuit Energizing. The conflict monitor shall be programmed to put the controller in a flashing sequence upon detection of a failure or conflicting signal display. The controller must also be programmed to energize the flash circuit if the conflict monitor is removed or loses its supply voltage. The conflict monitor must have a manual reset button to return the controller to normal operation after conflict circuit operation is no longer necessary.

3.4 Stop Time Circuit. A stop-time control circuit shall be supplied from the conflict monitor to force the timer unit to stop timing upon detection of a conflict.

3.5 Indicator. The front panel of the conflict monitor housing shall have an indicator which will be activated when a conflict or failure occurs as per Section 6 of NEMA Spec. TS1-1983.

3.6 Latch Circuit. The conflict monitor shall have a latch circuit, insuring that if a voltage monitor failure occurs, the intersection remains in conflict until reset.

3.7 Memory. The conflict monitor shall have the ability to store, in memory, a minimum of ninety-nine (99) conflict events, including date of conflict and channels conflicting.

3.8 Conflict Monitor Assignments

(1) Conflict monitor channels shall be assigned as follows:

Channel 1	Load Switch 1	Phase 1 Vehicle
Channel 2	Load Switch 2	Phase 2 Vehicle
Channel 3	Load Switch 3	Phase 3 Vehicle
Channel 4	Load Switch 4	Phase 4 Vehicle
Channel 5	Load Switch 5	Phase 5 Vehicle
Channel 6	Load Switch 6	Phase 6 Vehicle
Channel 7	Load Switch 7	Phase 7 Vehicle
Channel 8	Load Switch 8	Phase 8 Vehicle
Channel 2W	Load Switch 9	Phase 2 Ped
Channel 4W	Load Switch 10	Phase 4 Ped
Channel 6W	Load Switch 11	Phase 6 Ped
Channel 8W	Load Switch 12	Phase 8 Ped
Channel 9	Load Switch 13	Overlap A
Channel 10	Load Switch 14	Overlap B
Channel 11	Load Switch 15	Overlap C
Channel 12	Load Switch 16	Overlap D

(2) It shall be possible for the user to change conflict assignments without unsoldering any connections.

(3) All unused channels - vehicle or pedestrian - must be neatly tied or terminal mounted in such a manner that they are readily available in front of the panel. If tied, the harness wires must be labeled. If terminal mounted, the terminations must be labeled.

(4) A terminal shall be provided for the red enable feature.

(5) A terminal shall be provided for the hook up of any unused red channels to AC.

(6) Controller monitoring shall consist of; voltage monitor, 24VDC- I, 24VDC-II.

(7) The output relay shall operate a sixty (60) ampere, normally open, “A” type contactor without the use of an external or “cabinet interface” relay.

4. SUPER P CABINET

4.1 Housing. Each controller shall be furnished completely housed in a Type 5052-H32 aluminum housing of 0.125 inch thickness. The exterior dimensions of the cabinet shall be approximately 57 inches high, 58 inches wide, and 27 inches deep. The top of the cabinet shall be approximately 58 inches wide and 29 inches deep. The top of the cabinet must have a front to rear slope that will direct rain away from the front cabinet door. Door openings must be double-flanged. The interior of the cabinet will be divided into two compartments. The interior of the main cabinet shall be equipped with four (4) "C" mounting channels on both side walls and two (2) "C" mounting channels on the rear wall. The UPS portion of the cabinet shall be equipped with two (2) "C" mounting channels on each of the two side walls. All shelves, panels and individual equipment items must be mounted to these channels using 1.0" channel nuts with 1/4-20 bolts. All items mounted on panels must be securely fastened by bolting into drilled and tapped holes. No pop rivet or similar fastening methods will be accepted.

4.2 Doors. The cabinet shall have a main door hinged with one-quarter inch (1/4") minimum, continuous, removable stainless steel pins. The hinges themselves will be aluminum secured to the cabinet with stainless steel bolts. The battery compartment door on the side of the cabinet must be similarly hinged. The main cabinet door will be hinged on the right side. The battery compartment door will be hinged on the left side. The doors must be closely fitted to a neoprene gasket making the doors dust, water and weather resistant. The doors must be interchangeable with any other doors from any other controller.

Opening of the main door must provide complete access to the cabinet interior. The door shall be embossed, subject to approval, with the legend "CITY OF CHICAGO-TRAFFIC CONTROL" in letters at least one (1) inch high. The main door and the battery compartment door must have stops at 90, 150 and 180 degrees, from the closed position. The door latches must have three (3) point locking with rollers at the ends of the latch rods. The latch handle must be capable of being padlocked. The key lock for the latch mechanism must be a Corbin cylinder lock with keys to match existing City of Chicago controller cabinets. Two (2) keys must be furnished with each cabinet. Both the main door and the battery compartment door will have stainless steel handles with an 8" shank. The handles must be able to be padlocked. The padlocking arrangement must clear the lock and key.

Police Panel Door. The police panel door on the main door shall be furnished with a lock for a modified Chicago police key per sample to be furnished to the supplier. This key must have a shaft of at least one and three quarter inches (1-3/4") in length. Two keys must be furnished with each cabinet. The door will have a stainless steel piano hinge and be sealed with a neoprene

gasket.

Generator Door. This door will be on the rear of the cabinet. This door will have a stainless steel piano hinge and be sealed with a neoprene gasket. Two keys will be furnished for this door.

4.3 Cabinet Ventilation. The main cabinet compartment shall be provided with a mounting assembly to hold the forced air fan system. A fan, having a minimum air movement capacity of 100 CFM, shall be mounted in the air baffle in the top of the cabinet with an air outlet built into the roof overhang. The main door must be louvered and equipped with a removable, standard, commercially available aluminum dust filter. The battery compartment shall have a similar fan system. The battery compartment door must also have a louvered section with a removable dust filter. The ventilation openings must be equipped with removable covers for summer operation. No external fan housings or air outlets will be allowed. Any other method must be approved.

4.4 Shelves. The cabinet shall contain a vertically adjustable shelf large enough to accept the solid state controller and all other shelf mounted devices. The battery compartment shall have a minimum of three shelves.

4.5 Bolt Pattern. The bolt pattern shall be a four (4) point rectangular pattern matching the corresponding foundation. The dimensions will be 40.75" center-to-center and 18.5" center-to-center.

4.6 Finish. The exterior surfaces of the cabinet must be smooth. All drilled, tapped, or punched holes on the outer surface must be filled with liquid metal and ground smooth, and slotted screw heads must be ground smooth flush with surface. Bolts extending through cabinet wall must be round head, carriage, square shoulder type and fastened on the inside of the cabinet with an Esna nut and necessary gaskets to insure the weatherproofing integrity of the cabinet. The finished cabinet must be thoroughly degreased in a wash process and dried in a heated chamber. A thermosetting, ultra violet resistant, polyester powder coat must be electrostatically applied to all cleaned and treated surfaces and cured to a hard, mar resistant finish in a heated chamber at a temperature recommended by the powder coat paint manufacturer. Exterior color must conform to Federal Standard 595 #17038 for gloss black. Cabinet interior must be glossy white and may be either baked enamel or thermosetting, polyester powder coat. For either process, the interior must be prepared as described above. If the baked enamel finish is used, it must be preceded by one (1) coat of primer.

5. POWER SUPPLY

5.1 A sixty (60) ampere main breaker shall be inserted in series with the line.

5.2 An un-fused terminal bus shall be provided for ground side of the power supply and signal conductor commons.

5.3 Individual circuit breakers shall be supplied for: (a) AC+ lights, 50 amperes; (b) AC+ control, 10 amperes; (c) duplex outlet supply, 15 amperes.

5.4 The incoming line shall contain lightning protection devices consisting of, but not limited to, a metal oxide varistor and gas type arrestor. The gas type arrestor must be on the line side of the radio interference filter.

5.5 Contactor**.** A sixty (60) ampere, normally open, "A" type contactor shall be supplied for opening and closing the AC supply to the signal bus. The contactor must be mounted in such a manner on the power supply panel that accidental contact does not produce a safety hazard.

5.6 R.I.S. Filter. A radio interference suppression filter rated at sixty (60) amperes minimum shall be installed in line with the main power supply, after the sixty (60) ampere circuit breaker.

5.7 Ground. The grounded side of the power supply must be continuous throughout the controller and must be grounded to the controller cabinet in an approved manner meeting OSHA requirements.

5.8 Polarity. The phase conductors of the signal circuits shall have the same polarity as the phase side of the power supply, and the common conductor(s) shall be of the same polarity as the grounded side of the power supply.

6. UNINTERRUPTIBLE POWER SUPPLY

6.1 General. The uninterruptible power supply (UPS) will consist of batteries which will recharge through the 120 volt electric service line. In the event of a power disruption, the unit will automatically activate. The transfer from utility power to battery power will not interfere with the normal operations of the traffic controller, conflict monitor, or any other part of the traffic system. A generator port will be provided to accept input from an external generator that can operate the traffic signals. The UPS must be the product of an established manufacturer, and suitable for the service required. The UPS must be manufactured by an established manufacturer who has been in the business for a minimum of five (5) years.

6.2 General Operation

(1) The line power provided by ComEd is nominally 120 volt, single phase, 60 Hertz. The UPS system must take the line power, regulate it, and provide continuous 120 volt, single phase, 60 hertz power to the traffic system. The UPS must regulate the input line voltage within the limits specified herein. The input line voltage must also be transformed and rectified to charge the batteries. Under battery operation, the output from the batteries will go through an invertor to provide the proper A.C. current to provide continuous 120 volt, single cycle, 60 Hertz power to the traffic system. In the event of a power loss, the system must automatically switch to battery operation, without adversely affecting the traffic system. When power is restored, the system must automatically switch back without adversely affecting the traffic system. In the event the UPS system fails, an automatic switch must bypass the UPS and connect unconditioned power from ComEd directly to the traffic system. A manual bypass switch shall also be provided. The system shall be capable of running off a generator. The UPS will allow the generator to be put in or out of the system without adversely affecting the traffic system.

(2) The system will be capable of providing power for normal full timing mode, flash mode, or a combination of both. The operation will be field programmable to activate at various times, to change operation due to changing battery capacities, and to track alarm conditions, using the touch pad or remotely using the RS-232 interface. Programmability shall be in ASCII formats and shall not require any external or proprietary software. The DB-9 connector for the RS-232 interface shall be located on the front panel of the UPS. The UPS must provide a minimum of 4 hours of full normal timing for a full LED controlled intersection.

(3) In the event ComEd line voltage falls outside the high and low limits (95VAC and 130VAC should be the default values) the UPS must transfer the load to battery power. The high and low limits shall be programmable.

(4) The UPS must return to line mode when the ComEd power is restored within the proper limits for a specified period of time. The limits shall be programmable. The default values should be 105VAC and 125VAC. This time shall be programmable and should range from 3 to 30 seconds.

(5) The transfer time allowed, from disruption of normal utility line voltage to batteries or from batteries back to line voltage, must be such that the traffic signal system is not disrupted. The maximum transfer

time allowed will be 60 milliseconds.

6.3 Specifications

(1) The UPS capacity will be a minimum of 2000VoltAmps/ 1500 watts.

(2) The inverter shall have a minimum efficiency of 80%.

(3) The UPS will have an operating range of between -37°C. to +74°C.

(4) The manual bypass switch shall be rated at 240 volts, 40 amps.

(5) The UPS shall have a temperature compensated battery charging system. The charging system must compensate over a range of 2.5mV to 4 mV per degree centigrade per cell. Batteries must not be charged when temperatures exceed 50°C. The temperature sensor shall be located in the cabinet near the batteries.

(6) The charger shall be rated at 10 amps at 48 VDC.

(7) When under battery operation the UPS output voltage must be between 110 VAC and 125VAC, with a sine wave with THD less than 3% at 60 Hertz (±3 Hz).

(8) The UPS shall be equipped to prevent a malfunction feedback to the utility service or to the cabinet per UL 1778, Section 48 "Back-Feed Protection Test". The upstream back-feed voltage from the UPS must be less than 1 volt AC.

(9) The UPS shall have a lightning surge protection in compliance with IEEE/ ANSI C.62.41 for 2000 volts AC.

(10) The UPS shall not weigh more than 50 pounds.

(11) The UPS shall have a minimum efficiency of 95%.

(12) The generator bypass switch shall be supplied with a 30 amp, weather-proof locking receptacle and cover plate.

6.4 Computer Control and Display

(1) The UPS shall include an LCD display with programmable keypad, a red LED and a green LED, and an RS-232 interface.

(2) The UPS processor shall be capable of indicating, through the

LCD display or the RS-232 interface, the current battery charge status, various input/output voltages, power output, battery temperature, date, time, settings of programmable relays, events, and various other functions.

(3) The UPS shall provide a temperature control for the cabinet fan.

(4) The UPS shall be provided with a resettable inverter event counter and a cumulative inverter timer.

(5) The UPS shall be equipped with an event log for a minimum of 100 events. Each event must have a date and time.

(6) The UPS shall be capable of performing a self-test.

(7) Password protection shall be provided.

(8) The following LED conditions shall be used to indicate current status:

RED FLASHING - Alarm
RED STEADY - Fault
GREEN FLASHING - Battery Mode
GREEN STEADY - Line Mode

(9) The manual UPS bypass switch will allow the UPS to be maintained or replaced.

6.5 Battery System

(1) Individual batteries shall be 12 volt, and must be commercially available and easily replaced.

(2) Four 79ah batteries shall be supplied.

(3) The batteries will be connected in series. The wiring harness must be color coded and have quick disconnects.

(4) Batteries must be certified to operate over a temperature range of -25° C. to +74° C.

(5) The batteries shall be extreme temperature, deep cycle, sealed prismatic lead-calcium based AGM/VRLA (absorbed glass mat/valve regulated lead acid) .

(6) Maximum recharge time from protective low cut-off to 80% of full

capacity must not exceed 20 hours.

(7) Thermostat controlled heater strips or pads shall be supplied to keep battery operation efficient.

6.6 Relay Contacts

(1) The UPS shall provide 6 sets of panel-mounted, potential free, fully programmable relay contacts rated at 1 amp, 120 volt. The relays shall be numbered from C1 to C6.

(2) Each relay shall be programmable to activate under any number of the following conditions:

ON BATTERY, relay activates when UPS switches to battery power.
LOW BATTERY, relay activates when batteries have reached a certain level of remaining capacity. This is adjustable from 0 to100%.
TIMER, relay activates after battery power is on for a certain amount of time. This is adjustable from 0 to 8 hours.
ALARM, relay activates after a specific alarm is detected. Alarm conditions include line frequency, low output voltage, no temperature reading, overload, batteries not connected, high temperature, and low temperature.
FAULT, relay activates after a specific fault is detected. Fault conditions include short circuitry, low battery voltage, high battery voltage, high internal temperature, and excessive overload.
OFF, relay is not active.

7. LOAD SWITCH BAY

7.1 General. A panel shall be provided for mounting the load switch jacks, flash transfer relay jacks, flasher jack, auxiliary relays, time clock jacks, switches, flash change combination terminals, and terminals for field signal connections under non-interconnected operation. See Electrical Standard Drawings 964 and 965.

7.2 Wiring. Panel wiring must be neatly laced and properly terminated individual conductors. They must be insulated and properly sized for their application.

7.3 Load Circuits. Each load circuit shall be capable of carrying fifteen (15) amperes continuously at a temperature of 165° F. (74° C.).

7.4 Bus Feeds. Bus feeds shall be capable of carrying fifty (50) amperes continuously at a temperature of 165° F. (74° C.).

7.5 Equipment. In addition to the items listed in 2(a), the wiring panel shall include, but not be limited to, the following:

(1) Ten (10) ampere fuses with barrier type fuse holders shall be installed between the load switch signal output circuits and field terminals for signal light conductors. Each terminal shall be the barrier type with sufficiently long screws to accept four (4) #12 AWG solid conductors. The terminals must be located at least two inches (2") above the bottom of the cabinet.

(2) Switching Device. The signal load switching device shall be a three (3) circuit, solid state, jack mounted load switch which meets the N.E.M.A. Publication TS-1, Part 5 requirements. Each load switch shall be rated for a minimum fifteen (15) ampere continuous resistive load and must mate with an S-2412-SB panel socket. A minimum of twelve (12) and a maximum of sixteen (16) load switches to be provided with each cabinet, as defined in the contract.

(3) User Programmable Interface. Two (2) sets of terminal blocks shall be provided between the machine logic output and the input side of the load switches. By terminating all machine logic output on one set of terminals and all load switch input to the other set, an interface is thus created by which the machine logic can be readily connected to any of the load switches by means of a jumper wire. The two (2) sets of terminal blocks must be conveniently located in close proximity to each other and must be arranged such that, initially, each function will be factory wired directly from one set of terminals to the other without the need to criss-cross wires between blocks.

(4) Number of Signal Circuits:

a. Sixteen (16) load bay panel. Each panel shall be equipped with sixteen (16) load switch jacks for a minimum of forty-eight (48) signal circuits.

b. All unused signal circuits must be neatly tied or terminated. If tied, the harness wire must be labeled. If terminated, each termination must be identified.

7.6 Identification. All field terminals must be suitably identified, subject to approval.

8. FLASHING FEATURE

8.1 General. The flasher must be a solid state device, with no contact points or moving parts, producing between 50 and 60 flashes per minute with a 40 to 50 percent duty cycle. The flasher mechanism shall be mounted on a type P-406-SB plug which will mate with an S-406-SB socket on the controller panel. The flasher must utilize zero-point switching, with turn-on at the zero voltage point (± 5 degrees) of the power line sinusoid.

8.2 Flasher Panel. A panel must be provided with one (1) terminal wired to the flasher and marked "FL". The panel must be equipped with terminals to provide or omit flashing of all red and yellow outputs.

8.3 Flasher Circuits. Flashers shall provide two (2) output circuits to permit alternate flashing of signal phases and must be capable of carrying a minimum of twenty (20) amperes per circuit at 120 volts. The flasher must operate continuously so that flashing power will be available at the field terminal marked "FL". The flasher wiring must divide the loads imposed on the two (2) circuit flasher alternately on each phase.

8.4 Manual Flash. A manual flash switch shall provide flashing indication for all circuits. The flash change combination terminals must allow the selection of flashing either yellow or red on the main and/or cross streets, or complete omission of the flashing feature if required.

9. POLICE PANEL

9.1 Auto-Off Flash Switch. Each controller must be provided with an auto-off-flash switch. In the "AUTO" position the signals will be on and the controller timing unit will run normally. In the "OFF" position the signals will be OFF and the controller timing unit will continue to run. In the "FLASH" position the signals will flash and the controller timing unit will continue to run. The auto-off flash switch must be located on the side of the police switch panel that faces outward when the police door is open.

9.2 Auto-Hand Switch. Each controller will have an auto-hand switch on the back side of the police switch panel. This switch must be so arranged that the switch can be physically rotated 180 degrees to provide usage after opening the police panel door. It must be so mounted that the act of rotation does not affect the police switch panel. Switch terminals must not be exposed on either position. The auto-hand switch must provide a means of manually timing the signals by use of a separate, momentary contact, hand switch. Operation of the timer by manual control must provide the same color sequence as an automatic operation with no momentary undesirable indications appearing. Manual control must be possible with the door of the cabinet closed. The hand switch required for manual control must only be supplied when specified in

the contract. It must be of an approved weatherproof construction with a six (6) foot, retractable, flexible, extension cord to allow connection to the appropriate terminals on the panel of the controller. It must be possible to manually step through a vehicle clearance interval.

9.3 Terminal Block. A two point terminal block must be mounted on the back side of the police switch panel and the hand control circuit terminated on this block. This will be for installation of a hand control cord by others, as required.

9.4 Space Requirement. Adequate room must be provided in the police panel section to store the manual switch and retractable cord.

10. RELAYS

10.1 Transfer Relays. Eight (8) double pole, double throw, flash transfer relays shall be furnished with each controller. These relays must be jack mounted into an S-408-SB, or equivalent, socket mounted on the controller panel.

10.2 Contact Arm. Each contact arm must have over travel on the front and back contacts and be independent of any other contact arms. No adjustment of contact pressure or wipe must be necessary. Load capability must be a minimum of fifteen (15) amperes per contact continuously and thirty (30) amperes for one (1) minute. Contacts must be of coin or fine silver or an approved alternate.

10.3 Dust Cover. A suitable dust cover must be furnished for each relay.

10.4 Relay Mounting and Endurance. All relays supplied must meet their approved specified requirements and must have contacts which cannot be opened by unusual vibrations, shock, or momentary voltage excursions of up to 30%. All relays other than the flash and bus relay must be mounted on a molded base with eleven (11) or eight (8) pins for jack mounting to their respective panel or sub-base, and must be electrically interchangeable with those presently used by the City of Chicago.

11. COMMUNICATIONS INTERFACE PANEL

11.1 Where a communications interface has been specified to allow a controller to function as a Master or Secondary controller, then one of the specified options must be provided:

(1) Fiber Optic Communications Interfaces must meet the following requirements:

a. General. The fiber optic communications components must

consist of, but not be limited to, an internal fiber optic modem within the controller or an external fiber optic modem, a fiber optic patch panel to interface the modem to field fiber optic cables, and fiber optic jumpers between the modem and patch panel.

b. The modem must either be a multi-directional "star" type or a bi-directional type, as specified in the contract. All modems must be Electronic Industries Association (EIA) compatible for RS-232 data communications via fiber optic link. Modems must be multi-mode, operate at 850nm wavelength, and provide full-duplex, frequency modulated, asynchronous transmission at data rates of up to 38.4 kbps.

c. The fiber optic patch panel must consist of a 14" long by 5-3/4" wide by 3-1/4" high rack constructed in accordance with City of Chicago Electrical Standard Drawing #909. The rack must be designed to mount on the controller cabinet rails. "ST" type terminals, suitably labeled, must be provided for the connection of field fibers and Modem.

d. The fiber optic jumpers (i.e., optical patch cords) must consist of a single multi-mode fiber in 900 micron orange jacket, with "ST" type connectors factory installed on each end. The jumpers must be 3' long in Secondary (i.e., local) controller cabinets and 6' long in Master controller cabinets. The jumpers must be connected to the patch panel and supported in such a manner that the minimum bending radius is ten (10) times the diameter of the cable, and the cables exert no strain on the connectors. Each jumper must have a minimum tensile strength of 50 lbs.

(2) Copper Wire Interconnect Panels (Seven Wire, VAC) must meet the following requirements:

a. General. The interconnect panel must serve to isolate interconnect VAC from the controller. The panel must consist of, but not be limited to, seven (7) relays. Each relay interconnect circuit must include an M.O.V. properly rated for protection against lightning and switching surges injurious to the controller and a barrier type 3AG fuse receptacle and fuse not to exceed five (5) amperes. Each panel must provide a seven (7) wire interface with the T.B.C. functions described below and must provide barrier type terminals suitably labeled for these functions.

b. The secondary interconnect panel must be wired in such a manner that a VAC input activates a relay sending an input from that relay to the controller. It must have a minimum of seven (7) relays for

the following functions; Dial 2, Dial 3, Dial 4, Offset 1, Offset 2, Offset 3, M.U.T.C.D. flash.

c. The master interconnect panel must provide a means to establish outgoing VAC for a seven (7) wire interconnect system using eight (8) relays. The relays must have 24 VDC coils and be designated as, Dial 2, Dial 3, Dial 4, Sync, Offset 1, Offset 2, Offset 3, M.U.T.C.D. flash. The sync relay must be wired in such a manner that it provides the offset pulse to the contacts of the three (3) Offset relays.

d. Each relay must be a double pole type, with one pole designated as field interconnect output, and the other designated as controller input. Relay coils must be rated for continuous duty. Relay contacts must be rated for a continuous fifteen (15) AMP resistive load.

e. A terminal strip must be mounted on the top of the master interconnect panel for controller interface.

f. The master panel must interface with the T.B.C. terminals as described above.

g. Each output must be fused as outlined above.

12. RAILROAD INTERCONNECT REQUIREMENTS

12.1 General. The railroad preemption will meet the requirements of the ICC (Illinois Commerce Commission) and the requirements of IDOT (Illinois Department of Transportation).

12.2 IDOT. The railroad preemption will meet all the requirements of the Illinois Department of Transportation's Standard Specifications for Road and Bridge Construction, adopted January 1, 2012. It must meet all the requirements of Article 1073.01 (c) (2) and Article 1074.03 (a) (5) e.

12.3 ICC. The railroad preemption will meet all the requirements of the Illinois Commerce Commission, as stated herein.

(1) The railroad preempt relays and the City traffic cabinet in general must be able to be wired as indicated in IDOT's Standard 857006-01 "SUPERVISED RAILROAD INTERCONNECT CIRCUIT". A failure in the interconnection circuit will result in activation of a supervisory failure alarm.

(2) Remote Flash. The Remote Flash input to the controller must be

inverted from normal NEMA logic. Instead of grounding the input to Logic Ground (0 volts DC) to activate, the Remote Flash will be normally grounded and will be activated when the input is in the Logic 1 (+24 volts DC) state. This will preclude the installation of a controller without the proper railroad software and a normal controller with standard (non-railroad) software will not be able to run the traffic signals.

(3) Critical Components Series Loop. All critical components to railroad preemption such as relays and harnesses must utilize the 24 VOLT DC monitor voltage to form a series loop. Removal of any component will result in the traffic signals entering a flashing red condition. The 24 VOLT latch in the Management Malfunction Unit will be programmed, requiring manual reset if a failure in the series loop occurs.

(4) Controller Preempt Input Verification. Like the supervisory interconnection circuit monitors the integrity of the interconnect cable, this feature monitors the integrity of the controller railroad preemption input and associated wiring within the traffic controller cabinet. This will utilize a secondary railroad preemption input that is normally active (on) when no demand for railroad preemption is present. When a demand for railroad preemption is received, the normal railroad preemptor input is applied and the secondary input is dropped. If both inputs are either simultaneously on or simultaneously off for a time period of more than one (1) second, the controller will recognize this as an input failure. When a failure occurs, the traffic controller will be configured to provide a track clearance interval followed by a flashing red condition. This occurrence will set a preempt input alarm and also will require a manual reset of the controller.

(5) Track Clearance Green Re-service. Any demand for railroad preemption received at any point in the normal sequence, the emergency vehicle preemption sequence, a bus preemption sequence, or any other form of low priority preemption, or a previously called for railroad preemption sequence will result in the traffic controller providing a track clearance green indication within a “maximum time to track clearance green “ (usually 8 seconds depending upon site specific criteria) and will provide a full track clearance green time interval after the preemption demand was received. The controller software must have the capability to restart the railroad preemption sequence providing a full track clearance green interval from any point within the railroad preemption sequence from the start of track clear green through the entire dwell/hold interval(s) including any exit yellow

and red clearance intervals, if the demand for preemption drops and is reapplied. The number of times the controller is able to react to successive demands for railroad preemption must not be limited. This will be a software based routine that does not require any user programming and must be designed into the software.

(6) Preemption Priority. Preemptor number 1 is typically assigned to a supervisory failure in the interconnection circuit and preemptor 2 is typically assigned to a normal railroad preemption demand. Preemptor 1 must have priority over preemptor 2. Preemptor 2 must have priority over all other forms of preemption.

(7) Delay Time. In order to compensate for noisy or intermittent calls, the controller must have a programmable delay timing parameter for railroad preemptors, programmed at 1 second. Any demands for railroad preemption lasting less than this time will be ignored. This will apply to any subsequent demands for railroad preemption that may occur while the controller is still within the railroad preemption sequence from a prior demand.

(8) Non-Locking Preemption. The controller must have the capability to configure the railroad preemptors as non-locking calls. If a demand for preemption is placed for a duration of less than 1second (as programmed in the delay timer), the call will not lock and the controller will not initiate the preemption sequence. Furthermore, if an initial demand for preemption is dropped prematurely while the preemption sequence is still timing, the non-locking feature will allow the controller to re-service another demand for preemption.

(9) Minimum Green before Preemption. The controller must have a separate minimum green timing parameter, programmed at 1 second, that replaces normal controller phase minimum green times when entering railroad preemption. When a demand for preemption is applied, any active phase(s) must terminate immediately or after they have been active for 1 second if the demand occurs at the start of the phase(s). If any indications that are part of the track clearance green are active when the demand for railroad preemption is placed, those indications will not terminate until after the track clearance green interval is completed.

(10) Railroad Hold/Dwell Interval. The controller must have the capability to display a programmable phase(s) and rest in that phase(s) until the demand for railroad preemption is released. The controller must also have the option to cycle between a set of

programmable phases that don't conflict with the railroad crossing, or rest in an all-red steady state until the demand is released. The necessity for cycling during the hold interval or the use of an all-red steady state is determined by an assessment of the specific site. The controller must have a timing parameter that will provide a minimum hold/dwell time, even if the demand for preemption is dropped prematurely. The controller must be able to re-service any subsequent demands for preemption during this minimum hold/dwell time.

(11) Railroad Hold/Dwell Extension. The controller must have a timing parameter that will extend the hold/dwell interval for a programmed time after the demand for railroad preemption has been released. The controller must be able to re-service any subsequent demands for preemption during this extension time.

(12) Pre-signal Timing. When pre-signals are present in advance of a railroad crossing, during normal operation the pre-signal green indications terminate a programmable time (timed overlap) prior to the indications at the intersection. The duration of the timed overlap should not be reduced when leaving normal operation to service other forms of preemption, such as emergency vehicle or bus preemption. If a demand for railroad preemption occurs during the timed overlap portion of the normal sequence, the overlap timer must terminate and the track clear green interval must begin immediately, after the pre-signal yellow and red vehicle clearance intervals are completed.

(13) Remote Monitoring and Alarms. Capabilities to remotely monitor the traffic controller must be provided, including the capability to monitor the operation of the controller, upload logs/events, and to verify the integrity of the database. In addition, the controller must have the ability to automatically report alarms, such as preempt 1 activation, preemptor input failure, automatic flash, CRC failure, 24 volt failure, and other defined alarms. The controller must have the ability to prevent the remote download of changes to the critical data protected by the railroad preemption security feature.

(14) Blank-out Signs. If these signs are used for railroad preemption, they should activate immediately with the activation of the railroad interconnect circuit. They should deactivate immediately with the deactivation of the interconnect circuit, not after the controller exits the railroad preemption sequence. Whenever the traffic signals are in flashing red operation, cabinet circuitry must be such that the signs will remain operational if the interconnect circuit activates due to railroad warning device activation.

12.4 CRC. A CRC module with all connections, a USB memory device, software, and any other firmware necessary to make the CRC fully functional will be provided if so designated.

(1) Hardware. A 16 bit CRC (cyclical redundancy check) module must be provided. The module will connect to the ATC controller using unused I/O pins. Reassignment of unused inputs on the NEMA 'A', 'B', and 'C' connector I/O pins or connection to a proprietary 'D' module's input pins will be acceptable. The final CRC value for the specific intersection requirements will be set on the module for that intersection. Removing the CRC module during normal operation of the intersection, or mismatching the values in the database and the CRC, will result in a fault condition and put the intersection in flash mode.

(2) Software. The controller software/firmware will provide the logic and control facilities to fully implement CRC error detection. All the data elements (objects) required for the implementation will be contained in a proprietary data block. The software will provide a mechanism to "display" the final CRC value to be set on the CRC module.

A USB memory device will be utilized to 'lock' or 'unlock' the database. When the USB device is inserted into the controller, the controller will display a menu that will include a utility to 'unlock' the database. The USB device will contain a file structure that will allow access to the protected areas of the database. Once 'unlocked', the database can be edited through normal user interfaces. While the database is 'unlocked', the controller will drop the voltage/fault monitor signal to the conflict monitor to keep the intersection in flash. The CRC comparison check will be disabled during this period.

After all the changes to the database are completed, the user will use a utility on the USB to 'lock' the database. After the database is 'locked', another utility will allow the calculated CRC to be displayed. This can be used to configure the CRC module. After the CRC is connected and the USB is removed from the controller, the voltage/fault monitor signal to the conflict monitor will be enabled. A restart will be required to restart the controller.

Once the CRC module has been set (programmed), and the database has been locked, the controller can resume normal operation. The controller firmware will validate the stored CRC against the CRC module's value at least once per second.

13. WIRING

13.1 General. All electrical conductors must be stranded copper, with a minimum of nineteen (19) strands per conductor, and a concentrically applied 90° C. insulation with a 600 VAC rating. Wiring from the fuse block to the first distribution point, and to the controller bus, must be No. 10 AWG. Signal circuit wire must be No. 14 AWG. The wires must be provided with lugs or other approved terminal fittings for attachment to binding posts. All wiring between various parts of the controller must be neatly cabled. All wiring and terminal blocks must be tested for possible short circuits and resistance to ground by a high voltage dielectric test at 1,200 VAC. A wiring harness of adequate length must be provided to the timing device to allow the timer to be placed on top of the cabinet when required.

13.2 All VAC connections to load switches, flasher, and flash transfer relays must be soldered. All VAC connections on back of terminals must be soldered.

13.3 All VDC connections on back of terminals, and load switches must be soldered or connected with pre-approved terminations. All VDC connections to load switches are to be soldered or connected in a manner pre-approved by the City of Chicago's Division of Electrical Operations.

14. TESTING REQUIREMENTS

14.1 General. The testing on the controllers must be done as described herein. Environmental testing must be done at the manufacturer’s facilities or at an independent laboratory, and must be certified by the manufacturer or the independent laboratory. Functional testing will be done at the City’s facilities. All controllers provided under the contract must be tested as stipulated under “Functional Burn-In Testing” and “Physical Inspection” at the manufacturer’s facilities. If a controller is ordered for a specific location, the manufacturer shall program and test the controller at the factory and certify the test results.

14.2 N.E.M.A. Environmental Test. One controller, unless approved previously, must be tested, at the manufacturer's expense, in accordance with Part 2 of NEMA Standards Publication TS1-1983. All of the tests listed must be performed with all data properly recorded and certified. If the manufacturer changes the design, fabrication or components of a previously tested and approved controller, then a sample of the controller containing the new design, fabrication or components must be retested at the manufacturer's expense. Any N.E.M.A. environmental test references to minimum recall must include but not be limited to: All sixty-four (64) output circuits must be programmed in a sequence to simulate the normal functioning of the entire controller cabinet assembly; the conflict monitor must have a test board with the allowable channel jumpers installed to simulate normal operation; All

thirty-two (32) intervals must be programmed with a minimum of two (2) seconds per interval.

14.3 Functional "Burn In" Testing. The manufacturer of the controller must perform, at his manufacturing facilities, a one hundred (100) hour burn-in test on every controller, conflict monitor, and appurtenant devices. This test period must be certified by the manufacturer with supportive documentation and must include the device serial number, dates and times of test periods, and results. Any failed, or nonconforming components, must be replaced at this time. After each of the components has passed the burn-in test, they may be used in the assembly of the complete controller unit. Each completed unit must be subjected to the seventy-two (72) hour function test as described in this specification. The "burn in" requirement must include a test that uses all sixty-four (64) output circuits in "solid" burn as well as 1 pps and 5 pps for each circuit. All thirty-two (32) intervals must be programmed with a minimum of two (2) seconds per interval. The documentation for a test program to simulate the normal functioning of the controller phasing must be supplied. A copy of the test program must be approved by the City of Chicago, Division of Electrical Operations prior to testing. Certification of these tests must be attached to the outside of the shipping container. This certification is in addition to any other documentation and/or testing required by these specifications.

14.4 Testing Requirements. In addition to the NEMA environmental test and the "burn-in" requirements stated above, satisfactory performance of the traffic signal cabinet and its equipment must be demonstrated. The manufacturer must submit five (5) copies of his proposed "Test Procedure Document" for approval with the sample requested above. The test procedure must consist of two (2) sections; physical inspection and functional testing. If the test procedure is judged by the Commissioner or his duly authorized representative to be incomplete, inadequate or otherwise deficient, the contractor must revise and resubmit his "test procedure document" until it is approved. No controller will be accepted until the "test procedure document" has been approved. Functional testing must include, but not be limited to, phasing for multiple legged intersections, bridge and railroad pre-empts, flash operation, actuation, and any combinations of these features. Controllers designed to function without railroad pre-empts must be shown to function without the presence of a railroad interconnect. Options for downward compatibility when replacing either HMC1000 controllers or LMD40 controllers must also be demonstrated. In addition, it should be demonstrated that the controller functions within the MIST system. Any failure must be addressed by the manufacturer within the time frame allotted.

14.5 UPS. Testing of the equipment must verify that the operation meets the requirements of this specification. All equipment must be shown to operate correctly, including the rectifier, charger, inverter, batteries, and control unit.

The UPS must be connected to a dummy load at the factory and tested for performance under various conditions of line voltage and frequency, varying loads, temperature range, and humidity range. The automatic switching must be successfully demonstrated; losing line power and restoration of line power must not adversely affect the operation of the traffic signals. Use of the manual bypass switch must be successfully demonstrated. A generator must be connected to the unit and successfully operate the system without interruption. The batteries must be shown to be able to operate the traffic signals for the specified time. The batteries must be shown to be able to be recharged in the specified time between failures. The control unit, including the LCD display and the RS-232 interface, must be shown to function according to this specification. All reports and event monitoring must be successfully demonstrated. Programming functions must also be shown to work properly.

14.6 Physical Inspection. The "physical inspection" portion of the test procedure document must require the manufacturer to perform a physical inspection of workmanship and specification compliance for each traffic signal controller assembly. The inspection must be done using a detailed check list defining items to be inspected and criteria for acceptance. The inspection must include, but not be limited to, the following items:

(1) Hardware installation.
(2) Assembly mounting.
(3) Dimensions.
(4) Presence of specified devices and materials.
(5) Presence of required documents.
(6) Labeling and required serial numbers.
(7) Wiring including routing, covering, gauge, length, and soldering of terminations.
(8) Arrangement of equipment for safety and ease of calibration reprogramming troubleshooting and maintenance.
(9) Condition of cabinet body and finish.
(10) Condition and installation of doors, panels, gaskets and ventilation.
(11) High voltage test of insulation resistance to ground, with wires installed in cabinet and equipment disconnected.

14.7 Functional Testing. The "functional testing" portion of the Test Procedure must require the manufacturer to perform a complete room-temperature functional test of each complete traffic signal controller assembly for a minimum of seventy-two (72) hours. This test must be designed to concurrently check integrated hardware systems e.g., from simulated input to load switch output including conflict monitor and time base coordinator. All interface/controller interconnections must be tested. All load switch and interconnect relay positions must be tested, regardless of the number of load switches and interconnect relays being purchased. The functions tested must

include, but not be limited to, the following:

(1) Flash logic and operation (color, phases).
(2) Conflict monitor logic and operation.
(3) Police panel switch operation.
(4) Auxiliary panel switches (including fans).
(5) Interface panel.
(6) Time switch operation.
(7) Load switches (with a continuous ten (10) ampere load on each signal circuit).
(8) Outputs.
(9) Power interruptions of less than 500 ms.
(10) Power interruptions of more than 1.0 sec.
(11) Generator Hook-up.

15. SHIPMENT AND DELIVERY (Only applies to City commodity contracts)

15.1 Packaging. The cabinets must be shipped on individual pallets. Each cabinet must be individually wrapped and protected so that it can be handled without damage to the cabinet or its finish. The UPS and cabinet must be wrapped to give protection from the elements, as well as from shipping. If subassemblies or parts are ordered they must be suitably packaged to prevent damage during shipping and handling. All packages should be clearly labeled indicating the contents.

15.2 Delivery. The assembled cabinets, or subassemblies and parts, must be delivered to the Division of Electrical Operations at 2451 S. Ashland Avenue, unless otherwise directed. Assembled cabinets, or subassemblies and parts, must be available for testing and shipping within six weeks of the placement of an order.

CHICAGO ATC MATRIX - TABLE A

(ATC Standard Version 5-2b June 26, 2000)

Since the ATC standard specifies a "family" of controllers, the following options have been selected from the ATC standard to meet the City's needs.

Functional Requirement	ATC Clause #	Status	Details
Shelf Mounted	2.2.1 4.3.2.1	Required	(Shelf mount only)
Use of ATC Engine Board	2.2.2 4.3.2.2 5.1.1 5.1.2 5.3.2 5.3.4 5.3.5 5.3.5.1 5.4.2 5.4.3 5.4.4 5.4.5	Required	
Use of ATC Engine Board	5.2.1	Required	• Allowed component height below Engine Board PCB provided that the overall envelope remains unchanged, the clearance between the Host Board and Engine Board remains as specified, and the Engine Board still fits into a compliant Host Board
Use of ATC Engine Board	5.2.2 5.4.5	Required	In order to show the Ethernet communications to the Engine Board, the following "Reserved" pins can assume the following legacy functions: • P1-34: ENET2 Speed • P1-35: ENET2 Link/Activity • P1-36: ENET1 Speed • P1-37: ENET1 Link/Activity
Use of ATC Engine Board	5.3.1	Required	Minimum CPU capability of 500 MIPS
Use of ATC Engine Board	5.3.3	Required	Additionally, must provide a minimum of 16 MB of Flash total to accommodate future applications.
Use of ATC Engine Board	5.4.1	Required	• Engine Board shall not draw

			more than 4W of power from VPRIMARY (due to battery backup in Chicago) • Engine **may** supplement VSTANDBY_5 with on-board storage for its standby power.
Use of ATC Engine Board	5.4.3	Required	• All optional baud rates shall be supported
Parallel I/O	2.2.4	Required	• No support required for TS2 Type 1 or ITS cabinets • Must provide parallel I/O for TS2 Type 2 cabinets and legacy parallel I/O interfaces via interchangeable modules
Linux O/S and ATC BSP	2.2.5 4.3.1 4.3.3	Required	
Linux O/S and ATC BSP	2.2.5 4.3.1 4.3.3	Required	
Linux Kernel	Annex A	Required	
Parallel I/O	3.4	Required	Not required to support ITS Cabinet standard (NEMA cabinets are used)
Manage Clock/Calendar functions and synchronize with external source	3.5.1.3	Required	Must also support synchronization with absolute zero.
Manage Clock / Calendar functions and synchronize with External Source	4.1.3	Required	• BSP RTC driver shall automatically update the RTC with the OST time once per second with an accuracy of 0.1 seconds • Successive interruptions (e.g. on for 5 minutes, off for 3 minutes over a period of 8 hours) shall not introduce cumulative error
Configure and Verify Parameters	3.5.1.4 4.1.4	Required	
Upload/Download blocks of data	3.5.1.5 4.1.5	Required	

Monitor & Verify Application Status	3.5.1.6 4.1.6	Required	
Operator Control of Application Execution	3.5.1.7	Required	Only a local operator is allowed to manage the starting, stopping and scheduling of one or more applications on the ATC.
Operator Control of Application Execution	4.1.7	Required	
Long Term Storage of Log Data, etc	3.5.1.8 4.1.8	Required	
Support Diagnostics	3.5.3.3 4.3.4	Required	
Modes of Operation	3.7	Required	(Must support Standalone, Direct, and Distributed modes of operation)
Manage/Control a Variety of External Devices	4.2.1	Required	• Fixed Ports on the front panel shall be specified by the City • Only SP1 and SP2 are required to be supported on the modem slot • The dedicated synchronous serial port (SP5) is to be used exclusively for supporting a parallel I/O module (NEMA TS2 or legacy interface)
Monitor the Status of External Devices	4.2.2	Required	• Fixed Ports on the front panel shall be specified by the City • Only SP1 and SP2 and required to be supported on the modem slot • The dedicated synchronous serial port (SP5) is to be used exclusively for supporting a parallel I/O module (NEMA TS2 or legacy interface)
Support future Hardware Upgrades	4.3.2	Required	
Environmental Requirements	5.2.3	Required	
Front Panel Serial Ports	6.2.3.1 6.1.3 6.3.2.1	Required	One serial port on the front panel shall satisfy this section as an EIA-574 (25-pin) and be labeled “Port 2”.
Front Panel Serial Ports	6.2.3.1 6.3.2.1	Required	One serial port shall satisfy this section as an EIA-574 (9-pin) with a reduced

			pin-out (TXD, RXD, and DC Reference at a minimum) and be labeled “Port 4”. C50_ENABLE shall not be supported. A second serial port shall fully satisfy this section as an EIA-574 (25-pin) and be labeled “Port 5.”
Front Panel Serial Ports	6.2.3.2 6.1.3 6.3.2.2	Required	One serial port shall satisfy this section as an EIA-485 (15-pin) with the TS2 Type 1 Port 1 pin-out and be labeled “Port 1”.
Front Panel Ethernet Ports	6.2.3.9 6.3.2.9 7.1.4.4	Required	There shall be a minimum of two Ethernet ports on the Front Panel (one for ENET1, one for ENET2)
User Interface	7.1 7.1.1.2 7.1.4.4 7.1.4.5 7.1.4.7	Required	
User Interface	7.1.1	Required	Must meet City’s Minimum requirements
User Interface	7.1.1.1 7.1.2.1 7.1.3 7.1.4.1 7.1.5	Required	• Data key is not required • Front Panel Interface is to be integral to the controller (i.e. not removable, no SP6 connector) • “Option 1” to be selected but AUX switch is optional • Keypad shall have a minimum of 24 keys • LCD Display shall be graphical with a minimum resolution of 128 rows x 240 columns (up to 16 lines x 40 characters). • LCD pixel size shall be a minimum of 0.32mm x 0.32mm with a minimum pitch of 0.325mm with character size defined as 6 pixels wide x 8 pixels high • Refresh rate is a minimum of 10 times per second (due to larger display requirements) • LCD heater is mandatory to ensure sub-second LCD display

			response over full temperature range. Heater shall only be active when needed and User is interacting with the controller locally (due to battery backup requirements). • Heater Power shall be up to 15V at 1A current maximum
Power Supply	7.2 7.2.2 7.2.3 7.2.4 7.2.5 7.2.5.1 7.2.5.2 7.2.6.1 7.2.6.2 7.2.6.3 7.2.6.4 7.2.6.6	Required	12 V not required As applicable for NEMA cabinets only
Mechanical/Chassis	7.3.1.3 7.3.1.4	Required	• Only Shelf mounted units are acceptable • Only components / connectors specified by the City shall be located on either the Front or Rear panels. No C1 Type Connectors allowed.
I/O Interfaces	8.1.1 8.2.2 8.2.2.1 8.2.2.2 8.2.2.3	Required	• Support for TS2 Type 2 and TS1 Interfaces
I/O Interfaces	8.1.2 8.2.2.5	Required	• Support is only required for NEMA TS2 Type 2, TS1, and other similar legacy interfaces • NEMA TS2 Port 1 shall also be provided (for detectors only)
I/O Interfaces	8.2.3	Required	Port 1 Connector shall be provided as specified within this section (only used for detectors)
I/O Interfaces	8.2.1.13	Required	Legacy I/O interfaces shall respond as

			required.
I/O Interfaces not required	8.2.1	Required	• No support for Model 332 Cabinets or ITS Cabinets & devices is to be provided
Environmental & Test Procedures	9	Required	All subsections are required
Performance & Material Requirements	10	Required	All subsections are required
Performance & Material Requirements	10.1.15	Required	All PCBs and similar construction mechanisms shall be mounted vertically (i.e. no horizontal PCBs are allowed).
Quality Control	11	Required	All subsections are required

ELECTRICAL SPECIFICATION 1608
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
REVISED APRIL 2, 2021

ROADWAY LIGHTING CONTROL SMART NODES

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1. SUBJECT

This specification states the requirements for smart lighting control nodes. Each external or internal individual node is to be wired to an individual roadway luminaire. A third node will be used for control of a group of luminaires. Each node shall be connected to a wireless mesh network. There are three nodes specified. One node will consist of a standard twist-lock type (external node) which will be mounted to a matching receptacle on the outside of a roadway luminaire. The second type node will be mounted internally to a luminaire (internal node). The third type of node shall control a group of luminaires on a common circuit (circuit node). The nodes shall provide two-way wireless communications between the luminaires and the City's smart lighting system. Functions shall consist of energy monitoring, on/off control, dimming, and outage reporting.

2. GENERAL

2.1 Information Required. Each bidder shall submit with his proposal the following information relative to the nodes he proposes to furnish.

(1) Manufacturer's catalog description, including manufacturer's name and catalog ordering numbers.

(2) Specification sheets.

(3) Any other information as required herein.

2.2 Assembly. Each control node shall be delivered completely assembled, wired, and ready for installation.

2.3 Warranty. The manufacturer shall warrant every node against any defects due to design or workmanship developing within a period of five (5) years after the nodes have been accepted by the City. This will be interpreted particularly to mean failure of any component impairing the proper operation of the unit. Any

node developing defects within this period shall be replaced by the manufacturer at their sole expense and without cost to the City.

2.4 Sample. If so requested, a sample of the nodes of the manufacture intended to be furnished under this contract must be submitted to the Division of Electrical Operations within fifteen (15) days upon receipt of a request from the Chief Procurement Officer.

2.5 The manufacturer shall be ISO 9001 certified for quality management in the manufacturing field.

2.6 Nodes shall be FCC compliant for non-electrical interference.

2.7 Compliance. The nodes shall conform in detail to the requirements herein stated, and to the standards herein cited, of which the latest revisions shall govern.

3. HOUSING

3.1 Housings shall be molded of a UV stabilized polycarbonate, pigmented to an approved color. The housing is required to be impact resistant.

3.2 A weather-proof, permanent label shall be attached to each unit indicating the manufacturer's name, month and year of manufacture, model and serial number, voltage and load ratings, and provision for marking installation and removal dates.

3.3 The dimensions of the external twist-lock node shall not exceed 5" high by 3.5" in diameter. The external node shall not weigh more than10 ounces.

3.4 The dimensions of the internal node shall not exceed 2.5" high, 4.25" length, and 3.5" width. The internal node shall not weigh more than 11 ounces.

3.5 The internal smart node and the circuit smart node shall have lead wires of approximately 12 inches.

3.6 The external node shall have a neoprene or other approved gasket attached to the base to effectively seal the connections against weather and dust.

4. ENVIRONMENTAL

4.1 The nodes shall operate within the temperature range of -40º C to +70º C.

4.2 The external node shall have an ingress protection rating of IP66.

4.3 The internal node shall have an ingress protection rating of IP65.

4.4 The circuit node shall have an ingress protection rating of IP65.

5. ELECTRICAL

5.1 The nodes must function properly within the existing City lighting circuits and the power distribution system as provided by ComEd. Existing conditions shall not adversely affect the nodes, nor keep them from performing properly.

5.2 Power consumption shall be less than 2watts (at 120 volts).

5.3 The nodes must be stable and reliable over the range of 105 to 305 volts A.C., at 50/60 cycles.

5.4 Surge Arrestor. Over voltage protection shall be provided for the control components and the load circuit by means of a metal oxide varistor (MOV) or other specifically approved type arrestor. It must limit high voltage surges to a value at least 20% below the basic impulse insulation level (BIL in accordance with EEI-NEMA) of the control. The MOV must be rated for a minimum of 320 joules 6KV/3KA. In both external and internal nodes, the MOV must be mounted internally in the control housing.

5.5 Switching Relay. The ON-OFF switching operations shall be accomplished by normally closed contacts which must be opened by means of a rugged, properly rated, magnetic relay, subject to approval. The switching shall be positive and free of chatter and/or sticking of contacts. The contractor must provide test data verifying that contact chatter does not exceed 5 milliseconds when operated under loads as herein specified. The relay must have contacts of silver alloy, tungsten, or other specifically approved material.

5.6 Capacity. Maximum pass-through current shall be 10 amps. Maximum loading shall be 1500VA (960 watts).

5.7 Circuit nodes shall have an external antenna. The antenna shall be capable of being mounted to a cabinet and be weather hardened and vandal resistant. Lead wires for the antenna shall be included with each circuit node. A single antenna shall be capable of being shared by multiple nodes.

5.8 External twist-lock nodes shall be 7-pin. Internal nodes and circuit nodes shall have 7 lead -in wires. The circuit node shall also have wires for the antenna.

6. OPERATION

6.1 The external nodes shall meet the requirements of ANSI C136.10 for twist-lock controls, as well as UL 773. All nodes shall meet the requirements of ANSI C136.41 for dimming control.

6.2 Internal nodes shall be able to communicate with the network even when installed inside the metal housing of a luminaire.

6.3 If an external node loses communication, then operation will default to the photocell. If the photo-cell malfunctions, the control will default to the on position.

6.4 If an internal node or circuit node loses communication, then the default operation of the node will provide power to the luminaire and the luminaire will remain on or be turned on.

6.5 Ability for Light turn-on or turn-off by programmed schedule.

6.7 0-10VDC driver control, allowing dimming.

6.8 Remote control and reporting (two-way communications).

6.9 Metering.

(1) Energy metering (0.5% accuracy).

(2) Energy metering by hour, day, minute, with record keeping.

(3) Metering Range: 105 to 305 VAC, 10A RMS (ANSI C12.20)

7. PHOTO-CONTROL

7.1 The internal smart nodes and the circuit smart nodes shall not have a built-in photocell.

7.2 The external twist-lock node shall have a built-in photocell.

(1) Photoconductive Cell. The photocell shall consist of a suitable substrate, a chemically inert electrode material and a thin layer of photosensitive cadmium sulfide or other acceptable photosensitive material. It must be hermetically sealed in a glass to metal package to prevent moisture and contamination damage. Plastic cased cells are not acceptable. Filtered silicon sensors in clear epoxy cases are also acceptable. The cell must not

be subject to overloading due to the demand of the design circuit nor the ambient temperatures surrounding the cell.

(2) The external node control must be calibrated at 120V AC for a "turn-on" setting of 1.50 ± 0.30 horizontal foot candles of natural illumination with a 2-5 second turn OFF delay. The "turn-off" setting must be adjusted to one and one half (1.5) times the "turn-on" setting. The external node control must have a 1-2 second turn ON delay.

8. NETWORKING

The control nodes must operate on an open standards secure (WiSun) IEEE 802.15.4g wireless mesh based multi-application network with embedded Itron (formerly Silver Springs Network) communications.

The control nodes shall support Frequency-Hopping Spread Spectrum up to 300kbps mesh networking as well as automatic data routing with self-configuration, auto-healing & redundant uplinks.

The nodes shall operate within the City's Itron network.

9. SECURITY

The control nodes must have full application and link-layer security with full PKI (Public Key Infrastructure), Advanced Encryption Standard AES-128 or AES 256, and embedded firewall which includes. integrated multi-layer security with end-to-end encryption and capability to prohibit unauthorized access.

10. PACKAGING

10.1 Carton. Each smart lighting control node shall be individually packed in a carton of adequate strength and properly secured and protected to prevent damage to the unit during shipment, handling and storage. A master carton shall contain multiple units, each in individual cartons.

10.2 Marking. Each carton shall be clearly marked on the outside with the legend "SMART LIGHTING INTERNAL CONTROL NODE", "SMART LIGHTING EXTERNAL CONTROL NODE", or "SMART LIGHTING CIRCUIT NODE" (or similar as appropriate), with the number of units in the carton: volt-ampere load rating, voltage, manufacturer's name and catalogue number, and shipping or manufacturing date.

ELECTRICAL SPECIFICATION No. 1609
CITY OF CHICAGO
DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING
OCTOBER 20, 2017

OUTDOOR LED LUMINAIRE SPECIFICATIONS:
RESIDENTIAL STREETS, ALLEYS, & ARTERIAL STREETS (Cobra Head)

I. SUBJECT

A. This specification states the requirements for non-ornamental Light Emitting Diode (LED) outdoor lighting luminaires. The LED luminaires will be integrated into a centralized lighting management system.

II. GENERAL

A. References

American National Standards Institute (ANSI)

- ANSI C78.377-2015, "American National Standard for Electric Lamps—Specifications for the Chromaticity of Solid State Lighting (SSL) Products"
- ANSI C82.77-10-2014, "American National Standard for Lighting Equipment—Harmonic Emission Limits—Related Power Quality Requirements"
- ANSI C136.2-2015, "American National Standard for Roadway and Area Lighting Equipment—Dielectric Withstand and Electrical Transient Immunity Requirements"
- ANSI C136.10-2010, "American National Standard for Roadway and Area Lighting Equipment—Locking-Type Control Devices and Mating Receptacles—Physical and Electrical Interchangeability and Testing"
- ANSI C136.15-2015, "American National Standard for Roadway and Area Lighting Equipment—Luminaire Field Identification"
- ANSI C136.22-2004 (R2009, R2014), "American National Standard for Roadway and Area Lighting Equipment—Internal Labeling of Luminaires"
- ANSI C136.25-2013, "American National Standard for Roadway and Area Lighting Equipment—Ingress Protection (Resistance to Dust, Solid Objects and Moisture) for Luminaire Enclosures"
- ANSI C136.31-2015, "American National Standard for Roadway and Area Lighting Equipment—Luminaire Vibration"
- ANSI C136.37-2011, "American National Standard for Solid State Light Sources Used in Roadway and Area Lighting"
- ANSI C136.41-2013, "American National Standard for Roadway and

Area Lighting Equipment–Dimming Control Between an External Locking Type Control and Ballast or Driver"
- ASTM B85/B85M-14, "Standard Specification for Aluminum-Alloy Die Castings"
- ASTM B117-16, "Standard Practice for Operating Salt Spray (Fog) Apparatus"
- ASTM D523-14, "Standard Test Method for Specular Gloss"
- ASTM D1654-08, "Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments"
- ASTM G154-12a, "Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials"

Illuminating Engineering Society of North America (IES)

- ANSI/IES LM-63-02, "Standard File Format for Electronic Transfer of Photometric Data"
- IES LM-79-08, "Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products"
- ANSI/IES LM-80-15, "IES Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules"
- ANSI/IES RP-8-14, "Roadway Lighting"
- IES TM-21-11 (with Addendum B), "Projecting Long Term Lumen Maintenance of LED Light Sources"

Institute of Electrical and Electronics Engineers (IEEE)

- IEEE Std 1789-2015, "IEEE Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers"

International Electrotechnical Commission (IEC)

- IEC 60929:2011 (with Amendment 1), "AC and/or DC-supplied electronic control gear for tubular fluorescent lamps - Performance requirements"

Underwriters Laboratories (UL)

- ANSI/UL 1598 (3rd Edition), "Luminaires"

B. Submittal Requirements:

The Contractor must submit the following information pertaining to each specified luminaire type within fifteen (15) days of request:

1. Completed ATTACHMENT B – Submittal Form

2. Product Data Sheets.

a) Luminaire data sheets – including summary product description, dimensioned outline drawings, and nominal characteristics including but not limited to: initial luminous flux (lumens), input power (watts), input voltage range (volts), LED drive current (milliamps), correlated color temperature (kelvins), color rendering index, effective projected area (square feet) and weight (pounds).

b) LED Driver data sheet – including information described in LED Driver Requirements Section III-I-3.

c) LED light source data sheet

d) Surge protection device data sheet - if applicable

3. Photometric Performance Data

The manufacturer must provide photometric calculations, as part of each luminaire's submittal package, that demonstrate the luminaire's photometric performance will meet or exceed the photometric requirements listed in this specification. The submitted lighting calculations must include point-by-point illuminance, luminance and veiling luminance data, as well as listings of all indicated averages and ratios. Photometric reports must include the following information and be in accordance with the standards listed below:

a) IES LM-79-08 photometric report that includes measured values for initial luminous flux, input power, correlated color temperature, and color rendering index.

b) ANSI/IES LM-63-02 electronic format photometric file that corresponds to the LM-79 report.

c) LM-63 photometric calculations that demonstrate compliance with the illumination requirements specified herein using the LM-63 file. Calculation grids and observer locations not specified herein must be in accordance with ANSI/IES RP-8-14.

d) IES TM-21-11 calculations that derive the lumen maintenance (lamp lumen depreciation or LLD) factor applied to photometric calculations specified herein.

- ANSI/IES LM-80-15 and in-situ temperature measurement testing (ISTMT) reports containing data used in TM-21 calculations must also be submitted.

- TM-21 calculations must apply to the maximum LED case temperature from ISTMT, shall not extrapolate beyond six times the duration of available LM-80 test data, and must be submitted in the spreadsheet format of the ENERGY STAR TM-21 calculator (https://www.energystar.gov/products/spec/luminaires_specification_version_2_0_pd).

LM-79, ISTMT, and LM-80 reports must correspond directly to submitted luminaires, and must be produced by test laboratories that satisfy the Testing Laboratory Requirements of the Design Lights Consortium (www.designlights.org/content/QPL/ProductSubmit/LabTesting).

ISTMT must be conducted in accordance with the Design Lights Consortium Manufacturer's Guide (https://www.designlights.org/content/qpl/productsubmit).

ISTMT shall be conducted in an ambient temperature of 25 ± 5 °C. Ambient temperature variations above or below 25 °C shall be respectively subtracted from or added to temperatures recorded at points on the luminaire.

4. Safety Certification - file number indicating compliance with UL 1598. Applicable testing bodies are determined by the US Occupational Safety Health Administration (OSHA) as Nationally Recognized Testing Laboratories (NRTL) and include: CSA (Canadian Standards Association), ETL (Edison Testing Laboratory), and UL (Underwriters Laboratory).

5. Vibration Testing - the luminaire must comply with ANSI C136.31 at Vibration Test Level 2 (3.0 G).

6. Product Samples - at least two samples of each luminaire that the contractor proposes to use must be submitted to the City. All samples must be representative production units and be supplied at no cost to the City.

C. Assembly.

Each luminaire must be delivered completely assembled, wired, and ready for installation.

D. Warranty.

The luminaire manufacturer must warrant the performance and construction of luminaires to meet the requirements of this specification, and must warrant all parts, components and appurtenances against defects due to design, workmanship or material developing within a period of ten (10) years from the date of acceptance by the City.

- The inability of a luminaire to be dimmed will constitute a luminaire failure.
- Failure of 10% or more of the LED light sources (packages or arrays/modules) in a luminaire will constitute a luminaire failure.

- The warranty must apply for application on all of the City's existing electrical systems, both grounded and ungrounded.
- During the warranty period the City may, from time to time, test a random sampling of 10-20 luminaires for verification of light output per IES LM-79 and to test dimming functionality for a given luminaire population. The percentage of luminaires not performing as required in the random sampling will be applied to the total population quantity to determine the number of new luminaire replacements that must be delivered to the City by the manufacturer, without expense to the City.

E. Manufacturing Experience and Capacity

The manufacturer must demonstrate at least a five year history of manufacturing LED roadway and outside area luminaires by providing a list of prior projects with project description, date, location, quantities and reference contact information. The manufacturer must also demonstrate the capacity to supply the quantities required for the contract in a timely manner.

III. CONSTRUCTION

A. Weight

The net weight of these luminaires must not be more than 30 pounds.

B. Housing.

The preferred luminaire housing material is die-cast aluminum alloy meeting ASTM Specification A380. Alternate materials may be considered. The housing must enclose the mounting hardware, LED arrays, control receptacle, terminal board, and electronic driver. The housing must include a surface to facilitate leveling with a spirit level. The housing must have integral heat sink characteristics, such that all enclosed components will operate within their designed operating temperatures under expected service conditions. No external or removable heat shields or heat sinks; are permitted. The housing must be designed to encourage water shedding. The housing must be designed to minimize dirt and bug accumulation on the optic surface.

C. Mounting Provisions.

The luminaire must include a heavy gauge slip fitter clamping assembly suitable for secure attachment over the end of a two (2) inch 2" IP (2.375" OD) steel pipe with an approved means of clamping it firmly in mounting bracket. The slip fitter mounting clamp must contain an approved shield around the pipe entrance to block the entry of birds.

D. Access Door-Panel.

An access door panel allowing access to the terminal strip and LED driver must be provided. A die-cast aluminum door-panel composed of aluminum alloy A380 is preferred; alternate materials may be considered. The door-panel must be hinged to the luminaire housing and suitably latched and fastened at the closing end. It must be made to be removed easily. The hinge and fastening devices must be captive parts which will not become disengaged from the door panel.

E. Hardware.

All machine screws, locknuts, pins and set screws necessary to make a firm assembly, and for its secure attachment to the mast arm, must be furnished in place. All hardware must be of stainless steel, zinc plated steel, copper silicon alloy or other non-corrosive metal, and where necessary must be suitably plated to prevent electrolytic action by contact with dissimilar metals.

F. Finish.

The luminaire must have a polyester powder coat with a minimum 2.0 mil thickness. Surface texture and paint quality will be subject to approval. Color must be as specified in the order. A paint chip must be submitted as a sample upon request. The finish must exceed a rating of six per ASTM D1654 after 1000 hours of testing per ASTM B117. The coating must exhibit no greater than 30% reduction of gloss per ASTM D523 after 500 hours of QUV testing at ASTM G154 Cycle 6.

G. Ingress Protection.

1. The luminaire electric compartment housing must have an ingress protection rating of IP54 or better as described in ANSI C136.25-2013). The optical system must have a minimum rating of IP 66.

2. The luminaire must be listed for wet locations by a U.S. Occupational Safety Health Administration (OSHA) Nationally Recognized Laboratory (NRTL) and have a safety certification and file number indicating compliance with UL 1598.

H. General Luminaire Requirements

1. The luminaire must be rated to operate between -40° to +50° Celsius.

2. The luminaire must have the option of adding a house side shield. The shield should be designed to be easily installed in the field. The house side shield must be composed of a sturdy material capable of withstanding vibrations and weather conditions. The shield must cut off light trespass at approximately one mounting height behind the pole.

3. The luminaire must meet the requirements of ANSI C136.22 for internal labeling. A bar code with pertinent information for warranty and maintenance must be attached to the inside of the housing. A separate bar code label must be on the driver

4. The luminaire must be able to provide pertinent product information, for warranty and maintenance purposes, in a digital format that is compliant with the Digital Addressable Lighting Interface (DALI) protocol. This information will be transmitted through the networked Lighting Management control system.

I. Electrical Components

1. LED Optical Arrays

a) The LED arrays must be properly secured at the factory and must not require field adjustment for optimum photometric performance.

2. Terminal Block

a) A terminal block of high grade molded plastic of the barrier or safety type must be mounted within the housing in a readily accessible location.

b) Terminal block wiring; all necessary terminals, pre-wired to all luminaire components, must be provided.

c) Terminal block terminals must have copper plated or brass plated, clamp-type pressure connectors of an approved type for "line" connections, to accommodate wire sizes from #12 to #8 A.W.G.

d) Terminal block terminals for internal component connections must

be either the screw-clamp or quick disconnect type.

3. LED Driver:

a) Voltage. The electronic driver must operate at an input voltage range of between 120 and 277 volts, 60 Hertz. It must automatically sense the input voltage and adjust the output accordingly. The City uses nominal input voltages of 120, 208, and 240 for street lighting. When operated at any supply voltage between 80 percent and 110 percent of its rated supply voltage and at rated input frequency, a driver shall provide current and/or voltage regulation that equals or exceeds the values specified by the manufacturer.

b) Electrical Safety. Luminaires must operate at or below the Low-Risk Level, as defined in Figure 18 of IEEE 1789-2015. This requirement must be satisfied across the dimming range.

c) Power Factor (PF). The power factor of the driver over the design range of input voltages specified above must be in accordance to ANSI C82.77-2014. PF must be ≥ 0.9.

d) Total Harmonic Distortion (THD). The driver input current must have specified THD in accordance to ANSI C82.77-2014. THD must be $\leq 32\%$.

e) Thermal Protection. The driver must be thermally protected to shut off when operating temperatures reach unacceptable levels.

f) Electromagnetic Interference. Luminaire must comply with the FCC radiation emission limits for Class B digital devices given at 47 CFR 15.109.

g) Electrical Transient Immunity.

- Dielectric Withstand Testing - luminaire must meet the performance requirements specified in ANSI C136.2-2015 for dielectric withstand, using the DC test level and configuration.

- Electrical Transient Immunity - luminaire must meet the performance requirements specified in ANSI C136.2-2015 for electrical transient immunity, using the Enhanced (10 kV / 5 kA) combination wave test level.

- Transient Immunity Testing Requirements

  - During electrical transient immunity testing, the device under test (DUT) must: be connected to the power source through a series coupler/decoupler network (CDN), using a two-wire (hot or hot/neutral) connection between both the

power supply and CDN input and the CDN output and DUT.

- If AC mains is used to power the DUT, the input waveform must be characterized and documented both before and after electrical transient immunity testing, with the DUT operating at rated full output.

- For Pre-Test DUT Characterization, the diagnostic measurements shall, at a minimum, include the following: real power, input current (RMS; Root-Means-Square), power factor, and current distortion factor (THD-I Total Harmonic Distortion) when operating at rated full output.

- Manufacturer must indicate on submittal form whether failure of the electrical transient immunity system can possibly result in disconnect of power to luminaire.

h) Dimming Capability. The driver must be capable of dimming. The dimming range must be 10% to 100% of full output. The digital lighting interface used for dimming must be DALI (Digital Addressable Lighting Interface) as per the requirements of IEC 62386. There must be a minimum of 100 dimming steps between the top and bottom of the dimming range.

4. Wiring.

a) All components must be completely factory wired with non-fading, color coded leads. These leads must be insulated with an approved class of insulation and must be #16 AWG conductor at a minimum.

b) All wires within a single circuit path must be of the same size.

c) No wire-nut splicing will be allowed.

d) No unnecessary splices will be allowed.

e) Quick disconnects must be provided for all components.

f) All wires must be properly terminated.

5. Control Device Receptacle and Cap.

a) Twist-lock Receptacle for a control device that meets ANSI C136.41 must be mounted in the top of the housing with provision for proper positioning of the control device.

b) 7-pin Receptacle. The luminaire control receptacle must be fully

prewired and compliant with ANSI C136.41.

c) 3-prong Shorting Cap that meets ANSI C136.10 must be provided.

d) Receptacle Wire Leads must all be properly terminated.

e) Receptacle repositioning. The receptacle must be able to be repositioned without the use of tools.

f) Control Devices Not Included in LED Specifications. Whereas specifications for control receptacles are included, specifications for control devices are not. The control device performance requirements are part of the lighting management system specifications in the Smart Lighting Project Technology specifications.

6. Component Mounting.

All electrical components must be securely mounted in such manner that individual components can be easily maintained or replaced. Permanent straps or tie-wraps will not be permitted. The entire assembly should be easily disconnected and removed for replacement.

IV. PHOTOMETRIC REQUIREMENTS

1. Light Pollution.

To limit light pollution, the submitted luminaires must not emit any light above the horizon (0 lumens at angles ≥ 90° from luminaire nadir).

2. Lumen Maintenance.

a) LED arrays must deliver a minimum of 90% of initial lumen output at 36,000 hours of operation.

b) Light Loss Factor (LLF) < 1.0. Calculations for maintained values, i.e. LLF = LLD x LDD x LAT.

(1) Lamp Lumen Depreciation (LLD) calculated at 60,000 hours as per Section II-B-3-d above,
(2) Luminaire Dirt Depreciation (LDD) ≤0.90, and
(3) Luminaire Ambient Temperature (LAT) ≤0.96

Luminaires with less than 10,000 hours of available LM-80 test data may be submitted for consideration but must be clearly indicated as such.

3. Color Attributes

a) Color Rendering Index (CRI) shall be no less than 65.

b) Nominal Correlated Color Temperature (CCT) shall be 3000K as defined by ANSI C78.377 and described below:

Manufacturer-Rated Nominal CCT (K)	Allowable IES LM-79 Chromaticity Values	
	Measured CCT (K)	Measured Duv
3000	2870 to 3220	-0.006 to 0.006

4. City of Chicago Typical Lighting Contexts

   ATTACHMENT A (below) lists the photometric performance requirements for luminaires used in the following typical municipal outdoor lighting applications:

   - Modern Residential Streets - staggered poles on both sides.
   - Arterial Streets – two-sided opposite pole spacing
   - Arterial Streets – two-sided staggered pole spacing

ATTACHMENT A – Photometric Performance Requirements

STREET PARAMETERS				
TYPICAL LIGHTING CONTEXT	**RESIDENTIAL**	**ARTERIAL**		
POLE CONFIGURATION*	STAGGERED	OPPOSITE	STAGGERED	
RIGHT OF WAY (Width)	66 ft.	100 ft.	80 ft.	66 ft.
IES PAVEMENT CLASS	R3	R3	R3	R3
STREET WIDTH (Curb to Curb)	34 ft.	80 ft.	60 ft.	48 ft.
LANES (Incl Prking &Median)	4	7	6	4
PARKWAY (Width)	10 ft.	4 ft.	4 ft.	N/A
SIDEWALK (Width)	6 ft.	6 ft.	6 ft.	9 ft.
HEIGHT TO LUMINAIRE	18 ft.	33 ft.	33 ft.	33 ft.
MAST ARM LENGTH	8 ft.	12 ft.	12 ft.	8 ft.
POLE SETBACK (From Curb to Center of Pole)	3 ft.	3 ft.	3 ft.	3 ft.
IN-LINE POLE SPACING	220 ft.	210 ft.	210 ft.	210 ft.
MAINTAINED PERFORMANCE REQUIREMENTS				
LUMINAIRE REQUIREMENTS	STAGGERED	OPPOSITE	STAGGERED	
Max Input Power - Default /Normal Luminance (Watts)	120	180	180	180
Default/Normal AVG. Luminance (cd/m²)	≥1.5	≥1.7	≥1.7	≥1.7
AVG/MIN Uniformity Ratio	≤ 6:1	≤ 3:1	≤ 3:1	≤ 3:1
MAX/MIN Uniformity Ratio	≤10:1	≤ 5:1	≤ 5:1	≤ 5:1
MAX Veiling Luminance Ratio	≤ 0.4	≤ 0.3	≤ 0.3	≤ 0.3
AVG. Boosted Luminance (cd/m²) [Add-Alternate]	≥2.25	≥2.5	≥2.5	≥2.5
SIDEWALK				
Default AVG. Horizontal Illuminance (fc)	≥0.50	≥0.50	≥0.50	≥0.50
AVG.MIN Uniformity Ratio (Horizontal Illuminance)	≤ 4:1	≤ 4:1	≤ 4:1	≤ 4:1
LIGHT TRESPASS RESTRICTIONS - (as measured in a vertical plane 10' beyond ROW ≤3' height)				
MAX Vertical Illuminance	≤ 0.07	≤ 0.3	≤ 0.30	≤ 0.30

ATTACHMENT B - Product Submittal Form

Lighting Context	**e.g. Alleys**			
Product Information Description	***Product Data (Summary)***			***Submittal Reference Document***
Luminaire Designation				
Luminaire Manufacturer				
Luminaire Model Number				
Luminous Flux – initial	lumens			
Luminaire input power—initial	watts			
Luminaire input power—maintained	watts			
Luminaire input voltage- nominal range	volts			
LED drive current - initial	milliamps			
LED drive current - maintained	milliamps			
CCT (correlated color temperature)	kelvin			
CRI (color rendering index)				
EPA (effective projected area) - nominal	sq. ft.			
Luminaire Weight - nominal	lbs.			
Control Interface	☐ ANSI C136.41, 7-pin			
LED Driver – dimming capability	☐ Dimmable, 0-10V	☐ Dimmable, DALI		
LED driver- rated life	years			
Electrical transient immunity ANSI C136.2 combination wave test level	☐ Basic (6kV/3kA)	☐ Enhanced (10kV / 5kA)	☐ Elevated (20kV/10kA)	
Vibration Test-ANSI C136.31	☐ Level 2			
Luminaire warranty period	years			
IES LM-80 test duration	hours			IES LM-80-15 report
LED lumen maintenance at 36,000 hours	%			TM-21 calculator
Max. LED case temperature	degrees Celsius			ISTMT report

ELECTRICAL SPECIFICATION 1617
DIVISION OF ENGINEERING
DEPARTMENT OF TRANSPORTATION
CITY OF CHICAGO
SEPTEMBER 16, 2019

ACCESSIBLE PEDESTRIAN SIGNAL

SUBJECT

1. This specification states the requirements for an integrated accessible pedestrian signal assembly which will include a vibrotactile push-button with arrow, a speaker, a sign, and housing. This assembly will provide non-visual walk information for persons without sight or with low vision. The walk indications shall be both audible and vibrotactile. This assembly can be used for either actuated pedestrian signal crossings or for non-actuated pedestrian signal crossings.

GENERAL

2. (a) Specifications. The accessible pedestrian signal (APS) assembly must conform in detail to the requirements herein stated, and to the latest requirements of the Manual on Uniform Traffic Control Devices (MUTCD). The APS must also meet the most recent requirements of the Americans with Disabilities Act (ADA).

(b) Acceptance. APS assemblies not conforming to this specification will not be accepted.

(c) Bidders Submittal. Bidders must submit with their bids detailed specifications and any shop drawings that describe the physical appearance and the functionality of the APS.

(d) Sample. One complete APS assembly of the manufacture intended to be furnished must be submitted within fifteen (15) business days upon request of the Chief Procurement Officer.

(e) Warranty. The manufacturer must warrant the APS against defects due to design, workmanship, and material, for a period of five years from the date of acceptance by the City. If any assembly fails to properly function within this period, the manufacturer will replace the assembly, free of charge to the city, including shipping.

HOUSING

3. (a) The housing shall be cast aluminum. It shall be vandal resistant. The housing shall contain the speaker and the push-button, and be able to accommodate a 9 inch by 12 inch sign. The housing shall have a hole in the back to accommodate cable. The housing shall be mounted to a bracket with stainless steel screws.

(b) A cast aluminum mounting bracket shall be supplied. The mounting bracket will be manufactured to be mounted onto a tubular shaped pole or post using two 3/4 inch steel bands (0.03 inches thick) or two stainless steel screws. The mounting bracket shall accept the APS housing.

(c) The housing and bracket shall be powder coated Gloss Black with an enamel.

ELECTRICAL

4. (a) The APS shall operate on 12 volt DC.

(b) A separate power supply shall be provided. The power supply will have its own housing and be able to be mounted in the WALK/DONT WALK signal compartment.

(c) The power supply shall accept 120 volt ac input. There will be two inputs (WALK, DONT WALK) that will accept 89VAC to 250VAC at 120 VAC nominal, 27 watt maximum per input. Output shall be a maximum of 16VDC and 1.6 amps.

(d) An MOV rated at 5 joules shall provide electrical protection. Each input shall be fused at 1.5 amps.

(e) There shall be four input wires and four output wires. These wires shall be identified on the power supply: WALK, DONT WALK, NEUTRAL, and GROUND. The input wires shall be long enough to be terminated in the signal compartment. The output wires on the power supply shall have a single quick disconnect plug.

(f) The push-button switch contacts must be normally open and must be closed when the push-button is pressed, restoring immediately to a normal open position when released. The switch must be electrically insulated from the housing. The push-button output rating shall be 36VAC/DC, 100mA.

PUSH-BUTTON

5. (a) The push-button must meet ADA requirements and the requirements of the MUTCD (Chapter 4E.11-4E.12).

(b) The push-button must have a raised tactile arrow on its surface. The arrow must be adjustable, so that it can face in the direction of the associated crosswalk. The arrow will vibrate during the associated WALK interval.

(c) If there is an actuated walk, pushing the button will send a request to the controller.

SOUND

6. (a) All sounds generated by the APS must meet the requirements of the MUTCD (Chapter 4E.11-4E.12).

(b) Sound levels must be able to be manually adjusted. Sound levels must be in the 30dB to 90dB range.

(c) The APS must include an option for automatic sound adjustment due to ambient sound levels.

(d) The APS shall have a push-button locator "click" tone during DONT WALK and flashing DONT WALK intervals.

(e) The APS shall have two options for the WALK interval. The APS shall generate a rapid "click" tone during the WALK interval or shall have a programmable voice message during the WALK interval.

(f) When the push-button is pushed during the DONT WALK or flashing DONT WALK, the APS will respond with a voice message, either "wait" or another programmed voice message.

SIGN

7. (a) A 9" by 12" reflective sign that can be mounted to the housing back-plate shall be supplied.

(b) The sign shall be an R10-2, "CROSS ONLY ON WALK (symbol) SIGNAL", an R10-3, "PUSH BUTTON FOR WALK (symbol)", or another sign as specified in the order or contract. Each sign shall contain a message in Braille meeting the requirements of the ADA (Americans with Disabilities Act).

ENVIRONMENT

8. (a) The APS shall function correctly within the temperature range of -34ºC and +74ºC.

(b) The APS shall function correctly up to 100% non-condensing humidity.

(c) The APS shall function correctly under the power conditions from Commonwealth Edison.

PACKAGING

9. (a) General. The APS must be shipped fully assembled and ready for installation. Each assembly must be individually wrapped and boxed so that the assembly is not damaged in shipment.

(b) Labeling. Each box must be labeled in 3/8 inch high letters " ACCESSIBLE PEDESTRIAN SIGNAL". The City Commodity Code, contract number, manufacturer, and date of manufacture must be clearly labeled on the box.

IDOT TRAINING PROGRAM GRADUATE ON-THE-JOB TRAINING SPECIAL PROVISION (TPG)

Effective: August 1, 2012 Revised: February 2, 2017

In addition to the Contractor's equal employment opportunity (EEO) affirmative action efforts undertaken as required by this Contract, the Contractor is encouraged to participate in the incentive program described below to provide additional on-the-job training to certified graduates of the IDOT pre-apprenticeship training program, as outlined in this Special Provision.

IDOT funds, and various Illinois community colleges operate, pre-apprenticeship training programs throughout the State to provide training and skill-improvement opportunities to promote the increased employment of minority groups, disadvantaged persons and women in all aspects of the highway construction industry. The intent of this IDOT Pre-Apprenticeship Training Program Graduate (TPG) special provision (Special Provision) is to place these certified program graduates on the project site for this Contract in order to provide the graduates with meaningful on-the-job training. Pursuant to this Special Provision, the Contractor must make every reasonable effort to recruit and employ certified TPG trainees to the extent such individuals are available within a practicable distance of the project site.

Specifically, participation of the Contractor or its subcontractor in the Program entitles the participant to reimbursement for graduates' hourly wages at $15.00 per hour per utilized TPG trainee, subject to the terms of this Special Provision. Reimbursement payment will be made even though the Contractor or subcontractor may also receive additional training program funds from other non-IDOT sources for other non-TPG trainees on the Contract, provided such other source does not specifically prohibit the Contractor or subcontractor from receiving reimbursement from another entity through another program, such as IDOT through the TPG program. With regard to any IDOT funded construction training program other than TPG, however, additional reimbursement for other IDOT programs will not be made beyond the TPG Program described in this Special Provision when the TPG Program is utilized.

No payment will be made to the Contractor if the Contractor or subcontractor fails to provide the required on-site training to TPG trainees, as solely determined by IDOT. A TPG trainee must begin training on the project as soon as the start of work that utilizes the relevant trade skill and the TPG trainee must remain on the project site through completion of the Contract, so long as training opportunities continue to exist in the relevant work classification. Should a TPG trainee's employment end in advance of the completion of the Contract, the Contractor must promptly notify the IDOT District EEO Officer for the Contract that the TPG's involvement in the Contract has ended. The Contractor must supply a written report for the reason the TPG trainee involvement terminated, the hours completed by the TPG trainee on the Contract, and the number of hours for which the incentive payment provided under this Special Provision will be, or has been claimed for the separated TPG trainee.

Finally, the Contractor must maintain all records it creates as a result of participation in the Program on the Contract, and furnish periodic written reports to the IDOT District EEO Officer that document its contractual performance under and compliance with this Special Provision.

Finally, through participation in the Program and reimbursement of wages, the Contractor is not relieved of, and IDOT has not waived, the requirements of any federal or state labor or employment law applicable to TPG workers, including compliance with the Illinois Prevailing Wage Act.

METHOD OF MEASUREMENT: The unit of measurement is in hours.

BASIS OF PAYMENT: This work will be paid for at the contract unit price of $15.00 per hour for each utilized certified TPG Program trainee (TRAINEES TRAINING PROGRAM GRADUATE). The estimated total number of hours, unit price, and total price must be included in the schedule of prices for the Contract submitted by Contractor prior to beginning work. The initial number of TPG trainees for which the incentive is available for this contract is 1.

The Department has contracted with several educational institutions to provide screening, tutoring and pre-training to individuals interested in working as a TPG trainee in various areas of common construction trade work. Only individuals who have successfully completed a Pre-Apprenticeship Training Program at these IDOT approved institutions are eligible to be TPG trainees. To obtain a list of institutions that can connect the Contractor with eligible TPG trainees, the Contractor may contact: HCCTP TPG Program Coordinator, Office of Business and Workforce Diversity (IDOT OBWD), Room 319, Illinois Department of Transportation, 2300 S. Dirksen Parkway, Springfield, Illinois 62764. Prior to commencing construction with the utilization of a TPG trainee, the Contractor must submit documentation to the IDOT District EEO Officer for the Contract that provides the names and contact information of the TPG trainee(s) to be trained in each selected work classification, proof that that the TPG trainee(s) has successfully completed a Pre-Apprenticeship Training Program, proof that the TPG is in an Apprenticeship Training Program approved by the U.S. Department of Labor Bureau of Apprenticeship Training, and the start date for training in each of the applicable work classifications.

To receive payment, the Contractor must provide training opportunities aimed at developing a full journeyworker in the type of trade or job classification involved. During the course of performance of the Contract, the Contractor may seek approval from the IDOT District EEO Officer to employ additional eligible TPG trainees. In the event the Contractor subcontracts a portion of the contracted work, it must determine how many, if any, of the TPGs will be trained by the subcontractor. Though a subcontractor may conduct training, the Contractor retains the responsibility for meeting all requirements imposed by this Special Provision. The Contractor must also include this Special Provision in any subcontract where payment for contracted work performed by a TPG trainee will be passed on to a subcontractor.

Training through the Program is intended to move TPGs toward journeyman status, which is the primary objective of this Special Provision. Accordingly, the Contractor must make every effort to enroll TPG trainees by recruitment through the Program participant educational institutions to the extent eligible TPGs are available within a reasonable geographic area of the project. The Contractor is responsible for demonstrating, through documentation, the recruitment efforts it has undertaken prior to the determination by IDOT whether the

Contractor is in compliance with this Special Provision, and therefore, entitled to the Training Program Graduate reimbursement of $15.00 per hour.

Notwithstanding the on-the-job training requirement of this TPG Special Provision, some minimal off-site training is permissible as long as the offsite training is an integral part of the work of the contract, and does not compromise or conflict with the required on-site training that is central to the purpose of the Program. No individual may be employed as a TPG trainee in any work classification in which he/she has previously successfully completed a training program leading to journeyman status in any trade, or in which he/she has worked at a journeyman level or higher.

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

SPECIAL PROVISION
FOR
INSURANCE

Effective: February 1, 2007
Revised: August 1, 2007

All references to Sections or Articles in this specification shall be construed to mean specific Section or Article of the Standard Specifications for Road and Bridge Construction, adopted by the Department of Transportation.

The Contractor shall name the following entities as additional insured under the Contractor's general liability insurance policy in accordance with Article 107.27:

Village of Rosemont

City of Park Ridge

City of Chicago

Forest Preserve District of Cook County

The entities listed above and their officers, employees, and agents shall be indemnified and held harmless in accordance with Article 107.26.

State of Illinois
DEPARTMENT OF TRANSPORTATION
Bureau of Local Roads & Streets
SPECIAL PROVISION
FOR
LOCAL QUALITY ASSURANCE/ QUALITY MANAGEMENT QC/QA
Effective: January 1, 2022

Replace the first five paragraphs of Article 1030.06 of the Standard Specifications with the following:

"**1030.06 Quality Management Program.** The Quality Management Program (QMP) will be Quality Control / Quality Assurance (QC/QA) according to the following."

Delete Article 1030.06(d)(1) of the Standard Specifications.

Revise Article 1030.09(g)(3) of the Standard Specifications to read:

"(3) If core testing is the density verification method, the Contractor shall provide personnel and equipment to collect density verification cores for the Engineer. Core locations will be determined by the Engineer following the document "Hot-Mix Asphalt QC/QA Procedure for Determining Random Density Locations" at density verification intervals defined in Article 1030.09(b). After the Engineer identifies a density verification location and prior to opening to traffic, the Contractor shall cut a 4 in. (100 mm) diameter core. With the approval of the Engineer, the cores may be cut at a later time."

Revise Article 1030.09(h)(2) of the Standard Specifications to read:

"(2) After final rolling and prior to paving subsequent lifts, the Engineer will identify the random density verification test locations. Cores or nuclear density gauge testing will be used for density verification. The method used for density verification will be as selected below.

Density Verification Method	
☒	Cores
☐	Nuclear Density Gauge (Correlated when paving ≥ 3,000 tons per mixture)

Density verification test locations will be determined according to the document "Hot-Mix Asphalt QC/QA Procedure for Determining Random Density Locations". The density testing interval for paving wider than or equal to 3 ft (1 m) will be 0.5 miles (800 m) for lift thicknesses of 3 in. (75 mm) or less and 0.2 miles (320 m) for lift thicknesses greater than 3 in. (75 mm). The density testing interval for paving less than 3 ft (1 m) wide will be 1 mile (1,600 m). If a day's paving will be less than the prescribed density testing interval, the length of the day's paving will be the interval for that day. The density testing interval for mixtures used for patching will be 50 patches with a minimum of one test per mixture per project.

If core testing is the density verification method, the Engineer will witness the Contractor coring, and secure and take possession of all density samples at the

density verification locations. The Engineer will test the cores collected by the Contractor for density according to Illinois Modified AASHTO T 166 or AASHTO T 275.

If nuclear density gauge testing is the density verification method, the Engineer will conduct nuclear density gauge tests. The Engineer will follow the density testing procedure detailed in the document "Illinois Modified ASTM D 2950, Standard Test Method for Density of Bituminous Concrete In-Place by Nuclear Method".

A density verification test will be the result of a single core or the average of the nuclear density tests at one location. The results of each density test must be within acceptable limits. The Engineer will promptly notify the Contractor of observed deficiencies."

Revise the seventh paragraph and all subsequent paragraphs in Section D. of the document "Hot-Mix Asphalt QC/QA Initial Daily Plant and Random Samples" to read:

"Mixtures shall be sampled from the truck at the plant by the Contractor following the same procedure used to collect QC mixture samples (Section A). This process will be witnessed by the Engineer who will take custody of the verification sample. Each sample bag with a verification mixture sample will be secured by the Engineer using a locking ID tag. Sample boxes containing the verification mixture sample will be sealed/taped by the Engineer using a security ID label."

Illinois Department of Transportation

Storm Water Pollution Prevention Plan

Route	Marked Route	Section Number
Des Plaines River Trail - Segment 2		17-00034-00-BT
Project Number	**County**	**Contract Number**
1FDM(242)	Cook	61H78

This plan has been prepared to comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) Permit No. ILR10 (Permit ILR10), issued by the Illinois Environmental Protection Agency (IEPA) for storm water discharges from construction site activities.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature	Date
Lisa DeMatte	April 11, 2022

Print Name	Title	Agency
Pamela Sielski	Landscape Architect/Project Mgr	Forest Preserves of Cook County

Note: Guidance on preparing each section of BDE 2342 can be found in Chapter 41 of the IDOT Bureau of Design and Environment (BDE) Manual. Chapter 41 and this form also reference the IDOT Drainage Manual which should be readily available.

I. Site Description:

A. Provide a description of the project location; include latitude and longitude, section, town, and range:

The project involves work along the existing Des Plaines River Trail System between Bryn Mawr Avenue and Devon Avenue (from approximately STA 173+00 to STA 237+53) in the Forest Preserves of Cook County, Illinois (Latitude: N 41° 59' 21"; Longitude: W 87° 50' 57"); Section: 3; Township: 40N; Range: 12E

There is a project omission near the crossing at the interstate bridge, between approximately STA 182+49 and STA 186+25.

B. Provide a description of the construction activity which is the subject of this plan. Include the number of construction stages, drainage improvements, in-stream work, installation, maintenance, removal of erosion measures, and permanent stabilization:

The work to be performed under this contract consists of improvements to an existing multi-use trail (primarily reconstruction). The existing trail alignment will be used to the extent practical. Work will be completed in four stages (plus a pre-stage [tree protection & removal]) and includes installation/maintenance of erosion & sediment control (ESC) practices; excavation of existing path; haul away excess excavation/unsuitable material; retain existing drainage structures (e.g., culverts & inlets); placement of aggregate (subgrade, base course, and surface course); installation of Portland cement concrete and curb & gutter; installation of safety fence; furnish & place topsoil; final stabilization; removal of ESC measures; and all incidental and collateral work necessary to complete the project as shown on the plans and described in the special provisions.

C. Provide the estimated duration of this project:

12 months

D. The total area of the construction site is estimated to be 2.5 acres.

The total area of the site estimated to be disturbed by excavation, grading or other activities is 2.5 acres.

E. The following are weighted averages of the runoff coefficient for this project before and after construction activities are completed; see Section 4-102 of the IDOT Drainage Manual:

Pre-construction weighted C=0.41/Post-construction weighted C=0.53

F. List all soils found within project boundaries; include map unit name, slope information, and erosivity:

- 69A - Milford Silty Clay Loam, 0 to 2 percent slopes (K factor = 0.24 - low susceptibility of soil erosion)
- 192A - Del Rey Silt Loam, 0 to 2 percent slopes (K factor = 0.43 - high susceptibility of soil erosion)
- 327A/B - Fox Silt Loam, 0 to 4 percent slopes (K factor = 0.37 - moderate susceptibility of soil erosion)
- 529A - Selmass Loam, 0 to 2 percent slopes (K factor = 0.24 - low susceptibility of soil erosion)
- 533 - Urban Land (K factor not listed)
- 571A - Whitaker Loam, 0 to 2 percent slopes (K factor = 0.24 - low susceptibility of soil erosion)
- 696A - Zurich Silt Loam, 0 to 2 percent slopes (K factor = 0.37 - moderate susceptibility of soil erosion)
- 1107A - Sawmill Silty Clay Loam, Undrained, Frequently Flooded, 0 to 2 percent slopes (K factor = 0.37 - moderate susceptibility of soil erosion)
- 2811A - Urban Land-Anthroportic Udorthents Complex, 0 to 2 percent slopes (K factor not listed)

* K factor = soil erodibility factor

G. If wetlands were delineated for this project, provide an extent of wetland acreage at the site; see Phase I report:

Three wetland/waters of the U.S. areas were identified in Segment 2. Total = 0.48+ ac (Wetland #5 = 0.12+ ac; Wetland #6 = 0.13 ac; Wetland #7 = 0.23+ ac). The existing trail alignment will be used to the extent practical. The wetland/waters of the U.S. areas within Segment 2 will be avoided (i.e., no impacts are proposed). Erosion and sediment control Best Management Practices (BMPs) will be used to protect the wetland/waters of the U.S. areas. In a letter dated 02/01/2022, the U.S. Army Corps of Engineers (USACE) determined that a Section 404 Clean Water Act permit was not required for the proposed Segment 2 trail improvements.

H. Provide a description of potentially erosive areas associated with this project:

Based on the Soil Survey of Cook County, the soils throughout the project corridor are predominantly mapped as loams and silt loams with urban land also dominating the south half of the project corridor. Based on the K factor (soil erodibility factor), the mapped soils throughout most of the project corridor are low to moderately susceptible to erosion.

Potentially erosive areas associated with the project include idle, disturbed soils throughout the project corridor, most notably in areas with steep slopes and highly erodible soils (refer to Typical Sections and Plan & Profile Sheets). Steep slopes (approximately 3:1 [H:V]) are located along the west side of the proposed improvements from approximately STA 175+50 to STA 182+48 and STA 186+25 to 193+50 (north and south of the interstate crossing/bridge omission). Based on the K factor (soil erodibility factor), highly erodible soils are located along this stretch of the improvements (along with urban land/other soil types with low susceptibility to erosion).

I. The following is a description of soil disturbing activities by stages, their locations, and their erosive factors (e.g., steepness of slopes, length of slopes, etc.):

See Typical Sections, Construction Staging Details, Removal Plan, Plan & Profile Sheets, Erosion and Sediment Control Plan, and Cross-Sections.

J. See the erosion control plans and/or drainage plans for this contract for information regarding drainage patterns, approximate slopes anticipated before and after major grading activities, locations where vehicles enter or exit the site and controls to prevent offsite sediment tracking (to be added after contractor identifies locations), areas of soil disturbance, the location of major structural and non-structural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands) , and locations where storm water is discharged to surface water including wetlands.

K. Identify who owns the drainage system (municipality or agency) this project will drain into:

Forest Preserves of Cook County; Illinois Department of Transportation (IDOT); City of Chicago; City of Park Ridge

L. The following is a list of General NPDES ILR40 permittees within whose reporting jurisdiction this project is located:

IDOT; City of Chicago; City of Park Ridge ("waiver" per MS4 Status Report at IEPA website)

M. The following is a list of receiving water(s) and the ultimate receiving water(s) for this site. In addition, include receiving waters that are listed as Biologically Significant Streams by the Illinois Department of Natural Resources (IDNR). The location of the receiving waters can be found on the erosion and sediment control plans:

Receiving water(s): Unnamed Tributaries to the Des Plaines River
Ultimate receiving water(s): Des Plaines River
The receiving waters and the applicable segments of the Des Plaines River downstream of the project corridor are not listed as Biologically Significant Streams by IDNR

N. Describe areas of the site that are to be protected or remain undisturbed. These areas may include steep slopes (i.e., 1:3 or steeper), highly erodible soils, streams, stream buffers, specimen trees, natural vegetation, nature preserves, etc. Include any commitments or requirements to protect adjacent wetlands.

For any storm water discharges from construction activities within 50-feet of Waters of the U.S. (except for activities for water-dependent structures authorized by a Section 404 permit, describe: a) How a 50-foot undisturbed natural buffer will be provided between the construction activity and the Waters of the U.S. or b) How additional erosion and sediment controls will be provided within that area.

Sensitive environmental resources and areas of the site to be protected or to remain undisturbed are discussed in Section I.O below.

A 50-ft buffer will be provided where practicable and feasible. However, the project involves reconstructing an existing trail within Forest Preserve property - portions of which are located within wetland/stream buffer under existing conditions. No wetland/waters of the U.S. impacts are proposed as part of the improvements (i.e., no Section 404 Clean Water Act Permit is required). Off-site and preserved buffer areas will be protected by perimeter erosion barrier and other BMPs as discussed in this Storm Water Pollution Prevention Plan (SWPPP) and as shown on the Erosion and Sediment Control Plan.

A project goal/requirement was to avoid/minimize impacts to environmental (e.g., trees, wetlands, floodplain) and cultural resources located along the project corridor to the extent practical. This goal/requirement resulted in limited work space adjacent to the existing trail and limits structural BMP options. Therefore, vegetation removal, soil exposure, and staging construction activities will be coordinated as necessary to minimize idle, disturbed soils adjacent to buffer areas and wetlands/surface waters. Trail resurfacing is proposed between STA 229+70 and STA 230+65. This stretch of the project is adjacent to 100-year floodplain and a wetland/waters crossing. No soil excavation/soil disturbance is proposed within the trail resurfacing portion of the project. Additionally, the existing culverts and stone headwalls at the existing wetland crossings (Wetland #5 & #7) will remain. This will also minimize soil disturbance near the wetlands/buffers.

O. Per the Phase I document, the following sensitive environmental resources are associated with this project and may have the potential to be impacted by the proposed development. Further guidance on these resources is available in Section 41-4 of the BDE Manual.

Wetlands/waters of the U.S.; wetland/stream buffers; 100-year floodplain/riparian areas; trees; and highly erodible soils

☒ 303(d) Listed receiving waters for suspended solids, turbidity, or siltation.
The name(s) of the listed water body, and identification of all pollutants causing impairment:

Direct discharge points for the project include Unnamed Tributary(s) to the Des Plaines River and local MS4s. The Unnamed Tributary(s) are not 303(d) listed waters.

The project is located in two HUC 12 subwatersheds: north (Weller Creek-Des Plaines River [071200040505]) & south (Bensenville Ditch-Des Plaines River [HUC 071200040506]). In the vicinity of the project corridor, the north HUC 12 subwatershed drains to Des Plaines River segment AUID IL_G-28, and the south HUC 12 watershed drains to Des Plaines River segment AUID IL_G-15.

Des Plaines River (AUID IL_G-28) is on the 2020/2022 303(d) list (approved by the U.S. Environmental Protection Agency on 06/30/2022). Impairment causes include: unknown causes, chloride, dissolved oxygen (DO), flow regime modification, nitrogen, alteration in streamside or littoral vegetative covers, phosphorus (total), mercury, polychlorinated biphenyls (PCBs), and fecal coliform.

Des Plaines River (AUID IL_G-15) is on the 2020/2022 303(d) list (approved by the U.S. Environmental Protection Agency on 06/30/2022). Impairment causes include: unknown causes, mercury, nitrogen, PCBs, sedimentation/siltation, fecal coliform, phosphorus (total), and loss of instream cover.

Provide a description of how erosion and sediment control practices will prevent a discharge of sediment resulting from a storm event equal to or greater than a twenty-five (25) year, twenty-four (24) hour rainfall event:

The proposed improvements do not directly discharge to the Des Plaines River.

Provide a description of the location(s) of direct discharge from the project site to the 303(d) water body:

The proposed improvements do not directly discharge to the Des Plaines River.

The proposed improvements cross an Unnamed Tributary to the Des Plaines River at approximately STA 231 +00. The existing culvert and stone headwalls at this existing wetland/tributary crossing are to remain. Stormwater flows via surface runoff are anticipated to reach the tributary along this portion of the project corridor.

Provide a description of the location(s) of any dewatering discharges to the MS4 and/or water body:

At this time, there are no proposed dewatering discharge locations. If dewatering is required during construction activities, the Contractor shall provide additional dewatering information per Part II.G below, as necessary.

☒ Applicable Federal, Tribal, State, or Local Programs

See Part II.F below.

☒ Floodplain

Near the north end of the project corridor between approximately STA 230+50 to STA 231+90, the proposed trail crosses the 100-year floodplain of the Des Plaines River. To minimize soil disturbance, the existing culvert and stone headwalls at the existing tributary crossing within this floodplain area will remain. In addition, trail resurfacing is proposed between STA 229+70 and STA 230+65, immediately adjacent to 100-year floodplain crossing. No soil excavation/soil disturbance is proposed within the trail resurfacing portion of the project. Upstream and adjacent to the Des Plaines River floodplain, perimeter erosion barrier, erosion control blanket, and temporary seeding will be installed, as necessary. Refer to the Plan & Profile Sheets and the Erosion and Sediment Control Plan for additional information.

☒ Historic Preservation

In a memorandum dated, 11/17/2020, IDOT's Cultural Resources Unit made a "No Historic Properties Affected" finding pursuant to Section 106 of the National Historic Preservation Act. During Phase I coordination, it was determined that potential site impacts could be avoided through BMPs, including soil disturbance restrictions. BMPs have been incorporated into the Site Improvement Plans and Special Provisions, as necessary.

Two culverts within the Segment 2 project limits warrant National Register of Historic Places (NRHP) consideration. These culverts are located at approximately STA 213+00 and STA 231+00. The proposed trail will continue to cross these culverts. However, the proposed construction activities will not impact the existing historic structures. The trail will be resurfaced with aggregate or Portland cement concrete. The existing culverts and stone headwalls at these locations will remain.

☐ Receiving waters with Total Maximum Daily Load (TMDL) for sediment, total suspended solids, turbidity or siltation

TMDL (fill out this section if checked above)

The name(s) of the listed water body:

Not applicable - receiving waterbody stream segments do not have a TMDL

Provide a description of the erosion and sediment control strategy that will be incorporated into the site design that is consistent with the assumptions and requirements of the TMDL:

Not applicable - receiving waterbody stream segments do not have a TMDL

If a specific numeric waste load allocation has been established that would apply to the project's discharges, provide a description of the necessary steps to meet that allocation:

Not applicable - receiving waterbody stream segments do not have a TMDL

☒ Threatened and Endangered Species/Illinois Natural Areas (INAI)/Nature Preserves

Based on the Natural Resources Review by IDOT, dated 01/05/2021, there will be no adverse effect by the project on State-listed threatened or endangered species or INAI sites. Additionally, IDOT determined that the proposed improvements are not likely to jeopardize the continued existence of any Federally listed threatened or endangered species or result in the destruction or modification of any critical habitat. Segment 2 is not located within a nature preserve.

IDOT renewed the Biological Clearance for this project on 10/27/2022. Trees three (3) inches or greater in diameter at breast height shall not be cleared from April 1 through September 30 of any construction year.

☒ Other

Tree protection (e.g., root pruning and root preservation) shall be in accordance with the Site Improvement Plans, IDOT Standard Specifications, and Special Provisions.

Idle, disturbed highly erodible soils shall be stabilized in accordance with this SWPPP (see Section II below) and the Site Improvement Plans, including General Notes and Erosion and Sediment Control Plan.

☒ Wetland

Three wetlands were identified throughout the Segment 2 project corridor (see Section I.G above). Wetlands will be protected during construction by using perimeter erosion barrier and high visibility fencing. See the Erosion and Sediment Control Plan and General Notes.

P. The following pollutants of concern will be associated with this construction project:

- ☒ Antifreeze / Coolants
- ☒ Concrete
- ☒ Concrete Curing Compounds
- ☒ Concrete Truck Waste
- ☒ Fertilizers / Pesticides
- ☒ Paints
- ☒ Petroleum (gas, diesel, oil, kerosene, hydraulic oil / fluids)
- ☒ Soil Sediment
- ☒ Solid Waste Debris
- ☒ Solvents
- ☒ Waste water from cleaning construction equipments
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____

II. Controls:

This section of the plan addresses the controls that will be implemented for each of the major construction activities described in Section I.C above and for all use areas, borrow sites, and waste sites. For each measure discussed, the Contractor will be responsible for its implementation as indicated. The Contractor shall provide to the Resident Engineer a plan for the implementation of the measures indicated. The Contractor, and subcontractors, will notify the Resident Engineer of any proposed changes, maintenance, or modifications to keep construction activities compliant with the Permit ILR10. Each such Contractor has signed the required certification on forms which are attached to, and are a part of, this plan:

A. **Erosion and Sediment Controls:** At a minimum, controls must be coordinated, installed and maintained to:

1. Minimize the amount of soil exposed during construction activity;
2. Minimize the disturbance of steep slopes;
3. Maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible;
4. Minimize soil compaction and, unless infeasible, preserve topsoil.

B. **Stabilization Practices:** Provided below is a description of interim and permanent stabilization practices, including site- specific scheduling of the implementation of the practices. Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized. Stabilization practices may include but are not limited to: temporary seeding, permanent seeding, mulching, geotextiles, sodding, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Except as provided below in II.B.1 and II.B.2, stabilization measures shall be initiated **immediately** where construction activities have temporarily or permanently ceased, but in no case more than **one (1) day** after the construction activity in that portion of the site has temporarily or permanently ceases on all disturbed portions of the site where construction will not occur for a period of fourteen (14) or more calendar days.

1. Where the initiation of stabilization measures is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.

2. On areas where construction activity has temporarily ceased and will resume after fourteen (14) days, a temporary stabilization method can be used.

The following stabilization practices will be used for this project:

- ☒ Erosion Control Blanket / Mulching
- ☐ Geotextiles
- ☒ Permanent Seeding
- ☐ Preservation of Mature Seeding
- ☒ Protection of Trees
- ☐ Sodding
- ☒ Temporary Erosion Control Seeding
- ☐ Temporary Turf (Seeding, Class 7)
- ☐ Temporary Mulching
- ☒ Vegetated Buffer Strips
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____

Describe how the stabilization practices listed above will be utilized during construction:

Trees/vegetation provide erosion control. Perimeter controls will protect trees and buffer areas located in the vicinity of construction activities. Construction activities shall be performed in a manner that limits the amount of exposed soil at any one time. Temporary stabilization measures (including erosion control blanket and temporary seed) shall be installed at idle, disturbed areas in accordance with the NPDES ILR10 permit and the Erosion and Sediment Control Plan.

Describe how the stabilization practices listed above will be utilized after construction activities have been completed:

Permanent seeding (installed with erosion control blanket) shall be used as a permanent erosion control measure.

C. **Structural Practices:** Provided below is a description of structural practices that will be implemented, to the degree attainable, to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Such practices may include but are not limited to: perimeter erosion barrier, earth dikes, drainage swales, sediment traps, ditch checks, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. The installation of these devices may be subject to Section 404 of the Clean Water Act.

- ☐ Aggregate Ditch
- ☐ Concrete Revetment Mats
- ☒ Dust Suppression
- ☒ Dewatering Filtering
- ☐ Gabions
- ☐ In-Stream or Wetland Work
- ☒ Stabilized Construction Exits
- ☐ Stabilized Trench Flow
- ☐ Slope Mattress
- ☐ Slope Walls
- ☐ Temporary Ditch Check
- ☐ Temporary Pipe Slope Drain

- ☐ Level Spreaders
- ☐ Paved Ditch
- ☐ Permanent Check Dams
- ☒ Perimeter Erosion Barrier
- ☐ Permanent Sediment Basin
- ☐ Retaining Walls
- ☐ Riprap
- ☐ Rock Outlet Protection
- ☐ Sediment Trap
- ☒ Storm Drain Inlet Protection
- ☐ Temporary Sediment Basin
- ☐ Temporary Stream Crossing
- ☐ Turf Reinforcement Mats
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____

Describe how the structural practices listed above will be utilized during construction:

• Dust suppression shall be used to control dust and airborne dirt generated by the Contractor's construction activities. Dust control (if necessary) shall follow IDOT Standard Specifications.

• Dewatering filtering shall be used as necessary for excavation activities that encounter groundwater or other water that needs to be removed from the construction area. Dewatering shall follow the General Notes in the Site Improvement Plans and be in accordance with the NPDES ILR10 permit. Contractor shall provide additional dewatering information per Part II.G below, as necessary.

• Perimeter erosion barrier shall be installed at the perimeter of work areas, including where runoff sheet flows off site. Perimeter erosion barrier allows sediment to settle from runoff before storm water leaves the work area. Perimeter erosion barrier shall not be installed where sheet flow enters the construction site, unless directed by the Engineer. The work areas shall be graded as the project progresses to eliminate the concentration of runoff and/or appropriate sediment control devices shall be installed to trap sediment.

• Existing inlets, catch basins, and manholes with open lids shall be protected with appropriate inlet protection to detain and/or filter sediment-laden runoff and allow sediment to settle. Proposed drainage structures, if any, shall be protected with inlet and outlet protection immediately following their construction and prior to receiving runoff from disturbed soils.

• Stabilized construction entrance(s) shall be installed at ingress/egress points to reduce or eliminate the tracking of sediment onto public rights-of-way or streets.

Describe how the structural practices listed above will be utilized after construction activities have been completed:

• Temporary sediment controls shall be removed after final stabilization of those portions of the site located upslope of the controls.

D. **Treatment Chemicals**

Will polymer flocculants or treatment chemicals be utilized on this project: ☐ Yes ☒ No

If *yes* above, identify where and how polymer flocculants or treatment chemicals will be utilized on this project.

Polymer flocculants or treatment controls are not proposed at this time. However, if during construction activities, it is determined that polymer flocculants or treatment chemicals are necessary to maintain permit compliance, the SWPPP shall be updated with the information at Section G below. The Contractor must obtain approval from the Engineer prior to the use of any proposed polymer flocculants or treatment chemicals.

E. **Permanent (i.e., Post-Construction) Storm Water Management Controls:** Provided below is a description of measures that will be installed during the construction process to control volume and pollutants in storm water discharges that will occur after construction operations have been completed.The installation of these devices may be subject to Section 404 of the Clean Water Act.

1. Such practices may include but are not limited to: storm water detention structures (including wet ponds), storm water retention structures, flow attenuation by use of open vegetated swales and natural depressions, infiltration of runoff on site, and sequential

systems (which combine several practices).

The practices selected for implementation were determined based on the technical guidance in Chapter 41 (Construction Site Storm Water Pollution Control) of the IDOT BDE Manual. If practices other than those discussed in Chapter 41 are selected for implementation or if practices are applied to situations different from those covered in Chapter 41, the technical basis for such decisions will be explained below.

2. Velocity dissipation devices will be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., maintenance of hydrologic conditions such as the hydroperiod and hydrodynamics present prior to the initiation of construction activities).

Description of permanent storm water management controls:

Stormwater detention was not required for Segment 2. Tree preservation and permanent seeding (installed with erosion control blanket) shall be used as a permanent erosion control measure.

F. **Approved State or Local Laws:** The management practices, controls and provisions contained in this plan will be in accordance with IDOT specifications, which are at least as protective as the requirements contained in the IEPA's Illinois Urban Manual. Procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials shall be described or incorporated by reference in the space provided below. Requirements specified in sediment and erosion site plans, site permits, storm water management site plans or site permits approved by local officials that are applicable to protecting surface water resources are, upon submittal of an NOI, to be authorized to discharge under the Permit ILR10 incorporated by reference and are enforceable under this permit even if they are not specifically included in the plan.
Description of procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials:

• Metropolitan Water Reclamation District of Greater Chicago & Park Ridge - Cook County Watershed Management Ordinance (WMO) Permit

G. **Contractor Required Submittals:** Prior to conducting any professional services at the site covered by this plan, the Contractor and each subcontractor responsible for compliance with the permit shall submit to the Resident Engineer a Contractor Certification Statement, BDE 2342A.

1. The Contractor shall provide a construction schedule containing an adequate level of detail to show major activities with implementation of pollution prevention BMPs, including the following items:
   - Approximate duration of the project, including each stage of the project
   - Rainy season, dry season, and winter shutdown dates
   - Temporary stabilization measures to be employed by contract phases
   - Mobilization time-frame
   - Mass clearing and grubbing/roadside clearing dates
   - Deployment of Erosion Control Practices
   - Deployment of Sediment Control Practices (including stabilized cons
   - Deployment of Construction Site Management Practices (including concrete washout facilities, chemical storage, refueling locations, etc.)
   - Paving, saw-cutting, and any other pavement related operations
   - Major planned stockpiling operation
   - Time frame for other significant long-term operations or activities that may plan non-storm water discharges as dewatering, grinding, etc
   - Permanent stabilization activities for each area of the project
2. During the pre-construction meeting, the Contractor and each subcontractor shall provide, as an attachment to their signed Contractor Certification Statement, a discussion of how they will comply with the requirements of the permit in regard to the following items and provide a graphical representation showing location and type of BMPs to be used when applicable:
   - Temporary Ditch Checks - Identify what type and the source of Temporary Ditch Checks that will be installed as part of the project. The installation details will then be included with the SWPPP.
   - Vehicle Entrances and Exits - Identify type and location of stabilized construction entrances and exits to be used and how they will be maintained.
   - Material Delivery, Storage and Use - Discuss where and how materials including chemicals, concrete curing compounds, petroleum products, etc. will be stored for this project.
   - Stockpile Management - Identify the location of both on-site and off-site stockpiles. Discuss what BMPs will be used to prevent pollution of storm water from stockpiles.
   - Waste Disposal - Discuss methods of waste disposal that will be used for this project.
   - Spill Prevention and Control - Discuss steps that will be taken in the event of a material spill (chemicals, concrete curing

compounds, petroleum, etc.)

- Concrete Residuals and Washout Wastes - Discuss the location and type of concrete washout facilities to be used on this project and how they will be signed and maintained.
- Litter Management - Discuss how litter will be maintained for this project (education of employees, number of dumpsters, frequency of dumpster pick-up, etc.).
- Vehicle and Equipment Fueling - Identify equipment fueling locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Vehicle and Equipment Cleaning and Maintenance - Identify where equipment cleaning and maintenance locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Dewatering Activities - Identify the controls which will be used during dewatering operations to ensure sediments will not leave the construction site.
- Polymer Flocculants and Treatment Chemicals - Identify the use and dosage of treatment chemicals and provide the Resident Engineer with Material Safety Data Sheets. Describe procedures on how the chemicals will be used and identify who will be responsible for the use and application of these chemicals. The selected individual must be trained on the established procedures.
- Additional measures indicated in the plan.

III. Maintenance:

When requested by the Contractor, the Resident Engineer will provide general maintenance guides (e.g., IDOT Erosion and Sediment Control Field Guide) to the Contractor for the practices associated with this project. Describe how all items will be checked for structural integrity, sediment accumulation and functionality. Any damage or undermining shall be repaired immediately. Provide specifics on how repairs will be made. The following additional procedures will be used to maintain, in good and effective operating conditions, the vegetation, erosion and sediment control measures and other protective measures identified in this plan. It will be the Contractor's responsibility to attain maintenance guidelines for any manufactured BMPs which are to be installed and maintained per manufacture's specifications.

All controls shall be maintained in good working order by the General Contractor or Subcontractor. If repair is warranted, it shall be completed as soon as possible. New control measures needed or controls needing repair or modification as a result of an inspection shall be implemented as soon as practical, but no later than seven (7) calendar days following the inspection. Requests for repairs to existing controls or new control measures requested by a Regulatory Agency shall be initiated within 24 hours.

• Inlet Protection: Remove sediment from inlet filter baskets when basket is 25% full or 50% of the fabric pores are covered with silt. Clean filter if standing water is present longer than one hour after a rain event. Clean sediment or replace silt fence when sediment accumulates to one-third the height of the fabric. Where there is evidence of sediment accumulation adjacent to the inlet protection device, remove the deposited sediment by the end of the same business day in which it is found or by the end of the following business day if removal by the same business day is not feasible. Remove trash accumulated around or on top of the inlet protection device. When filter is removed for cleaning, replace fabric if any tear is present.

• Perimeter Erosion Barrier (PEB): Repair tears, gaps or undermining. Restore leaning PEB and ensure taut. Repair or replace any missing or broken stakes immediately. Clean PEB if sediment reaches one-third height of barrier. Remove PEB once final stabilization is established. Repair PEB if undermining occurs anywhere along its entire length.

• Erosion Control Blanket: Repair damage due to water running beneath the blanket and restore blanket when displacement occurs. Reseeding may be necessary. Replace all displaced blanket and re-staple.

• Seeding: Reapply seed if stabilization hasn't been achieved. Apply erosion control blanket (or alternative approved by Engineer) to hold seed in place if seed has been washed away or found to be concentrated in ditch bottoms. Restore rills as quickly as possible on slopes steeper than 1(V):4(H) to prevent sheet-flow from becoming concentrated flow patterns. Mow, if necessary, to promote seed soil contact when excessive weed development occurs. Supplement seed if weather conditions (extreme heat or cold) are not conducive to germination.

• Temporary Stabilized Construction Entrances: Replenish stone or replace exit if vehicles continue to track sediment onto the roadway from the construction site. Any sediment reaching a public or private roadway shall be removed before the end of the work day or sooner if directed by the Engineer. Track out shall be removed

by sweeping or shoveling these surfaces (or by using other similarly effective means of sediment removal approved by the Engineer). Hosing or sweeping tracked out sediment into any stormwater conveyance, storm drain inlet, or waters of the U.S. is prohibited. Ensure culverts (if provided) are free from damage and repair or replace as needed.

- Stockpile Management: Repair and/or replace perimeter controls and stabilization measures when stockpile material has potential to be discharged or leave the limits of the protection. Remove all off-tracked material by sweeping or other methods. Update the SWPPP any time a stockpile location has been removed, relocated, added or required maintenance. During summer months, stockpiles should be watered to maintain the cover crop.

- Dewatering: Ensure proper operation and compliance with permits or water quality standards. Remove accumulated sediment from the flow area. Dispose of sediment in accordance with all applicable laws and regulations. Remove and replace dewatering bags (if used) when half full of sediment or when discharge rate is impractical. Immediately stop discharge if receiving areas show signs of cloudy water, erosion, or sediment accumulation.

- Temporary Concrete Washout: Do not discharge wastewater into the environment (Note: Acidity, not particulates, is environmentally detrimental). Facilitate evaporation of low volume washout water. Clean and remove any discharges within 24 hours of discovery. If effluent cannot be removed prior to anticipated rainfall event, place and secure a non-collapsing, non-water collecting cover over the washout facility to prevent accumulation and precipitation overflow. Replace damaged liner immediately. Remove washout when no longer needed and restore disturbed areas to original condition. Properly dispose of solidified concrete waste.

- Material Delivery and Storage: Document the various types of materials delivered and their storage locations in the SWPPP. Update the SWPPP any time significant changes occur to material storage or handling locations and when they have been removed. Clean-up spills immediately. Remove empty containers.

- Solid Waste Management: Designate a waste collection area(s) and identify them in the SWPPP. Inspect inlets, outfalls, and drainageways for litter, debris, containers, etc. Observe the construction site for improper waste disposal. Update the SWPPP any time the trash management plan significantly changes. Correct items discarded outside of designated areas.

- Vehicle and Equipment Fueling, Cleaning, and Maintenance: Clean-up spills immediately. Contractor must provide documentation that spills were cleaned, materials disposed of, and impacts mitigated. Update the SWPPP when designated location has been removed, relocated, added or requires maintenance. In the event of a spill into a storm drain, waterway or onto a paved surface, the owner of the fuel must immediately take action to contain the spill. Once contained, clean-up the spill. As an initial step, this may involve collecting any bulk material and placing it in a secure container for later disposal. Follow-up cleaning will also be required to remove residues from paved or other hard surfaces.

- Portable Restroom Facilities: Maintain in accordance with applicable laws to prevent unsanitary conditions. Check for leaks and remove and replace as needed.

Additional information can be found in the IDOT Erosion and Sediment Control Field Guide and the Illinois Urban Manual.

IV. Inspections:

Qualified personnel shall inspect disturbed areas of the construction site including Borrow, Waste, and Use Areas, which have not yet been finally stabilized, structural control measures, and locations where vehicles and equipment enter and exit the site using IDOT Storm Water Pollution Prevention Plan Erosion Control Inspection Report, BC 2259. Such inspections shall be conducted at least once every seven (7) calendar days and within twenty-four (24) hours of the end of a storm or by the end of the following business or work day that is 0.5 inch or greater or equivalent snowfall.

Inspections may be reduced to once per month when construction activities have ceased due to frozen conditions. Weekly inspections

will recommence when construction activities are conducted, or if there is 0.5” or greater rain event, or a discharge due to snowmelt occurs.

If any violation of the provisions of this plan is identified during the conduct of the construction work covered by this plan, the Resident Engineer shall notify the appropriate IEPA Field Operations Section office by email at: epa.swnoncomp@illinois.gov, telephone or fax within twenty-four (24) hours of the incident. The Resident Engineer shall then complete and submit an “Incidence of Non-Compliance” (ION) report for the identified violation within five (5) days of the incident. The Resident Engineer shall use forms provided by IEPA and shall include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. All reports of non-compliance shall be signed by a responsible authority in accordance with Part VI. G of the Permit ILR10.

The Incidence of Non-Compliance shall be mailed to the following address:
Illinois Environmental Protection Agency
Division of Water Pollution Control
Attn: Compliance Assurance Section
1021 North Grand East
Post Office Box 19276
Springfield, Illinois 62794-9276

V. Failure to Comply:

Failure to comply with any provisions of this Storm Water Pollution Prevention Plan will result in the implementation of a National Pollutant Discharge Elimination System/Erosion and Sediment Control Deficiency Deduction against the Contractor and/or penalties under the Permit ILR10 which could be passed on to the Contractor.

Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

Division of Water Pollution Control
Notice of Intent (NOI) for General Permit
to Discharge Storm Water Associated with Construction Site Activities

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Permit Section at the above address.

For Office Use Only

Permit No. ILR10 _____

OWNER INFORMATION

Company/Owner Name: Forest Preserves of Cook County

Mailing Address: 536 N. Harlem Avenue Phone: (708) 771-1355

City: River Forest State: IL Zip: 60305 Fax:

Contact Person: Pamela Sielski E-mail: Pamela.sielski@cookcountyil.gov

Owner Type (select one) Special District

MS4 Community: ◯ Yes ☑ No

CONTRACTOR INFORMATION

Contractor Name:

Mailing Address: Phone:

City: State: Zip: Fax:

CONSTRUCTION SITE INFORMATION

Select One: ◉ New ◯ Change of information for: ILR10 _____

Project Name: Des Plaines River Trail (DPRT), Segment 2 Reconstruction County: Cook

Street Address: DPRT (Bryn Mawr Av to Devon Av) City: Park Ridge IL Zip: 60068

Latitude: 41 (Deg) 59 (Min) 21 N (Sec) Longitude: 87 (Deg) 50 (Min) 57 W (Sec) 3 Section 40N Township **12E** Range

Approximate Construction Start Date Jun 15, 2023 Approximate Construction End Date Jun 15, 2024

Total size of construction site in acres: 2.5

If less than 1 acre, is the site part of a larger common plan of development?

◯ Yes ◯ No

Fee Schedule for Construction Sites:
Less than 5 acres - $250
5 or more acres - $750

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Has the SWPPP been submitted to the Agency? ☑ Yes ◯ No

(Submit SWPPP electronically to: epa.constilr10swppp@illinois.gov)

Location of SWPPP for viewing: Address: City:

SWPPP contact information:

Inspector qualifications:

Contact Name:

Phone: Fax: E-mail:

Project inspector, if different from above

Inspector qualifications:

Inspector's Name:

Phone: Fax: E-mail:

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed $50,000 for the violation and an additional civil penalty of not to exceed $10,000 for each day during which the violation continues (415 ILCS 5/42) and may also prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

TYPE OF CONSTRUCTION (select one)

Construction Type: Reconstruction

SIC Code: 9512

Type a detailed description of the project:

Improvements to an existing multi-use trail. Existing trail alignment will be used to the extent practical. Work will be completed in four stages (plus pre-stage) and includes installation/maintenance of erosion & sediment control (ESC) practices; excavation of existing path; haul away excess excavation/unsuitable material; retain existing drainage structures; placement of aggregate (subgrade, base course, & surface course); installation of PCC and curb & gutter; installation of safety fence; furnish & place topsoil; final stabilization; removal of ESC measures; and all incidental and collateral work necessary to complete the project as shown on the plans and described in the special provisions.

HISTORIC PRESERVATION AND ENDANGERED SPECIES COMPLIANCE

Has the project been submitted to the following state agencies to satisfy applicable requirements for compliance with Illinois law on:

Historic Preservation Agency	◉ Yes	○ No
Endangered Species	◉ Yes	○ No

RECEIVING WATER INFORMATION

Does your storm water discharge directly to: ☑ Waters of the State or ☑ Storm Sewer

Owner of storm sewer system: Illinois Department of Transportation; City of Chicago; City of Park Ridge

Name of closest receiving water body to which you discharge: Unnamed Tributary to the Des Plaines River

Mail completed form to: Illinois Environmental Protection Agency
Division of Water Pollution Control
Attn: Permit Section
Post Office Box 19276
Springfield, Illinois 62794-9276
or call (217) 782-0610
FAX: (217) 782-9891

Or submit electronically to: epa.constilr10swppp@illinois.gov

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the provisions of the permit, including the development and implementation of a storm water pollution prevention plan and a monitoring program plan, will be complied with.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Owner Signature:	Date:
Pamela Sielski	Landscape Architect/Project Manager
Printed Name:	Title:

INSTRUCTIONS FOR COMPLETION OF CONSTRUCTION ACTIVITY NOTICE OF INTENT (NOI) FORM

Submit original, electronic or facsimile copies. Facsimile and/or electronic copies should be followed-up with submission of an original signature copy as soon as possible. Please write "copy" under the "For Office Use Only" box in the upper right hand corner of the first page.

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Permit Section at:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Permit Section
Post Office Box 19276
Springfield, Illinois 62794-9276
or call (217) 782-0610

FAX: (217) 782-9891

Or submit electronically to: epa.constilr10swppp@illinois.gov

Reports must be typed or printed legibly and signed.

Any facility that is not presently covered by the General NPDES Permit for Storm Water Discharges From Construction Site Activities is considered a new facility.

If this is a change in your facility information, renewal, etc., please fill in your permit number on the appropriate line, changes of information or permit renewal notifications do not require a fee.

NOTE: FACILITY LOCATION IS NOT NECESSARILY THE FACILITY MAILING ADDRESS, BUT SHOULD DESCRIBE WHERE THE FACILITY IS LOCATED.

Use the formats given in the following examples for correct form completion.

	Example	Format
Section	12	1 or 2 numerical digits
Township	12N	1 or 2 numerical digits followed by "N" or "S"
Range	12W	1 or 2 numerical digits followed by "E" or "W"

For the Name of Closest Receiving Waters, do not use terms such as ditch or channel. For unnamed tributaries, use terms which include at least a named main tributary such as “Unnamed Tributary to Sugar Creek to Sangamon River.”

Submission of initial fee and an electronic submission of Storm Water Pollution Prevention Plan (SWPPP) for Initial Permit prior to the Notice of Intent being considered complete for coverage by the ILR10 General Permits. Please make checks payable to: Illinois EPA at the above address.

Construction sites with less than 5 acres of land disturbance - fee is $250.

Construction sites with 5 or more acres of land disturbance - fee is $750.

SWPPP should be submitted electronically to: epa.constilr10swppp@illinois.gov. When submitting electronically, use Project Name and City as indicated on NOI form.

DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, CORPS OF ENGINEERS
231 SOUTH LA SALLE STREET
CHICAGO, ILLINOIS 60604-1437

REPLY TO
ATTENTION OF:

February 1, 2022

Operations Division
Regulatory Branch
LRC-2020-1156

SUBJECT: No Permit Required for Segment 2 of Des Plaines River Trail from Bryn Mawr Avenue to Devon Avenue, Cook County, Illinois (Latitude 42.009765, Longitude -87.861286)

Ms. Pamela Sielski
Forest Preserve District of Cook County
536 North Harlem Avenue
River Forest, Illinois 60305

Dear Ms. Sielski:

This is in response to your January 6, 2022, request that the U.S. Army Corps of Engineers issue a letter of no objection for the above-referenced activity. The subject project has been assigned number LRC-2020-1156. Please reference this number in all future correspondence concerning this project.

Following a review of the information you furnished to this office and assuming your project is conducted only as set forth in the information provided, this office has determined that the subject property does not require a Department of the Army (DA) permit to complete the proposed work. Please be aware that any unpermitted discharge into an area within the jurisdiction of this office may result in civil or criminal enforcement under the Clean Water Act, 33 U.S.C. Sec. 1319.

This determination is valid for a period of 5 years from the date of this letter and covers only your project as depicted in the plans titled, "State of Illinois Department of Transportation Plans for Proposed Federal Aid Highway, Des Plaines River Trail Segment 2 Reconstruction, Bryn Mawr Ave to Devon Ave, Section 17-00034-00-BT, Cook County" dated January 5, 2022, prepared by State of Illinois Department of Transportation. Soil erosion and sediment controls (SESC) measures shall be implemented at the project site and properly maintained throughout construction of the project. Proper installation and regular maintenance of SESC measures will prevent construction materials from entering downstream locations.

It is your responsibility to obtain any required state, county, or local approvals for impacts to wetland areas not under the Department of the Army jurisdiction. For projects located in unincorporated and unauthorized municipalities in Cook County, please contact the Metropolitan Water Reclamation District of Greater Chicago at (312) 751-3247. For projects in incorporated areas of Cook County, contact the authorized municipality for information related to the Watershed Management Ordinance.

This determination is based only on the proposed activity and is not an approved jurisdiction determination for the subject parcel. If you wish to receive an approved jurisdiction determination or have any questions, please contact Ms. Brielle Cummings of my staff by telephone at (312) 846-5545 or email at Brielle.K.Cummings@usace.army.mil.

Sincerely,

Diedra L. Mclaurin

Diedra L. McLaurin
Team Leader
Regulatory Branch

Copy Furnished:

Christopher B. Burke Engineering, Ltd. (Thomas McArdle)

WATERSHED MANAGEMENT PERMIT

Watershed Management Permit No. 22-032

METROPOLITAN WATER RECLAMATION DISTRICT
OF GREATER CHICAGO
111 EAST ERIE, CHICAGO, ILLINOIS, 60611 www.mwrd.org

INSTRUCTIONS FOR COMPLETING PERMIT FORM: Submit two original signed copies of this permit application (nine pages) and any required WMO schedules listed below; do not leave any blank spaces; use "X" for checking applicable information. Also submit two copies of location map and plans. Address all correspondence to the Local Sewer Systems Section; for any inquiries or assistance, telephone (312) 751-3255.

NAME AND LOCATION:

Name of Project (as shown on plans): Reconstruction of Des Plaines River Trail - Segment 2

Location of Project (street address or with respect to two major streets): Northern Project End: near the southwest corner of the Devon Avenue and Dee Road intersection, approximately 210 feet south of Devon Avenue; Southern Project End: North of Higgin Road

Municipality (Township, if unincorporated) City of Park Ridge

Section 3, Township 40 N, Range 12 E

PIN (include all PINs for project, use additional sheets if more than two): See the Attached ; Sheet - -

Check type of sewer area for project: ☐ Combined Sewer Area ■ Separate Sewer Area

■	Project Information (Required in all cases)	WMO Schedule A	(Page 5 of 9)
■	Sewer Summary (Required in all cases)	WMO Schedule B	(Page 6 of 9)
■	Sewer Connections (Required in all cases)	WMO Schedule C	(Page 7 of 9)
■	Detention & Stormwater Management Facilities (WMO)	WMO Schedule D	(3 Pages)
☐	Detention & Stormwater Management Facilities (Legacy)	WMO Schedule D_{Legacy}	(4 Pages)
☐	Lift Station and/or Force Main	WMO Schedule E	(2 Pages)
☐	Characteristics of Waste Discharge	WMO Schedule F	(2 Pages)
☐	Treatment or Pretreatment Facilities	WMO Schedule G	(2 Pages)
■	Hazard Areas (Floodplain / Floodway /Riparian Areas)	WMO Schedule H	(2 Pages)
☐	Affidavit Relative to Compliance with Article 7	WMO Schedule J	(1 Page)
☐	Affidavit of Disclosure of Property Interest	WMO Schedule K	(2 Pages)
☐	Notice of Requirements for Storm Water Detention	WMO Schedule L	(2 Pages)
☐	Current Survey of Property Interests (Attachment for Schedule K or L)	Exhibit A	
☐	Outfall, Direct Connection, District Owned or Leased Property	WMO Schedule O	(1 Page)
■	Soil Erosion and Sediment Control	WMO Schedule P	(2 Pages)
☐	Recording and Maintenance	WMO Schedule R	(2 Pages)
☐	Recording Exhibit (Attachment for Schedule K or L)	Exhibit R	
■	Wetlands and Wetland Buffer Areas	WMO Schedule W	(2 Pages)

Refer to Table 1 of § 201 of Article 2 of Watershed Management Ordinance for applicable Permitting Authority.

OTHER DOCUMENTS: Indicate title, number of pages and originator BY CBBEL: Plan Set (71 Sheets)
BY CBBEL: Stormwater Management Report including Exhibits and Appendices.

NOTE: ATTACH FEE PAYMENT VOUCHER AND PAYMENT IF APPLICABLE

DISTRICT USE ONLY

Application received: 2/1/2022 WMO Permit issued: 04/22/2022 WRP: Stickney

Issued by: ☒ DISTRICT ☐ Authorized Municipality

List of PINs

12-03-101-006-0000

12-03-101-007-0000

12-03-101-008-0000

12-03-101-005-0000

12-03-200-006-0000

12-03-200-008-0000

12-03-200-009-0000

WMO PERMIT
GENERAL CONDITIONS

WMO Permit Number: 22-032

1. **Definitions.** The definitions of Appendix A of the Watershed Management Ordinance are incorporated into this Watershed Management Permit by reference. Additionally, the following words and phrases shall be defined as follows:
    a) **Building and Occupancy Permit.** Building and Occupancy Permit issued by the Municipality.
    b) **Design Engineer.** A Professional Engineer who prepares plans and specifications for the project, and signs the Watershed Management Permit Application.
    c) **Inspection Engineer.** A Professional Engineer who inspects the development to ensure compliance with the design plans, specifications, a Watershed Management Permit, and the Watershed Management Ordinance.
    d) **Permit.** Watershed Management Permit.
    e) **General Conditions.** General Conditions contained in a Watershed Management Permit.
    f) **Special Conditions.** Special Conditions of this Watershed Management Permit.

2. **Adequacy of Design.** The schedules, plans, specifications and all other data and documents submitted for this Permit are made a part hereof. The Permit shall not relieve the Design Engineer of the sole responsibility for the adequacy of the design. The issuance of this Permit shall not be construed as approval of the concept or construction details of the proposed facilities and shall not absolve the Permittee, Co-Permittee or Design Engineer of their respective responsibilities.

3. **Joint Construction and Operation Permits.** Unless otherwise stated by the Special Conditions, the issuance of this Permit shall be a joint construction and operation permit, provided that the Permittee or Co-Permittee has complied with all General and Special Conditions.

4. **Allowable Discharges.** Discharges into the Sanitary Sewer system constructed under this Permit shall consist of sanitary Sewage only. Unless otherwise stated by the Special Conditions, there shall be no discharge of industrial wastes under this Permit. Stormwater shall not be permitted to enter the Sanitary Sewer system. Without limiting the general prohibition of the previous sentence, roof and footing drains shall not be connected to the Sanitary Sewer system.

5. **Construction Inspection.** All erosion and sediment control facilities, Stormwater Facilities, Detention Facilities, and Qualified Sewer Construction shall be inspected and approved by an Inspection Engineer acting on behalf of the Permittee or the Owner of the project, or by a duly authorized and competent representative of the Inspection Engineer. No sewer trenches shall be backfilled except as authorized by the Inspection Engineer after having inspected and approved the sewer installation.

6. **Maintenance.** Stormwater Facilities, Detention Facilities, Qualified Sewer Construction, Sanitary Sewer lines, Combined Sewer lines, systems or facilities constructed hereunder or serving the facilities constructed hereunder shall be properly maintained and operated at all times in accordance with all applicable requirements. It is understood that the responsibility for maintenance shall run as a joint and several obligation against the Permittee, the Co-Permittee, the property served, the Owner and the operator of the facilities, and said responsibility shall not be discharged nor in any way affected by change of ownership of said property, unless the District has authorized assignment of the permit.

7. **Indemnification.** The Permittee shall be solely responsible for and shall defend, indemnify and hold harmless the Metropolitan Water Reclamation District of Greater Chicago ("District", "MWRD", or "MWRDGC") and its Commissioners, officers, employees, servants, and agents from liabilities of every kind, including losses, damages and reasonable costs, payments and expenses (such as, but not limited to, court costs and reasonable attorneys' fees and disbursements), claims, demands, actions, suits, proceedings, judgments or settlements, any or all of which are asserted by any individual, private entity, or public entity against the District and its Commissioners, officers, employees, servants, or agents and arise out of or are in any way related to the issuance of this Permit. Without limiting the generality of the preceding sentence, the provisions of this paragraph shall extend to indemnify and hold harmless the District and its Commissioners, officers, employees, servants, and agents from any claims or damages arising out of or in connection with the termination or revocation of this Permit.

   The Permittee shall be solely responsible for and shall defend, indemnify and hold harmless an Authorized Municipality and its elected officials, officers, employees, servants, and agents from liabilities of every kind, including losses, damages and reasonable costs, payments and expenses (such as, but not limited to, court costs and reasonable attorneys' fees and disbursements), claims, demands, actions, suits, proceedings, judgments or settlements, any or all of which are asserted by any individual, private entity, or public entity against the Authorized Municipality and its elected officials, officers, employees, servants, or agents and arise out of or are in any way related to the issuance of this Permit. Without limiting the generality

of the preceding sentence, the provisions of this paragraph shall extend to indemnify and hold harmless the Authorized Municipality and its elected officials, officers, employees, servants, and agents from any claims or damages arising out of or in connection with the termination or revocation of this Permit.

8. **Sewer Construction by District.** Permittee understands and acknowledges that the District has the right and power to construct and extend sewer service facilities and render such services within the area to be served by the project for which this Permit is issued, and that by the District constructing and extending such sewer service facilities and rendering such services, the facilities constructed by the Permittee under this Permit may decrease in value, become useless or of no value whatsoever, the Permittee may also sustain a loss of business, income and profits.

   Therefore, by accepting this Permit and acting thereon, the Permittee, for itself, its successors and assigns, does remise, release and forever discharge the District and its Commissioners, officers, employees, servants, and agents of any and all claims whatsoever which Permittee may now have or hereafter acquire and which Permittee's successors and assigns hereafter can, shall, or may have against the District and its Commissioners, officers, employees, servants, and agents for all losses and damages, either direct or indirect, claimed to have been incurred by reason of the construction or extension at any time hereafter by the District of sewer service facilities in the service area contemplated by this Permit, the rendering of such services, which District facilities and services decrease the value of the facilities constructed by the Permittee under this Permit, make same useless or of no value whatsoever, including but not limited to, any and all damages arising under 70 ILCS 2605/19; the taking of private property for public use without due compensation; the interference with the contracts of Permittee; the interference with Permittee's use and enjoyment of its land; and the decrease in value of Permittee's land.

9. **Third Parties.** Regarding Qualified Sewer Construction, this Permit does not grant the right or authority to the Permittee: (a) to construct or encroach upon any lands of the District or of any other parties, (b) to construct outside of the territorial boundaries of the District except as allowed under an extraterritorial service agreement, (c) to construct or encroach upon the territorial boundaries of any units of local government within the District, (d) to connect to or discharge into or be served by (directly or indirectly) any sewer or sewer system owned or operated by third parties.

10. **Costs.** It is expressly stipulated and clearly understood that the Stormwater Facilities, Detention Facilities, Qualified Sewer Construction, or facilities for which the Permit is issued shall be constructed, operated and maintained at no cost to the District.

11. **Other Sewer Construction.** The District reserves the right, privilege and authority to permit others to reconstruct, change, alter and replace all sewers and appurtenances thereto at the point of connection of any sewerage system to a District interceptor and/or in public right-of-ways of District easements, and to introduce additional Sewage flow through this connection into the intercepting sewer of said District.

12. **Change of Use.** This Permit shall be incorporated in the Building and Occupancy Permit for the Building or Buildings served under this Permit. The Owner or occupant of any Building served under this Permit shall not cause, or permit, a change of use of the Building to a use other than that indicated in this Permit without first having obtained a written permission from the Executive Director of the District.

13. **Interceptors Overloading.** The District hereby serves notice that its interceptors may flow full and may surcharge, and flooding of the proposed system may occur. The Permittee agrees that the proposed systems shall be constructed, operated and maintained at the sole risk of the Permittee.

14. **Transferability.** This Permit may not be assigned or transferred without the written consent of the Executive Director of the District or Enforcement Officer of an Authorized Municipality. However, a Sole Permittee may be required to assign or transfer the Permit when divesting itself of ownership to a third-party and should notify the District prior to such divestment so that the District may determine whether assignment to the new owner is necessary.

15. **Termination.** The District has the right to enforce or revoke a Permit issued by either the District or an Authorized Municipality as outlined in Article 12 of the Watershed Management Ordinance.

    It is understood and agreed that in the event the Permittee shall default on or fail to perform and carryout any of the covenants, conditions or provisions of this Permit and such default or violation shall continue for sixty (60) days after receipt of notice thereof in writing given by the Executive Director of the District, then it shall be lawful for the District at or after the expiration of said sixty (60) days to declare said Permit terminated. The Permittee agrees that immediately upon receipt of written notice of such termination it will stop all operations, discontinue any discharges and disconnect the sewerage system or facilities constructed under this Permit. If the

Permittee fails to do so, the District shall have the right to disconnect said system. The Permittee hereby agrees to pay for any costs incurred by the District for said disconnection.

16. **Rights and Remedies.** The various rights and remedies of the District contained in this Permit shall be construed as cumulative, and no one of them shall be construed as exclusive of any one or more of the others or exclusive of any other rights or remedies allowed by applicable rules, regulations, ordinances and laws. An election by the District to enforce any one or more of its rights or remedies shall not be construed as a waiver of the rights of the District to pursue any other rights or remedies provided under the terms and provisions of this Permit or under any applicable rules, regulations, ordinances or laws.

17. **Expiration.** This Permit shall expire if construction has not started within one (1) year from the date of issue. Construction under an expired Permit is deemed construction without a Permit. All construction under this Permit shall be completed within three (3) years after the date of permit issuance. If conditions so warrant, an extension may be granted. For publicly financed projects (e.g. special assessments) the one (1) year period indicated will be considered from the date of final court action.

18. **Revocation.** In issuing this Permit, the District or Authorized Municipality has relied upon the statements and representations made by the Permittee or his agent. Any incorrect statements or representations shall be cause for revocation of this Permit, and all the rights of the Permittee hereunder shall immediately become null and void.

19. **Advance Notice.** The Permittee shall give the District or Authorized Municipality advance notice of at least two working days prior to the following: mobilization and installation of Erosion and Sediment Control Practices; commencement of construction; excavation for Qualified Sewer Construction; Major Stormwater Systems and Detention Facilities under this Permit; and completion of construction. When advance notice is given, the Permittee shall provide the Permit number, municipality and location.

20. **Compliance with Plans and Specifications.** All construction shall be in accordance with the plans and specifications submitted for this Permit and made a part hereof. No changes in, or deviation from the plans and specifications which affect capacity, maintenance, design requirements, service area or Permit requirements shall be permitted unless revised plans have been submitted to, and approved by the District or Authorized Municipality. The Permit together with a set of the plans and specifications (revised plans and specifications, if any) shall be kept on the jobsite at all times during construction and until final inspection and approval by the District or Authorized Municipality.

21. **Testing and Approval.** All construction under this Permit shall be subject to inspection, testing and approval by the District. All testing shall be made, or caused to be made, by the Permittee at no cost to the District and in the presence of the District representative. Upon satisfactory completion of construction, the Permittee and the owner shall submit, or cause to be submitted, a completion certificate and request for approval on the form prescribed by the District. No sewer or other facilities shall be put in service until all the conditions of the Permit have been satisfactorily met.

22. **Record Drawings.** Before final inspection and approval by the District or an Authorized Municipality, the Permittee shall furnish, or cause to be furnished to the District or an Authorized Municipality, a set of Record drawings and Schedule R for the site stormwater plan, Detention Facilities, Stormwater Facilities, and Qualified Sewer Construction.

23. **Compliance with Rules and Regulations.** The Permittee hereby expressly assumes all responsibilities for meeting the requirements of all applicable rules, regulations, ordinances and laws of Local, State and Federal authorities. Issuance of this Permit shall not constitute a waiver of any applicable requirements.

24. **Severability.** The provisions of this Permit are severable, and if any provision of this Permit, or the application of any provision of this Permit, is held invalid, the remaining provisions of this Permit shall continue in full force and effect.

25. **Property Rights.** This Permit does not convey any property rights of any sort, or any exclusive privilege.

26. **Conflict with Other Conditions.** In the case of conflict between these General Conditions and any other condition(s) in this permit, the other condition(s) shall govern.

WMO SCHEDULE A
PROJECT INFORMATION

Watershed Management Permit No. 22-032

1. **NAME OF PROJECT** Reconstruction of Des Plaines River Trail - Segment 2
(as shown on the plans)

2. **APPURTENANCES** (check all applicable items)

☐ Siphon ☐ Drop Manholes ☐ Public Lift Station (Submit Sch. E) ☐ Outfalls (Submit Sch. O)

☐ Stream Crossing ☐ Direct Connections to District → Describe N/A

3. **RECEIVING SANITARY/COMBINED SEWER SYSTEM**

A. System that project will connect to is:
☐ Existing ☐ Proposed /Under Construction → District Permit # N/A

List owners of all sewers from project to District interceptor N/A

4. **RECEIVING STORM SEWER SYSTEM TRIBUTARY TO WATERWAY**

A. System that project will connect to is:
☐ Existing ☐ Proposed /Under Construction → District Permit # N/A

List owners of all sewers from project to waterway N/A

5. **EXISTING LIFT STATION**

☑ No ☐ Yes → Receiving system includes existing lift station

If yes, indicate location _____

6. **FLOOD PROTECTION AREAS**
Does any part of the project area involve the following? (check all applicable items)

☑ Floodplain/Floodway/Riparian (Schedule H) ☑ Wetlands/Buffers/Riparian (Schedule W)

7. **SIZE OF PROJECT**

			Impervious area within project	
A. Total contiguous ownership interest	118.6	acres	C. Before development	0.832 acres
B. Development Area Open Space Development	1.435	acres	D. After development	0.883 acres

8. **STORMWATER MANAGEMENT**

A. Is project in the service area of a District permitted detention facility?
☑ No ☐ Yes → District Permit No. _____

B. Is stormwater management provided under this permit?
☐ No ☒ Yes → Required by: ☒ District (Submit Sch. D) ☐ Other

C. Type of stormwater management

☑ Runoff Control ☐ Volume Control ☐ Detention Storage

WMO SCHEDULE B
SEWER SUMMARY

Watershed Management Permit No. 22-032

PROJECT NAME: Reconstruction of Des Plaines River Trail - Segment 2
(as shown on the plans)

1. **SEWER SUMMARY:** Include all qualified sewer construction sewers (Sanitary sewers in combined and separate sewer areas and Storm sewers in combined sewer area) and their tributary type:
Sanitary (San), Combined (C), Storm to Combined (SC), Storm to Waterway (SW), or Storm part of Volume Control (SVC)

Tributary Type	Choose an Choose one	Choose an Choose one	Choose an Choose one	Choose an Choose one	Choose Choose one	Choose an Choose one	Choose Choose one
Pipe Size (in.)							
Total Length (ft.)							
Min. slope used (%)							
Pipe Material *							
Total Manholes							
Total Cleanouts							
Catch Basin/Inlets							

* Pipe material and joint specifications must be shown on plans. See Technical Guidance Manual for acceptable specifications.

Sewer construction in floodplain: ☒ No ☐ Yes → FPE _____ ft.

Sanitary Manholes in floodplain _____

Note: All structures shall have lids located above the FPE or be constructed with watertight, bolt down covers/lids.

2. **NATURE OF PROJECT** (Check all that apply)

Brief description Reconstruction of Des Plaines River Trail between Devon Avenue and Higgins Road

- ☒ Publicly financed
- ☐ Sewer extension to serve future development
- ☐ Sewer system serving a subdivision
- ☐ Storm sewers in combined sewer area
- ☐ Off-site trunk sewer to serve subdivision
- ☐ Service connections to serve buildings (Sch. C)
- ☐ Other _____

3. **SEWER EXTENSIONS**

Identify proposed project designed to service future connections (not included in Schedule C). Check the appropriate box and submit service area map and estimate of population equivalent (PE) to be served.

☒ NO ☐ YES → ☐ Service area map

☐ P.E. estimate submitted

WMO SCHEDULE C SEWER CONNECTIONS

Watershed Management Permit No. 22-032

(FILL OUT ALL SECTIONS THAT APPLY)

1. BUILDING CONNECTION DATA

A. RESIDENTIAL BUILDINGS

☐ Single Family Total dwelling units * _____

Number of sewer connections * _____ PE** _____

☐ Multi Family Total dwelling units * _____

Number of sewer connections * _____ PE** _____

B. COMMERCIAL& RECREATIONAL BUILDINGS

☐ Number of sewer connections _____ PE** _____

C. INDUSTRIAL BUILDINGS

☐ Number of sewer connections _____ PE** _____

* Each sanitary line exiting a building is a connection

** Population Equivalent (Submit calculations for each connection and total from all connections)

2. BUILDING USE - (Check all that apply)

A. COMMERCIAL & RECREATIONAL

Describe use of buildings, including principal product(s) or activities _____

_____

☐ Food preparation or processing (install grease separator)

☐ Swimming pool (provide pool plans)

☐ Manufacturing (describe) _____

☐ Laundromat (install lint basin)

☐ Auto service (install triple basin)

☐ Auto wash (install mud basin)

☐ Other _____

B. INDUSTRIAL BUILDINGS

Describe use of buildings, including principal product(s) or activities _____

_____

☐ Sewer connections will receive domestic sewage only

☐ Industrial waste is produced

NOTE: If industrial waste is produced, submit WMO Schedule F & WMO Schedule G and plumbing plans along with flow diagram for pretreatment system.

SCHEDULE D
STORMWATER MANAGEMENT FACILITIES

WMO Permit Number: 22-032

NAME OF PROJECT: Reconstruction of Des Plaines River Trail - Segment 2

(Submit a separate Schedule D for each stormwater facility, as needed)

1. RUNOFF REQUIREMENTS: Submit calculations and an exhibit that delineates the 100-year critical storm conveyed by the major stormwater system including cross-sections indicating the HGL at critical points (e.g. overflow weirs)

A. Method used to calculate the 100-year peak design runoff rate:
☒ Hydrologic model ☐ Rational Method → $i_{100\text{-year}}$ _____ in/hr

B. Onsite tributary area to the major stormwater system ..... *C* or *CN* North Culvert: 72 South Culvert:78 , North Culvert: 4.8 South Culvert:8.9 acres

C. Offsite tributary area to the major stormwater system ..... *C* or *CN* North Culvert: 76 South Culvert:79 , North Culvert: 58.1 South Culvert: 31.8 acres

D. Total tributary area to the major stormwater system ..... *C* or *CN* 77 , 103.6 acres

E. Ratio of offsite to onsite tributary area 6.56

F. Time-of-concentration ..... 85.8, 32.4, 64.8, 36.6 minutes

G. 100-year peak design runoff rate ..... North Culvert: 80 South Culvert: 72 cfs

H. Capacity of major stormwater system discharging offsite ..... North Culvert: 80 South Culvert: 72 cfs

I. Offsite discharge location of the major stormwater system:
☒ ROW/drainage easement ☐ Adjacent property *(submit calculations to comply with §502.3.B)*

J. Type and location of major stormwater system: Northern and southern culvert crossings

K. Building lowest entry elevation(s) are located at least 1 foot above the adjacent HGL:
(Submit calculations and cross-sections showing the lowest entry elevation(s) and adjacent HGL)
☐ Yes ☒ No *(for existing buildings located within the property holdings, submit acknowledgment)*

2. VOLUME CONTROL REQUIREMENTS: Submit calculations and a detail for the volume control facility including a cross-section indicating relevant elevations and the seasonal high groundwater table (SHGWT).

Volume Control requirements are not applicable

A. Does the site have any restrictive covenants related to environmental conditions (e.g., NFR letter)?
☐ No ☐ Yes → Explain: _____

B. Site constraint(s) that precludes the use of onsite retention-based practices *(submit documentation)*:
☐ None ☐ SHGWT ☐ Contaminated Soil ☐ Other: N/A

C. Proposed impervious area of development ..... _____ acres

D. Gross volume control storage *(2.C / 12)* ..... _____ ac-ft

E. The onsite gross volume control storage may be reduced when a site constraint is present:
1. Existing impervious area within development ..... _____ acres
2. VC storage reduction *(5)(2.D)[1 – (2.C / 2.E.1)]* ..... _____ ac-ft

F. Required volume control storage *(2.D – 2.E.2)* ..... _____ ac-ft

G. Provided volume within retention-based practice ..... _____ ac-ft

H. Volume control facility *(*only when a site constraint is present)*
☐ Retention-based practice → Type of practice: _____
☐ Flow-through practice* → Type of practice: _____
☐ Detention Storage* → Type of facility: _____
☐ Offsite retention-based practice* → WMO Permit Number: _____

I. Designed as an offsite retention-based practice:
☐ No ☐ Yes → Impervious runoff volume tributary to facility ..... _____ ac-ft

SCHEDULE D
STORMWATER MANAGEMENT FACILITIES

WMO Permit Number: 22-032

3. DETENTION REQUIREMENTS: Submit calculations and an exhibit that includes a cross-section of the detention facility and a detail of the control structure, and delineates the tributary, unrestricted, depressional storage, and bypass areas with the acreage and curve number indicated. Detention requirements are not applicable

A. Watershed specific release rate *(Appendix B)* _____ cfs/ac

B. Detention service area _____ acres

C. Gross allowable release rate _____ cfs

D. Unrestricted area _____ *CN* _____ , _____ acres

E. Unrestricted release rate *(100-year, 24-hour storm)* _____ cfs

F. Depressional storage release rate adjustment *(100-year, 24-hour storm)* _____ cfs

G. Net allowable release rate *(3.C – 3.E – 3.F)* _____ cfs

H. Control structure (restrictor) information:

1. Diameter _____ in
2. Actual Release Rate _____ cfs
3. C_d _____
4. HWL _____ ft
5. Type _____
6. Invert elevation _____ ft

I. Method used to determine the required detention volume:
☐ Hydrologic Model ☐ Nomograph

J. Time-of-concentration _____ minutes

K. Area detained *(include trade areas)* _____ *CN* _____ , _____ acres

L. Adjusted CN *(when onsite retention-based practices are provided)* _____

M. Required detention volume at actual release rate *(3.H.2)* _____ ac-ft

N. Provided detention volume at HWL *(3.H.4)* _____ ac-ft

O. Drawdown time _____ hours

P. Type of stormwater detention facility: _____

Q. Designed as an offsite detention facility:
☐ No ☐ Yes → Runoff volume tributary to facility _____ ac-ft

4. OFFSITE DETENTION REQUIREMENTS: This item is only applicable when the development utilizes an offsite detention facility to comply with the detention requirements. Offsite detention requirements are not applicable

A. Site limitation(s) that precludes the use of an onsite detention facility *(submit justification)*:
☐ Floodway ☐ Shallow Bedrock ☐ Other: N/A

B. Area requiring detention _____ *CN* _____ , _____ acres

C. Runoff volume from area to be detained offsite _____ ac-ft

D. WMO Permit Number for offsite detention facility _____

Engineering Firm: Christopher B. Burke Engineering, Ltd

Name: Darren T. Olson, PE, CFM, D.WRE **Phone:** (847) 823-0500

Title: Vice President, Water Resources **Email:** dolson@cbbel.com

Signature: _____ **Date:** 1/21/22

DARREN T. OLSON 062-056302 LICENSED PROFESSIONAL ENGINEER OF ILLINOIS EXP 11/23

SCHEDULE H

WMO Permit Number: 22-032

FLOODPLAIN/FLOODWAY & RIPARIAN ENVIRONMENTS

NAME OF PROJECT: Reconstruction of Des Plaines River Trail - Segment 2

1. **TYPE OF DEVELOPMENT** (*check one below*):

☐ Single-Family Home ☐ Residential Subdivision ☐ Multi-Family Residential
☐ Non-Residential ☐ Right-of-Way ■ Open Space

2. **FEMA FIRM PANELS**

Provide the Cook County FIRM panel(s) for the site: 17031C0376J (effective August 19, 2008)

3. **FLOODPLAIN**

A. Is there regulatory floodplain located onsite?

☐ No ■ Yes → Provide the name(s) of the flooding source(s): Des Plaines River

B. Is there Zone A floodplain within 100 feet of the project site or does the site require a project-specific floodplain study? ■ No ☐ Yes

C. If the answer to 3.A or 3.B is "Yes", complete the following.

List the BFE(s) on the project site (*Round to the nearest 0.1 ft. If more than one BFE, list each individually*):

629.0 ft, NAVD 88.

Provide the elevation source(s) of the BFE(s):

FEMA Cook County FIS Profiles (see Appendix 2 of the report)

D. Does the project include development of a residential building within 100-ft of the regulatory floodplain?

■ No ☐ Yes

E. If the development includes a new building or a foundation expansion of an existing building that increases the building footprint by the lesser of either 20% or 2,500 square feet, in aggregate, provide the lowest floor elevation: N/A ft, NAVD 88.

F. Does the project result in fill in the floodplain? ■ No ☐ Yes → Provide floodplain fill and compensatory storage quantities:

Floodplain Fill (acre-feet)		Compensatory Storage Provided (acre-feet)	
0.0	0 – 10 Year	0.0	0 – 10 Year*
0.0	10 – 100 Year	0.029	10 – 100 Year*
0.0	Total	0.029	Total**

* Must be at least 1.0 times the floodplain fill
** Must be at least 1.1 times the floodplain fill

SCHEDULE H

WMO Permit Number: 22-032

FLOODPLAIN/FLOODWAY & RIPARIAN ENVIRONMENTS

4. FLOODWAY

A. Is any part of the development in the regulatory floodway?

■ No ☐ Yes → Provide copy of IDNR-OWR Floodway Construction Permit for the development and describe appropriate use: _____

B. Does the development involve a waterway with greater than one square mile of tributary area?

■ No ☐ Yes → Provide copy of IDNR-OWR Floodway Construction Permit for the development

5. RIPARIAN ENVIRONMENTS

A. Is there a riparian environment located onsite?

☐ No ■ Yes → Proceed to Items 5.B and 5.C

B. Indicate the conditions that apply:

■ Jurisdictional Waters of the U.S. (50-ft buffer from OHWM)

☐ Jurisdictional or isolated waters with BSC of "A" or "B" or BSS Streams (100-ft buffer from OHWM)

■ Isolated Waters (30-ft buffer from OHWM)

C. Is the riparian environment adversely impacted by the development?

■ No ☐ Yes → Proceed to Item 6

6. MITIGATION FOR RIPARIAN IMPACTS

Prepare a riparian submittal and briefly describe the impacts and proposed mitigation: The existing trail alignment will be utilized by the project and although the trail is located within riparian area, the riparian area beyond the existing trail will not be impacted.

Engineering Firm: Christopher B. Burke Engineering, Ltd.

Name: Darren T. Olson, PE, CFM, D.WRE **Phone:** (847) 823-0500

Title: Vice President, Assistant Department Head, Water Resources **Email:** dolson@cbbel.com

Signature: _____ **Date:** 1/21/22

SCHEDULE P

WMO Permit Number: 22-032

SOIL EROSION AND SEDIMENT CONTROL

NAME OF PROJECT: Reconstruction of Des Plaines River Trail - Segment 2

1. PROJECT INFORMATION:

A. Project Area *(include all disturbed area)* ..... 1.435 acres

B. Stormwater discharges directly to:

- ☐ Storm Sewer
- ☐ Combined Sewer
- ☐ Overland Flow Route
- ■ Waters of the State → Name of water body: Des Plaines Rivers
- ☐ Other → Explain: _____

C. Indicate if any of the following special circumstances apply *(check all that apply)*:

- ☐ Volume Control Facility
- ■ Wetland / Buffer
- ☐ Outfall to Waterway
- ■ Floodplain / Floodway
- ■ Riparian Environment
- ☐ Tributary to Lake Michigan

D. Explain how special circumstances indicated in Item 1.C will be protected from erosion and sedimentation:

The project area will be delineated with perimeter erosion barrier and covered with temporary seeding, and erosion control blanket. In addition, wetlands are bound by an orange construction fence and marked on the plans as no-intrusion zone. All flood hazard areas(wetlands and floodplain) will be protected with a double row of silt fence.

2. SOIL EROSION AND SEDIMENT CONTROL PRACTICES:

Submit a soil erosion and sediment control plan indicating type, location, and detail for all practices. Include a sequence for all major construction activities. All practices must be constructed in accordance with the Illinois Urban Manual.

A. Indicate all temporary soil erosion and sediment control practices installed as part of the project:

- ■ Entrance / Exit Control
- ☐ Vegetative Control
- ☐ Filtration for Dewatering
- ■ Concrete Washout
- ☐ Matting / Mulching
- ☐ Conveyance Channel
- ■ Silt Fence
- ☐ Coir Roll
- ☐ Velocity Dissipation
- ☐ Double-Row Silt Fence
- ☐ Sediment Trap
- ☐ Cofferdam / Silt Curtain
- ☐ Inlet Control
- ☐ Sediment Basin
- ☐ Other: Temporary Erosion Control Blanket
- ☐ Other: _____

B. Indicate all permanent soil erosion control practices installed as part of the project:

- ☐ Vegetative Control
- ☐ Velocity Dissipation
- ☐ Other: Erosion Control Blanket (SPL)
- ☐ Other: _____

SCHEDULE W

WMO Permit Number: 22-032

WETLANDS, BUFFERS & RIPARIAN ENVIRONMENTS

NAME OF PROJECT: Reconstruction of Des Plaines River Trail - Segment 2

Complete all items, unless instructed to proceed to a later section.

1. WETLAND IDENTIFICATION: Wetland #5

2. ONSITE WETLANDS ***(Wetlands located within the property holdings are considered onsite wetlands. If multiple wetlands are located within the property holdings, submit a separate Schedule W for each wetland.)***

A. Is a wetland or farmed wetland located on the property interest?

☐ No → Proceed to Item 3 ■ Yes → Delineate wetland per §603.3. Proceed to Item 2.B

B. Is the onsite wetland within the development area or within 100 feet of the development?

☐ No → Proceed to Item 2.C ■ Yes → Submit a copy of the US Army Corps of Engineers (Corps) Jurisdictional Determination letter. Proceed to Item 2.D

C. Is an indirect wetland impact proposed?

■ No → Proceed to Item 3 ☐ Yes → Submit a copy of the US Army Corps of Engineers (Corps) Jurisdictional Determination letter. Proceed to Item 2.D

D. Does the Corps regulate the onsite wetland?

☐ No → Proceed to Item 2.F ■ Yes → Proceed to Item 2.E

E. Will the Corps regulated wetland be impacted by the development?

■ No → Proceed to Item 5 ☐ Yes → Submit a copy of the Corps permit application. (Approved Corps permit required prior to issuance.) Proceed to Item 4

F. Will the isolated wetland or associated buffer be impacted by the development?

■ No → Proceed to Item 5 ☐ Yes → Proceed to Item 4

3. OFFSITE WETLANDS ***(Wetlands located outside the property holdings are considered offsite wetlands. If multiple wetlands are located offsite within 100 feet of the property holdings, submit a separate Schedule W for each wetland.)***

A. Is there an offsite wetland located within 100 feet of the development site?

☐ No → Proceed to Item 3.E ☐ Yes → Delineate wetland per §603.5 and follow §603.6. Proceed to Item 3.B

B. Can a Corps Jurisdictional Determination letter be obtained?

☐ No → Consider high quality isolated wetland Proceed to Item 3.C ☐ Yes → Proceed to Item 3.C

C. Does the wetland buffer extend onto the development?

☐ No → Proceed to Item 3.E ☐ Yes → Proceed to Item 3.D

D. Is the wetland or associated buffer impacted by the development?

☐ No → Proceed to Item 3.E ☐ Yes → Proceed to Item 4

E. Is an indirect wetland impact proposed?

☐ No → Proceed to Item 5 ☐ Yes → Proceed to Item 4

SCHEDULE W

WMO Permit Number: 22-032

WETLANDS, BUFFERS & RIPARIAN ENVIRONMENTS

4. MITIGATION FOR WETLAND IMPACTS

☐ Standard Isolated ☐ High Quality Isolated ☐ Corps Jurisdictional

Prepare the wetland/buffer submittal and briefly describe the impacts and proposed mitigation, below. (If the wetland is a Corps regulated wetland, briefly describe the wetland impacts and mitigation proposed under the Corps permit.)

No wetland impact proposed

5. STORMWATER DETENTION WITHIN THE WETLAND

A. Is stormwater detention proposed within the wetland?

■ No → Proceed to Item 6 ☐ Yes → Proceed to Item 5.B

B. Is the wetland regulated by the Corps and is a Corps permit required for the development?

☐ No → Proceed to Item 5.D ☐ Yes → Proceed to Item 5.C

C. Did the Corps approve placing detention in the wetland?

☐ No → Detention not allowed ☐ Yes → Submit a copy of the approved Corps permit
Proceed to Item 6

D. Is the wetland considered a high quality isolated wetland?

☐ No → Hydrologic study required ☐ Yes → Detention not allowed

6. RIPARIAN ENVIRONMENTS

A. Is there a riparian environment located onsite?

☐ No → Proceed to Item 8 ■ Yes → Proceed to Items 6.B and 6.C

B. Indicate the conditions that apply:

■ Jurisdictional Waters of the U.S. (50-ft buffer from OHWM)

☐ Jurisdictional or isolated waters with BSC of "A" or "B" or BSS Streams (100-ft buffer from OHWM)

☐ Isolated Waters (30-ft buffer from OHWM)

C. Is the riparian environment adversely impacted by the development?

■ No → Proceed to Item 8 ☐ Yes → Proceed to Item 7

7. MITIGATION FOR RIPARIAN IMPACTS

A. Prepare a riparian submittal and briefly describe the impacts and proposed mitigation: _____

8. WETLAND SPECIALIST CERTIFICATION

NOTE: If the answers to Items 2.D, 2.F, 3.E, 5.A or 6.C are yes, prepare the appropriate wetland, buffer and riparian environment submittals with supporting documentation along with the Watershed Management Permit application. (Electronic signatures are not accepted.)

Company/Agency: Christopher B. Burke Engineering, Ltd.

Wetland Specialist: Thomas G. McArdle Title: Manager, Environmental Resources Department

Signature: TGM Date: 1/21/22

SCHEDULE W

WMO Permit Number: 22-032

WETLANDS, BUFFERS & RIPARIAN ENVIRONMENTS

NAME OF PROJECT: Reconstruction of Des Plaines River Trail - Segment 2

Complete all items, unless instructed to proceed to a later section.

1. WETLAND IDENTIFICATION: Wetland #6

2. ONSITE WETLANDS ***(Wetlands located within the property holdings are considered onsite wetlands. If multiple wetlands are located within the property holdings, submit a separate Schedule W for each wetland.)***

A. Is a wetland or farmed wetland located on the property interest?

☐ No → Proceed to Item 3 ■ Yes → Delineate wetland per §603.3. Proceed to Item 2.B

B. Is the onsite wetland within the development area or within 100 feet of the development?

☐ No → Proceed to Item 2.C ■ Yes → Submit a copy of the US Army Corps of Engineers (Corps) Jurisdictional Determination letter. Proceed to Item 2.D

C. Is an indirect wetland impact proposed?

■ No → Proceed to Item 3 ☐ Yes → Submit a copy of the US Army Corps of Engineers (Corps) Jurisdictional Determination letter. Proceed to Item 2.D

D. Does the Corps regulate the onsite wetland?

■ No → Proceed to Item 2.F ☐ Yes → Proceed to Item 2.E

E. Will the Corps regulated wetland be impacted by the development?

■ No → Proceed to Item 5 ☐ Yes → Submit a copy of the Corps permit application. (Approved Corps permit required prior to issuance.) Proceed to Item 4

F. Will the isolated wetland or associated buffer be impacted by the development?

■ No → Proceed to Item 5 ☐ Yes → Proceed to Item 4

3. OFFSITE WETLANDS ***(Wetlands located outside the property holdings are considered offsite wetlands. If multiple wetlands are located offsite within 100 feet of the property holdings, submit a separate Schedule W for each wetland.)***

A. Is there an offsite wetland located within 100 feet of the development site?

☐ No → Proceed to Item 3.E ☐ Yes → Delineate wetland per §603.5 and follow §603.6. Proceed to Item 3.B

B. Can a Corps Jurisdictional Determination letter be obtained?

☐ No → Consider high quality isolated wetland Proceed to Item 3.C ☐ Yes → Proceed to Item 3.C

C. Does the wetland buffer extend onto the development?

☐ No → Proceed to Item 3.E ☐ Yes → Proceed to Item 3.D

D. Is the wetland or associated buffer impacted by the development?

☐ No → Proceed to Item 3.E ☐ Yes → Proceed to Item 4

E. Is an indirect wetland impact proposed?

☐ No → Proceed to Item 5 ☐ Yes → Proceed to Item 4

SCHEDULE W

WMO Permit Number: 22-032

WETLANDS, BUFFERS & RIPARIAN ENVIRONMENTS

4. MITIGATION FOR WETLAND IMPACTS

☐ Standard Isolated ☐ High Quality Isolated ☐ Corps Jurisdictional

Prepare the wetland/buffer submittal and briefly describe the impacts and proposed mitigation, below. (If the wetland is a Corps regulated wetland, briefly describe the wetland impacts and mitigation proposed under the Corps permit.)

No wetland impact proposed

5. STORMWATER DETENTION WITHIN THE WETLAND

A. Is stormwater detention proposed within the wetland?

☒ No → Proceed to Item 6 ☐ Yes → Proceed to Item 5.B

B. Is the wetland regulated by the Corps and is a Corps permit required for the development?

☐ No → Proceed to Item 5.D ☐ Yes → Proceed to Item 5.C

C. Did the Corps approve placing detention in the wetland?

☐ No → Detention not allowed ☐ Yes → Submit a copy of the approved Corps permit
Proceed to Item 6

D. Is the wetland considered a high quality isolated wetland?

☐ No → Hydrologic study required ☐ Yes → Detention not allowed

6. RIPARIAN ENVIRONMENTS

A. Is there a riparian environment located onsite?

☐ No → Proceed to Item 8 ☒ Yes → Proceed to Items 6.B and 6.C

B. Indicate the conditions that apply:

☐ Jurisdictional Waters of the U.S. (50-ft buffer from OHWM)

☐ Jurisdictional or isolated waters with BSC of "A" or "B" or BSS Streams (100-ft buffer from OHWM)

☒ Isolated Waters (30-ft buffer from OHWM)

C. Is the riparian environment adversely impacted by the development?

☒ No → Proceed to Item 8 ☐ Yes → Proceed to Item 7

7. MITIGATION FOR RIPARIAN IMPACTS

A. Prepare a riparian submittal and briefly describe the impacts and proposed mitigation:

8. WETLAND SPECIALIST CERTIFICATION

NOTE: If the answers to Items 2.D, 2.F, 3.E, 5.A or 6.C are yes, prepare the appropriate wetland, buffer and riparian environment submittals with supporting documentation along with the Watershed Management Permit application. (Electronic signatures are not accepted.)

Company/Agency: Christopher B. Burke Engineering, Ltd.

Wetland Specialist: Thomas G. McArdle Title: Manager, Environmental Resources Department

Signature: Date: 1/21/22

SCHEDULE W

WMO Permit Number: 22-032

WETLANDS, BUFFERS & RIPARIAN ENVIRONMENTS

NAME OF PROJECT: Reconstruction of Des Plaines River Trail - Segment 2

Complete all items, unless instructed to proceed to a later section.

1. WETLAND IDENTIFICATION: Wetland #7

2. ONSITE WETLANDS ***(Wetlands located within the property holdings are considered onsite wetlands. If multiple wetlands are located within the property holdings, submit a separate Schedule W for each wetland.)***

A. Is a wetland or farmed wetland located on the property interest?

☐ No → Proceed to Item 3 ■ Yes → Delineate wetland per §603.3. Proceed to Item 2.B

B. Is the onsite wetland within the development area or within 100 feet of the development?

☐ No → Proceed to Item 2.C ■ Yes → Submit a copy of the US Army Corps of Engineers (Corps) Jurisdictional Determination letter. Proceed to Item 2.D

C. Is an indirect wetland impact proposed?

■ No → Proceed to Item 3 ☐ Yes → Submit a copy of the US Army Corps of Engineers (Corps) Jurisdictional Determination letter. Proceed to Item 2.D

D. Does the Corps regulate the onsite wetland?

■ No → Proceed to Item 2.F ☐ Yes → Proceed to Item 2.E

E. Will the Corps regulated wetland be impacted by the development?

■ No → Proceed to Item 5 ☐ Yes → Submit a copy of the Corps permit application. (Approved Corps permit required prior to issuance.) Proceed to Item 4

F. Will the isolated wetland or associated buffer be impacted by the development?

■ No → Proceed to Item 5 ☐ Yes → Proceed to Item 4

3. OFFSITE WETLANDS ***(Wetlands located outside the property holdings are considered offsite wetlands. If multiple wetlands are located offsite within 100 feet of the property holdings, submit a separate Schedule W for each wetland.)***

A. Is there an offsite wetland located within 100 feet of the development site?

☐ No → Proceed to Item 3.E ☐ Yes → Delineate wetland per §603.5 and follow §603.6. Proceed to Item 3.B

B. Can a Corps Jurisdictional Determination letter be obtained?

☐ No → Consider high quality isolated wetland Proceed to Item 3.C ☐ Yes → Proceed to Item 3.C

C. Does the wetland buffer extend onto the development?

☐ No → Proceed to Item 3.E ☐ Yes → Proceed to Item 3.D

D. Is the wetland or associated buffer impacted by the development?

☐ No → Proceed to Item 3.E ☐ Yes → Proceed to Item 4

E. Is an indirect wetland impact proposed?

☐ No → Proceed to Item 5 ☐ Yes → Proceed to Item 4

SCHEDULE W

WMO Permit Number: 22-032

WETLANDS, BUFFERS & RIPARIAN ENVIRONMENTS

4. MITIGATION FOR WETLAND IMPACTS

☐ Standard Isolated ☐ High Quality Isolated ☐ Corps Jurisdictional

Prepare the wetland/buffer submittal and briefly describe the impacts and proposed mitigation, below. (If the wetland is a Corps regulated wetland, briefly describe the wetland impacts and mitigation proposed under the Corps permit.)

No wetland impact proposed

5. STORMWATER DETENTION WITHIN THE WETLAND

A. Is stormwater detention proposed within the wetland?

■ No → Proceed to Item 6 ☐ Yes → Proceed to Item 5.B

B. Is the wetland regulated by the Corps and is a Corps permit required for the development?

☐ No → Proceed to Item 5.D ☐ Yes → Proceed to Item 5.C

C. Did the Corps approve placing detention in the wetland?

☐ No → Detention not allowed ☐ Yes → Submit a copy of the approved Corps permit
Proceed to Item 6

D. Is the wetland considered a high quality isolated wetland?

☐ No → Hydrologic study required ☐ Yes → Detention not allowed

6. RIPARIAN ENVIRONMENTS

A. Is there a riparian environment located onsite?

☐ No → Proceed to Item 8 ■ Yes → Proceed to Items 6.B and 6.C

B. Indicate the conditions that apply:

☐ Jurisdictional Waters of the U.S. (50-ft buffer from OHWM)

☐ Jurisdictional or isolated waters with BSC of "A" or "B" or BSS Streams (100-ft buffer from OHWM)

■ Isolated Waters (30-ft buffer from OHWM)

C. Is the riparian environment adversely impacted by the development?

■ No → Proceed to Item 8 ☐ Yes → Proceed to Item 7

7. MITIGATION FOR RIPARIAN IMPACTS

A. Prepare a riparian submittal and briefly describe the impacts and proposed mitigation: _____

8. WETLAND SPECIALIST CERTIFICATION

NOTE: If the answers to Items 2.D, 2.F, 3.E, 5.A or 6.C are yes, prepare the appropriate wetland, buffer and riparian environment submittals with supporting documentation along with the Watershed Management Permit application. (Electronic signatures are not accepted.)

Company/Agency: Christopher B. Burke Engineering, Ltd.

Wetland Specialist: Thomas G. McArdle Title: Manager, Environmental Resources Department

Signature: _____ Date: 1/21/22

SPECIAL CONDITIONS FOR PERMIT NO 22-032

1. Construction must conform to the soil erosion and sediment control requirements of this permit and any other local, state, and/or federal agencies.

2. This permit is issued subject to the runoff requirements of the WMO and in reliance of the drainage certification submitted by the design engineer. Development under this permit shall not increase flood elevations or decrease flood conveyance capacity of the area upstream or downstream of the developed property covered under this permit.

3. This permit is issued subject to the open space requirements of the WMO only, and is not subject to the volume control and detention requirements.

4. Construction must conform to the floodplain requirements of this permit and any other local and/or state requirements.

5. Construction covered by this permit is located within a designated floodplain according to the data source specified in the permit. The Permittee/Co-Permittee is hereby warned, and does hereby acknowledge, that the indemnification clause of this permit (General Condition No. 7) shall protect MWRD from any consequences caused by flood or high water. The Permittee/Co-Permittee assumes any and all liability for any claims and/or damages that may arise as a result of flood or high water.

6. Construction must conform to the compensatory storage requirements of this permit and any other local and/or state requirements.

7. Construction must conform to the wetland and riparian requirements of this permit and the requirements of the U.S. Army Corps of Engineers.

8. The MWRD shall have 24 hour-a-day unrestricted access to all MWRD structures/sewers/facilities.

9. No debris shall enter MWRD structures/sewers/facilities/waterways.

10. All access hatches/manhole covers on MWRD structures/manholes within the project area shall not be buried/covered.

ENGINEERING CERTIFICATIONS

Watershed Management Permit No. 22-032

CERTIFICATE BY DESIGN ENGINEER: I hereby certify that the project described herein has been designed in accordance with the requirements set forth in this application and all applicable ordinances, rules, regulations, local, state and federal laws, and design criteria of the issuing authority; that the storm drainage and sanitary sewer system designed for this project are proper and adequate; that where the design involves one or more connections to an existing local sewer system, the capacity of said system has been examined and the system is found to be adequate to transport the stormwater and/or wastewater that will be added through the proposed sewer without violating any provisions of the Illinois Environmental Protection Act or the rules and regulations thereunder.

Comments, if any: _____

Engineering Firm: Christopher B. Burke Engineering, Ltd. **Telephone:** (847) 823 - 0500

Address: 9575 W. Higgins Road, Suite 600 **City:** Rosemont **Zip:** 60018

MARTIN C. WORMAN 062-051360 P.E. LICENSED PROFESSIONAL ENGINEER OF ILLINOIS

Signature: _____ **Date:** 1/24/22
(Name and Title)

Email Address: mworman@cbbel.com

CERTIFICATE BY MUNICIPAL OR SYSTEM ENGINEER: The application and the drawings, together with other data being submitted with this application, have been examined by me and are found to be in compliance with all applicable requirements. The manner of drainage is satisfactory and proper in accordance with local requirements. The existing local sewer system to which the project discharges has been examined and the system is found to be adequate to transport the stormwater and/or wastewater that will be added through the proposed sewer without violating any provisions of the Illinois Environmental Protection Act or the rules and regulations thereunder.

I hereby certify that the project area is within the municipal corporate limits. ☒ YES ☐ NO

Owner of Local Sewer System: City of Park Ridge

Municipal Engineer: Sarah Mitchell **Telephone:** (847) 318-5455

Address: 505 Butler Place **City:** Park Ridge **Zip** 60068

LICENSED PROFESSIONAL ENGINEER SARAH K. MITCHELL 062-050392 STATE OF ILLINOIS

Signature: _____, City Engineer **Date:** 1-31-22
(Name and Title)

Email Address: smitchell@parkridge.us

CERTIFICATE BY INSPECTION ENGINEER: I hereby certify that construction of the project will be in substantial compliance with the data and the plans submitted with this application; that approval will be obtained from the issuing authority prior to making any changes that would affect capacity, maintenance, design requirements, service area or the Permit requirements; that a set of RECORD drawings, signed and sealed by the undersigned Engineer will be furnished to the District or an Authorized Municipality before testing and approval by the District or Authorized Municipality of the completed work.

Engineering Firm: Christopher B. Burke Engineering, Ltd. **Telephone:** (847) 823-0500

Address: 9575 W. Higgins Road, Suite 600 **City:** Rosemont **Zip** 60018

MARTIN C. WORMAN 062-051360 P.E. LICENSED PROFESSIONAL ENGINEER OF ILLINOIS

Signature: _____ **Date:** 1/24/22
(Name and Title)

Email Address: mworman@cbbel.com

SPECIAL CONDITIONS

Watershed Management Permit No. 22-032

This Permit is issued subject to the General Conditions and the attached Special Conditions.

If Permit is granted:

☒ **Please return two (2) copies of the Permit to the Permittee; or**
☒ **Please mail one (1) copy to Permittee and one (1) copy to the person designated below:**

Name: Darren T. Olson, PE, CFM, D.WRE

Address : 9575 W. Higgins Road, Suite 600, Rosemont, IL60018
Email : dolson@cbbel.com

CERTIFICATE BY APPLICANTS: We have read and thoroughly understand the conditions and requirements of this Permit application, and agree to conform to the Permit conditions and other applicable requirements of the District. It is understood that construction hereunder, after the Permit is granted, shall constitute acceptance by the applicants of any Special Conditions that may be placed hereon by the District or an Authorized Municipality. It is further understood that this application shall not constitute a Permit until it is approved, signed and returned by the Director of Engineering of the District or Enforcement Officer of an Authorized Municipality.

PERMITTEE	**CO-PERMITTEE**
The project area is within municipal corporate limits. ☒ Yes ☐ No ☐ Not Applicable	**(Co-Permittee is Property Owner)** Title to property is held in a land trust: ☐ Yes ☒ No If yes, Co-Permittee shall be beneficiary with Power of Direction
Municipality City of Park Ridge	Owner Forest Preserves of Cook County
Address 505 Butler Place	Address 536 N. Harlem Avenue
City Park Ridge Zip 60068	City River Forest Zip 60305
Signature [signature]	Signature Pamela Sielski
Name Sarah Mitchell (Print)	Name Pamela Sielski (Print)
Title City Engineer	Title Landscape Architect/ Project Manager
Date 1-31-22 Phone (847) 318-5455	Date 01/24/2022 Phone 708-771-1355
Email smitchell@parkridge.us	Email Pamela.sielski@cookcountyil.gov

REVIEW AND APPROVAL BY THE DISTRICT OR AUTHORIZED MUNICIPALITY

Reviewed by: Michael Cunico **Date** Digitally signed by Michael Cunico Date: 2022.04.19 13:30:29-05'00'
(Local Sewer Systems) or (Professional Engineer)

Approved for Issue
Approved by: Daniel M. Feltes **Date** Digitally signed by Daniel M. Feltes Date: 2022.04.22 16:19:30 -05'00'
(For the Director of Engineering) or (Enforcement Officer)

Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

Uncontaminated Soil Certification
by Licensed Professional Engineer or Licensed Professional Geologist
for Use of Uncontaminated Soil as Fill in a CCDD or Uncontaminated Soil Fill Operation LPC-663

Revised in accordance with 35 Ill. Adm. Code 1100, as amended by PCB R2012-009 (eff. Aug. 27, 2012)

This certification form is to be used by professional engineers and professional geologists to certify, pursuant to 35 Ill. Adm. Code 1100.205(a)(1)(B), that soil (i) is uncontaminated soil and (ii) is within a pH range of 6.26 to 9.0. If you have questions about this form, please telephone the Bureau of Land Permit Section at 217/524-3300.

This form may be completed online, saved locally, printed and signed, and submitted to prospective clean construction or demolition debris (CCDD) fill operations or uncontaminated soil fill operations.

I. Source Location Information

(Describe the location of the source of the uncontaminated soil)

Project Name: Des Plaines River Trail Segment 2 Pavement Rehab Office Phone Number, if available: 847-823-0500

Physical Site Location (address, including number and street):
Des Plaines River Trail from west of Bryn Mawr Avenue to Devon Avenue

City: Rosemont State: IL Zip Code: 60068

County: Cook Township: Chicago City

Lat/Long of approximate center of site in decimal degrees (DD.ddddd) to five decimal places (e.g., 40.67890, -90.12345):

Latitude: 41.98943 (Decimal Degrees) Longitude: -87.84843 (-Decimal Degrees)

Identify how the lat/long data were determined:

○ GPS ○ Map Interpolation ○ Photo Interpolation ○ Survey ✓ Other

EDR First Report

IEPA Site Number(s), if assigned: BOL: None BOW: None BOA: None

Approximate Start Date (mm/dd/yyyy): Approximate End Date (mm/dd/yyyy):

Estimated Volume of debris (cu. Yd.):

II. Owner/Operator Information for Source Site

Site Owner

Name: Forest Preserve District of Cook Co.
Street Address: 536 N Harlem Avenue
PO Box:
City: River Forest State: IL
Zip Code: 60305 Phone:
Contact: Pam Sielski
Email, if available: pamela.sielski@cookcountyil.gov

Site Operator

Name:
Street Address:
PO Box:
City: State:
Zip Code: Phone:
Contact:
Email, if available:

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed $50,000 for the violation and an additional civil penalty of not to exceed $10,000 for each day during which the violation continues (415 ILCS 5/42). This form has been approved by the Forms Management Center.

L-93,302

Project Name: Des Plaines River Trail Segment 2 Pavement Rehab Latitude: 41.98943 Longitude: - 87.84843

Uncontaminated Soil Certification

III. Basis for Certification and Attachments

For each item listed below, reference the attachments to this form that provide the required information.

a. A Description of the soil sample points and how they were determined to be sufficient in number and appropriately located 35 Ill. Adm. Code 1100.610(a)]:

See attached report. Topographic maps and aerials reviewed to 1891. Source site agricultural/wooded since before that time. Dee Road along north after 1948. I-90 through middle after 1960. Commercial areas on southeast after 1963. EDR identified nearby properties to Site on environmental database search. 12 soil borings performed.

b. Analytical soil testing results to show that soil chemical constituents comply with the maximum allowable concentrations established pursuant to 35 Ill. Adm. Code Part 1100, Subpart F and that the soil pH is within the range of 6.25 to 9.0,including the documentation of chain of custody control, a copy of the lab analysis; the accreditation status of the laboratory performing the analysis; and certification by an authorized agent of the laboratory that the analysis has been performed in accordance with the Agency's rules for the accreditation of environmental and the scope of the accreditation [35 Ill. Adm. Code 1100.201 (g), 1100.205(a), 1100.610]:

Samples PID screened identified no volatile organics. Samples C-1, C-2, C-4 and B-101, representing Site conditions, collected for analysis of VOCs, PNAs, total RCRA metals, & pH. Analytical results verify the soil meets MACs. pH of 8.65 for C-1, 7.93 for C-2, 7.23 for C-4, and 8.31 for B-101 also between 6.25 and 9.0, therefore, soil is uncontaminated.

IV. Certification Statement, Signature and Seal of Licensed Professional Engineer or Licensed Professional Geologist

I, Aaron J. Ulrey (name of licensed professional engineer or geologist) certify under penalty of law that the information submitted, including but not limited to, all attachments and other information, is to the best of my knowledge and belief, true, accurate and complete. In accordance with the Environmental Protection Act [415 ILCS 5/22.51 or 22.51a] and 35 Ill. Adm. Code 1100.205(a), I certify that the soil from this site is uncontaminated soil. I also certify that the soil pH is within the range of 6.25 to 9.0. In addition, I certify that the soil has not been removed from the site as part of a cleanup or removal of contaminants. All necessary documentation is attached.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Company Name:	Testing Service Corporation
Street Address:	360 South Main Place
City:	Carol Stream State: IL Zip Code: 60188
Phone:	630-462-2600

Aaron J. Ulrey
Printed Name:

Licensed Professional Engineer or
Licensed Professional Geologist Signature:

12-13-2021
Date:

P.E or L.P.G. Seal:

AARON JON ULREY
196.001390
REGISTERED
PROFESSIONAL
GEOLOGIST
STATE OF ILLINOIS

L-93,302

ACCESSIBLE PEDESTRIAN SIGNALS (APS) (BDE)

Effective: April 1, 2003
Revised: January 1, 2022

Description. This work shall consist of furnishing and installing accessible pedestrian signals (APS). Each APS shall consist of an interactive vibrotactile pedestrian pushbutton with speaker, an informational sign, a light emitting diode (LED) indicator light, a solid-state electronic control board, a power supply, wiring, and mounting hardware. The APS shall meet the requirements of the MUTCD and Sections 801 and 888 of the Standard Specifications, except as modified herein.

Electrical Requirements. The APS shall operate with systems providing 95 to 130 VAC, 60 Hz and throughout an ambient air temperature range of -29 to +160 °F (-34 to +70 °C).

The APS shall contain a power protection circuit consisting of both fuse and transient protection.

Audible Indications. A pushbutton locator tone shall sound at each pushbutton and shall be deactivated during the associated walk indication and when associated traffic signals are in flashing mode. Pushbutton locator tones shall have a duration of 0.15 seconds or less and shall repeat at 1-second intervals. Each actuation of the pushbutton shall be accompanied by the speech message "Wait".

If two accessible pedestrian pushbuttons are placed less than 10 ft (3 m) apart or placed on the same pole, the audible walk indication shall be a speech walk message. This message shall sound throughout the WALK interval only. The verbal message shall be modeled after: "'Street Name.' Walk Sign is on to cross "Street Name'." For signalized intersections utilizing exclusive pedestrian phasing, the verbal message shall be "Walk sign is on for all crossings". In addition, a speech pushbutton information message shall be provided by actuating the APS pushbutton when the WALK interval is not timing. This verbal message shall be modeled after: "Wait. Wait to cross 'Street Name' at 'Street Name'".

Where two accessible pedestrian pushbuttons are separated by at least 10 ft (3 m), the walk indication shall be an audible percussive tone. It shall repeat at 8 to 10 ticks per second with a dominant frequency of 880 Hz.

Automatic volume adjustments in response to ambient traffic sound level shall be provided up to a maximum volume of 100 dBA. Locator tone and verbal messages shall be no more than 5 dB louder than ambient sound.

At locations with railroad interconnection, an additional speech message stating "Walk time shortened when train approaches" shall be used after the speech walk message. At locations with emergency vehicle preemption, an additional speech message "Walk time shortened when emergency vehicle approaches" shall be used after the speech walk message.

Pedestrian Pushbutton. Pedestrian pushbuttons shall be at least 2 in. (50 mm) in diameter or width. The force required to activate the pushbutton shall be no greater than 3.5 lb (15.5 N).

A red LED shall be located on or near the pushbutton which, when activated, acknowledges the pedestrians request to cross the street.

Signage. A sign shall be located immediately above the pedestrian pushbutton and parallel to the crosswalk controlled by the pushbutton. The sign shall conform to one of the following standard MUTCD designs: R10-3, R10-3a, R10-3e, R10-3i, R10-4, and R10-4a.

Tactile Arrow. A tactile arrow, pointing in the direction of travel controlled by a pushbutton, shall be provided on the pushbutton.

Vibrotactile Feature. The pushbutton shall pulse when depressed and shall vibrate continuously throughout the WALK interval.

Method of Measurement. This work will be measured for payment as each, per pushbutton.

Basis of Payment. This work will be paid for at the contract unit price per each for ACCESSIBLE PEDESTRIAN SIGNALS.

80099

AGGREGATE SUBGRADE IMPROVEMENT (BDE)

Effective: April 1, 2012
Revised: April 1, 2022

Add the following Section to the Standard Specifications:

"**SECTION 303. AGGREGATE SUBGRADE IMPROVEMENT**

303.01 Description. This work shall consist of constructing an aggregate subgrade improvement (ASI).

303.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Coarse Aggregate	1004.07
(b) Reclaimed Asphalt Pavement (RAP)	1031.09

303.03 Equipment. The vibratory roller shall be according to Article 1101.01, or as approved by the Engineer. Vibratory machines, such as tampers, shall be used in areas where rollers do not fit.

303.04 Soil Preparation. The minimum immediate bearing value (IBV) of the soil below the improved subgrade shall be according to the Department's "Subgrade Stability Manual" for the aggregate thickness specified.

303.05 Placing and Compacting. The maximum nominal lift thickness of aggregate gradations CA 2, CA 6, and CA 10 when compacted shall be 9 in. (225 mm). The maximum nominal lift thickness of aggregate gradations CS 1, CS 2, and RR 1 when compacted shall be 24 in. (600 mm).

The top surface of the aggregate subgrade improvement shall consist of a layer of capping aggregate gradations CA 6 or CA 10 that is 3 in. (75 mm) thick after compaction. Capping aggregate will not be required when aggregate subgrade improvement is used as a cubic yard pay item for undercut applications.

Each lift of aggregate shall be compacted to the satisfaction of the Engineer. If the moisture content of the material is such that compaction cannot be obtained, sufficient water shall be added so that satisfactory compaction can be obtained.

303.06 Finishing and Maintenance. The aggregate subgrade improvement shall be finished to the lines, grades, and cross sections shown on the plans, or as directed by the Engineer. The aggregate subgrade improvement shall be maintained in a smooth and compacted condition.

303.07 Method of Measurement. This work will be measured for payment according to Article 311.08.

303.08 Basis of Payment. This work will be paid for at the contract unit price per cubic yard (cubic meter) or ton (metric ton) for AGGREGATE SUBGRADE IMPROVEMENT or at the contract unit price per square yard (square meter) for AGGREGATE SUBGRADE IMPROVEMENT, of the thickness specified."

Add the following to Section 1004 of the Standard Specifications:

"**1004.07 Coarse Aggregate for Aggregate Subgrade Improvement (ASI).** The aggregate shall be according to Article 1004.01 and the following.

(a) Description. The coarse aggregate shall be crushed gravel, crushed stone, or crushed concrete. In applications where greater than 24 in. (600 mm) of ASI material is required, gravel may be used below the top 12 in (300 mm) of ASI.

(b) Quality. The coarse aggregate shall consist of sound durable particles reasonably free of deleterious materials.

(c) Gradation.

(1) The coarse aggregate gradation for total ASI thickness less than or equal to 12 in. (300 mm) shall be CA 2, CA 6, CA 10, or CS 1.

The coarse aggregate gradation for total ASI thickness greater than 12 in. (300 mm) shall be CS 1 or CS 2 as shown below or RR 1 according to Article 1005.01(c).

	COARSE AGGREGATE SUBGRADE GRADATIONS				
Grad No.	Sieve Size and Percent Passing				
	8"	6"	4"	2"	#4
CS 1	100	97 ± 3	90 ± 10	45 ± 25	20 ± 20
CS 2		100	80 ± 10	25 ± 15	

	COARSE AGGREGATE SUBGRADE GRADATIONS (Metric)				
Grad No.	Sieve Size and Percent Passing				
	200 mm	150 mm	100 mm	50 mm	4.75 mm
CS 1	100	97 ± 3	90 ± 10	45 ± 25	20 ± 20
CS 2		100	80 ± 10	25 ± 15	

(2) Capping aggregate shall be gradation CA 6 or CA 10."

Add the following to Article 1031.09 of the Standard Specifications:

"(b) RAP in Aggregate Subgrade Improvement (ASI). RAP in ASI shall be according to Articles 1031.01(a), 1031.02(a), 1031.06(a)(1), and 1031.06(a)(2), and the following.

(1) The testing requirements of Article 1031.03 shall not apply.

(2) Crushed RAP used for the lower lift may be mechanically blended with aggregate gradations CS 1, CS 2, and RR 1 but it shall be no greater than 40 percent of the total product volume. RAP agglomerations shall be no greater than 4 in. (100 mm).

(3) For capping aggregate, well graded RAP having 100 percent passing the 1 1/2 in. (38 mm) sieve may be used when aggregate gradations CS 1, CS 2, CA 2, or RR 1 are used in the lower lift. FRAP will not be permitted as capping material.

Blending shall be through calibrated interlocked feeders or a calibrated blending plant such that the prescribed blending percentage is maintained throughout the blending process. The calibration shall have an accuracy of ± 2.0 percent of the actual quantity of material delivered."

80274

BLENDED FINELY DIVIDED MINERALS (BDE)

Effective: April 1, 2021

Revise the second paragraph of Article 1010.01 of the Standard Specifications to read:

"Different sources or types of finely divided minerals shall not be mixed or used alternately in the same item of construction, except as a blended finely divided mineral product according to Article 1010.06."

Add the following article to Section 1010 of the Standard Specifications:

"**1010.06 Blended Finely Divided Minerals.** Blended finely divided minerals shall be the product resulting from the blending or intergrinding of two or three finely divided minerals. Blended finely divided minerals shall be according to ASTM C 1697, except as follows.

(a) Blending shall be accomplished by mechanically or pneumatically intermixing the constituent finely divided minerals into a uniform mixture that is then discharged into a silo for storage or tanker for transportation.

(b) The blended finely divided mineral product will be classified according to its predominant constituent or the manufacturer's designation and shall meet the chemical requirements of its classification. The other finely divided mineral constituent(s) will not be required to conform to their individual standards."

80436

COMPENSABLE DELAY COSTS (BDE)

Effective: June 2, 2017
Revised: April 1, 2019

Revise Article 107.40(b) of the Standard Specifications to read:

"(b) Compensation. Compensation will not be allowed for delays, inconveniences, or damages sustained by the Contractor from conflicts with facilities not meeting the above definition; or if a conflict with a utility in an unanticipated location does not cause a shutdown of the work or a documentable reduction in the rate of progress exceeding the limits set herein. The provisions of Article 104.03 notwithstanding, compensation for delays caused by a utility in an unanticipated location will be paid according to the provisions of this Article governing minor and major delays or reduced rate of production which are defined as follows.

(1) Minor Delay. A minor delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two hours, but not to exceed two weeks.

(2) Major Delay. A major delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two weeks.

(3) Reduced Rate of Production Delay. A reduced rate of production delay occurs when the rate of production on the work in conflict with the utility in an unanticipated location decreases by more than 25 percent and lasts longer than seven calendar days."

Revise Article 107.40(c) of the Standard Specifications to read:

"(c) Payment. Payment for Minor, Major, and Reduced Rate of Production Delays will be made as follows.

(1) Minor Delay. Labor idled which cannot be used on other work will be paid for according to Article 109.04(b)(1) and (2) for the time between start of the delay and the minimum remaining hours in the work shift required by the prevailing practice in the area.

Equipment idled which cannot be used on other work, and which is authorized to standby on the project site by the Engineer, will be paid for according to Article 109.04(b)(4).

(2) Major Delay. Labor will be the same as for a minor delay.

Equipment will be the same as for a minor delay, except Contractor-owned equipment will be limited to two weeks plus the cost of move-out to either the

Contractor's yard or another job and the cost to re-mobilize, whichever is less. Rental equipment may be paid for longer than two weeks provided the Contractor presents adequate support to the Department (including lease agreement) to show retaining equipment on the job is the most economical course to follow and in the public interest.

(3) Reduced Rate of Production Delay. The Contractor will be compensated for the reduced productivity for labor and equipment time in excess of the 25 percent threshold for that portion of the delay in excess of seven calendar days. Determination of compensation will be in accordance with Article 104.02, except labor and material additives will not be permitted.

Payment for escalated material costs, escalated labor costs, extended project overhead, and extended traffic control will be determined according to Article 109.13."

Revise Article 108.04(b) of the Standard Specifications to read:

"(b) No working day will be charged under the following conditions.

(1) When adverse weather prevents work on the controlling item.

(2) When job conditions due to recent weather prevent work on the controlling item.

(3) When conduct or lack of conduct by the Department or its consultants, representatives, officers, agents, or employees; delay by the Department in making the site available; or delay in furnishing any items required to be furnished to the Contractor by the Department prevents work on the controlling item.

(4) When delays caused by utility or railroad adjustments prevent work on the controlling item.

(5) When strikes, lock-outs, extraordinary delays in transportation, or inability to procure critical materials prevent work on the controlling item, as long as these delays are not due to any fault of the Contractor.

(6) When any condition over which the Contractor has no control prevents work on the controlling item."

Revise Article 109.09(f) of the Standard Specifications to read:

"(f) Basis of Payment. After resolution of a claim in favor of the Contractor, any adjustment in time required for the work will be made according to Section 108. Any adjustment in the costs to be paid will be made for direct labor, direct materials, direct equipment, direct jobsite overhead, direct offsite overhead, and other direct costs allowed by the resolution. Adjustments in costs will not be made for interest charges, loss of anticipated profit, undocumented loss of efficiency, home office overhead and unabsorbed overhead

other than as allowed by Article 109.13, lost opportunity, preparation of claim expenses and other consequential indirect costs regardless of method of calculation.

The above Basis of Payment is an essential element of the contract and the claim cost recovery of the Contractor shall be so limited."

Add the following to Section 109 of the Standard Specifications.

"**109.13 Payment for Contract Delay.** Compensation for escalated material costs, escalated labor costs, extended project overhead, and extended traffic control will be allowed when such costs result from a delay meeting the criteria in the following table.

Contract Type	Cause of Delay	Length of Delay
Working Days	Article 108.04(b)(3) or Article 108.04(b)(4)	No working days have been charged for two consecutive weeks.
Completion Date	Article 108.08(b)(1) or Article 108.08(b)(7)	The Contractor has been granted a minimum two week extension of contract time, according to Article 108.08.

Payment for each of the various costs will be according to the following.

(a) Escalated Material and/or Labor Costs. When the delay causes work, which would have otherwise been completed, to be done after material and/or labor costs have increased, such increases will be paid. Payment for escalated material costs will be limited to the increased costs substantiated by documentation furnished by the Contractor. Payment for escalated labor costs will be limited to those items in Article 109.04(b)(1) and (2), except the 35 percent and 10 percent additives will not be permitted.

(b) Extended Project Overhead. For the duration of the delay, payment for extended project overhead will be paid as follows.

(1) Direct Jobsite and Offsite Overhead. Payment for documented direct jobsite overhead and documented direct offsite overhead, including onsite supervisory and administrative personnel, will be allowed according to the following table.

Original Contract Amount	Supervisory and Administrative Personnel
Up to $5,000,000	One Project Superintendent
Over $ 5,000,000 - up to $25,000,000	One Project Manager, One Project Superintendent or Engineer, and One Clerk
Over $25,000,000 - up to $50,000,000	One Project Manager, One Project Superintendent, One Engineer, and

	One Clerk
Over $50,000,000	One Project Manager, Two Project Superintendents, One Engineer, and One Clerk

(2) Home Office and Unabsorbed Overhead. Payment for home office and unabsorbed overhead will be calculated as 8 percent of the total delay cost.

(c) Extended Traffic Control. Traffic control required for an extended period of time due to the delay will be paid for according to Article 109.04.

When an extended traffic control adjustment is paid under this provision, an adjusted unit price as provided for in Article 701.20(a) for increase or decrease in the value of work by more than ten percent will not be paid.

Upon payment for a contract delay under this provision, the Contractor shall assign subrogation rights to the Department for the Department's efforts of recovery from any other party for monies paid by the Department as a result of any claim under this provision. The Contractor shall fully cooperate with the Department in its efforts to recover from another party any money paid to the Contractor for delay damages under this provision."

80384

CONSTRUCTION AIR QUALITY – DIESEL RETROFIT (BDE)

Effective: June 1, 2010
Revised: November 1, 2014

The reduction of emissions of particulate matter (PM) for off-road equipment shall be accomplished by installing retrofit emission control devices. The term "equipment" refers to diesel fuel powered devices rated at 50 hp and above, to be used on the jobsite in excess of seven calendar days over the course of the construction period on the jobsite (including rental equipment).

Contractor and subcontractor diesel powered off-road equipment assigned to the contract shall be retrofitted using the phased in approach shown below. Equipment that is of a model year older than the year given for that equipment's respective horsepower range shall be retrofitted:

Effective Dates	Horsepower Range	Model Year
June 1, 2010 [1/]	600-749	2002
	750 and up	2006
June 1, 2011 [2/]	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006
June 1, 2012 [2/]	50-99	2004
	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006

1/ Effective dates apply to Contractor diesel powered off-road equipment assigned to the contract.

2/ Effective dates apply to Contractor and subcontractor diesel powered off-road equipment assigned to the contract.

The retrofit emission control devices shall achieve a minimum PM emission reduction of 50 percent and shall be:

a) Included on the U.S. Environmental Protection Agency (USEPA) *Verified Retrofit Technology List* (http://www.epa.gov/cleandiesel/verification/verif-list.htm), or verified by the California Air Resources Board (CARB) (http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm); or

b) Retrofitted with a non-verified diesel retrofit emission control device if verified retrofit emission control devices are not available for equipment proposed to be used on the project, and if the Contractor has obtained a performance certification from the retrofit

device manufacturer that the emission control device provides a minimum PM emission reduction of 50 percent.

Note: Large cranes (Crawler mounted cranes) which are responsible for critical lift operations are exempt from installing retrofit emission control devices if such devices adversely affect equipment operation.

Diesel powered off-road equipment with engine ratings of 50 hp and above, which are unable to be retrofitted with verified emission control devices or if performance certifications are not available which will achieve a minimum 50 percent PM reduction, may be granted a waiver by the Department if documentation is provided showing good faith efforts were made by the Contractor to retrofit the equipment.

Construction shall not proceed until the Contractor submits a certified list of the diesel powered off-road equipment that will be used, and as necessary, retrofitted with emission control devices. The list(s) shall include (1) the equipment number, type, make, Contractor/rental company name; and (2) the emission control devices make, model, USEPA or CARB verification number, or performance certification from the retrofit device manufacturer. Equipment reported as fitted with emissions control devices shall be made available to the Engineer for visual inspection of the device installation, prior to being used on the jobsite.

The Contractor shall submit an updated list of retrofitted off-road construction equipment as retrofitted equipment changes or comes on to the jobsite. The addition or deletion of any diesel powered equipment shall be included on the updated list.

If any diesel powered off-road equipment is found to be in non-compliance with any portion of this special provision, the Engineer will issue the Contractor a diesel retrofit deficiency deduction.

Any costs associated with retrofitting any diesel powered off-road equipment with emission control devices shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed. The Contractor's compliance with this notice and any associated regulations shall not be grounds for a claim.

Diesel Retrofit Deficiency Deduction

When the Engineer determines that a diesel retrofit deficiency exists, a daily monetary deduction will be imposed for each calendar day or fraction thereof the deficiency continues to exist. The calendar day(s) will begin when the time period for correction is exceeded and end with the Engineer's written acceptance of the correction. The daily monetary deduction will be $1,000.00 for each deficiency identified.

The deficiency will be based on lack of diesel retrofit emissions control.

If a Contractor accumulates three diesel retrofit deficiency deductions for the same piece of equipment in a contract period, the Contractor will be shutdown until the deficiency is corrected.

Such a shutdown will not be grounds for any extension of the contract time, waiver of penalties, or be grounds for any claim.

80261

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (BDE)

Effective: September 1, 2000
Revised: March 2, 2019

FEDERAL OBLIGATION. The Department of Transportation, as a recipient of federal financial assistance, is required to take all necessary and reasonable steps to ensure nondiscrimination in the award and administration of contracts. Consequently, the federal regulatory provisions of 49 CFR Part 26 apply to this contract concerning the utilization of disadvantaged business enterprises. For the purposes of this Special Provision, a disadvantaged business enterprise (DBE) means a business certified by the Department in accordance with the requirements of 49 CFR Part 26 and listed in the Illinois Unified Certification Program (IL UCP) DBE Directory.

STATE OBLIGATION. This Special Provision will also be used by the Department to satisfy the requirements of the Business Enterprise for Minorities, Females, and Persons with Disabilities Act, 30 ILCS 575. When this Special Provision is used to satisfy state law requirements on 100 percent state-funded contracts, the federal government has no involvement in such contracts (not a federal-aid contract) and no responsibility to oversee the implementation of this Special Provision by the Department on those contracts. DBE participation on 100 percent state-funded contracts will not be credited toward fulfilling the Department's annual overall DBE goal required by the US Department of Transportation to comply with the federal DBE program requirements.

CONTRACTOR ASSURANCE. The Contractor makes the following assurance and agrees to include the assurance in each subcontract the Contractor signs with a subcontractor.

> The Contractor, subrecipient, or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of contracts funded in whole or in part with federal or state funds. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:
>
> (a) Withholding progress payments;
>
> (b) Assessing sanctions;
>
> (c) Liquidated damages; and/or
>
> (d) Disqualifying the Contractor from future bidding as non-responsible.

OVERALL GOAL SET FOR THE DEPARTMENT. As a requirement of compliance with 49 CFR Part 26, the Department has set an overall goal for DBE participation in its federally assisted contracts. That goal applies to all federal-aid funds the Department will expend in its federally assisted contracts for the subject reporting fiscal year. The Department is required to make a

good faith effort to achieve the overall goal. The dollar amount paid to all approved DBE companies performing work called for in this contract is eligible to be credited toward fulfillment of the Department's overall goal.

CONTRACT GOAL TO BE ACHIEVED BY THE CONTRACTOR. This contract includes a specific DBE utilization goal established by the Department. The goal has been included because the Department has determined the work of this contract has subcontracting opportunities that may be suitable for performance by DBE companies. The determination is based on an assessment of the type of work, the location of the work, and the availability of DBE companies to do a part of the work. The assessment indicates, in the absence of unlawful discrimination and in an arena of fair and open competition, DBE companies can be expected to perform 15.00 % of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set for in this Special Provision:

(a) The bidder documents enough DBE participation has been obtained to meet the goal or,

(b) The bidder documents a good faith effort has been made to meet the goal, even though the effort did not succeed in obtaining enough DBE participation to meet the goal.

DBE LOCATOR REFERENCES. Bidders shall consult the IL UCP DBE Directory as a reference source for DBE-certified companies. In addition, the Department maintains a letting and item specific DBE locator information system whereby DBE companies can register their interest in providing quotes on particular bid items advertised for letting. Information concerning DBE companies willing to quote work for particular contracts may be obtained by contacting the Department's Bureau of Small Business Enterprises at telephone number (217) 785-4611, or by visiting the Department's website at:
http://www.idot.illinois.gov/doing-business/certifications/disadvantaged-business-enterprise-certification/il-ucp-directory/index.

BIDDING PROCEDURES. Compliance with this Special Provision is a material bidding requirement and failure of the bidder to comply will render the bid not responsive.

The bidder shall submit a DBE Utilization Plan (form SBE 2026), and a DBE Participation Statement (form SBE 2025) for each DBE company proposed for the performance of work to achieve the contract goal, with the bid. If the Utilization Plan indicates the contract goal will not be met, documentation of good faith efforts shall also be submitted. The documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor is selected over a DBE for work on the contract. The required forms and documentation must be submitted as a single .pdf file using the "Integrated Contractor Exchange (iCX)" application within the Department's "EBids System".

The Department will not accept a Utilization Plan if it does not meet the bidding procedures set forth herein and the bid will be declared not responsive. In the event the bid is declared not responsive, the Department may elect to cause the forfeiture of the penal sum of the bidder's proposal guaranty and may deny authorization to bid the project if re-advertised for bids.

GOOD FAITH EFFORT PROCEDURES. The contract will not be awarded until the Utilization Plan is approved. All information submitted by the bidder must be complete, accurate and adequately document enough DBE participation has been obtained or document the good faith efforts of the bidder, in the event enough DBE participation has not been obtained, before the Department will commit to the performance of the contract by the bidder. The Utilization Plan will be approved by the Department if the Utilization Plan documents sufficient commercially useful DBE work to meet the contract goal or the bidder submits sufficient documentation of a good faith effort to meet the contract goal pursuant to 49 CFR Part 26, Appendix A. This means the bidder must show that all necessary and reasonable steps were taken to achieve the contract goal. Necessary and reasonable steps are those which, by their scope, intensity and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not successful. The Department will consider the quality, quantity, and intensity of the kinds of efforts the bidder has made. Mere *pro forma* efforts, in other words efforts done as a matter of form, are not good faith efforts; rather, the bidder is expected to have taken genuine efforts that would be reasonably expected of a bidder actively and aggressively trying to obtain DBE participation sufficient to meet the contract goal.

(a) The following is a list of types of action that the Department will consider as part of the evaluation of the bidder's good faith efforts to obtain participation. These listed factors are not intended to be a mandatory checklist and are not intended to be exhaustive. Other factors or efforts brought to the attention of the Department may be relevant in appropriate cases and will be considered by the Department.

(1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBE companies that have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBE companies to respond to the solicitation. The bidder must determine with certainty if the DBE companies are interested by taking appropriate steps to follow up initial solicitations.

(2) Selecting portions of the work to be performed by DBE companies in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Contractor might otherwise prefer to perform these work items with its own forces.

(3) Providing interested DBE companies with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

(4) a. Negotiating in good faith with interested DBE companies. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBE companies that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBE companies to perform the work.

b. A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBE companies is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also the ability or desire of a bidder to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidders are not, however, required to accept higher quotes from DBE companies if the price difference is excessive or unreasonable. In accordance with the above Bidding Procedures, the documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract.

(5) Not rejecting DBE companies as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.

(6) Making efforts to assist interested DBE companies in obtaining bonding, lines of credit, or insurance as required by the recipient or Contractor.

(7) Making efforts to assist interested DBE companies in obtaining necessary equipment, supplies, materials, or related assistance or services.

(8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBE companies.

(b) If the Department determines the bidder has made a good faith effort to secure the work commitment of DBE companies to meet the contract goal, the Department will award the contract provided it is otherwise eligible for award. If the Department determines the

bidder has failed to meet the requirements of this Special Provision or that a good faith effort has not been made, the Department will notify the responsible company official designated in the Utilization Plan that the bid is not responsive. The notification will also include a statement of reasons for the adverse determination. If the Utilization Plan is not approved because it is deficient as a technical matter, unless waived by the Department, the bidder will be notified and will be allowed no more than a five calendar day period to cure the deficiency.

(c) The bidder may request administrative reconsideration of an adverse determination by emailing the Department at "DOT.DBE.UP@illinois.gov" within the five calendar days after the receipt of the notification of the determination. The determination shall become final if a request is not made on or before the fifth calendar day. A request may provide additional written documentation or argument concerning the issues raised in the determination statement of reasons, provided the documentation and arguments address efforts made prior to submitting the bid. The request will be reviewed by the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person to consider all issues of documentation and whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten working days after receipt of the request for reconsideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

CALCULATING DBE PARTICIPATION. The Utilization Plan values represent work anticipated to be performed and paid for upon satisfactory completion. The Department is only able to count toward the achievement of the overall goal and the contract goal the value of payments made for the work actually performed by DBE companies. In addition, a DBE must perform a commercially useful function on the contract to be counted. A commercially useful function is generally performed when the DBE is responsible for the work and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. The Department and Contractor are governed by the provisions of 49 CFR Part 26.55(c) on questions of commercially useful functions as it affects the work. Specific counting guidelines are provided in 49 CFR Part 26.55, the provisions of which govern over the summary contained herein.

(a) DBE as the Contractor: 100 percent goal credit for that portion of the work performed by the DBE's own forces, including the cost of materials and supplies. Work that a DBE subcontracts to a non-DBE does not count toward the DBE goals.

(b) DBE as a joint venture Contractor: 100 percent goal credit for that portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work performed by the DBE's own forces.

(c) DBE as a subcontractor: 100 percent goal credit for the work of the subcontract performed by the DBE's own forces, including the cost of materials and supplies, excluding the purchase of materials and supplies or the lease of equipment by the DBE subcontractor from the Contractor or its affiliates. Work that a DBE subcontractor in turn subcontracts to a non-DBE does not count toward the DBE goal.

(d) DBE as a trucker: 100 percent goal credit for trucking participation provided the DBE is responsible for the management and supervision of the entire trucking operation for which it is responsible. At least one truck owned, operated, licensed, and insured by the DBE must be used on the contract. Credit will be given for the following:

(1) The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.

(2) The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission is receives as a result of the lease arrangement.

(e) DBE as a material supplier:

(1) 60 percent goal credit for the cost of the materials or supplies purchased from a DBE regular dealer.

(2) 100 percent goal credit for the cost of materials of supplies obtained from a DBE manufacturer.

(3) 100 percent credit for the value of reasonable fees and commissions for the procurement of materials and supplies if not a DBE regular dealer or DBE manufacturer.

CONTRACT COMPLIANCE. Compliance with this Special Provision is an essential part of the contract. The Department is prohibited by federal regulations from crediting the participation of a DBE included in the Utilization Plan toward either the contract goal or the Department's overall goal until the amount to be applied toward the goals has been paid to the DBE. The following administrative procedures and remedies govern the compliance by the Contractor with the contractual obligations established by the Utilization Plan. After approval of the Utilization Plan and award of the contract, the Utilization Plan and individual DBE Participation Statements become part of the contract. If the Contractor did not succeed in obtaining enough DBE participation to achieve the advertised contract goal, and the Utilization Plan was approved and contract awarded based upon a determination of good faith, the total dollar value of DBE work calculated in the approved Utilization Plan as a percentage of the awarded contract value shall become the amended contract goal. All work indicated for performance by an approved DBE shall be performed, managed, and supervised by the DBE executing the DBE Participation Commitment Statement.

(a) NO AMENDMENT. No amendment to the Utilization Plan may be made without prior written approval from the Department's Bureau of Small Business Enterprises. All requests for amendment to the Utilization Plan shall be emailed to the Department at DOT.DBE.UP@illinois.gov.

(b) CHANGES TO WORK. Any deviation from the DBE condition-of-award or contract plans, specifications, or special provisions must be approved, in writing, by the Department as provided elsewhere in the Contract. The Contractor shall notify affected DBEs in writing of any changes in the scope of work which result in a reduction in the dollar amount condition-of-award to the contract. Where the revision includes work committed to a new DBE subcontractor, not previously involved in the project, then a Request for Approval of Subcontractor, Department form BC 260A or AER 260A, must be signed and submitted. If the commitment of work is in the form of additional tasks assigned to an existing subcontract, a new Request for Approval of Subcontractor will not be required. However, the Contractor must document efforts to assure the existing DBE subcontractor is capable of performing the additional work and has agreed in writing to the change.

(c) SUBCONTRACT. The Contractor must provide copies of DBE subcontracts to the Department upon request. Subcontractors shall ensure that all lower tier subcontracts or agreements with DBEs to supply labor or materials be performed in accordance with this Special Provision.

(d) ALTERNATIVE WORK METHODS. In addition to the above requirements for reductions in the condition of award, additional requirements apply to the two cases of Contractor-initiated work substitution proposals. Where the contract allows alternate work methods which serve to delete or create underruns in condition of award DBE work, and the Contractor selects that alternate method or, where the Contractor proposes a substitute work method or material that serves to diminish or delete work committed to a DBE and replace it with other work, then the Contractor must demonstrate one of the following:

(1) The replacement work will be performed by the same DBE (as long as the DBE is certified in the respective item of work) in a modification of the condition of award; or

(2) The DBE is aware its work will be deleted or will experience underruns and has agreed in writing to the change. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so; or

(3) The DBE is not capable of performing the replacement work or has declined to perform the work at a reasonable competitive price. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so.

(e) TERMINATION AND REPLACEMENT PROCEDURES. The Contractor shall not terminate or replace a DBE listed on the approved Utilization Plan, or perform with other forces work designated for a listed DBE except as provided in this Special Provision. The Contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the Contractor obtains the Department's written consent as provided in subsection (a) of this part. Unless Department consent is provided for termination of a DBE subcontractor, the Contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the DBE in the Utilization Plan.

As stated above, the Contractor shall not terminate or replace a DBE subcontractor listed in the approved Utilization Plan without prior written consent. This includes, but is not limited to, instances in which the Contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm. Written consent will be granted only if the Bureau of Small Business Enterprises agrees, for reasons stated in its concurrence document, that the Contractor has good cause to terminate or replace the DBE firm. Before transmitting to the Bureau of Small Business Enterprises any request to terminate and/or substitute a DBE subcontractor, the Contractor shall give notice in writing to the DBE subcontractor, with a copy to the Bureau, of its intent to request to terminate and/or substitute, and the reason for the request. The Contractor shall give the DBE five days to respond to the Contractor's notice. The DBE so notified shall advise the Bureau and the Contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why the Bureau should not approve the Contractor's action. If required in a particular case as a matter of public necessity, the Bureau may provide a response period shorter than five days.

For purposes of this paragraph, good cause includes the following circumstances:

(1) The listed DBE subcontractor fails or refuses to execute a written contract;

(2) The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the Contractor;

(3) The listed DBE subcontractor fails or refuses to meet the Contractor's reasonable, nondiscriminatory bond requirements;

(4) The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;

(5) The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1200 or applicable state law.

(6) The Contractor has determined the listed DBE subcontractor is not a responsible contractor;

(7) The listed DBE subcontractor voluntarily withdraws from the projects and provides written notice to the Contractor of its withdrawal;

(8) The listed DBE is ineligible to receive DBE credit for the type of work required;

(9) A DBE owner dies or becomes disabled with the result that the listed DBE subcontractor is unable to complete its work on the contract;

(10) Other documented good cause that compels the termination of the DBE subcontractor. Provided, that good cause does not exist if the Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the Contractor can self-perform the work for which the DBE contractor was engaged or so that the Contractor can substitute another DBE or non-DBE contractor after contract award.

When a DBE is terminated or fails to complete its work on the Contract for any reason, the Contractor shall make a good faith effort to find another DBE to substitute for the original DBE to perform at least the same amount of work under the contract as the terminated DBE to the extent needed to meet the established Contract goal. The good faith efforts shall be documented by the Contractor. If the Department requests documentation under this provision, the Contractor shall submit the documentation within seven days, which may be extended for an additional seven days if necessary at the request of the Contractor. The Department will provide a written determination to the Contractor stating whether or not good faith efforts have been demonstrated.

(f) FINAL PAYMENT. After the performance of the final item of work or delivery of material by a DBE and final payment therefore to the DBE by the Contractor, but not later than 30 calendar days after payment has been made by the Department to the Contractor for such work or material, the Contractor shall submit a DBE Payment Agreement on Department form SBE 2115 to the Resident Engineer. If full and final payment has not been made to the DBE, the DBE Payment Agreement shall indicate whether a disagreement as to the payment required exists between the Contractor and the DBE or if the Contractor believes the work has not been satisfactorily completed. If the Contractor does not have the full amount of work indicated in the Utilization Plan performed by the DBE companies indicated in the Utilization Plan and after good faith efforts are reviewed, the Department may deduct from contract payments to the Contractor the amount of the goal not achieved as liquidated and ascertained damages. The Contractor may request an administrative reconsideration of any amount deducted as damages pursuant to subsection (h) of this part.

(g) ENFORCEMENT. The Department reserves the right to withhold payment to the Contractor to enforce the provisions of this Special Provision. Final payment shall not be

made on the contract until such time as the Contractor submits sufficient documentation demonstrating achievement of the goal in accordance with this Special Provision or after liquidated damages have been determined and collected.

(h) RECONSIDERATION. Notwithstanding any other provision of the contract, including but not limited to Article 109.09 of the Standard Specifications, the Contractor may request administrative reconsideration of a decision to deduct the amount of the goal not achieved as liquidated damages. A request to reconsider shall be delivered to the Contract Compliance Section and shall be handled and considered in the same manner as set forth in paragraph (c) of "Good Faith Effort Procedures" of this Special Provision, except a final decision that a good faith effort was not made during contract performance to achieve the goal agreed to in the Utilization Plan shall be the final administrative decision of the Department. The result of the reconsideration process is not administratively appealable to the U.S. Department of Transportation.

80029

PERFORMANCE GRADED ASPHALT BINDER (BDE)

Effective: January 1, 2023

Revise Article 1032.05 of the Standard Specifications to read:

"**1032.05 Performance Graded Asphalt Binder.** These materials will be accepted according to the Bureau of Materials Policy Memorandum, "Performance Graded Asphalt Binder Qualification Procedure." The Department will maintain a qualified producer list. These materials shall be free from water and shall not foam when heated to any temperature below the actual flash point. Air blown asphalt, recycle engine oil bottoms (ReOB), and polyphosphoric acid (PPA) modification shall not be used.

When requested, producers shall provide the Engineer with viscosity/temperature relationships for the performance graded asphalt binders delivered and incorporated in the work.

(a) Performance Graded (PG) Asphalt Binder. The asphalt binder shall meet the requirements of AASHTO M 320, Table 1 "Standard Specification for Performance Graded Asphalt Binder" for the grade shown on the plans and the following.

Test	Parameter
Small Strain Parameter (AASHTO PP 113) BBR, ΔTc, 40 hrs PAV (40 hrs continuous or 2 PAV at 20 hrs)	-5 °C min.

(b) Modified Performance Graded (PG) Asphalt Binder. The asphalt binder shall meet the requirements of AASHTO M 320, Table 1 "Standard Specification for Performance Graded Asphalt Binder" for the grade shown on the plans.

Asphalt binder modification shall be performed at the source, as defined in the Bureau of Materials Policy Memorandum, "Performance Graded Asphalt Binder Qualification Procedure."

Modified asphalt binder shall be safe to handle at asphalt binder production and storage temperatures or HMA construction temperatures. Safety Data Sheets (SDS) shall be provided for all asphalt modifiers.

(1) Polymer Modification (SB/SBS or SBR). Elastomers shall be added to the base asphalt binder to achieve the specified performance grade and shall be either a styrene-butadiene diblock, triblock copolymer without oil extension, or a styrene-butadiene rubber. The polymer modified asphalt binder shall be smooth, homogeneous, and be according to the requirements shown in Table 1 or 2 for the grade shown on the plans.

Table 1 - Requirements for Styrene-Butadiene Copolymer (SB/SBS) Modified Asphalt Binders		
Test	Asphalt Grade SB/SBS PG 64-28 SB/SBS PG 70-22	Asphalt Grade SB/SBS PG 64-34 SB/SBS PG 70-28 SB/SBS PG 76-22 SB/SBS PG 76-28
Separation of Polymer ITP, "Separation of Polymer from Asphalt Binder" Difference in °F (°C) of the softening point between top and bottom portions	4 (2) max.	4 (2) max.
TESTS ON RESIDUE FROM ROLLING THIN FILM OVEN TEST (AASHTO T 240)		
Elastic Recovery ASTM D 6084, Procedure A, 77 °F (25 °C), 100 mm elongation, %	60 min.	70 min.

Table 2 - Requirements for Styrene-Butadiene Rubber (SBR) Modified Asphalt Binders		
Test	Asphalt Grade SBR PG 64-28 SBR PG 70-22	Asphalt Grade SB/SBS PG 64-34 SB/SBS PG 70-28 SBR PG 76-22 SBR PG 76-28
Separation of Polymer ITP, "Separation of Polymer from Asphalt Binder" Difference in °F (°C) of the softening point between top and bottom portions	4 (2) max.	4 (2) max.
Toughness ASTM D 5801, 77 °F (25 °C), 20 in./min. (500 mm/min.), in.-lbs (N-m)	110 (12.5) min.	110 (12.5) min.
Tenacity ASTM D 5801, 77 °F (25 °C), 20 in./min. (500 mm/min.), in.-lbs (N-m)	75 (8.5) min.	75 (8.5) min.
TESTS ON RESIDUE FROM ROLLING THIN FILM OVEN TEST (AASHTO T 240)		
Elastic Recovery ASTM D 6084, Procedure A, 77 °F (25 °C), 100 mm elongation, %	40 min.	50 min.

(2) Ground Tire Rubber (GTR) Modification. GTR modification is the addition of recycled ground tire rubber to liquid asphalt binder to achieve the specified performance grade. GTR shall be produced from processing automobile and/or truck tires by the ambient

grinding method or micronizing through a cryogenic process. GTR shall not exceed 1/16 in. (2 mm) in any dimension and shall not contain free metal particles, moisture that would cause foaming of the asphalt, or other foreign materials. A mineral powder (such as talc) meeting the requirements of AASHTO M 17 may be added, up to a maximum of four percent by weight of GTR to reduce sticking and caking of the GTR particles. When tested in accordance with Illinois Modified AASHTO T 27 "Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates" or AASHTO PP 74 "Standard Practice for Determination of Size and Shape of Glass Beads Used in Traffic Markings by Means of Computerized Optical Method", a 50 g sample of the GTR shall conform to the following gradation requirements.

Sieve Size	Percent Passing
No. 16 (1.18 mm)	100
No. 30 (600 µm)	95 ± 5
No. 50 (300 µm)	> 20

GTR modified asphalt binder shall be tested for rotational viscosity according to AASHTO T 316 using spindle S27. GTR modified asphalt binder shall be tested for original dynamic shear and RTFO dynamic shear according to AASHTO T 315 using a gap of 2 mm.

The GTR modified asphalt binder shall meet the requirements of Table 3.

Table 3 - Requirements for Ground Tire Rubber (GTR) Modified Asphalt Binders		
Test	Asphalt Grade GTR PG 64-28 GTR PG 70-22	Asphalt Grade GTR PG 76-22 GTR PG 76-28 GTR PG 70-28
TESTS ON RESIDUE FROM ROLLING THIN FILM OVEN TEST (AASHTO T 240)		
Elastic Recovery ASTM D 6084, Procedure A, 77 °F (25 °C), 100 mm elongation, %	60 min.	70 min.

(3) Softener Modification (SM). Softener modification is the addition of organic compounds, such as engineered flux, bio-oil blends, modified vegetable oils, glycol amines, and fatty acid derivatives, to the base asphalt binder to achieve the specified performance grade. Softeners shall be dissolved, dispersed, or reacted in the asphalt binder to enhance its performance and shall remain compatible with the asphalt binder with no separation. Softeners shall not be added to modified PG asphalt binder as defined in Articles 1032.05(b)(1) or 1032.05(b)(2).

An Attenuated Total Reflectance-Fourier Transform Infrared spectrum (ATR-FTIR) shall be collected for both the softening compound as well as the softener modified

asphalt binder at the dose intended for qualification. The ATR-FTIR spectra shall be collected on unaged softener modified binder, 20-hour Pressurized Aging Vessel (PAV) aged softener modified binder, and 40-hour PAV aged softener modified binder. The ATR-FTIR shall be collected in accordance with Illinois Test Procedure 601. The electronic files spectral files (in one of the following extensions or equivalent: *.SPA, *.SPG, *.IRD, *.IFG, *.CSV, *.SP, *.IRS, *.GAML, *.[0-9], *.IGM, *.ABS, *.DRT, *.SBM, *.RAS) shall be submitted to the Central Bureau of Materials.

Softener modified asphalt binders shall meet the requirements in Table 4.

Table 4 - Requirements for Softener Modified Asphalt Binders	
Test	Asphalt Grade SM PG 46-28 SM PG 46-34 SM PG 52-28 SM PG 52-34 SM PG 58-22 SM PG 58-28 SM PG 64-22
Small Strain Parameter (AASHTO PP 113) BBR, ΔTc, 40 hrs PAV (40 hrs continuous or 2 PAV at 20 hrs)	-5°C min.
Large Strain Parameter (Illinois Modified AASHTO T 391) DSR/LAS Fatigue Property, Δ|G*|peak τ, 40 hrs PAV (40 hrs continuous or 2 PAV at 20 hrs)	≥ 54 %

The following grades may be specified as tack coats.

Asphalt Grade	Use
PG 58-22, PG 58-28, PG 64-22	Tack Coat”

Revise Article 1031.06(c)(1) and 1031.06(c)(2) of the Standard Specifications to read:

“(1) RAP/RAS. When RAP is used alone or RAP is used in conjunction with RAS, the percentage of virgin ABR shall not exceed the amounts listed in the following table.

HMA Mixtures - RAP/RAS Maximum ABR % 1/ 2/			
Ndesign	Binder	Surface	Polymer Modified Binder or Surface 3/
30	30	30	10
50	25	15	10
70	15	10	10
90	10	10	10

1/ For Low ESAL HMA shoulder and stabilized subbase, the RAP/RAS ABR shall not exceed 50 percent of the mixture.

2/ When RAP/RAS ABR exceeds 20 percent, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28).

3/ The maximum ABR percentages for ground tire rubber (GTR) modified mixes shall be equivalent to the percentages specified for SBS/SBR polymer modified mixes.

(2) FRAP/RAS. When FRAP is used alone or FRAP is used in conjunction with RAS, the percentage of virgin asphalt binder replacement shall not exceed the amounts listed in the following table.

HMA Mixtures - FRAP/RAS Maximum ABR % 1/ 2/			
Ndesign	Binder	Surface	Polymer Modified Binder or Surface 3/
30	55	45	15
50	45	40	15
70	45	35	15
90	45	35	15
SMA	- -	- -	25
IL-4.75	- -	- -	35

1/ For Low ESAL HMA shoulder and stabilized subbase, the FRAP/RAS ABR shall not exceed 50 percent of the mixture.

2/ When FRAP/RAS ABR exceeds 20 percent for all mixes, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28).

3/ The maximum ABR percentages for GTR modified mixes shall be equivalent to the percentages specified for SBS/SBR polymer modified mixes."

Add the following to the end of Note 2 of Article 1030.03 of the Standard Specifications.

"A dedicated storage tank for the ground tire rubber (GTR) modified asphalt binder shall be provided. This tank shall be capable of providing continuous mechanical mixing throughout and/or recirculation of the asphalt binder to provide a uniform mixture. The tank shall be heated and capable of maintaining the temperature of the asphalt binder at 300 °F to 350 °F (149 °C to 177 °C). The asphalt binder metering systems of dryer drum plants shall be calibrated with the actual GTR modified asphalt binder material with an accuracy of ±0.40 percent."

80441

SEEDING (BDE)

Effective: November 1, 2022

Revise Article 250.07 of the Standard Specifications to read:

"**250.07 Seeding Mixtures.** The classes of seeding mixtures and combinations of mixtures will be designated in the plans.

When an area is to be seeded with two or more seeding classes, those mixtures shall be applied separately on the designated area within a seven day period. Seeding shall occur prior to placement of mulch cover. A Class 7 mixture can be applied at any time prior to applying any seeding class or added to them and applied at the same time.

TABLE 1 - SEEDING MIXTURES			
Class - Type		Seeds	lb/acre (kg/hectare)
1	Lawn Mixture 1/	Kentucky Bluegrass	100 (110)
		Perennial Ryegrass	60 (70)
		Festuca rubra ssp. r*ubra* (Creeping Red Fescue)	40 (50)
1A	Salt Tolerant	Kentucky Bluegrass	60 (70)
	Lawn Mixture 1/	Perennial Ryegrass	20 (20)
		Festuca rubra ssp. *rubra* (Creeping Red Fescue)	20 (20)
		Festuca brevipilla (Hard Fescue)	20 (20)
		Puccinellia distans (Fults Saltgrass or Salty Alkaligrass)	60 (70)
1B	Low Maintenance	Turf-Type Fine Fescue 3/	150 (170)
	Lawn Mixture 1/	Perennial Ryegrass	20 (20)
		Red Top	10 (10)
		Festuca rubra ssp. *rubra* (Creeping Red Fescue)	20 (20)
2	Roadside Mixture 1/	*Lolium arundinaceum* (Tall Fescue)	100 (110)
		Perennial Ryegrass	50 (55)
		Festuca rubra ssp. r*ubra* (Creeping Red Fescue)	40 (50)
		Red Top	10 (10)
2A	Salt Tolerant	*Lolium arundinaceum* (Tall Fescue)	60 (70)
	Roadside Mixture 1/	Perennial Ryegrass	20 (20)
		Festuca rubra ssp. *rubra* (Creeping Red Fescue)	30 (20)
		Festuca brevipila (Hard Fescue)	30 (20)
		Puccinellia distans (Fults Saltgrass or Salty Alkaligrass)	60 (70)
3	Northern Illinois	*Elymus canadensis*	5 (5)
	Slope Mixture 1/	(Canada Wild Rye) 5/	
		Perennial Ryegrass	20 (20)
		Alsike Clover 4/	5 (5)
		Desmanthus illinoensis	2 (2)
		(Illinois Bundleflower) 4/ 5/	
		Schizachyrium scoparium	12 (12)
		(Little Bluestem) 5/	
		Bouteloua curtipendula	10 (10)
		(Side-Oats Grama) 5/	
		Puccinellia distans (Fults Saltgrass or Salty Alkaligrass)	30 (35)
		Oats, Spring	50 (55)
		Slender Wheat Grass 5/	15 (15)
		Buffalo Grass 5/ 7/	5 (5)
3A	Southern Illinois	Perennial Ryegrass	20 (20)
	Slope Mixture 1/	*Elymus canadensis*	20 (20)
		(Canada Wild Rye) 5/	
		Panicum virgatum (Switchgrass) 5/	10 (10)
		Schizachyrium scoparium	12 (12)
		(Little Blue Stem) 5/	
		Bouteloua curtipendula	10 (10)
		(Side-Oats Grama) 5/	
		Dalea candida	5 (5)
		(White Prairie Clover) 4/ 5/	
		Rudbeckia hirta (Black-Eyed Susan) 5/	5 (5)
		Oats, Spring	50 (55)

Class – Type		Seeds	lb/acre (kg/hectare)
4	Native Grass 2/ 6/	*Andropogon gerardi* (Big Blue Stem) 5/	4 (4)
		Schizachyrium scoparium (Little Blue Stem) 5/	5 (5)
		Bouteloua curtipendula (Side-Oats Grama) 5/	5 (5)
		Elymus canadensis (Canada Wild Rye) 5/	1 (1)
		Panicum virgatum (Switch Grass) 5/	1 (1)
		Sorghastrum nutans (Indian Grass) 5/	2 (2)
		Annual Ryegrass	25 (25)
		Oats, Spring	25 (25)
		Perennial Ryegrass	15 (15)
4A	Low Profile Native Grass 2/ 6/	*Schizachyrium scoparium* (Little Blue Stem) 5/	5 (5)
		Bouteloua curtipendula (Side-Oats Grama) 5/	5 (5)
		Elymus canadensis (Canada Wild Rye) 5/	1 (1)
		Sporobolus heterolepis (Prairie Dropseed) 5/	0.5 (0.5)
		Annual Ryegrass	25 (25)
		Oats, Spring	25 (25)
		Perennial Ryegrass	15 (15)
4B	Wetland Grass and Sedge Mixture 2/ 6/	Annual Ryegrass	25 (25)
		Oats, Spring	25 (25)
		Wetland Grasses (species below) 5/	6 (6)

Species:	% By Weight
Calamagrostis canadensis (Blue Joint Grass)	12
Carex lacustris (Lake-Bank Sedge)	6
Carex slipata (Awl-Fruited Sedge)	6
Carex stricta (Tussock Sedge)	6
Carex vulpinoidea (Fox Sedge)	6
Eleocharis acicularis (Needle Spike Rush)	3
Eleocharis obtusa (Blunt Spike Rush)	3
Glyceria striata (Fowl Manna Grass)	14
Juncus effusus (Common Rush)	6
Juncus tenuis (Slender Rush)	6
Juncus torreyi (Torrey's Rush)	6
Leersia oryzoides (Rice Cut Grass)	10
Scirpus acutus (Hard-Stemmed Bulrush)	3
Scirpus atrovirens (Dark Green Rush)	3
Bolboschoenus fluviatilis (River Bulrush)	3
Schoenoplectus tabernaemontani (Softstem Bulrush)	3
Spartina pectinata (Cord Grass)	4

Class – Type		Seeds	lb/acre (kg/hectare)
5	Forb with Annuals Mixture 2/ 5/ 6/	Annuals Mixture (Below) Forb Mixture (Below)	1 (1) 10 (10)

Annuals Mixture - Mixture not exceeding 25 % by weight of any one species, of the following:

Coreopsis lanceolata (Sand Coreopsis)
Leucanthemum maximum (Shasta Daisy)
Gaillardia pulchella (Blanket Flower)
Ratibida columnifera (Prairie Coneflower)
Rudbeckia hirta (Black-Eyed Susan)

Forb Mixture - Mixture not exceeding 5 % by weight PLS of any one species, of the following:

Amorpha canescens (Lead Plant) 4/
Anemone cylindrica (Thimble Weed)
Asclepias tuberosa (Butterfly Weed)
Aster azureus (Sky Blue Aster)
Symphyotrichum leave (Smooth Aster)
Aster novae-angliae (New England Aster)
Baptisia leucantha (White Wild Indigo) 4/
Coreopsis palmata (Prairie Coreopsis)
Echinacea pallida (Pale Purple Coneflower)
Eryngium yuccifolium (Rattlesnake Master)
Helianthus mollis (Downy Sunflower)
Heliopsis helianthoides (Ox-Eye)
Liatris aspera (Rough Blazing Star)
Liatris pycnostachya (Prairie Blazing Star)
Monarda fistulosa (Prairie Bergamot)
Parthenium integrifolium (Wild Quinine)
Dalea candida (White Prairie Clover) 4/
Dalea purpurea (Purple Prairie Clover) 4/
Physostegia virginiana (False Dragonhead)
Potentilla arguta (Prairie Cinquefoil)
Ratibida pinnata (Yellow Coneflower)
Rudbeckia subtomentosa (Fragrant Coneflower)
Silphium laciniatum (Compass Plant)
Silphium terebinthinaceum (Prairie Dock)
Oligoneuron rigidum (Rigid Goldenrod)
Tradescantia ohiensis (Spiderwort)
Veronicastrum virginicum (Culver's Root)

Class – Type		Seeds	lb/acre (kg/hectare)
5A	Large Flower Native Forb Mixture 2/ 5/ 6/	Forb Mixture (see below)	5 (5)
	Species:		% By Weight
	Aster novae-angliae (New England Aster)		5
	Echinacea pallida (Pale Purple Coneflower)		10
	Helianthus mollis (Downy Sunflower)		10
	Heliopsis helianthoides (Ox-Eye)		10
	Liatris pycnostachya (Prairie Blazing Star)		10
	Ratibida pinnata (Yellow Coneflower)		5
	Rudbeckia hirta (Black-Eyed Susan)		10
	Silphium laciniatum (Compass Plant)		10
	Silphium terebinthinaceum (Prairie Dock)		20
	Oligoneuron rigidum (Rigid Goldenrod)		10
5B	Wetland Forb 2/ 5/ 6/	Forb Mixture (see below)	2 (2)
	Species:		% By Weight
	Acorus calamus (Sweet Flag)		3
	Angelica atropurpurea (Angelica)		6
	Asclepias incarnata (Swamp Milkweed)		2
	Aster puniceus (Purple Stemmed Aster)		10
	Bidens cernua (Beggarticks)		7
	Eutrochium maculatum (Spotted Joe Pye Weed)		7
	Eupatorium perfoliatum (Boneset)		7
	Helenium autumnale (Autumn Sneeze Weed)		2
	Iris virginica shrevei (Blue Flag Iris)		2
	Lobelia cardinalis (Cardinal Flower)		5
	Lobelia siphilitica (Great Blue Lobelia)		5
	Lythrum alatum (Winged Loosestrife)		2
	Physostegia virginiana (False Dragonhead)		5
	Persicaria pensylvanica (Pennsylvania Smartweed)		10
	Persicaria lapathifolia (Curlytop Knotweed)		10
	Pychanthemum virginianum (Mountain Mint)		5
	Rudbeckia laciniata (Cut-leaf Coneflower)		5
	Oligoneuron riddellii (Riddell Goldenrod)		2
	Sparganium eurycarpum (Giant Burreed)		5
6	Conservation Mixture 2/ 6/	*Schizachyrium scoparium* (Little Blue Stem) 5/	5 (5)
		Elymus canadensis (Canada Wild Rye) 5/	2 (2)
		Buffalo Grass 5/ 7/	5 (5)
		Vernal Alfalfa 4/	15 (15)
		Oats, Spring	48 (55)
6A	Salt Tolerant Conservation Mixture 2/ 6/	*Schizachyrium scoparium* (Little Blue Stem) 5/	5 (5)
		Elymus canadensis (Canada Wild Rye) 5/	2 (2)
		Buffalo Grass 5/ 7/	5 (5)
		Vernal Alfalfa 4/	15 (15)
		Oats, Spring	48 (55)
		Puccinellia distans (Fults Saltgrass or Salty Alkaligrass)	20 (20)
7	Temporary Turf Cover Mixture	Perennial Ryegrass	50 (55)
		Oats, Spring	64 (70)

Notes:

1/ Seeding shall be performed when the ambient temperature has been between 45 ºF (7 ºC) and 80 ºF (27 ºC) for a minimum of seven (7) consecutive days and is forecasted to be the same for the next five (5) days according to the National Weather Service.
2/ Seeding shall be performed in late fall through spring beginning when the ambient temperature has been below 45 ºF (7 ºC) for a minimum of seven (7) consecutive days and ending when the ambient temperature exceeds 80 ºF (27 ºC) according to the National Weather Service.
3/ Specific variety as shown in the plans or approved by the Engineer.
4/ Inoculation required.
5/ Pure Live Seed (PLS) shall be used.
6/ Fertilizer shall not be used.
7/ Seed shall be primed with KNO_3 to break dormancy and dyed to indicate such.

Seeding will be inspected after a period of establishment. The period of establishment shall be six (6) months minimum, but not to exceed nine (9) months. After the period of establishment, areas not exhibiting 75 percent uniform growth shall be interseeded or reseeded, as determined by the Engineer, at no additional cost to the Department."

80445

SOURCE OF SUPPLY AND QUALITY REQUIREMENTS (BDE)

Effective: January 2, 2023

Add the following to Article 106.01 of the Standard Specifications:

"The final manufacturing process for construction materials and the immediately preceding manufacturing stage for construction materials shall occur within the United States. Construction materials shall include an article, material, or supply that is or consists primarily of the following.

(a) Non-ferrous metals;

(b) Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);

(c) Glass (including optic glass);

(d) Lumber;

(e) Drywall.

Items consisting of two or more of the listed construction materials that have been combined through a manufacturing process, and items including at least one of the listed materials combined with a material that is not listed through a manufacturing process shall be exempt."

80448

SUBCONTRACTOR AND DBE PAYMENT REPORTING (BDE)

Effective: April 2, 2018

Add the following to Section 109 of the Standard Specifications.

"**109.14 Subcontractor and Disadvantaged Business Enterprise Payment Reporting.** The Contractor shall report all payments made to the following parties:

(a) first tier subcontractors;

(b) lower tier subcontractors affecting disadvantaged business enterprise (DBE) goal credit;

(c) material suppliers or trucking firms that are part of the Contractor's submitted DBE utilization plan.

The report shall be made through the Department's on-line subcontractor payment reporting system within 21 days of making the payment."

80397

SUBCONTRACTOR MOBILIZATION PAYMENTS (BDE)

Effective: November 2, 2017
Revised: April 1, 2019

Replace the second paragraph of Article 109.12 of the Standard Specifications with the following:

"This mobilization payment shall be made at least seven days prior to the subcontractor starting work. The amount paid shall be at the following percentage of the amount of the subcontract reported on form BC 260A submitted for the approval of the subcontractor's work.

Value of Subcontract Reported on Form BC 260A	Mobilization Percentage
Less than $10,000	25%
$10,000 to less than $20,000	20%
$20,000 to less than $40,000	18%
$40,000 to less than $60,000	16%
$60,000 to less than $80,000	14%
$80,000 to less than $100,000	12%
$100,000 to less than $250,000	10%
$250,000 to less than $500,000	9%
$500,000 to $750,000	8%
Over $750,000	7%"

80391

SUBMISSION OF PAYROLL RECORDS (BDE)

Effective: April 1, 2021
Revised: November 1, 2022

FEDERAL AID CONTRACTS. Revise the following section of Check Sheet #1 of the Recurring Special Provisions to read:

"STATEMENTS AND PAYROLLS

The payroll records shall include the worker's name, the worker's address, the worker's telephone number when available, the worker's social security number, the worker's classification or classifications, the worker's gross and net wages paid in each pay period, the worker's number of hours worked each day, and the worker's starting and ending times of work each day. However, any Contractor or subcontractor who remits contributions to a fringe benefit fund that is not jointly maintained and jointly governed by one or more employers and one or more labor organization must additionally submit the worker's hourly wage rate, the worker's hourly overtime wage rate, the worker's hourly fringe benefit rates, the name and address of each fringe benefit fund, the plan sponsor of each fringe benefit, if applicable, and the plan administrator of each fringe benefit, if applicable.

The Contractor and each subcontractor shall certify and submit payroll records to the Department each week from the start to the completion of their respective work, except that full social security numbers shall not be included on weekly submittals. Instead, the payrolls shall include an identification number for each employee (e.g., the last four digits of the employee's social security number). In addition, starting and ending times of work each day may be omitted from the payroll records submitted. The submittals shall be made using LCPtracker Pro software. The software is web-based and can be accessed at https://lcptracker.com/. When there has been no activity during a work week, a payroll record shall still be submitted with the appropriate option ("No Work", "Suspended", or "Complete") selected."

STATE CONTRACTS. Revise Item 3 of Section IV of Check Sheet #5 of the Recurring Special Provisions to read:

"3. Submission of Payroll Records. The Contractor and each subcontractor shall, no later than the 15th day of each calendar month, file a certified payroll for the immediately preceding month to the Illinois Department of Labor (IDOL) through the Illinois Prevailing Wage Portal in compliance with the State Prevailing Wage Act (820 ILCS 130). The portal can be found on the IDOL website at https://www2.illinois.gov/idol/Laws-Rules/CONMED/Pages/Prevailing-Wage-Portal.aspx. Payrolls shall be submitted in the format prescribed by the IDOL.

In addition to filing certified payroll(s) with the IDOL, the Contractor and each subcontractor shall certify and submit payroll records to the Department each week from the start to the completion of their respective work, except that full social security numbers shall not be included on weekly submittals. Instead, the payrolls shall include an

identification number for each employee (e.g., the last four digits of the employee's social security number). In addition, starting and ending times of work each day may be omitted from the payroll records submitted. The submittals shall be made using LCPtracker Pro software. The software is web-based and can be accessed at https://lcptracker.com/. When there has been no activity during a work week, a payroll record shall still be submitted with the appropriate option ("No Work", "Suspended", or "Complete") selected."

80437

TRAINING SPECIAL PROVISIONS (BDE)

Effective: October 15, 1975
Revised: September 2, 2021

This Training Special Provision supersedes Section 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities," and is in implementation of 23 U.S.C. 140(a).

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training aimed at developing full journeyman in the type of trade or job classification involved. The number of trainees to be trained under this contract will be **1** . In the event the Contractor subcontracts a portion of the contract work, it shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also ensure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within the reasonable area of recruitment. Prior to commencing construction, the Contractor shall submit to the Illinois Department of Transportation for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee it employs on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority trainees and women (e.g. by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps it has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he or she has successfully completed a training course leading to journeyman status or in which he or she has been employed as a journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used, the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by the Illinois Department of Transportation and the Federal Highway Administration. The Illinois Department of Transportation and the Federal Highway Administration shall approve a program, if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved by not necessarily sponsored by the U.S. Department of Labor Employment Training Administration shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the Illinois Department of Transportation and the Federal Highway Administration. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirement of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program.

It is not required that all trainees be on board for the entire length of the contract. A Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The Contractor shall furnish the trainee a copy of the program he will follow in providing the training. The Contractor shall provide each trainee with a certification showing the type and length of training satisfactorily complete.

The Contractor shall provide for the maintenance of records and furnish periodic reports documenting its performance under this Training Special Provision.

For contracts with an awarded contract value of $500,000 or more, the Contractor is required to comply with the Illinois Works Apprenticeship Initiative (30 ILCS 559/20-20 to 20-25) and all applicable administrative rules to the extent permitted by Section 20-20(g). For federally funded projects, the number of trainees to be trained under this contract, as stated in the Training Special Provisions, will be the established goal for the Illinois Works Apprenticeship Initiative 30 ILCS 559/20-20(g). The Contractor shall make a good faith effort to meet this goal. For federally funded projects, the Illinois Works Apprenticeship Initiative will be implemented using the FHWA approved OJT procedures. The Contractor must comply with the recordkeeping and reporting obligations of the Illinois Works Apprenticeship Initiative for the life of the project, including the certification as to whether the trainee/apprentice labor hour goals were met.

Method of Measurement. The unit of measurement is in hours.

Basis of Payment. This work will be paid for at the contract unit price of 80 cents per hour for TRAINEES. The estimated total number of hours, unit price, and total price have been included in the schedule of prices.

20338

VEHICLE AND EQUIPMENT WARNING LIGHTS (BDE)

Effective: November 1, 2021
Revised: November 1, 2022

Add the following paragraph after the first paragraph of Article 701.08 of the Standard Specifications:

"The Contractor shall equip all vehicles and equipment with high-intensity oscillating, rotating, or flashing, amber or amber-and-white, warning lights which are visible from all directions. In accordance with 625 ILCS 5/12-215, the lights may only be in operation while the vehicle or equipment is engaged in construction operations."

80439

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012
Revised: November 1, 2021

The Contractor shall submit a weekly report of Disadvantaged Business Enterprise (DBE) trucks hired by the Contractor or subcontractors (i.e. not owned by the Contractor or subcontractors) that are used for DBE goal credit.

The report shall be submitted to the Engineer on Department form "SBE 723" within ten business days following the reporting period. The reporting period shall be Sunday through Saturday for each week reportable trucking activities occur.

Any costs associated with providing weekly DBE trucking reports shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed.

80302

WORK ZONE TRAFFIC CONTROL DEVICES (BDE)

Effective: March 2, 2020

Add the following to Article 701.03 of the Standard Specifications:

"(q) Temporary Sign Supports .....1106.02"

Revise the third paragraph of Article 701.14 of the Standard Specifications to read:

"For temporary sign supports, the Contractor shall provide a FHWA eligibility letter for each device used on the contract. The letter shall provide information for the set-up and use of the device as well as a detailed drawing of the device. The signs shall be supported within 20 degrees of vertical. Weights used to stabilize signs shall be attached to the sign support per the manufacturer's specifications."

Revise the first paragraph of Article 701.15 of the Standard Specifications to read:

"**701.15 Traffic Control Devices.** For devices that must meet crashworthiness standards, the Contractor shall provide a manufacturer's self-certification or a FHWA eligibility letter for each Category 1 device and a FHWA eligibility letter for each Category 2 and Category 3 device used on the contract. The self-certification or letter shall provide information for the set-up and use of the device as well as a detailed drawing of the device."

Revise the first six paragraphs of Article 1106.02 of the Standard Specifications to read:

"**1106.02 Devices.** Work zone traffic control devices and combinations of devices shall meet crashworthiness standards for their respective categories. The categories are as follows.

Category 1 includes small, lightweight, channelizing and delineating devices that have been in common use for many years and are known to be crashworthy by crash testing of similar devices or years of demonstrable safe performance. These include cones, tubular markers, plastic drums, and delineators, with no attachments (e.g. lights). Category 1 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 1 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2024.

Category 2 includes devices that are not expected to produce significant vehicular velocity change but may otherwise be hazardous. These include vertical panels with lights, barricades, temporary sign supports, and Category 1 devices with attachments (e.g. drums with lights). Category 2 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 2 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2024.

Category 3 includes devices that are expected to cause significant velocity changes or other potentially harmful reactions to impacting vehicles. These include crash cushions (impact

attenuators), truck mounted attenuators, and other devices not meeting the definitions of Category 1 or 2. Category 3 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 3 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2029. Category 3 devices shall be crash tested for Test Level 3 or the test level specified.

Category 4 includes portable or trailer-mounted devices such as arrow boards, changeable message signs, temporary traffic signals, and area lighting supports. It is preferable for Category 4 devices manufactured after December 31, 2019 to be MASH-16 compliant; however, there are currently no crash tested devices in this category, so it remains exempt from the NCHRP 350 or MASH compliance requirement.

For each type of device, when no more than one MASH-16 compliant is available, an NCHRP 350 or MASH-2009 compliant device may be used, even if manufactured after December 31, 2019."

Revise Articles 1106.02(g), 1106.02(k), and 1106.02(l) to read:

"(g) Truck Mounted/Trailer Mounted Attenuators. The attenuator shall be approved for use at Test Level 3. Test Level 2 may be used for normal posted speeds less than or equal to 45 mph.

(k) Temporary Water Filled Barrier. The water filled barrier shall be a lightweight plastic shell designed to accept water ballast and be on the Department's qualified product list.

Shop drawings shall be furnished by the manufacturer and shall indicate the deflection of the barrier as determined by acceptance testing; the configuration of the barrier in that test; and the vehicle weight, velocity, and angle of impact of the deflection test. The Engineer shall be provided one copy of the shop drawings.

(l) Movable Traffic Barrier. The movable traffic barrier shall be on the Department's qualified product list.

Shop drawings shall be furnished by the manufacturer and shall indicate the deflection of the barrier as determined by acceptance testing; the configuration of the barrier in that test; and the vehicle weight, velocity, and angle of impact of the deflection test. The Engineer shall be provided one copy of the shop drawings. The barrier shall be capable of being moved on and off the roadway on a daily basis."

80427

WORKING DAYS (BDE)

Effective: January 1, 2002

The Contractor shall complete the work within 80 working days.

80071

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under title 23, United States Code, as required in 23 CFR 633.102(b) (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services). 23 CFR 633.102(e).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider. 23 CFR 633.102(e).

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services) in accordance with 23 CFR 633.102. The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in solicitation-for-bids or request-for-proposals documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract). 23 CFR 633.102(b).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract. 23 CFR 633.102(d).

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR Part 230, Subpart A, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal Employment Opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (*see* 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140, shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR Part 35 and 29 CFR Part 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract. 23 CFR 230.409 (g)(4) & (5).

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, sexual orientation, gender identity, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action or are substantially involved in such action, will be made fully cognizant of and will implement the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action

within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs (i.e., apprenticeship and on-the-job training programs for the geographical area of contract performance). In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. 23 CFR 230.409. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established thereunder. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors, suppliers, and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurances Required:

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:
(1) Withholding monthly progress payments;
(2) Assessing sanctions;
(3) Liquidated damages; and/or
(4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women.

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of more than $10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, the contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location under the contractor's control where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA- 1273 format and FHWA program requirements.

1. Minimum wages (29 CFR 5.5)

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding (29 CFR 5.5)

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally- assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records (29 CFR 5.5)

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or

subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees (29 CFR 5.5)

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the

corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. 23 CFR 230.111(e)(2). The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract as provided in 29 CFR 5.5.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract as provided in 29 CFR 5.5.

9. Disputes concerning labor standards. As provided in 29 CFR 5.5, disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility (29 CFR 5.5)

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), the following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek. 29 CFR 5.5.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph 1 of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph 1 of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1 of this section. 29 CFR 5.5.

* $27 as of January 23, 2019 (See 84 FR 213-01, 218) as may be adjusted annually by the Department of Labor; pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990).

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 2 of this section. 29 CFR 5.5.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs 1 through 4 of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1 through 4 of this section. 29 CFR 5.5.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” in paragraph 1 of Section VI refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions: (based on longstanding interpretation)

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;
(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), the contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. Pursuant to 23 CFR 635.116(c), the contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR Part 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract. 23 CFR 635.108.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance

with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal- aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR Part 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 11, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of $150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.326.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.326.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200. 2 CFR 180.220 and 1200.220.

1. **Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction. 2 CFR 180.320.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default. 2 CFR 180.325.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances. 2 CFR 180.345 and 180.350.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900-180.1020, and 1200. “First Tier Covered Transactions” refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant

who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction. 2 CFR 180.330.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold. 2 CFR 180.220 and 180.300.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/). 2 CFR 180.300, 180.320, and 180.325.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default. 2 CFR 180.325.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.335;.

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property, 2 CFR 180.800;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification, 2 CFR 180.700 and 180.800; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

3. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances. 2 CFR 180.365.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900 – 180.1020, and 1200. You may contact the person to which this proposal is

submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated. 2 CFR 1200.220 and 1200.332.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold. 2 CFR 180.220 and 1200.220.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment. 2 CFR 180.325.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(a) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(b) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(c) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

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XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000. 49 CFR Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier

subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

XII. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

Contract Provision - Cargo Preference Requirements

In accordance with Title 46 CFR § 381.7 (b), the contractor agrees—

"(1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

(2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b) (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

(3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract."

Provisions (1) and (2) apply to materials or equipment that are acquired solely for the project. The two provisions do not apply to goods or materials that come into inventories independent of the project, such as shipments of Portland cement, asphalt cement, or aggregates, when industry suppliers and contractors use these materials to replenish existing inventories.