

14

August 2, 2024 Letting

Notice to Bidders, Specifications and Proposal



**Contract No. 62U90
COOK County
Section FAI 90 23 TBR
Route FAI 190
District 1 Construction Funds**

Prepared by

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Checked by

(Printed by authority of the State of Illinois)



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. August 2, 2024 prevailing time 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. 62U90
COOK County
Section FAI 90 23 TBR
Route FAI 190
District 1 Construction Funds**

Toll Plaza 31 Relocation Kennedy Express (I-90) to I-190 WB Ramp to Airport in Rosemont, Illinois

- 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 readvertise the proposed improvement, and to waive technicalities.

By Order of the
Illinois Department of Transportation

Omer Osman,
Secretary

INDEX
FOR
SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2024

This index contains a listing of SUPPLEMENTAL SPECIFICATIONS and frequently used RECURRING SPECIAL PROVISIONS.

ERRATA Standard Specifications for Road and Bridge Construction (Adopted 1-1-22) (Revised 1-1-24)

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ILLINOIS TOLLWAY
SUPPLEMENTAL SPECIFICATIONS
TO THE IDOT
STANDARD SPECIFICATIONS FOR
ROAD AND BRIDGE CONSTRUCTION
ADOPTED January 1, 2022

Issued March 1, 2024
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STATE OF ILLINOIS

SPECIAL PROVISIONS

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction," adopted January 1, 2022, the Tollway Supplemental Specifications, the latest edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways," and the "Manual of Test Procedures for Materials" in effect on the date of invitation for bids, and the Supplemental Specifications and Recurring Special Provisions indicated on the Check Sheet included herein which apply to and govern the construction of FAI Route 190 (I-190), Section FAI 90 23 TBR, Cook County, Contract No. 62U90 and in case of conflict with any part or parts of said Specifications, the said Special Provisions shall take precedence and shall govern.

FAI Route 190 (I-190)
Section FAI 90 23 TBR
Cook County
Contract No. 62U90

LOCATION OF PROJECT

The project is located along Ramp F, exit ramp from Jane Addams Memorial Tollway Eastbound I-90 and Tri-State Tollway Southbound I-294 to WB I-190/Mannheim Road at Toll Plaza 31. The gross and net length of the project is 130.00 feet (0.025 mile).

DESCRIPTION OF PROJECT

The work consists of the construction of a new ramp toll plaza and demolition of the existing toll plaza which is within Illinois Tollway jurisdiction. The improvement includes a control building at new toll plaza, electrical work at the plaza, ramp reconstruction, erosion control and protection, special waste excavation, earth excavation and embankment, removal of existing improvements, miscellaneous storm sewers, removal of existing sanitary septic systems, pavement marking and signage, communication tower, roadway lighting, traffic control and protection, maintaining ITS, urban enhancements and all incidental collateral work necessary to complete the improvements as shown on the Plans and as described herein.

SOILS INFORMATION

The reports are available for inspection at IDOT District 1, 201 W. Center Court, Schaumburg, Illinois.

Abbreviated Roadway Geotechnical Report
EB I-90/SB I-294 to WB I-190 Ramp (Ramp F), Cook County, IL
PTB 195-04, IDOT Job No. D-91-356-20
Prepared by: Wang Engineering, Inc.
Dated April 19, 2024

Technical Memorandum
Overhead Sign Structures and Toll Plaza Tower
EB I-90/SB I-294 to WB I-190 Ramp (Ramp F), Cook County, IL
PTB 195-04, IDOT Job No. D-91-356-20
Prepared by: Wang Engineering, Inc.
Dated January 15, 2024

Geotechnical Design Memorandum
Toll Plaza Control Building
EB I-90/SB I-294 to WB I-190 Ramp (Ramp F), Cook County, IL
PTB 195-04, IDOT Job No. D-91-356-20
Prepared by: Wang Engineering, Inc.
Dated April 10, 2024

PERMITS

In accordance with Article 107.04 – Permits and Licenses, of the Standard Specifications for Road and Bridge Construction dated January 1, 2022, the Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work. These permits may include, but are not limited to, the Illinois State Toll Highway Authority (Tollway), Federal Aviation Administration (FAA), and others.

The Contractor will be required to obtain a permit from the Illinois State Toll Highway Authority (Tollway) prior to initiating any lane closures on the Tollway or doing any work on the Tollway jurisdiction. See TOLLWAY PERMIT AND BOND (D1) special provisions for additional information.

Coordination for this project will be required with the Federal Aviation Administration (FAA). The Contractor is responsible to secure FAA permits based on the Contractor's means and methods. The minimum review time on permit submittals is 45 days. Any deviations from the permit review time will not be considered justification for additional time and the Contractor will be expected to complete the project in accordance with the specified completion date.

All costs related to the permit requirements will be included in the cost of the Contract.

TOLLWAY PERMIT AND BOND (D1)

Effective: January 13, 1989

The Contractor will be required to obtain a permit from the Illinois State Toll Highway Authority (ISTHA) according to Article 107.04 of the Standard Specifications prior to initiating any lane closures on the Tollway or doing any work on the ISTHA right of way. As part of the permit, the Contractor will be required to post a surety bond with the ISTHA.

The Contractor will furnish a copy of the authorized permit to the Engineer.

JURISDICTION LIMITS-TOLLWAY (ILLINOIS TOLLWAY)

Effective: April 23, 2021

Revised: October 23, 2023

Description. The following special provisions of this contract are restricted in application to the Tollway's jurisdiction. Any references to locations that are within the project limits, whether stated or implied within the following special provisions, shall be modified to be the limits of Tollway's jurisdiction as shown in the plans, unless otherwise directed by the Engineer. In addition to the following special provisions, the Tollway Standard Drawings included in the plans are also restricted in application to the Tollway's jurisdiction.

- WARRANTY (ILLINOIS TOLLWAY)
- EARTHWORK MANAGEMENT PLANS
- EARTH AND ROCK EXCAVATION (ILLINOIS TOLLWAY)
- EMBANKMENT (ILLINOIS TOLLWAY)
- SOURCE REQUIREMENTS FOR FURNISHED EXCAVATION (ILLINOIS TOLLWAY)
- REINFORCEMENT BARS (ILLINOIS TOLLWAY)
- ASPHALT PAVEMENT CONSTRUCTION (ILLINOIS TOLLWAY)
- ASPHALT MIXTURES (ILLINOIS TOLLWAY)
- RECLAIMED ASPHALT MATERIALS (RAM) (ILLINOIS TOLLWAY)
- SURFACE SMOOTHNESS TESTING (ILLINOIS TOLLWAY)
- PORTLAND CEMENT CONCRETE (ILLINOIS TOLLWAY)
- PORTLAND CEMENT CONCRETE PAVEMENT (ILLINOIS TOLLWAY)
- PRODUCTION OF RECYCLED AGGREGATE (ILLINOIS TOLLWAY)
- FABRICATING AND FINISHING STRUCTURAL STEEL (ILLINOIS TOLLWAY GBSP)
- MAINTENANCE OF TRAFFIC

CONTRACTOR COOPERATION

The Contractor's attention is directed to the fact that other separate contracts may be under construction during the duration of this Contract.

The Contractor will be governed by Article 105.08 of the Standard Specifications.

The Contractor will be required to attend a weekly coordination meeting at a time and location to be determined by the Department.

The Contractor will coordinate proposed project start dates and sequence of construction with the Engineer to present an effective and timely schedule for successful completion of the project.

COORDINATION OF THE CONTRACT DOCUMENTS

Coordination of contract documents shall be in accordance with Article 105.05. The Illinois Tollway Supplemental Specifications to the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction will be applicable as the supplemental specification designated in Article 105.05 for all items of work within the Tollway jurisdictional limits.

The Contractor shall not commence any work on the Illinois Tollway under this contract until all the insurance as specified in Article 107.26 and 107.27 of the Tollway Supplemental Specifications or any Special Provisions has been provided and approved. The Contractor must provide a copy of the Certificate of Insurance to the Tollway. The permit to commence work on the Tollway's property will not be issued until receipt of the Certificate of Insurance.

The Tollway and its officers, agents, directors and employees shall be listed as additional insured parties in the general liability insurance and the Tollway shall be added as an additional protected party on all performance bonds required by the Contractor. The insurance shall be maintained throughout construction of the project.

PROGRESS SCHEDULE

Description. Time is of the essence in this Contract. It may be necessary for the Contractor to work longer hours, use additional crews, and work during weekends in order to complete the work within the required time limit. The Contractor shall submit a Critical Path Method (CPM) Progress Schedule as described below for the Engineer's approval before the work can be started.

The Contractor will not be allowed any compensation for working longer hours or using extra shifts; and working on weekends or during Holidays; working during winter months, etc. to meet the specified Completion Date.

This work shall consist of preparing, revising and updating a detailed progress schedule based upon the Critical Path Method (CPM). This work shall also consist of performing time impact analysis of the progress schedule based upon the various revisions and updates as they occur.

Requirements. The software shall produce an electronic progress schedule for submission to the department that is 100% compatible with Primavera SureTrak 3.0 Project Manager, published by Primavera Systems, Inc.

Format. The electronic schedule format shall contain the following:

- a. Project Name: (Optional).
- b. Template: Construction.
- c. Type: SureTrak: Native file format for stand-alone contracts.
- d. Planning Unit: Days (calendar working).
- e. Number/Version: Original or updated number.
- f. Start Date: Not later than ten days after execution of the contract.
- g. Must Finish Date: Completion date for completion date contracts.
- h. Project Title: Contract number.
- i. Company Name: Contractor's name.

Calendars.

- a. Completion Date Contracts. The base calendar shall show the proposed working days of the week and the proposed number of work hours per day.

Schedule Development. The detailed schedule shall incorporate the entire contract time. The minimum number of activities shown on the schedule shall represent the work incorporating the pay items whose aggregate contract value constitutes 80 percent of the total contract value. These pay items shall be determined by starting with the pay item with the largest individual contract value and adding subsequent pay item contract values in descending order until 80 percent of the contract value has been attained. Any additional activities required to maintain the continuity of the schedule logic shall also be shown.

The following shall be depicted in the schedule for each activity:

- a. Activity Identification (ID) Numbers. The Contract shall utilize numerical designations to identify each activity. Numbering of activities shall be in increments of not less than ten digits.

- b. A description of the work represented by the activity (maximum forty-five characters). The use of descriptions referring to a percentage of a multi-element item (i.e., construct deck 50%) shall not be used. Separate activities shall be included to represent different elements of multi-element items (i.e., forms, reinforcing, concrete, etc.). Multiple activities with the same work description shall include a location as part of the description.
- c. Proposed activity duration shall be shown in whole days. The Contractor shall provide production rates to justify the activity duration. Schedule duration shall be contiguous and not interruptible.

The schedule shall indicate the sequence and interdependence of activities required for the prosecution of the work. The schedule logic shall not be violated.

Activities should be broken down such that each activity encompasses a single operation or tightly-integrated operations in a single, contiguous and continuous area of the project, with no activity exceeding \$200,000 without the consent of the Engineer.

Total Float shall be calculated as finish float. The schedule shall be calculated using retained logic. The Contractor shall not sequester float by calendar manipulations or extended duration. Float is not for the exclusive use or benefit of either the Department or the Contractor.

Tabular Reports.

- a. The following tabular reports will be required with each schedule submission:
 - 1. Classic Gantt
 - 2. Pert with Time Scale
- b. The heading of each tabular report shall include, but not be limited to, the project name, Contract number, Contractor name, report date, data date, report title and page number.
- c. Each of the tabular reports shall also contain the following minimum information for each activity.
 - 1. Activity ID
 - 2. Activity Description
 - 3. Original Duration (calendar day/working day)
 - 4. Remaining Duration (calendar day/working day)
 - 5. Activity Description
 - 6. Early Start Date

7. Late Start Date
 8. Early Finish Date
 9. Late Finish Date
 10. Percent Complete
 11. Total Float
 12. Calendar ID
 13. Work performed by DBE Subcontractors and Trainees shall be shown in the Gantt Report.
- d. Reports shall be printed in color on 11 in. x 17 in. (minimum) size sheets. The Classic Gantt shall show all columns, bars, column headings at the top, time scale at the top and shall show relationships.

Submission Requirements. The initial schedule shall be submitted prior to starting work but no later than five calendar days after execution of the contract. Updated schedules shall be submitted according to Article 108.02 except that as a minimum, updated schedules will be required at the 25, 50, and 75 percent completion points of the contract.

Updating.

- a. The Contractor shall not make any changes to the original duration, activity relationships, constraints, costs, add or delete activities, or alter the schedule's logic when updating the schedule.
- b. The originally approved baseline CPM schedule will be designated as the "Target Schedule" and shall only be changed based on a Change Order that extends the Contract duration. All updates will be plotted against the "Target Schedule." If the Contractor believes any such changes result in an overall increase in the contract time, the Contractor will immediately submit a request for extension of time along with the changed progress schedule and a detailed justification for the time extension request in accordance with Article 108.08.
- c. The updated information will include the original schedule detail and the following additional information:
 1. Actual start dates
 2. Actual finish dates
 3. Activity percent completion

4. Remaining duration of activities in progress
 5. Identified or highlighted critical activities
- d. The Contractor shall submit scheduling documents in the same formats and number as indicated in this section.
 - e. The Engineer shall withhold progress payments if the Contractor does not submit scheduled updates as required.
 - f. Upon receipt of the CPM schedule update, the Engineer will review the schedule for conformance with the Contract Documents and degree of detail. The Engineer, within fourteen (14) Days after receipt of the Updated CPM Schedule and supporting documents, will approve or reject it with written comments. If the Updated CPM schedule is rejected, the Contractor must submit a Revised Updated CPM Schedule within seven (7) Days after the date of rejection.
 - g. The updated progress schedule must accurately represent the Project's current status.

Contractor Changes to the Schedule.

The Contractor shall comply with the following requirements regarding proposed changes to the approved baseline CPM schedule:

- a. If the Contractor proposes to make any changes in the approved baseline CPM schedule, the Contractor shall notify the Engineer in writing, stating the reasons for the change, identifying each changed activity (including duration and interrelationships between activities) and providing a diskette of the proposed changed schedule. Every effort must be made by the Contractor to retain the original Activity ID numbers.
- b. The Engineer has the authority to approve or disapprove the proposed change in the baseline CPM schedule and shall do so in writing within ten (10) Days after receipt to the Contractor's submission.
- c. If the Engineer approves the change in the baseline. All monthly updates will be plotted against the new "Target Schedule".
- d. If the Engineer approves a portion of the change to the baseline CPM schedule, the Contractor shall submit a revised CPM schedule incorporating such change(s) within ten (10) Days after approval along with a written description of the change(s) to the schedule.

Recovery Schedule.

- a. The Contractor shall maintain an adequate work force and the necessary materials, supplies and equipment to meet the current approved baseline CPM schedule. In the event that the Contractor, in the judgment of the Engineer, is failing to meet the approved CPM schedule including any Contract milestones, the Contractor shall submit a recovery schedule.
- b. The recovery schedule shall set forth a plan to eliminate the schedule slippage (negative float). The plan must be specific to show the methods to achieve the recovery of time, i.e. increasing manpower, working overtime, weekend work, employing multiple shifts. All costs associated with implementing the recovery schedule shall be borne by the Contractor.
- c. Upon receipt of the CPM recovery schedule, the Engineer will review the schedule for conformance with the Contract Documents and degree of detail. The Engineer will approve the schedule or reject it with written comments within fourteen (14) Days of receipt of the recovery schedule and supporting documents. If the detailed CPM recovery schedule is rejected, the Contractor must submit a revised CPM recovery schedule within seven (7) Days of the date of rejection.

Revised Schedule.

The Engineer may direct the Contractor to revise the approved CPM schedule. Reasons for such direction may include, but are limited to, the following: (1) changes in the Work, (2) rephrasing of the Project or any phase, (3) a change in the duration of the Project or phase, and (4) acceleration of the Project or phase.

- a. The Engineer will direct the Contractor to provide a revised CPM schedule in writing.
- b. The Contractor will provide the revised CPM schedule within ten (10) Days of receipt of the Engineer's written direction.
- c. The Engineer has the authority, in its sole discretion, to approve or reject the revised CPM schedule and will do so in writing within ten (10) Days after receipt of the Contractor's submission. If the Engineer approves the revised schedule, such schedule will be designated the new "Target Schedule".

The schedule shall be submitted in the Sorted by Activity Layout (SORT4). The activities on the schedule shall be plotted using early start, late start, early finish, late finish and total finish.

For every schedule submission, the Contractor shall submit to the Engineer, four Windows XP compatible compact disks of all schedule data. Included on the disks shall be all of the tabular and graphic reports, network diagrams and bar chart data. Two copies shall be submitted on CD/R disks and two copies shall be submitted on CDD/RW disks. In addition, four plots of the CD/R disks will be approved initial or revised progress schedule for the contract. The approval will be documented by the Engineer on a corresponding plot of the schedule and returned to the Contractor.

Four copies of each schedule submission shall be printed in color on 11 in. x 17 in. (minimum) size sheets showing all columns, bars, column headings at the top, time scale at the top and showing relationships.

The schedule shall indicate the critical path to contract completion. Only one controlling item shall be designated at any point in time on the schedule.

Acceptance or approval of any progress schedule by the Engineer shall not be construed to imply approval of any particular method of construction, sequence of construction, any implied or stated rate of production. Acceptance will not act as a waiver of the obligation of the Contractor to complete the work in accordance with the contract proposal, Plans and Specifications, modify any rights or obligations of the Department as set forth in the contract, nor imply any obligation of a third party. Acceptance shall not be construed to modify or amend the contract or the time limit(s) therein. Acceptance shall not relieve the Contractor of the responsibility for the accuracy of any of the information included on the schedule. Failure of the Contractor to include in the schedule any element of work required for the performance of the contract, any sequence of work required by the contract, or any known or anticipated condition affecting the work shall not excuse the Contractor from completing all work required within the time limit(s) specified in the contract notwithstanding acceptance of the schedule by the Engineer.

Basis of Payment. This work will not be paid for separately, but shall be considered as included in the costs of the various items of work in the contract.

WINTER WORK

No adjustment will be made in the contract unit prices for any concrete in winter to meet the required completion dates specified in the contract.

SUBMITTALS

There are elements of construction that may require long lead times between order and delivery to the project site for installation. The Contractor must prioritize timely submittals of shop drawings to minimize any delays in project execution.

The Contractor shall provide notice to the Engineer concerning shop drawing submittal schedules and when shop drawing submittal deadlines may be delayed.

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.

STATUS OF UTILITIES (D1)

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.

Stage Pre-Stage to Stage 4

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	DURATION OF TIME
Ramp F at Relocated Toll Plaza 31 & Near Existing Toll Plaza 31	Electric	<p>New electric to service the proposed control building.</p> <p>Electric conduits along the north side of the ramp are no longer needed with the demolition of the Toll Plaza and AT&T buildings.</p>	ComEd	<p>ComEd to install new electric service infrastructure at the new toll plaza control building to distribute power within the building.</p> <p>ComEd will disconnect service of existing conduits running to existing Toll Plaza 31 building and AT&T building.</p> <p>Duration of time is not available.</p>
Ramp F at Relocated Toll Plaza 31 & Near Existing Toll Plaza 31	Gas	<p>New gas line to service the proposed control building.</p> <p>Gas service along the north side of the ramp is no longer needed with the demolition of the Toll Plaza building.</p>	Nicor	<p>Nicor to install new gas line for the new toll plaza control building and to distribute natural gas to the generator.</p> <p>Nicor will remove gas meter that is attached to the existing Toll Plaza building and remove or abandon existing gas line.</p> <p>5 days</p>
Ramp F at Relocated Toll Plaza 31 & Near Existing Toll Plaza 31	Fiber/ Telephone	<p>Installation of new antennas on the new communication tower for fiber and telephone.</p> <p>Antennas with fiber and telephone lines</p>	AT&T	<p>After installation of the new communication tower, AT&T will install new antennas, ground equipment, generator, fiber and phone lines.</p>

		are attached to the Illinois Tollway Tower within fenced area behind Toll Plaza building is no longer needed since new service will be rerouted to the relocated toll plaza.		AT&T will remove antennas, equipment, building, diesel generator, fiber and phone lines near the existing toll plaza 31 building. 30 days
Ramp F near Existing Toll Plaza 31	Fiber Optic	Tollway fiber optic is no longer needed with the demolition of the Toll Plaza building.	Illinois Tollway	The existing Tollway fiber optic to be disconnected and removed. 30 days

Pre-Stage to Stage 4: 65 Days Total Installation

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
ComEd	A.J. Culum, Vincent Mazzaferro	779-231-1027, 872-395-1872, 312-758-8838	Anthony.Culum@ComEd.com , Vincent.MazzaferroPE@ComEd.com , Plansubmittalsandmaprequests@exeloncorp.com
Nicor Gas	Taylor Lierow, Saki Forah, Michal Ann Beyke, & Charles "Chip" Parrot	630-388-3319	X2tliero@southernco.com , sforah@southernco.com , mbeyke@southernco.com , cparrot@southernco.com , gasmaps@southernco.com
AT&T	Andrew Notestine, Alexander Bryant, Stan Plodzien & Jamie Gwin	312-810-9963, 630-272-9010, 630-573-5423, 630-573-6496	an201m@att.com , ab8652@att.com , sp3264@att.com , jp8128@att.com
Village of Rosemont	Frank Rocha, Anthony Dericco, & Lisa DiMatteo	847-823-0500, 847-698-3744	RochaF@VillageOfRosemont.org , adericco@cbbel.com , DiMatteoL@VillageOfRosemont
Illinois State Toll Highway Authority (ISTHA)	John Lussow	331-238-4916	jlussow@getipass.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.

Pre-stage to Stage 4

STAGE / LOCATION	TYPE	DESCRIPTION	OWNER
SB I-294	Fiber Optic	Crown Castle maintains active fiber optic cable along the west side of SB I-294 are to be protected and not disturbed.	Crown Castle
Ramp F to WB I-190 Entrance Ramp	Fiber Optic	Verizon and MCI maintain active fiber optic cable in two 1.5" HDPE conduits along WB I-190 west of the access road that are to be protected and not disturbed.	MCI/Verizon/ Telecom/Cogent
Ramp F to WB I-190 Entrance Ramp	Electric	ComEd maintains active overhead 12KV electric on poles along the west side of the Ramp E to WB I-190 entrance ramp that shall be protected and not disturbed.	ComEd
Ramp F to WB I-190 Entrance Ramp	Electric	ComEd maintains active underground electric line adjacent to the east side CN Railroad that shall be protected and not disturbed.	ComEd

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
Crown Castle (Sunesys, Lighttower, & Sidera)	Mike Kyriazakos & John Pyka	847-370-7617, 312-415-8184	Michael.Kyriazakos@crowncastle.com , John.Pyka@crowncastle.com , & Fiber.dig@crowncastle.com
MCI/Verizon/ Telecom/Cogent	Charles Schero, Sandra B. Cisneros, Joe Chaney, John Buher, Jason Jarvis, Steven Hughes	732-335-5588, 219-314-6926, 312-612-5216	investigations@verizon.com , john.buher@verizon.com , scisneros@telecom-eng.com , jason.jarvis@verizon.com , shughes@cogentco.com
ComEd	A.J. Culum, Vincent Mazzaferro	779-231-1027, 872-395-1872, 312-758-8838	Anthony.Culum@ComEd.com , Vincent.MazzaferroPE@ComEd.com , Plansubmittalsandmaprequests@exeloncorp.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.

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.”

PROSECUTION OF THE WORK

Add the following to Article 108.03 of the Standard Specifications:

“The Contract will not be allowed to proceed with construction operations until March 1, 2025. The Engineer’s written approval shall be obtained by the Contractor before proceeding with any work on this project.”

WORK RESTRICTIONS

When the Contractor obtains the written approval by the Engineer to proceed with construction operations, the Contractor will be required to begin tree clearing and removal in accordance with the Plans and special provisions. Tree clearing and removal is only allowed from November 1st to March 30th.

COMPLETION DATE PLUS WORKING DAYS (D1)

Revise Article 108.05 (b) of the Standard Specifications as follows:

"When a completion date plus working days is specified, the Contractor shall complete all contract items and safely open all roadways to traffic by 11:59 PM on December 5, 2025 except as specified herein.

The All Electronic Tolling (AET) shall be fully functional and operating to the satisfaction of the Engineer on or before September 26, 2025.

The Contractor will be allowed to complete all clean-up work and punch list items within 10 working days after the completion date for opening the roadway to traffic. Under extenuating circumstances the Engineer may direct that certain items of work, not affecting the safe opening of the roadway to traffic, may be completed within the working days allowed for clean up work and punch list items. Temporary lane closures for this work may be allowed at the discretion of the Engineer.

Article 108.09 or the Special Provision for "Failure to Complete the Work on Time", if included in this contract, shall apply to both the completion date and the number of working days.

FAILURE TO COMPLETE THE WORK ON TIME (D1)

Effective: September 30, 1985

Revised: January 1, 2007

Should the Contractor fail to complete the work on or before the completion date as specified in the Special Provision for "Completion Date Plus Working Days", or within such extended time as may have been allowed by the Department, the Contractor shall be liable to the Department in the amount of **\$ 10,000**, not as a penalty but as liquidated damages, for each calendar day or a portion thereof of overrun in the contract time or such extended time as may have been allowed.

In fixing the damages as set out herein, the desire is to establish a certain mode of calculation for the work since the Department's actual loss, in the event of delay, cannot be predetermined, would be difficult of ascertainment, and a matter of argument and unprofitable litigation. This said mode is an equitable rule for measurement of the Department's actual loss and fairly takes into account the loss of use of the roadway if the project is delayed in completion. The Department shall not be required to provide any actual loss in order to recover these liquidated damages provided herein, as said damages are very difficult to ascertain. Furthermore, no provision of this clause shall be construed as a penalty, as such is not the intention of the parties.

A calendar day is every day shown on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later.

TRAFFIC CONTROL PLAN (D1)

Effective: September 30, 1985

Revised: January 1, 2007

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:

704001	Temporary Concrete Barrier
720001	Sign Panel Mounting Details
720006	Sign Panel Erection Details

DETAILS:

Suggested Stages of Construction and Traffic Control Plan - General Notes and Narrative
Suggested Stages of Construction and Traffic Control Plan - Typical Sections
Suggested Stages of Construction and Traffic Control Plan

SPECIAL PROVISIONS:

Maintenance of Roadways (D1)
Public Convenience and Safety (D1)
Tollway Permit and Bond (D1)
Traffic Control Plan (D1)
Work Zone Traffic Control Devices (BDE)
Temporary Pavements (Illinois Tollway)
Temporary Concrete Barrier, Cross-Bolt Connection (Illinois Tollway)
Maintenance of Traffic
Demolition of Plaza Canopy
Pavement Marking and Marker Removal (Illinois Tollway)

TOLLWAY STANDARDS:

- D4-08 Roadway Delineators and Reflectors
- D10-03 Temporary Concrete Barrier with Cross-Bolt Connection
- E1-07 Construction Signs
- E3-09 Shoulder Closure Details
- E4-07 Maintenance of Traffic Reverse Curve
- E5-10 Temporary Gore Details
- E6-07 Contractor Access to Work Area

LIST OF INCIDENTALS TO THE PAY ITEMS

The Contractor’s attention is called to several specific incidental work items as noted on the Contract Plans and Special Provisions and in addition to the lists in the Standard Specifications. Listed below is a listing of these items for general information only. The list is not intended to be all-inclusive and, therefore, the Contractor is responsible to perform all work according to the Plans, Special Provisions, the Standard Specifications, and Illinois Tollway Supplemental Specifications.

PAY ITEM NUMBER	ITEM	INCIDENTAL WORK
20200100	EARTH EXCAVATION	Clearing of brush and trees < 6 inches diameter, existing pipe underdrain removal and pipe underdrain headwall removal, aggregate shoulders, aggregate surface course removal, removal of unforeseen abandoned underground utilities where it conflicts with proposed improvements.
44000100	PAVEMENT REMOVAL	Saw cut (full depth) shall be required at the joint between pavement, sidewalk, curb, curb and gutter, gutter, flume, median, driveway pavement, and hot-mix asphalt surfaces. Removal of any existing pavement fabric, steel reinforcement, or wire mesh in the pavement.
44000300	CURB REMOVAL	Saw cut (full depth) shall be required at the joint between pavement, sidewalk, curb, curb and gutter, gutter, flume, median, driveway pavement, and hot-mix asphalt surfaces.

PAY ITEM NUMBER	ITEM	INCIDENTAL WORK
		Removal of any existing pavement fabric.
44000400	GUTTER REMOVAL	<p>Saw cut (full depth) shall be required at the joint between pavement, sidewalk, curb, curb and gutter, gutter, flume, median, driveway pavement, and hot-mix asphalt surfaces.</p> <p>Removal of any existing pavement fabric and portions of existing concrete flume.</p>
44000600	SIDEWALK REMOVAL	<p>Saw cut (full depth) shall be required at the joint between pavement, sidewalk, curb, curb and gutter, gutter, median, driveway pavement, and hot-mix asphalt surfaces.</p> <p>Removal of any existing pavement fabric.</p>
44004250	PAVED SHOULDER REMOVAL	<p>Saw cut (full depth) shall be required at the joint between pavement, sidewalk, curb, curb and gutter, gutter, flume, median, driveway pavement, and hot-mix asphalt surfaces.</p> <p>Removal of any existing pavement fabric.</p>
550A0360	STORM SEWERS, CLASS A, TYPE 2 15"	<p>Elbows and Tees and Collars. Connecting to drainage structures.</p> <p>Temporary plugs during Staging when only portions of Storm Sewers are to be installed.</p>
63200310	GUARDRAIL REMOVAL	Removal of guardrail reflector marker.
X4402805	ISLAND REMOVAL	<p>Saw cut (full depth) shall be required at the joint between pavement, sidewalk, curb, curb and gutter, gutter, median, driveway pavement, and hot-mix asphalt surfaces.</p> <p>Removal of any existing pavement fabric.</p>

PAY ITEM NUMBER	ITEM	INCIDENTAL WORK
J1420010	PORTLAND CEMENT CONCRETE PAVEMENT 12" (JOINTED)	Drilling and grouting of dowel bars in the existing pavement for connecting with proposed pavement.
JS630002	GALVANIZED STEEL PLATE BEAM GUARDRAIL, TYPE A 6 FOOT POSTS	Includes cost of splicing to existing guardrail.
JS601320	PIPE UNDERDRAINS, FABRIC LINED TRENCH 6"	Connecting to existing pipe underdrains and drainage structures.
CONTRACT	PERMITS	All costs related to the permit requirements will be included in the cost of the Contract.
CONTRACT	WARRANTY	All costs related to the warranty requirements will be included in the cost of the Contract.
CONTRACT	EARTHWORK MANAGEMENT PLANS	All costs related to the Earthwork Management Plans will be included in the cost of the Contract.
CONTRACT	STREET CLEANING AND SWEEPING	All work associated with street cleaning and sweeping will be included in the cost of Contract.
CONTRACT	CONCRETE WASHOUTS	All work associated with the installation and maintenance shall be incidental to the Contract.

WARRANTY (ILLINOIS TOLLWAY)

Effective: January 11, 2010

Revised: March 1, 2024

GENERAL

This special provision amends and supersedes any previous warranty provisions and is in addition to the warranty requirements of Article 105.18 of the Illinois Tollway Supplemental Specifications.

The Contractor warrants that all work completed under the contract pay items, including all materials and workmanship furnished by the Contractor and subcontractors shall comply with the contract, and that the work shall be free from defects or failures for the period specified after commencement of the warranty period. The Contractor does not warrant the work against failures due to design defects, due to the Illinois Tollway's routine maintenance operations or due to the occurrence of acts of nature that the finished work was not designed to withstand.

The Contractor guarantees that after receipt of notice from the Illinois Tollway as provided herein, he/she shall perform the warranty work as specified in the notice in accordance with the warranty work actions specified herein including all necessary incidental work to complete the action and restore the complete facility, and damage to adjoining structures caused by failure of the warranted work, including but not limited to removal, engineering, material procurement, reinstallation, or replacement at the Contractor's cost and expense. The Illinois Tollway's remedies under this warranty are not exclusive but are in addition to any other remedies provided by this contract or law. The additional obligations undertaken by the Contractor to provide this warranty for the work and to perform in accordance herewith shall be secured by a performance and payment bond provided by the Contractor in a form furnished by the Illinois Tollway and said bond to remain in full force and effect for the duration of the warranty period.

For the purpose of this special provision, the following definitions shall apply:

Warranty: An assurance by the seller and/or manufacturer of a product that the goods or property will continue to perform as promised or represented and which provides for a specific remedy, such as repair or replacement, in the event the goods or property fails within a specific timeframe.
Guaranty: An assurance by the contractor that the specific Work will meet expected workmanship standards as stated in the contract or in accordance with industry standards and provides for a specific remedy, such as repair or replacement of the Work, if it fails within a specific timeframe.

Std. Sp/S.P.	DESCRIPTION	CONTRACTOR	MANUFACTURER
	ROADWAY and BRIDGES		
109.08(b) Illinois Tollway Suppl.	GUARANTY AGAINST DEFECTIVE WORK	1 year	
S.P.	EXPANSION JOINTS (JOINT SEAL SYSTEM - P.C.C. PAVEMENT) and NEW BRIDGE EXPANSION JOINTS	3 years	3 years
	BUILDINGS		
S.P.	PREFABRICATED CONTROL BUILDING, LOCATION 1	2 years	10 years
S.P.	SELF SUPPORTING COMMUNICATION TOWER STRUCTURAL STEEL	1 year	1 year
	BUSINESS SYSTEMS		
S.P.	PLAZA ELECTRICAL WORK	1 year	1 year
S.P.	PLAZA ELECTRICAL WORK (UPS)	2 years	2 years
S.P.	PLAZA ELECTRICAL WORK (ENGINE GENERATOR SET)	2 years	2 years
S.P.	VES CAMERA WASH SYSTEM, SINGLE CABINET, NITROGEN GENERATOR	1 year	1 year
S.P.	NETWORK EQUIPMENT	1 year	1 year
	INTELLIGENT TRANSPORTATION SYSTEMS		
S.P.	VIDEO POWER JUNCTION BOX	1 year	1 year
S.P.	ITS SECURITY CLOSED CIRCUIT TELEVISION (CCTV) CAMERA	1 year	3 years

COMMENCEMENT OF WARRANTY PERIOD

The Warranty Period Start Date shall be the Contract Completion date stated in the Chief Engineer’s letter to the Contractor confirming that the Contractor has completed all work.

Commencement of warranty does not relieve the Contractor of any remaining or contractual obligations. Approval of the Warranty Period Start Date shall not be construed as final acceptance of the work of the contract not subject to approval.

The Contractor shall submit Tollway form A-27 documenting the warranty items and terms.

WARRANTY REQUIREMENTS

The Illinois Tollway will notify the Contractor of the need for corrective action. The Contractor shall perform corrective action promptly as defined in the notification. The notification will provide for a requested start date for performance of corrective action covered by the notice, and for a number of working days estimated to complete the corrective action. The Illinois Tollway and Contractor may agree upon a start date and reasonable period of performance to define prompt completion.

TREE REMOVAL (ILLINOIS TOLLWAY)

Effective: April 1, 2016

Revised: September 2, 2020

Description. This work shall consist of the cutting, grubbing, removal, and disposal of trees in accordance with Section 201 of the Standard Specifications except as herein modified.

Add the following to Article 201.03:

Mechanical equipment shall not be used in areas of standing water. Written permission from the Engineer is required prior to opening, lowering or otherwise disturb existing right-of-way fencing or other permanent fencing to access work.

Add the following to Article 201.04:

The Contractor shall comply with Illinois Department of Agriculture (IDOA) and the United States Department of Agriculture (USDA) quarantine requirements, guidance and restrictions for tree removal and disposal of vegetation.

The Contractor shall maintain vigilance to minimize the spread of Emerald Ash Borer (EAB), other pests and invasive weeds during removal, storage and disposal operations.

Refer to the Illinois Department of Agriculture website at <https://www2.illinois.gov/sites/agr/Insects/Pests/EmeraldAshBorer/Pages/default.aspx> for additional information on Emerald Ash Borer.

Tree removal cannot occur between April 1st and October 31st due to Tollway's commitment to protect bat pup season.

ADJUSTMENTS AND RECONSTRUCTIONS (D1)

Effective: March 15, 2011

Revised: October 1, 2021

Revise the first paragraph of Article 602.04 to read:

“602.04 Concrete. Cast-in-place concrete for structures shall be constructed of Class SI concrete according to the applicable portions of Section 503. Cast-in-place concrete for pavement patching around adjustments and reconstructions shall be constructed of Class PP-2 concrete, unless otherwise noted in the plans, according to the applicable portions of Section 1020.”

Revise the third, fourth and fifth sentences of the second paragraph of Article 602.11(c) to read:

“Castings shall be set to the finished pavement elevation so that no subsequent adjustment will be necessary, and the space around the casting shall be filled with Class PP-2 concrete, unless otherwise noted in the plans, to the elevation of the surface of the base course or binder course. HMA surface or binder course material shall not be allowed. The pavement may be opened to traffic according to Article 701.17(e)(3)b.”

Revise Article 603.05 to read:

“603.05 Replacement of Existing Flexible Pavement. After the castings have been adjusted, the surrounding space shall be filled with Class PP-2 concrete, unless otherwise noted in the plans, to the elevation of the surface of the base course or binder course. HMA surface or binder course material shall not be allowed. The pavement may be opened to traffic according to Article 701.17(e)(3)b.”

Revise Article 603.06 to read:

“603.06 Replacement of Existing Rigid Pavement. After the castings have been adjusted, the pavement and HMA that was removed, shall be replaced with Class PP-2 concrete, unless otherwise noted in the plans, not less than 9 in. (225 mm) thick. The pavement may be opened to traffic according to Article 701.17(e)(3)b.

The surface of the Class PP concrete shall be constructed flush with the adjacent surface.”

Revise the first sentence of Article 603.07 to read:

“603.07 Protection Under Traffic. After the casting has been adjusted and the Class PP concrete has been placed, the work shall be protected by a barricade and two lights according to Article 701.17(e)(3)b.”

WOODEN FENCE REMOVAL

Description. This work shall consist of removing and disposing the existing wooden fence as shown in the Plans, unless otherwise directed by the Engineer.

Construction Requirements. No removal work shall be completed without the approval of the Engineer. All associated hardware and appurtenances of the existing fence including but not limited to post foundations, fittings, post, and accessories, shall be removed off-site and disposed of by the Contractor in a legal disposal site. The resulting void from the removal of the post or foundation holes shall be backfilled and compacted to the satisfaction of the Engineer.

Method of Measurement. The wooden fence removal shall be measured for payment in feet along the top of existing fence.

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

REMOVE EXISTING FLAGPOLE

Description. This work shall consist of removing and disposing the existing flagpole and any associated foundation located adjacent to the existing Toll Plaza 31 building. The foundation shall be removed to at least 2 feet below grade, with removed material disposed of according to Article 202.03. The void caused by the removal of the foundation shall be backfilled and compacted with suitable material approved by the Engineer. The surface of the filled void or hole shall be treated to match the surrounding area. All debris resulting from the removal process shall be removed and disposed of by the Contractor.

Method of Measurement. This work shall be measured for payment in each for REMOVE EXISTING FLAGPOLE.

Excavation of earth necessary to perform the removal of existing foundation will not be measured for payment.

Basis of Payment. This work will be paid for at the contract unit price per each for REMOVE EXISTING FLAGPOLE. This price shall include all equipment, labor, and materials necessary to remove and dispose of the existing flagpole and any foundation, and their associated hardware and appurtenances.

GENERAL ELECTRICAL REQUIREMENTS

Effective: June 1, 2021

This special provision replaces Articles 801.01 – 801.07, 801.09 – 801-16 of the Standard Specifications.

Definition. Codes, standards, and industry specifications cited for electrical work shall be by definition the latest adopted version thereof, unless indicated otherwise.

Materials by definition shall include electrical equipment, fittings, devices, motors, appliances, fixtures, apparatus, all hardware and appurtenances, and the like, used as part of, or in connection with, electrical installation.

Standards of Installation. Materials shall be installed according to the manufacturer's recommendations, the NEC, OSHA, the NESC, and AASHTO's Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.

All like materials shall be from the same manufacturer. Listed and labeled materials shall be used whenever possible. The listing shall be according to UL or an approved equivalent.

Safety and Protection. Safety and protection requirements shall be as follows.

Safety. Electrical systems shall not be left in an exposed or otherwise hazardous condition. All electrical boxes, cabinets, pole handholes, etc. which contain wiring, either energized or non-energized, shall be closed or shall have covers in place and be locked when possible, during nonworking hours.

Protection. Electrical raceway or duct openings shall be capped or otherwise sealed from the entrance of water and dirt. Wiring shall be protected from mechanical injury.

Equipment Grounding Conductor. All electrical systems, materials, and appurtenances shall be grounded. Good ground continuity throughout the electrical system shall be assured, even though every detail of the requirements is not specified or shown. Electrical circuits shall have a continuous insulated equipment grounding conductor. When metallic conduit is used, it shall be bonded to the equipment grounding conductor, but shall not be used as the equipment grounding conductor.

Detector loop lead-in circuits, circuits under 50 volts, and runs of fiber optic cable will not require an equipment grounding conductor.

Where connections are made to painted surfaces, the paint shall be scraped to fully expose metal at the connection point. After the connection is completed, the paint system shall be repaired to the satisfaction of the Engineer.

Bonding of all boxes and other metallic enclosures throughout the wiring system to the equipment grounding conductor shall be made using a splice and pigtail connection. Mechanical connectors shall have a serrated washer at the contact surface.

All connections to structural steel or fencing shall be made with exothermic welds. Care shall be taken not to weaken load carrying members. Where connections are made to epoxy coated reinforcing steel, the epoxy coating shall be sufficiently removed to facilitate a mechanical connection. The epoxy coating shall be repaired to the satisfaction of the Engineer. Where connections are made to insulated conductors, the connection shall be wrapped with at least four layers of electrical tape extended 6 in. (150 mm) onto the conductor insulation.

Submittals. At the preconstruction meeting, the Contractor shall submit a written listing of manufacturers for all major electrical and mechanical items. The list of manufacturers shall be binding, except by written request from the Contractor and approval by the Engineer. The request shall include acceptable reasons and documentation for the change.

Within 30 calendar days after contract execution, the Contractor shall submit, for approval, through the Traffic Operations Construction Submittals Application (TOCS) system the manufacturer's product data (for standard products and components) and detailed shop drawings (for fabricated items). Submittals for the materials for each individual pay item shall be complete in every respect. Submittals which include multiple pay items shall have all submittal material for each item or group of items covered by a particular specification, grouped together and the applicable pay item identified. Various submittals shall, when taken together, form a complete coordinated package. A partial submittal will be returned without review unless prior written permission is obtained from the Engineer.

Each PDF document must be a vector format PDF from the originating supplier or program and not scanned images.

The submittal must clearly identify the specific model number or catalog number of the item being proposed.

For further information and requirements regarding the TOCS system, the Contractor should reference the *TOCS Contractors User Guide*.

The submittal shall be properly identified by route, section, county, and contract number.

The Contractor shall have reviewed the submittal material and affixed his/her stamp of approval, with date and signature, for each individual item.

Illegible print, incompleteness, inaccuracy, or lack of coordination will be grounds for rejection.

Items from multiple disciplines shall not be combined on a single submittal and transmittal. Items for lighting, signals, surveillance and CCTV must be in separate submittals since they may be reviewed by various personnel in various locations.

The Department may provide a list of pay items broken out by discipline upon request for a particular contract.

The Engineer will review the submittals for conformance with the design concept of the project according to Article 105.04 and the following. The Engineer will stamp the drawings indicating their status as "Approved", "Approved as Noted", "Disapproved", or "Information Only". Since the Engineer's review is for conformance with the design concept only, it shall be 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, or layout drawings by the Engineer's approval thereof. The Contractor shall still be in full compliance with contract and specification requirements.

All submitted items reviewed and marked "Disapproved" or "Approved as Noted" shall be resubmitted by the Contractor in their entirety, unless otherwise indicated within the submittal comments.

Work shall not begin until the Engineer has approved the submittal. Material installed prior to approval by the Engineer, will be subject to removal and replacement at no additional cost to the Department.

Certifications. When certifications are specified and are available prior to material manufacture, the certification shall be included in the submittal information. When specified and only available after manufacture, the submittal shall include a statement of intent to furnish certification. All certificates shall be complete with all appropriate test dates and data.

Authorized Project Delay. See Article 801.08

Maintenance transfer and Preconstruction Inspection:

General. Before performing any excavation, removal, or installation work (electrical or otherwise) at the site, the Contractor shall request a maintenance transfer and preconstruction site inspection, to be held in the presence of the Engineer and a representative of the party or parties responsible for maintenance of any lighting and/or traffic control systems which may be affected by the work. The request for the maintenance transfer and preconstruction inspection shall be made no less than fourteen (14) calendar days prior to the desired inspection date. The maintenance transfer and preconstruction inspection shall:

Establish the procedures for formal transfer of maintenance responsibility required for the construction period.

Establish the approximate location and operating condition of lighting and/or traffic control systems which may be affected by the work

Marking of Existing Cable Systems. The party responsible for maintenance of any existing lighting and/or traffic control systems at the project site will, at the Contractor's request, mark and/or stake, once per location, all underground cable routes owned or maintained by the State. A project may involve multiple "locations" where separated electrical systems are involved (i.e. different controllers). The markings shall be taken to have a horizontal tolerance of at least 1 foot (304.8 mm) to either side. The request for the cable locations and marking shall be made at the same time the request for the maintenance transfer and preconstruction inspection is made. The Contractor shall exercise extreme caution where existing buried cable runs are involved. The markings of existing systems are made strictly for assistance to the Contractor and this does not relieve the Contractor of responsibility for the repair or replacement of any cable run damaged in the course of his work, as specified elsewhere herein. Note that the contractor shall be entitled to only one request for location marking of existing systems and that multiple requests may only be honored at the contractor's expense. No locates will be made after maintenance is transferred, unless it is at the contractor's expense.

Condition of Existing Systems. The Contractor shall conduct an inventory of all existing electrical system equipment within the project limits, which may be affected by the work, making note of any parts which are found broken or missing, defective or malfunctioning. Megger and load readings shall be taken for all existing circuits which will remain in place or be modified. If a circuit is to be taken out in its entirety, then readings do not have to be taken. The inventory and test data shall be reviewed with and approved by the Engineer and a record of the inventory shall be submitted to the Engineer for the record. Without such a record, all systems transferred to the Contractor for maintenance during construction shall be returned at the end of construction in complete, fully operating condition."

Maintenance and Responsibility During Construction.

Lighting Operation and Maintenance Responsibility. The scope of work shall include the assumption of responsibility for the continuing operation and maintenance of the existing, proposed, temporary, sign and navigation lighting, or other lighting systems and all appurtenances affected by the work as specified elsewhere herein. Maintenance of lighting systems is specified elsewhere and will be paid for separately

The proposed lighting system must be operational prior to opening the roadway to traffic unless temporary lighting exists which is designed and installed to properly illuminate the roadway.

Energy and Demand Charges. The payment of basic energy and demand charges by the electric utility for existing lighting which remains in service will continue as a responsibility of the Owner, unless otherwise indicated. Unless otherwise indicated or required by the Engineer duplicate lighting systems (such as temporary lighting and proposed new lighting) shall not be operated simultaneously at the Owner's expense and lighting systems shall not be kept in operation during long daytime periods at the Owner's expense. Upon written authorization from the Engineer to place a proposed new lighting system in service, whether the system has passed final acceptance or not, (such as to allow temporary lighting to be removed), the Owner will accept responsibility for energy and demand charges for such lighting, effective the date of authorization. All other energy and demand payments to the utility shall be the responsibility of the Contractor until final acceptance.

Damage to Electrical Systems. Should damage occur to any existing electrical systems through the Contractor's operations, the Engineer will designate the repairs as emergency or non-emergency in nature.

Emergency repairs shall be made by the Contractor, or as determined by the Engineer, the Department, or its agent. Non-emergency repairs shall be performed by the Contractor within six working days following discovery or notification. All repairs shall be performed in an expeditious manner to assure all electrical systems are operational as soon as possible. The repairs shall be performed at no additional cost to the Department.

Lighting. An outage will be considered an emergency when three or more lights on a circuit or three successive lights are not operational. Knocked down materials, which result in a danger to the motoring public, will be considered an emergency repair.

Temporary aerial multi-conductor cable, with grounded messenger cable, will be permitted if it does not interfere with traffic or other operations, and if the Engineer determines it does not require unacceptable modification to existing installations.

Marking Proposed Locations for Highway Lighting System. The Contractor shall mark or stake the proposed locations of all poles, cabinets, junction boxes, pull boxes, handholes, cable routes, pavement crossings, and other items pertinent to the work. A proposed location inspection by the Engineer shall be requested prior to any excavation, construction, or installation work after all proposed installation locations are marked. Any work installed without location approval is subject to corrective action at no additional cost to the Department.

Inspection of electrical work. Inspection of electrical work shall be according to Article 105.12 and the following.

Before any splice, tap, or electrical connection is covered in handholes, junction boxes, light poles, or other enclosures, the Contractor shall notify and make available such wiring for the Engineer's inspection.

Testing. Before final inspection, the electrical work shall be tested. Tests may be made progressively as parts of the work are completed or may be made when the work is complete. Tests shall be made in the presence of the Engineer. Items which fail to test satisfactorily shall be repaired or replaced. Tests shall include checks of control operation, system voltages, cable insulation, and ground resistance and continuity.

The forms for recording test readings will be available from the Engineer in electronic format. The Contractor shall provide the Engineer with a written report of all test data including the following:

- Voltage Tests
- Amperage Tests
- Insulation Resistance Tests
- Continuity tests
- Detector Loop Tests

Lighting systems. The following tests shall be made.

- (1) Voltage Measurements. Voltages in the cabinet from phase to phase and phase to neutral, at no load and at full load, shall be measured and recorded. Voltage readings at the last termination of each circuit shall be measured and recorded.
- (2) Insulation Resistance. Insulation resistance to ground of each circuit at the cabinet shall be measured and recorded with all loads disconnected. Prior to performance of the insulation resistance test, the Contractor shall remove all fuses within all light pole bases on a circuit to segregate the luminaire loads.

On tests of new cable runs, the readings shall exceed 50 megohms for phase and neutral conductors with a connected load over 20A and shall exceed 100 megohms for conductors with a connected load of 20A or less.

On tests of cable runs which include cables which were existing in service prior to this contract, the resistance readings shall be the same or better than the readings recorded at the maintenance transfer at the beginning of the contract. Measurements shall be taken with a megohm meter approved by the Engineer.

- (3) Loads. The current of each circuit, phase main, and neutral shall be measured and recorded. The Engineer may direct reasonable circuit rearrangement. The current readings shall be within ten percent of the connected load based on material ratings.

- (4) Ground Continuity. Resistance of the system ground as taken from the farthest extension of each circuit run from the controller (i.e. check of equipment ground continuity for each circuit) shall be measured and recorded. Readings shall not exceed 2.0 ohms, regardless of the length of the circuit.
- (5) Resistance of Grounding Electrodes. Resistance to ground of all grounding electrodes shall be measured and recorded. Measurements shall be made with a ground tester during dry soil conditions as approved by the Engineer. Resistance to ground shall not exceed 10 ohms.

ITS. The following test shall be made in addition to the lighting system test above.

Detector Loops. Before and after permanently securing the loop in the pavement, the resistance, inductance, resistance to ground, and quality factor for each loop and lead-in circuit shall be tested. The loop and lead-in circuit shall have an inductance between 20 and 2500 microhenries. The resistance to ground shall be a minimum of 50 megohms under any conditions of weather or moisture. The quality factor (Q) shall be 5 or greater.

Fiber Optic Systems. Fiber optic testing shall be performed as required in the fiber optic cable special provision and the fiber optic splice special provision.

All test results shall be furnished to the Engineer seven working days before the date the inspection is scheduled.

Contract Guarantee. The Contractor shall provide a written guarantee for all electrical work provided under the contract for a period of six months after the date of acceptance with the following warranties and guarantees.

- (a) The manufacturer's standard written warranty for each piece of electrical material or apparatus furnished under the contract. The warranty for light emitting diode (LED) modules, including the maintained minimum luminance, shall cover a minimum of 120 months from the date of delivery.
- (b) The Contractor's written guarantee that, for a period of six months after the date of final acceptance of the work, all necessary repairs to or replacement of said warranted material or apparatus for reasons not proven to have been caused by negligence on the part of the user or acts of a third party shall be made by the Contractor at no additional cost to the Department.
- (c) The Contractor's written guarantee for satisfactory operation of all electrical systems furnished and constructed under the contract for a period of six months after final acceptance of the work.

The warranty for an uninterruptable power supply (UPS) shall cover a minimum of two years from date the equipment is placed in operation; however, the batteries of the UPS shall be warranted for full replacement for a minimum of five years.

Record Drawings. Alterations and additions to the electrical installation made during the execution of the work shall be made on the PDF copy of the as-Let documents using a PDF editor. Hand drawn notations or markups and scanned plans are not acceptable. These drawings shall be updated daily and shall be available for inspection by the Engineer during the work. The record drawings shall include the following:

- Cover Sheet
- The Electrical Maintenance Contract Management System (EMCMS) location designation, i.e. "L" number
- Summary of Quantities, electrical items only
- Legends, Schedules, and Notes
- Plan Sheets
- Pertinent Details
- Single Line Diagrams
- Other useful information useful to locate and maintain the systems.

Any modifications to the details shall be indicated. Final quantities used shall be indicated on the Summary of Quantities. Foundation depths used shall also be listed.

As part of the record drawings, the Contractor shall inventory all materials, new or existing, on the project and record information on inventory sheets provided by the Engineer.

The inventory shall include:

- Location of Equipment, including rack, chassis, slot as applicable.
- Designation of Equipment
- Equipment manufacturer
- Equipment model number
- Equipment Version Number
- Equipment Configuration
 - Addressing, IP or other
 - Settings, hardware or programmed
- Equipment Serial Number

The following electronic inventory forms are available from the Engineer:

- Lighting Controller Inventory
- Lighting Inventory
- Light Tower Inspection Checklist
- ITS Location Inventory

The information shall be entered in the forms; handwritten entries will not be acceptable; except for signatures. Electronic file shall also be included in the documentation.

When the work is complete, and seven days before the request for a final inspection, the 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 through TOCS, on CD-ROM as well as hardcopy's for review and approval.

In addition to the record drawings, PDF copies of the final catalog cuts which have been Approved and Approved as Noted with applicable follow-up shall be submitted along with the record drawings. The PDF files shall clearly indicate either by filename or PDF table of contents the respective pay item number. Specific part or model numbers of items which have been selected shall be clearly visible. Hard copies of the catalog are not required with this submittal.

The Contractor shall provide three sets of electronically produced drawings in a moisture proof pouch to be kept on the inside door of the controller cabinet or other location approved by the Engineer. These drawings shall show the final as-built circuit orientation(s) of the project in the form of a single line diagram with all luminaires numbered and clearly identified for each circuit.

Final documentation shall be submitted as a complete submittal package, i.e. record drawings, test results, inventory, etc. shall be submitted at the same time. Partial piecemeal submittals will be rejected without review.

A total of three hardcopies and two CD-ROMs of the final documentation shall be submitted. The identical material shall also be submitted through the TOCS system utilizing the following final documentation pay item numbers:

Pay Code	Description	Discipline
FDLRD000	Record Drawings - Lighting	Lighting
FDSRD000	Record Drawings - Surveillance	Surveillance
FDTRD000	Record Drawings - Traffic Signal	Traffic Signal
FDIRD000	Record Drawings - ITS	ITS
FDLCC000	Catalog Cuts - Lighting	Lighting
FDSCC000	Catalog Cuts – Surveillance	Surveillance
FDTCC000	Catalog Cuts – Traffic Signal	Traffic Signal
FDICC000	Catalog Cuts - ITS	ITS
FDLWL000	Warranty - Lighting	Lighting
FDSWL000	Warranty - Surveillance	Surveillance
FDTWL000	Warranty - Traffic Signal	Traffic Signal
FDIWL000	Warranty - ITS	ITS
FDLTR000	Test Results - Lighting	Lighting
FDSTR000	Test Results - Surveillance	Surveillance
FDTTR000	Test Results - Traffic Signal	Traffic Signal
FDITR000	Test Results - ITS	ITS
FDLINV00	Inventory - Lighting	Lighting
FDSINV00	Inventory - Surveillance	Surveillance
FDTINV00	Inventory - Traffic Signal	Traffic Signal
FDIINV00	Inventory - ITS	ITS
FDLGPS00	GPS - Lighting	Lighting
FDSGPS00	GPS - Surveillance	Surveillance
FDTGPS00	GPS - Traffic Signal	Traffic Signal
FDIGPS00	GPS - ITS	ITS

Record Drawings shall include Marked up plans, controller info, Service Info, Equipment Settings, Manuals, Wiring Diagrams for each discipline.

Test results shall be all electrical test results, fiber optic OTDR, and Fiber Optic power meter as applicable for each discipline.

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

- All light poles and light towers.
- Handholes and vaults.
- Junction Boxes
- Conduit roadway crossings.
- Controllers.
- Control Buildings.
- Structures with electrical connections, i.e. DMS, lighted signs.
- Electric Service locations.
- CCTV Camera installations.
- Roadway Surveillance installations.
- Fiber Optic Splice Locations.
- Fiber Optic Cables. Coordinates shall be recorded along each fiber optic cable route every 200 feet.
- All fiber optic slack locations shall be identified with quantity of slack cable included. When sequential cable markings are available, those markings shall be documented as cable marking into enclosure and marking out of enclosure.

Datum to be used shall be North American 1983.

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

1. District
2. Description of item
3. Designation
4. Use
5. Approximate station
6. Contract Number
7. Date
8. Owner
9. Latitude
10. Longitude
11. Comments

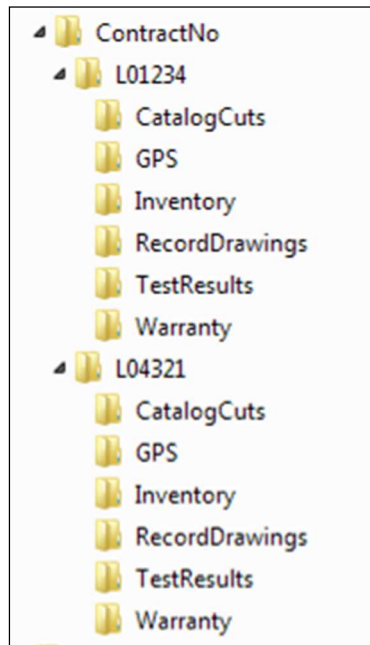
A spreadsheet template will be available from the Engineer for use by the Contractor.

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 minimum 5 meter accuracy after post processing.

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

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

The documents on the CD shall be organized by the Electrical Maintenance Contract Management System (EMCMS) location designation. If multiple EMCMS locations are within the contract, separate folders shall be utilized for each location as follows:



Extraneous information not pertaining to the specific EMCMS location shall not be included in that particular folder and sub-folder.

The inspection will not be made until after the delivery of acceptable record drawings, specified certifications, and the required guarantees.

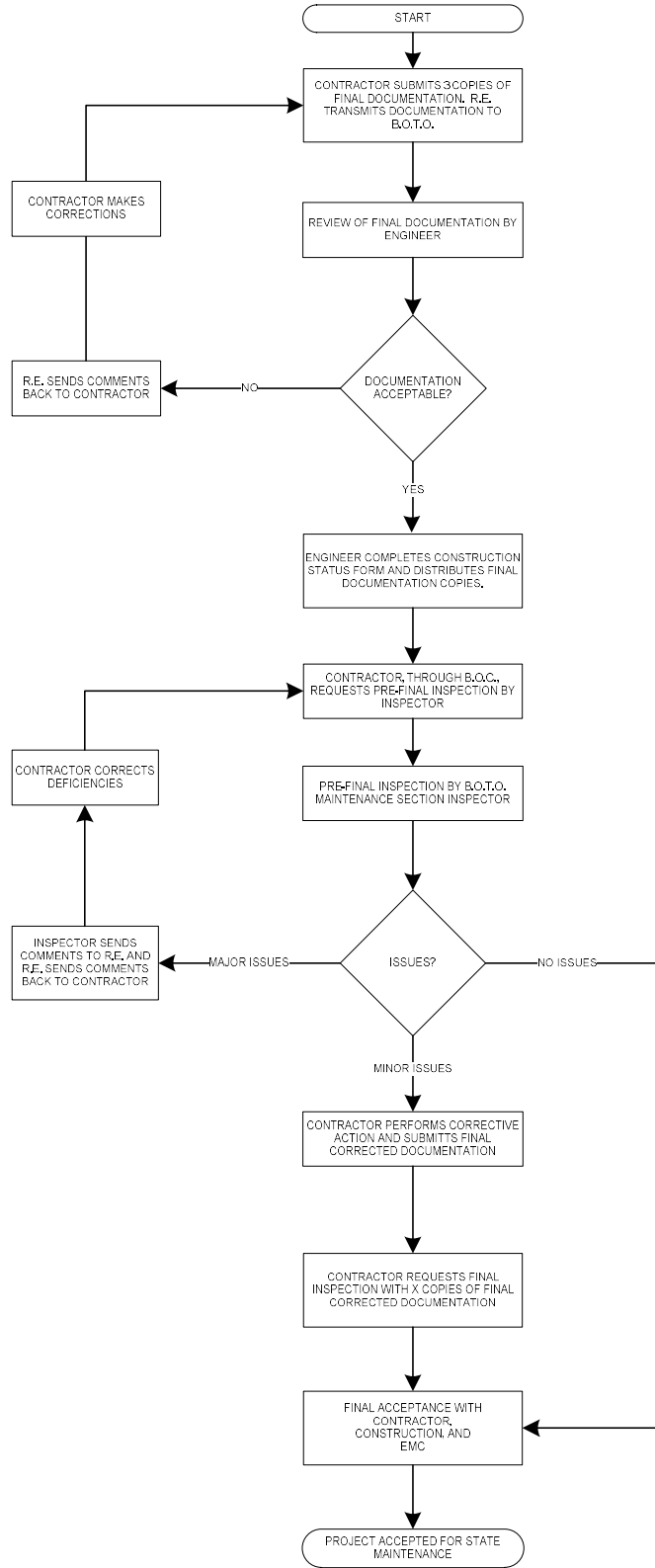
The Final Acceptance Documentation Checklist shall be completed and is contained elsewhere herein.

All CD's shall be labeled as illustrated in the CD Label Template contained herein.

Acceptance. Acceptance of electrical work will be given at the time when the Department assumes the responsibility to protect and maintain the work according to Article 107.30 or at the time of final inspection.

When the electrical work is complete, tested, and fully operational, the Contractor shall schedule an inspection for acceptance with the Engineer no less than seven working days prior to the desired inspection date. The Contractor shall furnish the necessary labor and equipment to make the inspection.

A written record of the test readings taken by the Contractor according to Article 801.13 shall be furnished to the Engineer seven working days before the date the inspection is scheduled. Inspection will not be made until after the delivery of acceptable record drawings, specified certifications, and the required guarantees.



Final Acceptance Documentation Checklist

LOCATION	
Route	Common Name
Limits	Section
Contract #	County
Controller Designation(s)	EMC Database Location Number(s)

ITEM	Contractor (Verify)	Resident Engineer (Verify)
Record Drawings -Three hardcopies (11" x 17") -Scanned to two CD-ROMs	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Field Inspection Tests -Voltage -Amperage -Cable Insulation Resistance -Continuity -Controller Ground Rod Resistance (Three Hardcopies & scanned to two CD's)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
GPS Coordinates -Excel file (Check Special Provisions, Excel file scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
Job Warranty Letter (Three Hardcopies & scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
Catalog Cut Submittals -Approved & Approved as Noted (Scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
Lighting Inventory Form (Three Hardcopies & scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
Lighting Controller Inventory Form (Three Hardcopies & scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
Light Tower Inspection Form (If applicable, Three Hardcopies & scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>

Three Hardcopies & scanned to two CD's shall be submitted for all items above. The CD ROM shall be labeled as shown in the example contained herein.

General Notes:

Record Drawings – The record drawings should contain contract cover sheet, summary of quantities showing all lighting pay item sheets, proposed lighting plans and lighting detail sheets. Submit hardcopies shall be 11” x 17” size. Temporary lighting plans and removal lighting plans should not be part of the set.

Field Inspection Tests – Testing should be done for proposed cables. Testing shall be per standard specifications. Forms shall be neatly filled out.

GPS Coordinates – Check special provisions “General Electrical Requirements”. Submit electronic “EXCEL” file.

Job Warranty Letter – See standard specifications.

Cutsheet Submittal – See special provisions “General Electrical Requirements”. Scan Approved and Approved as Noted cutsheets.

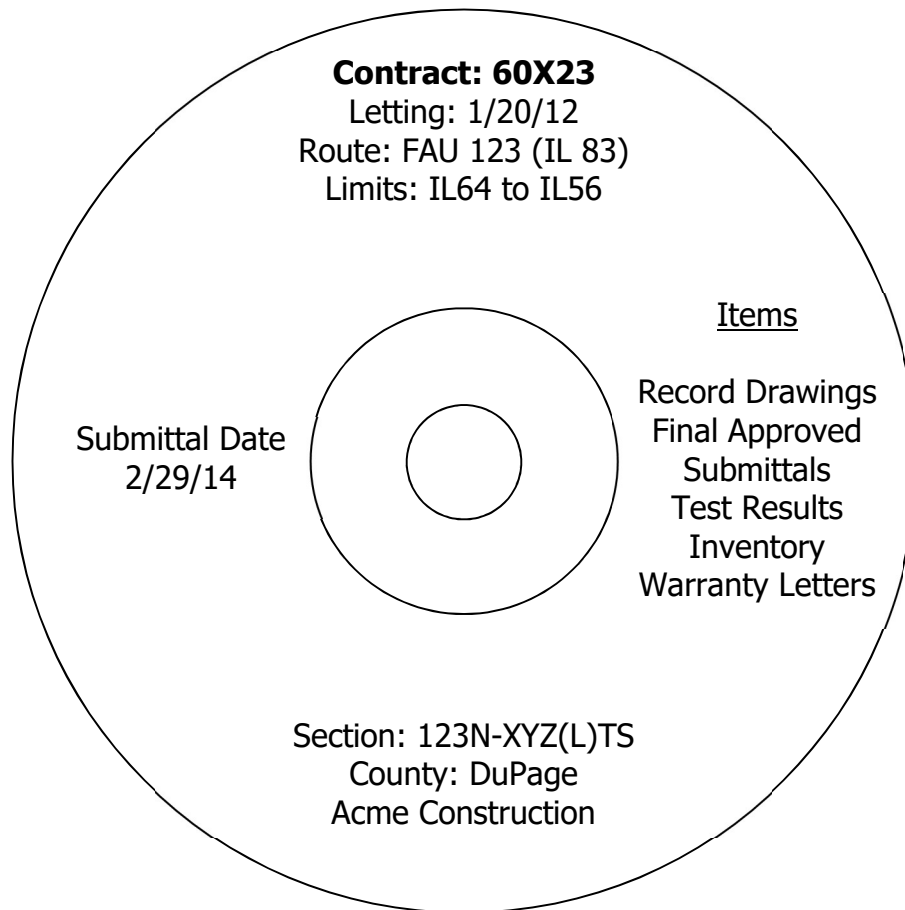
Lighting Inventory Form – Inventory form should include only proposed light poles, proposed light towers, proposed combination (traffic/light pole) lighting and proposed underpass luminaires.

Lighting Controller Inventory Form – Form should be filled out for only proposed lighting controllers.

Light Tower Safety Inspection Form – Form should be filled out for each proposed light tower.

CD LABEL FORMAT TEMPLATE.

Label must be printed; hand written labels are unacceptable and will be rejected.



MAINTAINING ITS DURING CONSTRUCTION

Description. Intelligent Transportation Systems (ITS) references IDOT traffic surveillance infrastructure. These elements include, but are not limited to, the following: induction loops, Radar Vehicle Sensing Devices (RVSDs), copper communication cables, power cables, cabinets, and communication equipment.

General Requirements. Effective the date the Contractor's activities (ITS or otherwise) begin at the job site, the Contractor shall be responsible for the proper operation and maintenance of ITS elements that are part of, or that may be affected by, the work until final acceptance by the Engineer or as otherwise determined by the Engineer.

Before performing any excavation, removal, or installation work (ITS or otherwise) at the site, the Contractor shall initiate a request for a maintenance transfer and preconstruction inspection to be held in the presence of the Engineer and a representative of the party or parties responsible for maintenance of any ITS systems that may be affected by the work. This includes co-ordination with adjacent projects that may have an effect on the ITS infrastructure. The request for the maintenance preconstruction inspection shall be made no less than seven (7) calendar days prior to the desired inspection date.

Existing ITS elements, when depicted on the plans, are intended only to indicate the general equipment installation 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 condition and location of the ITS components and systems to be maintained and installed.

Existing ITS components shall be defined as any ITS component or device in service at the time of the commencement of construction activities. The contract drawings indicate the general extent of any existing ITS elements, but whether indicated or not, it remains the Contractor's responsibility to ascertain the extent of effort required for compliance with these specifications, and failure to do so will not be justification for extra payment or reduced responsibilities.

Maintaining ITS During Construction - It is the Contractor's responsibility to maintain vehicle detection, which includes speed and volume data, in all lanes within the construction limits for this project, on all roadway segments and ramps that will be open to traffic. Where the existing detection cannot be maintained, the Contractor shall provide a temporary detection system, approved by IDOT, at no additional cost to the contract. The Contractor's responsibility shall include protection or removal and storage of any ITS/Communication cabinets and protecting in place any cables, conduits and ITS devices in or adjacent to the work zone. This work may also include the abandonment of the existing device and communication pathway and the installation of a temporary device such as a RVSD with a wireless communication. This work shall also include the relocation and adjustment of RVSD and wireless detection devices as necessary in coordination with construction staging. It is the Contractor's responsibility to maintain closed circuit television cameras including associated fiber optic communications and power.

The Contractor is responsible for the disconnection, rerouting, and reconnection of all fiber and copper communication cables currently located in existing conduits as indicated in the plans. The disconnection and reconnection must be made at an existing splice point or communication cabinet where a connection is made, or as otherwise indicated in the plans. The existing communication and infrastructure must be properly maintained for the duration of construction activities and the Contractor must coordinate the disconnection and reconnection activities with the Engineer.

All work required to maintain, relocate or provide temporary ITS infrastructure as depicted in the plans or otherwise necessary and as provided for in this special provision shall be paid for under the Maintaining ITS During Construction pay item. No component items germane to this work shall be paid for separately.

Once construction activities are complete, all temporary equipment installed will become the property of the Department and shall remain in place, except where a proposed location has been identified in the plans. All final locations and installations of ITS devices, communication cabinets, junction boxes, conduit, fiber optic, copper cable, wireless equipment and associated infrastructure shall be protected, secured and have the Engineer's approval. Proper documentation, to include latitude and longitude for all equipment locations and communication pathway must be turned over to the Department. The proposed plan for this work must be presented to the Engineer for approval prior to the commencement of the work.

Method of Measurement. The contractor shall demonstrate to the satisfaction of the Engineer that the ITS components, devices and infrastructure have been properly installed, protected and maintained and that the appropriate data is being transmitted to the Traffic Management Center prior to submitting a pay request. In order for final payment to be released the contractor must demonstrate that the equipment is working as intended following inspection by the Engineer. Failure to do so will be grounds for denying the pay request.

Basis of Payment. Maintaining ITS During Construction and Rerouting ITS Communication shall be paid for at the contract unit price per calendar month (Cal Mo) for MAINTAINING ITS DURING CONSTRUCTION, which shall include all work as described herein.

BOLLARD REMOVAL

Description. This work shall consist of removing and disposing the existing bollards located adjacent to the existing Toll Plaza 31 building around the existing flagpole. Any voids or holes caused by the removal process shall be backfilled and compacted with suitable material approved by the Engineer. The surface of the filled void or hole shall be treated to match the surrounding area. All debris resulting from the removal process shall be removed and disposed of by the Contractor. The removed material shall be disposed of according to Article 202.03.

Method of Measurement. This work shall be measured for payment in each for BOLLARD REMOVAL.

Basis of Payment. This work will be paid for at the contract unit price per each for BOLLARD REMOVAL. This price shall include all equipment, labor, and materials necessary to remove and dispose of the existing bollards.

ISLAND REMOVAL

Description. This work shall consist of sawcutting, removing, and disposing of the existing concrete island, nosing, and base at locations shown on the Plans and as directed by the Engineer.

Construction Requirements. All existing concrete island including any concrete base, adjacent curb or gutter, nosing, steel reinforcement if present and other appurtenances integral to the concrete island shall be completely removed. The concrete island, nosing, and base to be removed shall be saw cut full depth at the ends and all edges of portions to be removed if it is adjacent to pavement that remains. Any excavation made by the Contractor for the removal shall be replaced. The excavated space shall be filled with material satisfactory to the Engineer and placed according to Section 205 and Article 1009.04 of the Standard Specifications at no additional cost to the Department.

Disposal of Material. Materials resulting from the removal shall be disposed of according to Article 202.03 of the Standard Specifications.

Method of Measurement. This work shall be measured for payment in place and the area computed in square feet for ISLAND REMOVAL.

Removal of any of the items outside the designated limits as shown on the plans are as directed by the Engineer will not be measured for payment.

Basis of Payment. This work will be paid for at the contract unit price per square foot for ISLAND REMOVAL.

ABANDON AND FILL EXISTING STORM SEWER

Description. This work shall consist of filling existing sewers that are to be abandoned at the locations shown on the Plans or as directed by the Engineer.

Construction Requirements. Based on a review of available information it is believed that there are no existing active connections draining into the pipe to be abandoned. However, before the pipe is abandoned, the Contractor must field verify there are no existing active connections draining into the pipe to be abandoned. In the event there are existing active connections, the Contractor must either re-route the existing active connection or maintain the existing pipe so as not to block flow from the existing active connections at no additional cost.

After field verification there are no existing active connections draining into the pipe to be abandoned, the Contractor must plug the pipe with Class SI Concrete or brick and suitable mortar to the satisfaction of the Engineer, and fill the remaining empty length of pipe with Controlled Low-Strength Material. The Controlled Low-Strength Material (CLSM) must meet material requirements with Article 593.02 of the Standard Specifications.

Method of Measurement. This work will be measured for payment in feet for the pipe to be abandoned in place.

Basis of Payment. This work will be paid for at the contract unit price per foot which price shall include all materials, labor, tools and equipment, backfilling of any excavation necessary for ABANDON AND FILL EXISTING STORM SEWER at locations shown in the plans, as specified herein, and as directed by the Engineer.

CLEANING EXISTING DRAINAGE STRUCTURES (D1)

Effective: September 30, 1985

Revised: May 1, 2022

All existing storm sewers, pipe culverts, manholes, catch basins and inlets shall be considered as drainage structures insofar as the interpretation of this Special Provision is concerned. When specified for payment, the location of drainage structures to be cleaned will be determined in the field by the Engineer.

All existing drainage structures which are to be adjusted or reconstructed shall be cleaned according to Article 602.15 of the Standard Specifications. This work will be paid for according to accordance with Article 602.16 of the Standard Specifications.

All other existing drainage structures which are specified to be cleaned by the Engineer will be cleaned according to Article 602.15 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price each for DRAINAGE STRUCTURES TO BE CLEANED, and at the contract unit price per foot (meter) for STORM SEWERS TO BE CLEANED, of the diameter specified.

ABANDON EXISTING WATER MAIN, FILL WITH CLSM

Description. This work shall consist of cutting, capping, plugging, and filling the existing 6" diameter water main including all bends, fittings and all other appurtenances identified to be abandoned on the Plans. This work also includes the installation of concrete thrust block in accordance with the applicable portions of Section 501 of the Standard Specifications.

The existing water main that has been determined to not be affected by the proposed improvements may remain and abandoned-in-place. All pipes to be abandoned under this item shall have all openings sealed with a one (1) foot minimum length concrete plug and shall be filled with controlled low-strength material (CLSM). The Controlled Low-Strength Material (CLSM) must meet material requirements with Article 593.02 of the Standard Specifications.

The water main shall be accessed from two locations. The location on the east side of Ramp F will be exposed under WATER MAIN REMOVAL. The second location, east of the CN Railroad, shall be located and exposed near the existing valve vault as detailed in the Plans. A portion of the existing water main shall be cut and a cap shall be placed on the section of the water main to remain. A concrete thrust block shall be installed as shown on the details in the Plans.

The location and elevation of the existing water main and valve vault shown in the Plans are approximated. The Contractor shall field verify the locations and elevations of the water main and all other utilities that may cross beneath or over the existing water main to be abandoned. The Contractor shall take all necessary precautions to protect and prevent any damage to the existing utilities. No additional compensation shall be given for any variations or modifications required to be made to the abandonment of the existing water main.

The Contractor is advised that the work will be performed on a potable water system owned and operated by the Village of Rosemont. As such, all operations shall be performed in such a way as to avoid contamination of the water system through the introduction of contaminants or the process of the work. All work will require the review and approval of the Village of Rosemont prior to the commencement of work operations.

In coordination with the Village of Rosemont, the water main has been shutdown. Prior to commencement of work, the Contractor shall contact the Village of Rosemont to verify the water main shutdown. The water main shutdown required to perform the work will only be allowed based upon scheduling with the Village of Rosemont. Any water main dewatering required during the abandonment of water main pipe shall be included as part of the successful abandonment of the water main.

Method of Measurement. This work will be measured for payment in place in feet. The length will include all concrete plugs and CLSM placed within pipes to remain.

No separate measurement will be made for thrust blocks.

Basis of Payment. This work will be paid for at the contract unit price per foot for ABANDON EXISTING WATER MAIN, FILL WITH CLSM, which price will be payment in full for all labor, equipment and materials necessary to complete the work as described and includes all excavation and backfill as necessary. No separate payment will be made for the cap and concrete plugs installed to seal the pipes to be abandoned under this item.

Thrust blocks will not be paid for separately but shall be included in the cost of water main abandonment.

WATER MAIN REMOVAL

Description. This work shall consist of removing the existing 6" diameter water main including all bends, fittings and all other appurtenances. Water main shall be removed according to Article 561 of the Standard Specifications and in conformance with the methods identified in Article 551.03 of the Standard Specifications.

The Contractor is advised that the work will be performed on a potable water system owned and operated by the Village of Rosemont. As such, all operations shall be performed in such a way as to avoid contamination of the water system through the introduction of contaminants or the process of the work. All work will require the review and approval of the Village of Rosemont prior to the commencement of work operations.

In coordination with the Village of Rosemont, the water main has been shutdown. Prior to commencement of work, the Contractor shall contact the Village of Rosemont to verify the water main shutdown. The water main shutdown required to perform the work will only be allowed based upon scheduling with the Village of Rosemont. Any water main dewatering required during the removal of water main pipe shall be included as part of the successful removal of the water main.

The location and elevation of the existing water main shown in the Plans are approximated. The Contractor shall field verify the locations and elevations of the water main and all other utilities that may cross beneath or over the existing water main to be abandoned. The Contractor shall take all necessary precautions to protect and prevent any damage to the existing utilities to remain. In the event when abandoned/retired utilities may be encountered, the removal of these utilities shall be included within the water main removal work. No additional compensation shall be given for any variations or modifications required to be made to the removal of the existing water main.

Method of Measurement. This work shall be measured for payment according to Article 561.04 of the Standard Specifications.

Excavation in rock will be measured for payment according to Article 502.12.

Trench backfill will be measured for payment according to Article 208.03.

Basis of Payment. This work will be paid for at the contract unit price per foot for WATER MAIN REMOVAL, of the diameter specified, which price will be payment in full for all labor, equipment and materials necessary to complete the work as described and includes all excavation, abandoned/retired utility pipe or conduit removal, backfill and proper disposal of pipe and fittings to be removed.

Excavation in rock will be paid for according to Article 502.13.

Trench backfill will be paid for according to Article 208.04.

Removal and replacement of unsuitable material below plan bedding grade will be paid for according to Article 109.04.

ENGINEER'S FIELD OFFICE TYPE A (D1)

Effective: January 1, 2022

Revise the first paragraph of Article 670.02 to read:

670.02 Engineer's Field Office Type A (D1). Type A (D1) field offices shall have a ceiling height of not less than 7 feet and a floor space of not less than 1000 square feet with a minimum of two separate offices. The office shall also have a separate storage room capable of being locked for the storage of the nuclear measuring devices. The office shall be provided with sufficient heat, natural and artificial light, and air conditioning. Doors and windows shall be equipped with locks approved by the Engineer.

Add the following to Article 670.07 Basis of Payment.

The building or buildings, fully equipped, will be paid for at the contract unit price per calendar month or fraction thereof for ENGINEER'S FIELD OFFICE, TYPE A (D1).

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.

Site 3976-COV-1: ROW, I-190 between approximately M.M. 0 and M.M. 3, Chicago and Rosemont, Cook County

- Station 408+95 to Station 409+20 (CL SB I-294 Ramp), 0 to 45 feet RT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameter: Manganese.
- Station 515+95 to Station 516+15 (CL EB I-190 Ramp), 0 to 45 feet RT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameter: Manganese.
- Station 518+25 to Station 519+00 (CL EB I-190 Ramp), 0 to 20 feet RT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(b)(1).
- Station 519+00 to Station 519+95 (CL EB I-190 Ramp), 0 to 20 feet RT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameter: Manganese.
- Station 519+95 to Station 520+95 (CL EB I-190 Ramp), 0 to 20 feet RT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: Lead, and Manganese.
- Station 520+95 to Station 521+95 (CL EB I-190 Ramp), 0 to 20 feet RT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameter: Manganese.
- Station 521+95 to Station 523+00 (CL EB I-190 Ramp), 0 to 20 feet RT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameter: Manganese.
- Station 523+00 to Station 523+60 (CL EB I-190 Ramp), 0 to 20 feet RT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(b)(1).
- Station 518+30 to Station 518+95 (CL EB I-190 Ramp/SB I-294 Ramp), 35 to 45 feet LT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(b)(1).
- Station 518+95 to Station 519+95 (CL EB I-190 Ramp/SB I-294 Ramp), 30 to 45 feet LT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: Arsenic, Lead, and Manganese.
- Station 519+95 to Station 520+95 (CL EB I-190 Ramp/SB I-294 Ramp), 30 to 45 feet LT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameter: Manganese.
- Station 520+95 to Station 521+70 (CL EB I-190 Ramp/SB I-294 Ramp), 30 to 45 feet LT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: Benzo(a)pyrene, and Manganese.
- Station 521+70 to Station 521+95 (CL EB I-190 Ramp/SB I-294 Ramp), 0 to 45 feet LT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: Benzo(a)pyrene, and Manganese.
- Station 521+95 to Station 523+00 (CL EB I-190 Ramp/SB I-294 Ramp), 0 to 65 feet LT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: Arsenic, and Manganese.

At the I-190 ROW property, Arsenic was detected at concentrations exceeding the TACO Tier 1 soil remediation objectives for the Construction Worker exposure route in soil boring 3976-COV-1-12, from the sample interval 10 to 15 feet deep, as noted in the Final Preliminary Site Investigation Report for this project, submitted April 22, 2024 by Huff & Huff, Inc. Procedures shall be implemented to protect site workers and observers from hazards encountered during construction activities in locations containing contaminated materials, pursuant to Article 669 of the Standard Specifications for Road and Bridge Construction manual.

- Station 523+95 to Station 524+00 (CL EB I-190 Ramp/SB I-294 Ramp), 25 to 65 feet LT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameter: Manganese.
- Station 524+95 to Station 526+45 (CL EB I-190 Ramp/SB I-294 Ramp), 25 to 35 feet LT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameter: Manganese.
- Station 537+05 to Station 538+00 (CL EB I-190 Ramp/SB I-294 Ramp), 0 to 15 feet LT and 0 to 110 feet RT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: Benzo(a)anthracene, and Benzo(a)pyrene.
- Station 538+00 to Station 539+10 (CL EB I-190 Ramp/SB I-294 Ramp), 0 to 15 feet LT and 0 to 110 feet RT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameter: Manganese.
- Station 540+00 to Station 542+50 (CL EB I-190 Ramp/SB I-294 Ramp), 70 to 200 feet RT. The Engineer has determined this material meets the criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameters: Arsenic, and Manganese.

Engineered Barrier. An engineered barrier shall be installed in soils excavation areas to limit the exposure and control the migration of contamination from the contaminated soil that remains within the excavation areas. It shall be placed beneath the trench backfill material at the following locations:

- Station 521+95 to Station 523+00 (CL EB I-190 Ramp/SB I-294 Ramp), 0 to 65 feet LT (ROW, PESA Site 3976-COV-1, ROW/Toll Plaza 31, Chicago, and Rosemont) – non-special waste. Contaminants of concern sampling parameters: Arsenic.

The engineered barrier shall consist of a geosynthetic clay liner system, geomembrane liner, or equivalent material as approved by the Engineer. A geosynthetic clay liner shall be composed of a bentonite clay liner approximately 0.25 inches thick. The engineered barrier shall have a permeability of less than 10^{-7} cm/sec. Installation of the geosynthetic clay liner system shall be in accordance with the manufacturer's recommendations except that all laps shall face down-slope.

The geomembrane liner shall have a minimum thickness of 30 mils. The geomembrane liner shall line the entire trench and installed in accordance with the manufacturer's recommendations.

No equipment will be allowed on the engineered barrier until it is covered by a minimum of 1 foot of backfill. Any damage to the engineered barrier caused by the Contractor shall be repaired at no additional expense to the Department in accordance with the manufacturer's recommendations and as directed by the Engineer.

Method of Measurement: The engineered barrier will be measured for payment in place and the area computed in square yards.

Basis of Payment: The engineered barrier will be paid for at the contract unit price per square yard for ENGINEERED BARRIER.

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**

BUILDING REMOVAL WITH ASBESTOS ABATEMENT (BDE)

Effective: September 1, 1990

Revised: August 1, 2022

Description. This work shall consist of the removal and disposal of building(s), including all foundations, retaining walls, and piers, down to a plane 1 ft (300 mm) below the ultimate bottom of building elevation or proposed bottom of construction elevation. The building(s) are identified as follows:

<u>Bldg. No.</u>	<u>Parcel No.</u>	<u>Location</u>	<u>Description</u>
1	ISTHA facility Toll Plaza 31 (O'Hare-West Plaza)	Southbound on the North Tri-State Tollway (I-190)	ISTHA Property

CONSTRUCTION REQUIREMENTS

General. The IEPA's "State of Illinois Demolition/Renovation/Asbestos Project Notification Form" shall be submitted and a copy sent to the Engineer. It shall be updated if there is a change in the start and/or finish date or if the quantity of asbestos changes by more than 20 percent.

Asbestos abatement work shall be performed by an IDPH licensed Contractor prequalified with the Illinois Capital Development Board who has an on-site supervisor licensed by IDPH and employs workers licensed by IDPH. This work shall be completed according to the requirements of the U.S. Environmental Protection Agency (USEPA), IEPA, OSHA, and local regulatory agencies.

Discontinuance of Utilities. The Contractor shall arrange for the discontinuance of all utility services and the removal of the metering devices that serve the building(s) according to the respective requirements and regulations of the city, county, or utility companies involved. The Contractor shall disconnect and seal the service outlets.

Posting. Upon execution of the contract and prior to the removal of any buildings, the Contractor shall paint or stencil, in contrasting colors of an oil base paint, on all sides of each building or structure, the following posting:

NO TRESPASSING
VIOLATORS WILL BE PROSECUTED

The postings shall be positioned prominently on the structure(s) so they can be easily read and at a sufficient height to prevent defacing.

Asbestos Abatement. Friable asbestos containing building materials (ACBMs) and Category II non-friable ACBMs shall be removed from the building(s) prior to demolition. Category II non-friable ACBMs include asbestos containing transite boards, siding, and other cementitious materials (cement pipe or highly weathered roofing shingles/materials) which have a likelihood of becoming friable during typical demolition activities (by crumbling, pulverizing, or otherwise reducing to powder) making them regulated asbestos containing materials (RACM). Removed ACBM shall be kept separate from non-ACBM demolition debris for purposes of transport and disposal.

Category I non-friable ACBM may be kept in place for demolition or removal of the building unless it has become friable as determined by the ACBM inspector. If the Contractor demolishes the building(s) with the non-friable asbestos in place, the following shall apply.

- (a) The Contractor shall continuously wet the non-friable ACBM and other building debris with water during demolition and loading for disposal.
- (b) The Contractor shall dispose of all demolition debris as ACBM.

The Contractor shall perform air monitoring during asbestos abatement activities. Air sampling shall be conducted by a qualified air sampling professional. Air sampling shall be conducted according to NIOSH Method 7400. Air monitoring equipment shall be calibrated and maintained in proper operating condition. The Contractor shall submit a copy of the air sampling professional's certificate to the Engineer. The results of the tests, and daily calibration and maintenance records shall be kept on site and be available to the Engineer upon request.

Personal monitoring shall be conducted per applicable OSHA regulations. Excursion limits shall be monitored daily, and corrective actions taken immediately to bring excursions within OSHA permissible exposure limits.

When asbestos is removed prior to demolition, clearance testing per IDPH shall be conducted upon the removal of ACBM.

Submittals. The following submittals shall be made to the Engineer prior to the start of the asbestos abatement:

- (a) Manufacturer's certification stating that vacuums, ventilation equipment, and other equipment required to contain airborne fibers conform to ANSI 29.2.
- (b) A listing of the brand name, manufacturer, and specification of all sealants or surfactants to be used.
- (c) Proof that arrangements for transport and disposal of ACBMs have been obtained (i.e., a letter of authorization to utilize designated landfill).
- (d) A detailed work plan of the Contractor's anticipated procedures including the location and layout of decontamination units, the sequencing of work, the respiratory protection plan, a site safety plan, a disposal plan, and a detailed description of the methods to be used to control pollution.
- (e) Proof of the Contractor's prequalification with Capital Development Board and employee certifications with IDPH.

Submittals that shall be made upon completion of abatement work:

- (f) Copies of waste chain-of-custodies, trip tickets, shipping manifests, or disposal receipts for asbestos waste materials removed from the work area.
- (g) Copies of each day's work site entry logbook with information on worker and visitor access.
- (h) Logs documenting filter changes on respirators, HEPA vacuums, negative pressure ventilation units, and other engineering controls.
- (i) Test results of any bulk material analysis and air sampling data collected during the abatement including results of any on-site testing by any federal, state, or local agency.

Any holes, such as basements, shall be backfilled according to Article 502.10.

Basis of Payment. This work will be paid for at the contract lump sum unit price for BUILDING REMOVAL NO. 1.

Removal and disposal of friable ACBM will be paid for at the contract lump sum unit price for REMOVAL AND DISPOSAL OF FRIABLE ASBESTOS, BUILDING NO. 1.

Removal and disposal of non-friable ACBM will be paid for at the contract lump sum unit price for REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. 1.

EARTHWORK MANAGEMENT PLANS

Description. This work shall consist of providing earthwork management plans for the earth and rock excavation, furnished material, borrow excavation, unsuitable excavation, topsoil, and embankment work including the excavation of incidental items, performance-based items, structure excavation and channel excavation.

REQUIREMENTS

General. The Contractor shall be responsible for filling out the A-51 Earthwork Construction Plan (ECP) and A-53 Earthwork Final Construction Report (EFCR) forms when the total amount of excavation required is greater than 300 cubic yards as a minimum documentation of the items listed above. The Contractor can use the forms on the Illinois Tollway website at <https://www.illinoistollway.com/documents/20184/238197/B1+A+Forms+Tollway+January+2024.zip/4beb8f2d-ec1e-a32c-f7a2-7775442ae866?version=6.0&t=1707509923150&download=true> and also shown under Appendix B – Illinois Tollway Forms.

As part of the A-51 ECP, the Contractor(s) or firm(s) performing the regulated substances monitoring, field screening, and/or additional sampling, as defined in special provision Disposal of Regulated Substances and Uncontaminated Soil, shall either be pre-qualified in Hazardous Waste (Simple or Advanced) by IDOT or demonstrate acceptable project experience in remediation and special waste operations for contaminated sites in accordance with applicable Federal, State, or local regulatory requirements using A-51 ECP.

The initial A-51 ECP will be required to be filled out at least 14 days prior to performing excavation.

The Engineer will require up to 30 calendar days for review of the A-51 ECP. The review may involve rejection or revision and resubmittal; in which case, an additional 14 days will be required for each subsequent review. Earthwork shall not commence until the A-51 ECP has been approved by the Engineer. After approval, the A-51 ECP shall be revised and resubmitted to reflect changed conditions in the field.

The Contractor shall be responsible for tracking staging activities between generation, staging, sampling, testing, inspections, and final placement or disposal. Documentation pertaining to staging shall be included in the A-51 ECP to be approved by the Engineer.

The A-53 EFCR form shall be filled out prior to contract final completion date in SP 103.1. The A-53 EFCR shall describe the methods and manners in which all soils including hazardous waste, non-special waste, uncontaminated soil and soils reused on site were managed during construction activities. The Contractor shall submit the A-53 EFCR Form to the Engineer for review and approval.

Basis of Payment. All costs related to the work of preparing, submitting, updating and administering an Earthwork Construction Plan and Earthwork Final Construction Report shall be considered as included in the various items of work in the contract and will not be paid for separately.

EARTH AND ROCK EXCAVATION (ILLINOIS TOLLWAY)

Effective: October 29, 2012

Revised: April 6, 2022

Description. This work shall consist of the excavation and transportation of suitable excavated material to embankment locations throughout the limits of the contract, or the excavation, transportation, and disposal of excavated material according to Section 202 of the Standard Specifications except as modified herein. This work also includes the placement of material at embankment locations in accordance with the Illinois Tollway Special Provision for Embankment. This work does not include excavation for structures or channel excavation.

Revise Article 202.03 of the Standard Specifications to read:

“202.03 Removal and Disposal of Surplus, Unsuitable Materials, and Organic Waste.

Suitable excavated materials of any moisture content shall not be wasted without permission of the Engineer. The Contractor shall dispose of all surplus, unsuitable materials, and organic waste, in such a manner that public or private property will not be damaged or endangered. Suitable but excessively moist excavated materials if used for embankment may be treated in accordance with the Illinois Tollway Special Provision for Embankment to obtain the specified compaction levels.

Suitable earth, stones and boulders naturally occurring within the right-of-way may be placed in fills or embankments in lifts and compacted according to Section 205. Reclaimed Asphalt Pavement (RAP) may be used in embankment or in fill according to the Illinois Tollway Special Provision for Embankment. No material will be allowed for reuse within Tollway right-of-way outside contract limits without prior approval from the Tollway in accordance with Article 107.22 of the Supplemental Specifications.

Excavated Soils are classified for disposal and are also classified for reuse or non-reuse in accordance with the Illinois Tollway Special Provision for Disposal of Regulated Substances and Uncontaminated Soils. Soils approved for reuse may be used for embankment. Aside from the materials listed above, all other construction and demolition debris or waste shall be disposed of in a licensed landfill or otherwise disposed of as allowed by State or Federal laws and regulations.

Organic waste originating within the right-of-way limits may be chipped or shredded and placed as mulch around landscape plantings within the right-of-way when approved by the Engineer. Chipped or shredded material to be placed as mulch shall not exceed a depth of 6 inches.

When the Contractor proposes to dispose of uncontaminated surplus excavated material off the right-of-way, the Contractor shall obtain and file with the Engineer permission in writing, from the property owner, for the use of the property for this purpose. The approval of the proposed disposal site shall be according to Article 107.22 of the Illinois Tollway Supplemental Specifications. Any such disposal shall not create an unsightly or objectionable appearance or detract from the natural topographic features, nor be placed at an elevation higher than that of the adjacent roadway without permission from the Engineer.

A volume of excavated material from sewer trenches, electrical or ITS trenches, drainage structures, or other underground construction is shown on the plans for information. At the approval of the Engineer, this material may be placed within the right-of-way according to the Illinois Tollway Special Provision for Embankment. Reuse of excavated material from trenches and drainage, electrical, or fiber structures or other underground construction is classified in accordance with the Illinois Tollway Special Provision for Disposal of Regulated Substances and Uncontaminated Soil.

If unsuitable material is present at or below the finished grade, it shall be removed and replaced with suitable material as directed by the Engineer. Unsuitable material shall be placed as approved by the Engineer within the right-of-way according to the Illinois Tollway Special Provision for Embankment.

Revise the first paragraph of Article 202.07(b) to read as follows:

“(b) Measured Quantities. Earth and rock excavation will be measured in their original positions, and the volumes in cubic yards computed by the method of average end areas. The volume of any unsuitable material removed will be measured for payment in cubic yards.”

Revise the second paragraph of Article 202.08 to read as follows:

“Removal and disposal of unsuitable material will be paid for at the contract unit price per cubic yard for REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL.”

Revise the fourth paragraph of Article 202.08 to read as follows:

When the contract does not contain a pay item for removal and disposal of unsuitable material, hazardous waste, or non-special waste disposal (Type 1) and the item is required, it will be paid for according to Article 109.04 of the Illinois Tollway Supplemental Specifications

EMBANKMENT (ILLINOIS TOLLWAY)

Effective: April 16, 2014

Revised: April 6, 2022

Description. The work shall consist of the construction of embankments by depositing, placing, and compacting earth, stone, gravel, or other materials of acceptable quality above the natural ground surface or other surface. This work also includes modifying the moisture content of the suitable embankment material to achieve the specified compaction by drying, adding water, or by chemical treatments.

The work shall be in accordance with Sections 202, 204, and 205 of the Standard Specifications except as modified herein, and in accordance with the Tollway Special Provision for Embankment Modification when chemical treatments are applied.

Materials

1. Embankment Source Submittal Requirements

Unless otherwise specified in the contract plans, proposed earth excavation, borrow excavation and furnished excavation locations are to be designated by the Contractor and approved by the Engineer prior to their use.

The Contractor shall submit the following information to the Engineer for approval no later than 30 days prior to the planned start of work at each area:

- a) Location map for the proposed excavation:
 - a. Property boundaries
 - b. Planned excavation extents
 - c. Access locations
 - d. Planned depths and quantity of excavation
 - e. Contractor's proposed sampling locations for geotechnical and environmental testing.
- b) Narrative describing the planned use, schedule and quantities planned for the excavation.
- c) Written permission for the Illinois Tollway and Engineer to enter the non-job site property to collect earth excavation and furnished excavation soil samples for geotechnical and environmental testing.

2. Embankment Material

Embankment material shall be as required in Sections 202, 204, and 205 of the Standard Specifications, except as follows.

Embankment material shall be sampled, tested, and approved before use. The contractor shall identify embankment sources, and provide equipment as the Engineer requires, for the collection of samples from those sources. Samples will be furnished to the Engineer a minimum of 14 days prior to use in order that laboratory tests for approval and compaction can be performed. Embankment material placement cannot begin until tests are completed and approval given. The Engineer may collect independent soil samples and perform confirmatory tests prior to approval. One test will be performed for every 5000 cubic yards of material, or as required by the Engineer.

Replace Article 1009.04 of the Standard Specification with the following:

1009.04 Soil and Other Materials for Embankments, Fills, and Subgrades. The Engineer may designate a soil as suitable, unsuitable, or restricted-use; and stable or unstable through visual inspection and the testing described below.

Suitable and restricted-use soil shall be defined as follows.

Test	Suitable Soil	Restricted-Use Soil
Standard Dry Density at Optimum Moisture Content (OMC), (Illinois Modified AASHTO T 99 – Method C & Annex A1), lb/cu ft	98 min.	98 min.
Organic Content, (AASHTO T 194, Wet Combustion), %	10 max.	10 max.
Silt and Fine Sand, (AASHTO T 88), %	65 max.	
Passing No. 200 Sieve, %	35 min.	
Plasticity Index, (AASHTO T 90), %	12 min.	
Liquid Limit, (AASHTO T 89), %	50 max.	60 max.

A stable and suitable or restricted-use soil shall meet the above criteria and in addition have a moisture content within the range defined in Article 205.06.

An unstable and suitable or restricted-use soil shall meet the above criteria, but the moisture content exceeds the maximum defined in Article 205.06. These soils may be modified per the Tollway Embankment Modification Special Provision.

Restricted-use miscellaneous materials shall include stones and boulders naturally occurring within the right-of-way; broken concrete without protruding metal bars; bricks; rock; stone; uncontaminated dirt and sand generated from construction or demolition activities; and other materials proposed by the Contractor and approved by the Engineer.

If reclaimed asphalt pavement (RAP) is used, it shall not be used within the ground water table or as a fill if ground water is present. RAP shall be according to the Illinois Tollway Special Provision for Production of Recycled Aggregate. Gradation deleterious count shall not exceed 10% of total RAP and 5% of other by total weight per Illinois Test Procedure (ITP) 203 in the IDOT Manual of Aggregate Quality Test Procedures. Gradations may be performed dry, without the need for washing per ASTM C136. The following requirements shall be met.

- 1) The material shall have 100% passing the 1.5-inch sieve and be well graded down through fines.
- 2) The material shall be determined as well graded by calculating the Coefficient of Uniformity (C_u) and Coefficient of Curvature (C_c) per ASTM D2487, with required $C_u \geq 4.0$, and $3.0 \geq C_c \geq 1.0$.
- 3) RAP shall not be used within the top five feet of embankment in any pavement with concrete layers, or within the top eight feet of embankment in a flexible, full depth asphalt pavement. RAP shall not be used in embankment above any rigid underground structures or bedrock. RAP shall not be used within lineal 100 feet of a transition approach slab or approach slab.
- 4) RAP in the embankment shall be capped with 3 feet material that meets the requirements above.

If there are changed or differing site conditions according to Article 105.01, an absence or sparsity of geotechnical data, or for other reasons; an unstable and suitable or restricted-use soil may be declared unsuitable by the Engineer.

Other excavated material not described above shall be designated as unsuitable by the Engineer. At the discretion of the Engineer, soils that exhibit potential for significant erosion or excessive volume change may also be designated as unsuitable.

CONSTRUCTION REQUIREMENTS

1. Placing Embankment Material

Embankment material shall be placed in accordance with Article 205.04 of the Standard Specifications, with the following additional requirements.

In addition to Article 202.03 of the Standard Specifications, broken concrete, reclaimed asphalt with no expansive aggregate, or uncontaminated dirt and sand generated from construction or demolition activities shall be placed in 6-inch lifts and disked with the underlying lift until a uniform homogenous material is formed. This process also applies to the overlaying lifts. The disk must have a minimum blade diameter of 24 inches.

The placement of reclaimed asphalt pavement shall only be allowed when ambient air temperature is 40°F and rising.

Replace the second sentence of paragraph six of Article 205.03 of the Standard Specifications, with the following:

When embankments are to be constructed on hillsides or existing slopes that are steeper than 4H:1V, steps shall be keyed into the existing slope by stepping and benching as shown in the plans or as directed by the engineer.

Replace the second sentence of paragraph three of Article 205.04 of the Standard Specifications, with the following:

Restricted-use materials shall be encapsulated by suitable soil a minimum of 3 ft, measured vertically and horizontally from each face of the in-place restricted-use materials.

2. Compaction of Embankment Material

Embankment material shall be compacted in accordance with Article 205.06 of the Standard Specifications, except as follows.

RAP shall be compacted to not less than 100 percent of the standard laboratory density, according to AASHTO T99 (Method C) using a coarse particle correction (AASHTO T99, Annex A.1)

Soils classification for moisture content control will be determined by the Soils Inspector using visual field examination techniques and the IDH Textural Classification Chart.

When tested for density in place each lift shall have a moisture content as follows.

The minimum moisture content of all embankment lifts shall be 80% of the optimum moisture content and shall not exceed 110% on any type of soil except for the moisture restrictions mentioned below for clay loam, silt and silt loam soils when determined according to AASHTO T99, Method C using a coarse particle correction (AASHTO T99, Annex A1).

- a) A maximum of 105 percent of the optimum moisture for all forms of clay loam soils.
- b) A maximum of 90 percent of the optimum moisture for silt and silt loam soils.

The Contractor shall disk and dry the embankment material to achieve proper moisture and density. The Contractor will be permitted to use an approved additive to effectively provide a quicker drying time. As soon as acceptable moisture contents are achieved, the Contractor must complete the compaction of the layer as specified herein and to the satisfaction of the Engineer. No separate payment will be made for this work.

If the Engineer approves the Contractor to place embankment with an excessively high moisture content (greater than 120 percent of the optimum moisture content at the time of placement), then the Contractor will be compensated in accordance with the Illinois Tollway special provision for Embankment Modification to reduce the moisture to between 80% and 110% of the optimum moisture content at the time of compaction.

Method of Measurement. This work will not be measured for payment. Mechanical compaction will not be measured for payment.

Basis of Payment. This work and any disking and drying, additive or water applied will not be paid for separately but shall be considered as included in the various items of excavation, and their construction shall be included in the unit prices for those items.

When suitable embankment material with excessively high moisture contents at the time of placement are approved by the Engineer to be modified and placed, this work will be paid for according to the Illinois Tollway special provision for EMBANKMENT MODIFICATION.

SOURCE REQUIREMENTS FOR FURNISHED EXCAVATION (ILLINOIS TOLLWAY)

Effective: October 31, 2019

Revised: April 23, 2021

Description. This work shall consist of testing and excavating suitable material obtained from off-site location(s) outside Illinois Tollway rights of ways, approved by the Engineer, and transporting the material to various locations throughout the limits of the contract. The work shall be completed in accordance with Section 204 of the Standard Specifications except as follows.

Add the following to Article 204.02.

The Contractor shall be responsible for all testing of furnished or borrow material before removal from the off-site location. Material shall be tested for Zone "A" embankment geotechnical parameters according to the Illinois Tollway Special Provision for Embankment. In addition, In-situ Moisture Content (AASHTO T-265) and soil pH (AASHTO T-289) shall be tested.

One sample per 5,000 cubic yards of furnished material shall be analyzed for 35 Ill. Adm. Code 740 Appendix A Tables A through D Target Compound List (TCL) parameters and herbicides. For all locations, the Contractor shall supply only furnished material that does not exceed 35 Ill. Adm. Code 742 Appendix B Table B Soil Remediation Objectives for the Industrial Commercial Ingestion and Inhalation Exposure Routes. In addition to meeting the Industrial Commercial requirements, for locations within a municipality that does not have an existing IEPA approved groundwater ordinance upon award of contract, the Contractor shall supply only furnished material that does not exceed Ill. Adm. Code 742 Appendix B Table B Soil Remediation Objectives for the Soil Component of the Groundwater Ingestion Exposure Route (Class I).

The Contractor shall obtain written agreement from the property owner in accordance with Article 107.22 of the Supplemental Specifications.

Add the following to Article 204.08 Basis of Payment.

The Contractor shall be responsible for any additional Maintenance of Traffic, trucking, temporary erosion and sediment control, and permanent restoration that is associated with the use of the site at no cost to the Tollway. The additional work will not be measured for payment but shall be included in the Contract unit price per cubic yard for FURNISHED EXCAVATION.

FABRICATING AND FINISHING STRUCTURAL STEEL (ILLINOIS TOLLWAY GBSP)

Effective: March 5, 2024

Revised: May 21, 2024

Description. The work shall consist of fabricating and finishing all structural steel for Illinois Tollway as required by Section 505, 506 and 1094 of the Standard Specifications except as modified herein.

CONSTRUCTION REQUIREMENTS

Add the following to Article 505.03 of the Standard Specifications.

“Only welds detailed on the approved shop drawings shall be permitted on the structure. Any weld made that is not detailed on the approved shop drawings shall be approved by the Engineer on a case-by-case basis. Any additional fabrication performed after this observation shall be at the fabricator’s own risk without approval of the Engineer. This requirement shall not be a reason to cause delay of the project and shall be at no additional cost to the Illinois Tollway.

Prior to fabrication, the fabricator shall submit a document package to the Engineer for approval that includes the applicable items of the following: Quality Manual, Current AISC Certification, Welding Procedures, Standard Operating Procedures that apply to the work to be performed, Coating Preparation, Coating Application Procedures, Quality Control Certifications, Quality Control Procedures, (including 3rd party documentation) NDT Procedures, NDT Certifications with Current Visual Acuity Records, NDT Written Practice, Shop Drawings, and Shop Vertical Assembly Drawing. Equipment Calibration Records and Welder Qualification Test Records with Continuity Logs shall be provided to the inspector and Engineer prior to the start of fabrication.”

Replace Article 505.04 (c) (4) paragraph 2 & 3 of the IDOT Standard Specifications with the following.

“Girders shall be fabricated to specified cambers by cutting web plates to the required geometries before attaching flanges. All heat induced camber correction shall be applied to the flange portion of the girder. Camber correction that requires web heating or seven (7) or more heat locations on the flange shall require submittal for engineering approval outlining location of the heating patterns and the method of heating prior to commencing heating operations. The prescribed camber shall be obtained before heat-curving and the Contractor shall make allowance for any anticipated losses during fabrication. Rolled shapes shall not be shop cambered, unless otherwise specified. If the contract requires cambering rolled shapes or if straightening as received material is necessary, proposed procedures must be submitted for the Engineer’s approval.”

Horizontal curvature and vertical camber will not be measured for final acceptance until all heating and welding operations are completed and the flanges have cooled to a uniform ambient temperature. Horizontal curvature will be checked with the beam or girder in an upright position. For beams or girders curved after reaming or drilling field splices, 33 percent of the girder or beam lines shall be checked assembled after curving to verify final geometry. Prior to assembly, the fabricator shall submit a scope of assembly submittal outlining the components that will be assembled in this process. The most rigid components of the structure must be included in assembly and shall be verified by the engineer prior to disassembly.”

Add the following to Article 505.04 (l) (5) of the IDOT Standard Specifications.

“All exposed edge surfaces shall be conditioned by grinding, sanding or milling to remove the hardened layer of the material remaining after thermal cutting operations. The edges shall provide a smooth uniform appearance with the appropriate radius required in Article 506 upon completion of conditioning operations. Hardened edges caused by cutting shall be sufficiently removed to achieve the required surface profile for coated surfaces.”

Add the following after paragraph 2 of Article 505.04 (q) of the IDOT Standard Specifications.

“Welding shall only be performed while an AWS CWI, or SCWI is present at the Site/facility of welding activities in the role of Quality Control. Should the CWI/SCWI not be present during welding operations, all welding activities shall cease until adequate Quality Control Inspectors have returned to the facility/site. This requirement shall not be a reason to cause delay of the project and shall be at no additional cost to the Illinois Tollway.”

Add the following after paragraph 4 of Article 505.04 (q) (2) of the IDOT Standard Specifications.

“Limit each individual web-to-flange fillet weld repair to 2 percent of the weld length and grinding/conditioning repairs of web-to-flange fillet welds to 7 percent of the weld length.

CJP Groove Welds at the web-to-flange connections shall have no more than 5% the total weld length repaired.

If the fabricator or contractor exceed the repair limits, the Engineer shall have the option to revoke the WPS and the supporting PQR used to perform the initial production welding. The Tollway defines a repair as any area of the welded member not meeting the requirements of Bridge Welding Code or applicable code in the as welded condition.”

Add the following to Article 505.04 (q) (3) of the IDOT Standard Specifications.

“The progression for all weld passes in the vertical position shall be upward (including repairs).”

Replace Article 505.04 (q) (4) of the IDOT Standard Specifications with the following.

“Welder Qualification. All welders, welding operators, and tack welders shall be qualified by test according to the applicable welding code. Testing shall be administered and certified by a third-party certified welding inspector (CWI) independent of the fabricator or contractor and the CWI certification must be valid at the time of qualification. The Engineer may accept evidence of previous qualification for welders under the applicable welding specifications.”

Add the following to Article 505.04 (q) (5) of the IDOT Standard Specifications.

“Splice welds requiring NDT inspections shall have weld reinforcement removed by grinding on all surfaces. These surfaces are required to be ground flush in accordance with the applicable welding code requirements.”

Add the following to Article 505.04 (q) (6) of the IDOT Standard Specifications

“All required NDT inspections of girders, floor beams, trusses, and fabricated items shall be performed after heating operations have been completed.

The fabricator shall document any welding repair on the approved shop drawings. All repairs that include welding shall be NDT inspected. NDT shall be performed after any weld or base metal excavation and upon completion of any welding activity for the entire repair plus twelve inches on each side of repair. NDT selection shall be as required by the BWC and as modified herein. Upon conclusion of the inspections, the documentation shall be provided to the QA Inspector.

PT or MT inspection shall be performed at the ends of all CJP (butt, corner, and T joint) weld terminations upon completion of cutting and grinding operations. This inspection shall be performed and accepted prior to further fabrication operations being performed.

MT inspection shall be required at the ends of fillet welded web to flange connections on girders, boxes, tub girders and all other primary members after final length trimming has been performed.

All discontinuities within 6db of the rejection criteria found by UT shall be recorded on the NDT report.

In addition to UT testing performed prior to galvanization, all Structural Steel Items with Complete Joint Penetration Welds (CJP) in corner and T joints to be galvanized shall be inspected with NDE/UT after coating application to ensure toe cracks have not developed in the base metal after the coating application process. This inspection shall be performed with an appropriate UT procedure referencing a calibration standard accounting for the galvanized thickness and written by a NDT UT Level III. In the event toe cracks have developed, a fully documented repair procedure shall be submitted to the Engineer for acceptance prior to starting any corrective actions.”

Add the following to the second paragraph of Article 506.09 of the IDOT Standard Specifications.

“All materials to be galvanized shall be blast cleaned to SSPC-SP6, Commercial Blast Cleaning prior to being galvanized and after all fabrication activities have been concluded and accepted by the Inspector.”

Replace Article 1094.05 (h) of the IDOT Standard Specifications with following.

“Nondestructive Examination/Nondestructive Testing (NDE/NDT). To determine compliance with these specifications, all welds shall be visually inspected and, in addition, complete joint penetration welds subjected to computed stress shall be inspected by radiographic testing (RT) for butt welds and ultrasonic testing (UT) for T and corner joints. RT shall utilize aluminum edge blocks and location marks similar to those specified for steel in Article 505.04 in addition to the AWS D1.2/D1.2M Structural Welding Code - Aluminum requirements.

The dye penetrant testing (DPT) shall be performed according to ASTM E 165, Standard Methods for Liquid Penetrant Inspection, Method B, Procedure B-2 or B-3. DPT shall be used on partial joint penetration groove welds and fillet welds as follows: 100 percent of the top and bottom cantilever truss chords to connection and gusset plates near column; 100 percent of top connection plate to collar; 100 percent of simple span splice flanges to main chords; and random 50 percent of main chords to diagonals, horizontals, and verticals as directed by the Engineer. Required NDE/NDT shall be the responsibility of the Contractor and its cost shall be included in the fabrication.

All aluminum truss section Fillet Welds and Partial Joint Penetration (PJP) Groove Welds shall be inspected by DPT, including root passes of PJP Groove Welds. Flange to Chords of the Aluminum structures shall be inspected 100% of the weld length. UT inspection of Aluminum CJP groove welds will not be permitted, RT shall be used.”

REINFORCEMENT BARS (ILLINOIS TOLLWAY)

Effective: February 12, 2020

Revised: January 15, 2024

Description. The work shall consist of furnishing, providing additional material for testing and placing reinforcement bars as required by Section 508 of the Standard Specifications except as modified herein. For work outside the limits of bridge approach pavement, all references in the IDOT Highway Standards and Standard Specifications for reinforcement shall be epoxy coated, unless noted on the plans. This includes dowel bars and tie bars in all pavements, shoulders, curb, gutter, combination curb and gutter and median; and chair supports for CRC pavement.

Reinforcement for IDOT Highway Standard drainage structures shall be as shown on the Standards, unless otherwise noted on the plans.

Materials. Materials shall be according to Article 508.02 of the Standard Specifications except as modified herein.

Add the following to Article 1006.10 of the Standard Specifications.

- d) **Stainless Steel Reinforcement Bars.** Furnish reinforcement bars meeting the requirements of ASTM A955-19. Stainless steel bars shall be UNS S24000, S24100, S31653, S31803, S32101, S32205, or S32304 as defined in ASTM A955. The reinforcement bars shall be a minimum of Grade 60. The manufacturer of the stainless steel reinforcing bar shall be AASHTO Product Evaluation and Audit Solutions compliant.

Unless otherwise noted, all metal hardware cast into concrete in the portion of the structure using stainless steel reinforcement, such as inserts, brackets, cable clamps, metal casings and other miscellaneous items, shall be ASTM A955-19 stainless steel and finished according to the requirements of ASTM A380. This includes the following items:

- (1) Mechanical and Bar Splicers.
- (2) Chairs and Supports. Chairs and continuous supports shall be stainless steel or plastic. Stainless steel chairs and supports used above steel beams shall have plastic coated feet.
- (3) Concrete Inserts. Furnish concrete inserts with closed-back ferrule threaded to receive UNC threaded bolts or rods. Article 1006.13 proof loading shall apply.
- (4) Dowels.
- (5) Tie Wire. Tie wire shall be in a dead soft annealed condition.

Sacrificial, non-structural elements used in the bridge deck construction may be galvanized steel but must be separated from the stainless steel reinforcement as required by this specification. All non-stainless steel items shall meet the approval of the Engineer.

CONSTRUCTION REQUIREMENTS

Add the following to Article 508.03 of the Standard Specifications.

General. All reinforcement bars or bar bundles delivered to the project site shall be clearly identified with tags bearing identification information. The tags shall also include the bar description, UNS designation, heat number and sufficient identification to track each bar bundle to the appropriate mill report. All bundles delivered to the jobsite shall have a tag and mill report provided to the Engineer. Bundles without tags and mill reports shall be rejected.”

Training. The Contractor shall provide for technical support and training by the supplier in the unloading, storage, handling, placing and tying of the reinforcement bars and bar splicers.

Reinforcement Bar Sampling. The Material Engineering Consultant (MEC) representative will select jobsite samples in accordance with IDOT Policy Memorandum, "Reinforcement Bar and/or Dowel Bar Plant Certification Procedure". The Tollway will sample at the same frequency prescribed for IDOT District One. These samples are independent of and in addition to samples taken by IDOT District One. The Contractor shall assist the MEC representative in obtaining the required sample from the jobsite.

If necessary, the MEC representative will contact the Supplier to include extra bar in their next shipment. The Contractor will be advised of the bar description and shipment via email. When the shipment arrives, the Contractor shall advise the MEC representative who will arrange to visit the project to make a random selection from the bars delivered to the project.

Revise the first paragraph of Article 508.03 with the following.

"Storage, Protection, and Handling. Reinforcement bars shall be stored off the ground using platforms, skids, or other supports; and shall be protected from injury and from deterioration or contamination. Stainless steel bars shall be delivered and stored so that they are not touching other types of metal. Epoxy coated and stainless steel reinforcement bars shall be stored on wooden or padded steel cribbing and all systems for handling shall have padded contact areas. The bars or bundles shall not be dragged or dropped."

Revise the third paragraph of Article 508.05 of the Standard Specifications with the following.

Epoxy coated reinforcement bars shall be tied with plastic coated wire, epoxy coated wire, or molded plastic clips. Uncoated wire or molded plastic clips may be used to secure reinforcement bars except epoxy coated reinforcement bars and stainless steel reinforcement bars. Molded plastic clips may be used in lieu of wire to secure bar intersections but shall not be permitted in horizontal bar mats subject to construction foot traffic or to secure contact lap splices. Plastic clips shall adequately secure the reinforcement bars and shall permit the concrete to flow through and fully encase the reinforcement. Plastic clips may be recycled plastic and shall meet the approval of the Engineer. Metal items used to complete the installation of stainless steel reinforcement bars (such as mechanical or bar splicers, chairs and supports, inserts, dowels, tie wire, and concrete beam stirrups) must be fabricated with stainless steel, as detailed in the above Article 1006.10(d). Do not tie stainless steel reinforcement to uncoated steel reinforcement. Direct contact is not acceptable. Stainless steel reinforcing bars may be in direct contact with undamaged epoxy coated reinforcing bars. If construction conditions require contact with another type of steel that will remain in the structure, insulation shall be provided between the different steels in the form of dielectric material such as plastic coating, polyethylene tubing, electrical tape or other method approved by the engineer.

Revise the second paragraph of Article 508.06 of the Standard Specifications with the following.

“Metal bar supports shall be made of cold-drawn wire or other metal products, and shall be either ASTM A955 stainless steel, epoxy coated, galvanized or plastic tipped. When the reinforcement bars are epoxy coated, the metal supports shall be epoxy coated. Plastic supports may be recycled plastic. Supports for stainless steel reinforcement bars shall be according to Article 1006.10(d)(2). Supports shall be provided in sufficient number and spaced to provide the required clearances. Supports shall adequately support the reinforcement bars and shall permit the concrete to flow through and fully encase the reinforcement. The legs of supports shall be spaced to allow an opening that is a minimum 1.33 times the nominal maximum aggregate size used in the concrete. Nominal maximum aggregate size is defined as the largest sieve which retains any of the aggregate sample particles.”

Method of Measurement. Method of Measurement shall be according to Article 508.10 of the Standard Specifications except as modified herein.

Insert the following after the second paragraph of Article 508.10(b) of the Standard Specifications.

Stainless steel reinforcement bars will be measured in pounds as computed for the sizes and lengths of bars shown on the Plans or as authorized by the Engineer. This shall include all lap lengths show in the plans and any additional bars required for independent testing. In computing the quantity to be paid for, the quantity of bars of the cross section shown on the Plans, or authorized, will be used. These weights are given in the following table based on an assumed density of 495 pounds per cubic foot.

English Bar Size	Weight, lb/ft
No. 3	0.378
No. 4	0.686
No. 5	1.058
No. 6	1.511
No. 7	2.059
No. 8	2.713
No. 9	3.441
No. 10	4.358
No. 11	5.352
No. 14	7.72
No. 18	13.72

Basis of Payment. Revise Article 508.11 of the Standard Specifications with the following.

“Reinforcement bars in special reinforced pavement designs and in reinforced concrete structures where the concrete is paid for at a unit price per cubic yard, will be paid for at the contract unit price per pound for REINFORCEMENT BARS, REINFORCEMENT BARS, EPOXY COATED or REINFORCEMENT BARS, STAINLESS STEEL.

Bar splicer assemblies will be paid for at the contract unit price per each for BAR SPLICERS or BAR SPLICERS, STAINLESS STEEL.

Mechanical splicers will be paid for at the contract unit price per each for MECHANICAL SPLICERS or MECHANICAL SPLICERS, STAINLESS STEEL.

Any technical support to be provided to the Contractor by the stainless steel supplier shall be included in the cost of each stainless steel item.

FIRE HYDRANTS REMOVAL

Description. This work shall consist of the removal of the existing Village of Rosemont fire hydrants, auxiliary valves, and valve boxes adjacent to the existing Toll Plaza 31 building.

The Contractor shall remove the fire hydrant, auxiliary valves, and valve boxes and coordinate delivery to the location specified by the Village of Rosemont or dispose of them off-site in an approved manner at the direction of the Engineer.

If the hydrant removal shown in the Plans results in a portion of existing water main pipe abandoned without removal, the existing remaining pipe shall be abandoned by installing a concrete bulkhead within the end of the pipe. The bulkhead shall extend a minimum length into the pipe equal to the diameter of the pipe being filled or one (1) foot, whichever length is greater.

All excavation associated with the removal of the fire hydrant shall be backfilled with compacted trench backfill to the proposed ground surface as shown on the Plans and will not be paid for separately.

Method of Measurement. This work will be measured in units of each.

Basis of Payment. This work will be paid for at the contract unit price per each for FIRE HYDRANTS REMOVAL which price will be payment in full for all labor and materials necessary to complete the work as described. Salvaging of any materials will be considered included in this item.

TREE STUMP REMOVAL

Description. This work shall consist of the removal and disposal of an existing tree stump where the tree had been previously cut and the stump remains in place as shown on the Plans. The work shall be performed according to Section 201 of the Standard Specifications. The entire tree stump shall be removed to the satisfaction of the Engineer.

Method of Measurement. This work will be measured in units of each.

Basis of Payment. This work will be paid for at the contract unit price per each for TREE STUMP REMOVAL.

TOPSOIL AND COMPOST (ILLINOIS TOLLWAY)

Effective: February 10, 2014

Revised: April 1, 2016

Description. This work shall consist of furnishing, excavating, transportation of topsoil to locations throughout the limits of the contract, temporary stockpiling, placing topsoil, placing special types of topsoil, placing compost, disposal of surplus excavated topsoil, or permanently stockpiling surplus excavated topsoil for the future use.

Materials. Materials shall be according to the following provisions of the Standard Specifications:

<u>Item</u>	<u>Article/Section</u>
(a) Topsoil (Furnished from outside of the R.O.W.)	1081.05(a)
(b) Compost	1081.05(b)

CONSTRUCTION REQUIREMENTS

Excavating Topsoil. Topsoil shall be obtained from within the limits of the Illinois Tollway right-of-way at the locations designated in the plans or approved by the Engineer.

When special types of topsoil are specified, each type shall be handled separately and not allowed to mix with any other material. When special types of topsoil (Hydric, Prairie or Woodland) are specified, the seeds and plants within the excavated special topsoils are desirable to maintain. To keep these seeds and plants viable, the topsoil shall be excavated then placed as directed by the Engineer or as specified in the contract.

If, at the time of stripping, the topsoil cannot be placed in its final location as shown on the plans, the material shall be handled in one of the following ways, as directed by the Engineer:

- a) Temporarily stockpiled.
- b) Disposed of. Only applicable to surplus topsoil.
- c) Permanently stockpiled for the future use by the Illinois Tollway. The permanent stockpile location(s) shall be as shown in the plans or designated by the Engineer.

When stockpiling, special measures, such as watering the stockpile, dust control, temporary seeding, and silt fence shall be required as directed by the Engineer and will be paid according to Article 104.02 of the Illinois Tollway Supplemental Specifications.

Furnishing Topsoil. If additional topsoil is required to complete the contract to the lines, grades and depth as shown on the plans, the Contractor shall furnish the additional topsoil from areas outside the limits of the Illinois Tollway right-of-way. This additional topsoil obtained from outside the Illinois Tollway right-of-way shall be tested in accordance with Section 1081.05(a) of the Standard Specifications and approved by the Engineer prior to its use. The Contractor is responsible for all testing of material obtained from an outside source.

Placing Topsoil and Compost. Topsoil shall not be placed until the area to be covered has been shaped, trimmed, and finished according to Section 212 of the Standard Specifications. All irregularities or depressions in the surface due to weathering or other causes shall be filled or smoothed out before the topsoil is placed. If the existing surface has become hardened or crusted, it shall be disked or raked or otherwise broken up so as to provide a bond with the lift of topsoil to be applied, as directed by the engineer.

When compost is specified, it shall be placed at the specified depth on top of the topsoil. The Engineer will verify that the proper topsoil and compost depths have been applied. After verification of proper depth, the Contractor shall completely incorporate the compost into the topsoil by disking or tilling.

Finishing. The surface of the topsoil or compost/topsoil blend shall be free from clods, stones, sticks and debris and shall be according to the lines, grades and the minimum depth as shown on the plans or as directed by the Engineer. A single pass from a track or roller over the entire surface shall be made. Care must be taken to avoid excessive compaction of the topsoil.

Surplus Topsoil. Surplus topsoil shall not be disposed of before topsoil placement is complete unless otherwise approved by the Engineer. Surplus topsoil shall be disposed of in a licensed landfill, recycled, reused, or otherwise disposed of as allowed by State or Federal solid waste disposal laws and regulations and solid waste determinations of the Illinois Environmental Protection agency (IEPA). Surplus topsoil shall not be thickened on site without prior approval from the Engineer.

When the contractor proposes to dispose of surplus topsoil off the Illinois Tollway right-of-way, the Contractor shall obtain and file with the Engineer permission in writing, from the property owner, for the use of the property for this purpose. The approval of the proposed disposal site shall be in accordance with Article 107.22 of the Illinois Tollway Supplemental Specifications. Any such disposal shall not create an unsightly or objectionable appearance or detract from the natural topographical features, nor be placed at an elevation higher than that of the adjacent roadway without permission from the Engineer.

Method of Measurement. This work will be measured for payment as follows:

Topsoil excavation shall be that material obtained from within the limits of the Illinois Tollway right-of-way in the areas designated on the plans which will be measured in cubic yards in its original position. The volume will be computed by the method of average end areas. Topsoil excavation shall include the excavating, hauling, and stockpiling of the material in the locations approved by the Engineer. Temporary stockpiling of topsoil will not be measured separately for payment.

Topsoil placement will be measured in place in square yards and multiplied by the specified or agreed upon depth to establish a volumetric quantity. Topsoil disposal and/or topsoil permanently stockpiled for the future use by the Illinois Tollway will be calculated as the difference between the topsoil excavation quantity and the topsoil placement volumetric quantity. If the topsoil placement depth is thickened from what is shown on the plans the associated Topsoil Excavation and Disposal quantities will be adjusted accordingly.

Topsoil furnish and place, and compost furnish and place shall be that material obtained from outside the Illinois Tollway right-of-way and will be measured in place in square yards, at the depth specified.

Excavation and embankment quantities for the roadway have been computed on the basis of cut and fill after the topsoil is stripped.

Basis of Payment. That portion of the excavated topsoil material that will be placed within the lines and grades specified in the Contract will be paid per cubic yard as TOPSOIL EXCAVATION AND PLACEMENT. That portion of the excavated topsoil material that will be disposed of or permanently stockpiled for future use by the Illinois Tollway will be paid per cubic yard as TOPSOIL EXCAVATION AND DISPOSAL.

Topsoil and compost brought from outside the Illinois Tollway right-of-way will be paid for at the contract unit prices per square yard for TOPSOIL FURNISH AND PLACE, of the thickness specified and COMPOST FURNISH AND PLACE, of the thickness specified.

SUBGRADE FILTER FABRIC (ILLINOIS TOLLWAY)

Effective: December 18, 2013

Revised: April 23, 2021

Description. This work shall consist of furnishing and installing filter fabric on a prepared earth surface or chemically stabilized subgrade for separation from the open graded coarse aggregate used under pavements.

The filter fabric shall consist of woven yarns or nonwoven filaments of polyolefins or polyesters. Woven fabrics shall be Class 3 according to AASHTO M288. Woven slit film geotextiles (i.e., geotextiles made from yarns of a flat, tape-like character) shall not be permitted. Non-woven fabric shall be Class 2 according to AASHTO M288. After forming, the fabric shall be processed so that the yarns or filaments retain their relative positions with respect to each other. The fabric shall be new and undamaged.

The filter fabric shall be manufactured in widths of not less than 6 ft. Sheets of fabric may be sewn together with thread of a material meeting the chemical requirements given for the yarns or filaments to form fabric widths as required. The sheets of filter fabric shall be sewn together at the point of manufacturer or another approved location.

The filter fabric shall be according to the following:

PHYSICAL PROPERTIES ^{1/}		
	Gradation Nos. RR4 & RR5	
	Woven	Non-Woven
Grab Strength, lb; ASTM D4632 ^{2/}	180 min.	157 min.
Elongation/Grab Strain, %; ASTM D4632 ^{2/}	49 max.	50 min.
Trapezoidal Tear Strength, lb; ASTM D4533 ^{2/}	67 min.	56 min.
Puncture Strength, lb; ASTM D6241 ^{2/}	370 min.	309 min.
Ultraviolet Stability, % retained strength after 500 hours of exposure – ASTM D4355	50 min.	50 min.

^{1/} NTPEP results to meet test requirements. Manufacturer shall have public release status and current reports on laboratory results in Test Data of NTPEP's DataMine.

^{2/} Values represent the minimum average roll value (MARV) in the weaker principal direction, MD or XD (MD = Machine direction and XD = Cross Machine Direction).

As determined by the Engineer, the filter fabric shall meet the requirements noted in the following after an onsite investigation of the subgrade soil.

Subgrade Soil by Weight Passing the No. 200 sieve, %	Apparent Opening Size, Sieve No. – ASTM D4751 ^{1/}	Permittivity, sec ⁻¹ ASTM D4491
0 to 49	60 max.	0.2 min.
50 and above	70 max.	0.1 min.

^{1/} Values represent the maximum average roll value.

CONSTRUCTION METHODS

Construction for the placement or installation of the filter fabric shall be in accordance with Section 210.03 and 210.04 of the Standard Specifications except as modified herein.

Replace the first paragraph of Article 210.04 with the following:

210.04 Placement of Granular Blanket. The granular blanket shall be constructed to the width and depth required on the plans. The granular blanket or material to be placed over the installed fabric shall be used in conjunction with the subgrade filter fabric. The material shall be back dumped on the fabric in a sequence of operations beginning at the outer edges of the treatment area with subsequent placement towards the middle.

Method of Measurement. Subgrade filter fabric will be measured for payment in place and the area computed in square yards.

Basis of Payment. Subgrade filter fabric will be paid for at the contract unit price per square yard for SUBGRADE FILTER FABRIC.

ASPHALT PAVEMENT CONSTRUCTION (ILLINOIS TOLLWAY)

Effective: July 25, 2019

Revised: March 5, 2024

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- 1. **Description.** This Special Provision establishes and describes the responsibilities of the Contractor in producing and constructing asphalt pavements. Any verbiage relating to “Hot Mix Asphalt” Mixtures in the referenced documents is considered interchangeable with the Tollway’s use of “Warm Mix Asphalt” (WMA) Mixtures, unless specifically noted herein.
- 2. **References.** The following documents are referenced in this Special Provision. References to Articles are to the IDOT Standard Specifications. Work shall be according to Sections 406, 407, 1102, 1030 and 1032 of the Standard Specifications except as modified herein.
 - 2.1. Illinois Department of Transportation (IDOT) – Current Standard Specifications for Road and Bridge Construction
 - 2.2. Illinois Department of Transportation (IDOT) – Supplemental Specifications and Recurring Special Provisions.
 - 2.3. Illinois Department of Transportation (IDOT) – Manual of Test Procedures for Materials
 - 2.4. Illinois Tollway – Illinois Tollway Manual of Test Procedures (referred to as “Tollway-Modified” throughout this document)
 - 2.5. Illinois Tollway Special Provision for Asphalt Mixtures
 - 2.6. Illinois Tollway Special Provision for Reclaimed Asphalt Materials (RAM)
 - 2.7. Illinois Tollway Special Provision for Surface Smoothness Testing
 - 2.8. Illinois Tollway Approved List of Asphalt Modifiers
 - 2.9. Illinois Tollway Approved List of Warm Mix Asphalt (WMA) Technologies

3. Quality Control/ Quality Assurance (QC/QA). QC/QA shall be in accordance with Articles 1030.06 and 1030.09 of the Standard Specifications, except as modified herein.

3.1. Quality Control (QC) Addendum for Warm Mix Asphalt (WMA) Production.

Replace the first 5 paragraphs of Article 1030.06 with the following:

“Quality Control / Quality Assurance (QC/QA) shall be used for each asphalt mixture.

The following shall apply to QC/QA.”

Replace the third sentence of the first paragraph of Article 1030.06(b) with the following.

“Job-specific QC Addenda to the Annual QC Plan must be submitted using the Tollway Form A-81 "Quality Control (QC) Addendum for Warm Mix Asphalt (WMA) Production”.”

Delete the first sentence of Article 1030.09.

Replace Footnote 4/ in Article 1030.09(a)(2) with the following:

“4/ If the required tonnage of any mixture for a single pay item is less than 1000 tons in total, Footnote 3/ shall not apply, unless otherwise waived by the Engineer. If waived, the mixture shall be produced using a mix design that has been verified as specified and validated by the Tollway’s recent acceptable field test data. A Hot-Mix Asphalt Level II Technician shall oversee all quality control operations for the mixture.”

Replace Articles 1030.09 (g) and 1030.09(h) with the following:

“(g) Quality Assurance by the Engineer. The Engineer will conduct quality assurance tests on split samples taken by the Contractor for quality control testing. In addition, the Engineer will witness the sampling and splitting of these samples a minimum of twice a month and will immediately retain the samples for quality assurance testing.

The overall testing frequency will be performed over the entire range of Contractor samples and will be equal to or greater than ten percent for gradations and equal to or greater than 20 percent for asphalt binder content, bulk specific gravity, maximum specific gravity and field density. The Engineer may select any or all split samples for assurance testing. The Engineer will initiate quality assurance testing during mixture field verification. These tests may be performed immediately or anytime up to ten working days after sampling. The test results will be made available to the Contractor as soon as they become available.

The Contractor's density gauge/core correlation will be verified utilizing the Engineer's density gauges.

The Engineer may witness the sampling and testing being performed by the Contractor. The Engineer will document all witnessed samples and tests.

The Engineer will promptly notify the Contractor, both verbally and in writing, of observed deficiencies. If the Engineer observes that the sampling and quality control tests are not being performed according to the applicable test procedures, the Engineer may stop production until corrective action is taken.

The Engineer may elect to obtain samples for testing, separate from the Contractor's quality control process, to verify specification compliance. No more than 20 cores per day will be required by the Engineer for the purpose acceptance and/or comparison with density gauge measurements. The cost of this work will not be paid for separately but shall be considered as included in the unit price bid for the HMA item involved. Differences between the Contractor's and the Engineer's split sample test results will be considered acceptable if within the following limits.

Test Parameter	Acceptable Limits of Precision
% Passing: ^{1/}	
1/2 in. (12.5 mm)	5.0 %
No. 4 (4.75 mm)	5.0 %
No. 8 (2.36 mm)	3.0 %
No. 30 (600 μm)	2.0 %
No. 200 (75 μm)	2.2 %
Asphalt Binder Content	0.3 %
Maximum Specific Gravity of Mixture	0.026
Bulk Specific Gravity	0.030
VMA	1.4 %
Density (% Compaction)	1.0 % (Correlated)

^{1/} Based on washed ignition.

The Tollway may run extractions for assurance, when deemed necessary by the Engineer.

In the event comparison of the required plant test results is outside the above acceptable limits of precision, Tollway split or independent samples fail the control limits, a Tollway extraction indicates non-compliance, or a continual trend of difference between Contractor and Tollway test results is identified, the Engineer will immediately investigate. The Engineer may suspend production as stated in Article 108.07 of the Standard Specifications, while the investigation is in progress. The investigation may include testing by the Engineer of any remaining split samples or a comparison of split sample test results on the HMA currently being produced. The investigation may also include review and observation of the Contractor's technician performance, testing procedure, and equipment.

If a problem is identified with the mix, the Contractor shall take immediate corrective action. After corrective action, both the Contractor and the Engineer shall immediately resample and retest according to Article 1030.05(d)(6).

In the event comparison of the required field test results (densities) are outside the above acceptable limits of precision, Tollway split or independent samples fail the density limits, or a continual trend of difference between Contractor and Tollway test results is identified, the Engineer will immediately investigate. The investigation will include testing by the Engineer of any remaining random density locations. The Engineer may establish additional locations for testing by both the Contractor and the Tollway to provide further comparison results. The investigation shall also include review and observation of the Density Tester performance, testing procedure, and equipment. The original correlation and/or comparison data, for both gauges, shall be reviewed as part of the investigation process. If the problem continues, the Engineer may require a new correlation be performed.

Warm Mix Asphalt (WMA) Verification Testing: Tollway Materials will conduct periodic WMA verification testing to determine compliance with specification requirements. Verification testing will consist of WMA mixture and/or field density testing. WMA mixtures will be sampled according to the Tollway Test Procedure 015 "Warm Mix Asphalt Sampling from the Paver Auger." Density will be determined by correlated density gauge or cores. Verification tests will be within the following tolerances from the Adjusted Job Mix Formula:

Parameter	Precision
Percent Passing #200 sieve	± 2.0 %
Asphalt Binder Content (Dense Graded mixtures)	± 0.4 %
Asphalt Binder Content (SMA mixtures)	± 0.3 %
Air Voids	± 1.5%
Field VMA	-1.0 to + 2.0 percent*
Density	Passing

*- compared to mix design minimum

In the event the verification test exceeds these tolerances, an investigation will be conducted by Tollway Materials, the CM, and Contractor to determine the causes and possible solutions."

- 3.2. Control Limits.** Add the following category to the table in Article 1030.09(c) of the Standard Specifications.

"Tollway Table 1 – Asphalt Stabilized Subbase Control Limits

Parameter	Individual Test
1/2 in. (12.5 mm)	± 15 %
No. 4 (4.75 mm)	± 10 %
No. 200 (75 µm)	± 2.5 %
Asphalt Content	± 0.5 %
Air Voids	± 1.2 % (of design)
VMA	-0.7%

4. Asphalt Plant. The asphalt plant shall be calibrated and approved by IDOT or the Illinois Tollway before the production of asphalt mixtures. The type of plant used to produce asphalt mixtures shall meet the requirements of Article 1102.01 of the Standard Specifications, except were modified herein.

4.1. Dust Collection. Add the following to the first paragraph of Article 1102.01(a)(4) of the Standard Specifications.

“Positive dust control must be used.”

IL-4.75 Dust Collection – Add the following to Article 1102.01(a)(4)(a) of the Standard Specifications.

“5. Plant modifications may be required to accommodate the addition of higher percentages of mineral filler as required by the JMF.

6. Only metered bag house dust may be returned directly back to the mix. Any additional minus No. 200 (75 μ m) material needed to produce the IL-4.75 shall be mineral filler.”

4.2. Hot-Mix Silos and Surge Bins. Replace the last paragraph of Article 1102.01(a)(5) of the Standard Specifications with the following.

“IL-4.75 mixtures containing steel slag sand or aggregate having absorptions \geq 2.5 percent shall have a silo storage plus haul time of not less than 1.5 hours.

Storage silos or surge bins must be able to hold a minimum of 200 tons of warm mix asphalt. Surge bins or silos are required to contain a batching device to charge the silo or surge bin and prevent the incoming WMA from forming a conical pile within the silo or surge bin. All SMA mixtures shall have a silo storage plus haul time of not less than 1.0 hour. Silo storage plus haul time of all SMA mixture types shall not exceed 6.0 hours.”

4.3. Storage Tanks for Asphalt Binders. Add the following paragraphs to Article 1102.01(a)(6) of the Standard Specifications.

“SBS/SBR. SBS/SRB PG 76-22, SBS PG 70-22, SBS PG 70-28, or SBS PG 64-34 binder shall be shipped, maintained, and stored at the mix plant according to the manufacturer’s requirements. Polymer modified asphalt binder shall be placed in an empty tank and not blended with other asphalt binders.

Terminal Blend Ground Tire Rubber (GTR). A dedicated storage tank for “terminal blended GTR” shall be required at the hot mix plant. The GTR binder shall be placed in an empty tank and not blended with other asphalt cements. This tank shall be equipped with a mechanical agitator, capable of providing continuous mixing and/or recirculation of the asphalt-rubber blend. This tank shall be heated and capable of maintaining the temperature of the homogeneous blend of asphalt cement and GTR at 325°F to 375°F for a minimum of 45 minutes. Terminal Blended GTR modified asphalt may be stored at the asphalt production facility for up to 30 days at 300°F to 350°F with continuous mixing.”

4.4. Equipment for Weighing HMA. Add the following to Article 1102.01(a)(7).

“The printouts shall be maintained in a file at the plant for a minimum of one year or as directed by the Engineer and shall be made available upon request. The printing system will be inspected by the Engineer prior to production and verified at the beginning of each construction season thereafter.”

4.5. Equipment for FRAP/RAP/RAS. Replace the last two sentences Article 1102.01(a)(9) of the Standard Specifications with the following.

“To remove or reduce oversized material, a scalping screen, crushing unit, or comparable sizing device approved by Tollway Materials shall be used in the RAP/FRAP/RAS feed system to remove or reduce oversized material. If material passing the sizing device adversely affects the mix production or quality of the mix, the sizing device shall be set at a size specified by Tollway Materials.

RAS shall be incorporated into the asphalt mixture either by a separate weight depletion system or by using the RAP weigh belt. Either feed system shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes. While an auger-feed system is preferred, any system must provide a consistent, even flow of material and be approved by the Illinois Tollway. The portion of RAS shall be controlled accurately to within ± 0.5 percent of the amount of RAS utilized. When using the weight depletion system, flow indicators or sensing devices shall be provided and interlocked with the plant controls such that mixture production is halted when RAS flow is interrupted.

If the RAP/FRAP/RAS control tolerances or QC/QA test results require corrective action, the Contractor shall cease production of the mixture containing RAP/FRAP/RAS and either switch to the virgin aggregate design or submit a new RAP/FRAP/RAS design.”

4.6. Loose Fiber. In Article 1102.01(a)(10) of the Standard Specifications, replace “Stabilizing Additive” with “Loose Fiber” and add the following to the first paragraph of Article 1102.01(a)(10) of the Standard Specifications.

“When new equipment is provided for adding fibers into the mix, a representative from supplier/manufacturer of the equipment shall be present for calibration and first day of production (test strip). The Contractor shall notify Tollway Materials of Loose Fiber calibrations, and Tollway Materials shall be afforded the opportunity to witness calibrations.”

Add the following to Article 1102.01(a)(10)a of the Standard Specifications.

“The batch size shall not exceed 75% of pugmill size as rated by IDOT. The fiber shall be added to the aggregate in the weigh hopper or as approved and directed by Tollway Materials. The fibers are to be uniformly distributed prior to the injection of asphalt cement into the mixes.”

Replace the last sentence of Article 1102.01(a)(10)b of the Standard Specifications with the following.

“The fiber shall be added to the aggregate and uniformly dispersed prior to the injection of asphalt cement.”

4.7. Asphalt Additives and Modifiers. Add the following to the end of Article 1102.01(a) of the Standard Specifications.

“(11) WMA Additives. When a mix is produced using an approved warm mix asphalt technology, the asphalt mixing plant shall be modified as required by the additive or process manufacturer to introduce the technology and produce an asphalt mixture meeting the volumetric properties specified in the Illinois Tollway Special Provision for Asphalt Mixtures. Plant modifications may include additional plant instrumentation, the installation of asphalt binder foaming systems and/or warm mix additive delivery systems, tuning the plant burner and adjusting the flights in order to operate at lower production temperatures and/or reduced tonnage.

All metering devices will meet the current IDOT requirement for liquid additives, except they shall be capable of controlling the introduction of additive into the asphalt binder within ± 2.0 percent of the amount specified or required. Document the integration of plant controls and interlocks when using warm mix additive metering devices. The Contractor shall notify Tollway Materials of WMA Additive calibrations, and Tollway Materials shall be afforded the opportunity to witness calibrations.

(12) Terminal Blend Ground Tire Rubber. The use of GTR modified asphalt may require additional plant modifications approved by Tollway Materials.

(13) Dry Process GTR. Shall be controlled with a feeder system using a proportioning device that is accurate to within ± 3 percent of the amount required. The system shall automatically adjust the feed rate to maintain the material within this tolerance at all times and shall have a convenient and accurate means of calibration. The system shall provide in-process monitoring, consisting of either a digital display of output or a printout of feed rate, in pounds per minute, with data recorded, to verify feed rate. The supply system shall report the feed in 1 lb. increments using load cells that will enable the user to monitor the depletion of the GTR. Monitoring the system volumetrically will not be allowed. The feeder shall interlock with the aggregate weigh system and asphalt binder pump to maintain the correct proportions at all production rates.

Flow indicators or sensing devices for the system shall be interlocked with the plant controls to interrupt the mixture production if the GTR introduction output rate is not within the ± 3 percent tolerance given above. This interlock will immediately notify the operator if the targeted rate exceeds introduction tolerances. All plant production will cease if the introduction rate is not brought back within tolerance after 30 seconds. When the interlock system interrupts production and the plant has to be restarted, upon restarting operations; the modifier system shall run until a uniform feed can be observed on the output display. All mix produced prior to obtaining a uniform feed shall be rejected.

With a drum mixing plant, introduce the dry process GTR prior to the injection of asphalt cement. The point of introduction in the drum mixer will be approved by Tollway Materials prior to production. The Contractor shall notify Tollway Materials of Dry Process GTR calibrations, and Tollway Materials shall be afforded the opportunity to witness calibrations. Ensure the GTR will not become entrained in the exhaust system of the drier or plant and will not be exposed to the drier flame at any point after induction.

During operations, the asphalt plant shall record feed records daily from the feeder unit for the purposes of verifying dry process GTR inputs into the process.

(14) Equipment for Rejuvenators. When a rejuvenator is used, it shall be added to the asphalt binder using an approved in-line blending system located between the asphalt binder supply tank and distribution onto the heated aggregate. The in-line blending system shall be installed so that the rejuvenator cannot recirculate and return to the asphalt binder supply tank. The in-line blending system shall deliver a consistent and controllable stream of rejuvenator to the asphalt binder under all operating weather conditions and shall control the introduction of rejuvenator into the asphalt binder within +/- 2 percent of the amount specified or required. The Contractor shall use manufacturer's methods and procedures for handling and storing the rejuvenator.

All metering devices will meet the current IDOT requirements for liquid additives. Document the integration of plant control and interlocks when using metering devices. The contractor shall notify Tollway Materials of rejuvenator calibrations, and Tollway Materials shall be given the opportunity to witness calibrations."

5. **Placement.** Asphalt mix placement shall conform to Article 406.06, 442.08 and 1030.08 of the Standard Specifications except as modified herein.

5.1. Pavement Preparation. The base shall be prepared according to 406.05 of the Standard Specifications except as modified herein.

Revise the application rate table in 406.05(c)(1) with this table:

Type of Surface to be Tacked	Residual Asphalt Rate lb/sq ft
Milled HMA, Aged Non-Milled HMA, Milled Concrete, Non-Milled Concrete & Tined Concrete	0.055
New HMA	0.035

Replace the second paragraph of 406.05(c)(1) with the following:

The tack coat shall be placed one lane at a time. Pavement with tack coat applied shall not be opened to traffic until the subsequent asphalt lift is placed. Any vertical or inclined face that is to be paved against shall be tack coated at the above specified rate.

Add the following to the third paragraph of 406.05(c):

If failing results are encountered, the contractor shall be notified, and another test performed on the next tack application. Payment deduction will be enforced for all pavement affected by failing results. A failing test applies to all areas from the beginning of the job or the most recent passing result. Payment for areas with less than required tack coat shall be applied according to the following table:

Tack Quantity less than Specified (lb/sq-ft)	Deduction from unit price of HMA lift above tack placement**
0.001 – 0.010*	\$1.00/ton
0.011 – 0.020*	\$2.00/ton
0.021 – 0.030*	\$5.00/ton
> 0.030*	Remove and replace HMA lift above tack placement at contractor's expense

*If tack quantity results are available before subsequent lift of HMA is placed, the contractor will have the opportunity to place additional tack to get the quantity within specification.

**If the HMA lift above tack placement is paid for by square yards, the Engineer will use an HMA weight of 112 lbs. per square yard-inch to convert deductions.

5.2. Placement Conditions. Replace the first two paragraphs of Article 406.06(c) of the Standard Specifications with the following.

“(c) Placement Conditions: Asphalt mixes shall be placed on a clean, dry surface and when weather conditions are suitable. Asphalt mixes shall be placed within the temperature ranges (measured in the shade) listed below. Work shall not begin when local conditions indicate rain is imminent.

Tollway Table 2 – Ambient Air Temperature Requirements for Asphalt Mixes

	WMA Binder and Surface Course and SMA	WMA IL-4.75
Minimum Ambient Air Temperature (In shade)	32°F and Rising	40°F and Rising
Delivery Temperature (In truck just prior to placement)	250 to 280°F for neat virgin asphalt 270 to 300°F for modified virgin asphalt	

Minimum ambient air temperature requirements may be waived with the approval of the Engineer and Tollway Materials. Asphalt mix below the minimum specified delivery temperature shall be rejected by the Engineer. The first three loads of asphalt mix above the maximum specified delivery temperature may be acceptable at start up, otherwise shall be rejected by the Engineer.

The minimum ambient air temperature specifications in Tollway Table 2 can be waived, with all the following conditions:

- 1) All mix testing specifications are met.
- 2) The contractor shall submit a cold weather paving plan including, but not limited to, actions by the Quality Control Manager in the event that asphalt mix requirements are not achieved.
- 3) No paving shall be conducted on frozen ground.
- 4) The WMA chemical additive dosage shall be increased 50% from the mix design target. No foaming will be allowed when outside of the ambient air temperatures (Tollway Table 2).
- 5) Non-tracking or fast cure tack is used.
- 6) For IL-4.75 level binder, the growth curve target density shall have been created during allowable ambient air temperatures (Tollway Table 2)."

5.3. IL-4.75 Placement. Replace Article 406.06(c)(1)a of the Standard Specifications with the following.

"a. The surface shall be dry for at least 12 hours, and clean, prior to placement of the mixture."

5.4. SMA Placement. Replace Article 406.06(c)(2)a of the Standard Specifications with the following.

"a. SMA mixture produced with a Warm Mix Additive Technology shall be placed at a minimum compaction temperature as recommended by the technology manufacturer after the SMA test strip has been placed and tested."

Replace the last sentence of the third paragraph of Article 406.06(f) of the Standard Specifications with the following.

"In no case shall speed of the paver exceed 50 ft (15 m) per minute for binder and surface mixtures or 25 ft/min for SMA during placement."

5.5. Field Conditions. Replace the last sentence of paragraph two of Article 1030.12 and Article 1030.12(a) through (d) of the Standard Specifications with the following.

"All trucks shall be covered when hauling the mixture to the paver."

Add the following to Article 1030.12 of the Standard Specifications:

"Release agents for all equipment used in transporting and placing WMA, including but not limited to transportation vehicles, material transfer devices, pavers, rollers, and miscellaneous equipment must be listed on IDOT's Qualified Product List for Asphalt Release Agents for Vehicles Transporting Hot Mix Asphalt"

- 5.6. Spreading and Finishing. Replace the last paragraph of Article 406.06(f) of the Standard Specifications with the following.

“A painted stringline shall be used as a guide for the finishing machine in order to maintain a uniform edge alignment; if any other method is proposed, it shall meet the approval of the Engineer prior to paving. Irregularities in the alignment of the outside edges and along the longitudinal joint shall be corrected by adding or removing asphalt mixture before the edges are rolled.

The stringline shall be painted on the pavement or base in a manner that provides a clear, well-defined path for the paver operator to follow. The paver operator shall operate the paver in such a manner that the painted stringline guide is clearly visible. A painted stringline shall be used for every lift. Additional care must be taken where curved lanes are being paved to ensure a good guideline through the curves.

The paver screed shall be operated such that the end gate shoe is in contact with or within ½” of the pavement surface while paving to properly form the pavement edge and minimize the need for raking at the joints.

Excess asphalt mixture deposited on the existing base, binder course, or surface course outside the limits of the lane being laid shall be removed immediately and disposed of as directed by the Engineer.”

- 5.7. Construction Joints. Replace the first five paragraphs of Article 406.06(h)(2) with the following.

- “(2) Longitudinal Joints. For asphalt overlays, including the asphalt lifts in composite pavement construction, the longitudinal joint in all lifts shall be the same as the longitudinal joint location of the underlying pavement.

For full-depth asphalt pavements or when stage construction prohibits the total completion of a particular lift, the longitudinal joint in one lift shall be offset from the longitudinal joint in the preceding lift between 3 and 6 inches. The longitudinal joint in the surface course shall be at the lane width of the roadway.

For all asphalt surface placement, the joint shall be a minimum of 2 inches from the edge of the final pavement marking. For all Asphalt Pavement consisting of 3 or more lifts, the contractor shall submit to the Engineer for approval a drawing showing the location of the longitudinal joint of each lift in relationship to the final lane line. The drawing shall contain final pavement marking, including width, as well as location and limits of any staggered longitudinal joints.

For ramp pavements, the joint locations are not limited by the above conditions.

The contractor shall continuously monitor the constructed longitudinal joints for straightness. Straightness is defined as no greater than a 2-inch deviation over 16 feet from the plan location of the longitudinal joint.”

Replace the first sentence of the eight paragraph of Article 406.06 (h)(2) with the following:

“The LJS shall be applied in a single pass with a self-propelled LJS pressure distributor. Non-self-propelled or melter kettle equipment shall not be allowed unless the Contractor successfully performs an off-site placement of 1000 feet of LJS entirely within specification. At least 100 feet of the off-site placement location must have a cross slope greater than 2%. If any part of the off-site placement is out of specification, it must be repeated until passing before approval for on-site use. The off-site placement may be waived at the Engineer’s discretion if the Contractor provides evidence of previous successful placements with the same equipment and personnel on Illinois Tollway or other local agency projects.”

Replace the twelfth and thirteenth paragraphs of Article 406.06 (h)(2) with the following.

“The Contractor shall furnish to the Engineer a bill of lading for each tanker supplying material to the project. The application rate of LJS shall be verified within the first 500 ft of the day’s placement and every 12,000 ft thereafter. A suitable paper or pan shall be placed at a random location in the path of the LJS. After application of the LJS, the paper or pan shall be picked up and weighed at the job site on a certified scale. The application rate must be verified before the LJS application can continue. The tolerance between the application rate shown in the LJS Application Table and the calculated rate shall be between +5 percent and -10 percent.

A 1 qt sample shall be taken from the distributor at the jobsite once for during the initial placement and from one additional random placement for each contract and sent to Tollway Materials.”

Replace the fourteenth paragraph of Article 406.06 (h)(2) with the following.

“When LJS is placed on asphalt, the LJS shall be suitable for construction traffic to drive on without pickup or tracking of the LJS within 30 minutes of placement. If pickup or tracking occurs, LJS placement shall stop, and all damaged areas shall be repaired. When LJS is placed on concrete, the LJS shall be covered immediately following its application with fine aggregate spread at a uniform rate of 1 to 2 lb/sq-yd.”

5.8. Maximum Lifts Per Day. Add the following to Article 406.06.

“(i) Maximum Lifts Per Day. The Contractor shall not place more than two subsequent lifts of WMA per 12-hour period unless waived by the Engineer. In no case shall the Contractor place a subsequent lift of WMA prior to the underlying WMA cooling to below 140°F. The temperature shall be measured at three equally spaced readings across the mat, with readings taken two feet from both edges of pavement and one reading at the center, with all readings below 140°F. Temperatures shall be checked at a minimum of 500 feet increments when lifts are placed in the same 12-hour period.”

6. **Compaction.** Asphalt compaction shall conform to Article 406.07 and 1030.09 of the Standard Specifications except as modified herein.

- 6.1. General Requirements. Add the following paragraphs to Article 406.07 of the Standard Specifications.

“Compact the asphalt mix immediately after spreading and finish compaction before the asphalt mixture temperature falls below the minimum job mix compaction temperature as recommended by the manufacturer of the Warm Mix Additive technology used. Discontinue paving if the Contractor is unable to achieve the specified density before the mixture cools below the minimum recommended Warm Mix Additive mix design compaction temperature.

The addition of a non-foaming detergent to the roller water will be allowed to prevent sticking, if necessary.

Traffic will not be permitted on asphalt pavement until the temperature of the mat has fallen below 140°F.”

- 6.2. Rollers. Modify note 4/ of Article 406.07(a) of the Standard Specifications to the following:

“4/ The Contractor shall provide a minimum of two steel wheel tandem rollers (T_B), and/or oscillatory rollers (O_T), and/or three-wheel (3W) rollers for breakdown and one finish steel-wheeled roller (T_F) meeting the requirements of Articles 406.07 and 1101.01(e). 3W, T_B , and T_F rollers shall be a minimum of 280 lb/in, except when used for SMA, a minimum of 310 lb/in shall be required. The 3W, O_T , and T_B rollers shall be operated at a uniform speed not to exceed 3 mph, 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 to Article 406.07(b) of the Standard Specifications.

“Rolling patterns shall be as established by the Tollway Materials approved test strip. Any change to the rolling pattern, including but not limited to a change in equipment or number of passes, shall require a new growth curve and be approved by the Engineer and Tollway Materials.”

- 6.3. Density Modifications. Add the following to Article 1030.09(b) of the Standard Specifications.

“For acceptance, mat density shall be measured either by correlated nuclear gauge (Illinois-modified ASTM D 2950), correlated non-nuclear gauge (Tollway Modified ASTM D7113), or from cores obtained by the Contractor at random locations. The correlation coefficient (“r” value) for correlating density gauge densities with core densities shall be greater than 0.87. For the correlation to be valid, two or more of the cores must read at least 1.0% below the minimum required densities for both the mat and edge densities.

The use (or non-use) of mineral filler for density testing shall be consistent with the method used for the test strip gauge correlation. Mineral Filler is not allowed on 4.75mm mixes.

Non-nuclear gauges will be allowed in lieu of nuclear gauges in accordance with Tollway Modified ASTM D7113.”

- 6.4. Longitudinal Joint Density. Replace the second paragraph of Article 1030.09(b)(1) of the Standard Specifications with the following:

“Longitudinal joint density testing shall be performed at each random density test location. Longitudinal joint testing shall be located at a distance equal to the lift thickness, or a minimum of two inches, from each pavement edge (i.e. for a four inch lift the near edge of the density gauge or core barrel shall be within four inches from the edge of pavement). It shall be documented as to whether the joint was confined or unconfined. The joint density value shall be determined using either a correlated density gauge or cores.”

Replace the Article 1030.09(b)(1)(b) of the Standard Specifications with the following:

“(b) Unconfined Edge. Each unconfined edge joint density shall be represented by an average of two one-minute density readings or a single core density at the given density test location and shall meet the density requirements specified herein. When using a correlated density gauge, the gauge shall be rotated 180 degrees between readings. If the two readings are not within 1.5 lb./cu ft., then one additional reading shall be taken. Additional density readings taken at a given site shall not be allowed to replace the original density readings unless an obvious error has occurred (i.e. the density gauge was sitting on debris).”

- 6.5. IL-4.75 Requirements. Add the following to Article 1030.09(b) of the Standard Specifications.

“The density of the IL-4.75 mixture shall be according to the following.

The Contractor shall perform a growth curve at the beginning of each day. Quality Assurance shall be present for growth curve measurements. If an adjustment is made to the specific mix design, the Engineer or Tollway Materials reserve the right to request an additional growth curve and supporting tests at no additional cost to the Illinois Tollway.

Compaction of the growth curve shall commence immediately after the course is placed and at a temperature of not less than 300°F. The growth curve, consisting of a plot of lb./cu ft. vs. number of passes with the project breakdown roller, shall be developed. This curve shall be established by use of a density gauge. Tests shall be taken after each pass until the highest lb./cu ft. is obtained. This value shall be the target density provided the air voids are within acceptable limits. If air voids are not within the specified limits, corrective action shall be taken, and a new target density shall be established. A new growth curve is required if the breakdown roller used on the growth curve is replaced with a new roller during production.

The target density shall apply only to the specific gauge used. If additional gauges are to be used to determine density specification compliance, the Contractor shall establish a unique minimum allowable target density from the growth curve location for each gauge. The Engineer will establish a target density for its Quality Assurance density gauge from the growth curve location.

All lifts shall be compacted to an average density of not less than 95 percent nor greater than 102 percent of the target density obtained on the growth curve. The average density shall be based on tests representing one day's production.

Quality Control density tests shall be performed at randomly selected locations within ¼ mile intervals per lane. In no case shall more than one half day's production be completed without density testing being performed.”

6.6. Class D Patching Requirements. Replace Article 442.08(b) with the following.

“The density of the Class D Patching mixture shall be according to the following.

The Contractor shall perform a growth curve on the first patch filled each day. Quality Assurance shall be present for growth curve measurements. If an adjustment is made to the specific mix design, the Engineer or Tollway Materials reserve the right to request an additional growth curve and supporting tests at no additional cost to the Illinois Tollway.

Compaction of the growth curve shall commence immediately after the course is placed and at a temperature of not less than 275°F. The growth curve, consisting of a plot of lb./cu ft. vs. number of passes with the project breakdown roller, shall be developed. This curve shall be established by use of a density gauge. Tests shall be taken after each pass until the highest lb./cu ft. is obtained. This value shall be the target density provided the air voids are within acceptable limits. If air voids are not within the specified limits, corrective action shall be taken, and a new target density shall be established. A new growth curve is required if the vibratory roller used on the growth curve is replaced with a new roller during production.

The target density shall apply only to the specific gauge used. If additional gauges are to be used to determine density specification compliance, the Contractor shall establish a unique minimum allowable target density from the growth curve location for each gauge. The Engineer will establish a target density for its Quality Assurance density gauge from the growth curve location.

The above procedure shall be repeated for each lift placement of the patch.

All lifts shall be compacted to an average density of not less than 97 percent nor greater than 103 percent of the lift target density obtained on the growth curve(s). A valid test shall consist of three locations, equally spaced within the patch and average together.

Quality Control density tests shall be performed at randomly selected locations within ¼ mile intervals per lane. In no case shall more than one half day's production be completed without density testing being performed.”

6.7. Control Limits. Revise the density control limits table and footnotes of Article 1030.09(c) of the Standard Specifications to the following.

“Tollway Table 4 – Density Control Limits

Mixture Composition	Parameter	Individual Test (includes confined edges)	Unconfined Edge Joint Density Minimum
IL-4.75 ¹	Ndesign = 50	Growth Curve, 95 – 102%, see 6.5.	
Class D Patch	Ndesign = 70	Growth Curve, 97 – 103%, see 6.6.	
IL-9.5, IL-12.5	Ndesign = 90	92.0 – 96.0%	91.0%
IL-9.5, IL-12.5	Ndesign < 90	92.5 – 97.4%	91.0%
IL-19.0	Ndesign = 90	93.0 – 96.0%	91.0%
IL-19.0	50 < Ndesign < 90	93.0 – 97.4%	91.0%
IL-19.0	Ndesign = 50	94.0 – 98.4%	92.0%
SMA	Ndesign = 80	93.5 – 97.4%	92.0%
Asphalt Stabilized Subbase	Ndesign = 50	95.0 - 98.4 %	92.0%

1/ A density gauge/core correlation shall not be required for IL-4.75 mixtures.

If the longitudinal joint densities do not meet the minimum requirements of Tollway Table 4, the Engineer may allow the use of a Rapid Penetrating Emulsion (RPE) in lieu of remove and replace.”

7. Test Strip and Production Testing.

Replace the Article 1030.10 with the following:

“For each contract, a 300 ton (for dense graded mixes) or 400 ton (for SMA mixes) test strip will be required at the beginning of the WMA production for each mix design. This can be waived by the Engineer if a test strip has been performed and the results approved by Tollway Materials in the same calendar year. The test strip shall be performed according to the IDOT document *Hot Mix Asphalt Test Strip Procedures*.

Before start-up, target values shall be determined by applying gradation correction factors to the JMF when applicable. These correction factors shall be determined from previous experience. The target values, when approved by the Engineer, shall be used to control HMA production. Plant settings and control charts shall be set according to target values.

Before constructing the test strip, target values shall be determined by applying gradation correction factors to the JMF when applicable. After any JMF adjustment, the JMF shall become the Adjusted Job Mix Formula (AJMF). Upon completion of the first acceptable test strip, the JMF shall become the AJMF regardless of whether or not the JMF has been adjusted. If an adjustment/plant change is made, the Engineer may require a new test strip to be constructed. If the HMA placed during the initial test strip is determined to be unacceptable to remain in place by the Engineer, it shall be removed and replaced.

The limitations between the JMF and AJMF are as follows.

Parameter	Adjustment
1/2 in. (12.5 mm)	± 5.0 %
No. 4 (4.75 mm)	± 4.0 %
No. 8 (2.36 mm)	± 3.0 %
No. 30 (600 µm)	*
No. 200 (75 µm)	*
Asphalt Binder Content	± 0.3 %

* In no case shall the target for the amount passing be greater than the JMF.

Any adjustments outside the above limitations will require a new mix design.

Hamburg Wheel and DCT testing shall be conducted on the first full day of production after an approved test strip and shall meet the requirements set forth in the Illinois Tollway Asphalt Mixtures Special Provision. Production Hamburg Wheel and DCT testing is required each calendar year. Production performance testing should be submitted to the Engineer and Tollway Materials within 5 days of sampling. If failures occur, the Contractor shall make allowable mix adjustments/plant changes prior to the next placement, then resample and retest. If the Engineer or Tollway Materials determines additional adjustments to the mix will not produce acceptable results, a new mix design shall be required.

The Tollway reserves the right to request and witness investigative samples of any material, or conduct field testing, at any point during the project.”

Replace IDOT’s “Manual of Test Procedures for Materials - Appendix B4 - HMA Test Strip Procedures” with the following.

“General Requirements. A QC/QA mixture test strip will be required for all asphalt mixes. The mix design shall be approved by Tollway Materials prior to the test strip. Target values shall be provided by the Contractor and will be approved by Tollway Materials or their designee prior to construction of the test strip. A pre-pave meeting shall be held to coordinate personnel and materials prior to the construction of the test strip.

The test strip shall be constructed at a location approved by the Engineer and Tollway Materials to determine the mix properties, density, and laydown characteristics, and as needed to finalize any proposed mix design. These test results and visual inspections on the mixture shall be used to make corrective adjustments if necessary.

Prior to the start of mix production and placement the Engineer, in conjunction with Tollway Materials, will review and approve all test strip results, mix designs, and rolling pattern.

Team Members. The start-up team may consist of the following with required personnel in bold:

- (1) Resident Engineer
- (2) Tollway Project Manager, or representative
- (3) Tollway Materials representative
- (4) Contractor's QC Manager
- (5) Construction Manager's QA representative
- (6) Contractor's QC technician
- (7) Supplier representative (Required for new technologies)

Communication. The Contractor shall advise the team members of the anticipated start time of production for the test strip. The QC Manager shall direct the activities of the test strip team. An Illinois Tollway-appointed representative from the start-up team will act as spokesperson for the Illinois Tollway.

Process. The Test Strip(s) for asphalt mixtures shall be in accordance with the Standard Specifications except as modified herein. For SMA, the Test Strip(s) shall consist of approximately 400 tons. For asphalt stabilized base, binder course and surface course, the Test Strip(s) shall consist of approximately 300 tons.

- a. Mix Information. On the day of construction of the Test strip, the Contractor shall provide the start-up team documentation of test data showing the combined hot-bin or the combined aggregate belt sample and mineral filler at a drier-drum plant.
- b. Mix and Gradation Test Strip Samples. The first and second sets of mixture and gradation samples shall be taken by the Contractor at such times as to represent the mixture between the two growth curves and the rolling pattern area, respectively. All test strip samples shall be processed by the Contractor for determination of mix composition and volumetric properties including air voids. This shall include washed gradation tests. This information shall then be compared to the JMF and required design criteria. Prepare and test any WMA test strip mixtures, including gyratory compacted specimens for QC/QA using the same test methods, procedures and frequencies as specified for HMA, except that the WMA mixture shall be aged at the production temperature for a period of 2 hours before gyratory or performance-based test specimens are compacted.

All samples shall be processed for determination of the mix composition and volumetric properties, including air voids, before production may continue. The test data shall meet the JMF target value control limits to be considered acceptable. If the results of the required plant tests exceed the JMF target value control limits, the Contractor shall propose ingredient materials adjustments. This mixture AJMF proposal shall be uploaded into the Web-Based Project Management System (WBPM) and directed to the Engineer and Tollway Materials.

The Contractor shall upload a proposal for full mixture production whether changes to the JMF need to be made or not. Full production of the mixture shall not commence until the Engineer and Tollway Materials have approved the test strip.

If the Engineer or Tollway Materials determines that the Contractor proposed adjustments to the mix may not produce acceptable results, a meeting between Tollway Materials and the Quality Control Manager shall be required to discuss the proposed changes before a 2nd Test Strip can be attempted.

- c. **Compaction Equipment.** It shall be the responsibility of the start-up team to verify roller compliance before commencement of growth curve construction. All paving and rolling equipment required by Section 4 herein for use on the specific mix and application shall be utilized on the test strip.

For vibratory rollers, appropriate amplitude shall be selected on the basis of the roller weight and mat thickness to achieve maximum density. The vibratory roller speed shall be balanced with frequency so as to provide compaction at a rate not less than 10 impacts per 1 foot, which shall be maintained throughout paving operations.

- d. **Construction of the Test Strip.** After the Contractor has produced the mix, transported the mix, and placed approximately 100 to 150 tons of mix, placement of the mix shall stop, and a growth curve shall be constructed. After completion of the first growth curve, paving shall resume for 50 to 100 tons of mix, placement shall stop, and the second growth curve shall be constructed within this area. Additional growth curves may be required if an adjustment/plant change is made during the test strip. The Contractor shall use the specified rolling procedures for all portions of the test strip except for the growth curve areas which shall be compacted as directed by the QC Manager. Smoothness of the test strip shall be to the satisfaction of the Engineer.
- e. **Location of Test Strip.** The test strip shall be located on a pavement type similar to the contract pavement and acceptable to the Engineer and Tollway Materials. It shall be on a relatively flat portion of the roadway. Descending/Ascending grades or ramps shall be avoided.
- f. **Compaction Temperature.** For WMA mixtures, the temperature of the mix at the beginning of the growth curve shall be within the additive / process manufacturer's recommended temperature range for compaction, with the lowest compaction temperature not less than 220°F.
- g. **Compaction and Testing.** The QC Manager will specify the roller(s) speed and number of passes required to obtain a completed growth curve. The density gauge shall be placed near the center of the hot mat and the position marked for future reference. With the bottom of the density gauge and the source rod clean, a density reading using the gauge's shortest time setting (without mineral filler) shall be taken after each pass of the roller. Rolling shall continue until the maximum density is achieved and three consecutive passes show no appreciable increase in density or no evidence of destruction of the mat. The growth curve shall be plotted.

- h. Evaluation of Growth Curves. Mixtures which exhibit density potential less than 94 percent or greater than 97 percent of the maximum theoretical density (D) shall be considered as sufficient cause for mix adjustment. If a mix adjustment is made, an additional test strip may be requested. The Illinois Tollway will pay half the cost of the contract unit price for a test strip if an additional test strip is required. The information shall then be compared to the AJMF and required design criteria.

If the density gauge potential of the mixture does not exceed 91 percent, the operation will cease until all test data is analyzed or a new mix design is produced.

In addition, other aspects of the mixture, such as appearance, segregation, texture, or other evidence of mix problems, should be noted and corrective action taken at this time.

- i. Density Gauge/Core Correlation. A correlation of core and density gauge test results shall be performed on-site as defined in the IDOT's "Procedure for Correlating Nuclear Gauge Densities with Core Densities". All correlation locations shall be cooled with ice or dry ice so that cores can be taken as soon as possible. Three locations shall be selected. Two sites shall be located on the two growth curves from the first acceptable test strip. The third location shall be in an area corresponding to the second set of mixture/ gradation samples taken at the plant. The correlation may be performed with or without mineral filler placed on the testing locations, however all future correlated density testing shall be consistent with the method selected for the test strip. This correlation shall be completed at the same time by the Contractor prior to the next day's production.

Documentation. The Test Strip rolling pattern information (including growth curves) and required plant tests will be tabulated by the contractor with copies provided to each team member, and the original submitted to the Engineer and Tollway Materials. Any change to the rolling pattern shall be approved by the Engineer and Tollway Materials."

- 8. Pavement Surface Smoothness.** Smoothness testing of the finished ~~and~~ asphalt surface shall be conducted according to the requirements of the Illinois Tollway Special Provision for Surface Smoothness Testing, except were modified herein

Each pavement segment shall be reported and compared to the acceptable smoothness limit based on International Roughness Index (IRI) and Localized Roughness (LR) as provided in the table below:

Tollway Table 5 – Smoothness Requirements

Pavement Surface	Maximum IRI (in/mi)	Maximum LR (in/mi)
Surface Course	60	125
Binder Course ^{1/}	70	125
Ramp (Posted speed < 45 mph)	100	145
Ramp (Posted speed ≥ 45mph)	80	135

1/ Only to be used if roadway is opened to traffic prior to placement of Surface Course

The final pavement surface shall meet the requirements for both IRI and LR. For each pavement segment that exceeds either the maximum acceptable initial IRI or LR value, there are two methods for proceeding:

- (1) Remove and replace the pavement that exceeds the limit.
- (2) Grind the segment to bring the pavement surface into conformance with the acceptable limits without adversely affecting the required thickness of the pavement structure.

Either of the above options shall be applied to each rejectable segment. The contractor shall provide a corrective work plan describing the methods, procedures and limits of repair. The corrective work shall not proceed until the plan has been approved in writing by the Engineer. Once remediation has been completed, smoothness testing shall be required by the contractor.

The Contractor shall notify the Engineer at least 24 hours prior to commencement of the corrective work. The Contractor shall not commence corrective work until the methods, procedures and limits have been approved in writing by the Engineer.

All smoothness corrective work shall be for the entire lane width. Pavement cross slope shall be maintained through areas where corrective action is performed.

Surface corrections shall be made prior to placing permanent pavement markings. In the event that permanent pavement markings are damaged or destroyed during corrective work, they will be replaced at no cost to the Illinois Tollway.

A sufficient length of pavement shall be corrected to address areas of unacceptable smoothness without producing additional high or low points. Retesting of the segments after corrective action shall include the segment prior and four segments after the corrected segment.

9. Pay Adjustments

9.1. Construction Joints. See sections 5.5 and 5.6 of this document.

For SMA binder and surface, the Engineer will assess a 1-ton quantity deduction for each instance where a 2-inch or greater deviation in the longitudinal joint is found within a 16-foot segment measured from the top of the constructed mat. Deductions shall only be applied to deviations noted along an unconfined edge prior to construction of the adjacent lane. No more than 1 deduction will be assessed in any 16-foot length.

9.2. Bleeding and/or Flushing for SMA Surface Pavement.

If bleeding or flushing occurs in SMA pavement, regardless of the cause, areas of bleeding larger than one square foot within a five-foot length of pavement shall result in a deduction of 2 tons in the SMA measured for payment as specified. If bleeding or flushing occurs in SMA, regardless of the cause, areas of bleeding larger than 10 square feet within a five-foot length of pavement shall result in the entire area affected to be removed and replaced with equivalent SMA for the full width of the paving lane at no additional cost to the Illinois Tollway.

10. Method of Measurement

This work will be measured for payment as indicated in Table 6 below.

Tollway Table 6 – Method of Measurement

Item	Method of Measurement	According to Article
Asphalt Stabilized Base	Square Yard	312.15
Asphalt Shoulders	Square Yard	482.07
Base Course	Square Yard	355.10
Asphalt Binder and Surface	Ton	406.13
IL-4.75 and SMA	Ton	406.13
Longitudinal Joint Seal	Foot	406.13
Pavement Patching	Square Yard	442.11
Tack Coat	Pound	406.13
Temporary Pavement	Square Yard	406.13
Test Strips	Each	406.13 ^{1/}

1/ Test strip information is measured when finalized and accepted by the Engineer

11. Basis of Payment

Tack Coat will be paid for at the contract unit price per pound of residual asphalt applied for ASPHALT TACK COAT, ASPHALT POLYMERIZED TACK COAT and ASPHALT TACK COAT (NON-TRACKING).

Longitudinal joint sealant (LJS) will be paid for at the contract unit price per foot for LONGITUDINAL JOINT SEALANT, LONGITUDINAL JOINT SEALANT, HALF WIDTH, and LONGITUDINAL JOINT SEALANT, HALF WIDTH AND VERTICAL.

When Warm Mix Asphalt Base Course is specified, this work will be paid for at the contract unit price per square yard for WARM-MIX ASPHALT BASE COURSE, of the thickness specified.

When Mixture IL-4.75 Leveling Binder is specified, this work will be paid for at the contract unit price per ton for POLYMERIZED WARM MIX LEVELING BINDER (MACHINE METHOD), IL-4.75, N50 or WARM MIX LEVELING BINDER (MACHINE METHOD), of the type specified.

When Asphalt Stabilized Subbase is specified, this work will be paid for at the contract unit price per square yard for STABILIZED SUBBASE, of the type and thickness specified.

When Asphalt overlay are constructed, this work will be paid at the contract unit price per ton for STONE MATRIX WARM MIX ASPHALT SURFACE COURSE, of the type specified, STONE MATRIX ASPHALT SURFACE FRICTION COURSE, of the type specified, STONE MATRIX WARM MIX ASPHALT BINDER COURSE, of the type specified, WARM-MIX ASPHALT SURFACE COURSE, of the type specified, and WARM-MIX ASPHALT BINDER COURSE, of the type specified.

When Warm Mix Asphalt Shoulders are constructed along the edges of the completed pavement structure, this work will be paid for at the contract unit price per square yard for WARM-MIX ASPHALT SHOULDERS, STONE MATRIX WARM MIX ASPHALT SHOULDER COURSE, or WARM MIX ASPHALT SHOULDER, SPECIAL of the thickness specified. If a shoulder overlay is proposed, it will be paid for at the contract unit price per ton of the type of asphalt specified.

When WMA Pavement (Full-Depth) is constructed, this work will be paid for at the contract unit price per square yard for WARM-MIX ASPHALT BASE COURSE, of the thickness specified and at the Contract unit price per ton of the type of WMA or SMA specified in the plans.

When Temporary Pavement or Pavement Patching is specified, this work will be completed and paid in accordance with the Illinois Tollway special provision for "Temporary Pavement", "Asphalt Partial Depth Removal and Overlay Patching", and "Asphalt Pavement Patching"

Test Strip. Add the following to Article 406.14 of the Standard Specifications:

“WMA or SMA test strips will be evaluated for payment at the contract unit price each for CONSTRUCTING WARM MIX ASPHALT TEST STRIP or TEST STRIP (STONE MATRIX ASPHALT), according to the following:

- (a) If the WMA or SMA placed during the initial test strip is determined to be acceptable, the mixture and test strip will be paid at the contract unit prices, which price shall not include the 400 or 300 tons of mix, as well as the appropriate testing. If an additional test strip is required due to a mixture change, the additional test strip will be paid for.
- (b) If the WMA or SMA placed during the initial test strip (1) is determined to be unacceptable to remain in place by the Engineer, and (2) was not produced within the tolerances of the JMF, the initial mixture and test strip will not be paid for and shall be removed at no additional cost to the Illinois Tollway. An additional test strip will be paid for in full, if produced within the JMF tolerances.
- (c) If the WMA or SMA placed during the initial test strip (1) is determined to be unacceptable to remain in place by the Engineer, and (2) was produced within the tolerances of the JMF, the mixture shall be removed. Removal will be paid for according to Article 109.04 of the Tollway Supplemental Specifications. This initial mixture and test strip will be paid for at the contract unit price, and any additional test strips will be paid for at one half the unit price of each test strip.
- (d) If the WMA or SMA placed during a test strip is determined to be acceptable to remain in place by the Engineer and the Engineer deems a new start-up is required for any reason, the initial mixture and test strip will be paid for at the contract unit prices. The additional mixture will be paid for at the contract unit price and any additional test strips will be paid for at one-half the unit price for each test strip.
- (e) If the Contractor requests and is granted approval for a mix design other than the initial approved WMA or SMA mix design, they shall construct a test strip for the new mix design at no additional cost to the Illinois Tollway.

ASPHALT MIXTURES (ILLINOIS TOLLWAY)

Effective: July 25, 2019

Revised: March 5, 2024

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1. **Description.** This work shall consist of designing Asphalt Mixes for the Illinois Tollway. Any verbiage relating to “Hot Mix Asphalt” Mixtures in the referenced documents is considered interchangeable with the Tollway’s use of “Warm Mix Asphalt” (WMA) Mixtures, unless specifically noted herein.

2. **Reference Standards.** The following documents are referenced in the Illinois Tollway Asphalt Mixtures Special Provision and must be followed in the asphalt mix design process unless revised herein.

- 2.1. Illinois Department of Transportation (IDOT) – Current Standard Specifications for Road and Bridge Construction
- 2.2. Illinois Department of Transportation (IDOT) – Supplemental Specifications and Recurring Special Provisions
- 2.3. Illinois Department of Transportation (IDOT) – Manual of Test Procedures for Materials
- 2.4. Illinois Department of Transportation (IDOT) – Manual of Aggregate Quality Test Procedures
- 2.5. Illinois Tollway – Illinois Tollway Manual of Test Procedures (referred to as TTP)
- 2.6. Illinois Tollway – Approved List of Asphalt Binder and Mixture Modifiers
- 2.7. Illinois Tollway – Approved List of Warm Mix Asphalt (WMA) Technologies
- 2.8. Illinois Tollway – Special Provision for Reclaimed Asphalt Materials (RAM)

3. Requirements. Contractor and Consultant laboratories performing the tasks set forth in this special provision shall either be AASHTO resource Accredited or meet the minimum requirements specified in the current version of the IDOT policy memorandum 6-08 “Minimum Private Laboratory Requirements for Construction Materials Testing or Mix Design,” as determined by Tollway Materials.

4. Materials.

4.1. Fine Aggregate – If the contractor proposes a non-IDOT-approved source, testing and acceptance procedures must be reviewed and approved by Tollway Materials. Fine Aggregate shall conform to Article 1003.03 of the Standard Specifications except as modified herein.

Revise the first paragraph of Article 1003.03(a) of the Standard Specifications to read:

“(a) Description. Fine aggregate for Asphalt Mixtures may consist of sand, stone sand, slag sand or steel slag sand as permitted by Tollway Table 1. For gradation FA 22, uncrushed material will not be permitted. Fine aggregate for SMA shall consist of stone sand, slag sand, or steel slag sand.”

Revise the first through third paragraphs of Article 1003.03(c) of the Standard Specifications with the following.

“(c) Gradation. Fine aggregate gradations for Asphalt Mixtures shall be FA 1, FA 2, FA 20, FA 21, or FA 22, as permitted by Tollway Table 1.

Tollway Table 1 – Allowable Fine Aggregate Gradations

Mixture Type	FA1	FA2	FA20	FA21	FA22
SMA	Not Permitted		Permitted	Not Permitted ^{1/}	Permitted
Binder and Surface Course	Permitted				
IL-4.75	Permitted				
Asphalt Stabilized Subbase	Permitted				

^{1/} Allowed if no RAP, FRAP or RAS in mix

For mixtures with a Ndesign = 90 and for mixture IL-4.75, at least 50 percent of the required fine aggregate fraction shall consist of either stone sand, slag sand, or steel slag meeting the FA 20 gradation.

For mixture IL-19-0, Ndesign = 90, the fine fraction shall consist of at least 67% manufactured sand meeting the FA 20 gradation. The manufactured sand shall be stone sand, slag sand, steel slag sand, or combinations thereof.”

4.2. Coarse Aggregate – If the contractor proposes a non-IDOT-approved source, testing and acceptance procedures must be reviewed and approved by Tollway Materials. Coarse Aggregate shall conform to Article 1004.03 of the Standard Specifications, except as modified herein.

Revise Article 1004.01 (b) of the Standard Specifications to include the Additional Requirements for SMA Coarse Aggregate as listed in Tollway Table 2.

“Tollway Table 2 – Additional Requirements for SMA Coarse Aggregate

Quality Test	Test Method & Procedure	Coarse Aggregate Material		
		Crushed Gravel	Dolomite	Category I FRAP for SMA
Coarse Aggregate Angularity	ITP 5821	>98% two fractured faces		
Flat & Elongated	ITP 4791	≤ 10% (5:1)	≤ 10% (5:1)	
LA Abrasion	ITP 96	≤ 28.0%	≤ 28.0%	
Micro-Deval ^{1/}	ASTM D6928 or AASHTO T327	≤ 11.0%	≤ 11.0%	<9.0%

^{1/} All Micro-Deval testing must be performed by a laboratory with AASHTO Re: Source aggregate accreditation. The Engineer reserves the right to verify Micro-Deval testing.”

Revise Article 1004.03(a) to add Tollway Table 3 for Allowable Coarse Aggregate for SMA Mixes.

“Tollway Table 3 – Allowable Coarse Aggregate for SMA Mixes

Coarse Aggregate	Friction Surface	Surface	Unmodified SMA ^{1/}	Binder
Crushed Steel Slag	Permitted	Permitted	Permitted	Not Permitted
Quartzite				Permitted
Granite				
Diabase / Trap Rock				
Crushed Gravel	Not Permitted	Not Permitted	≤ 25%	≤ 25%
Dolomite				

^{1/}Crushed Steel Slag is not permitted in Unmodified SMA if used in the Binder”

4.3. Mineral Filler – Shall conform to Article 1011 except as modified herein.

Add the following to Article 1011.01 of the Standard Specifications.

“As an option, collected baghouse dust may be used in lieu of manufactured mineral filler, provided: 1) there is enough available for the production of the mix for the entire project, and 2) a mix design was prepared with collected baghouse dust.”

4.4. RAP/FRAP/RAS Requirements – RAP/FRAP/RAS stockpile production shall conform to the Illinois Tollway Reclaimed Asphalt Materials (RAM) special provision. Additionally:

- (1) The coarse aggregate in all RAP and FRAP shall be equal to or less than the nominal maximum size requirement for the asphalt mixture to be produced. Only FRAP that is processed over a 5/16 in. or smaller screen will be permitted in the IL-4.75 mm mix.
- (2) RAP and FRAP stockpiles containing steel slag shall be approved for use in surface mixtures only.

4.5. Asphalt Binder –

All asphalt binder shall conform to the Article 1032.05 of the Standard Specifications except as modified herein.

Revise Table 1 of Article 1032.05 (b) as follows.

Add “SB/SBS PG 64-34” in Row 2, Column 2, underneath “SB/SBS PG 70-28.”

Revise Table 2 of Article 1032.05 (b) as follows.

Add “SBR PG 64-34” in Row 2, Column 2, underneath “SBR PG 70-28.”

Revise Table 1 and 2 Notes of Article 1032.05 (b) with the following.

“Note: The SBS/SBR PG 76-22, SBS/SBR PG 70-22, SBS/SBR PG 70-28 or SBS/SBR PG 64-34 binder shall meet the requirements of Article 1032.05(b) of the Standard Specifications. In addition, the elastic recovery of the asphalt binder used shall be a minimum of 80.”

Add the following paragraph to Article 1032.05 (b).

“The base asphalt binder that is blended with the Terminal Blend Ground Tire Rubber (GTR) or Dry Process GTR shall meet the requirements of Article 1032.05 of the Standard Specifications. The GTR blended asphalt shall comply with the specified PG Grade in accordance Table 1 of Article 1032.05 (b) of the Standard Specifications with exception to the Separation of Polymer test and Force Ratio. In addition, the elastic recovery shall be a minimum of 75% for all grades of GTR blended asphalt binder. Dynamic Shear Rheometer tests on GTR blended asphalt binder shall use a 2.00mm gap for 25mm plates.”

4.6. Mix Additives

Fibers – Replace Article 1030.02(h) (Note 2) of the Standard Specifications with the following.

“Note 2. A fiber additive shall be included in all SMA mixtures. For Cellulose or Mineral Fiber, the fiber additive shall comply with the requirements of AASHTO M 325. RAS may be used as a fiber additive in Stone Matrix Asphalt (SMA) mixtures. Fibers may be used in other asphalt mixtures if approved by Tollway Materials.”

Warm Mix Additives – Replace Article 1030.02(i) (Note 3) of the Standard Specifications with the following.

“Note 3. Warm mix additives/processes shall be on the Illinois Tollway’s Approved List of Warm-Mix Asphalt (WMA) Technologies.”

Asphalt Modifiers – GTR and Rejuvenators shall be on the Illinois Tollway’s Approved List of Asphalt Binder and Mixture Modifiers.

5. Mix Design.

5.1. Gradation Requirements – Shall conform to Article 1030.05 of the Standard Specifications except as modified herein.

Revise the Table in Section 1030.05(a)(1) of the Standard Specifications as follows.

“Tollway Table 4 - Gradation Requirements

Mixture Composition Range (% Passing) ^{1/}							
Sieve Size	SMA IL-12.5 ^{4/}	SMA IL-9.5 ^{4/}	IL-19.0	IL-12.5	IL-9.5	IL-4.75	Asphalt Stabilized Subbase
1 in. (25 mm)	-	-	100	-	-	-	100
3/4 in. (19.0 mm)	100	-	90 – 100	100	-	-	90 - 100
1/2 in. (12.5 mm)	82 – 100	100	69 – 89	90 – 100	100	-	69 - 89
3/8 in. (9.5 mm)	65 max	90 – 100	-	89 max	90 – 100	100	-
No. 4 (4.75 mm)	20 – 30	36 – 50	45 – 60	28 – 65	32 – 69	90 - 100	45 – 60
No. 8 (2.36 mm)	16 – 24 ^{3/}	16 – 32	30 – 45	28 – 48	34 ⁵ – 52 ^{2/}	70 - 90	30 – 45
No. 16 (1.18 mm)	-	-	20 – 35	10 – 32	10 – 32	50 - 65	20 – 35
No. 30 (600 μm)	12 – 16	12 – 18	-	-	-	35 - 55	-
No. 50 (300 μm)	10 – 15	-	8 – 16	4 – 15	4 – 15	15 - 30	8 – 16
No. 100 (150 μm)	-	-	6 – 9	3 – 10	3 – 10	10 - 18	6 – 9
No. 200 (75μm)	8 – 10	7.5 – 9.5	3 – 6	4 – 6	4 – 6	7 - 9	3 – 6

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/ When establishing the Adjusted Job Mix Formula (AJMF) the percent passing the #8 (2.36 mm) sieve shall not be adjusted above 24 percent.

4/ When the bulk specific gravity (Gsb) of the component aggregates vary by more than 0.20, the blend gradations shall be based on percent by volume.

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.”

All asphalt plants are required to use positive dust control. The contractor may choose to develop the mix design with less than 1.0 percent mineral filler added in the laboratory.

5.2. Volumetric Requirements - Shall conform to Article 1030.05 of the Standard Specifications except as modified herein.

Revise the table of Article 1030.05(b) of the Standard Specifications to the following tables.

“Tollway Table 5 – Binder and Surface Course Mix Volumetric Requirements

VOLUMETRIC REQUIREMENTS Binder and Surface Course Mixes					
Ndesign	Design Air Voids Target %	Voids in the Mineral Aggregate (VMA), % minimum			Ratio Dust/Asphalt Binder
		IL-19.0	IL-12.5	IL-9.5	
30	3.0	N/A	N/A	15.0	1.0 Max
50	3.0	13.5 ^{2/}	14.0	15.0	
70	4.0 ^{1/}	13.5	14.0	15.0	
75	3.5				
90	4.0				

1/ Target air voids on IL-19.0 N70 Binder shall be 3.5%

2/ IL-19.0 N50 Binder 3.0% void mixes placed on shoulders or temporary pavement are allowed a VMA minimum of 12.5%”

“Tollway Table 6 – SMA, IL-4.75mm, and Asphalt Stabilized Subbase Volumetric Requirements

Property	Mixture Type		
	SMA	IL-4.75	Asphalt Stabilized Subbase
Design Air Voids	3.5 % @ 80 Gyration	3.5 % @ 50 Gyration	2.0 % @ 50 Gyration
Voids in the Mineral Aggregate (VMA), % (Minimum)	16.0 % (for specific gravity of coarse aggregate < 2.78) ^{1/} 17.0 % (for specific gravity of coarse aggregate ≥ 2.78) ^{1/}	18.5	11.0
Ratio Dust/Asphalt Binder	-	1.0 max	1.2 max
Draindown (%) (Maximum)	0.2 ^{2/}		-

1/The calculation for the Gsb is a weighted average including the RAP and/or FRAP

2/The draindown shall be determined at the job mix formula asphalt binder content at the mixing temperature of 350°F, as per AASHTO T305.”

5.3. Recovered Asphalt Binder Performance Grade

Reserved.

5.4. Reclaimed Asphalt Pavement (RAP) and Fractionated Reclaimed Asphalt Pavement (FRAP)

All stockpiles shall conform to the Illinois Tollway Reclaimed Asphalt Materials (RAM) special provision.

Tollway Table 7 – Allowable RAP in Asphalt Mixtures

RAP Type	Mixture Type			
	SMA and IL-4.75mm	Surface Course	Binder Course	Asphalt Stabilized Subbase
Homogenous	Not Permitted	Permitted	Permitted	Permitted
Conglomerate 3/8		Not Permitted		
Conglomerate 5/8			Not Permitted	
Conglomerate DQ				

Tollway Table 8 – Allowable FRAP in Asphalt Mixtures

FRAP Type		Mixture Type		
		SMA	IL – 4.75mm	Unmodified SMA, Binder, Surface, and Asphalt Stabilized Subbase
Category I	Fine	Permitted ^{1/}	Permitted	Permitted
	Coarse	≤15% ^{2/}	Not Permitted	
Category II	Fine	Not Permitted ^{3/}	Permitted	
	Coarse		Not Permitted	

1/ When using FRAP for SMA, the fine portion Category 1 FRAP may be used separately or as proportioned with the stone sand.

2/ Category 1 Coarse FRAP may be increased to 25% provided it is from a friction SMA source.

3/ A Category 2 Fine-FRAP source may be used in the mix design for SMA provided that the fine aggregate angularity of the fine FRAP sand, following the Illinois Tollway Modified Test Procedure (TTP) 002, equals 45.0 or greater.

5.5. Reclaimed Asphalt Shingles (RAS) in Asphalt Mixtures

Quality requirements of RAS materials can be found in the Illinois Tollway Special Provision for Reclaimed Asphalt Materials (RAM).

RAS shall not exceed 5.0 percent by weight of the total mix for all asphalt mixtures.

For asphalt mixtures that contain RAS that has not been mechanically blended with any other product, a bulk specific gravity (G_{sb}) of 2.300 shall be used for RAS in the design. Blended RAS products may have other specific gravity values for use in asphalt mix design but shall be verified by the Illinois Tollway. When the blended RAS product is approved

by the Illinois Tollway an approval letter will be sent to the supplier with the approved gradation and specific gravity assignment.

5.6. Asphalt Binder Replacement (ABR)

Virgin asphalt binder performance grade (PG) shall depend on the mix type, the types of reclaimed materials, the level of binder replacement, and the presence of a rejuvenator. For SMA and IL-4.75, the contractor shall use a SBS polymer, a Terminal Blend GTR, or a Dry Process GTR to modify the asphalt mixture.

Tollway Table 9 - RAM, ABR, and Asphalt Binder Requirements

Reclaimed Asphalt Material (as permitted in Tollway Tables 7 & 8)		RAP ^{1/} /FRAP/RAS	FRAP/RAS	Category 1 ^{2/} FRAP with RAS
ABR		0-17%	18-33%	34-50%
Allowable Mix Options	SMA and IL-4.75 ^{3/}	SBS/SBR 70-28 GTR PG 70-28 PG 58-28 10% ⁴ Dry GTR		SBS/SBR 64-34 GTR PG 64-34 PG 52-34 ^{6/} 10% ⁴ Dry GTR
	Unmodified SMA and Binder & Surface Course	PG 58-28 ^{7/9/}		PG 52-34 ^{5/6/7/10/}
	Asphalt Stabilized Subbase	PG 58-28 ^{7/8/}		

1/ RAP not allowed in SMA

2/ Category II is allowed in Binder and Surface Course, and Asphalt Stabilized Subbase

3/ IL-4.75 ABR cannot exceed 33%

4/ Dry GTR shall be added at the WMA Plant at a rate of not less than 10% nor greater than 12%,
by weight, of the virgin asphalt cement needed for the mix design.

5/ Up to 60% ABR on N50 IL 19.0mm Binder

6/ PG 46-34 shall be considered an equivalent to PG 52-34

7/ Alternate Grades or Modifiers may be considered with approval of the Engineer

8/ Up to 65% ABR on Asphalt Stabilized Subbase

9/ PG 64-22 + Rejuvenator is an allowed substitute for PG 58-28 for shoulders or temporary
pavement

10/ PG 58-28 or 52-28 + Rejuvenator is an allowed substitute for PG 52-34 or PG 46-34 for
shoulders or temporary pavement

Rejuvenators may only be used in Unmodified SMA and Binder & Surface Course mixtures placed on the shoulder or temporary pavement. The Contractor shall demonstrate the dosage of rejuvenator required to meet the PG specified in Table 9 above using a Continuous Performance Grading of the combined asphalt binder and rejuvenator per AASHTO M 320 and D7643. This dosage must be used in the design and follow all requirements per the Asphalt Mixtures Design Verification Procedure (TTP 005).

For all asphalt mixtures containing RAS or more than 17 percent Asphalt Binder Replacement, a chemical additive shall be used as the WMA technology.

5.7. Performance Testing

Replace 1030.05(c) and 1030.05(d) with the following.

“(c) The following tests are additionally required for mix design.

The contractor shall determine the asphalt mix maximum rut depth using the Hamburg Wheel Tracking (HWT) test. Testing shall conform to Illinois Tollway Modified Test Procedure AASHTO T324. The maximum rut depth shall meet Hamburg Requirements in Table 10.

Determination for Need of Anti-Strip Additive. The mixture designer shall determine if an additive is needed in the mix to prevent stripping. The determination will be based on the stripping inflection point as calculated according to the Illinois Tollway Modified Test Procedure AASHTO T324. The stripping inflection point requirements are listed in Table 10.

For WMA designs proposed using organic or chemical additives, Hamburg Wheel testing according to Illinois Tollway Modified AASHTO T324 shall be conducted on a laboratory mixed sample at the recommended WMA additive dosage rate.

Tollway Table 10 - Hamburg and Stripping Inflection Point Requirements

Mixture Type	Maximum Rut Depth	Maximum Rut Depth Recorded at # Wheel Passes	Minimum # of Wheel Passes at Stripping Inflection Point ¹
SMA ^{2/}	6 mm	20,000	15,000
Unmodified SMA	9 mm	15,000	10,000
IL-4.75	12.5 mm	15,000	10,000
Mainline Binder Course N _{design} > N50	12.5 mm	15,000	10,000
Mainline Binder Course N _{design} = N50	12.5 mm	10,000	7,500
Surface Course N _{design} ≤ N70	12.5 mm	10,000	7,500
Shoulder Binder Course	12.5 mm	7,500	5,000
Asphalt Stabilized Subbase	12.5 mm	7,500	5,000

1/ If the Stripping Inflection point does not meet minimum requirements, the designer has the option to perform the Tensile Stripping Ratio (TSR) test per article 1030.04(c)

2/ Calculation of the stripping inflection point is not required for SMA with less than 4.0 mm rut depth at 20,000 passes.

The contractor shall determine the asphalt mix fracture energy using the Disk-Shaped Compact Tension (DCT) Test. Testing shall conform to Illinois Tollway Modified ASTM D7313. For WMA designs proposed using organic or chemical additives, DCT testing according to Illinois Tollway Modified ASTM D7313 shall be conducted on a laboratory mixed sample at the recommended WMA additive dosage rate. Fracture energy shall meet the DCT requirements of Table 11.

Tollway Table 11 – DCT Requirements

Mixture Type	Minimum Fracture Energy
SMA – Friction Surface	775 J/m ²
SMA – Surface	700 J/m ²
SMA – Binder	650 J/m ²
Unmodified SMA	500 J/m ²
IL 4.75	450 J/m ²
Mainline Binder Course N _{design} > N50	425 J/m ²
Mainline Binder Course N _{design} = N50	450 J/m ²
Surface Course N _{design} ≤ N70	450 J/m ²
Shoulder Binder Course	425 J/m ²
Asphalt Stabilized Base	N/A

5.8. Asphalt Binder Performance Grade

Reserved.

5.9. Mix Design Verification

IDOT verified mix designs will be accepted as long as they meet the requirements of this special provision. If the contractor requests to use an IDOT verified mix design and intends to add a warm mix chemical additive for use on the Tollway, the contractor must provide test results of a 1-point at optimum AC using the additive, showing compliant volumetrics, SIP, Hamburg and DCT.

For all non-IDOT approved mix designs, the mix design verification process shall be according to the Tollway Standard Method of Test for Asphalt Mixture Design Verification Procedure TTP 005.

Mixture components may not be substituted within an approved mix design. A new mix design verification process is required for alternate mixture components. Substitutions for neat unmodified asphalt binder of the same AASHTO M 320 grade will be allowed if the Contractor provides test results of a 1-point verification at optimum AC using the substituted asphalt binder showing compliant volumetrics, SIP, Hamburg and DCT. Asphalt binder substitutions will not be allowed for mixes that use an SBS polymer, a Terminal Blend GTR, or a Dry Process GTR, or a Rejuvenator; changes to these asphalt binders require a new mix design.

RECLAIMED ASPHALT MATERIALS (RAM) (ILLINOIS TOLLWAY)

Effective: July 25, 2019

Revised: August 30, 2023

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8. Aggregate Applications

1. **Description.** This work shall consist of the quality and production requirements for Reclaimed Asphalt Materials (RAM) used in Tollway asphalt mixes, subgrade aggregate, and aggregate shoulders. This Special Provision shall replace Articles Section 1031 Reclaimed Asphalt Pavement and Reclaimed Asphalt Shingles of the Illinois Department of Transportation (IDOT) Standard Specifications.
2. **References.** The following documents are referenced in the Illinois Tollway Reclaimed Asphalt Material (RAM) Special Provision.
 - 2.1. Illinois Department of Transportation – Current Standard Specifications
 - 2.2. Illinois Department of Transportation – Manual of Test Procedures
 - 2.3. Illinois Tollway – Illinois Tollway Manual of Test Procedures
 - 2.4. Illinois Tollway – Asphalt Mixtures Special Provision
 - 2.5. Illinois Tollway - Subgrade Aggregate Special Provision
 - 2.6. Illinois Tollway – Aggregate Shoulders Special Provision
3. **Requirements.** Laboratories performing the tasks set forth in this special provision shall either be AASHTO re:source accredited or meet the minimum requirements specified in the current IDOT policy memorandum 6-08.3 “Minimum Private Laboratory Requirements for Construction Materials Testing or Mix Design.”

4. Materials. The Contractor shall construct individual, sealed stockpiles meeting one of the definitions for Reclaimed Asphalt Pavement (RAP), Fractionated Reclaimed Asphalt Pavement (FRAP), or Reclaimed Asphalt Shingles (RAS) described in the following subsections.

4.1. RAP and FRAP Description.

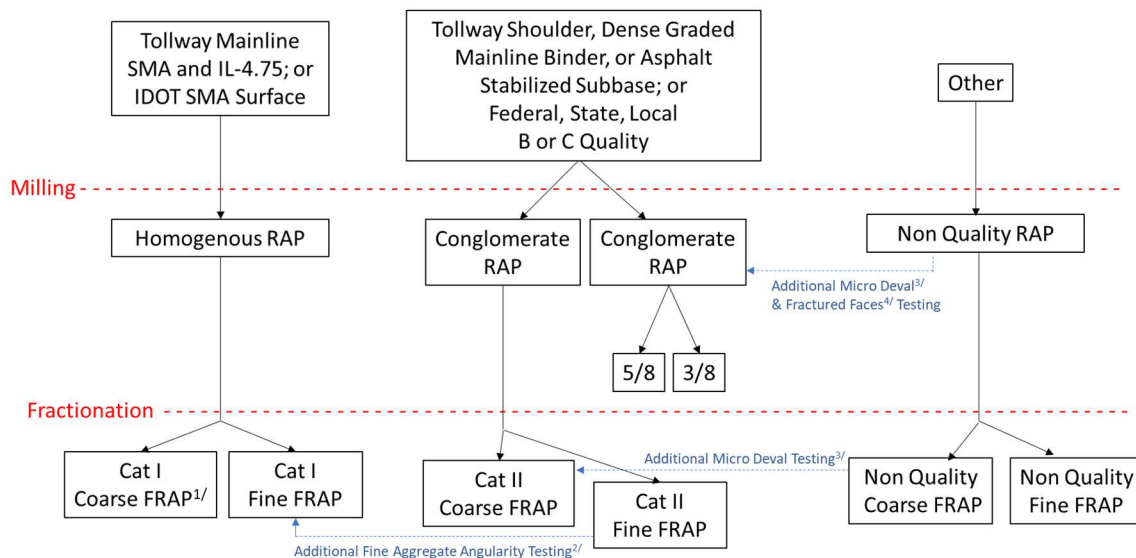
Reclaimed Asphalt Pavement (RAP) is the material resulting from cold milling or crushing of an existing asphalt pavement. The Contractor shall supply written documentation that RAP and/or FRAP originated from routes or airfields under federal, state, or local agency jurisdiction.

4.2. RAP and FRAP Stockpiles.

Prior to milling, the Contractor shall request IDOT or the Illinois Tollway to provide verification of the quality of the RAP to clarify the appropriate RAP and FRAP stockpile type. RAP/FRAP taken from an Illinois Tollway Class I, Superpave mainline (high ESAL) surface or binder mixtures is designated as containing Class B quality coarse aggregate. For RAP/FRAP taken from an Illinois Tollway location or other routes or airfields under federal, state or local agency jurisdiction, if Tollway Materials has documentation of the quality of the aggregate, the Contractor shall use the assigned quality provided by Tollway Materials. For pre-existing stockpiles, documentation must be provided that guarantees the following requirements are met.

RAP/FRAP containing contaminants, such as earth, brick, sand, concrete, sheet asphalt, bituminous surface treatment (i.e. chip seal), pavement fabric, joint sealants, etc., will be unacceptable unless the contaminants are removed to the satisfaction of the Engineer. Sheet asphalt shall be stockpiled separately.

Tollway Table 1 - Allowable sources and minimum quality for RAP and FRAP Stockpiles



^{1/} If Category I Coarse FRAP is used as Friction Category I Coarse FRAP, the surface and binder lifts must be Milled separately.

^{2/} See Tollway Asphalt Mixtures Special Provision, Section 5.4 for specific requirements

^{3/} See Tollway Table 9 for Micro-Deval requirements

^{4/} See Tollway Table 9 for Fractured Faces requirements

All RAP/FRAP stockpiles shall be sufficiently separated to prevent intermingling at the base. Stockpiles shall be identified by signs indicating the type of material. No additional material shall be added to the pile after the pile has been sealed.

4.2.1. RAP Stockpiles

(a) Homogeneous. Homogeneous RAP stockpiles shall consist of sources that represent all of the following:

- The same aggregate quality but shall be at least C quality
- The same type of crushed aggregate (either crushed natural aggregate, ACBF slag, or steel slag)
- Equivalent design gradation requirements
- Design asphalt binder content within 2%

If approved by the Engineer, combined single pass surface/binder millings may be considered "homogenous" with a quality rating dictated by the lowest coarse aggregate quality present in the mixture.

(b) Conglomerate. Conglomerate RAP stockpiles may represent more than one aggregate type and/or quality. This RAP may have an inconsistent gradation and/or asphalt binder content prior to processing. Conglomerate RAP stockpiles shall not contain steel slag or other expansive material as determined by the Tollway Materials.

1) Conglomerate 5/8 – The coarse aggregate in this RAP shall be crushed aggregate of at least C quality and be processed by crushing to where all RAP shall pass the 5/8 in. or smaller screen.

2) Conglomerate 3/8 – The coarse aggregate in this RAP shall be crushed aggregate of at least B quality, and be processed by crushing to where all RAP shall pass the 3/8 in. or smaller screen.

(c) Non-Quality. RAP stockpiles that do not meet the requirements of the stockpile categories listed above, or have no documentation of quality, shall be classified as "Non-Quality". Non-Quality RAP may be used for Capping Aggregate.

4.2.2. FRAP Stockpiles

FRAP shall require mechanical separation of RAP materials into appropriate sizes using an approved separation device. The Contractor is required to have a QC plan approved by Tollway Materials, a fractionation device approved the Tollway Materials, and sufficient cold feed bins. Fractionated RAP shall be separated by source (Category I and II), size (fine and coarse portions), and presence of steel slag and/or expansive materials, and shall be stockpiled separately. Separate calibrated cold feed bins are required for each size of FRAP.

(a) FRAP Category

- 1) Category I: The aggregate type shall be crushed/manufactured and may represent more than one aggregate type. Category 1 coarse portion shall be at least B quality. Stockpiles designated as “with steel slag/expansive materials” shall be milled from surface friction course pavements that include steel slag and/or expansive materials. Category I coarse portion FRAP containing steel slag may be blended with friction aggregate to obtain the specified properties in asphalt surface friction course mixes.
- 2) Category II: Aggregates present may represent more than one aggregate type and/or quality. The fine aggregate in this RAP shall be manufactured or natural sand. The coarse aggregate in this RAP may be crushed aggregate shall be at least C quality. Category 2 coarse portion RAP stockpiles shall not contain steel slag or other expansive material and shall not contain uncrushed gravel as determined by the Illinois Tollway.

(b) FRAP Size

- 1) Fine Portion: The fine portion of FRAP is the portion of the processed material that meets the gradation in the table below.

Tollway Table 2 - Fine FRAP Gradation Requirements

Sieve Size	Percent Passing
3/8 in. (9.5mm)	100
No. 4 (4.75mm)	95-100

- 2) Coarse Portion: The coarse portion of FRAP is one or more of the coarse portions of the processed material larger than the No. 4 sieve. The maximum top size of the coarse portion of FRAP may not exceed Tollway Table 3, and the gradation must be within Table 3’s limits.

Tollway Table 3 – Coarse FRAP Size Requirements for Mix Designs

Asphalt Mix Design Designation	Maximum FRAP Screen Size 100% Passing	No. 4 Sieve (Percent Passing)
19.0 mm	5/8 inch	≤45%
12.5 mm	5/8 inch	
9.5 mm	½ inch	

4.3. RAS Description.

RAS shall be salvaged asphalt shingles from the processing and grinding of pre-consumer or post-consumer shingles.

The RAS producer must be certified under the current version of IDOT's "Qualified Producer List of Certified Sources for Reclaimed Asphalt Shingles."

4.4. RAS Stockpile.

RAS stockpiles shall be sufficiently separated to prevent intermingling at the base. Stockpiles shall be identified by signs indicating the type of material. No additional material shall be added to the pile after the pile has been sealed.

4.4.1 RAS Type

- 1) Type 1. Type 1 RAS shall be processed, pre-consumer asphalt shingles salvaged from the manufacturer of asphalt roof shingles.
- 2) Type 2. Type 2 RAS shall be processed post-consumer shingles only, salvaged from residential dwellings of four units or less, that are not subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP).

RAS shall meet either Type 1 or Type 2 requirements as specified herein. Type 1 and Type 2 RAS shall not be blended in any asphalt mixture. Processed RAS materials from Type 1 or Type 2 RAS sources shall be stockpiled separately from other recycled materials. Blending of RAS materials in a stockpile with other recycled materials from other sources is prohibited.

The RAS producer may mechanically blend sand (FM 01, FM 02, FM 20 or FM 22) or fine, processed reclaimed asphalt pavement (RAP) up to an equal weight of processed RAS will be permitted. The process and procedures to incorporate sand or RAP shall be included in the producer's QC Plan. The sand shall be "B Quality" or better from an approved Aggregate Gradation Control System source.

Processed Type 1 or Type 2 RAS materials shall not contain more than 0.5% deleterious materials. Deleterious materials including, but not limited to, asbestos, metals, glass, rubber, nails, soil, brick, tars, paper, wood, and plastics, shall not exceed 0.5% by weight as determined on material retained on the 4.75 mm (No. 4) sieve.

4.4.2 RAS Size

RAS Requirements: All RAS materials shall be processed by certified producers such that the following gradation requirements in Tollway Table 4 are met:

Tollway Table 4 - RAS Gradation Requirements

Sieve Size	Percent Passing
3/8 in. (9.5 mm)	100
No. 4 (4.75 mm)	93 - 100

5. Testing.

Reclaimed asphalt materials to be used on Illinois Tollway projects shall be tested by the contractor according to the following requirements. The Engineer or Tollway Materials reserves the right to witness and test any sample (split or agency-taken) to verify the Contractor/processors' test results. All RAP/FRAP/RAS gradation and asphalt production test results shall be uploaded into I-MIRS when testing is complete.

5.1. RAP and FRAP

When used in asphalt mixtures, the RAP/FRAP shall be sampled and tested as follows for mix design and production.

Extract RAP/FRAP samples using a chemical extraction according to Illinois Modified AASHTO T164 or Illinois Tollway Modified ASTM D8159 Automatic Extraction Procedure. Report both gradation and asphalt content at the frequencies in Tollway Table 5.

Tollway Table 5 - RAP/FRAP Stockpile Testing Frequencies

Testing Type	Number of tests	Tonnage
Mix Design Gradation	Average of 5 tests	200 - 2500 ton
Start-up Production	1 test per 500 ton	Up to 2000 ton
RAP/FRAP Production	1 test per 2000 ton	Throughout production

The above frequencies shall be used for establishing a RAP/FRAP gradation target for mix design and production of new RAP/FRAP for use in existing an asphalt mix design.

In addition, each type and size of RAP/FRAP shall be sampled from the stockpile loadout face at a minimum frequency of once per week per plant location when WMA is being produced. These samples shall be tested using chemical extraction according to Illinois Modified AASHTO T164 or Illinois Tollway Modified ASTM D8159 Automatic Extraction Procedure. The results shall be uploaded to I-MIRS. A record of test results, including a 4 test running average, shall be maintained by the Contractor and be available to the Engineer for review on request.

Daily WMA plant reports shall reflect the most current four test running average for each type and size RAP/FRAP used during its production.

For use of an existing un-tested RAP/FRAP stockpile, the Contractor shall submit a plan for approval to the Illinois Tollway proposing a satisfactory method of sampling and testing the RAP/FRAP pile either in-situ or by re-stockpiling. The sampling plan shall meet the minimum frequency required above and detail the procedure used to obtain representative samples throughout the pile for testing. Additionally, each field sample shall be split to obtain two samples of test sample size. One of the two test samples from the final split shall be labeled and stored for Tollway Materials use.

5.2. RAS

When used in asphalt mixtures, the RAS shall be sampled and tested as follows for mix design and production.

Extract RAS samples using a chemical extraction according to Illinois Modified AASHTO T164 or Illinois Tollway Modified ASTM D8159 Automatic Extraction Procedure. Report both gradation and asphalt content at the frequencies in Tollway Table 6.

Tollway Table 6 - RAS Stockpile Testing Frequencies

Testing Type	Number of tests	Tonnage
Mix Design Gradation	Average of 5 tests	200 - 1000 ton
Start-up Stockpile	1 test per 200 ton	Up to 1000 ton
Continued Stockpile	1 test per 500 ton	Throughout stockpiling

The above frequencies shall be used for establishing a RAS gradation target for mix design and stockpiling of RAS for use in existing an asphalt mix design.

Dry Gradation and Deleterious Content shall be tested at the same frequency as extractions. A sample of 500 to 700 grams of the RAS shall be air dried and dry sieved on the 3/8 and No. 4 sieve and any deleterious material larger than the No. 4 sieve shall be removed and weighed. Dry gradations shall meet the gradation specified in Tollway Table 4, and deleterious content shall meet the requirements set forth in Section 4.4.1 of this document.

6. Evaluation of Tests

6.1. RAP and FRAP

Once the Mix Design RAP/FRAP target is established for a stockpile, that gradation and asphalt content will be the target for future stockpile testing. When adding to an existing approved stockpile, production of RAP/FRAP shall follow the “start-up” frequencies in Tollway Table 5. If the average of the first 4 tests fall within the targets of Tollway Table 7, production can continue and testing frequencies shall follow “production” frequencies in Tollway Table 5.

Tollway Table 7 – RAP/FRAP Extraction Requirements Compared to Mix Design

Parameter	Homogeneous / Conglomerate 5/8 and 3/8 RAP	Conglomerate “D” Quality	Fine FRAP	Coarse FRAP
1 in. (25 mm)		± 5 %		
1/2 in. (12.5 mm)	± 8 %	± 15 %		± 8 %
No. 4 (4.75 mm)	± 6 %	± 13 %		± 6 %
No. 8 (2.36 mm)	± 5 %		± 5 %	
No. 16 (1.18 mm)		± 15 %		
No. 30 (600 µm)	± 5 %		± 5 %	
No. 200 (75 µm)	± 2.0 %	± 4.0 %	± 2.0 %	
Asphalt Binder	± 0.4 % ^{1/}	± 0.5 %	± 0.3 %	± 0.3 %

1/ The tolerance for conglomerate 3/8 shall be ± 0.3%.

If the running average of four, for any property, falls outside the tolerances set forth in Tollway Table 7, the RAP/FRAP shall be diverted into another stockpile. The RAP/FRAP can be placed on the approved stockpile after two consecutive tests, tested at a frequency of one sample per 500 tons, each pass the requirements of Tollway Table 7.

6.2. RAS

Once the Mix Design RAS target is established for a stockpile, that gradation and asphalt content will be the target for future stockpile testing. When adding to an existing approved stockpile, RAS testing shall follow the “start-up” frequencies in Tollway Table 6. If the average of the first 4 tests fall within the targets of Tollway Table 8, production can continue and testing frequencies shall follow “stockpile” frequencies in Tollway Table 6.

Tollway Table 8 – RAS Testing Requirements Compared to Mix Design

Parameter	RAS Sample
No. 8 (2.36 mm)	±5%
No. 16 (1.18 mm)	±5%
No. 30 (600 µm)	±4%
No. 200 (75 µm)	±2.0%
Asphalt Binder	±1.5%

If the running average of four, for any property, falls outside the tolerances set forth in Tollway Table 8, the RAS shall be stockpiled separately. At that time, the Contractor shall contact the RAS producer and stop shipment until the producer can assure compliance. When new RAS is shipped, test at the start up frequency for the running average of 4 passes the requirements of Tollway Table 8.

7. Quality Designation of RAP/FRAP

See Tollway Table 1 for Tollway quality designation of RAP/FRAP. If the quality is not known, the quality shall be determined as follows.

The Contractor shall obtain a representative sample witnessed by Tollway Materials. The sample shall be a minimum of 50 lb. (25 kg). The sample shall be extracted according to Illinois Modified AASHTO T164 or Illinois Tollway Modified ASTM D8159 Automatic Extraction Procedure by a consultant laboratory prequalified by IDOT for the specified testing. The consultant laboratory shall submit the test results along with the recovered aggregate to Tollway Materials. The cost for this testing shall be paid by the Contractor. The aggregate portion of the RAP/FRAP must meet the requirements in Tollway Table 9:

Tollway Table 9 – RAP/FRAP Aggregate Quality Testing Requirements

Quality Test	Test Procedure	Minimum Requirement
Micro Deval	ASTM D6928 or AASHTO T327	≤15.0%
Coarse Aggregate Angularity	ITP 5821	≥85.0% 2 or more crushed faces ≥97.0% 1 or more crushed faces

8. RAP in Aggregate Applications

RAP in Aggregate Shoulders. The use of RAP in aggregate shoulders shall be as follows.

Stockpiles and Testing. RAP stockpiles may be any of those listed herein, except Non-Quality and FRAP.

Gradation.

- 1) The material shall have 100% passing the 1.5-inch sieve and be well graded down through fines.
- 2) The material shall be determined as well graded by calculating the Coefficient of Uniformity (Cu) and Coefficient of Curvature (Cc) per ASTM D2487, with required Cu ≥ 4.0, and Cc ≥ 1.0 and ≤ 3.0.

SURFACE SMOOTHNESS TESTING (ILLINOIS TOLLWAY)

Effective: August 22, 2014

Revised: January 30, 2023

Description. This work shall consist of measuring surface smoothness for all pavement except for performance related specified pavement. Surface smoothness testing shall be conducted on all mainline, auxiliary lanes and ramp lanes. The requirements for calibration of equipment measuring surface smoothness and verification process for the output data at the project site are defined in the Tollway Manual of Test Procedures.

Definitions.

1. Smoothness. Smoothness is defined using the International Roughness Index (IRI) value of the pavement in each wheelpath per smoothness segment.
2. Smoothness Segment. A smoothness segment shall be defined as:
 - a. One lane of pavement wide and a length of 0.1 mile.
 - b. Partial segments are less than 0.1 mile and shall be included in the analysis.
3. Pavement Exemptions. The first and last 25' of the pavement segment where the contractor is not responsible for the adjoining surface shall be exempt. Also exempt shall be variable width pavement, ramp pavement within 300 feet of an intersection, and pavement constructed with plan lengths less than 600 feet.
4. Wheelpath. The wheelpath shall be the location of the IRI transducers with the data collection vehicle centered between the location of the permanent lane markings, as shown in the plans.

Equipment.

Surface Testing Equipment. Required surface testing and analysis equipment and their jobsite transportation shall be provided by the Contractor. The Contractor shall furnish a properly certified, calibrated and documented inertial profiler (IP) according to the Illinois Tollway Testing Procedure (TTP) 007 – Surface Smoothness Equipment and Procedural Requirements.

The Contractor shall perform and report the Daily Profiler Calibration Verification (Tollway Testing Form 002) prior to each use. The Engineer can request a new demonstration of the daily calibrations/verifications and verify computer settings at any time. Should the equipment not verify or equipment changes are noted by the Engineer, the profile device will not be used. The Contractor shall furnish an operator trained in the operation of the particular IP to be used on the project.

IRI Calculation Software. The software program for IRI calculation shall be the FHWA's Profile Viewing and Analysis (ProVAL) software.

Surface Testing.

The pavement section shall be surface smoothness tested in accordance with AASHTO R57 and Tollway Testing Procedure (TTP) 007 – Surface Smoothness Equipment and Procedural Requirements, in the direction of travel, and in the presence of the Engineer.

The Contractor shall notify the Engineer a minimum of 24 hours prior to surface smoothness measurements, remove all dirt and debris from the surface of the travel lanes prior to performing the surface smoothness measurements, and provide necessary traffic control and survey stationing for all surface smoothness measurements. The pavement must be dry prior to testing.

The Contractor will obtain smoothness data for each lane by obtaining the IRI values for the left and right wheelpaths in each tested lane. Corrective work is performed based on what is identified in the Contractor's initial smoothness measurements. The calculated IRI and LR reported to the Engineer shall be the final individual values in each segment.

The Contractor will use a 16 ft straightedge in accordance with Article 1101.10(a) to evaluate exempt areas and areas of concern. A 3/16-inch tolerance will be used with the straightedge.

Reporting.

Prior to performing any smoothness testing, the Contractor shall submit all documentation of IP calibration/verification. Final smoothness results shall be reported to the Engineer within seven business days of completing testing.

The Contractor will submit to the Engineer the following documents:

1. The completed Tollway Testing Form (TTF) 005 – Surface Smoothness Profiler Data Summary, including the final data for each lane
2. TTF 002 - Daily Profiler Calibration Verification Report for each day of profiler use corresponding to the data reported in TTF 005
3. ProVAL .ppf file of the profile data for each lane reported in TTF 005
4. ProVAL Smoothness Assurance Reports (for IRI) PDF for each lane reported in TTF 005
5. ProVAL Ride Quality Reports (for LR) PDF for each lane reported in TTF 005

PORTLAND CEMENT CONCRETE PAVEMENT (ILLINOIS TOLLWAY)

Effective: November 20, 2013

Revised: July 13, 2023

Description. This work shall consist of constructing portland cement concrete pavement on a stabilized subbase in accordance with Section 420 of the Standard Specifications, as shown in the plans, or through other referenced contract special provisions except as modified herein.

Materials. Materials shall be according to Article 420.02 of the Standard Specifications, except as modified herein:

Replace Article 420.02(a) of the Standard Specifications with the following:

Concrete supplied for the concrete pavement under this special provision will be an Illinois Tollway Class TL mix designed in accordance with the Illinois Tollway Special Provision for Portland Cement Concrete.

Equipment. Equipment shall be according to Article 420.03 of the Standard Specifications.

CONSTRUCTION REQUIREMENTS

Portland cement concrete pavement shall be constructed according to Articles 420.04 through 420.18 of the Standard Specifications except as modified herein.

Revise the first paragraph of Article 420.05(c) of the Standard Specifications to read:

“(c) Transverse Contraction Joints. Transverse contraction joints shall consist of planes of weakness created by sawing grooves in the surface of the pavement and shall include load transfer devices consisting of dowel bars. The Contractor shall detail his methodology for ensuring correct placement of dowel bars and correct sawing of the joints. Transverse contraction joints shall be according to the following.”

Revise Article 420.05(c)(1)b. of the Standard Specifications to read:

“b. Crack within Joint Area. If an uncontrolled crack occurs within 3 in. of either side of the joint, a minimum of 6 ft of pavement removal and replacement will be required.”

Revise Article 420.05(c)(2) of the Standard Specifications to read:

“(2) Dowel Bars. Dowel Bars shall be installed parallel to the centerline of the pavement and parallel to the proposed pavement surface. Installation shall be according to one of the following methods.

- a. Dowel Bar Assemblies. The assembly shall act as a rigid unit with each component securely held in position relative to the other members of the assembly. The entire assembly shall be securely installed.

Metal stakes shall be used; nails, clips or a combination of shall not be used. The stakes shall penetrate the subgrade or subbase at least 12 inches.

Prior to placing concrete, any deviation of the dowel bars from the correct horizontal or vertical alignment (horizontal skew or vertical tilt) greater than 3/8 in. in 12 in shall be corrected and a light coating of oil shall be uniformly applied to all dowel bars.

The horizontal support wires or shipping tie wires of the dowel bar assembly shall be cut near the welds and removed from the stabilized subbase prior to concrete placement.

Care shall be exercised in depositing the concrete at the dowel bar assemblies so the horizontal and vertical alignment will be retained.

- b. Dowel Bar Insertion. The dowel bars may be placed in the pavement slab with a mechanical dowel bar inserter (DBI) attached to a formless paver for pavements ≥ 7.0 in. in thickness. A light coating of oil shall be uniformly applied to all dowel bars.

The DBI shall insert the dowel bars with vibration into the plastic concrete after the concrete has been struck off and consolidated without deformation of the slab. After the bars have been inserted, the concrete shall be refinished and no voids shall exist around the dowel bars. The forward movement of the paver shall not be interrupted by the inserting of the dowel bars.

The location of each row of dowel bars shall be marked in a manner to facilitate where to insert the bars, and where to saw the transverse joint.”

Add the following to Article 420.05(c) of the Standard Specifications.

“(3) Placement Tolerances for Dowel Bars. Place the dowel bars in the concrete pavement within the following tolerances.

- a. Longitudinal Translation (Sideshift). Longitudinal translation (sideshift) shall be defined as the position of the center of the dowel bar along the longitudinal axis, in relation to the sawed joint.

The left and right wheelpaths shall be determined by excluding the middle 2.5 ft of the striped pavement lane. Each joint shall have greater than 50 percent of dowel bars per wheelpath with a minimum embedment length of 6.0 inches. Embedment length shall be defined as the length of dowel bar embedded on the short side of the sawed joint. An unacceptable joint shall be replaced with a Class B patch or one or more dowel bar retro fits.

- b. Vertical Translation (Mislocation). Vertical translation (mislocation) shall be defined as the difference in the vertical position of the dowel bar relative to the theoretical midpoint of the slab.

Any joint having a dowel bar with top concrete cover less than the Required Cover in the table will be considered unacceptable and shall be removed. Any joint having a dowel bar with bottom concrete over less than 2.50 inches will be considered unacceptable and shall be removed. An unacceptable joint shall be replaced with a Class B patch or one or more dowel bar retro fits.

Pavement Thickness	Required Cover (inches)
10.0	3.1
10.5	3.3
11.0	3.5
11.5	3.7
12.0	4.0
12.5	4.0
13.0	4.0
13.5	4.1
14.0	4.3

- c. Vertical Tilt or Horizontal Skew (Misalignment). Vertical tilt or horizontal skew (misalignment) shall be defined as the difference in position of the dowel bar ends with respect to each other. Vertical tilt is measured in the vertical axis whereas horizontal skew is measured in the horizontal axis. Misalignment shall be measured in terms of a joint score. The joint score shall be defined as the degree of misalignment evaluated for a single transverse joint for each lane of pavement. The joint score shall be determined as follows:

$$Joint\ Score = \left(1 + \left(\frac{x}{x-n} \right) \sum_{i=1}^{x-n} W_i \right)$$

where:

W_i = weighting factor (Table 1.) for dowel i

x = number of dowels in a single joint

n = number of dowels excluded from the joint score calculation due to measurement interference

Maximum Dowel Misalignment – The degree of misalignment applicable to a single dowel bar, calculated as:

$$\text{Maximum Dowel Misalignment} = |\max\{\text{Misalignment}_{\text{vertical tilt}}, \text{Misalignment}_{\text{horizontal skew}}\}|$$

Table 1.	
Maximum Dowel Misalignment (d)	Weighting Factor (
d < 0.6 in.	0
0.6 in < d < 0.8 in.	2
0.8 in. < d < 1 in.	4
1 in. < d < 1.5 in.	5

A dowel bar with a vertical tilt or horizontal skew (maximum dowel misalignment) greater than 1.5 in. shall be cut. If more than two dowel bars per wheel path are required to be cut in the joint, the joint will be considered unacceptable. An unacceptable joint shall be replaced with a Class B patch or one or more dowel bar retrofits.

Single dowel bar misalignment shall be controlled as to not exceed a maximum joint score of 12.

A joint score greater than the specified maximum will be considered locked. Four consecutive joints with a score greater than the specified maximum total score will all be considered unacceptable.

Four consecutive locked joints shall be corrected by selecting one joint and cutting one or several dowel bars. Preference shall be given to cutting a dowel bar within the middle 2.5 ft of the pavement lane to avoid the wheelpaths. If none of the four locked joints will have a joint score less than or equal to 12 after selecting one or several dowel bars to cut, one of the joints shall be replaced with a Class B patch.

- d. Joint Repair and Corrective Action Plan. The Contractor shall submit the joint repair plan including materials and techniques to the Engineer for approval prior to repair.

In the repair plan, ensure that greater than 50 percent of dowel bars per wheelpath are within the acceptable tolerances. No more than two consecutive dowel bars shall be outside the acceptable tolerances.

Any bar removed from the pavement during remediation shall be replaced as part of the joint repair plan.

If repairs are necessary for a joint that was constructed without dowel bars, the repair plan shall include five dowel bars per wheelpath. No more than two consecutive joints constructed without dowel bars may be repaired with dowel bar retrofits.

- (4) Testing of Dowel Bar Placement. The placement of the dowel bars will be tested by the Tollway with the MIT SCAN2-BT or an equivalent device that conforms to ASTM E3013 – 17: Standard Test Method for Evaluating Concrete Pavement Dowel Bar Alignment Using Magnetic Pulse Induction. The device shall be calibrated to the type and size dowel bar used in the work according to the manufacturer's instructions.

The Contractor shall facilitate the dowel bar alignment testing by cleaning all transverse contraction joints following saw cutting and other construction activities and clearing the pavement of any obstructions. It is the responsibility of the Contractor to ensure that the Tollway has access to the transverse joints so that dowel bar alignment testing can be completed in a timely manner.

a. Production Paving.

The Tollway will test all transverse joints. If three consecutive days of paving result in less than 5 percent of the joints on each day being unacceptable prior to a corrective measure, the Tollway may reduce the testing frequency.

b. Test Report.

- (1) Electronic Reporting. The test reports shall be an MS-Excel spreadsheet with an embedded map showing dowel bar layout in horizontal and side views as produced by the device software. The latest version of the device's manufacturer provided software will be used.

The electronic report will include the following:

1. Contract number, date, highway number and direction of traffic.
2. Joint number, lane number and station.
3. Bar number and x-location of dowel bar.
4. Horizontal skew and vertical tilt (misalignment) in inches.
5. Embedment (Sideshift) in inches.
6. Depth to center of dowel bar in inches.
7. Depth to the top end of the dowel bar in inches.
8. Joint Score.
9. All out-of-tolerance readings shall be highlighted in red.
10. Joint images generated by the latest MagnoProof software.
11. Scan direction.
12. Any external sources of interference noted.

- (2) Production Reporting. Test reports will be provided to the Contractor within two working days of completing each paving day's testing.
- c. If the Illinois Tollway determines that the measurement data for a dowel bar is affected by magnetic interference, then the dowel bar shall be evaluated using other means. If the magnetic interference occurs at a longitudinal joint, the Contractor shall verify proper tie bar placement and remediate the longitudinal joint to the satisfaction of the Engineer.
- d. If the Contractor disputes the test values, the Contractor may provide their own MIT-SCAN2-BT device and trained personnel to test the disputed joints. At least one of the Contractor's trained personnel shall have completed MIT-SCAN2-BT New Equipment Training. The Contractor must provide written notification to the Engineer of their intention to re-test the disputed joints. The Contractor must perform the re-tests in the presence of the Engineer according to Illinois Tollway Test Procedure (TTP) 009. The Illinois Tollway will re-test the disputed joint with the Contractor. The Contractor shall evaluate the dowel bar alignment data immediately following the retests according to TTP 009. The Contractor shall submit the following to the Engineer:
- (1) The calibration parameter file (.cpf) for the device and bar size tested.
 - (2) The most recent calibration certificate for the device
 - (3) The .hdfx scan file(s)
 - (4) The specified excel output

Remove the ninth paragraph of Article 420.07 Placing. Add the following to the end of Article 420.07 of the Standard Specifications:

"When the surface temperature, as measured on the surface with a device as approved by the Engineer, of the Stabilized Subbase is 115 °F or greater the Contractor shall spray the Stabilized Subbase with equipment that meets the approval of the Engineer. The Stabilized Subbase shall be cooled to a surface temperature below 110 °F before paving. The water spray shall not produce excessive water runoff or leave puddles on the Stabilized Subbase at the time of paving. All cooling shall be completed a minimum of 10 minutes prior to paving. The surface temperature shall be monitored during the paving operation to determine if the Stabilized Subbase requires re-spraying. The water used shall meet the requirements of Section 1002 of the Standard Specifications."

Remove Article 420.08 Placement of Reinforcement.

Replace Article 420.09 (e) (1) of the Standard Specifications with the following:

(e) Final Finish. Type A final finish shall be used unless Type B is specified.

(1) Type A. Texturing of the top of plastic concrete shall be obtained by the use of an artificial turf drag followed immediately by a mechanically operated metal comb longitudinal tining device. The artificial turf shall be made of molded polyethylene with synthetic turf blades approximately 0.85 inches long and containing approximately 7,200 individual blades per square foot. The drag shall be suitably attached to an approved device that permits control of the time and rate of texturing. The artificial turf shall be full pavement width and of sufficient size that during the finishing operation; approximately 2 feet of the turf parallel to the pavement centerline shall be in contact with the pavement surface. The drag shall be operated in a longitudinal direction so as to produce a uniform appearing finish meeting the approval of the Engineer. If necessary for maintaining intimate contact with the pavement surface, the drag may be weighted down using lumber, rebar, or other suitable material.

The metal comb shall consist of a single line of tempered spring steel tines spaced at 0.75-inch centers and securely mounted in a suitable head. The tines shall be flat and of a size and stiffness sufficient to produce a groove of the specified dimensions in the plastic concrete without tearing of the pavement edge or surface. The Contractor shall modify the equipment or operations if an acceptable pavement edge or surface is not produced. The mechanically operated metal comb shall be attached to an exclusive piece of equipment which is mechanically self-propelled.

The tining device shall be operated so as to produce a relatively uniform pattern of grooves parallel to the pavement centerline spaced at approximately 0.75-inch centers, 0.13 to 0.19 inch deep, and 0.13 inch wide. Longitudinal tining shall stop at 1 to 1.5 inches from the edge of travel lanes. Tining devices shall be maintained clean and free from encrusted mortar and debris to ensure uniform groove dimensions. The tining finish shall not be performed too soon after pavement placement whereby the grooves may close up. The tining grooves shall be neat in appearance, parallel with the longitudinal joint, uniform in depth and in accordance with these specifications.

Hand tining or tining with a mechanically operated comb combined with the curing equipment specified in Article 1101.09 of the Standard Specifications will be permitted where the specifications permit hand finishing or vibratory screeds, one lane construction up to 16 ft. wide, gaps, projects with a net length of ½ mile or less, and where the production rate on any paving day will be less than 1,500 cubic yards per day. A foot bridge shall be provided for the hand tining operation for all pavements over 12 ft. wide, unless it can be demonstrated to the satisfaction of the Engineer that an alternate texturing operation produces satisfactory results.”

Replace Article 420.10 of the Standard Specifications with the following:

“420.10 Surface Tests. Pavement smoothness testing shall be performed by the Contractor just prior to any change in maintenance of traffic stages, before opening the pavement to public traffic, and only after any corrective actions and or grinding is performed by the Contractor.

- (a) Evaluation. The surface of the finished pavement will be tested according to the Illinois Tollway Special Provision for Surface Smoothness Testing and the Tollway Testing Procedure (TTP) 010 ProVAL Protocol for smoothness. Each lane tested shall be evaluated and reported separately.
- (b) Acceptable Smoothness Limits. The finished concrete pavement surface shall be evaluated for acceptance based on International Roughness Index (IRI) and Localized Roughness (LR) as provided in the tables below:

Location	Maximum IRI (in/mi)	Maximum LR (in/mi)
Mainline	80	125
Ramp (design speed < 40 mph)	120	145
Ramp (design speed 40 to 50 mph)	110	140
Ramp (design speed > 50 mph)	100	135

- (c) Corrective Work. The final pavement surface must meet the requirements for both IRI and LR. For each pavement segment that exceeds either the maximum acceptable initial IRI or LR value, there are two methods for proceeding:
 1. Remove and replace the pavement that exceeds the limit.
 2. Grind the segment to bring the pavement surface into conformance with the acceptable limits without adversely affecting the required thickness of the pavement structure.

Either of the above options shall be applied to each rejectable segment. The contractor shall provide a corrective work plan describing the methods, procedures and limits of repair. The corrective work shall not proceed until the plan has been approved in writing by the Engineer. Once remediation has been completed, smoothness testing shall be required by the contractor.

The Contractor shall notify the Engineer at least 24 hours prior to commencement of the corrective work. The Contractor shall not commence corrective work until the methods, procedures and limits have been approved in writing by the Engineer. All smoothness corrective work shall be for the entire lane width. Pavement cross slope shall be maintained through areas where corrective action is performed. Surface corrections shall be made prior to placing permanent pavement markings. In the event that permanent pavement markings are damaged or destroyed during corrective work, they will be replaced at no cost to the Illinois Tollway. A sufficient length of pavement will be corrected to address areas of unacceptable smoothness without producing additional high or low points. Retesting of the segments after corrective action shall include the segment prior and four segments after the corrected segment.

Revise Article 420.13 of the Standard Specifications to read:

“420.13 Opening to Traffic. The concrete pavement shall not be opened to construction vehicles meeting legal axle weights (legal loads) until an in-place compressive strength of a minimum of 2,500 psi as determined by Illinois Tollway Test Procedure (TTP) 014 Estimating Concrete Strength by Maturity. The wheels of any construction vehicle shall not travel within 1 foot of any free edge of the pavement until a minimum of 3,000 psi as determined by TTP 014.

The concrete pavement shall not be opened to public traffic until an in-place compressive strength of a minimum of 3,500 psi as determined by TTP 014 or until a minimum compressive strength of 3,500 psi as tested in accordance with Illinois Modified AASHTO T 22 and 7 days after placement.

TTP 014 shall not be used in place of random sampling requirements for strength acceptance. Compressive strength for ultimate strength acceptance shall be a minimum of 3,500 psi at 7 days and tested in accordance with Illinois Modified AASHTO T 22. Test cylinders shall be made and cured in accordance with Illinois Modified AASHTO T 23. Strength shall be defined as the average of two 6 x 12 in. cylinder breaks.”

Revise Article 420.15 of the standard Specifications to read:

“420.15 Tolerance in Thickness. Determination of pavement thickness, computation of thickness, and requirements relative to deficient thickness shall be according to Article 407.10(b), except for the option of correcting deficient pavement with additional lift(s) shall not apply.

Tollway Materials may independently verify thickness with the MIT Scan T2 device or an approved equivalent with AASHTO Standard T 359-16. The device shall be calibrated per manufacturer standards and validated using the Illinois Tollway’s MIT Scan-T2 validation system and should be operated within the manufacturer’s tolerances.

Random locations for Independent verification shall be determined according to ASTM D3665.”

Remove Article 420.16 Pavement Connector for Bridge Approach Slab.

Remove Article 420.17 Adjacent to Railroad Grade Crossing.

Method of Measurement. This work will be measured for payment in accordance with Article 420.19 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per square yard for PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED), of the total thickness specified.

Protective coat will be paid for at the contract unit price per square yard for PROTECTIVE COAT.

Removing and replacing curing and protective cover, when required, will be paid for according to Article 109.04 of the Illinois Tollway Supplemental specifications.

PORTLAND CEMENT CONCRETE (ILLINOIS TOLLWAY)

Effective: March 11, 2022

Revised: November 16, 2023

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1. Description. This item shall consist of the materials, mixture design, production, testing, curing, low air temperature protection, and temperature control of concrete. This item shall be in accordance with Section 1020 of the IDOT Standard Specifications for Road and Bridge Construction and the IDOT Special Provision for Quality Control/Quality Assurance of Concrete Mixtures, except as modified herein, and shall apply to all IDOT classes of concrete and the following Illinois Tollway portland cement concrete (PCC) mixtures:

- Class AX - high early strength patching of pavements and structures
- Class HP - high performance concrete
- Class MC - mass concrete structures including drilled shafts
- Class TL - ternary cementitious with an optimized aggregate gradation for pavement

2. Reference Standards. The current versions of following documents are referenced in the Portland Cement Concrete Special Provision and shall be followed, except as modified herein.

- 2.1. Illinois Department of Transportation (IDOT) – Standard Specifications for Road and Bridge Construction
- 2.2. Illinois Department of Transportation (IDOT) – Supplemental Specifications and Recurring Special Provisions
- 2.3. Illinois Department of Transportation (IDOT) – Manual of Test Procedures for Materials
- 2.4. Illinois Department of Transportation (IDOT) – Manual of Aggregate Quality Test Procedures
- 2.5. Illinois Tollway – Illinois Tollway Manual of Modified Test Procedures
- 2.6. Illinois Tollway – Approved List of Shrinkage Reducing Admixtures (SRA)
- 2.7. Indiana Department of Transportation (INDOT) ITM 222 – Specific Gravity Factor and Absorption of Lightweight Fine Aggregate
- 2.8. Applicable American Association of State Highway and Transportation Officials (AASHTO) Test Methods
- 2.9. Applicable American Society for Testing and Materials (ASTM) Test Methods

3. Requirements.

3.1. Laboratory. Contractor and Consultant laboratories performing testing for mixture qualification shall be AASHTO re:source accredited. Laboratories performing testing for field acceptance shall be either AASHTO re:source accredited or meet the minimum requirements specified in the current version of IDOT policy memorandum 6-08 "Minimum Private Laboratory Requirements for Construction Materials Testing or Mix Design."

3.2. Equipment. Compression Machine Requirements. All laboratories reporting compressive strength results for all PCC items shall utilize compressive testing machines capable of storing results digitally for the duration of the contract and producing those results on request. This requirement extends to Quality Control laboratories furnished by the Contractor or their subcontractors, Quality Assurance laboratories representing the Engineer, or Independent Assurance laboratories reporting directly to the Tollway. The digital readouts shall be provided to the Engineer upon request and shall display the following:

- Specimen identification number
- Diameter and cross-sectional area of specimen
- Specimen age at time of test
- Date and time of test
- Rate of loading to the nearest pound per second and maximum load achieved to the nearest pound of applied load
- Compressive strength calculated to nearest pounds per square inch
- Type of fracture and any length/diameter corrections applied
- Test equipment and technician identification
- Laboratory name and location

If a volumetric mobile mixer is utilized, it shall be in accordance with Tollway Test Procedure (TTP) 016 Volumetric Mobile Mixer Approval Procedures.

3.3. Personnel. Personnel conducting strength testing for mixture qualification and field acceptance shall be certified as an American Concrete Institute (ACI) Concrete Strength Testing Technician.

- 4. Materials.** Portland cement, water, fine and coarse aggregates, supplementary cementitious materials, and concrete admixtures shall conform to the requirements of Division 1000 of Standard Specifications with exceptions as noted. Specific references are as follows:

Table 1 – Materials for Concrete Mixtures

Material	Section
Portland Cement	1001
Water	1002
Fine Aggregates	1003
Coarse Aggregates	1004 & Section 4.1 below
Supplementary Cementitious Materials	1010 & Section 4.2 below
Concrete Admixtures	1021 & Section 4.3 below
Other Materials	Section 4.4 below

4.1. Coarse Aggregate.

Table 2 – Coarse Aggregate Requirements

Mixture Class	Section
AX	1004
HP	1004 & Section 4.1.1
MC	1004
TL	1004 & Section 4.1.2

- 4.1.1. For Class HP mixtures, aggregates shall contain no more than two percent by weight of deleterious materials. Deleterious materials shall include substances whose disintegration is accompanied by an increase in volume which may cause spalling of the concrete.
- 4.1.2. For Class TL mixtures, all coarse aggregate gradations and sources used in the mixture design shall be on the IDOT Freeze-Thaw Rating List for 30 Year Extended Life Pavement Design.

Revise footnote 6/ of Article 1004.01(b) of the Standard Specifications to read as follows:

“6/ For crushed aggregate, if the material finer than the No. 200 sieve consists of the dust from fracture, essentially free from clay or silt, this percentage may be increased to 3.5.”

4.2. Supplementary Cementitious Materials (SCM).

Table 3 – SCM Requirements

Mixture Class	Section
AX	1010 & Section 4.2.1
HP	1010, Section 4.2.1 & Section 4.2.2
MC	
TL	1010 & Section 4.2.1

4.2.1. The limestone in a portland-limestone cement is not classified as an SCM.

4.2.2. For Class HP and MC mixtures, SCM's shall have an alkali content less than 3.5 percent (Na_2O_{eq}).

4.3. Concrete Admixtures.

Table 4 – Concrete Admixtures

Mixture Class	Section
AX	1021, Section 4.3.1 & Section 4.3.2
HP	
MC	
TL	1021, Section 4.3.2 & Section 4.3.3

4.3.1. Shrinkage reducing admixtures (SRA) shall be per the Illinois Tollway Approved List of Shrinkage Reducing Admixtures (SRA).

4.3.2. Replace Article 1020.05(b)(9) with the following:

(9) When a Type F admixture is used, retempering with water will not be allowed. When a Type G admixture is used, retempering with water or with Type G admixture will not be allowed.

4.3.3. For Class TL mixtures, the injection and subsequent mineralization of CO₂ may be permitted provided it is used in accordance with the manufacturer's recommendations and meets the requirements for an ASTM C494 Type S admixture.

4.4. Other Materials.

4.4.1. Fiber reinforcement may be permitted provided the material is used in accordance with the product manufacturer's recommendations and it is demonstrated that the concrete complies with the herein established performance requirements.

4.4.2. Lightweight aggregate shall meet the requirements of ASTM C1761. The surface moisture and absorption capacity shall be determined in accordance with INDOT Procedure ITM 222.

5. Mixture Design.

5.1. Proportioning.

5.1.1. SCM.

5.1.1.1. For Class AX, HP, and MC mixtures, a portion of the portland cement shall be replaced with at least one SCM to meet the performance parameters in section 5.2.

5.1.1.2. For Class TL mixtures, ternary concrete incorporates portland cement, slag cement, fly ash and other SCM's to produce a mix with three cementitious constituent materials. Slag, fly ash, and any other SCM's combined as constituent materials in a ternary mix or as part of a blended cement shall consist of no less than 35% and no more than 50% of the total cementitious material.

5.1.2. **Alkali Silica Reactivity.** Concrete shall be proportioned such that the maximum total alkali content ($\text{Na}_2\text{O}_{\text{eq}}$) contributed by portland cement (as determined in accordance with AASHTO T 105) does not exceed the requirements in Table 5.

Table 5: Alkali Content

Mixture Class	AX	HP	MC	TL
Maximum Alkali Content contributed by Portland Cement (lb/yd ³)	5.0	4.0	4.0	5.0

For all mixtures, the requirements in Table 5 shall be waived, if one of the following two requirements are met.

5.1.2.1. Each aggregate shall be evaluated individually in accordance with ASTM C1260 and must have a measured expansion no greater than 0.10 percent after 16 days.

Each aggregate that does not meet this limit when tested with portland cement alone may demonstrate acceptance using a blended cement or a combination of portland cement and supplementary cementitious materials proposed for the mixture. The supplementary cementitious replacement content needed to pass the ASTM C1260 requirement shall become the minimum required replacement percentage of the concrete mixture.

5.1.2.2. The aggregate has been evaluated in accordance with ASTM C1293 within the last 12 months and has an average expansion of three concrete specimens equal to or less than 0.04 % at one year.

5.1.3. Estimated Concrete Temperature and Equivalent Cement Ratio (w/c_{eq}) for Class MC Mixtures.

- 5.1.3.1. Estimated temperature rise of the proposed concrete mixture shall be less than 80°F when calculated according to the following equation:

Temperature Rise = $0.16 \times C_{eq}$, where C_{eq} is the equivalent cement content given by

$$C_{eq} = C + 0.5 \times F_{ClassF} + 0.8 \times (F_{ClassC} + S_{100}) + 0.9 \times S_{120} + 1.25 \times (SF + MK),$$

and C represents portland cement, F_{ClassF} is Class F fly ash, F_{ClassC} is Class C fly ash, S_{100} is Grade 100 slag, S_{120} is Grade 120 slag, SF is silica fume, and MK is metakaolin. These values are in pounds per cubic yard of concrete.

Other proposed cementitious contents may be submitted if testing is performed to demonstrate the actual temperature rise of the concrete will be less than 80°F or if the approved thermal control plan demonstrates the maximum temperature limit and the maximum temperature difference limits won't be exceeded. Several different possible methods may be utilized to demonstrate the actual temperature rise, including a super insulated 3'x3'x3' test block (ATR cube method), Quadrel Q-drum, or other similar measurement that evaluates the semi-adiabatic temperature rise of concrete. The testing procedure must be approved by the Illinois Tollway.

- 5.1.3.2. The equivalent w/c_{eq} shall not be greater than 0.45 when calculated using the equivalent cement content used for calculation of temperature rise.

5.1.4. Aggregate Gradation.

- 5.1.4.1. For Class AX mixtures, the coarse aggregate gradation shall be CA 13, CA 14, CA 16, or a blend of these gradations, except CA 11 may be used for full-depth patching.
- 5.1.4.2. For Class HP and MC mixtures, CA 11, CA 13, CA 14, CA 16 or a blend of these gradations shall be used. The combined coarse aggregate gradation shall have a minimum of 45 percent passing the ½ in. sieve.
- 5.1.4.3. For Class TL mixtures, the coarse aggregate shall be a combination of two or more gradations specified in Article 1004.01(c) of the Standard Specifications and shall be combined with the fine aggregate during batching at the concrete plant to produce a combined aggregate gradation that complies with Table 6. Each of the individual aggregate gradations used in the mixture design shall be an average of a minimum of 5 stockpile gradations from existing stockpiles at the plant.

Table 6 – Tarantula Curve Gradation Requirements

Sieve Size	Tarantula Curve Limits % <i>Retained by Weight</i>
1 in.	0
¾ in.	≤ 20
½ in.	4 - 20
⅜ in.	4 - 20
# 4	4 - 20
# 8	≤ 12
# 16	≤ 12
# 30	4 - 20
# 50	4 - 20
#100	≤ 10
#200	≤ 2
Coarse Sand % Retained (No. 8 to No. 30 Sieve)	> 15
Fine Sand % Retained (No. 30 to No. 200 Sieve)	24 - 34

5.2. Laboratory Performance Parameters. Class AX, HP, and MC mixtures require a laboratory trial batch to demonstrate the following requirements. A laboratory trial batch is not required for Class TL mixtures.

5.2.1. **Slump Loss.** For HP and MC mixtures, unless otherwise approved by the Illinois Tollway, the initial slump (measured within 10 minutes after the addition of water) shall be between 3 and 8 inches. The slump shall be no less than 3 inches for at least 45 minutes after the addition of water as measured by Illinois Modified AASHTO T 119. The change in slump shall be no greater than 2 inches in 20 minutes and no greater than 4 inches from the initial measurement (measured within 10 minutes after the addition of water). The concrete temperature during testing shall be greater than 70°F. Specimens for compressive strength and hardened air void analysis shall be cast after the final slump measurement.

5.2.2. **Compressive Strength.** Compressive strength shall be no less than the values in Table 7 when determined in accordance with Illinois Modified AASHTO T 22. Test cylinders shall be made and cured in accordance with Illinois Modified AASHTO R 39. Strength shall be defined as the average of two 6 x 12 in. cylinder breaks.

Table 7: Minimum Compressive Strength Requirements

Mixture Class	Age	AX	HP	MC
		(psi)		
Interim Strength	16 hours	2,500 ^{1/}	-	-
	36 hours	4,000 ^{2/}	-	-
Ultimate Strength	14 days	3,500 ^{1/}	4,000 ^{4/}	3,500 ^{2/&4/}
	28 days	-	-	4,000 ^{3/&4/}

^{1/} Pavement

^{2/} Structures

^{3/} Drilled shaft. The time to obtain the specified strength may be increased to a maximum 56 days.

^{4/} The compressive strength determined in the laboratory shall be designated as f_{target} for future acceptance of the mixture

- 5.2.3. **Plastic Air Content.** Plastic air content shall meet the requirements in Table 8 when determined in accordance with Illinois Modified AASHTO T 152.

Table 8 – Plastic Air Content Requirements

Mixture Class	AX	HP	MC
Air Content (%) Range	5.0 – 8.0		

- 5.2.4. **Time to Cracking.** Net time to cracking shall be no less than the values in Table 9 when determined in accordance with ASTM C1581. Prior to batching for a test sample, all coarse aggregate particles exceeding 3/4-inch shall be removed and replaced with an equal volume of minus 3/4-inch graded material.

Table 9 – Minimum Time to Cracking Requirements

Mixture Class	AX	HP	MC
Time to Cracking (days)	10	28	-

- 5.2.4.1. For Class HP mixtures, this test shall be waived if the concrete mixture contains 605 lb/yd³ or less total cementitious material and a minimum dosage of 1.5 gal/yd³ of approved SRA.

- 5.2.5. **Length Change.** Measured shrinkage shall be no greater than the values in Table 10 after 21 days of air drying when determined in accordance with AASHTO T 160. Specimens shall be wet cured for 7 days prior to air drying. The initial reading for calculation of shrinkage shall be taken at the initiation of drying.

Table 10: Measured Shrinkage

Mixture Class	AX	HP	MC
Length Change	0.05%	0.03%	0.04% ^{1/}

^{1/} The length change requirement will be waived if the mixture will only be used for drilled shaft construction.

5.2.6. Freeze Thaw Durability.

5.2.6.1. Class AX, HP, and MC mixtures shall possess an air-void system having the following characteristics as determined by ASTM C457 (Method B):

- Spacing factor not exceeding 0.008-in.
- Specific surface not less than 600 in²/in³
- Total air content not less than 4.0 percent

5.2.6.2. For Class AX, HP, and MC mixtures, the durability factor shall be no less than 80 percent after 300 cycles of freezing and thawing as determined in accordance with Illinois Tollway Modified AASHTO T 161. The freeze-thaw testing in accordance with Illinois Tollway Modified AASHTO T 161 shall be waived if the air-void system parameters are met.

5.2.7. Resistance to Penetration of Chloride Ions.

5.2.7.1. The total charge passed shall not exceed the values in Table 11 when determined in accordance with AASHTO T 277 using the accelerated curing procedure. Test specimens shall be made in accordance with Illinois Modified AASHTO R 39. Specimens shall be cured for one week at 73 °F and the following three weeks at 100 °F. An interim test result can be provided at the option of the contractor. A test shall consist of three specimens.

Table 11: Chloride Penetrability

Mixture Class	AX	HP	MC
	Total Charge Passed (coulombs)		
28 days	2000	1250	-

5.2.7.2. For Class AX and HP mixtures, electrical surface resistivity shall be determined in accordance with Tollway Modified AASHTO T 358 and be reported for information. 4 x 8 in. cylinder specimens shall be used and shall be made in accordance with Illinois Modified AASHTO R 39 and moist-cured in lime-water for 28 days prior to testing.

5.3. Field Trial Batch Performance Parameters. Class AX, HP, MC, and TL mixtures require a field trial batch, witnessed by the Tollway, to demonstrate the following requirements. The Contractor shall schedule the field trial batch with Tollway Materials a minimum of 7 days before the proposed date of the trial batch.

5.3.1. **Slump.** Slump shall meet the requirements of Table 12 when determined in accordance Illinois Modified AASHTO T 119.

Table 12 – Trial Batch Slump Requirements

Mixture Class	AX	HP	MC	TL
Slump (inches)	3-8	3-8 ^{1/}	3-8 ^{1/}	2-4 ^{2/}

^{1/} Slump loss shall be tested in accordance with section 5.2.1.

^{2/} Slump less than 2 inches will be permitted if the mixture is intended for slipform placement.

5.3.2. **Compressive Strength.** Compressive strength shall be no less than the values in Table 13 when determined in accordance with Illinois Modified AASHTO T 22. Test cylinders shall be made and cured in accordance with Illinois Modified AASHTO T 23. Strength shall be defined as the average of two 6 x 12 in. cylinder breaks.

Table 13 – Trial Batch Compressive Strength Requirements

Type of Strength	Age	AX	HP	MC	TL
		(psi)			
Interim	16 hours	2,500 ^{1/}	-	-	-
	3 days	-	-	-	2,500
Ultimate	36 hours	4,000 ^{2/}	-	-	-
	14 days	3,500 ^{1/}	$4000 \leq f_c \leq [f_{target}^{2/} + 1500]^{3/}$	$3,500 \leq f_c \leq [f_{target}^{2/} + 1500]^{2/ \& 3/}$	3,500
	28 days	-	-	$4,000 \leq f_c \leq [f_{target}^{2/} + 1500]^{3/ \& 4/}$	-

^{1/} Pavement

^{2/} Structures

^{3/} f_{target} and f_c are defined as the strength obtained in the laboratory and field trial batches, respectively.

^{4/} Drilled Shaft. The 7 and 14-day compressive strength results shall also be provided. The time to obtain the specified strength may be increased to a maximum 56 days.

5.3.3. **Plastic Air Content.** Plastic air content shall meet the requirements of Table 14 when determined in accordance with Illinois Modified AASHTO T 152.

Table 14 – Trial Batch Plastic Air Requirements

Mixture Class	AX	HP	MC	TL
Air Content (%)	+/- 1.5 from design, Minimum of 4.0	5.0 – 8.0%	5.0 – 8.0%	5.0 – 8.0%, 5.5 - 8.0% for slipform

5.3.4. **Freeze Thaw Durability.**

5.3.4.1. Class AX, HP, MC, and TL mixtures shall possess an air-void system having the following characteristics as determined by ASTM C457 (Method B):

- Spacing factor not exceeding 0.008-in.
- Specific surface not less than 600 in²/in³
- Total air content not less than 4.0 percent

5.3.4.2. The air-void system requirement in Section 5.3.4.1 shall be waived if the mixture has a system air metric (SAM) number no greater than 0.20 and an air content no less than 5.0% when determined in accordance with AASHTO TP 118. In addition, the difference between the QC and Tollway Materials representative's SAM number and air content shall be no greater than 0.1 and 0.9%, respectively.

5.3.5. **Water / Cementitious Materials Ratio.** For AX, HP, MC and TL mixtures, water / cementitious materials ratio shall be design -0.03, +0.00.

5.3.6. **Resistance to Penetration of Chloride Ions.**

5.3.6.1. The total charge passed shall not exceed the values in Table 15 when determined in accordance with AASHTO T 277 using the accelerated curing procedure. Test specimens shall be made in accordance with Illinois Modified AASHTO T 23. Specimens shall be cured for one week at 73 °F and the following three weeks at 100 °F. An interim test result can be provided at the option of the contractor. A test shall consist of three specimens.

Table 15: Chloride Penetrability

Mixture Class	AX	HP	MC	TL
	Total Charge Passed (coulombs)			
28 days	2000	1500	-	-

5.3.6.2. For Class AX, HP, and TL mixtures, electrical surface resistivity shall be determined in accordance with Tollway Modified AASHTO T 358 and be reported for information. 4 x 8 in. cylinder specimens shall be used and shall be made in accordance with Illinois Modified AASHTO T 23 and moist-cured in lime-water for 28 days prior to testing.

5.3.7. **Maturity.** For Class AX, HP, MC, and TL mixtures, a strength-maturity relationship shall be developed in accordance with Illinois Tollway Test Procedure (TTP) 014 Estimating Concrete Strength by Maturity. If the maturity verification fails during use, then the Contractor shall be responsible for developing a new maturity-strength relationship according to TTP 014.

5.4. Mixture Qualification Submittal. The concrete mixture design shall be submitted using the Tollway A-70 form, and a mixture submittal shall include the following items:

5.4.1. Mixture design showing:

- Quantities, description, sources and mill certifications of all mixture ingredients
- Design water-cementitious materials ratio (w/cm)
- Design Slump
- Design Air content
- Gradation and absorption of all aggregates
- Bulk specific gravity (SSD) of all cementitious materials and aggregates
- Theoretical mass and fresh density
- Admixture dosage

5.4.2. A trial batch report demonstrating that the concrete complies with the performance requirements herein specified.

5.4.3. A strength-maturity relationship in accordance with Illinois Tollway Test Procedure (TTP) 014 Estimating Concrete Strength by Maturity.

5.5. Mixture Design Approval.

5.5.1. Once verified, a mixture design will be approved for use for a three-year period. In addition, any change in aggregate or cement source; cement/supplementary cementitious type, grade or classification; or admixture brand or manufacturer; must be approved by Tollway Materials and will require a resubmittal and additional testing to screen for potential changes in performance. Additional testing will be limited only to tests in this special provision and may consist only of selected tests depending on the substitution.

5.5.2. **Fly Ash Substitution.** For Class TL mixtures, a source of fly ash may be substituted for another source of fly ash of the same class if the LOI does not differ by more than 2.0% and the specific gravity does not differ by more than 10% or if the proportions of the mixture are corrected to account for differences in specific gravity. A fly ash substitution will require a trial batch at an AASHTO re:source accredited laboratory to demonstrate the new mixture meets all requirements of Section 5.3., except Section 5.3.6., at the time of resubmittal. The SAM option in Section 5.3.4.2. cannot be used for a fly ash substitution. Specimens shall also be cast during the laboratory trial batch to meet Section 5.3.6; however, these results can be submitted for record once testing is complete.

6. Field Production

6.1. Quality Plan.

6.1.1. At least 14 days prior to the first concrete placement, the Contractor shall submit the Tollway A-71 form, Quality Control Plan for Concrete Production at the Jobsite.

6.1.2. Prior to placements requiring cold weather protection, the Contractor shall submit the Tollway A-72 form, QC Plan for Cold Weather Placement of Concrete.

6.2. Production Facility and Transportation Equipment. Production facilities and transportation equipment shall be in accordance with Section 1103, with the following additions:

The production facility and ready-mix trucks supplying portland cement concrete shall have a current Certification of Ready Mixed Concrete Production Facilities from the National Ready Mixed Concrete Association (NRMCA). The Contractor's Quality Control Plan shall include documentation of NRMCA certification.

6.3. Mixing Portland Cement Concrete.

6.3.1. Replace the table in Article 1020.11(a)(7) with the following:

The time elapsing from when water is added to the mix until it is deposited in place at the site of the work shall not exceed 30 minutes when the concrete is transported in nonagitating trucks.

The maximum haul time for concrete transported in truck mixers or truck agitators shall be according to the following.

Concrete Temperature at Point of Discharge °F	Haul Time ^{1/}	
	Hours	Minutes
50-64	1	30
>64 – without retarder	1	0
>64 – with retarder	1	30

^{1/} To encourage start-up testing for mix adjustments at the plant, the first two trucks will be allowed an additional 15 minutes haul time whenever such testing is performed.

6.4. Curing. Class AX, MC, and TL mixtures shall be in accordance with Article 1020.13 for the appropriate type of construction. For Class HP mixtures, curing shall be in accordance with Article 1020.13(a)(5) of the Standard Specifications for a 7-day period, with the following additions:

6.4.1. The temperature of the curing water shall not be more than 20 °F cooler than the surface temperature of the concrete at the time the water and concrete come in contact. The curing water temperature shall be measured in the storage tank. The surface temperature of the concrete shall be measured under the cotton mats placed for curing. Measuring the temperatures of the curing water and concrete surface, and any required heating or cooling of the curing water, shall be the responsibility of the contractor.

6.4.2. Use black or dark colored plastic sheets when the daily high ambient temperature is below 60 °F. Use white or similarly reflective plastic sheets when the daily high ambient temperature is above 85°F. Use any color or transparency of plastic sheet at temperatures between 60 and 85 °F.

6.4.3. Remove Article 1020.13(a)(6).

6.5. Protection of Concrete Other Than Structures from Low Air Temperatures

The Contractor shall protect the concrete in accordance with Article 1020.13(c), except as revised herein:

- 6.5.1. Replace the 3rd sentence of the 2nd paragraph of Article 1020.13(c) with the following.

The protective cover shall also extend a minimum of 1 ft. beyond the placed concrete and shall remain in place until the estimated in-place concrete strength as determined by Illinois Tollway Test Procedure (TTP) 014 Estimating Concrete Strength by Maturity meets the design strength of the item. This is to evaluate when removal of protection is allowed, or when concrete can be opened to traffic. Final acceptance of the strength of the item is based on standard laboratory cured cylinders.

- 6.5.2. Replace the 3rd paragraph of Article 1020.13(c) with the following.

The Contractor shall provide means for checking the temperature near the surface of the concrete during the protection period according to Article 1020.13(d)(1) and Section 6.6.2 of this special provision.

- 6.5.3. Replace the 4th paragraph of Article 1020.13(c) with the following.

The concrete temperature should be a minimum of 40 °F and a maximum of 90 °F, but shall not be less than 35 °F. The Contractor is advised the protection specified, including the insulation R value, is an approximation for meeting the 40 °F minimum within the first 48 hours of placement. Additional insulation during the protection period may be required to meet the requirements in Section 6.5.1 of this special provision. The Contractor shall implement corrective action, as detailed in the A-72 form, if temperature probe sensor readings are below 40°F.

6.6. Protection of Concrete Structures from Low Air Temperatures

The Contractor shall protect the concrete in accordance with Article 1020.13(d), except as revised herein:

- 6.6.1. Replace the 2nd sentence of the 1st paragraph of Article 1020.13(d) with the following.

This protection shall remain in place until the estimated in-place concrete strength as determined by Illinois Tollway Test Procedure (TTP) 014 Estimating Concrete Strength by Maturity meets the design strength of the item. This is to evaluate when removal of protection is allowed, or when concrete can be opened to traffic. Final acceptance of the strength of the item is based on standard laboratory cured cylinders.

- 6.6.2. Replace the 8th sentence of 5th paragraph of Article 1020.13(d)(1) with the following.

Temperature sensor readings shall be provided to the Engineer in the morning of each day for the duration of the required protection.

- 6.6.3. Replace the 6th paragraph of Article 1020.13(d)(1) with the following.

The concrete temperature should be a minimum of 45 °F and a maximum of 90 °F, but shall not be less than 40 °F. The Contractor is advised the protection specified, including the insulation R value, is an approximation for meeting the 45 °F minimum within the first 72 hours of placement. Additional insulation during the protection period may be required to meet the requirements in Section 6.6.1 of this special provision. The Contractor shall implement corrective action, as detailed in the A-72 form, if temperature probe sensor readings are below 45°F.

- 6.6.4. Add the following to Article 1020.13(d):

For Class HP mixtures, when protection is required, the temperature of water for curing shall be no less than 45°F.

- 6.6.5. Add the following to Article 1020.13(d)(1)

6.6.5.1. Protection Method IA. For superstructure and moment slabs, Protection Method I shall apply, with the following exception: The insulating material shall only cover the top and sides of the superstructure and moment slabs.

6.6.5.2. Protection Method IB. For superstructure and moment slabs, Protection Method I shall apply, with the following exceptions: The insulating material shall only cover the top and sides of the bridge deck. The Contractor shall place heating coils uniformly across the superstructure and moment slabs.

6.7. Temperature Control. Temperature control for concrete placement shall be in accordance with Article 1020.14, except as revised herein.

- 6.7.1. The temperature of the surfaces to receive concrete shall not be less than 40°F.

6.7.2. The temperature of the concrete at the point of placement shall not be less than 60°F for ternary mixtures or for any concrete with more than 20% fly ash or 35% slag replacement of Portland cement. This does not apply to Class MC mixtures.

6.7.3. Class HP mixtures shall not be placed when the ambient air temperature exceeds 90°F without approval of the Engineer and the maximum concrete temperature shall be 85°F at the point of placement, except when placement operations are conducted at night, when the maximum concrete temperature shall be 90°F.

6.8. Field Acceptance.

6.8.1. Concrete mixtures shall be tested and evaluated according to the Illinois Department of Transportation Recurring Special Provision for Quality Control/Quality Assurance of Concrete Mixtures, except as revised herein.

- 6.8.1.1. Add the following to Article 1020.16(g) Schedule B Footnote 2/:

If a gap in the placement of a given mix design exceeds two hours, the procedure to determine testing frequency shall restart for slump, air content, temperature, and compressive strength.

6.8.1.2. Revise Article 1020.16(g) Schedule B Footnote 7/ to read:

The test of record for strength shall be the day indicated in Article 1020.04 and herein as ultimate strength. Compressive strength, as measured using Illinois Modified AASHTO T 22, shall be determined using only 6 x 12 in. cylinders. Estimated in-place concrete strength as determined by Illinois Tollway Test Procedure (TTP) 014 Estimating Concrete Strength by Maturity shall be used to determine early falsework and form removal, early pavement (interim strength) or bridge opening to traffic, or to monitor strengths.

6.8.2. Acceptance to this specification shall be based on the key characteristics in Table 16:

Table 16 – Field Acceptance Requirements

Test	AX	HP	MC	TL
Strength (psi)	Interim: 2,500 at 16 hours ^{1/} Ultimate: 3,500 at 14 days ^{1/} Ultimate: 4,000 at 36 hours ^{2/}	Ultimate: 4000 $\leq f_c \leq [f_{target} + 1500]$	Ultimate: 3,500 $\leq f_c \leq [f_{target} + 1500]$ ^{2/} Ultimate: 4,000 $\leq f_c \leq [f_{target} + 1500]$ ^{3/}	Interim: 2,500 at 3 days Ultimate: 3,500 at 14 days
Plastic Air Content (%)	Design \pm 1.5%, Minimum of 4%	5.0 – 8.0%		5.0 – 8.0% 5.5 - 8.0% for slipform
Slump (in.)	3-8	3-8		2-4 ^{4/}
Water / cementitious materials ratio	Design -0.03, +0.00			

^{1/} Pavement

^{2/} Structures

^{3/} Drilled Shaft. The 7 and 14-day compressive strength results shall also be provided. The time to obtain the specified strength may be increased to a maximum 56 days, provided the curing period specified in Article 1020.13 is increased to a minimum of 14 days.

^{4/} For Slipform Placement - Maintain the concrete at a uniform consistency. The Engineer will not allow an edge slump greater than 1/2 inch where no additional concrete work is to be constructed immediately adjacent to the pavement being placed. The Engineer will not allow an edge slump greater than 1/4 inch where additional concrete work is to be constructed immediately adjacent to the pavement being placed.

ASPHALT PAVEMENT SURFACE REMOVAL (ILLINOIS TOLLWAY)

Effective: September 21, 2011

Revised: March 1, 2023

Description. This work shall consist of removal of the existing asphalt pavement surface for subsequent resurfacing with asphalt mixtures in accordance with Section 440 of the Standard Specifications except as modified herein.

Revise the Article 440.04 of the Standard Specifications to read:

“Asphalt Surface Removal for Subsequent Resurfacing. The existing asphalt pavement surface shall be removed to the depth specified on the plans with a self-propelled milling machine. The machine shall be equipped with a means to control dust and other particulate matter created by the cutting action. The temperature at which the work is performed, the nature and condition of the equipment, and the manner of performing the work shall be such that the milled surface is not torn, gouged, shoved or otherwise damaged by the milling operation. Sufficient cutting passes shall be made so that all irregularities or high spots are eliminated to the satisfaction of the Engineer. The removal shall provide a milled surface that has uniform texture and a smooth riding surface for traffic. When tested with a 16 ft (5 m) straightedge, the milled surface shall have no surface variations in excess of 3/16 in. (5 mm). The 16 ft (5 m) straightedge shall be supplied by the Contractor.

No transverse vertical edges will be allowed. Transverse milled surface tie-ins to existing pavement shall be tapered to not less than a 50:1 slope. Transverse tapered joints may be tapered with the milling machine, a temporary asphalt wedge, or other methods approved by the Engineer. No longitudinal joint between the milled and existing surfaces shall fall between 1 to 5 feet of any lane line.

If the transverse joint is tapered with a temporary asphalt wedge, the milled surface at the joint shall be constructed as a butt joint the full depth of the lift of asphalt to be placed on the milled surface. The Contractor shall be responsible for maintaining this asphalt wedge until all corresponding asphalt mixture is placed. All work associated with this joint will not be paid for separately, but shall be included in the cost of milling.

If the transverse joint is tapered with a milling machine, a butt joint shall be cut into the taper the full depth of the lift of asphalt to be placed on the milled surface prior to commencement of resurfacing. All work associated with this joint will not be paid for separately, but shall be included in the cost of milling.

All debris and milled material, including that removed by other means, shall be immediately removed from the milled surfaces and adjacent surfaces. Surfaces shall be cleaned of all fines and dust prior to opening to traffic and to the satisfaction of the Engineer. Vacuum trucks, street sweepers or pick-up brooms shall be used to clean the milled surfaces. The Contractor shall conduct operations in such a manner that dust is controlled and is not objectionable.

When working adjacent to traffic, the Contractor shall immediately remove material that is spilled on the traveled way.

Removing the existing asphalt pavement surface to the required depth adjacent to structures in the pavement surface such as drain castings and utility covers shall be accomplished in a manner satisfactory to the Engineer using either machine or hand methods. Castings for existing utility or drainage structures within the pavement which are exposed to traffic after the pavement has been milled shall be protected according to Article 603.07 of the Standard Specifications.

The roadway shall be left in a safe and usable condition at the end of each work day. Property damage due to the asphalt surface removal activities is the responsibility of the Contractor, as indicated in Article 107.38 of the Tollway Supplemental Specifications.

Milled pavement shall be resurfaced within four calendar days.”

Add the following to Article 1101.16 of the Standard Specifications:

“Operation of a milling machine with broken or missing teeth will not be allowed. Worn teeth shall be replaced if the milling machine does not produce a uniform surface. The milling machine shall be capable of picking up the removed asphalt in a single operation. A self loading conveyer shall be an integral part of the milling machine”

Method of Measurement. This work will be measured for payment in Square Yards.

Basis of Payment. This work will be paid for at the Contract unit price per Square Yard for HOT-MIX ASPHALT REMOVAL of the depth specified.

DOWEL BARS

Description. This work shall consist of furnishing and placing dowel bars between the existing concrete pavement and new pavement construction.

Materials. The dowel bars shall meet the requirements of 1006.11 of the Standard Specifications.

Construction. The work shall be performed as described in the applicable portions of Article 420.05 and 442.06, Tollway Standard A7-06, and as shown on the Plans. The work shall include drilling the existing concrete to accept the dowel bars, furnishing 18” long epoxy coated 1 ½” dowel bars, grouting the dowel bars into the existing pavement and all required cleaning.

Method of Measurement. Dowel Bars will be measured for payment in place and the actual number of bars installed counted.

Basis of Payment. This work will be paid for at the contract unit price per each for DOWEL BARS of the diameter specified. The unit price shall include all equipment, labor and materials required to install the dowel bars into existing concrete pavement.

AGGREGATE SHOULDERS (ILLINOIS TOLLWAY)

Effective: October 23, 2006
Revised: February 03, 2023

Revise Section 481 of the Standard Specifications to read:

“SECTION 481. AGGREGATE SHOULDERS

481.01 Description. This work shall consist of the furnishing and placing filter fabric (for new shoulders where specified) furnishing, placing, shaping and compacting aggregate on a prepared subgrade adjacent to the edges of the completed pavement structure or stabilized shoulder.

481.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Coarse Aggregate (Note 1)	1004.04
(b) RAP Material (Note 2)	1031
(c) Filter Fabric (Note 3)	1080.02

Note 1. Grading shall be CA-6 with aggregate shoulders Type A and B, and CA-1 for aggregate shoulders special, Type C. If recycled aggregate is used for this application, work shall be in accordance with the Special Provision for Production of Recycled Aggregate and Article 1004.04.

Note 2. Reclaimed asphalt pavement (RAP) may be used as aggregate wedge shoulders Type B and Aggregate Shoulders, Type B. All recycled material shall be meet the requirements found in the Tollway Special Provision for Production of Recycled Aggregate and Reclaimed Asphalt Materials (RAM).

Note 3. Filter fabric shall meet the requirements of Article 1080.02 for ground stabilization.

481.03 Equipment. Equipment shall be according to the following.

Item	Article/Section
(a) Tamping Rollers	1101.01
(b) Pneumatic-Tired Rollers	1101.01
(c) Three-Wheel Rollers (Note 1)	1101.01
(d) Tandem Rollers (Note 1)	1101.01
(e) Vibratory Machine (Note 2)	
(f) Aggregate Spreaders	1102.04

Note 1. Three-wheel or tandem rollers shall weigh from 6 to 10 tons and not less than 200 lb/in. nor more than 325 lb/in. of width of roller.

Note 2. The vibratory machine shall meet the approval of the Engineer.

CONSTRUCTION REQUIREMENTS

481.04 Subgrade Preparation. The subgrade shall be prepared in a manner approved by the Engineer and any required filter fabric shall be placed. A minimum IBV of 4 in accordance with Illinois Test Procedure 501 shall be maintained on the subgrade.

481.05 Moisture Content. Prior to being placed on the subgrade, the aggregate shall contain sufficient moisture to provide satisfactory compaction.

For Type A shoulders, the water and aggregate shall be mixed through a controlled aggregate mixing system. The system shall consist of a mechanical mixing device and aggregate and water measuring devices, meeting the approval of the Engineer. Wetting the aggregate in cars, bins, stockpiles, or trucks will not be permitted.

481.06 Aggregate Shoulders With and Without Filter Fabric, Type A and Type B. The shoulders shall be constructed in lifts of not more than 6 in. thick when compacted, except that if tests indicate the desired results are being obtained, the compacted thickness of any lift may be increased to a maximum of 8 in. The aggregate shall be placed with a spreader.

Each lift of material shall be compacted with a tamping roller, a pneumatic-tired roller, a vibratory machine, or a combination of any of the three, until the compaction has been approved by the Engineer. If the moisture content of the material is not such as to permit satisfactory compaction during the compacting operations, water shall be added in such quantity that satisfactory compaction can be obtained. The top lift shall be given a final rolling with a three-wheel or tandem roller.

If any subgrade material is worked into the aggregate during the compacting or finishing operation, all granular material within the affected area shall be removed and replaced with new aggregate.

The shoulders shall be constructed to the thicknesses shown on the plans. Thickness determinations shall be made at such points as the Engineer may select. When the constructed thicknesses are less than 90 percent of the thicknesses shown on the plans, aggregate shall be added to obtain the required thicknesses; however, the surface elevation of the completed shoulders shall not exceed by more than 1/8 in. the surface elevation shown on the plans or authorized by the Engineer.

481.07 Aggregate Wedge Shoulders, Type B. Prior to placing the aggregate wedge shoulder, Type B, the weeds and grass on the area to be covered shall be cut. The aggregate shall be deposited in its final position with a spreader and compacted to the satisfaction of the Engineer. If the moisture content of the aggregate is not such as to permit satisfactory compaction during the rolling operations, water shall be added in such quantity that satisfactory compaction can be obtained.

481.08 Aggregate Shoulders Special, Type C. The aggregate shoulder special, Type C, shall be placed along the edge of paved shoulders or as a backfill behind curbs constructed at the edge of shoulder only where there is to be existing or new guardrail at the completion of the work or in other specific locations such as large wash-outs at the edge of shoulders.

Before any aggregate is placed, weeds, grass, and miscellaneous vegetation shall be removed from the area in a manner acceptable to the Engineer. The Contractor shall give the Engineer at least 48 hours' notice that an area will be prepared to receive treatment, prior to the placement of the aggregate.

The aggregate shall be placed along the existing pavement or behind the existing curb in sufficient quantity and in such a manner that after compaction the aggregate shall have the configuration shown on the Plans. If any subgrade material is worked into the aggregate during the compacting or finishing operation, all granular material within the affected area shall be removed and replaced with new aggregate.

Aggregate containing free water at the time of delivery will be rejected by the Engineer and shall not be incorporated in the work.

481.08 Opening to Traffic. The road shall be open to traffic according to Article 701.07.

481.09 Method of Measurement. This work will be measured for payment in tons, cubic yards or square yards according to Article 311.08, except payment will not be made for aggregate outside the plan width.

481.10 Basis of Payment. This work will be paid for at the contract unit price per ton or per cubic yard for AGGREGATE SHOULDERS, TYPE B, AGGREGATE SHOULDERS WITH FILTER FABRIC, TYPE A, or AGGREGATE SHOULDERS WITH FILTER FABRIC, TYPE B; at the contract unit price per ton for AGGREGATE WEDGE SHOULDER, TYPE B, or AGGREGATE SHOULDERS SPECIAL, TYPE C; or at the contract unit price per square yard for AGGREGATE SHOULDERS, TYPE A, AGGREGATE SHOULDERS, TYPE B, AGGREGATE SHOULDERS WITH FILTER FABRIC, TYPE A, or AGGREGATE SHOULDERS WITH FILTER FABRIC, TYPE B of the thickness specified.”

PRODUCTION OF RECYCLED AGGREGATE (ILLINOIS TOLLWAY)

Effective: May 11, 2020

Revised: April 6, 2022

Description. This work shall consist of producing recycled aggregate intended for use on the Illinois Tollway system in accordance with this special provision. Recycled aggregate production consists of processing reclaimed portland cement concrete (PCC) or reclaimed asphalt pavement (RAP) into aggregate meeting the contract requirements.

Requirements. The Contractor shall submit the Illinois Tollway A-60 Form “Material Management Plan for Production of Recycled Aggregate” 14 days prior to removal, processing, or placement of material. The Contractor shall update and resubmit the A-60 form prior to any changes throughout production.

Material Sources.

Reclaimed PCC can be from an interstate or primary roadway pavement or structure under the jurisdiction of the Illinois Tollway or IDOT, or from runway pavement from any airport under FAA jurisdiction. Reclaimed PCC from local roads or streets can be used if the source of the original aggregates in the concrete are known and the coarse aggregate quality is “C” or better based on current IDOT standard specifications. The producer of the recycled aggregate shall be responsible for documentation of the aggregate source.

Reclaimed PCC may consist of material from local roads or streets of unknown source and quality if the material is certified by an independent laboratory based on “C” quality coarse aggregate quality requirements identified in the Article 1004.01(b) of the standard specifications.

RAP shall follow the material requirements of the Illinois Tollway Recycled Asphalt Materials (RAM) Special Provision.

Material Production.

Notification shall be given to the Engineer and the Tollway of new recycling and production 48 hours prior to the start of operations. The Engineer shall approve the concrete removal method or stockpiled reclaimed material prior to crushing.

Stockpiling and Handling:

Degradation is of primary concern in handling aggregates. Steel-tracked equipment shall not be operated on stockpiles. Free-fall from conveyor equipment onto load-out stockpiles shall be held to a maximum of 15 feet.

The fall height requirement may be waived if the aggregate source uses special remixing procedures or a device approved by the Tollway. If the fall height requirement is waived, a comparison of a series of samples taken during the loading-out operation to those taken from the production belt shall be made to estimate the effect of the aggregate-handling method on degradation.

Stockpiling and handling of aggregate shall be designed to hold segregation to a minimum. Coned stockpiles built with stationary or movable conveyor equipment shall be loaded out in such a manner as to mitigate segregation. Radial and longitudinal conveyors or stackers shall be kept in motion to reduce coning. Where possible, a spreader chute on the stacker shall be used to broaden or flatten the wedge shape of the pile. Cascading down the sides of the pile shall be held to a minimum. Material shall be loaded out from wedge-shaped piles with an end-loader or equipment having similar type loading action working from the end of the pile, with care taken to work the entire width of the pile to remix the material as much as possible. The method of aggregate-handling and stockpiling currently in use at a particular processing location shall be considered satisfactory provided the method is within the requirements of this special provision, and that the product, when checked at a load-out point, meets the gradation requirements.

Aggregate produced under this special provision shall be stockpiled separately and identified by signs. Signs shall have a minimum of 3" lettering. Each individual sign shall be free-standing and moveable. Any changes made to signing must be pre-approved by the Tollway.

Windrow stockpiles shall follow the same standards as stockpiles. Existing subbase aggregates shall not be intermixed with the recycled concrete either when picking up the broken concrete, feeding the concrete into the crusher, or when stockpiling the recycled aggregate.

Stockpiles shall be sufficiently separated from each other to prevent cross-contamination and intermingling at the base. To prevent contamination, stockpiles shall be separated from the existing soil by pads a minimum of 12" thick constructed of granular material that will compact and provide a stable and clean area for the loader operator to work without contaminating the approved stockpile during loadout. Material used for pads shall not be loaded out for use as the stockpiled aggregate.

Contamination:

Processing procedures for reclaimed PCC and RAP shall ensure material other than the respective PCC or RAP is not incorporated into the processed aggregate. Aggregates and soils underlying existing pavements shall not be present in raw feeds or processed materials. RAP or PCC containing soil or other foreign material shall be considered contaminated and subject to rejection.

The Tollway and the Engineer reserve the right to reject unacceptable material at any point during production or placement. Raw feed and processed stockpiles or windrows displaying evidence of contamination can be rejected upon visual inspection by the Tollway or the Engineer. Contaminating material includes but is not limited to reinforcing steel, soil, wood, fabric, brick, concrete washout, natural aggregates with rounded particles or other foreign material.

Personnel and Laboratories:

Sampling and testing personnel overseeing the Contractor’s control processes (including consultants and contractors) at the processing locations are required to have successfully completed the IDOT Quality Management Training Program Aggregate Technician course (5-day, CET 021). Personnel who have successfully completed the IDOT Quality Management Training Program Mixture Aggregate Technician course (CET 020, 3-day) shall be permitted to conduct gradation testing only under the supervision of a 5-day Aggregate Technician.

Laboratories shall have the required equipment or alternatives approved by the Tollway specified in the IDOT Manual of Test Procedures for Materials Appendix D3 “Aggregate Laboratory Equipment.” Additionally, the testing lab must have a Gilson screen shaker (or approved equivalent) capable of sieving the maximum aggregate size of PGE.

Testing:

Quality control (QC) frequencies for testing shall follow the requirements listed in Table 1. Each crusher is considered its own operation, with individual start up and testing frequencies. If crushing equipment is to be moved to a new location, a gradation test shall be run within the first 500 tons.

Quality Assurance (QA) will sample both start of production samples, test one of the two samples, and test the second if the first does not compare with QC. QA will test 20% of normal production samples. The Contractor shall not place material until “Start of Production” testing results are approved by the Engineer.

Sampling and gradation testing of PGE shall follow the Illinois Tollway Testing Procedure (TTP) 003. Sampling and gradation testing of RAP capping or any other recycled aggregate shall follow IDOT Manual of Test Procedures for Materials: Illinois Test Procedure (ITP) 2 and ASTM C 136.

Table 1 – QC Testing Frequencies for Reclaimed PCC or RAP for Aggregate

Start of Production	Normal Production	Stockpile/ Loadout	Control Charts	Master Band
1 per 2,000 T for the first 4,000 T	1 per 10,000 T 2 per day max 1 per week min	1/week	No	No

Any QC failing gradation sample (start-of-production, normal-production, or stockpile) or a failing and non-comparing QA gradation sample shall be evaluated according to the following procedure and, if necessary, immediate action taken to correct a failing gradation. Recycled aggregate QC/QA comparisons, with the exception of PGE, shall follow the IDOT Manual of Test Procedures QC/QA Procedure “Procedure for Sample Comparison”. QC/QA comparisons for PGE shall follow TTP 003.

If a QC gradation sample fails or a QA gradation sample fails and does not compare to QC, one (1) split resample from the same sampling location shall immediately be taken and tested. If the QC resample passes and QA does not observe a non-comparing failure, the testing frequency being run prior to the failure shall be resumed. If the QC resample fails or QA fails and does not compare to QC, a second resample shall immediately be taken.

If the second QC resample passes and QA does not observe a non-comparing failure, the start-of-production sampling frequency shall be initiated. All samples in the series must pass before the normal production or stockpile sampling frequency for that location can be restarted.

If the second QC production resample fails or a QA gradation sample fails and does not compare to QC, aggregate production shall cease or be diverted from the stockpile. Corrective action shall be initiated by the Contractor. No material shall be placed on the stockpile until a passing QC gradation sample is taken and tested along with a QA sample that does not observe a non-comparing failure. The start-of-production frequency shall then be run at that location. All samples in the series must pass before the normal-production or stockpile sampling frequency for that location can be restarted. Material diverted from the stockpile following a second resample gradation failure shall not be re-incorporated into the stockpile unless approved by the Engineer.

Any action taken, such as resampling, screen changes, separate stockpiling, etc., shall be noted in the remarks area of the failing test report in the Illinois Materials Inspection and Reporting System (I-MIRS). The certified 5-day Aggregate Technician shall monitor the corrective action.

Documentation:

Throughout production, records shall be generated and on file for the type, source, and quantity of recycled aggregate. These records must be available to the Engineer and the Tollway on request. If the records are unavailable, the Engineer can order the Contractor to suspend placement of the related product. Gradation testing shall be reported in I-MIRS.

Method of Measurement. This work will not be measured for payment.

Basis of Payment. This work will not be paid for separately but shall be included in the respective pay item being produced.

TEMPORARY PAVEMENTS (ILLINOIS TOLLWAY)

Effective: August 14, 2014

Revised: June 3, 2022

Description. This work shall consist of constructing a temporary pavement of the specified classification at the locations shown on the plans or as directed by the Engineer.

Unless shown elsewhere in the plans, all temporary pavements are to be constructed on a compacted aggregate base with a minimum thickness of 9 inches.

TEMPORARY PAVEMENT, CLASS 1 shall be for temporary pavements that are designed to be opened to traffic for a period of 6 months or less and shall consist of either a 10 inch undoweled Portland cement concrete pavement in accordance with Sections 353 and 354 of the Standard Specifications except final finish shall be according to Article 420.09(e)(1); or of a 6 inch asphalt pavement in accordance with Sections 355 and 356 of the Standard Specifications and of the Illinois Tollway special provisions for Asphalt Mixtures, Asphalt Pavement Construction, and Reclaimed Asphalt Materials. All asphalt mixtures shall be warm mix asphalt.

TEMPORARY PAVEMENT, CLASS 2 shall be for temporary pavements that are designed to be opened for a period of more than 6 months and no more than 12 months. The pavement shall consist of either an 11.5 inch undoweled Portland cement concrete pavement in accordance with Sections 353 and 354 of the Standard Specifications except final finish shall be according to Article 420.09(e)(1); or of a 9 inch asphalt pavement in accordance with Sections 355 and 356 of the Standard Specifications and of the Illinois Tollway special provisions for Asphalt Mixtures, Asphalt Pavement Construction, and Reclaimed Asphalt Materials. All asphalt mixtures shall be warm mix asphalt.

TEMPORARY PAVEMENT, CLASS 3 shall be for temporary pavements that are designed to be opened for a period of more than 12 months and no more than 5 years. The pavement shall consist of either a 10.5 inch doweled Portland cement concrete pavement in accordance with the Tollway's Portland Cement Concrete Pavement special provision; or of a 10.5 inch full depth asphalt pavement in accordance with the Illinois Tollway special provisions for Asphalt Mixtures, Asphalt Pavement Construction, and Reclaimed Asphalt Materials. All asphalt mixtures shall be warm mix asphalt.

If a 10.5 inch doweled Portland cement concrete pavement is used, the pavement will be tested for dowel bar alignment.

Add the following to Article 420.05(c) of the Standard Specifications.

“(3) Placement Tolerances for Dowel Bars. Place the dowel bars in the concrete pavement according to the following tolerances.

- a. Longitudinal Translation (Sideshift). Longitudinal translation (sideshift) shall be defined as the position of the center of the dowel bar along the longitudinal axis, in relation to the sawed joint.

The left and right wheelpaths shall be determined by excluding the middle 2.5 ft of the striped pavement lane. Each joint shall have greater than 50 percent of dowel bars per wheelpath with a minimum embedment length of 6.0 inches. Embedment length shall be defined as the length of dowel bar embedded on the short side of the sawed joint. An unacceptable joint shall be replaced with a Class B patch or one or more dowel bar retro fits.

Any joint having less than the required number of dowel bars per wheelpath meeting the minimum embedment length will be considered unacceptable.

- b. Vertical Translation (Mislocation). Vertical translation (mislocation) shall be defined as the difference in the vertical position of the dowel bar relative to the theoretical midpoint of the slab.

Any joint having a dowel bar with top concrete cover less than 3.3 inches will be considered unacceptable.

- c. Vertical Tilt or Horizontal Skew (Misalignment). Vertical tilt or horizontal skew (misalignment) shall be defined as the difference in position of the dowel bar ends with respect to each other. Vertical tilt is measured in the vertical axis whereas horizontal skew is measured in the horizontal axis. Misalignment shall be measured in terms of a joint score. The joint score shall be defined as the degree of misalignment evaluated for a single transverse joint for each lane of pavement. The joint score shall be determined as follows:

$$Joint\ Score = \left(1 + \left(\frac{x}{x-n} \right) \sum_{i=1}^{x-n} W_i \right)$$

where:

W_i = weighting factor (Table 1.) for dowel i
 x = number of dowels in a single joint
 n = number of dowels excluded from the joint score calculation due to measurement interference

Maximum Dowel Misalignment – The degree of misalignment applicable to a single dowel bar, calculated as:

$$Maximum\ Dowel\ Misalignment = \max\{Misalignment_{vertical\ tilt}, Misalignment_{horizontal\ skew}\}$$

Table 1.	
Maximum Dowel Misalignment (d)	Weighting Factor (
d < 0.6 in.	0
0.6 in < d < 0.8 in.	1
0.8 in. < d < 1 in.	2
1 in. < d < 1.5 in.	4

A dowel bar with a vertical tilt or horizontal skew (maximum dowel misalignment) greater than 1.8 in. may be cut. If the Contractor elects not to cut a dowel bar exceeding the maximum dowel misalignment, or if more than two dowel bars per wheel path are required to be cut in the joint, the joint will be considered unacceptable.

Single dowel bar misalignment shall be controlled as to not exceed a maximum joint score of 15.

A joint score greater than the specified maximum will be considered locked. Four consecutive joints with a score greater than the specified maximum total score will all be considered unacceptable.

- d. Joint Repair and Corrective Action Plan. The Contractor may elect to cut individual dowels that exceed the maximum dowel misalignment, while ensuring that greater than 50 percent of dowel bars per wheelpath are within the acceptable tolerances. No more than two consecutive dowel bars shall be outside the acceptable tolerances

In all other cases, in lieu of remediation of the joint, the Contractor shall pay to the Illinois Tollway the amount of \$500 for each unacceptable joint.

- (4) Testing of Dowel Bar Placement. The placement of the dowel bars will be tested by the Tollway with the MIT SCAN2-BT or an equivalent device that conforms to ASTM E3013 – 17: Standard Test Method for Evaluating Concrete Pavement Dowel Bar Alignment Using Magnetic Pulse Induction. The device shall be calibrated to the type and size dowel bar used in the work according to the manufacturer's instructions.

The Contractor shall facilitate the dowel bar alignment testing by cleaning all transverse contraction joints following saw cutting and other construction activities and clearing the pavement of any obstructions. It is the responsibility of the Contractor to ensure that the Tollway has access to the transverse joints so that dowel bar alignment testing can be completed in a timely manner.

a. Production Paving.

The Tollway will test all transverse joints. If three consecutive days of paving result in less than 5 percent of the joints on each day being unacceptable prior to a corrective measure, the Tollway may reduce the testing frequency.

b. Test Report.

- (1) Electronic Reporting. The test reports shall be an MS-Excel spreadsheet with an embedded map showing dowel bar layout in horizontal and side views as produced by the device software. The latest version of the device's manufacturer provided software will be used.

The electronic report will include the following:

13. Contract number, date, highway number and direction of traffic.
14. Joint number, lane number and station.
15. Bar number and x-location of dowel bar.
16. Horizontal skew and vertical tilt (misalignment) in inches.
17. Embedment (Sideshift) in inches.
18. Depth to center of dowel bar in inches.
19. Depth to the top end of the dowel bar in inches.
20. Joint Score.
21. All out-of-tolerance readings shall be highlighted in red.
22. Joint images generated by the latest MagnoProof software.
23. Scan direction.
24. Any external sources of interference noted.

- (3) Production Reporting. Test reports will be provided to the Contractor within two working days of completing each paving day's testing.

- c. If the Illinois Tollway determines that the measurement data for a dowel bar is affected by magnetic interference, then the dowel bar shall be evaluated using other means. If the magnetic interference occurs at a longitudinal joint, the Contractor shall verify proper tie bar placement and remediate the longitudinal joint to the satisfaction of the Engineer.
- d. If the Contractor disputes the test values, the Contractor may provide their own MIT-SCAN2-BT device and trained personnel to test the disputed joints. At least one of the Contractor's trained personnel shall have completed MIT-SCAN2-BT New Equipment Training. The Contractor must provide written notification to the Engineer of their intention to re-test the disputed joints. The Contractor must perform the re-tests in the presence of the Engineer according to Illinois Tollway Test Procedure (TTP) 009. The Illinois Tollway will re-test the disputed joint with the Contractor. The Contractor shall evaluate the dowel bar alignment data immediately following the retests according to TTP 009. The Contractor shall submit the following to the Engineer:
 - (1) The calibration parameter file (.cpf) for the device and bar size tested.
 - (2) The most recent calibration certificate for the device
 - (3) The hdfx scan file(s)
 - (4) The specified excel output"

The removal of the temporary pavement shall conform to Section 440 of the Standard Specifications. The removal of any temporary base, if required, shall conform to Section 202 of the Standard Specifications.

Materials. Concrete used for Class 1 or 2 temporary pavements shall be Class PV concrete in accordance with Section 1020 of the Standard Specifications. Concrete used for Class 3 temporary pavements shall be Class TL concrete in accordance with the Illinois Tollway Special Provision for Portland Cement Concrete

Asphalt mixtures used for Class 1, 2, or 3 shall be designated in the asphalt mix table shown in the plans. The asphalt mixtures shall conform to the Illinois Tollway special provisions for Asphalt Mixtures, Asphalt Pavement Construction, and Reclaimed Asphalt Materials.

Method of Measurement. This work will be measured 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 TEMPORARY PAVEMENT, CLASS 1, TEMPORARY PAVEMENT, CLASS 2, or for TEMPORARY PAVEMENT, CLASS 3.

Removal of temporary base aggregate will be paid for separately at the contract unit price per cubic yard for EARTH EXCAVATION.

Removal of temporary pavement will be paid for separately at the contract unit price per square yard for PAVEMENT REMOVAL.

CATCH BASINS, TYPE G-2, TYPE G-2 FRAME AND GRATE

Description. This work shall consist of constructing concrete catch basins with frames and grates or lids of the size specified in accordance with the applicable portions of Section 602 of the Standard Specifications, Illinois Tollway Standard Drawing B8, the details on the plans and as specified herein.

Materials. Catch basins shall be precast reinforced concrete in accordance with Article 602.02 of the Standard Specifications.

Construction Requirements. Work shall follow the applicable portions of Section 602 of the Standard Specifications and Tollway Standard Drawing B8. A minimum 2'-0" from the lowest storm sewer invert and bottom of catch basin shall be provided in accordance with Illinois Tollway Standard B8. Precast material shall in accordance with Section 602.07.

Method of Measurement. This work shall be measured for payment in each for CATCH BASINS, TYPE G-2, TYPE G-2 FRAME AND GRATE.

Basis of Payment. This work will be paid for at the contract unit price per each for CATCH BASINS, TYPE G-2, TYPE G-2 FRAME AND GRATE.

CATCH BASINS, TYPE A, 4'-DIAMETER, TYPE G-2 FRAME AND GRATE

Description. This work shall consist of constructing concrete catch basins with frames and grates or lids of the size specified in accordance with the applicable portions of Section 602 of the Standard Specifications, IDOT Highway Standard 602001, Illinois Tollway Standard Drawing B8, the details on the plans and as specified herein.

Materials. Catch basins shall be precast reinforced concrete in accordance with Article 602.02 of the Standard Specifications.

Construction Requirements. Work shall follow the applicable portions of Section 602 of the Standard Specifications. A minimum 34" from the lowest storm sewer invert and bottom of catch basin shall be provided in accordance with IDOT Highway Standard 602001. Precast material shall in accordance with Section 602.07.

Method of Measurement. This work shall be measured for payment in each for CATCH BASINS, TYPE A, 4'-DIAMETER, TYPE G-2 FRAME AND GRATE.

Basis of Payment. This work will be paid for at the contract unit price per each for CATCH BASINS, TYPE A, 4'-DIAMETER, TYPE G-2 FRAME AND GRATE.

CONCRETE CURB TYPE C

Description. This work shall consist of constructing concrete curb in accordance with applicable portions of Section 606 of the Standard Specifications, Illinois Tollway Standard Drawing B1, the plans and as directed by the Engineer.

Materials. Materials shall meet the applicable requirements of Division 1000 of the Standard Specifications.

Construction Requirements. Construction of the concrete curb shall conform to the details shown in the Plans, Illinois Tollway Standard Drawing B1 and applicable portions of Section 606 of the Standard Specifications.

Method of Measurement. This work shall be measured for payment in feet along the face of concrete curb, which measurement will include drainage castings incorporated in various curbs. The lengths of transitions from one type of curb to another will be included in the measured quantities for the types having the largest cross-sectional areas of concrete.

Basis of Payment. This work will be paid for at the contract unit price per foot for CONCRETE CURB TYPE C.

GUTTER, TYPE G

Description. This work shall consist of constructing concrete gutter in accordance with applicable portions of Section 606 of the Standard Specifications, Illinois Tollway Standard Drawings B1 and B5, the plans and as directed by the Engineer.

Materials. Materials shall meet the applicable requirements of Division 1000 of the Standard Specifications.

Construction Requirements. Construction of the gutter shall conform to the details shown in the Plans, Illinois Tollway Standard Drawing B1 and B5, and applicable portions of Section 606 of the Standard Specifications. Where there is an existing flume that is remaining, the installation of the apron and the upper portion of the concrete flume to match into the existing section are included in this item and will not be paid for separately.

Method of Measurement. This work shall be measured for payment in feet along the flow line of the gutter, which measurement will include drainage castings incorporated in various gutters. The lengths of transitions from one type of gutter to another will be included in the measured quantities for the types having the largest cross-sectional areas of concrete.

Basis of Payment. This work will be paid for at the contract unit price per foot for GUTTER, of the type specified.

TRAFFIC BARRIER TERMINAL, TYPE T1 (SPECIAL) TANGENT (ILLINOIS TOLLWAY)

Effective: October 1, 2009

Revised: March 1, 2023

Description. This work shall consist of furnishing and erecting a traffic barrier terminal as shown in the Plans and/or directed by the Engineer.

Materials. Materials shall be in accordance with Article 631.02 of the Standard Specifications.

Construction Requirements.

General. General requirements for traffic barrier terminal shall be according to Article 631.03 of the Standard Specifications, except as modified herein.

Add the following to Article 631.03 of the Standard Specifications.

The rail elements shall be of uniform section. Warped or deformed elements will be rejected. The edges of the elements shall be rolled or rounded so that they present no sharp edges. All connections and splices shall be made with button head bolts with oval shoulders in such a manner that there will be no appreciable projection on the road side of the guardrail.

Replace Article 631.04 of the standard specifications with following.

The Traffic Barrier Terminal, Type T1 (Special) shall meet the testing criteria contained in MASH for Test Level 3 and be approved by the Illinois Tollway. The terminal shall conform to the individual manufacturer's specifications and shall be installed according to the manufacturer's instructions. The terminal shall be installed at the taper rate shown on Illinois Tollway Standard Drawing C6.

The terminal shall be delineated with a direct applied reflective terminal marker per the Section 725 of the Tollway Supplemental Specifications. No other guardrail delineation shall be attached to the terminal section.

The traffic barrier terminals shall be in accordance with the following table.

Terminal	MASH Test Level	Model No.	Manufacturer
Traffic Barrier Terminal, Type T1 (Special)	3	MSKT-SP-MGS	Road Systems, Inc.

Fabrication. The plates for the rail element shall be blanked to proper shape, fabricated, and ready for assembly when received. No punching, drilling, cutting, or welding will be permitted in the field. Plates in lap splices shall make contact throughout the entire area of the splice.

Erection. Materials or hardware, on which the galvanizing has been damaged shall be replaced with new materials having properly galvanized surfaces, except subject to the approval of the Engineer, minor damage to galvanized surfaces may be repaired by field galvanizing in accordance with the recommendations of the American Hot Dip Galvanizers Association.

The rail and post elements shall be erected to the required elevation. The top of the rail shall be visually straight in horizontal alignment and shall be continuously parallel to the roadway profile grade in vertical alignment. If insufficient adjustment is available in the holes, posts shall be reset, at no additional cost to the Illinois Tollway, until the traffic barrier terminal is properly aligned. The brackets may be loosely bolted to the posts, and after erection of rail elements, the rail shall be carefully aligned, and the bolts then fully tightened. Nuts shall be drawn up tight on all bolts.

Posts. Terminal posts (end and line) shall be a steel system. Wood posts shall not be permitted. Posts Number 3 thru downstream terminal limit shall be standard line posts. Posts shall be installed according to Article 634.05 of the Standard Specifications.

Block-outs. All block-outs shall be wooden, either southern pine or Douglas fir (coast region), Grade No. 1 structural. Plastic and/or steel block-outs shall not be permitted.

Contractor's Responsibility for Underground Facilities. It shall be the Contractor's responsibility to ascertain in advance of any work, by any and all possible means, the presence of underground electrical or telecommunications cables in or near the vicinity of the work. It shall be the Contractor's further responsibility to notify the Engineer at least ten days in advance of setting new posts when working near underground electrical or telecommunications cables. The Illinois Tollway or its representative will then locate any such cables which may be in jeopardy. It shall be the Contractor's responsibility to preserve cable location markings and all information relating thereto given to him/her, and to effectively communicate such information to his/her workers. If the Contractor cuts or damages any such cables, either through carelessness or failure to follow the foregoing procedures, he/she shall be responsible for repairing all damages or replacing the cable without splicing and all at no additional cost to the Illinois Tollway and without cause for the Contractor claiming delay.

Such repair or replacement shall include the immediate installation by the Contractor, without further notice to him/her, of temporary cables satisfactory to the Engineer, the temporary cables to remain in service until the directed repairs or replacements are made. Stringing temporary cables on the ground shall not be allowed in any circumstances. Temporary cables shall be either:

(a) Suitable for direct burial installation, acceptable to the Engineer, and shall be buried to a depth not less than 12 inches.

(b) Weather-proof cable, acceptable to the Engineer, and shall be suspended not less than 8 feet above the highest point of terrain between supports, unless otherwise directed by the Engineer. Suspended temporary cables may be attached to existing poles, or, in their absence, shall be attached to supports acceptable to the Engineer, furnished and installed by the Contractor.

Any posts that are to be located near or over any buried cable shall be installed by first digging a hole by hand, and then installing the post and backfilling the hole. No posts shall be driven under such conditions. Care shall be taken while digging by hand so as not to damage the cable.

All efforts on the Illinois Tollway's part to advise the Contractor as to the locations of underground cables notwithstanding, it shall be understood that such locations are at best approximate, may be in error, and that such efforts by the Illinois Tollway shall not relieve the Contractor of any responsibility for restoring damage resulting from the activities of any employee, Subcontractor, agent, or representative of the Contractor.

The Contractor shall also be responsible for notifying owners of other cables and underground facilities which may be jeopardized by the Contractor's operations in the same manner as required for notice to the Illinois Tollway.

Method of Measurement. This work will be measured for payment, complete in place, in units of each.

The pay limits between the traffic barrier terminal and the adjacent guardrail shall be as shown on Illinois Tollway Standard Drawing C6.

Basis of Payment: This work will be paid for at the contract unit price per each, for TRAFFIC BARRIER TERMINAL, TYPE T1 (SPECIAL) TANGENT.

TERMINAL MARKER – DIRECT APPLIED will be paid for separately.

GUARDRAIL BARRIER REFLECTORS, TYPE B will be paid for separately.

ORNAMENTAL FENCE REMOVAL

Description. This work shall consist of removing and disposing of the existing anti-climb and anti-ram barrier fence system shown in the Plans and/or as directed by the Engineer. The removal of any gates installed along sections of the existing fence is considered under this item.

Construction Requirements. No removal work shall be completed without the approval of the Engineer. All associated hardware and appurtenances of the existing anti-climb and anti-ram barrier fence system including but not limited to the fence panels, brackets, rails, cabling, fasteners, fittings, gates, posts, foundations, and accessories shall be removed off-site and disposed of by the Contractor in a legal disposal site. Any part of the existing fence or posts that are damaged that is not called out for to be removed shall be replaced at the Contractor's expense.

The Contractor shall not damage the existing buildings adjacent to the fence. Any damage to the building shall be repaired by the Contractor at no additional cost to the Department.

Concrete foundations for the fencing posts, braces and other units shall be located and removed in its entirety. The foundations are estimated to be 5 feet deep and 3 feet in diameter. The hole shall be backfilled with suitable material approved by the Engineer. The removed material and debris shall be disposed of according to Article 202.03 of the Standard Specification.

Method of Measurement. Ornamental fence removal shall be measured for payment in feet for ORNAMENTAL FENCE REMOVAL and measured along the top of the fence from center to center of end post, including the length occupied by gates.

Basis of Payment. This work will be paid for at the contract unit price per foot for ORNAMENTAL FENCE REMOVAL at the specified locations. Additionally, this price shall include all equipment, labor, and materials necessary to remove and dispose of the existing anti-climb fence panels, anti-ram barrier fence panels, brackets, rails, cabling, fasteners, fittings, gates, posts, concrete foundations, and the associated hardware and appurtenances.

SLOPED HEADWALL

Description. This work shall consist of constructing a cast-in-place Class SI concrete headwall structure with reinforcement bars in accordance with applicable portions of Section 503 and 508 of the Standard Specifications, through other referenced contract special provisions except as modified herein, the Plans, Tollway Standard Drawing B9, and/or as directed by the Engineer.

Materials. The headwalls shall be cast-in-place of Class SI concrete with reinforcement bars according to the applicable portions of Sections 503 and 508 of the Standard Specifications and Illinois Tollway Special Provision for Reinforcement Bars.

Construction Requirements. Construction shall conform to the details shown in the Plans, Tollway Standard Drawing B9 and applicable portions of Section 503 and 508 of the Standard Specifications and Illinois Tollway Special Provision for Reinforcement Bars.

The required excavation, backfilling, restoration and ditch grading shall be included in the contract unit price.

Sloped Headwalls are to be used only in slopes specified in the Tollway Standard Drawing B9 and shall be constructed flush with the existing or proposed final grade.

Unsuitable material and suitable material in excess of that required for backfilling shall be disposed of by the Contractor according to Article 202.03 of the Standard Specification.

Method of Measurement. This work shall be measured for payment in each for SLOPED HEADWALL of type, and diameter specified.

Basis of Payment. This work will be paid for at the contract unit price per each for SLOPED HEADWALL of the type, and diameter specified. Additionally, this price shall include all equipment, labor, tools, materials, and incidentals necessary to complete the work as specified.

TEMPORARY CONCRETE BARRIER, CROSS-BOLT CONNECTION (ILLINOIS TOLLWAY)

Effective: January 15, 2021
Revised: March 16, 2023

Replace Section 704 of the Standard Specifications in its entirety with the following.

704.01 Description. This work shall consist of furnishing, placing, maintaining, repairing, relocating, and removing precast concrete barrier at temporary locations.

704.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Precast Temporary Concrete Barrier (Note 1)	1042
(b) Reinforcement Bars.....	1006.10(a)
(c) Anchor Pins (Note 2)	
(d) Connecting Rods and Hardware s (Note 3)	
(f) Fast Set Concrete (Note 4)	

Note 1. Precast concrete barrier units shall be supplied by one of the approved manufacturers. The approved list of Temporary Concrete Barrier wall as found on the Illinois Tollway Website.

Note 2. Anchor pins shall be according to the requirements of ASTM F 1554 Grade 36.

Note 3. Connecting Rods shall be threaded according to the requirements of ASTM A193 B7 and of the diameter and length shown in the plans. Plate Washers shall be according to the requirements of ASTM A36 and of the size shown in the plans. Washers shall be 7/8" and according to the requirements of ASTM F436. Nuts shall be 7/8" Heavy Hex and according to the requirements of ASTM A563.

Note 4. Fast set concrete shall be a product from the Illinois Tollway Approved List of Fast Set Concrete as listed on the Illinois Tollway Website.

704.03 General. Precast concrete barrier shall be the F shape as detailed on the plans. Precast barrier units shall meet the following tolerances.

Dimension	Tolerance
Length	1 in.
Cross-Bolt insert placement	½ in. in either the vertical or horizontal direction.
Cross-Bolt leave-out block	¼ in. in opening dimension width
Horizontal Alignment	1/8 in. per 10 feet of length
Horizontal Skew	¼ in.
Vertical Batter	1/8 in. per foot of depth

704.04 Submittals. Temporary Concrete Barrier produced prior to 2023 (“Alternate Temporary Concrete Barrier”) by Welch Bros., inc. and Utility Concrete Products, LLC with cross bolt connection differing from that detailed on the plans may be proposed for use. To be considered, prepared shop drawings, stamped and sealed by an Illinois Licensed Structural Engineer must be submitted and approved by the Engineer prior to being installed. Such shop drawings must include details relative to the following:

1. All connection hardware, including plates, washers, nuts, threaded rods, thrie-beam and/or spacers, between the Alternate Temporary Concrete Barrier and Temporary Concrete Barrier specified in the plans, or anchoring device.
2. Supporting documentation and FHWA Approval letter for connecting hardware if different than those specified in Note 3.
3. Location plan and transition type between Alternate Temporary Concrete Barrier and Temporary Concrete Barrier wall specified in the plans, including min/max space between such successive barrier units for barrier located on pavement /structure on alignment.
4. An Illinois Licensed Structural Engineer sealed evaluation letter stating the Alternate Temporary Concrete Barrier will provide equal or better performance than that specified in the contract plans and meet or exceed Manual for Assessing Safety Hardware (MASH) 2016 TL-3 evaluation criteria (structural adequacy and occupant risk) for longitudinal barriers.

704.05 Installation. The temporary concrete barrier shall be installed at the locations and according to details shown in the plans. The barriers shall be seated on bare, clean pavement or paved shoulder and connected with cross bolts in a smooth, continuous line at the locations provided by the Engineer.

Units of free-standing barrier shall be connected to adjacent units using the cross-bolt connection hardware shown in the plans. Units of temporary concrete barrier shall be snug tight against adjacent units such that no light is visible between units. Cross bolts shall be inserted, washers placed, and nuts tightened. Nuts shall be impact wrench tight. At locations where temporary concrete barrier is placed on roadways with a curve, a variable gap of 0”- 2” will be allowed at the base of one edge of adjacent barrier units placed on curved alignments. The other edge shall be flush.

Except on bridge decks, or where alternate anchoring details are shown on the plans, the barrier unit at each end of an installation shall be anchored to the pavement or paved shoulder using six anchor pins and shielded with an impact attenuator as shown on the plans. When anchoring of additional barrier units within the installation is specified on the plans, three anchor pins shall be installed in the traffic side holes of the required barriers.

Where both anchored and free-standing barrier units are used in a continuous installation, a transition shall be provided between them. The transition from anchored to free-standing barrier shall consist of two anchor pins installed in the end holes on the traffic side of the first barrier beyond the anchored section and one anchor pin installed in the middle hole on the traffic side of the second barrier beyond the anchored section. The third barrier beyond the anchored section shall then be free-standing.

Improper installation, including anchoring, of the temporary concrete barrier shall be subject to penalty in accordance with Illinois Tollway Supplemental Specifications Article 701.08(b). An incident of non-compliance for the temporary concrete barrier installation shall be defined anytime the Engineer finds during the daily inspection, the temporary concrete barrier is missing anchors, missing cross bolts and hardware, improper cross-bolt connections, incorrect anchors, and/or has improper embedment depth of anchors.

Temporary concrete barriers located on bridge decks shall be restrained as shown in the plans. Anchor pins shall not be installed through bridge decks, bridge approach slabs or transition approach slabs, unless otherwise noted.

Temporary concrete barriers or attachments that are damaged during transportation, placement or relocation and determined to be unacceptable by the Engineer shall be repaired or replaced. The Engineer will be the sole judge in determining which units or attachments require repair or replacement.

The temporary concrete barriers shall be removed when no longer required by the contract. After removal, all anchor pin holes in the pavement or paved shoulder shall be completely filled with an approved fast setting concrete. No Alternate Temporary Concrete Barrier shall remain in place after the contract and must be removed prior to completion.

704.06 Inspection. The Engineer is responsible for the inspection, documentation, and acceptance of the temporary concrete barrier. The Engineer will inspect the temporary concrete barrier prior to the transport of the temporary concrete barrier to the job site and will inspect the installation and anchorage of the temporary concrete barrier during placement.

704.07 Repairs. Repairs on temporary concrete barrier damaged on site from placement or impacts by vehicles shall be repaired using lane closures. Repairs to temporary concrete barrier adjacent to a travel lane shall not be performed without prior approval of the Engineer. Materials used for repairs shall be in accordance with the materials specified herein.

Spalled or Delaminated Concrete shall be repaired as follows:

(a) Concrete spalling and delamination of depths less than 1 inch will not require patching if the exposed cavity has side slopes of at least 1:3. Grinding of the concrete cavity perimeter will be allowed to satisfy the required 1:3 (V:H) side slope.

(b) Concrete spalling and delamination of a depth 1 inch to a depth of 2 inches shall be repaired utilizing approved fast set concrete.

(c) Concrete spalling and delamination of depths greater than 2 inches will be considered for repair by methods proposed by the Contractor and approved by the Engineer.

Connecting rods, plate washers, or anchor nuts which are bent, cracked, or deformed shall be replaced with hardware meeting the requirements specified in 704.02 Note 2.

704.08 Method of Measurement. This work will be measured for payment in feet in place along the centerline of the barrier. When the barrier is relocated within the limits of the jobsite, the relocated barrier will be measured for payment in feet in place along the centerline of the barrier.

Anchor pins and any required repairs to the anchor pin holes will not be measured for payment. Labor and materials to connect Alternate Temporary Concrete Barrier and Temporary Concrete Barrier as specified in the plans will not be measured for payment.

Impact attenuators will be measured separately.

704.09 Basis of Payment. This work will be paid for at the contract unit price per foot for TEMPORARY CONCRETE BARRIER, CROSS-BOLT CONNECTION or RELOCATE TEMPORARY CONCRETE BARRIER, CROSS-BOLT CONNECTION. All repairs shall be included in the contract unit price. All material and labor for connecting Alternate Temporary Concrete Barrier wall to Temporary Concrete Barrier wall as specified in the plans will not be paid for separately but included in the cost of the type of wall specified.

Furnishing and installing anchor pins will not be paid for separately but will be included in the unit price for TEMPORARY CONCRETE BARRIER, CROSS-BOLT CONNECTION or RELOCATE TEMPORARY CONCRETE BARRIER CROSS-BOLT CONNECTION.

Impact attenuators will be paid for separately.

RELOCATE TEMPORARY CONCRETE BARRIER, CROSS-BOLT CONNECTION, TO REMAIN IN PLACE

Description. This work shall consist of furnishing, placing, maintaining, and relocating precast concrete barrier at locations specified in the Plans. This work shall be completed in accordance with the applicable portions of TEMPORARY CONCRETE BARRIER, CROSS-BOLT CONNECTION (ILLINOIS TOLLWAY) and as noted herein. This work shall also include anchor and connection pins, where required.

Installation. The precast concrete barrier shall be installed according to TEMPORARY CONCRETE BARRIER, CROSS-BOLT CONNECTION (ILLINOIS TOLLWAY). The precast concrete barrier shall not be removed at the end of the contract. After the Contract is closed, the Contractor shall leave the existing barrier in place and ownership and maintenance of barrier shall be transferred over to the Illinois Tollway.

Method of Measurement. RELOCATE TEMPORARY CONCRETE BARRIER, CROSS-BOLT CONNECTION, TO REMAIN IN PLACE shall be measured for payment per foot.

Basis of Payment. This work shall be paid for at the contract unit price per foot for RELOCATE TEMPORARY CONCRETE BARRIER, CROSS-BOLT CONNECTION, TO REMAIN IN PLACE, which price shall include all labor, equipment, and materials necessary to furnish and place temporary impact attenuator.

IMPACT ATTENUATORS, TEMPORARY (SEVERE USE, NARROW), TEST LEVEL 3, TO REMAIN IN PLACE

Description. This work shall consist of furnishing, placing, maintaining, and relocating temporary impact attenuators of the category and test level specified at locations specified in the Plans. This work shall be completed in accordance with the applicable portions of Section 706 of the Standard Specifications and as noted herein.

Installation. Impact attenuators shall be installed according to the applicable portions of Section 706 of the Standard Specifications. The impact attenuators shall not be removed at the end of the contract. After the Contract is closed, the Contractor shall leave the existing impact attenuator in place and ownership and maintenance of barrier shall be transferred over to the Illinois Tollway.

Method of Measurement. This work will be measured for payment as each, where each is defined as one complete installation.

Basis of Payment. This work shall be paid for at the contract unit price per each for IMPACT ATTENUATORS, TEMPORARY (SEVERE USE, NARROW), TEST LEVEL 3, TO REMAIN IN PLACE, which price shall include all labor, equipment, and materials necessary to furnish and place impact attenuators.

RAISED PAVEMENT LANE MARKER (ILLINOIS TOLLWAY)

Effective: July 1, 2009

Revised: April 1, 2016

Description. This work shall consist of furnishing and installing plowable prismatic reflector type pavement markers on pavement and/or concrete bridge decks as shown in the Plans, or as directed by the Engineer.

This work shall include necessary pavement and/or deck preparation for the raised pavement marker installation.

Materials. All materials for raised pavement lane markers shall meet the following specifications:

(a) The markers shall be low profile units consisting of an iron casting according to ASTM A 536-84, Grade 72-45-05 hardened to 52-54RC to which is attached a replaceable prismatic retro-reflector for reflecting light from one direction as specified. The casting shall be shaped to deflect a snowplow blade upward, thus preventing damage to the reflectors. The bottom of the casting shall incorporate two parallel keels and a bow shaped web designed to fit into a grooved road surface. The casting shall have leveling tabs to ensure proper embedment and shall be fastened to the road surface using an epoxy adhesive. The casting shall be designed for one directional plowing. The casting shall be marked with the manufacturer's name and the model number of the marker shall be visible after installation.

(b) The overall dimensions for pavement raised reflective pavement markers shall be approximately 10 inches long by 5.5 inches wide and a maximum of 1.76 inches high. The overall dimensions for bridge raised pavement lane markers shall be approximately 9.25 inches long by 5.86 inches wide and a maximum of 1.25 inches high. The surface of the keel and web shall be free of scale, dirt, rust, oil, grease, or any other contaminant which may reduce bond.

(c) The reflector shall be of the prismatic type consisting of a methyl methacrylate or suitably compounded acrylonitrile butadiene styrene (ABS) shell filled with a mixture of an inert thermosetting compound and filler material. The exterior surface of the shell shall be smooth and contain one (monodirectional) methyl methacrylate prismatic reflector face of the color specified. The shell shall be fabricated in a manner that will provide a mechanical interlock between the thermosetting compound and the shell. The thermosetting compound shall bond directly to the backside of the metalized lens surface. The manufacturer's trademark shall be molded in the face of the reflector lens or on the reflector body so as to be visible after installation.

(d) The reflector lens shall be high-intensive type corner cube prismatic and shall provide total internal reflection of the light entering the lens face. The reflector shall be 4 in. long x 2 in. wide x 0.44 in. high and fit securely into a recessed area on the upper surface of the marker casting web. The reflective surface shall be a minimum of 1.6 sq in. in area. The reflector shall have an abrasion resistant reflective surface.

(e) The specific intensity of the reflective surface at 0.2 degrees divergence angle shall be as follows when the incident light is parallel to the base of the marker.

Minimum Specific Intensity (candelas/foot candle)		
Color	Incidence Angle	
	0°	20°
Crystal	3.0	1.2

Construction Requirements. It shall be the Contractor's responsibility to determine the location of any traffic control devices installed in the pavement and/or deck before beginning work, and shall conduct work to avoid damage to these devices. Any damage to these devices caused by the Contractor's operation shall be repaired at no additional cost to the Illinois Tollway.

The pavement and/or deck to which the marker is to be applied shall be accurately cut to the marker manufacturer's specifications. The depression shall be clean and dry prior to the installation of the marker.

The pavement shall be cut to match the bottom contour of the marker using a concrete saw fitted with 18 and 20-inch diameter blades. The bridge deck shall be cut to match the bottom contour of the marker using a concrete saw fitted with 18 and 19-inch diameter blades. Diamond blades shall be used on portland cement concrete pavement. The entire cut shall be made in a single plunge. Single blade cutting shall not be used. The cut shall be clean and completely dry prior to pouring the epoxy. After the cut is cleaned, the configuration shall be checked using a pavement marker. The marker shall fit easily within the cut with the leveling tabs resting on the pavement. If any force is required to place or remove the marker or if the leveling tabs do not rest on the pavement surface, the cut shall be enlarged as necessary. Installations on crowned pavements and/or decks, superelevations, or ramps shall be cut deeper than those on level pavements if necessary to get proper marker fit. A rapid setting (hard in one hour) epoxy meeting the requirements of AASHTO M 237 shall be poured into the cut to within 3/8 inch of the pavement surface. The installed height for the reflective pavement markers shall be approximately 0.3 in. above the road surface.

The marker shall then be placed into the epoxy-filled cut. After placement of the marker, epoxy should be flush with the pavement and/or deck surface. The leveling tabs shall rest on the pavement surface and the marker tips shall be slightly below the pavement surface when properly installed. There shall be no epoxy on the reflective lens. The epoxy, when properly mixed, shall be hard cured in 30-45 minutes. If after one hour, a screwdriver or other pointed instrument can be pushed into the epoxy, the marker and the uncured epoxy shall be removed, the marker shall be cleaned and the unit reinstalled.

The pavement and/or deck surface temperature and the ambient air temperature shall be at or above 50 °F at the time of installation of the marker for the epoxy adhesive to properly cure.

The reflectors may be attached to the castings prior to or after the placement of the markers. The depression in the web shall be clean and dry. The reflector shall be laminated to an elastomeric pad and adhesively attached to the casting. A primer meeting the marker manufacturer's specifications shall be applied to the web surface. The protective paper or plastic film covering the adhesive pad shall be removed immediately prior to placing the reflector on the casting. Once the film covering is removed, extreme care shall be taken to avoid contamination of the exposed pad surface.

In lieu of an adhesive pad, an adhesive meeting the marker manufacturer's specification should be used. The adhesive shall be placed either on the reflector or on the web in sufficient quantity so as to ensure complete coverage of the contact area with no voids present and with a slight excess after the reflector is pressed in place. The reflector shall be placed on the casting with sufficient pressure to firmly seat it in place.

The raised pavement lane marker shall be in accordance with the Manufacturer's details and specifications. The raised reflective pavement markers shall not be laid directly over a longitudinal or transverse crack or joint. The raised reflective markers shall be placed in line with the permanent pavement markings with edge of the marker offset, toward traffic, a minimum distance of 2 in. from any joint (longitudinal or transverse) or crack in the pavement surface.

Reflector.

Where only the raised pavement lane marker reflector is specified in the Plans, the remaining portions of the existing raised pavement lane marker shall be cleaned by sandblasting or other methods approved by the Engineer. The contractor shall make certain the casting surface is dry and free of dirt and rust prior to placing the reflector on the casting.

Raised Pavement Lane Markers Inspection.

The permanent raised pavement lane marker will be inspected following installation, but no later than November 30. In addition, they will be inspected following a winter performance period that will extend 180 days from November 30.

Within 15 calendar days after the end of the winter performance period, a final performance inspection will be made. If this inspection discloses any work which is not visibly intact and serviceable, the Contractor shall, within 30 calendar days, completely repair or replace such work to the satisfaction of the Engineer.

Measured in its entirety, the work shall be 97 percent intact.

Upon completion of the final performance inspection or after satisfactory completion of any necessary corrections, the Engineer shall notify the Contractor in writing of the date of such final performance inspection and release him/her from further performance responsibility.

Method of Measurement. This work will be measured for payment, complete in place, in units of each.

Basis of Payment. This work will be paid for at the contract unit price per each, for RAISED PAVEMENT LANE MARKER, RAISED PAVEMENT LANE MARKER, BRIDGE, RAISED PAVEMENT LANE MARKER REFLECTOR.

PLANTING WOODY PLANTS

Description. This work shall consist of furnishing, transporting, layout and planting trees within areas shown in the Plans and as specified herein. All work shall conform to Section 201 of the Standard Specifications and Section 253 of the Illinois Tollway Supplemental Specifications, except as modified herein and as directed by the Engineer.

Plant Material Source – Pre-Shipping Inspection

All materials for planting shall comply with Section 1081 of the Standard Specifications.

Within 30 days of the Notice to Proceed, the Contractor shall notify the Engineer of the proposed sources of the plant materials. When requested by the Engineer, the Contractor shall coordinate a mutually agreeable time for the Engineer or their proxy to visit each of the source locations to inspect the quality of the plant material prior to shipment to the project site. The Engineer may request representative Nursery photographs of plant material and/or additional inspection of plant material at the Contractor's holding yard prior to planting. The Engineer or their proxy have the right to reject the source provider's plant material. Inspections and plant source reviews shall be completed at least 30 days prior to the expected delivery of plant material and allow enough time for suitable alternate sources and substitutions.

Substitutions

Substitutions are not permitted unless formally requested and authorized by the Engineer. If plant material specified is not obtainable, a written request shall be submitted for consideration of the nearest equivalent size/variety with no increase of Contract price. The Contractor shall submit a list of all sources contacted for each material plant item that they have found to be unavailable. Procurement cost is not a valid reason for claiming that the material is not available. The Engineer is under no obligation to accept any proposed substitutions.

Communications

The Contractor is responsible to communicate all concerns, deviating or conflicting project issues and questions with the Engineer in a timely manner to avoid delay in the construction schedule.

Delivery Schedule

The Contractor shall coordinate with the Engineer, to develop a mutually agreeable delivery schedule and delivery locations. The Contractor shall contact the Engineer, via phone 24 hours prior to each delivery with an approximate arrival time. Should these conditions not be met, the Engineer may reject the delivery and re-delivery shall be arranged by the Contractor at no additional cost.

Excavation and Utility Conflicts

Buried utility lines are known to be located within the work zone. The Contractor shall have existing underground utilities field located prior to any digging or ground disturbance. The Contractor shall notify the Engineer of potential conflicts. The Contractor shall avoid all utilities and coordinate planting beds with the Engineer as shown in the tree and shrub installation details in the plans.

Plant layout shown on the plans is approximate and requires layout and field adjustment. Any locations where plantings may be shown above or near utilities, shall be relocated to 10 feet to either side of the utility line (20 feet total width) and as shown in plan details. No digging, plowing, incorporation, drilling, or excavation shall occur within the 20-foot wide utility corridor.

Layout of Planting

Article 253.07 of the Standard Specifications, shall be modified as follows:

253.07 Layout of Planting Areas: The Contractor shall furnish all 30-inch high wire – 4-inch x 5-inch vinyl marking flags for locating woody plants and shall mark the common name of plants. The Contractor shall place the marking flags for individual trees and shrub bed planting. The Engineer will review the proposed planting locations identified by the Contractor prior to the start of the planting operation.

Excavation of Plant Holes

Holes for planting woody plants shall be as shown in the Balled and Burlapped Planting Details in the plans.

The following revises the second sentence of 253.08 (a) of the Standard Specifications to:
The diameter of the hole for all balled and burlapped trees shall be 8 feet diameter. The depth of the holes shall be equal to the root ball minus 2 inches.

Planting Procedures

Add to Article 253.10 of the Standard Specifications paragraph two:

When the hole is excavated for planting the tree compost shall be mixed and incorporated to amend the excavated soil before it is used to backfill the planting pit.

Compost to amend backfill shall not exceed 5% of the volume of backfill.

Add the following to Article 1081.05(b) of the Standard Specifications:

Compost shall be mature, high quality, free of weed seeds, free of heavy metals and other deleterious contaminants, and have Electrical Conductivity of less than 4.0 mmhos/cm.

Prior to using Compost for this work the Contractor shall provide a sample of the compost and lab reports demonstrating compliance with requirements to the Engineer.

Replace Article 253.11 of the Standard Specifications. MULCH COVER with the following:

Within 3 days of planting, a four-inch depth of approved shredded hardwood bark mulch shall be placed in a circle/ring around each installed woody plant as shown in the planting details. No filter fabric shall be installed. When trees are four feet or closer together mulch be placed in a connected bed covering the entirety of all bare earth associated with the plantings.

Trees shall have mulched rings mulched with 4 inches depth of shredded hardwood bark mulch in accordance with the planting and edging details.

Period of Establishment

Revise the first paragraph of Article 253.14 PERIOD OF ESTABLISHMENT, of the Standard Specifications and the Illinois Tollway Supplemental Specifications as follows:

Prior to final acceptance, all plants shall endure a period of establishment. The period of establishment shall consist of one (1) year, including two establishment inspections.

The period of establishment will begin in June upon Substantial Completion after all initial plantings are complete and will end in May of the following year.

The Establishment Inspections will be held by the Engineer in September following Substantial Completion and in May of the following year when all replacement plantings, plant care work, and clean-up are complete.

To qualify for each Establishment Inspection, all plants shall have been in place, in a live healthy condition, on or before Substantial Completion and on or before November 30 for the second Establishment Inspection. To be acceptable, plants shall be in a live healthy condition, representative of their species, at the time of each Establishment Inspection.

Final acceptance of the plantings will be based on a Final Establishment Inspection in the April following Substantial Completion. All plants must be alive and in a healthy condition. Plants which, in the opinion of the Engineer, are dead or are in an unhealthy or unsightly condition, have lost their natural shape due to dead branches, excessive pruning, inadequate or improper maintenance, watering care or other causes, will be considered dead.

Method of Measurement. This work will be measured in units of EACH.

Basis of Payment. This work will be paid for as specified in Article 253.17 of the Standard Specifications modified as follows:

Compost to amend the planting backfill soil will be considered part of the cost of planting and not paid separately.

Shredded Hardwood Bark mulch and edging required will be considered part of the cost of the planting and not paid separately.

All plant care specified for the plantings through the full one (1) year Period of Establishment will be considered as part of the cost of planting and not paid separately. Plant care shall end at Final Completion.

All watering specified for the plantings through the full one (1) year Period of Establishment will be considered as part of the cost of planting and not paid separately. Watering requirements shall comply with the Illinois Tollway Supplemental Specifications Article 253.12(a).

The cost of all replacement plantings required herein during the Period of Establishment are considered part of the cost of planting the trees and shrubs and not paid separately.

Revise 253.17 (a) and (b) as follows:

Upon completion of planting, mulch covering, wrapping and bracing, 100 percent of the pay item(s) will be paid.

Payment provisions not described above will remain as specified in the Standard Specifications.

MAINTENANCE OF TRAFFIC

Description. This work shall consist of furnishing, installation, maintenance, relocation and removal of work zone traffic control and protection along Ramp E and Ramp F, exit ramps from Jane Addams Memorial Tollway Eastbound I-90 and Tri-State Tollway Southbound I-294 to WB I-190, and Toll Plaza 31 in accordance with Section 701 of the Illinois Tollway Supplemental Specifications, Plans, details, and as further defined and prescribed herein.

Devices. Per Illinois Tollway Supplemental Specifications Article 701.03 except as modified herein.

The Contractor shall be responsible for the proper location, installation, and arrangement of all traffic control devices as shown in the maintenance of traffic plans.

All traffic control devices used for the maintenance of traffic shall be reflectorized prior to installation and cleaned as specified by the Engineer. All signs shall be bolted to sign supports unless otherwise noted.

All traffic control devices including, but not limited to drums, vertical panels, and barricades immediately adjacent to the edge of traveled way shall be equipped with mono-directional steady burning lights. A minimum of 1-foot shy distance between the traffic control device and the temporary pavement marking shall be provided throughout, unless otherwise noted.

All signs furnished by the Illinois Tollway shall be obtained by the Contractor from the Illinois Tollway sign shop in Naperville, IL.

All temporary construction signs (including signs from the MUTCD and the Illinois Tollway Standard Drawings) shall be included in the MAINTENANCE OF TRAFFIC unless otherwise specified.

One Type "A" warning light shall be installed above each of the first three pairs of advance warning signs.

General Requirements. Per Illinois Tollway Supplemental Specifications Article 701.04 except as modified herein.

The following standards shall be used on the Illinois Tollway jurisdiction: D10, E1, E3, E4, E5 and E6.

Traffic conditions, crashes and other unforeseen emergency conditions may require the Engineer to restrict, modify, or remove lane closures or channelization shown on the Plans. The Contractor shall make the necessary adjustments as directed by the Engineer without delay. Compliance with this requirement shall be considered included in the contract unit price of the MAINTENANCE OF TRAFFIC.

Allowable Lane Closures. None.

Allowable Shoulder Closures. Allowable shoulder closures shall conform to Tollway standard E3.

Coordination. Per Illinois Tollway Supplemental Specifications Article 701.04(b) except as modified herein.

The Contractor shall coordinate all work with the Illinois Tollway Incident Manager, Andrew McKissick, at (630) 241-6800 x4907 at least a minimum of ten (10) days prior to any stage changes.

It is the Contractor's responsibility to maintain coordination between adjacent contracts throughout the duration of the project. The Contractor is directed to the fact that other separate contracts are, or may be, in force that intersect the limits of this project as noted in CONTRACTOR COOPERATION. The Contractor shall coordinate with the other Contractors for phasing of this work to not delay work. When conflicts arise between Contractors with respect to Maintenance of Traffic, said conflicts shall be resolved by the Engineer. No additional compensation will be allowed for compliance.

Plaza 31 Improvements Construction Sequences and Traffic Staging. Per Illinois Tollway Supplemental Specifications Article 701.05, except as modified as herein. For additional information, see Suggested Stage of Construction and Traffic Control Plans.

The Suggested Stage of Construction and Traffic Control Plans indicates the suggested sequence of construction and maintenance of traffic patterns for Contract 62U90. Limitations for holiday periods shall be as specified in the Illinois Tollway Supplemental Specifications 701.07.

The Contractor, in general, shall follow the procedures and sequence of operations as specified in the Plans, required under this Contract. The order in which the various operations are specified herein is based on the requirements that public vehicular traffic must be maintained, positive natural drainage of storm water must be controlled and seasonal constraints on the work must be recognized and the work progress in a timely manner to meet the specified completion date.

The Contractor may vary the sequence of operations provided that detailed plans and documentation, prepared by the Contractor, are submitted to and approved by the Engineer.

Prior to the removal of the existing Toll Plaza 31 site, the new All Electronic Toll (AET) shall be fully tested and operational for a minimum of two (2) weeks. The Contractor shall also notify the Illinois Tollway at least 14 days in advance before any demolition work to collect and salvage any existing equipment and/ or items as noted in REMOVAL OF PLAZA EQUIPMENT.

Holiday Periods.

Holiday periods shall be per the Illinois Tollway Supplemental Specifications Section 701.07 with the following additions.

Independence Day - 12:00 Noon Wednesday, July 3, 2024 through 9:00 A.M. Monday, July 8, 2024.

Method of Measurement. This work will not be measured for payment.

Basis of Payment. This work will be paid for at the contract lump sum for MAINTENANCE OF TRAFFIC.

DEMOLITION OF PLAZA CANOPY

Description. This work shall consist of furnishing all labor, equipment, supplies, materials and operations necessary for the complete removal and disposal of the existing canopy at Plaza 31 as shown in the Plans. The work shall include the removal of all items on the canopy, but not limited to the roof, horizontal superstructure, steel columns, foundations, connection hardware, roof drain, drainage systems, conduits, attached signs to the structure, signs, sign supports, fire extinguishers, electronic lane control signs, control gates, warning lights, fluorescent lights, guardrail and posts, traffic barrier terminals, electrical, HVAC and mechanical materials and systems within the Plaza 31 area. The Contractor shall secure the site within 48 hours prior to any demolition. Disconnection, capping or sealing, abandoning in place or removal of utilities, protection of adjacent construction, environmental protections (noise, dust, etc.) and disposal of demolition materials shall be included in the work.

All work shall be done in accordance with applicable portions of Sections 501, 669, and 736 of the Standard Specifications. Removal and disposal of any materials shall be in accordance with Article 202.03 of the Standard Specifications.

Backfilling shall follow in accordance with Article 502.10 and Section 205 of the Standard Specifications.

Environmental Testing and Remediation. The Contractor must provide inspection, testing, and identification of any lead, asbestos or hazardous materials on the Plaza Canopy structure. Field inspections and sampling must be completed within 7 calendar days of receiving notice to proceed. Environmental reports must be received within 21 calendar days following the date of the Environmental Field Inspection.

If the Environmental reports show positive testing for asbestos or other material, the Contractor shall enlist an IDPH Licensed Asbestos Abatement Contractor to remove all Asbestos Containing Materials (ACMs) from the canopy prior to any demolition. The Abatement Contractor shall be responsible for all notifications and fees as required by state and local agencies.

Prior to the start of work, submittal shall be provided as follows:

- A. Submittals required for Asbestos Abatement Experience
 - I. Company Experience: Prior to starting work, the Contractor shall supply evidence that he/she has been prequalified with the Illinois Capital Development Board and that he/she has been included on the Illinois Department of Public Health's list of approved Contractors.
 - II. Personnel Experience:
 - a. For Superintendent, the Contractor shall supply:
 - i. Evidence of knowledge of applicable regulations in safety and environmental protection is required as well as training in asbestos abatement as evidenced by the successful completion of a training course in supervision of asbestos abatement as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to the Engineer prior to the start of work.
 - ii. Documentation of experience with abatement work in a supervisory position as evidenced through supervising at least two asbestos abatement projects; provide names, contact, phone number, and locations of two projects in which the individual(s) has worked in a supervisory capacity.
 - b. For workers involved in the removal of friable and non-friable asbestos, the Contractor shall provide training as evidenced by the participation and successful completion of an accredited training course for asbestos abatement workers as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to all employees who are working on this project.
- B. Submit documentation indicating that all employees have had medical examinations and instruction on the hazards of asbestos exposure, on use and fitting of respirators, on protective dress, on use of showers, on entry and exit from work areas, and on all aspects of work procedures and protective measures as specified in Worker Protection Procedures.
- C. Submit manufacturer's certification stating that vacuums, ventilation equipment, and other equipment required to contain airborne fibers conform to ANSI 29.2.
- D. Submit the brand name, manufacturer, and specification of all sealants or surfactants to be used. Testing under existing conditions will be required at the direction of the Engineer.
- E. Submit proof that all required permits, site locations, and arrangements for transport and disposal of asbestos-containing or asbestos-contaminated materials, supplies, and the like have been obtained (i.e., a letter of authorization to utilize designated landfill).
- F. Submit a list of penalties, including liquidated damages, incurred through noncompliance with asbestos abatement project specifications.
- G. Submit a detailed abatement plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination units, the sequencing of work, the respiratory protection plan to be used during this work, a site safety plan, a disposal plan including the location of an approved disposal site, and a detailed description of the methods to be used to control pollution. The plan shall be submitted to the Engineer prior to the start of work.
- H. Submit proof of written notification and compliance with Paragraph "Notifications."

Upon completion of abatement work, submittals shall be provided as follows:

- A. Submit original trip tickets, disposal receipts for all asbestos waste materials removed from the work area, and copies of all waste chain-of-custodies;
- B. Submit daily copies of work site entry logbooks with information on worker and visitor access;
- C. Submit logs documenting filter changes on respirators, HEPA vacuums, negative pressure ventilation units, and other engineering controls; and
- D. Submit results of any bulk material analysis and air sampling data collected during the course of the abatement including results of any on-site testing by any federal, state, or local agency.

Removal of ACM shall be conducted in accordance with NESHAP regulations 40 CFR 61, Subpart M, and OSHA regulations 29 CFR 1926.1101. At the conclusion of the abatement project, all ACM shall be removed from the work area and transported to a regulated landfill location approved for disposal of asbestos-containing waste. Upon completion of the abatement, the Contractor shall provide waste disposal chain-of-custody to the Engineer. These records shall be maintained for a period not less than 3 years.

Upon satisfaction of the Engineer that the requirements above have been met, the plaza canopy will be released for demolition.

If Lead-Based Paints (LBP) are indicated on the Environmental report, manual demolition, scraping, and sanding; heat gun applications; power tool cleaning (with or without dust collection systems); cleanup activities where dry expandable abrasives are used; rivet busting; abrasive blasting (including enclosure movement ore removal); welding; cutting; and torch burning.

Demolition Plans and Procedures. The Contractor shall retain the services of an Illinois Licensed Structural Engineer, experienced in the analysis and preparation of demolition plans, for the completion of a project-specific demolition plan. The Structural Engineer shall sign and seal the demolition plan, drawings, and calculations for the proposed demolition.

The Demolition Plan and Procedures shall be complete in detail for all phases, stages, and conditions anticipated during demolition. The demolition plan shall include structural calculations and supporting documentation necessary to completely describe and document the means, methods, sequence, temporary support positions, and loads necessary to safely demolish the structure in conformance with the contract documents and as outlined herein. The demolition plan shall include an assessment of the existing structure condition and an evaluation of the capacity and stability of the existing structure during demolition. Any deterioration observed in the condition assessment shall be accounted for in the evaluation. The strength and stability of the existing structure or portions of the structure shall be maintained at all times during the proposed demolition. This may include supplemental bracing, shoring, or strengthening of the existing structure.

The Demolition Plans and Procedures shall provide complete details of the demolition process including but not limited to:

- (a) Plan of Work Area: a plan of work area showing the existing bridge, the existing support structures (piers and abutments), roads, railroad track, waterway (including location and dimensions of any navigational channel(s) and any navigational clearances which shall be respected during construction); overhead and underground utilities (include voltage information if power lines); nearby structures and conditions that may limit access; staging or material storage areas; right-of-way and easement lines; identification of any Federal Aviation Administration (FAA) restrictions; site ground suitability for crane operation; any other information that may be pertinent to the demolition.
- (b) Maintenance of Traffic: Information on the location and numbers of lanes being closed, duration of closures, proposed lanes widths of remaining lanes, information on any complete road closures. Procedure and sequence of operations, including a schedule that address work items that need to comply with specific working hour limitations.
- (c) Demolition Sequence: The Demolition Plans and Procedures shall indicate the demolition sequence for all primary members (including indication of any attached secondary members), noting the use of temporary support conditions, such as (but not limited to) holding crane positions, temporary supports, and falsework. The demolition sequence shall be shown in an illustrative plan view of the bridge for each demolition stage, highlighting the structural components to be removed, their weights and center of gravity locations, lifting crane locations for primary member picks, and any temporary support conditions that are necessary during the particular stage. The illustrative plan view shall be accompanied with a written narrative of the procedure to be followed by the demolition contractor, which shall state items such as structural components to be removed, use of temporary supports, use of temporary bracing or hold cranes.
- (d) Crane Information: The Demolition Plans and Procedures shall show the location of each crane to be used for each primary member pick and removal, the crane type, crane pick radius, the crane support methods (crane mats, barges, work trestles, etc.), and the means of attachment to the girders being lifted or supported. The submittal shall include capacity charts or tables that address, and demonstrate the adequacy of, each crane configuration, boom length, counterweight configuration, outrigger configuration, and pick weight required to do the proposed work. The Demolition Plans and Procedures shall also indicate any potential above or below-ground obstructions or restrictions to crane operations (such as existing structures, utilities, etc.). When cranes are required to be placed on existing structures (bridges, culverts, etc.), the structure shall be evaluated to ensure it has adequate capacity to withstand crane loading. Calculations that show the structure can withstand the loads without damage shall be provided.

- (e) Lifting Devices and Special Procedures: The Demolition Plans and Procedures shall include the details, weight, capacity, and arrangement of all rigging (beam clamps, lifting lugs, etc.) and all lifting devices (such as spreader and lifting beams) required for lifting primary members. The Demolition Plans and Procedures shall also specify details for rigging or lifting devices bolted or welded to existing members which are to remain. Girder stresses at critical points along the girder length during progressive stages of demolition shall be evaluated to assure that the structural integrity and stability of the girders yet to be removed are always maintained. Stresses at lift points induced because of lifting shall be evaluated and if required, adequate bracing provided as indicated by the analysis. The strength and stability of the existing structure or portions of the structure shall always be maintained during the proposed crane operations. This may include supplemental strengthening of the existing structure. Where applicable, the Demolition Plans and Procedures shall provide special lifting/handling procedures for any primary member with potential stability or slenderness issues. The Demolition Plans and Procedures shall also include the approximate center of gravity locations for the primary member picks of non-symmetric girders and assemblies.
- (f) Load Restrictions: Restrictions regarding wind loading and construction dead and live loadings, and any other applicable loading restrictions, shall be included on the Demolition Plans and Procedures, as necessary.
- (g) Temporary Supports: The Demolition Plans and Procedures shall include the location of any temporary support structures and bracing, as well as details of the temporary support structure itself. If the temporary support is to be constructed by the Contractor on site, a complete design with full details, including member sizes, connections, and bracing elements, shall be provided in the Demolition Plans and Procedures. All foundation requirements for temporary support structures shall be provided in the Erection Plans and Procedures.
- The Demolition Plans and Procedures shall indicate the location of hold cranes used to provide temporary support to the girder(s) being removed and the associated crane loads, crane type and capacity, and boom lengths.
- If the structure is to be staged constructed and a portion of the existing structure needs to support traffic, the Demolition Plans and Procedures shall clearly indicate appropriate restraint of existing girders from twisting or layover at supports.
- (h) Design Criteria: The demolition engineering calculations shall be prepared in accordance with the AASHTO LRFD Bridge Design Specifications, Latest Edition, the AASHTO LRFD Bridge Construction Specifications, Latest Edition, AASHTO Guide Design Specifications for Bridge Temporary Works, Latest Edition, AASHTO Guide Specifications for Wind Load on Bridges During Construction, and AASHTO S10.1 Steel Bridge Erection Guide Specifications unless otherwise noted on the contract plans or herein. For Existing structures designed per ASD or LFD Designs, AASHTO Standards Specifications for Highway Bridges, 17th Edition may be used.

- (i) Load combinations: When required, load combinations shall be in accordance with AASHTO LRFD Bridge Design Specifications, latest Edition unless otherwise noted in the contract documents.
- (j) Crane Lift Plan: The crane lift plan and procedures shall meet all applicable Occupational Safety and Health Administration (OSHA) requirements. Cranes shall not be operated when wind speeds at the site attain the maximum wind velocity based on the surface/load ratio recommendations of the manufacturer: At winds greater than 20 mph, the operator, rigger, and lift supervisor shall cease all crane operations, evaluate conditions and determine if the lift shall proceed. This determination shall be based on wind calculations per manufacturer's recommendations.
- (k) Structural Adequacy of temporary Components: Substantiate the structural adequacy and stability of any and all temporary support components (including temporary shoring, temporary crane supports, crane mats, barges, work trestles, girder tie-downs, jacking devices, or any other temporary components) necessary for each step of the structure demolition. When applicable, manufacturers' ratings or catalog cuts for pre-engineered devices may be used to meet this requirement.

Lifting beams, lifting devices, rigging components (rigging), and jacking devices shall meet all applicable OSHA requirements for marking with rated loads and proof testing of special custom design grabs, hooks, clamps, or other lifting accessories for prefabricated structures to 125 percent of their rated loads.

Utilities. The Contractor shall contact J.U.L.I.E. 1-800-892-0123 or 811, a minimum of 72 hours prior to start of demolition and their facilities shall be located prior to any work on the site, or in any easement, right-of-way, or suspected utility location. Any utilities shown on the plans are for graphic representation only and shall be verified in the field.

The Illinois Tollway does not participate in the J.U.L.I.E. One-Call System or the National 811 Locate Routing Program. The Contractor shall use the on-line A-36 system on the Illinois Tollway Website <https://www.illinoisvirtualltollway.com/DoingBusiness.aspx> for all locate requests. A valid State, Tollway, or County Contract Number or a valid Permit Number will be required. The Contractor may call 1-331-238-4860 for any questions.

Utilities beyond the property line that serve the structure shall be removed and sealed in an approved manner.

The Contractor shall take reasonable action to determine the location of any underground utility facilities in and near the area for which such excavation operation is to be conducted; and shall plan the excavation or removal to avoid or minimize interference with underground utility facilities within the tolerance zone by utilizing such precautions that include, but are not limited to, hand excavation, vacuum excavation methods, and visually inspecting the excavation while in progress until clear of the existing marked facility;

During and following excavation and/or removal, the Contractor shall protect existing underground utility facilities in and near the excavation or removal area as required to avoid damage to the facility.

The Contractor shall backfill all excavations in such manner and with such materials as may be reasonably necessary for the protection of existing underground utility facilities in and near the excavation or removal area.

Traffic Operations. The traffic using Interstates I-90, I-294, I-190, exit ramps from I-90 and I-294 to WB I-190/Mannheim Road must remain open to all lanes of traffic during demolition activities unless the Contractor has secured the necessary permits from the Illinois Department of Transportation and Illinois Tollway to allow for temporary closure of lanes.

Existing Information. The existing plaza canopy totals approximately 2520 square feet in area as shown on the Existing Demolition plan sheets. The completeness of the information shown on the Existing Demolition plan sheets are not guaranteed and shall be field verified. Information is furnished for the Contractor's convenience and is to be used solely at the Contractor's risk.

Disposal. The Contractor shall be responsible for removing all demolition material and debris from the site, and disposing of demolition materials in a legal manner, in an EPA approved landfill acceptable to the Engineer. The costs for legal disposal of all demolition material shall be at no additional cost to the Department.

Method of Measurement. This work will not be measured for payment.

Any material used for protection, or any temporary supports and temporary working platforms for any element of the plaza canopy removal shall not be measured separately for payment but shall be considered included in this item.

Excavation necessary to perform the removal of existing structures will not be measured for payment.

Basis of Payment. This work will be paid for at the contract lump sum for DEMOLITION OF PLAZA CANOPY.

The environmental testing will not be paid for separately and shall be included in the lump sum cost.

The cost of the ACM abatement, if required, shall be paid separately on a force account basis per Article 109.04 of the Standard Specifications.

REMOVAL OF PLAZA EQUIPMENT

Description. This work shall consist of furnishing all labor, equipment, supplies, materials and operations necessary for removal of existing toll plaza equipment for AET lanes at Toll Plaza 31 (I-90 eastbound/I-294 southbound ramp to I-190 westbound). All removal work, as shown on plans and/ or specified herein, unless specifically covered by other pay items, shall be included.

Applicable Drawings. For the removal work specified in this Special Provision, the Contractor is responsible for determining the extent and staging of removal based on the roadway maintenance of traffic, the removal plans, plaza electrical drawings and a review of all the contract drawings that show the extent of the existing structures to remain in place.

Construction Requirements. Removal work shall conform to the applicable portions of Sections 501 and 842 of the Standard Specifications, the Contract Drawings, and as herein described. Removal work at the existing plaza shall include, but not be limited to, the removal of all ducts, conduits, cables, pipes, toll collection equipment, security/watchdog cameras, card access system, UPS, bypass switch, DC power plant system/batteries, light fixtures, panels, metal boxes, and other miscellaneous items and appurtenances as required.

The Contractor shall prepare detailed working drawings for removal after a careful review of Contract Drawings, record shop drawings, a site walk-thru, and coordination with the Engineer. These working drawings shall be in accordance with Article 105.04 of the Illinois Tollway Supplemental Specifications and shall include staging. Prior to start of removal, the detailed drawings for demolition will need to be approved by the Engineer for conformance to: maintenance of traffic issues, toll collection, and salvage of reusable equipment (existing). All disconnections and removals of toll collection equipment shall be coordinated with the Illinois Tollway Business Systems unit through the Engineer, prior to any disruption in the toll collection of each lane.

The Illinois Tollway intends to salvage certain materials and equipment prior to removal work. The Contractor shall carefully remove these items and return items to be salvaged to the Tollway at their M-6 Maintenance Facility. The Illinois Tollway forces also intend to remove and salvage specific equipment noted on the plans after the new Plaza 31 site is fully tested and operational. All other items shall be disposed of as specified in Sections 501 of the Standard Specifications and/ or the plans. The Contractor shall disconnect and remove panels, junction boxes, lights, cables (except for disconnection of video/data cables) and conduits from the plaza islands and any other equipment shown on the plans, before start of demolition, but after arrangements have been made for the operation of toll collection facilities. The Illinois Tollway Business Systems' maintenance contractor will disconnect existing video/data cables. However, the cables and conduits for video/data shall be removed by the Contractor. The Contractor shall connect all power devices. The Contractor shall notify the Tollway at least 14 days in advance of start of removal operations so that Tollway forces can coordinate these activities with their operations and provide a list of equipment/items to be salvaged.

Removal of the junction and pull boxes, conduits, cables, and equipment mounted on the islands shall be staged in accordance with the sequence of construction and maintenance of traffic shown in the Contract Drawings to continue toll collection at all times during construction as directed by the Engineer. The toll equipment located on the islands should be protected from any damage from construction activities and/or weather elements. Until the electrical cabinets have been removed and/or relocated, the subject equipment shall be protected such that water from rain, snow or flooding does not enter the cabinets. No additional compensation will be made for any such protective work.

All demolished piping, conduits, cables, equipment, and miscellaneous items and appurtenances, except those salvaged to the Tollway as noted on the plans, and any other material shall be removed from the islands, canopy, and plaza and properly disposed of by the Contractor in accordance with Article 202.03 of the Standard Specifications.

Method of Measurement. This work will not be measured for payment.

Basis of Payment. This work will be paid at the contract lump sum price for REMOVAL OF PLAZA EQUIPMENT.

NATURAL GAS SERVICE

Description. This work shall consist of furnishing and installing a natural gas service and all hardware and accessories required for the intended service, from the Nicor gas meter to the building. This work includes piping, valves, regulators, hangers, supports and piping identification. This work also includes the stainless steel conduit sleeve from the gas meter to beyond the retaining wall, as shown on the plans, for installation of the HDPE gas line by Nicor.

Materials and Submittals.

- a. Furnish and install all piping, locking shutoff valve, unions, connections and meter installation per NICOR Standards.
- b. Product Data: For piping, valves, specialties, hangers and supports, and piping identifications. Include pressure rating (psig) and rated capacity (CFH) and accessories for all valves and specialties.
- c. Shop Drawings: Provide piping layout and coordination drawings and for natural gas piping system. Indicate clearances and interfaces with equipment and other piping systems.
- d. Coordination Drawings – Fully coordinated drawings showing all trades
- e. Operation and Maintenance Data: For valves and specialties, include in Operations and Maintenance manuals.
- f. Test Reports: Provide as per requirements of "Field Quality Control" of Part 3.

Codes and Standards.

- a. Illinois State Codes:
 1. 2009 International Building Code
 2. 2012 International Energy Conservation Code
 3. 2009 International Fire Code
 4. 2009 International Fuel Gas Code
 5. 2009 International Mechanical Code
- b. Local Jurisdiction Codes and Ordinances
- c. Local Utility Requirements
- d. National Fire Protection Association (NFPA):
 - 54 - National Fuel Gas Code
- e. American Society of Mechanical Engineers (ASME):
 - A13.1 "Scheme for the Identification of Piping Systems"
 - B31.9 - "Building Services Piping"
 - B16.3 - "Malleable Iron Threaded Fittings"
 - B16.39 - "Malleable Iron Threaded Unions"
- f. American Society for Testing and Materials (ASTM):
 - A53 - "Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless"
- g. American National Standards Institute (ANSI):
 - Z21.15- "Manually Operated Gas Valves for Appliances, Appliance Connector Valves, and Hose End Valves"
 - Z21.21 - "Automatic Valves for Gas Appliances"
- h. American Gas Association (AGA)
- i. Listing and Labeling Requirements of National Electric Code and OSHA Regulation 1910.7

Sequencing and Scheduling

- a. Notification of Interruption of Service: Notify the Engineer 14 days before the gas supply will be turned off.
- b. Work Interruptions: Leave gas systems in a safe condition when interruptions in work occur while repairs or alterations are being made to existing gas piping systems.

Manufacturers

- a. The name of the product manufacturer indicates a product used as the basis of the design shown on the Contract Drawings. The Contractor may submit an equivalent product for approval. Such submittals for "or-equal" status must comply with the requirements of the specifications and codes.

Low Pressure Piping (Above-Grade, Within Building)

- a. Steel Pipe: ASTM A53, Type "S", Seamless, Grade "B", Schedule 40, Black.
- b. Fittings/Joints:
 1. 3 inch & less: Malleable iron, threaded, ASME B16.3, Class 150, standard pattern fittings, threaded joints.
- c. Unions and Flanges:
 1. 3 inch & less: Class 150 malleable iron unions, ASME B16.39, female pattern, bras-to-iron seat, ground joint.

Natural Gas Hose Connector

1-1/2" ID Stripwound Natural Gas Hose Connector. Fully interlocking stripwound hose assembly used for connecting standby generators to a permanent gas piping system. This hose has the ability to absorb the vibration from the generator. Minimum 12" length. Install parallel to generator.

Gaskets and Joining Materials

- a. Joint Compound and Teflon Tape: Approved for natural gas usage and to be applied on male pipe threads only. Lampwick will not be .
- b. Gasket Material: Thickness, material, and type suitable for natural gas.

Valves

- a. Shut-Off Valves:
 1. Manual Valves: Valves to be as per ANSI Z21.15 and ANSI Z21.15A.
 2. Automatic Valves: Valves to be as per ANSI Z21.21 or ANSI Z21.21A; 2-inch and smaller with threaded ends; 2-1/2 inch and larger with flanged ends.
- b. Low Pressure Gas Stop Valves: 2-inch and smaller; AGA certified and stamped, plug or ball type; bronze body & plug or chrome-plated brass ball; with flat head, square head, or lever handle and threaded ends; with locking (tamperproof) feature.

Piping Specialties

- a. Gas Meters, Gas Meter Bars and Service Gas Pressure Regulators furnished and installed by the Gas Utility Company, NICOR.
- b. Gas Pressure Regulators: ANSI Z21.18 or ANSI Z21.18a, single stage, steel jacketed, corrosion-resistant pressure regulators. Include atmospheric vent, elevation compensator, with threaded ends for 2 inches and smaller and flanged ends for 2-1/2 inches and larger. Regulator pressure ratings, inlet and outlet pressures, and flow volume in standard cubic feet per hour of natural gas at of specific gravity are as indicated on Contract Drawings.
 1. Line Gas Pressure Regulators: Inlet pressure rating not less than system pressure.
 2. Gas Pressure Regulators: Inlet pressure rating not less than system pressure, with capacity and pressure setting matching appliance.
 3. Gas Pressure Regulator Vents: Factory- or field-installed corrosion-resistant screen in opening when not connected to vent piping.

Protective Coating and Corrosion Protection

- a. Furnish pipe and fittings with factory-applied, corrosion-resistant polyethylene coating for use in corrosive atmosphere. Coating properties include:
 1. Applied to pipe and fittings treated with a compatible primer prior to application of tape.
 2. Overall Thickness: 20 mils, synthetic adhesive.
- b. Field applied coating shall be installed in accordance with the requirements of the local utility.
- c. Corrosion protection systems shall be in accordance with the requirements of the local utility.
- d. Prepare and paint outside of conduits with coal tar epoxy-polyamide paint as approved by utility company.

Hangers and Supports

- a. Hangers and supports are to be provided under this Section as specified herein.
- b. Manufactured Units
 1. Hangers and support components shall be factory fabricated of materials, design, and manufacturer complying with MSS SP-58, and meeting Utility Company requirements.
 - i. Components shall have galvanized coatings where installed for piping and equipment that will not have field-applied finish.
 - ii. Pipe attachments shall have nonmetallic coating for electrolytic protection where indicated on Contract Drawings.

Piping Identifications

- a. Pipe Markers:
 1. Snap-On Type: Provide manufacturer's standard pre-printed, semi-rigid snap-on, color-Coded pipe markers, complying with ASME A13.1 and as approved by the Engineer.
 2. Small Pipes: For external diameters less than 6", (including insulation if any), provide full-band pipe markers, extending 360 degrees around pipe at each location, fastened by one of the following methods:
 - i. Snap-on application of pre-tensioned semi-rigid pipe marker.
 - ii. Taped to pipe (or insulation) with color-Coded plastic adhesive tape, not less than 3/4" wide; full circle at both ends of pipe marker, tape lapped 1-1/2".
 3. Lettering: Comply with piping system nomenclature as specified, scheduled or shown on Contract Drawings, and abbreviate only as necessary for each application.
 4. Arrows: Print each pipe marker with arrows indicating direction of flow, either integrally with piping system service lettering (to accommodate both directions).
- b. Valve Tags:
 1. Valves in equipment rooms and main risers shut-off valves shall be tagged with valve tags.
 2. Valve Tags: Provide stainless steel valve tags with stamp-engraved piping system abbreviation in 1/4" high letters and sequenced valve numbers 1/2" high, and with 5/32" hole for fastener.
 - i. Provide 1/2" diameter tags, except as otherwise indicated.
 - ii. Provide size and shape as specified or scheduled for each piping system.
 - iii. Fill tag engraving with black enamel.
 3. Valve Tag Fasteners: Provide manufacturer's standard stainless steel chain (wire link or beaded type), or S-hooks of the sizes required for proper attachment of tags to valves, and manufactured specifically for that purpose.
 4. Access Panel Markers: Provide manufacturer's standard 1/16" thick engraved laminate access panel markers, with abbreviations and numbers corresponding to concealed valve. Include 1/8" center hole to allow attachment.

CONSTRUCTION REQUIREMENTS

Preparation for Installation

- a. Precautions: Close equipment shutoff valves before turning off gas to the premises or Section of piping. Perform leakage test as specified in "Field Quality Control" Article to determine that all equipment is turned off in the piping Section to be affected.
- b. Prepare and paint outside of conduits with coal tar epoxy-polyamide paint as approved by utility company.

Piping Installation

- a. Drips and Sediment Traps: Install drip and sediment traps at points where condensate may collect, at gas meters, and as close as practical to inlets to gas appliances. Locate where readily accessible to permit cleaning and emptying. Do not install where condensate would be subject to freezing.
 1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use minimum-length nipple of 3 pipe diameters, but not less than 3 inches long, and same size as connected pipe. Install with space between bottom of drip and floor for removal of plug or cap.
- b. Install gas piping at a uniform grade of 1/4 inch in 15 feet, upward toward risers. Install piping upward from service risers to meters, and service regulator.
- c. Make reductions in pipe sizes using eccentric reducer fittings.
- d. Connect branch piping from top or side of horizontal piping and not from bottom.
- e. Install unions in pipes 2 inches and smaller, adjacent to each valve, at final connection to each piece of equipment, and elsewhere as indicated on Contract Drawings.
- f. Install dielectric fittings (unions and flanges) with 1 ferrous and 1 brass or bronze- end connections, separated by insulating material, where piping of dissimilar metals are joined.
- g. Anchor piping to ensure proper direction of piping expansion and Contraction. Install expansion joints, expansion loops, and pipe guides as indicated on Contract Drawings.
- h. Install vent piping for gas pressure regulators and gas trains, extend outside the building, and vent to atmosphere. Terminate vents with turned-down, reducing elbow fittings with corrosion-resistant insect screens.
- i. All gas piping shall be installed in accordance with utility company specifications for cathodic protection.
- j. Install gas piping next to gas-utilizing equipment and appliances to allow servicing and maintenance.
- k. Connect gas piping to gas-utilizing equipment and appliances with shutoff valves and unions. Make connections downstream of valves and unions, with flexible connectors where indicated.
- l. Seal all penetrations to maintain a watertight and airtight building.

Valve Installation

- a. Install valves in accessible locations, protected from physical damage. Tag valves with a metal tag attached with a metal chain indicating the piping systems supplied.
- b. Install a gas valve upstream of each gas pressure regulator. Where two gas pressure regulators are installed in series in a single gas line, a manual valve is not required at the second regulator.
- c. Install a gas valve upstream and within 6 feet of each gas-utilizing appliance. Install a union or flanged connection downstream from the valve to permit removal of controls.
- d. Install pressure-relief or pressure-limiting devices so they can be readily operated to determine if valve is free; test to determine pressure at which they will operate; and examine for leakage when in closed position.

Hanger and Support Installation

- a. Install hangers for horizontal piping with following maximum spacing and minimum rod sizes:

Nominal Pipe Size (Inches)	Steel Pipe Max. Span (Feet)	Min. Rod Diameter (Inches)
1/2 to 1-1/4	8	3/8
1-1/2 to 2	12	3/8

- b. Install building attachments within concrete or to structural steel. Install additional attachments at concentrated loads, including valves, guides, strainers, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten insert to forms. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- c. Install hangers and supports to allow controlled movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion.
- d. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

Adjusting of Hangers and Supports

- a. Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- b. Touch-Up Painting: Immediately after erection of anchors and supports, inspect for any abraded areas of shop paint and paint exposed areas with same material as used for shop painting to comply with SSPC-PA-1 requirements for touch-up of field-painted surfaces.
 1. Apply by brush to provide a minimum dry film thickness of 2.0 mils.

Installation of Piping System Identification

- a. Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.
- b. Locate pipe markers and color bands as follows wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior non-concealed locations:
 1. Near each valve and control device.
 2. Near each branch, excluding short take-offs for equipment.
 3. Near locations where pipes pass through walls or floors/ ceilings, or enter non-accessible enclosures.
 4. At access doors, and similar access points which permit view of concealed piping.
 5. Near major equipment items and other points of origination and termination.
 6. Spaced intermediately at maximum spacing of 50' along each piping run, except reduce spacing to 25' in congested areas of piping and equipment.
 7. Piping operating at pressure above 1/2 PSIG shall be marked to identify the maximum pressure levels with the piping.
 8. Piping at different pressure shall be color Coded.
- c. Provide valve tag on every valve, cock and control device in each gas piping system; exclude check valves, valves within factory-fabricated equipment units. List each tagged valve in valve schedule for each piping system.
- d. All valves shall be tagged to indicate the operating pressure level within the distribution piping.

Painting

- a. Exposed gas piping both inside and outside building shall be painted after installation with a compatible metal primer coat and a finish coat of yellow paint compatible for application.

Electrical Bonding and Grounding

- a. Install above-ground portions of natural gas piping systems that are upstream from equipment shutoff valves, electrically continuous and bonded to a grounding electrode according to NFPA 70.

Do not use gas piping as a grounding electrode.

Field Quality Control

- a. Inspect, test, natural gas systems according to NFPA 54, gas utility requirements, and local jurisdiction requirements.
- b. Repair leaks and defects with new materials, and retest system until satisfactory results are obtained.
- c. Report test results promptly and in writing to the Engineer.
- d. Verify capacities and pressure ratings of gas meters, regulators, valves, and specialties.
- e. Verify correct pressure settings for pressure regulators.
- f. Verify that specified piping tests are complete.

Adjusting

- a. Adjust controls and safety devices. Replace damaged and malfunctioning controls and safety devices.

Method of Measurement. This work will be measured in units of each, completed in place and accepted.

Basis of Payment. This work will be paid for at the contract unit price per each for NATURAL GAS SERVICE.

VIDEO POWER JUNCTION BOX (ILLINOIS TOLLWAY)

Effective: March 1, 2022

Revised: March 1, 2023

Description. This work shall consist of furnishing, installing, configuring, and testing of the Video Power Junction Box (VPJB) per the contract plans and as directed by the Engineer, and as part of a fully functional ITS site. This work shall include providing new conduits, electrical cables, communication and materials required to deliver power and communication to the VPJB and to the ITS devices connected to the Illinois Tollway ITS network via the VPJB.

The work under this special provision shall be in association with the installation of ITS device pole (where applicable), electrical cables, grounding, communications, and security CCTV camera for structure mount, pole mount, or wall mount.

Two models of VPJB are available. **Model A** shall be used where the distance between the VPJB and the Illinois Tollway main communication switch in a plaza building is less than three hundred feet and connected via indoor rated CAT 6 cable. **Model B** shall be used where the distance between the VPJB and the communication switch located in the plaza building is greater than three hundred feet and connected via fiber optic cable.

Materials. The main components of the system are as described below. Equipment may vary by type of installation as shown on the plans. All other ancillary connection cables, circuit breakers, brackets, and all other items required for the installation of a fully functional VPJB, are shown on drawing(s).

- Enclosure Cabinet
- Grounding
- Power supply, terminal blocks, power outlets, and circuit breakers
- Ethernet DIN Relay and components
- CCTV PoE Injector and PoE Surge Suppressor
- Network switch (VPJB Model B only)
- Power cables
- CAT 6 communication cable
- Labeling

The following are the specific materials for the system component described above. The number of CCTV cameras connected to the VPJB may vary by location. The Contractor shall not exceed a maximum of four PoE power injectors and surge suppressors per VPJB enclosure.

If a site requires the installation of one or two or three cameras connected to one Video Power Junction Box then only install the required quantity of PoE injectors and CCTV surge suppressors.

- **Enclosure Cabinet**

- **Video Power Junction Box NEMA 1, for above ground indoor installation**

- The Enclosure Cabinet shall be a NEMA 1, 36" H x 30" W x 12" D enclosure manufactured by Hoffman, Model A36N30DLP with a 32" x 28.5" back panel manufactured by Hoffman, Model A36N30MP or approved equivalent. The enclosure shall be mounted to the wall at the location shown on the plans using manufacturer recommended hardware. The enclosure shall also be supplied with a grounding kit so that the enclosure door can be properly grounded to the cabinet.

- **Video Power Junction Box NEMA 4X, for underground tunnel installation or outdoor installation**

- The Enclosure Cabinet shall be a NEMA 4X Stainless Steel, 36"H x 30"x 12"D enclosure manufactured by Hoffman, Model A36H3012SS6LP with a 33" x 27" back panel manufactured by Hoffman, Model A36P30 or approved equivalent. The enclosure shall be mounted to the wall at the location shown on the plans using manufacturer recommended hardware. The enclosure shall also be supplied with a grounding kit so that the enclosure door can be properly grounded to the cabinet.

The Contractor shall install the enclosure cabinet such that a minimum clearance is maintained on both sides of the enclosure. Thereby, allowing the door to open to a minimum of 120 degrees during maintenance while avoiding interference with nearby equipment and enclosures.

- **Grounding**

The enclosure shall be equipped with two (2) grounding bar systems as shown on the plans. The ground bars shall be Hoffman Model PGS2K or approved equivalent. One ground bar shall be connected to the neutral bus and one shall be connected to the ground bus.

- **Power Requirements**

The enclosure shall be equipped with a 1-pole, 30 Amp circuit breaker with terminal shield. The circuit breaker shall be Eaton Model HFD1030L & 625B229G06 or approved equivalent. The circuit breaker shall be installed in the enclosure as shown on the plans.

A three (3) conductor 10 AWG electric cable shall be installed between the video power junction box and existing UPS panel inside the Plaza or power source inside a 1-1/2" galvanized steel conduit and terminated at the circuit breaker, unless otherwise shown on the plans.

If the power source is from an existing UPS panel, a 30 Amp circuit breaker may need to be installed inside the UPS panel. The 30 Amp circuit breaker shall be included as part of this pay item and shall not be paid for separately.

A clear plexiglass safety cover panel shall be provided to encompass the 120 VAC equipment as shown on the plans with dimensions and details shown on the plans. The Contractor shall permanently affix a label stating "DANGER 120 VAC" for voltage as field conditions warrant.

- **Ethernet DIN Relay and Components**

The enclosure shall be equipped with an Ethernet DIN Relay Digital Loggers Model DIN IV or approved equivalent. The DIN Relay shall be mounted on a DIN rail as shown on the plans. A 24 VDC - 4Amp power supply to power the DIN Relay shall be installed on the DIN rail as shown on the plans. The power supply shall be Wavetronix Model Click 204 or ISS LAMBDA DSP100-24. The power supply shall be wired as shown on the plans.

The Contractor shall install a junction box with a quad receptacle, and it shall be wired as shown on the plans.

For VPJB Model A, the Contractor shall install an indoor grade CAT 6 communication cable between the DIN Relay and the existing plaza network switch when the distance is less than three hundred feet as shown on the plans.

For VPJB Model B, the Contractor shall install a fiber optic cable between the plaza communication switch and the VPJB when the distance is greater than three hundred feet. The cameras to be connected to the VPJB Model B will be connected to the communication switch in the VPJB Model B enclosure.

For each of the CCTV camera to be installed outdoor, the Contractor shall install an outdoor rated CAT 6 communication cable between the PoE camera surge suppressor to the CCTV camera and no transition coupling is permitted.

- **CCTV PoE injector and PoE Surge Protection**

The CCTV PoE injector and surge suppressor shall be provided as part of the specific CCTV camera pay item and shall be installed in the enclosure. The number of cameras being terminated at each enclosure as shown on the plans shall not exceed four per VPJB. See the project plans for more details. All wiring shall be done according to the plans. The CAT 6 cables from the PoE surge suppressor to the CTV camera shall pass through the VPJB enclosure at the locations shown on the plans through a 1-1/2" conduit.

Use PoE model Axis T8154 60W Midspan 120 VAC.

PoE CCTV camera models shall be furnished with a CAT6 Surge Protection Device (SPD) to protect against power surges in the communication cable. For Axis cameras, the surge suppression device shall be by Axis model number T8061.

The Contractor shall terminate the CAT 6 cable from each CCTV camera at the PoE surge suppressor. The Contractor shall also run a CAT 6 jumper from the PoE surge suppressor to the PoE injector. For VPJB Model A, the Contractor shall install an indoor rated CAT 6 cable from each PoE injector to the existing network switch in the plaza communication room. For a VPJB Model B, the Contractor shall install a fiber optic cable between the VPJB and the plaza communication switch when distance exceeds three hundred feet. All CCTV connected to a VPJB Model B will be connected to the communication switch within the VPJB Model B enclosure.

The final connection port on the network switch shall be coordinated with the ITS network engineer at least 10 business days prior to making the connection.

- **Network switch (Video Power Junction Box Model B only)**

The Contractor shall install a Cisco network switch and associated power supply on a DIN Rail inside the VPJB Model B enclosure as shown on the plans. The Cisco switch with power supply shall be a Cisco IE-4000-8T4G-E switch with PWR-IE170W-PC-AC= power supply and L-IE4000-RTU= IP services license.

The Contractor shall provide a Single Mode Fiber Small Form-Factor Plug (SFP) Module and shall be a Cisco 1Gbps transceivers Model GLC-LX-SM-RGD.

The Fiber Optic Communication ITS Assembly shall be paid for separately under Fiber Optic Communications, ITS Assembly pay item.

- **Cables**

All cables internal to the VPJB enclosure providing power to the various components shall be 16 AWG. Cables used for grounding shall be green, neutral conductor shall be white, and power (HOT) conductor shall be black. For DC power cables the positive shall be red and the negative shall be black. All power wiring shall be RHH/RHW with wire terminals or tinned.

All CAT 6 cable(s) shall be a four (4) pair 23 AWG bare copper wire Belden Model 7953A blue in color or approved equivalent. For CCTV installed outdoor, the CAT 6 cable(s) between the CCTV camera and the PoE surge suppressor shall be outdoor rated and no transition coupling is permitted. For CCTV installed in a building, the cable shall be indoor rated CAT 6 cable for connection between the CCTV camera and the PoE surge suppressor. All other CAT 6 cable(s) shall be indoor rated. Both ends of the CAT 6 cable shall be terminated with RJ-45 modular data plugs using the T-568B Ethernet wiring standard. The Contractor shall use the appropriate RJ-45 connector for the CAT 6 cable provided by the camera manufacturer before entering the camera mounting arm housing.

The procurement and installation of the components described above and on the plans including the power cables, terminal blocks, DIN rail, cable management, mounting hardware, and conduit associated with this pay item shall be included as part of this pay item and shall not be paid separately.

- **Labeling**

The Contractor shall follow the Illinois Tollway ITS Labeling Guide for all labeling of components. This shall include a label on the IP DIN Relay showing the full IP address. The ITS Labeling Guide manual can be found on the Illinois Tollway's website.

A laminated plastic nameplate with 3/8 inch black letters on a white background shall be installed on the front of each junction box, and laminated plastic nameplates with 1/4 inch black letters on white background shall be installed at terminal blocks with self-tapping stainless steel screws.

The Contractor shall affix a small label with the Illinois Tollway Contract number and date of manufacturing on the inside of the VPJB access door.

The Contractor shall submit to the Engineer a request for variance when changing equipment provided on the Submittal attached to this special provision. The variance shall be the formal request of an approval of an equal or better substitute for a specified part by providing justification and supporting manufacturer's specifications and other relevant documentation.

CONSTRUCTION REQUIREMENTS

The Contractor shall closely coordinate with the Engineer. This includes, but is not limited to, the following:

Pre-Procurement Documentation Approval. The Contractor shall submit for approval to the Engineer, within 10 business days from NTP, a detailed schedule showing dates for: product submittals and approvals; device configuration by the Illinois Tollway; construction/installation; testing; burn-in period; and warranty of each video power junction box. This detailed schedule shall be included in the project schedule, as required per Illinois Tollway Supplemental Specifications Article 108.02. Schedules for each video power junction box to be deployed within the larger construction contract and shall be staggered based on resources to be employed.

If this installation is part of a larger ITS deployment or construction project, then the furnishing, installation, calibration and testing of the video power junction box site(s), shall be specifically noted in the overall project schedule.

The Contractor shall submit for approval to the Engineer, within 10 business days from NTP, a completed Contractor Submittal Checklist and associated submittals.

The Contractor shall make all submissions to the Engineer through the Illinois Tollway's Web Based Project Management (WBPM) system.

The Contractor must obtain approval of the schedule, catalog cut sheets, cabinet wiring diagrams, and calculations from the Engineer prior to purchasing any equipment and subsequently performing the installation per the approved documents, contract plans, and specifications.

Pre-Installation Requirements. When there are less than 5 Cisco communication switches and less than 5 DIN Relays, the Illinois Tollway will elect to have the Contractor deliver the switches and DIN Relays to the Illinois Tollway's Central Administration (CA) Building for configuration and labeling prior to installation by the Contractor. The Contractor shall deliver the switches and DIN Relays at least thirty (30) days prior to the scheduled field installation. The Contractor shall provide an A-14 form to the Engineer during acceptance of the communication switch at CA showing the equipment, each equipment specific serial number, and the field location of each piece of equipment. This form will be signed by both the Engineer and the Contractor. The Contractor shall take possession of the devices from the Illinois Tollway upon notification by the Engineer of configuration and labeling completion.

When 5 or more switches or DIN Relays need programming, the Illinois Tollway ITS technician will program all ITS elements within that system (Switch, CCTV(s), DIN Relay (s)) at a location determined by the Contractor. At least thirty (30) days prior to the scheduled field installation, the Contractor shall provide notice to the Illinois Tollway to schedule the programming. The Contractor shall have all units ready for programming at the same time and shall specify the location of the devices to be programmed.

Video Power Junction Box Installation. The Contractor shall install the VPJB enclosure to the building structure as shown on the contract plans.

All associated conduit, wire, power service feeds, circuit breakers, brackets, etc. as shown on the contract plans, and all items and workmanship required to successfully pass the Site Test stated within this specification and in the Illinois Tollway "ITS Device Testing Requirement" Special Provision, will be the sole responsibility of the Contractor and incidental to this pay item.

The Contractor shall be responsible for making the final power connection to power panels. The Contractor shall coordinate with the Illinois Tollway and Building Maintenance prior to final connection.

The Contractor shall coordinate with the Illinois Tollway for exact location of the VPJB prior to installation. The VPJB installation shall include any location adjustment within 20ft of the proposed location to accommodate field adjustment to avoid conflicts with the existing facilities and other facility equipment. This work shall be included as part of this pay item.

Testing. The Contractor shall be required to perform testing according to the ITS Device Testing Requirements Special Provision using the attached checklists and as modified below.

Modifications to First Unit Factory Visual Inspection. The Contractor (or the Contractor's equipment fabricator) shall completely assemble for inspection a VPJB of each configuration specified in the plans which includes the cabinet, all equipment, modules, components and complete all internal wiring (including labeling). The Contractor shall have one set of contract plans and two sets of shop drawings on site to be redlined with any discrepancies noted. One set of redlines will be retained by the Illinois Tollway. The Contractor may optionally perform an AC power test in the shop following successful completion of the Factory Visual Inspection.

Modifications to Site Testing. The Engineer shall attach to the Site Test Report photos of the assembly showing:

- The interior of the cabinet, framing all components together as closely as possible.
- The cabinet mounting arrangement attaching it to the building.
- The camera screen shot for each CCTV installed and connected via VPJB. Refer to the Illinois Tollway "CCTV Camera ITS Assembly" Special Provision for details.

Warranty. All VPJB units shall be warranted and guaranteed against defects and/or failure in design, materials, and workmanship within the warranty period as stipulated in the Illinois Tollway "Warranty" Special Provision. The Contractor shall submit the warranty terms as part of each material item's shop drawing submittal for approval.

The warranty shall provide that, in the event of a malfunction during the warranty period, the defective system component shall be replaced with a new component by the manufacturer or his/her representative.

Any system component that, in the opinion of the Engineer, fails three (3) times prior to the expiration of the warranty will be judged as an unsuitable system and shall require the entire system be replaced by the device manufacturer or representative with a new system of the same type at no additional cost to the Illinois Tollway. The unsuitable system shall be permanently removed from the project. A failure shall also be defined as the field device becoming unable to comply with all applicable standards at the time of original construction.

All manufacturer's equipment guarantees, or warranties shall be included in the maintenance manuals for the subject equipment.

Method of Measurement. This work will be measured in units of each.

Basis of Payment. This work will be paid for at the contract unit price per each VIDEO POWER JUNCTION BOX, of the model and enclosure type specified.

The payment to the Contractor will adhere to the following schedule:

Ten percent (10%) of the contract unit price will be paid upon receipt of submission and approval of all product submittal documentation, shop drawings, and calculations.

Eighty percent (80%) of the contract unit price will be paid at completion of the local field test acceptance by the Engineer. Written approval from the Engineer that all local field tests have been accepted is required before payment is released.

The final ten percent (10%) of the contract unit price will be paid after Final System Acceptance. The final inspection of the entire system will be performed by the Engineer in the presence of a representative of the Contractor. Written approval from the Engineer that Final Acceptance has been granted is required before payment is released.

The installation and testing of the ITS device pole (where applicable), electrical cables, grounding, communications, and security CCTV Camera (structure mount, pole mount or wall mount) shall be paid for under separate items.

VIDEO POWER JUNCTION BOX CHECKLIST

PAY ITEM # JT132822, JT132823, JT132832, JT132833, JT132834, JT132835 SUBMITTAL STATUS
 Contract # APPROVED
 e-Builder Submittal Package #: APPROVED AS NOTED
 e-Builder Submittal Date: REJECTED
 Reviewed By (CM Staff Name):
 Review Date:

LOCATION OF REFERENCE	DETAIL SHEET ITEM	ITEM DESCRIPTION	APPROVED MANUFACTURER	APPROVED MODEL No.	SUBMITTED AS SPECIFIED?	MANUFACTURER	PROPOSED EQUIVALENT MODEL No.	NOTES
CABINET ENCLOSURE AND ASSOCIATED MATERIAL								
SPEC. PROV.		NEMA 1 ENCLOSURE ENCLOSURE BACKPANEL	HOFFMAN	A 36N30DLP				
SPEC. PROV.		NEMA 4X ENCLOSURE ENCLOSURE BACKPANEL	HOFFMAN	A 36N30MIP				
SPEC. PROV.		TERMINAL BLOCKS	HOFFMAN	A 36H30T2SS6LP				
SPEC. PROV.		TWO GROUNDING BAR SYSTEM (GROUND & NEUTRAL)	ALLEN BRADLEY	1492-CD8				
DETAIL DWG.		(1) STANDARD RECEPTACLE (CABINET)	HOFFMAN	PSS2K				
DETAIL DWG.		DUCT SEAL PUTTY	HUBBELL	BR20WR				
DETAIL DWG.		DUCT SEAL PUTTY	RAINBOW TECHNOLOGIES					
DETAIL DWG.		DN RAIL (MINIMUM OF 36")						
ETHERNET FIELD SWITCH								
SPEC. PROV.		ETHERNET FIELD SWITCH	CISCO	IE-4000-8T4G-E				
SPEC. PROV.		ETHERNET FIELD SWITCH POWER SUPPLY	CISCO	PWR-IE170W-PC-A-C=				
SPEC. PROV.		IP SERVICES LICENSE	CISCO	L-IE4000-RTU=				
SPEC. PROV.		(1) 1 GBPS SFP FIBER TRANSCEIVER MODULE	CISCO	GLC-LX-SM-RGD=				
DETAIL DWG.		OUTDOOR / INDOOR RATED 4PR 23AWG 1000BASE-T CAT6 PATCH CABLES						
CIRCUIT BREAKERS								
DETAIL DWG.		5A CIRCUIT BREAKER (4)	ALLEN BRADLEY	1492-SPM1B050				
DETAIL DWG.		240V, 1P, 30A CIRCUIT BREAKER COVERED TERMINAL SHIELD	EATON	HFD1030L				
IP ADDRESSABLE RELAY								
SPEC. PROV.		IP ADDRESSABLE RELAY 8-CHANNEL	DIGITAL LOGGERS	DN IV				
AC/DC POWER SUPPLIES/TRANSFORMERS								
SPEC. PROV.		AC/DC POWER SUPPLY	WAVETRONIX, LAMBDA	CLICK-204, DSP100-24				
DETAIL DWG.		CLEAR FLEXIGLASS COVERING						
SPEC. PROV.		120 VAC SURGE PROTECTION DEVICE	COOPER CROUSE HINDS	MA15/D1/SI OR APPROVED EQUAL				
DETAIL DWG.		1" x 1" WIRING DUCT	PANDUIT	FIX1LG6 WITH COVER C1LG6				
DETAIL DWG.		SPlice BLOCK	ALTECH	38041				

SELF SUPPORTING COMMUNICATION TOWER FOUNDATION

Description

This work shall consist of designing and constructing a foundation for the 70-foot monopole radio-tower system at the proposed Plaza 31 site.

Contractor Responsibilities

The Contractor shall be responsible for coordinating and monitoring the schedule of the tower foundation.

It is the Contractor's responsibility to ascertain existing field conditions before bidding on the Project, specifically as they relate to Lump Sum items.

The Contractor shall also be responsible for the following items:

- (a) Providing the name, local address and 24-hour telephone number of the on-site supervisor. The Contractor shall promptly notify the Engineer of any changes in supervision or any changes in the supervisor's local address and telephone number.
- (b) Removing all excavated material and legally dispose of new foundation excavation off Tollway Right-Of-Way.

All foundation construction, materials and assemblies associated with the monopole radio-tower system shall be detailed and documented in working / shop drawings, as required by the Illinois Tollway Supplemental Specifications Article 105.04. Any fabrication or construction done prior to the review and approval by the Engineer shall be at the Contractor's risk. All corrections shall be made at no additional cost to the Department.

Submittals Required

The Contractor shall submit legible sets of the following required documents:

- (a) Foundation design - 5 sets for distribution stamped by Structural Engineer licensed in the State of Illinois.
- (b) Certified mill test report for steel members and bolts for review.
- (c) The Contractor shall provide for tower structural analysis and planned foundation analysis and approval by Tower Technology, Inc. of Kansas City, MO., prior to construction. Analysis and S.E. stamped approval shall be submitted to the Engineer. Upon final tower erection, the Contractor shall also employ Tower Technology, Inc. for a field inspection of the tower and foundations.

Specific structural loading requirements are cited under the "SELF SUPPORTING COMMUNICATION TOWER STRUCTURAL STEEL" special provision. It is the responsibility of the Contractor to verify that all bids for this tower project have been approved by Tower Technology, Inc. to meet the minimum loading requirements set forth.

Tower foundation/caisson shaft dimensions and rebar inspection, to verify compliance with submittals from tower manufacturer, are the responsibility of the Contractor, **NOT** Tower Technology, Inc. Foundations/caissons may **NOT** be poured until compliance with tower manufacturer submittals is verified by the Engineer.

NOTE TO CONTRACTOR: Tower Technology, Inc. shall be hired, at Contractor's sole expense, but reporting to the Engineer, for design review and structural field inspection of the tower and foundation. Tower Technology's determination shall stand as a final opinion and will not be negotiable.

Design Criteria - Foundations

The Tower subcontractor shall provide all personnel supervision, equipment, tools and transportation necessary to design, locate and construct foundations as shown on the plans. The work shall be performed by a specialty contractor experienced in tower foundation construction. The Contractor shall submit satisfactory evidence of successful completion of at least three recent installations comparable to the scope of this contract.

Tower foundations shall be designed as to be in accordance with the tower steel requirements of structural unit stresses resulting from the specified loads not exceeding 0.75 of the allowable unit stresses.

Contractor shall submit both a list containing at least three (3) projects completed in the last three (3) years on which the Tower Foundation subcontractor has constructed similar foundations. The list of projects shall contain names and phone numbers of owner's representatives who can verify the Tower Foundation subcontractors' participation on those projects. No later than one month prior to construction, the Contractor shall submit an installation plan for review by the Engineer. This plan shall provide information on the following:

- (a) Name and experience record of the superintendent in charge of operations for this project.
- (b) List of proposed equipment to be used including cranes, drills, augers, bailing buckets, final cleaning equipment, dewatering equipment, slurry pumps, core sampling equipment, tremies or concrete pumps, casing, etc.
- (c) Details of overall construction operation sequence.
- (d) Details of excavation methods.
- (e) When slurry is required, details of the methods to mix, circulate and de-sand slurry.
- (f) Details of methods to clean the excavation.
- (g) Details of reinforcement placement including support and centralization methods.
- (h) Details of concrete placement including proposed operational procedures for free fall, trim or pumping methods.

The Engineer will evaluate the installation plan and calculations for conformance with the plans and specifications. The Engineer will notify the Contractor of any additional information required and/or changes necessary to meet the Contract requirements. All procedural approvals given by the Engineer shall be subject to trial in the field and shall not relieve the Contractor of the responsibility to satisfactorily complete the work as detailed in the plans and specifications.

Shop Drawings: Shall include a layout showing the location of each foundation; foundation details; anchor bolt locations for tower base plates; reinforcement steel schedule; bills of material; details; pertinent dimensions; and spacing for each type of foundation.

Certified Reports: The Contractor shall furnish certified mill test reports for reinforcement bars and anchor bolts, as to materials chemical and physical properties and origin of manufacture. The Contractor shall furnish all materials in accordance with the *Structural Steel Procurement Act* of the State of Illinois (Act 565/4, 565/5), which requires the use of structural materials (framing and fasteners) manufactured or produced in the United States. The final assembly of foreign produced or manufactured steel products in the United States does not constitute compliance with this act and will not be accepted by the Department. Foreign steel, regardless of where it is poured or stamped, is unacceptable. Subsurface Investigation Report must include boring logs if the Contractor proposes changes to the construction specification.

Prior to start of construction, the Contractor shall be responsible to confirm that tower center locations are correct and correspond to the site drawings even though stakes may have previously been set by others.

Qualification and Certifications

In addition to the requirements stated in the contract documents, the Contractor shall submit:

1. A copy of company's Quality Assurance program with the shop drawings for review.

Soil Borings

See the contract plans for soil boring information.

Unit Stresses

All components of a tower and supporting elements shall be so proportioned that the unit stresses resulting from the specified loads shall not exceed 0.50 of the allowable unit stresses of the *Specification for the Design, Fabrication and Erection of Structural Steel for Buildings* issued by the American Institute of Steel Construction.

Excavations - Open Pit

Character of Excavation: The Contractor shall ascertain for himself the character of the excavation to be performed. Any subsurface investigation furnished to the Contractor by the Department is for reference only and does not limit his liability.

All excavation included in the base bid shall include the removal of all materials as encountered in obtaining the required lines, grades and size and depth of foundations regardless of the method used or the character to type of material removed, with the exception of rock as defined within the "Excavation of Rock" Article of this special provision.

Quality Assurance

The overall workmanship shall be of a high quality generally accepted as standard practices and procedures in the industry. All work shall be carefully and accurately performed. All members shall be straight and true to the drawings.

The Contractor shall maintain his work area at the tower site in a neat and orderly condition free of debris and unnecessary packing material.

- (a) American National Standards Institute (ANSI) and Telecommunications Industry Association (TIA): ANSI/TIA-222-I, "Structural Standards for Antenna Supporting Structures, Antennas, and Small Wind Turbine Support Structures."
- (b) American Concrete Institute (ACI): 318-02 Building Code Requirements for Reinforced Concrete.
- (c) American Society for Testing and Materials (ASTM) Standards:
 - ASTM A-706 Specifications for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
 - ASTM F-1554 Specification for Anchor Bolts, Steel 36, 55, and 105-ksi Yield Strength
- (d) International Building Code (IBC), 2024

Concrete

Concrete for foundations shall be Class DS in accordance with Section 1020 of the Standard Specifications.

Measuring, Mixing and Delivery of Concrete

General: Unless otherwise directed, the concrete ingredients shall be measured, mixed and delivered in truck mixers in accordance with *ASTM C94, Alternative No. 2*.

Job Mixed Concrete: If approved, for small quantities of concrete, job mixed concrete shall be mixed in an approved type batch mixer. Do not exceed manufacturer's rated capacity of mixer.

Ready (Truck) Mixed Concrete: With each batch of concrete delivered to the project, the concrete supplier shall furnish duplicate batch delivery tickets as required by *ASTM C94*.

Anchor Bolts

Anchor bolts shall be hot dipped galvanized after fabrication and be in accordance with Article 1006.09 of the Standard Specifications. Anchor bolts shall be carefully set at the location shown on the Plans, by the use of properly supported templates, supplied by the Contractor, which will ensure the correct positioning of the bolts during concrete placing operations. The anchor bolts and templates shall be procured sufficiently in advance to permit placing of the bolts in accordance with the Plans, and rechecking of their positioning prior to placing the concrete. Anchor bolts shall be carefully cleaned, placed, and firmly secured to ensure that they will not be displaced during concreting operations. All threads on anchor bolts shall be carefully greased after the bolts are firmly in position, but prior to concreting. The positioning of all anchor bolts shall be carefully observed during and at the completion of concreting operations to insure they are in the proper position upon completion of the work. At the completion of the work, all bolts shall be plumb and the dimension between the centers of any two tower bolt groups shall not vary from the dimension indicated on the shop drawings by more than 1/4", nor shall the center of any tower bolt group be more than 1/4" from its indicated position, nor shall any tower bolt in a group vary more than 1/16" from its indicated position relative to the center of the group. Anchor length shall leave the exposed end projecting between 1/2 inch and 2 inches above the top of the nut.

Fasteners - Bolts and Nuts

Bolts used in any primary structural connection shall be a minimum of 1/2" in diameter. Under no circumstances shall bolts less than 3/8" in diameter be utilized. High strength bolts, nuts and washers shall conform to ASTM A-325, or A-449. Baseplate anchor bolts shall have triple nuts (one nut below the baseplate, followed by an appropriate-sized washer, the baseplate, and then two nuts above), and shall conform to ASTM A-325. The top of the baseplate anchor bolt shall be elevated above the top of the second upper baseplate nut, as to not form a indentation or depression in which moisture may accumulate.

Proper wrenches (not pipe wrenches or channel locks) or sockets shall be utilized when securing all nuts and bolts. One month prior to the expiration of tower warranty the contractor shall return and re-torque all nuts and bolts. Any nuts and bolts damaged from improper tools shall be replaced by the Contractor, at no additional cost to the Department.

An Anco self-locking nut or Engineer approved equivalent shall be used on all bolts. Tower manufacturer will supply replacement bolts in any instances where either the contractor or the Engineer determines that supplied hardware is inadequate (too short to fully engage the nut or other physical damage) and these shall be installed at no additional cost to the Department.

All bolts, nuts and locknuts shall be manufactured in the U.S.A.

Reinforcement Bars

Reinforcement bars shall be installed as shown on the approved Shop Drawings, and in conformance with Section 508 of the Standard Specifications and Illinois Tollway Special Provision for Reinforcement Bars, except that Article 508.07, **Method of Measurement** and Article 508.08, **Basis of Payment**, shall NOT apply. All bars shall be free of rust, mud, or any deleterious material which would hinder bonding of concrete and steel. Reinforcement cages shall be straight and shall conform to the design dimensions. Adequate provisions shall be made to ensure that the reinforcement bars will remain in place throughout placement of concrete and that specified concrete cover for the reinforcement bars is attained and maintained.

Epoxy coated reinforcement bars shall be used exclusively in foundations.

Materials and Products

- (a) Deformed Bars: Shall comply with ASTM A-706 Specifications for Low-Alloy Steel Deformed and Plain Bars for Concrete.
- (b) Epoxy Coating: Shall comply with ASTM A 775.
- (c) Steel Wire: Shall comply with ASTM A 82.
- (d) Tie Wire: Shall comply with Federal Specification QQ-W-461, annealed steel, black, 16 gauge minimum.
- (e) Welded Electrodes: Shall comply with AWS A5.1, low hydrogen, E70 series.
- (f) Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcement in place shall be epoxy coated complying with Article 508.05 of the Standard Specifications, unless otherwise shown. Bolster tips shall be plastic coated.

Form Materials

All materials shall be new.

Tube Forms: Forming of all drilled shaft foundations, above grade, shall be Sonotube Fibre Forms, as manufactured by Sonoco Products Company or approved equal.

Rock Anchor Grouts

Use one of the products listed below:

- (a) "Embeco" 602 Grout, manufactured by Master Builders, Cleveland, Ohio, and clean potable water. Use mortar from unbroken bags only with 2.6 to 2.7 gallons of water per 100 pound sack of dry mortar or as per manufacturer's instructions.

- (b) Colma-Dur Lv, manufactured by Sika Chemical Corp. of Lyndhurst, NJ. Mix with Colma quartzite aggregate (sand), 1 gallon of Colma-Dur Lv with 3 1/2 parts (loose volume) of dry aggregate.

- (c) Grout made with ordinary Portland cement and "will-grout" powder additive 0.005% by weight. For rough measurement, use one level teaspoonful of "will-grout" powder for every sack of cement. Water-cement ratio should be around 0.4 (by weight). Use approximately 4 1/2 gallons of water per sack of Type III cement. Preferably use Portland cement Type III if outside temperature is higher than 75 degrees F, use Type I, "Will-grout" 25 manufactured by Williams Form Engineering Corp., Grand Rapids, Michigan, or approved equal.

Packing

Part Numbers: Each fabricated structural member shall be stamped with a part number which shall be clearly legible after galvanizing. The numbers shall correspond to markings shown on the approved shop drawings and material parts lists.

Packing: Each pallet, bundle, barrel, reel and container shall clearly be labeled with an inventory number and site name. On each, the number shall relate to the packing list such that the contents in quantity and description can be determined. The Contractor shall receive, off-load and store all materials delivered, and protect all materials from damage or theft.

Hardware

Small hardware items and all threaded fasteners (such as bolts, plates, and brackets) shall be packed in metal or wood containers to protect the pieces from being lost or damaged.

Burlap bags or pasteboard boxes shall be utilized within the metal or wooden containers to keep like items from becoming intermixed.

Inspection - Contractor Quality Assurance

The Contractor shall assure that throughout his operations he is in full compliance with these specifications. Prior to leaving the site, he shall carefully inspect his completed work in order to avoid returning to the site for corrections.

The Contractor shall remove from the site all packing materials and trash resulting from his operations. This shall be accomplished prior to final tower acceptance. Trash shall not be burned or buried on or in the vicinity of the site and shall be removed from the site and properly disposed of.

A schedule shall be coordinated by the Contractor with the Engineer for the inspection and acceptance of the tower upon its completion.

Excavation of Rock

If required, rock excavation shall be considered EXTRA WORK as specified in Article 104.02 of the Illinois Tollway Supplemental Specifications and shall be paid for as provided by Article 109.04, and shall be in addition to the excavation specified above. *Rock* means material which cannot be removed by hand or with the aid of the heaviest mechanical-excavation equipment commercially available for this purpose. Boulders under a half-cubic yard in volume shall not be classified as rock. Removal of rock, thus defined, shall be done only after written authorization by the Engineer.

Excavations which remain open overnight shall be adequately barricaded and covered over to prevent persons of any size, or animals, from falling into the excavation.

Excavating shall not be done when the ground is frozen or too wet for proper compaction. Claims for extra payment resulting from adverse weather conditions will not be considered. The extent and depth of excavation shall be as shown on approved drawings.

Care shall be taken not to damage or displace underground piping and conduit projecting through the fill. The Contractor shall be responsible for repair, at no additional cost to the Department, of any damage caused by his work to new or existing underground work.

Workmanship

All excavations shall be square cut and horizontal. If the excavation is inadvertently carried below the depth indicated for the foundation, concrete shall be used to fill the required elevation at no additional expense to the Department.

Where an excavation is carried to a depth called for on the drawings and the nature of soil is unsatisfactory, the excavation shall be deepened and/or modified as directed by the Engineer.

All excavation and trenching shall be in accordance with the latest OSHA regulations. (Construction Standards Subpart P). The Contractor shall provide, install, and maintain all shoring, bracing, and sheet piling necessary to support the side of excavations as may be required to prosecute the work properly and protect all property and construction adjacent to the excavations.

All topsoil shall be separately removed and stockpiled for later use in the final backfilling process.

The Contractor shall remove any unused spoil from the foundation excavation(s) and legally dispose of this material off the Tollway's Right-Of-Way. The cost of doing so shall be considered as included with this pay item.

Removal of Water

The Contractor shall remove in an approved manner all surface or underground water encountered during the term of the contract which in any way affects the construction work.

Excavation, Drilled - Drilling Equipment

Drilled foundation excavations shall be made by auger or rotary drill. Auger shall be of vented design to prevent suction in the shaft during bit removal.

Temporary Steel Casing (if required): Shall be commercially available welded steel pipe or approved equal. Wall thickness shall be sufficient to prevent crushing or deformation of the casing by earth or water pressure. Steel pipe shall not be less than 0.500 inch thick, and with a yield stress of not less than 36,000 psi. Tolerances on the outside diameter and other dimensions of the steel casing shall be the standard API tolerances applicable to regular steel line pipe.

Construction Methods

Drilled Shaft Foundations: Drill shafts to the design depths with a drilling machine capable of developing sufficient torque and using methods as approved by the Engineer. Maintain sidewall stability during construction. The bottom of all drilled shafts shall be leveled and cleaned of loose material and free water before concrete is placed. All material removed from drilled shafts shall be removed from the site.

Drilling by the wet-hole method shall be approved by the Engineer. Drilling mud, if used, shall be contained and removed from the site after operations are completed.

If required or as directed by the Engineer, temporary casing shall be installed in each shaft as the excavation proceeds to prevent caving or fall-in. Casing shall be at least as large in inside diameter as the nominal foundation size. Any casing found to be crushed or deformed by earth or water pressure shall be removed and replaced by suitable casing of heavier weight.

Construction Tolerances

Bottom elevation of foundation shall be at design depth unless soil conditions require a design modification that would require the approval of the Engineer.

Center of each foundation at the top shall not vary radially from the design center by more than 2 inches.

Shafts shall be bored plumb to a tolerance of not more than 1.5 percent of the length, nor exceeding 12.5 percent of the shaft diameter or 15 inches, whichever is less.

Place tower anchor bolts to the design depth, centers and orientation as shown on the approved Shop Drawings.

Excavation Inspection

All tower foundation excavations or shafts will be inspected by the Engineer or Tower Technology, Inc. at the time of drilling, to make sure the assigned depth and bearing stratum has been reached; and prior to the placement of concrete, to make sure the shaft is in proper condition for concreting. Sufficient time shall be provided to permit inspection of the shaft and to check all dimensions and reinforcement. The location of the shaft as drilled and its plumb shall be determined before concrete is placed. Sufficient equipment and personnel shall be supplied by the Contractor to permit safe inspection of all shafts.

Any foundation excavation or shaft found to be out of center or plumb beyond the tolerances specified, shall be corrected as directed at no additional cost to the Department including removal and replacement, if required.

Provisions for Weather

Hot Weather Requirements: Care shall be taken with concreting operations during hot and/or extremely dry weather. Protective measures such as retarders may be used as approved by the Engineer.

Cold Weather Requirements:

- (a) Concrete delivered in outdoor temperatures lower than 40 degrees F shall have a temperature not less than 60 degrees F, nor more than 90 degrees F, unless otherwise directed.
- (b) Continue concreting operations when the temperature drops below 32 degrees F, employing protective measures by using standard approved admixtures, high early strength concrete, heated aggregates and heated enclosures around the work, or any combination as approved. The work shall not stop because of cold weather unless specifically authorized by the Engineer.

- (c) The Contractor shall provide adequate, approved equipment for heating concrete materials and protecting the concrete during freezing or near freezing weather. The temperature of the concrete shall be kept above 50 degrees F during critical curing periods.
- (d) All concrete materials, reinforcements, forms, ground and other surfaces which will be in contact with the concrete shall be free from frost or ice. Materials containing frost or ice shall not be used. Accelerating admixtures proposed for use shall have written approval of the Engineer.

Concrete Curing

Keep all concrete in a moist condition after placing by approved methods; 7 days minimum for normal Portland cement concrete, 3 days minimum for high-early strength concrete. The curing operation shall begin immediately after the finishing operation and be a continuation of that operation.

Forms shall be kept continually wet. Unformed surfaces (slabs) shall be covered with sheet membrane lapped 4" with edges taped and membrane weighted to keep it in place. Concrete under membrane shall be kept moist and membrane shall be maintained in good repair during curing period. Concrete shall be kept at a reasonably constant temperature throughout the curing period.

Finishing Exposed Concrete

Finish exposed concrete, applying a bonding compound to the concrete area to be patched, in accordance with the manufacturer's recommendations. As soon as practical after form removal, remove all fins and rough spots; patch all holes, honeycombs and other irregularities; remove all oil, grease, dirt, efflorescence, latency and other foreign material from all exposed concrete surfaces.

Unless otherwise noted, rub all vertical concrete surfaces exposed in the finished work with a carborundum stone or an approved mechanical grinding stone, leaving the concrete with a sound, smooth surface.

Patching Mortar: Mix patching mortar in the same proportions as the concrete with the following exceptions:

- (a) Omit coarse aggregate.
- (b) Mortar shall be a stiffer mix of 1 to 1 or 1 to 1/2 using sand passing a No. 14 screen.
- (c) Keep water content to a minimum.
- (d) Substitute white Portland cement for a portion of the gray to overcome the tendency of the patching mortar to appear darker than the concrete. Determine the proper proportions by making samples and allowing to dry before comparing with the concrete.

- (e) Defective areas, including holes and honeycombs, shall be chipped out to a minimum one-inch depth into sound material. Thoroughly wet and fill all exposed voids with patching mortar.

Reinforcement Bars Fabrication and Placement

Fabrication: Fabricate reinforcement bars to conform to the required shapes and dimensions as shown on the approved Shop Drawings, with fabrication tolerances complying with the *CRS/Manual*.

In case of fabricating errors, do not straighten or rebend reinforcement bars in a manner that will weaken or injure the material. Heating of reinforcement bars will not be permitted.

All bends for stirrups and ties shall be made around a pin having a diameter not less than four times the diameter of the bar. Bends for other bars shall be made around a pin with diameter at least six times the diameter of the bar for bars No. 8 and smaller, and eight times the diameter of the bar for bars larger than No. 8. All reinforcement bars shall be bent cold. Standard hooks shall conform to requirements of Section 7.1, *ACI 318*.

Reinforcement bars with any of the following defects will not be acceptable.

- (a) Bar lengths, depths and/or bends exceeding the specified fabrication tolerances.
- (b) Bends or kinks not shown.
- (c) Bars with reduced cross section due to excessive rusting or other cause.

Placement of Forms

The edges and contact faces of forms shall be coated with non-staining mineral oil, such as Nox-concrete Form Coating, or equivalent as approved by the Engineer. The Contractor shall make certain that the forms are completely dry and free of coatings. The coating material shall be allowed to float onto the plywood with a minimum of brushing at the rate of approximately 200 square feet per gallon. Stiff brushes shall not be used. If the coating does not adhere in a uniform thickness, thinner shall be added as recommended by the manufacturer or the rate of coverage shall be extended.

Forms for Drilled Shaft Foundations: Install tube forms for the portion of foundations above grade. Forms shall be fitted, braced and stiffened to prevent deflection from weight of concrete. Forms shall receive a form release coating. Forms shall present a smooth, hard, uniform texture to the exposed concrete surfaces.

Exposed Surfaces: Exercise care in removing forms from exposed surfaces so that surfaces are not marred or gouged.

Structural Backfill

All material and debris shall be removed from excavations along with all wood forms before backfilling.

Backfilling against concrete may not proceed until 24 hours after placement of concrete. Fill shall be compacted equally on all sides of the foundations.

Method of Backfilling and Compaction

Unless noted otherwise in contract drawings and specifications, fill materials shall be placed in horizontal layers of 9 inch lifts and each layer compacted with vibrating compactors such as tampers, reamers or vibro plates to 95% proctor density as defined in ASTM D 698.

Soil should be compacted at a water content equal to optimum moisture content plus or minus 2 percent.

Excess Material: All excavated material, except that material culled per this Special Provision shall be used in backfill including mounding over the anchor blocks. Excess excavated material shall be disposed of off-site in accordance with Article 202.03 of the Standard Specifications.

Finish Grade: The finished grade at backfilled and other disturbed areas shall conform to the lines and grades shown on the site drawings.

Areas around buildings and tower shall be graded to cause surface water to flow away. See site work for additional information.

Rock Anchor Grouting Procedure

Drill a minimum 4-inch diameter, maximum 5-inch diameter hole in the rock. During drilling a continuous supply of water should be maintained to avoid overheating.

Clean the drilled hole with water and air to remove dirt, chips, oil and grease. Force water into the bottom of the drilled hole until clean water returns from the top, then leave the hole full of clean water.

Insert reinforcing rod and ½ inch ID pipe (or hose with 3 to 5 feet of pipe on end) to bottom of hole and pump grout slowly at about 20 psi pulling pipe as grout rises. Instead of pumping the grout, a funnel may be used at the end of the pipe to place the grout slowly pulling the pipe as the grout rises. The mortar-grout will displace water without appreciable dilution if the rate of rise of grout is less than 2 feet per minute. Maintain pumping until pipe is totally out of the hole and until all diluted grout (if any) has been displaced.

As grout stiffens following pumping operation, cut grout back about 2 inches and fill this recess with water to ensure proper curing.

No mortar or epoxy shall be pumped when the ambient air temperature is below 40 degrees Fahrenheit, without written approval from the Engineer.

Any suitable piston type grout pump may be used; consult manufacturer's representative for details; use the pumps only in accordance with the manufacturer's written operating instructions/guidelines.

Cover and protect anchor bolt threads during placement of concrete. Grout tower baseplates in accordance with the tower manufacturer's recommendations.

Method of Measurement. This work will not be measured for payment.

Basis of Payment. The work will be paid for at the contract lump sum price for SELF SUPPORTING COMMUNICATION TOWER FOUNDATION.

SELF SUPPORTING COMMUNICATION TOWER STRUCTURAL STEEL

Description

This work shall consist of designing and constructing the 70-foot steel monopole radio-tower system at the proposed Plaza 31 site. For tower foundation requirements, see the SELF SUPPORTING COMMUNICATION TOWER FOUNDATION special provision.

Contractor Responsibilities

The Contractor shall be responsible for coordinating and monitoring the schedule of the tower.

It is the Contractor's responsibility to ascertain existing field conditions before bidding on the Project, specifically as they relate to Lump Sum items.

The Contractor shall also be responsible for the following items:

- (a) Furnish and install sufficient temporary crane lighting to comply with the FAA regulations regarding obstacles and obstructions to aerial navigation (FAA "Advisory Circular – 70/7460-1M" can be found on the FAA website).
- (b) Providing the name, local address and 24-hour telephone number of the on-site supervisor. The Contractor shall promptly notify the Engineer of any changes in supervision or any changes in the supervisor's local address and telephone number.

All foundation and tower construction, materials and assemblies associated with the monopole radio-tower system shall be detailed and documented in working / shop drawings, as required by the Illinois Tollway Supplemental Specifications Article 105.01. Any fabrication or construction done prior to the review and approval by the Engineer shall be at the Contractor's risk. All corrections shall be made at no additional cost to the Department.

Submittals Required

The Contractor shall submit legible sets of the following required documents:

- (a) Tower engineering drawings - 5 sets for distribution, stamped by Structural Engineer licensed by the State of Illinois.
- (b) Submit certified mill test report for steel members and bolts for review.
- (c) Tower installation manual and full sets of as-built drawings and a parts list.
- (d) The Contractor shall provide for tower structural analysis and planned foundation analysis and approval by Tower Technology, Inc. of Kansas City, MO., prior to construction. Analysis and S.E. stamped approval shall be submitted to the Engineer. Upon final tower erection, the Contractor shall also employ Tower Technology, Inc. for a field inspection of the tower and foundations.

Specific structural loading requirements are cited under this special provision. It is the responsibility of the contractor to verify that all bids for this tower project have been approved by Tower Technology, Inc. to meet the minimum loading requirements set forth.

Tower foundation/caisson shaft dimensions and rebar inspection, to verify compliance with submittals from tower manufacturer, are the responsibility of the Contractor, **NOT** Tower Technology, Inc. Foundations/caissons may **NOT** be poured until compliance with tower manufacturer submittals is verified by the Engineer or Tower Technology.

NOTE TO CONTRACTOR: Tower Technology, Inc. shall be hired, at Contractor's sole expense, but reporting to the Engineer, for design review and structural field inspection of the tower and foundation. Tower Technology's determination shall stand as a final opinion and will not be negotiable.

Qualification and Certifications

In addition to the requirements stated in the contract documents, the Contractor shall submit with the shop drawings:

1. A copy of company's Quality Assurance program.

Quality Assurance

The overall workmanship shall be of a high quality generally accepted as standard practices and procedures in the industry. All work shall be carefully and accurately performed. All members shall be straight and true to the drawings.

The Contractor shall maintain his work area at the tower site in a neat and orderly condition free of debris and unnecessary packing material.

- (a) American National Standards Institute (ANSI) and Telecommunications Industry Association (TIA): ANSI/TIA-222-I, "Structural Standards for Antenna Supporting Structures, Antennas, and Small Turbine Support Structures."

(b) American Institute of Steel Construction (AISC): Design, Fabrication and Erection of Structural Steel for Buildings.

(c) American Welding Society (AWS): D1.1 Code for Arc and Gas Welding in Building Construction.

(d) American Society for Testing and Materials (ASTM) Standards:

- ASTM A-36 Specification for Structural Steel
- ASTM A-53 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
- ASTM A-123 Specification for Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strip
- ASTM A-153 Specifications for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- ASTM A-307 Specification for Carbon Steel Externally Threaded Standard Fasteners
- ASTM A-325 Specification for High Strength Steel Bolts for Structural Steel Joints [including Suitable Nuts and Plain Hardened Washers]
- ASTM A-394 Specification for Zinc-Coated Steel Transmission Tower Bolts, Zinc Coated and Bare
- ASTM A-441 High Strength Low Alloy Structural Steel Shapes, Plates on Bars for Welded, Riveted or Bolted Construction, Specification For.
- ASTM A-448 Specification for High Strength Steel Shapes, Plates and Bars
- ASTM A-449 Specification for Hex Cap Screw, Bolts and Studs, Steel, Heated Treated, 120/105/90 ksi Minimum Tensile Strength, General Use
- ASTM A-475 Specification for Zinc-Coated Steel Wire Strand
- ASTM A-500 Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- ASTM A-513 Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing
- ASTM A-572 Specification for High-Strength Low-Alloy Columbium-Vanadium Steel of Structural Quality

(e) International Building Code (IBC), 2024

General Requirements.

Materials for the monopole radio-tower system installed shall include the following items as listed in this special provision.

- (a) Tower steel shall include only U.S. manufactured hardware. All pieces and fasteners shall be galvanized according to ASTM standards aforementioned, and all connections must have at least 2 bolt threads fully through the nut and engaging the lock-pin after exiting the nut.
- (b) The tower shall be fitted with a fall arrest system and climbing step bolts. (see: Tower Climbing Safety Device).
- (c) Grounding system and testing shall be according to the grounding system special provision.
- (d) Bonding jumpers shall be used for multiple section monopole towers to ensure electrical continuity.
- (e) Project management support and field engineering.

Design Calculations and Shop Drawings

Any fabrication or construction begun prior to the Engineer's express written approval of the design documents and drawings shall be at the risk of the Contractor.

Complete shop drawings shall be submitted for review of the tower assembly and construction including complete erection schedules and procedures with bolt torque requirements, design calculations and materials parts list.

Calculation Documentation

A complete and detailed structural analysis shall be performed for the tower and submitted to the Engineer for approval. All calculations used to determine the stresses, proportion the structure and design the connection of the tower foundations and all supporting elements shall be included.

Tower Steel

The self-supporting tower shall be a monopole steel tower. The shaft shall have a minimum yield strength of 65,000 psi.

Provisions shall be made during fabrication for all bolt holes, necessary for the mounts and side arm struts. No post manufacturing or punching of galvanized members will be permitted.

The tower shall be of hot-dipped galvanized steel. Construction shall be analyzed and designed as a multi-sided tapered shaft fixed at the ground position and shall take into effect the following:

Tower shall be designed per the TIA-222-I standard with the following exceptions:

- The design structural loading for the tower based on typical wireless carrier antennas shall be an EPA of 110ft² and 1500 lbs per TIA-222-I.
- Fully populated tower (including all hardware and any other attachments) shall maintain a maximum stress ratio of 0.75 for the structure, connections, and foundations.
- Structural basic wind speed without ice (V) shall be 120MPH.
- Structural basic wind speed with ice (Vi) shall be 60 MPH with the design ice thickness (ti) of ¾ inch.
- Tower shall be designed as a Class II structure, in Exposure Category C and in Topographic Category 1.
- Maximum twist and sway for the structure shall be limited to 0.75 degrees under the structural design loading.
- Each vertical appurtenance shall be designed assuming each full EPA will be subject to a full wind for each wind direction (i.e. no reduction for side loading, shielding or cluster mounting). An applicable Ka factor may be applied to each vertical appurtenance.
- A complete analysis, foundation design, soil report, and drawing package shall be supplied for each design. The analysis and drawings shall include all pertinent data associated with the tower design.

All structural data, as listed above, shall be verified, by the Contractor, via Tower Technology, Inc. structural analysis prior to tower erection. The structure shall not exceed a stress ratio of 0.75. The wind load shall be defined as the maximum forces and torques produced by the specified unit horizontal wind pressure acting on the tower, antenna assemblies, and other appurtenances attached thereto. In all cases, the specified ice coating shall be included as part of the projected area.

Galvanized safety cabling shall be provided for the climbing step bolts. Cabling shall be configured not to interfere with future antenna mounting internal to the tower. Turn buckles shall be installed to adjust tension on cable.

All materials shall be new. Mill certificates and other proof of material type, grade and quality shall be made available to the Engineer upon request. Structural steel shall conform to ASTM A 36, A 572 Grade 65 or as approved. The minimum thickness of any fabricated steel part shall be 1/8 inch.

Galvanizing

All materials and hardware shall be hot-dip zinc galvanized according to the applicable ASTM standards after fabrication.

Fasteners - Bolts and Nuts

Bolts used in any primary structural connection shall be a minimum of 1/2" in diameter. Under no circumstances shall bolts less than 3/8" in diameter be utilized. High strength bolts, nuts and washers shall conform to ASTM A-325, or A-449. Baseplate anchor bolts shall have triple nuts (one nut below the baseplate, followed by an appropriate-sized washer, the baseplate, and then two nuts above), and shall conform to ASTM A-325. The top of the baseplate anchor bolt shall be elevated above the top of the second upper baseplate nut, as to not form a indentation or depression in which moisture may accumulate.

Proper wrenches (not pipe wrenches or channel locks) or sockets shall be utilized when securing all nuts and bolts. One month prior to the expiration of tower warranty the contractor shall return and re-torque all nuts and bolts. Any nuts and bolts damaged from improper tools shall be replaced by the Contractor, at no additional cost to the Department.

An Anco self-locking nut or Engineer approved equivalent shall be used on all bolts. Tower manufacturer will supply replacement bolts in any instances where either the contractor or the Engineer determines that supplied hardware is inadequate (too short to fully engage the nut or other physical damage) and these shall be installed at no additional cost to the Department.

All bolts, nuts and locknuts shall be manufactured in the U.S.A.

Tower Climbing Safety Device

Tower shall be equipped with a climbing safety device, designed and supplied by the tower manufacturer. The safety device shall consist of a stainless-steel cable attached to the tower near the climbing step bolts and a safety clamping device that slides along the cable.

Two safety clamping devices (Soll Vi-Go Fall Arrester, 3/8" size, with swivel carabiner), designed for use with 3/8" stainless steel safety cable, shall be provided.

The cable shall be attached externally (outside of tower), to enable direct climbing on the step bolts. Stainless steel safety cable shall have tower manufacturer supplied clamping devices at the top and bottom, with middle cable guides at tower manufacturer recommended positions between. Cable shall be sized at 8mm (3/8"). Tower climbing safety device shall meet OSHA standards.

Two safety belts/harnesses shall be furnished with each tower. DBI-Sala Exofit XP Tower Climbing Harness (six D-Ring model, with five D-Rings on the front, including a center D-Ring, and one on the back)-are required, in size "large" unless specified otherwise by the Engineer.

Pole Antenna Mounting Assembly

A pole top mounted antenna mounting assembly shall be furnished and installed with the tower. The pole antenna mounting assembly shall be three sided and include steel grating for workers to stand on and handrail kits (vertical and horizontal pipes) meeting OSHA requirements.

Protective Grounding - General

The tower bonding jumper system shall meet Motorola's R-56 guidelines, which in turn are derived from the ANSI/TIA-222-G and NFPA 780 (Standard for the Installation of Lightning Protection Systems). While the Motorola R-56 guidelines are comprehensive and should be strictly adhered to, the tower manufacturer shall verify the multiple section monopole (if applicable) bonding jumpers meet the requirements of Motorola R-56.

Lightning protection components (air terminals or rods) shall be installed at the top of the tower and be bonded to the tower grounding system. These elements intercept lightning strikes and provide a path for electrical discharge to safely reach the grounding system.

Dissimilar Metals: Special attention must be given to the tower bonding jumper system (especially connections) to prevent the occurrence of galvanic action. Dissimilar metals shall not be allowed in direct contact with each other.

Packing

Part Numbers: Each fabricated structural member shall be stamped with a part number which shall be clearly legible after galvanizing. The numbers shall correspond to markings shown on the approved shop drawings and material parts lists.

Packing: Each pallet, bundle, barrel, reel and container shall clearly be labeled with an inventory number and site name. On each, the number shall relate to the packing list such that the contents in quantity and description can be determined. The Contractor shall receive, off-load and store all materials delivered, and protect all materials from damage or theft.

Heavy components shall be banded together in bundles not to exceed 1,000 pounds. Protection shall be provided for any items susceptible to bending or shipping damage. Similar items or items to be utilized within a particular assembly shall be banded or packed together.

Hardware

Small hardware items and all threaded fasteners (such as bolts, plates, and brackets) shall be packed in metal or wood containers so as to protect the pieces from being lost or damaged.

Burlap bags or pasteboard boxes shall be utilized within the metal or wooden containers to keep like items from becoming intermixed.

Packing List

Each shipment must come with a detailed packing list. This list shall identify each item in the shipment by part number and/or size description and provide their respective unit weights. In addition, a summary sheet shall be included in the shipment.

This summary sheet shall list the total number of barrels, bundles, boxes, reels, pails and other container units. It shall also list total shipment weight and the weight of each container unit.

Every container unit shall be provided with a quantity identity packing list in a water-resistant envelope. Duplicate copies of the packing list shall be provided upon delivery.

Inspection - Contractor Quality Assurance

The Contractor shall ensure compliance with the specifications at all times during his operations. Before leaving the site, the Contractor shall carefully inspect all completed work to avoid any need for corrections.

The Contractor is responsible for removing all packing materials and trash generated from their operations from the site. This shall be done before final acceptance of the tower. The Contractor shall not burn or bury trash on or in the vicinity of the site. The Contractor shall make sure to dispose of it properly.

The Contractor shall coordinate a schedule with the Engineer for the inspection and acceptance of the tower upon its completion.

Miscellaneous

Place tower anchor bolts to the design depth, centers and orientation as shown on the approved Shop Drawings.

All bolts used for connecting vertical members shall be installed horizontally, with the head on the inside of the member, on horizontal members they shall be installed vertically, with the head on the top of the member.

Drift pins will be permitted only to bring several parts together. They shall not be used in a manner which will distort or damage the metal or to enlarge unfair holes.

Field drilling or reaming of holes will not be permitted, except with the Engineer's written approval. Any non-galvanized ferrous metal surfaces shall be treated with coats of both a zinc rich paint (such as Galvanox) and a final protective coat, matching galvanized steel in color.

The tower shall be plumbed and maintained in proper position and alignment as it is being erected. Field welding or burning shall be avoided and will not be permitted without written approval of the Engineer.

Tower Assembly

The following procedure shall be followed to minimize "built-in" tower twist during erection.

- (a) Blocking of "horses" shall be utilized for supporting tower sections during ground assembly. They shall be maintained to provide adequate support for this section in a level position during all assembly operations.
- (b) The individual tower sections shall be assembled and slip-fit together per the manufacturers recommendations.
- (c) Assembly shall follow the tower manufacturer's drawings and specifications. Approved fasteners shall be used and tightened as recommended by the tower manufacturer. If tightening is not specified by the manufacturer, all bolts shall be tightened by the "turn of nut" method as listed in the Specification for Structural Joints using ASTM A325 or A490 bolts approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.
- (d) As erection progresses, the tower shall be securely fastened to take care of dead load, wind and erection stresses. Tower shall be erected plumb.
- (e) During construction all steel shall be carefully handled to protect against damage. Damaged or lost members shall be replaced at no additional cost to the Department. Zinc-rich paint shall be applied to abraded surfaces.

Installation of Tower Base

Both the foundation surface and the base shall be cleaned of mud, grime and other foreign matter. The foundation may be damp, but standing puddles or pools of water on its surface shall be eliminated.

Four steel wedges shall be placed midway between the anchor bolts under the base and leveling nuts shall be positioned so that the base is at the elevation specified on the drawings. For self-supporting monopole towers with multiple sections, all sections of the tower shall be installed before leveling the base.

The base shall be leveled in two directions with a spirit level, and the nuts on the anchor bolts tightened. Level and elevation shall be checked after the nuts have been tightened and if necessary, the wedges or leveling nuts should be adjusted to re-level the base.

Tower Design Drawings and As-Built Drawings

The following shall be included on the drawings and shall show the tower exactly as it is to be built at individual site. **"Typical" or pre-printed drawings will not be acceptable.**

- (a) Station name, tower height, manufacturer's model number, & serial number.
- (b) Elevation and plan views of the tower indicating the tower orientation, antennas, mounts and antenna path azimuths.
- (c) Section assembly drawings showing ALL tower members and their identification numbers, base plate, climbing step bolt mounting details, bolt sizes and types, and any other information necessary to identify each tower component.
- (d) Pole antenna mounting assembly drawings including all components necessary for supporting future antennas.
- (e) Miscellaneous drawings showing the supporting elements and positioning of lightning rod, etc.

Handling and Storing

Major materials either received for erection, as new materials, or disassembled and relocated elsewhere, as existing materials, as part of this contract shall be neatly stored on blocking at least 6" above the ground until it is assembled or used. Minor materials such as hardware, lightning rod, etc., shall be protectively stored to prevent injury or loss due to theft and other causes.

Correction of any sustained damages to or substitution of any items shall not be undertaken by the Contractor without the approval of the Engineer.

Method of Measurement. This work will not be measured for payment.

Basis of Payment. This work will be paid for at the contract lump sum price for SELF SUPPORTING COMMUNICATION TOWER STRUCTURAL STEEL which payment shall constitute full compensation for designing, constructing, and furnishing all labor and materials and incidental items to complete the work as specified. Payment will not be authorized until all documentation has been received and accepted by the Engineer. The payment to the Contractor will adhere to the following schedule:

Ten percent (10%) of the contract unit price will be paid upon receipt of submission and approval of all product submittal documentation, calculations, and shop drawings.

Eighty percent (80%) of the contract unit price will be paid by the Engineer at completion of the tower erection. Written approval from the Engineer of acceptance is required before payment is released.

Ten percent (10%) of the contract unit price will be paid after final acceptance of the completed tower assembly and accessories by the Engineer in the presence of the Contractor. Written approval from the Engineer of acceptance is required before payment is released.

GROUNDING SYSTEM

General Requirements.

The grounding system shall be installed in accordance with the "General Requirements" specified later within this document.

Quality Assurance

The overall workmanship shall be of a high quality generally accepted as standard practices and procedures in the industry. All work shall be carefully and accurately performed.

The Contractor shall maintain his work area at the tower site in a neat and orderly condition free of debris and unnecessary packing material.

In the event of conflict between any portion of these provisions and the requirements set forth in any of the referenced documents, this provision shall govern.

- (a) American National Standards Institute (ANSI) and Telecommunications Industry Association (TIA): ANSI/TIA-222-G, "Structural Standards for Antenna Supporting Structures and Antennas."
- (b) American Society for Testing and Materials (ASTM) Standards: ASTM A-123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products ASTM A-153 Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware
- (c) Motorola R-56 Standards and Guidelines for Communications Sites (Latest Edition)

Materials for the grounding system (nominally) Installed shall include the following items as listed in specification.

- (a) Grounding system and testing (maximum resistance shall not exceed 5 ohms for tower halo). Halo ground shall be at least #2 AWG, solid bare copper tinned wire, continuous run, buried 4" min. below grade with four radials from the monopole tower to separate ground rods.
- (b) Exothermic connection shall be used for all exterior/outdoor grounding points.

Protective Grounding • General

The grounding system shall meet Motorola's R-56 guidelines, which in turn are derived from the ANSI/TIA-222-G and NFPA 780 (Standard for the Installation of Lightning Protection Systems.) While the Motorola R-56 guidelines are comprehensive, and should be strictly adhered to, the following criteria are being reiterated, and in some Instances expanded upon (under the recommendations of the R-56 guidelines, when said guidelines offer a range of construction options) to meet the Department's best Interests:

- (a) Four copper-clad steel ground rods shall be installed and connected to the monopole tower. These ground rods shall have a minimum diameter of 5/8 inches (.625") and a minimum length of 10 feet. The top/head of each ground rod shall be driven vertically to a 44" below grade (IL Tollway requirement, as optioned within Motorola R-56), using the proper tool to prevent ground rod deformation and ground rod head deformation. In addition to the four ground rods at the tower, there shall be additional ground rods installed, using the above depth and materials criteria, at set intervals around the tower ground ring 'halo. As per R-56's Chapter 6.31, 'ground rods shall not be installed more than 4.9 m (16ft.) apart (or twice the length of the rod) and not less than 1.8m (6ft.) apart. Splicing of two or more ground rods, to achieve the specified 10' length is not allowed.
- (b) The ground rods are to be installed at least 3 feet outside of any concrete piers or footings.
- (c) All external grounding conductors (ground leads) shall be #2 AWG bare, tinned solid copper wire (not copper clad steel.) All attachments of said ground leads shall be made by exothermic (Cadweld) connection. The alternative, or utilizing stranded 35mm 2 wire as optioned under R-56's Chapter 6.3.2.1 "Grounding Conductors, General Specifications" shall not be allowed.
- (d) A continuous ground ring "halo" shall be installed around the outside of the tower in the approximation of a circle and exothermically welded to all ground rods. It shall be located at least 3 feet beyond any adjacent building foundation and 5 feet beyond any buried fiber optic lines. The ground ring material shall be #2 AWG bare, tinned solid copper wire (not copper clad steel) in a continuous run, buried below the frost line (minimum of 44 inches below grade • as optioned within Motorola R-56.) The excavated tower ground ring area, and associated ground rods, shall remain open (excavated) until final approval is given by the Engineer. Failure to follow this directive will result in complete re-excavation by the Contractor, at the Contractor's full expense.
- (e) A neutral third party shall be brought on (recommended by the Engineer and at the contractor's expense) to perform final ground resistance measurements for the integrated grounding system. Said testing agency (to be familiar with Motorola's R-56 requirements, in specific Chapter 4.3 ('Soil Resistivity Measurements.)) In no instances shall the same firm which installed the integrated grounding system perform final acceptance testing on the integrated grounding system. If, after grounding testing is complete, any previously Contractor-buried portions of the integrated grounding system need to be re-excavated, this shall be performed by the Contractor, at the Contractor's full expense. This aforementioned process shall be repeated until an acceptable grounding test result is obtained.
- (f) All exterior (whether above or below grade) ground wire connections must be made using the exothermic (Cadweld) process.

- (g) If the permanent grounding system is not completed, the Contractor shall provide temporary grounding consisting of a 5/8 (0.625 inch diameter by 10 foot long copper-clad steel ground rod driven near the tower and #2 AWG bare, tinned solid copper wire connected to the tower and ground rod with suitable clamps when the tower reaches a height of at least 20 feet. Permanent grounding shall be provided immediately after tower erection is complete.
- (h) The fence posts (every corner and also end posts, such as next to buildings and gates) shall be properly grounded with #2 solid bare copper wire and incorporated into the tower grounding halo (direct line from each fencing ground point to the main tower halo -no loop-backs will be allowed). Gates shall be grounded with a minimum of #6 AWG stranded copper wire back to the supporting fence post. Ground conductor shall be bonded to the gate and fence post using the exothermic Cadweld process.
- (i) Sharp bends shall be avoided. Grounding conductors should be run as straight as possible with the least number of bends as possible. A minimum bending radius of 8 inches shall be used. Motorola R-56 specifies this in detail and should be followed in all instances.
- (j) All ground conductors shall be separated a minimum of two inches from signal/control cables or AC power cables.

Dissimilar Metals: Special attention must be given to the grounding system (especially connections) to prevent the occurrence of galvanic action. Dissimilar metals shall not be allowed in direct contact with each other.

NOTE TO CONTRACTOR: Motorola shall be hired, at Contractor's sole expense, but reporting to the Engineer, for a final R-56 compliance inspection, analysis and report for all site grounding components (tower, fencing, and all other applicable components). Motorola's determination shall stand as a final opinion and will not be negotiable.

Lightning Rod

Provision shall be made and material provided for securely, fastening and connecting a 5/8 Inch diameter (minimum) by 5 feet long Copperweld lightning rod at the top of the tower.

Contractor shall provide, install and make the 5-foot lightning rod and its connection in strict accordance with the manufacturer's written guidelines. Connection to the lightning ground system shall be completed before installation of radio antennas or waveguides. The payment for lightning rod and its connection to grounding system shall be incidental to pay item for "Grounding System".

Packing

Each pallet, bundle, barrel, reel and container shall clearly be labeled with an inventory number and site name. On each, the number shall relate to the packing list such that the contents in quantity and description can be determined. The Contractor shall receive, off-load and store all materials delivered, and protect all materials from damage or theft.

Hardware: Small hardware items shall be packed in metal or wood containers so as to protect the pieces from being lost or damaged. Burlap bags or pasteboard boxes shall be utilized within the metal or wooden containers to keep like items from becoming intermixed.

Packing List

A detailed packing list shall accompany each shipment. Every item within the shipment shall be identified with part number and/or size description along with the unit weights.

A summary sheet shall be included which shall list the total number of barrels, bundles, boxes, reel, pails and other container units. The total shipment weight and the weight of each container unit shall be listed.

Each container shall be provided with a quantity identity packing list placed in a water-resistant envelope. Duplicate packing lists shall be provided upon delivery.

Handling and Storing

Materials received as part of this contract shall be neatly stored until it is used. Minor materials such as hardware must be protectively stored to prevent injury or loss due to theft and other causes.

Correction of any sustained damages to or substitution of any items shall not be undertaken by the Contractor without the approval of the Engineer.

Method of Measurement. This work will not be measured for payment.

Basis of Payment. This work will be paid for at the contract lump sum price for GROUNDING SYSTEM which payment shall constitute full compensation for furnishing all labor and materials and incidental items to complete the work as specified. Payment will not be authorized until all documentation has been received and accepted by the Engineer.

COMMUNICATION TOWER REMOVAL

Description. This work shall consist of all labor, equipment, and materials required for the removal and disposal of the existing Tollway communication monopole tower structure, foundation, mounting platform, horizontal transmission line support, and accessories adjacent to the existing Toll Plaza 31 building. Removal shall be started only after the new communication tower is operational.

General Requirements.

Structure: This work shall consist of removing the existing self-supporting cylindrical monopole tower structure of approximately 70-foot height, triangular platform attached to the pole, horizontal transmission line support, and associated hardware and appurtenances. The antennas and transmission line cabling shall be removed by AT&T.

Foundation: This work shall consist of removing the existing concrete foundation which includes the concrete and reinforcement bars to at least 5 feet below the ground level and the hole shall be backfilled with suitable material approved by the Engineer. The removed material and debris shall be disposed of according to Article 202.03 of the Standard Specification.

Method of Measurement. The work under this item as described herein will not be measured separately.

Basis of Payment. The work will be paid for at the contract lump sum price for COMMUNICATION TOWER REMOVAL which payment shall constitute full compensation for the work as specified. Payment will not be authorized until it is accepted by the Engineer.

PLAZA ELECTRICAL WORK (ILLINOIS TOLLWAY)

Effective: January 20, 2014

Revised: March 1, 2024

Description. This work shall consist of furnishing and performing all operations necessary for the complete installation and execution of the PLAZA ELECTRICAL WORK for the main and remote toll plazas, as well as control buildings, as shown on the contract plans (Plans) and hereinafter specified, complete and operational in every respect. All electrical work at the main and remote toll plazas, including the connections between the buildings and the toll plazas as well all electrical work for all electrical tolling equipment on monotubes and/or islands for each tolling plaza shall be included in this pay item.

Also included in this pay item shall be all fiber optic and ITS power laterals to the inside of toll plazas from nearest outside power and communication handholes.

Apparatus, appliances, material or work not shown on the Plans, but mentioned in these special provisions, or vice versa, or any incidental accessories necessary to make the plaza electrical work complete and ready for operation, even though not specified or shown on the Plans shall be furnished and installed by the Contractor under this pay item at no additional cost to the Illinois Tollway.

Materials. The main components of the plaza electrical work are as described below. All other ancillary items required for a fully functional and complete installation are included as part of the work under this special provision. Materials and installations shall conform to the applicable Codes and Standards.

The following equipment will be furnished and installed by the Illinois Tollway:

- VES Camera Housings
- VES Cameras and Computers
- Data Logger Computer
- I-PASS Readers
- I-PASS Antenna
- Loops. Details include, but are not limited to, the following:
 1. Saw cuts for Quantum or IDRIS and Main Loops
 - a. Installation of all loops back to the barrier wall junction boxes
 - b. Splicing of all loop to loop lead-in cables inside the barrier wall junction boxes

The following equipment shall be furnished and installed by the Contractor:

- All Power and Communication Conduit Runs, Fittings, and Bushings
- All Wires and Cables – 600 Volt
- All Special Cables and Associated Hardware (if required)
- All Enclosures for Electrical Equipment and Fittings
- All Pull Boxes and Junction Boxes
- All Outlet Boxes
- All Wiring Devices
- All Cable Trays-Aluminum
- All Panelboards
- A Local Control
- All Building Lighting Fixtures
- A Card Access System
- A Fire Alarm System
- An Uninterruptible Power Supply (UPS) System
- All Equipment Racks
- A Data logger Camera, Video System, and Fiber Optic Equipment
- A Front and Rear Violation Enforcement System (VES) Camera Video Power Junction Box
- Security Video Camera System
- All Service Entrance Equipment
- An Engine-Generator Set
- All Automatic and Non-Automatic Transfer Switches
- All Electrical Identification
- All Transformer Foundations
- All Communication Equipment
- A Reader Enclosure

- All Power and Communication Cable Runs
- A Lighting Control Panel (Roadway Lighting)
- All underground raceways and other infrastructure, as shown on the contract plans, for connectivity to the Illinois Tollway fiber backbone at the toll plaza building
- All Electric and Gas Service Installations and Connections
- A complete Grounding Electrode System
- All VES Camera Power and Communication Cabling
- All Automatic and Manual Bypass Switches
- All Electrical Testing
- All Loop Lead-in Cabling runs from inside the toll plaza to the barrier wall junction boxes
- All I-Pass Antenna Cabling and Mounting Hardware
- All CCTV Digital Equipment
- All Fiber Optic Patch Panels

The following are the specific materials for the components described above:

Conduit, Fittings, and Bushings

- Galvanized Rigid Steel (GRS) Conduit. GRS conduit shall be heavy wall type, hot-dipped galvanized with zinc-coated threads, and must be Underwriters' Laboratory (UL) labeled. GRS conduit and couplings shall be threaded, rigid steel, hot-dipped galvanized. The GRS conduit shall meet the requirements of Section 810 of the Standard Specifications. Acceptable manufacturers shall be Allied Tube & Conduit, Republic Conduit, Wheatland Tube Company, or approved equal.
- PVC Coated GRS Conduit. PVC coated rigid steel conduit, including elbows and couplings, shall meet the requirements of Section 810 of the Standard Specifications. Acceptable PVC coated manufacturers shall be Calbond, ABB Ocal, Robroy Industries or approved equal.
- Rigid Nonmetallic Conduit. The conduit, fittings, and accessories shall be manufactured from polyvinyl chloride complying with ASTM D 1784 and with all applicable requirements of NEMA Publication No. TC2, UL Standard 651 for EPC-40-PVC and EPC-80-PVC. Acceptable manufacturers shall be Allied Tube & Conduit, Cantex, Carlon, or approved equal.
- Flexible Conduit. Plastic-coated, flexible metal conduit shall be in accordance with UL 360, type UA with PVC outer jacket and integral ground conductor as manufactured by Anamet, Electro Flex, AFC Cable Systems, or approved equal. Flexible conduit installed in wet locations, exterior locations, and at motors shall be liquid-tight type and shall meet the requirement of Section 810 of the Standard Specifications. Flexible liquid-tight conduit shall be galvanized steel with a UL listed moisture and oil-proof plastic coated jacket.
- Conduit Bushings. Conduit bushings shall be malleable iron body with 150 degrees C insulating ring. Insulating material shall be self-extinguishing, locked in place, and non-removable. Acceptable manufacturers shall be Appleton Model Series BU75I, OZ/Gedney Model Series IBC, or approved equal.
- Conduit Fittings. All conduit fittings shall be of the types specified and in accordance with UL 514 for normal application and UL 886 for use with plastic-coated flexible metal conduit.

Breather-drain fittings, when required, shall be manufactured by Crouse-Hinds Co., Appleton Electric Co., or approved equal.

Conduit proofing and testing

- All conduits shall be cleaned by wire brush mandrel to remove all dirt and other foreign materials and install compression plugs on both end of the conduit until conductors are installed. The Contractor shall record the results on the Conduit Test form attached to this special provision and provide it to the Engineer for review and acceptance.
- The wire-brush mandrel and solid aluminum mandrel submittal shall be SIGNED BY BOTH the Contractor and the Engineer and submitted via the WBPM system for approval.
- All conduits installed under this contract, the Contractor shall proof the conduit system with a solid aluminum mandrel, as per the Table below, to remove any obstruction or debris. The Contractor shall perform the conduit proofing in the presence of the Engineer. The Contractor shall apply a pressure of 100 – 110 psi to the conduit, close the air output valve and stop compressor, and measure air pressure loss. The maximum allowable air pressure loss within 2 minutes of pressurization is 20 psi. The Contractor shall record results on the Conduit Test form attached to this special provision. The form is signed by the Engineer and submitted via the WBPM system.

Conduit Size (in)	Mandrel Diameter (in)	Minimum Mandrel Length (in)	Maximum Mandrel Length (in)	Proof (%)
1	0.60	1.0	4	80
1 ¼	0.86	1.5	4	80
1 ½	1.12	1.8	4	80
2	1.62	2.4	6	80
2 ½	2.0	2.75	7	80
3	2.5	3.25	8	80
4	3.5	4.25	8	85
6	5.5	6.25	10	85

Wires and Cables-600 Volts

- Wires and cables shall be soft copper, properly refined, and shall have minimum conductivity of 98 percent. Conductors for power and lighting shall not be less than size 12 AWG, shall conform to the latest NEC, and shall bear Underwriters' Laboratory label. Wires for signal and control systems shall be stranded size 14 AWG, unless otherwise indicated on the Plans or in other items of these special provisions.
- Wires and cables shall be delivered to the job site in original packing or on factory reels. All wires and cables shall bear tagging or marking on the finish at regular intervals consisting of manufacturer's name as well as the insulation type, voltage rating, UL listing and date of manufacturing.

- Wire and cable shall have factory color-coded insulation and shall be installed and connected as follows:
 1. Color coding for voltage system of 250 volts and less shall be:
 - "A" Phase: Black
 - "B" Phase: Red
 - "C" Phase: Blue
 - Neutral: White
 - Ground: Green
 2. Color coding for voltage system of over 250 volts and less than 600 volts shall be as follows:
 - "A" Phase: Brown
 - "B" Phase: Orange
 - "C" Phase: Yellow
 - Neutral: Grey
 - Ground: Green
 3. Green shall be used for grounding only.
- The insulation shall be applied tightly to the conductor and shall be free stripping.
- Branch circuit wiring shall be solid copper size 12 AWG unless otherwise specified.
- Wires size 10 AWG and larger shall be stranded copper unless otherwise specified.
- Wires type THHN/THWN thermo-plastic insulated, rated 90°C dry and 90°C wet shall be used for lighting, power, and other wiring applications not otherwise specified.
- Wires type SF-2 silicone insulated glass braid jacket, size 12 AWG (minimum size), 200°C-rated shall be used for fixture wiring and for recessed LED fixtures.
- Wires type THHN thermo-plastic insulated, 90°C-rated, shall be used for continuous row LED fixture wiring.
- Teflon insulated wires, 200°C-rated, shall be used for wiring applications within five (5) feet of boilers and one (1) foot of heating pipes.
- Single conductor cables installed outdoors in exposed conduit installations shall be cross-linked polyethylene (XLP) insulated. The cables shall be UL listed as Type RHH/RHW-2/USE-2, 600-volt rated at conductor temperatures not exceeding 90°C in wet or dry locations. The cable shall be manufactured in accordance with ICEA Standard S-95-658, NEMA WC 70, and UL Standard 44.
- Ground cables shall be soft drawn, annealed, stranded copper with green insulation in required sizes and quantities for all equipment grounding.
- The 600-volt insulated wires and cables shall be factory tested prior to shipment in accordance with ICEA standards for the insulation specified.
- Samples and reports on the results of shop tests for all wire and cables, descriptive literature for splices and terminations shall be submitted to the Engineer.

Acceptable cable manufacturers for 600-volt rated cable shall be American Insulated Wire Corp., General Cable, Prysmian, Southwire, Advanced Digital Cable, or approved equal.

Connectors

- Compression connectors shall be long barrel, tin-plated copper, and closed end compression type. The barrel for each cable lug shall be sized for the exact cable size specified.
- Copper-Aluminum connectors are not acceptable. Mechanical or set-screw types are not acceptable. The cables shall be terminated with the die type compression tools.
- Conductors size 2 AWG and larger shall terminate in two (2)-hole solderless lugs.
- Conductors size 8 AWG through size 3 AWG inclusive shall terminate in one (1)-hole lugs. Acceptable manufacturers shall be Burndy Type YA, Anderson Type VHCL, Panduit Series LCB or LCC, Thomas & Betts Co., Series 54800 and 54900, or approved equal.

Special Cables and Associated Hardware (if required)

- The Contractor shall furnish and install shielded control cables, shielded power cables, shielded data cables, telecom cables and coaxial cables as shown on the Plans and as specified herein. All cables shall be identified at both ends per EIA/TIA Standard TIA-606 for labeling of telecommunication components.
- Multi-Conductor Shielded Power and Control Cable. The conductor shall be stranded, uncoated, annealed, bare copper. The cable shall be color-coded per ICEA/NEC (K2) specifications, unless otherwise indicated. The binder shall be a polyester tape.
- Each cable assembly shall have an overall shield. The shield shall be aluminum/polyester with a drain wire. Stranded tinned copper size 18 AWG wire shall have size 20 AWG drain wire. Stranded tinned copper size 16 AWG wire shall have size 18 AWG drain wire. Stranded tinned copper size 14 AWG, size 12 AWG and size 10 AWG wire shall have size 16 AWG drain wire.
- The jacket shall be black PVC with a nylon rip cord. The voltage rating shall be 600 Volt. The temperature rating shall be 90°C dry and 75°C wet.
- The multi-conductor shielded cable shall be Manhattan Type PTN-TC "Foil-Shield" overall for direct burial. The multi-paired shielded cable shall be Manhattan Type MMIC-TC "Foil-Shield" overall for direct burial.
- Loop extension cable shall be 1-pair size 14 AWG multi-conductor shielded cable, Belden 603133 or approved equal.
- Shielded Power Cable. Multi-conductor normal AC and UPS 120 volt shielded power cable shall be color coded BLACK (Ground), RED (Hot) and BLUE (Neutral), and shall have cable ID markers at each end. The neutral shall be white taped at both ends in all junction boxes and terminal boxes where the cable overall jacket is removed. The ground shall be green taped at both ends in all junction boxes and terminal cabinets where the cable overall jacket is removed. The cable shall be 3/C size 12 AWG, Manhattan M-33867 or 3/C size 10 AWG, Manhattan M-33903, or approved equal.

- Traffic Violation Light Cable. The multi conductor traffic violation light cable shall have the color coding - BLACK (ground), RED (red light), BLUE (neutral), ORANGE (green light), YELLOW (violation light), BROWN (I-Pass light, where used). The neutral shall be white taped at both ends where the cable overall jacket is removed. The ground shall be green taped at both ends in all junction boxes, terminal cabinets where the cable overall jacket is removed. The cable shall be 7/C size 12 AWG, Manhattan M-33871, or approved equal.
- Lane Control Signal Cable. The multi-conductor lane control signal cable shall have the color coding - BLACK (ground), RED (red "X"), BLUE (neutral), ORANGE (green arrow). The neutral shall be white taped at both ends where the cable overall jacket is removed. The ground shall be green taped at both ends in all junction boxes, terminal cabinets where the cable overall jacket is removed. The cable shall be 4/C size 14 AWG, Manhattan M-33848, or approved equal.
- 24 Volt DC Multi-conductor Camera Power Cable. The multi-conductor cable for cameras shall have color coding - RED (Hot), BLACK (Neutral), and BLUE (Ground). The neutral shall be white taped at both ends where the cable overall jacket is removed. The ground shall be green taped at both ends in all junction boxes, terminal cabinets where the cable overall jacket is removed. The cable shall be 3/C size 16 AWG, Manhattan M-33828, or approved equal.
- Data and Communication Cable. All outdoor data and communication cables shall be temperature hardened and Outside Plant (OSP) rated cable.
 1. Individually Shielded Cables:
 - a. The conductor shall be stranded, tinned, annealed copper.
 - b. The insulation shall be color-coded polyethylene.
 - c. Each pair shall be individually shielded with an aluminum/polyester shield and size 22 AWG stranded tinned copper drain wire.
 - d. The jacket shall be red Teflon.
 - e. The voltage rating shall be 300 volts.
 - f. The temperature rating shall be 80°C.
 2. Six (6) pair size 22 AWG shielded cable shall be Belden number 88778 or Manhattan number M43106.
 3. Three (3) pair size 22 AWG shielded cable shall be Belden number 88777 or Manhattan number M43103.
 4. Four (4) pair size 23 AWG or size 24 AWG, outside plant rated CAT-6 cable shall be Belden number 7953A or Berk-Tek number 10139885. This cable shall be used for all outdoor device connections. This outdoor cable shall transition to the indoor CAT-6 cable (item #5) at the surge protection device for the respective line.
 5. Four (4) pair size 23 AWG or size 24 AWG, indoor CAT-6 cable shall be Belden number 2412 or Berk-Tek number 10136342. This cable shall be used for all indoor cabling and interconnections. This indoor cable shall transition to the outdoor CAT-6 cable (item #4) at the surge protection device for the respective line.
 6. Four (4) pair size 24 AWG, RS-422 cable, shall be Belden number 88104 or Quabbin number 8221.
- Coaxial Cable – I-Pass Antennas. Coaxial cable for I-Pass antennas shall be CommScope number LDF4-50A. I-Pass antenna mounting hardware shall be furnished and installed by the Contractor as shown on the Plans.

Enclosures for Electrical Equipment and Fittings

Enclosures for electrical equipment shall conform to the area classification noted on the Plans. NEMA Type 12 enclosures shall be used in indoor dry areas. NEMA Type 4 or 4X enclosures shall be used for all outdoor panels and junction boxes. All outdoor enclosures shall be 316 Stainless Steel.

Pull Boxes and Junction Boxes

- Pull boxes and junction boxes shall meet the requirements of Section 813 of the Standard Specifications, except as modified on the Plans and as required by this special provision. Outdoor boxes shall be JIC NEMA Type 4X, minimum 16 gauge, 316 stainless steel with stainless steel hinged cover and fasteners, unless otherwise noted on the Plans.
- Indoor boxes shall be NEMA Type 12 gasketed, 14 gauge, continuously welded seam, galvanized box and cover. Each cover shall be secured with round, recessed, pan head, or flat head stainless steel screws.

Acceptable manufacturers shall be Appleton Electric, Austin,, Cooper Crouse-Hinds, Hoffman, Keystone, OZ/Gedney, or approved equal.

Outlet Boxes

- Outdoor outlet boxes shall be malleable iron cast type.
- Outlet boxes for exterior fixtures, receptacles and switches shall be malleable iron with malleable iron covers complete with gaskets.
- Outlet boxes in interior areas, installed concealed shall be galvanized, pressed steel, knockout type, punched or partially punched.
- Exposed boxes for switches, receptacles, etc., inside the building shall be the solid box type. Outlet boxes shall conform to UL 514 standard.

Acceptable manufacturers shall be Appleton, Killark, Raco, Steel City, or approved equal.

Wiring Devices

- All wiring devices shall be installed in cast FS boxes with FS covers.
- Switches. Toggle switches shall be rated 20 amperes, 120/277 volts, single-pole, and shall conform to Federal Specification W-C-596. The handle of each switch shall be brown or ivory. Single pole switches shall be Hubbell number LHIR, or approved equal.
- Receptacles. Convenience outlets for general use shall be duplex, 3 wire, 20 ampere, 125 volts, NEMA 5-20R grounding type, Hubbell number HBL5362, or approved equal. Outlets shall be brown or ivory as approved by the Engineer.
- UPS receptacles shall be orange in color, duplex, 3 wire, 20 ampere, 125 volts, isolated ground type, Hubbell number IG5362, or approved equal.
- Exterior receptacles shall be weatherproof, GFCI, 120 volt, 20 amp, NEMA 5-20R with extra-duty in-use cover, Hubbell model #GF5362SG or approved equal.

Cable Trays-Aluminum

- Cable tray system shall be made of straight sections, fittings, and accessories as defined in the latest NEMA VE-1. The system shall consist of cable tray, vertical bends, horizontal bends, covers with clamps, splice plates, end plates, tray to box splice plates, and necessary mounting hardware. The hardware material shall be as recommended by the manufacturer.
- The cable tray system shall be B-Line Series 24, aluminum, B-Line Material A, with a ventilated trough over a 12 inch rung spacing and necessary mounting.
- Straight section structural elements and splice plates shall be extruded or plate aluminum as applicable.
- Side rails shall be inward C-shape configuration and shall be pre-drilled to accept splice plates. Loading depths for cable tray system shall be in accordance with NEMA VE-1 tolerances. Loading classifications and test specimens shall be in accordance with NEMA VE-1.
- Fittings shall be formed with a smooth constant radius. Fitting radii shall be 12 inches or 24 inches for three (3) inch loading depths.
- Straight and expansion splice plates shall have a four-bolt pattern in three (3) inch and two (2) inch fill systems. Dimension tolerances shall be in accordance with NEMA VE-1.
- Cable tray supports shall be supplied by same manufacturer as that of the cable tray system. Supports shall be as shown on the Plans and as required by the system.

Acceptable manufacturers shall be Cooper B-Line Systems, Inc., or approved equal.

Panelboards

- Each panelboard shall have voltage characteristics, bus size, main lugs only or main circuit breakers, surface mounted or recessed mounted cabinet, and number and size of branch circuit breakers as shown on the Plans. In general, panelboards shall be enclosed in 14 gauge (minimum) steel cabinet of dead front type, having steel trim, and door with continuous piano concealed hinges and cylinder type locks including two (2) keys thereof. Each panelboard shall be UL rated for short circuit rating as specified. Series integrated ratings are not acceptable.
- Cabinets. Cabinets shall comply with applicable NEMA standards and shall be suitable for flush or surface mounting in locations as shown on the Plans. The cabinets shall provide a minimum of six (6) inches clear space for wiring gutters at top, bottom, and sides. Each cabinet shall be a minimum of 24 inches wide. Each cabinet shall be large enough to accommodate external cables and any special lug bus required to connect to oversized cable due to voltage drop.
- Doors and Trims. Doors shall have concealed hinges. Trims shall be fastened with self-adjusting clamps. Double doors shall be provided where necessary, or as indicated on the Plans.

- Circuit Breakers. Circuit breakers shall be of "bolt on" type, and shall have a minimum interrupting rating of 65,000 amperes at 240 volts AC.
 1. All busses shall be hard drawn electrolytic copper having 98 percent conductivity and sized on a basis of 1000 amperes maximum per square inch of cross sectional area.
 2. Circuit breakers for all panels shall be thermal-magnetic with each pole providing inverse time delay and instantaneous circuit protection.
 3. Circuit breakers shall be back connected to bus bars, molded case heavy-duty type.
 4. Each panel-board shall be furnished with a full-length ground bus drilled and tapped to accommodate a ground cable for each circuit breaker. Cable terminals shall be provided.
 5. Branch circuit breakers shall be single or multiple-pole with capacities and trip ratings as specified or as shown on the Plans.
 6. Each branch circuit breaker shall be identified by a card holder or designating button mounted adjacent to the circuit breaker to properly identify each circuit.
 7. Neutral cables, where called for, shall be grouped and arranged on a common bus and each terminal shall be stamped to indicate number of breakers with which it is associated.
- Panelboards Interior. Each panel interior shall be provided with adjustable brackets to permit leveling and aligning in cabinets. All lugs and terminators shall be copper. Aluminum copper connectors are not acceptable. Interchangeable locking devices shall be provided to lock breakers in an "Off" or "On" position.

Acceptable manufacturers shall be Eaton, General Electric, Siemens, Square D/Schneider Electric, or approved equal.

Local Control

- All enclosures for local control equipment shall have proper NEMA rating for the area in which they are installed.
- Safety switches shall be rated at 250 volts AC for 208 and 120 volts AC circuits. Each safety switch shall be heavy duty, non-fusible, horsepower rated.
- Circuit breakers for 120 volts and 208 volts service shall be 240 volt rated, "bolt-on" type, and shall have an interrupting rating of 65,000 amperes at 240 volts AC.
- Each circuit breaker and disconnect switch shall have an external handle that can be padlocked in the "OFF" position. Handle operation shall be quick-make, quick-break, tease-proof mechanism.

Acceptable circuit breaker manufacturers shall be Eaton, General Electric, Siemens, Square D/Schneider Electric, or approved equal. Acceptable disconnect switch manufacturers shall be Eaton, General Electric, Siemens Energy & Automation, Inc., or approved equal.

Lighting Fixtures

- Interior and exterior lighting fixtures shall be complete with all necessary mounting hardware, fittings, reflectors, etc., and shall be ready for installation.
- Light Emitting Diode (LED) Fixtures. LED fixtures shall be of the type called for on the Plans. The Contractor shall provide auxiliary supports for proper fixture mounting and installation.
- Exterior Lighting. Exterior lighting shall be equipped with photo-cells, hand-off-auto selector switch, and contactor-controlled as indicated on the Plans.
- Emergency Lighting. The Contractor shall furnish and install material necessary to provide wall mounted, battery-powered, emergency lighting as indicated on the Plans. Each battery-powered LED emergency lighting unit shall be provided with wall mounting bracket. The Contractor shall furnish and install all materials necessary to provide wall mounted "EXIT" signs, as indicated on the Plans.
- Light Control. Contactors shall be 600 volts AC, and ampere-rated as required, electrically operated, electrically held type, with auxiliary relay for hand-off-auto and remote photo-cell control. Contactors shall be installed in NEMA type enclosures as shown on the Plans.

Photo-cell control shall conform to the requirements of Article 1068.01(e) of the Standard Specifications.

Card Access System

- The card access system shall have a minimum capacity of 25 cardholders, expandable to a maximum of 100 at the access point. Each card record file shall include employee name, department, title, and phone number. The system shall maintain up to eight issue levels for each card, and retain the original card number and other access parameters should the card be lost, stolen, or re-assigned. Every time a card is re-issued or re-assigned with a new issue level, the previously issued card shall be automatically voided. Acceptable Manufacturer shall be Hirsch Electronics, Inc. model "Hirsch Management System 8".
- The work specified in this Section shall include, but not be limited to, the following:
 1. DIGI*Trac 8 Door Controller
 2. Card Readers
 3. Power Supply
 4. Supervised Magnetic Switch
 5. DIGI TRAC Controller Software
 6. Cables
 7. Raceway
- Components:
 1. M8 Model 8 Controller Board
 2. BPS 24-4 Power Supply – Securitron (used for door strikes)
 3. SNIB2 Secure Network Interface Board
 4. AEB8 Alarm Expansion Boards (Quantity four (4))
 5. MB2 Mounting Boxes with MRIA (one (1) per door access)
 6. XMS Motion Sensors (one (1) per door)
 7. CR20LBL HID Card Reader (one (1) per door)
 8. D80 Electric Door Lever (one (1) per door)

9. Ademco Recessed Door Contacts (one (1) set per door)
 10. TSB-C Door Cards (one (1) per door)
 11. MELM-1 (32-used for alarms)
 12. Belden No. 8723, 2-pair cable (2 cable runs from Hirsch Panel to each door)
 13. Belden No. 8760, 2 conductor cable (1 cable run from Hirsch panel to each door)
 14. Belden No. 9431, 3-pair cable (run from the Hirsch Panel to the TSIC board –Phoenix Contact)
 15. Belden No. 8777, 3-pair cable (run from any alarm point to the Phoenix Contact Terminal block on the TSIC board)
 16. Phoenix Terminal Block-PN# UK5N (Quantity 32)
 17. DIN Rail
- Central Controller. The controller shall incorporate a state-of-the-art, multi-user, multi-tasking Central Processing Unit (CPU) specifically designed as a security management system. The system shall be listed by Underwriters Laboratories.
 - System Software. The software shall have the capability to provide Time and Attendance. The software shall report and control entry and exit during user-defined work day using standard working shifts or flexible time schedules.
 - Cards. The Contractor shall provide a total of 25 security cards.
 - All readers shall be heavy duty construction with a tough cast metal housing and shall have tamper switch alarm monitoring.

Fire Alarm System

- The fire alarm system shall include, but not limited to, one (1) Fire Alarm Control Panel (FACP), Transponder Panel (TXP), fire alarm initiating and indicating devices, power supply conduit and wire, and accessories required to provide a complete and operational system.
- Fire Alarm Control Panel (FACP). The FACP shall provide power, annunciation, supervision, detection, and alarm for fire and smoke detection. The FACP shall be an intelligent system with a microprocessor and memory. The FACP shall use intelligent analog detector technology. The FACP shall be UL-listed independently as a fire alarm control unit in addition to being listed as a critical component of a proprietary multiplex system.
- Central Processing Unit (CPU). The central processing unit (CPU) shall be incorporated in the FACP and shall be microprocessor-based and provide the necessary system logic circuitry and interrogate/response polling to perform required automatic control-by-event, time of day functions, and trouble switching as delineated by the drawings or specifications.
 1. The CPU shall include Electrically Erasable Programmable Read-Only Memory (EEPROM) memory for emergency file lists and system program instructions. Programming instructions and basic life safety software shall be completely nonvolatile. The system shall not utilize moving disk technology where dust, humidity, or temperature can cause adverse operating performance.

2. The CPU shall be software equipped to provide automatic control-by-event programming, whereby the receipt of an alarm point may be programmed to operate any or all of the control points within the system. Automatic control-by-event actions for life safety functions shall be retained in nonvolatile memory for reliability.
 3. The CPU unit shall be completely field-programmable on site by the manufacturer's representative. Systems requiring Programmable Read-Only Memory (PROM) burning without on-site editing capability from this panel shall not be acceptable. Edited changes shall be nonvolatile. The central processing unit and memory shall have the capability of supporting a minimum of 25 addressable supervised inputs and outputs.
- Transponder Panel (TXP). A transponder panel (TXP) shall contain input and output electronic control boards to accept dry contacts from other devices with the signal voltage being provided by the TXP. The transponder shall receive its commands for outputs from the FACP and shall transmit input data to the FACP. The transponder shall operate in a master/slave configuration whereas the transponder is not required to operate as a stand-alone NFPA 72 FACP. The transponder shall communicate with the FACP by means of a two-wire multiplex data communication line.
 - Smoke Detector - Photoelectric Type. The photoelectric type smoke detector unit shall be of the two-piece construction, a plug-in detector with the electronics and a mounting base.
 - The detector shall operate on the light refractory principle and shall have a rate compensation circuit to increase detection sensitivity upon rapid buildup of smoke. The detector shall automatically adjust the sensitivity to compensate for the effects due to dirt and dust accumulation on the sensor.
 - The detector shall be a closed contact on alarm type. A trouble condition shall annunciate at the Hirsch control panel if the detector is inoperable due to internal or wiring failure.
 - Manual Stations. The manual station shall consist of die-cast aluminum housing with a hinged back-plate, along with a provision for mounting on a standard outlet box. The station shall have terminals for in and out wiring of the initiating circuit manual. A test means shall be provided for each station. The manual stations shall be of the addressable type. Stations shall be designed for either surface or semi-flush mounting. The stations shall be red with a high gloss enamel finish. Inscriptions, text, and marks shall be on the front plate in white raised, cast letters. Target background shall be white.
 - Single Action Type. The single action type shall consist of a handle which, when pulled, shall activate the alarm contacts. A key-locked front hinged cover shall be opened to reset the station.
 - Keys and Locks. All keys for the manual stations reset locks with the FACP shall be keyed alike.
 - Wires and Cables. Wires and cables installed for fire alarm systems shall be copper, solid, and shall be sized as per manufacturer's recommendations. The Contractor shall verify with the manufacturer of the fire alarm system the requirement of wire types and sizes for the proposed fire alarm system. The following wire and cable characteristics shall be met:

1. Initiating Device Signal Circuits:
 - a. Type: Twisted, shield, pair.
 - b. Size: 16 AWG.
 - c. Application: Initiating circuits connected to smoke detectors and pull station.
 2. Communication Lines:
 - a. Type: Twisted, shield, pair.
 - b. Size: 14 AWG for communications between the Hirsch control panel and Demark terminal.
 - c. Application: Communication circuit to headquarters.
 3. 24 Volt DC Power:
 - a. Type: THHN/THWN.
 - b. Size: 12 AWG.
 - c. Application: Circuits for addressable devices.
- Sequence of Operation: The actuation of any signal initiating device shall cause all alarm signals to be transmitted to the office center until the actuating device is restored to normal and the control panel is reset. This shall also cause the air handling units to shut down. In the event of operating power failure, an open circuit or ground in the system, the system trouble lamp and trouble signal shall actuate.

Acceptable manufacturers shall be Simplex Time Recorder Co., Cerberus Pyrotronics, Fenwal, or approved equal.

Uninterruptible Power Supply (UPS) System

The UPS for tolling equipment shall include UPS units, bypass module switch and all interconnecting conduits and wiring. The UPS unit shall be rated for 120/208 volt, 1-phase, 60 Hertz input and output at 8 KVA. Each UPS unit shall be furnished with the standard internal batteries mounted in the same enclosure.

The UPS shall be Eaton model number 9PXM with battery cabinet and the following characteristics:

- Power rating: 8 KVA
- Power factor: 0.9
- Energy efficiency: $\geq 93\%$
- Dimensions: 35" x 35" x 25.5" w/o Battery Cabinet.
- Input: Voltage Range: 80 – 144 V (line-neutral)
- Input Frequency: 60 Hz +/- 5 Hz
- Output THD: < 5%
- Output: Voltage: 120/208V
- Output Frequency: 60 Hz +/- 0.1 Hz
- Battery type: Valve regulated lead acid (VRLA)
- Each UPS shall be provided with an Eaton NETWORK-M2 internal module. The Contractor shall furnish and install CAT 6 cable from the UPS to the CISCO switch.

The bypass module shall be Eaton model number BPM125HW.

Equipment Racks

- The Contractor shall provide four (4) 4-post equipment racks in the main toll plaza building and four (4) 4-post equipment racks in the remote toll plaza building, as shown on the Plans.
- The equipment racks shall be heavy duty steel 4-post equipment racks, gray, and shall be provided with one (1) 12-outlet power strip.

Acceptable manufacturers shall be Cooper B-line, model number SB837090CFB, or approved equal.

Data Logger Camera Video Power Junction Box

- Each data logger camera video junction box shall be equipped with a Power over Ethernet (PoE) mid-span injector, Category 6 line surge protection device, and ground bar as shown on the Plans and specified herein.
- Indoor enclosures shall be 36" x 30" x 12" single door, NEMA Type 1 with back panel. Type 1 enclosures shall be Hoffman model number CSD363012 with back panel model number CP3630, or approved equal.
- PoE mid-span injector shall be rated 60 watts with 120 volts primary and shall be Axis Communications model number T8154.
- Surge protection device for the Category 6 (CAT-6) line shall be Axis model number T8061.
- Ground bar shall be Hoffman model number PG2SK, or approved equal.
- Panel wiring shall be size 12 AWG stranded copper with Type SIS cross-linked polyethylene insulation.
- A laminated plastic nameplate with 3/8 inch black letters on a white background shall be installed on the front of each junction box, and laminated plastic nameplates with 1/4 inch black letters on white background shall be installed at terminal blocks with self-tapping stainless steel screws.
- Each video junction box shall be assembled in accordance with the details shown on the Plans.
- One (1) Digital Logger DIN Relay 4 in each toll plaza building.
- CAT 6 Jumper cables as needed.

Data Logger Camera, Video System, and Fiber Optic Equipment

- The Contractor shall furnish and install data logger camera(s) including associated power supplies, video devices, fiber optic termination devices, and fiber optic cables and accessories as shown on the Plans and specified herein. This work shall also include termination and testing of the complete fiber optic cable run (end to end) and connecting each toll plaza control building to the Illinois Tollway’s network that is run over backbone fiber optic cables that the control buildings are connected to. The Contractor shall install single mode fiber to the remote toll plaza, when needed. When required, the main toll plaza control building shall be connected to the remote toll plaza control building by a 48-strand single mode fiber optic cable. All other fiber optic cables and patch panels shall be included under this pay item. Jumpers, patch cords, active network hardware and testing to provide a fully functional network with the Illinois Tollway’s Central Administration Building shall be per the NETWORK EQUIPMENT special provision.
- Data Logger Camera Assemblies. Each data logger PTZ camera assembly shall consist of the following items:
 1. An Axis Q-6315-LE or Axis Q6318-LE PTZ dome camera.
 2. All pole mounting attachments and accessories as recommended by Axis.
 3. The dome camera assembly shall include a 1080p IP color camera, 30X optical zoom lens, pan/tilt and receiver in an environmentally sealed pendant enclosure. The enclosure shall be suitable for extremely low temperature operation (-40°C).
 4. The camera shall be mounted at 20’.
- Fiber Optic Cable. Fiber optic cable shall be single-mode (SMFO) loose tube all-dielectric cable with a dry water-blocking agent.
 1. All fiber optic cables shall be armored ALTOS All-Dielectric Cable®, as manufactured by Corning Cable Systems. The individual fibers shall have the following characteristics:
 - a. Single-mode Fiber Optic Strand – The individual strands shall be 8.2 µm and shall have a maximum attenuation of 0.35 dB/km @ 1310 nm wavelength.
 2. All toll plaza buildings within this project shall be connected to the Illinois Tollway’s backbone fiber via armored single mode cable as shown on the Plans. Splicing to the backbone shall be completed by G4S in coordination with the Illinois Tollway’s fiber optic Project Manager. The Contractor shall coordinate this work with the Engineer.
 3. The following tables list the typical number of strands and the respective ALTOS® part numbers:

FIBER COUNT	SINGLE MODE (SMFO) CORNING PART NUMBER
48	048EUC-T4101D20

4. Fiber optic cables shall utilize fusion splicing techniques. Mechanical connectors are not allowed for splicing of fiber optic cables.
 5. The toll plaza building shall use rack-mounted connector panel housing for cross-connection and interconnections. The connector panel housing shall reside in the local fiber racks as shown on the Plans and shall be Corning System part number CCH-04U. The connector panel housing shall be able to accept twelve (12) single-mode panels and shall be four (4) rack units high.
- Network equipment, switches, jumpers and Small Form Pluggable (SFP) modules shall be furnished and installed per the NETWORK EQUIPMENT special provision.

Front and Rear Violation Enforcement System (VES) Camera Video Power Junction Box

- The Contractor shall furnish and install the front and rear VES camera video junction boxes and pedestals (when required) as shown on the Plans. Each front and rear VES camera video junction box shall be equipped with a transformer, fuses, terminal blocks and ground bar as shown on the Plans and specified herein.
- Front and rear VES camera video power enclosure for the main toll plaza shall be 48" x 24" x 8" single door, NEMA Type 1 with back panel, Hoffman model number A-48N24BLP with model number A-48N24MP back panel or approved equal.
- Additional equipment required to be provided by the Contractor is as listed below:
 1. Power supply rated at 120VAC input / 24VDC output, TDK-Lambda Model number QM7FSDL 24/24DMS 24/24DMS 24/24DMS 24/24DMS 24/24DMS.
 2. Fused terminal blocks shall be rated 30 amperes, 57 volts and shall be equipped with 5 ampere Bussman Type FNM. Fused terminal blocks shall be Allen-Bradley model number 1492-FB1M30-D1 (with red LED) or approved equal.
 3. Terminal blocks shall be rated 35 amperes, 600 volts. Terminal blocks shall be Allen-Bradley model number 1492-CD8 or approved equal.
 4. Surge suppressor for the Category 6 (CAT-6) line shall be Phoenix Contact DATATRAB D-LAN-CAT.6, and for the 24 volts AC/DC line shall be Cooper Crouse-Hinds MTL model number 24580.
 5. Power distribution block shall be rated 175 amperes and shall be Marathon model number 1322580.
 6. Miniature circuit breaker shall be rated 15 amperes, 1-pole and shall be Schneider Electric model number QOU115.
 7. Panel wiring shall be size 12 AWG stranded copper with Type SIS cross-linked polyethylene insulation.

Service Entrance Equipment

- The main service disconnect shall consist of breakers, necessary buses, associated equipment, and shall be suitable for use with service entrance equipment.
- Service Characteristics. ComEd will provide a pad mounted 208/120 volts, 3-phase, 4-wire, 60 hertz transformer.
- Related work by the Contractor. The Contractor shall provide the required transformer pads along with the secondary side conduit and cable from the utility metering cabinet to the main disconnect switch in the control building. The utility metering cabinet shall be NEMA Type 3R and be provided by the Contractor per the Utility company requirements. The Contractor shall provide the conduit/trench and back-filling for the transformer grounding electrode system around the pad.
- Main Service Disconnect Circuit Breaker. The main service disconnect device shall be molded case circuit breaker with an interrupting rating of 65,000 amperes at 240 volts AC. The circuit breaker shall be molded case construction; UL listed in accordance with UL standard 489 and shall meet the requirements of NEMA Standard ABI-1975. The circuit breaker shall be provided with ground fault protection. The Enclosure shall be of NEMA Type 12 construction and shall be UL listed in accordance with UL standard 891. All live components shall be contained in the grounded metal enclosure.

- Main Distribution Panel (MDP). The main distribution panel shall be 208 volts, 3-phase, 4-wire, 200 amperes, as specified on the Plans, and as herein specified. The main distribution panel shall meet all UL enclosure requirements and shall be furnished with a UL label.
 1. The main distribution panel shall be completely factory assembled with incoming line main device and feeder devices. The incoming line main device shall be front accessible. The main distribution panel and breakers shall be the product of a single manufacturer. The enclosure shall be of NEMA Type 12 construction.
 2. The equipment shall be designed, built, and tested in accordance with applicable portions of the latest editions of NEMA PB-2, Underwriters Laboratories standard UL-891, and the latest requirements of the National Electrical Code. All sections and devices shall be UL listed and labeled.
 3. The distribution panel, as a complete unit, shall be given a short circuit current rating of 65,000 amperes by the manufacturer. Such a rating shall be established by actual tests conducted by the manufacturer, in accordance with applicable UL standards, on equipment constructed similarly to the subject distribution panel.
- Bus Bars. All bus bars shall be hard drawn electrolytic copper having 98 percent conductivity and sized on a basis of a maximum of 1000 amperes per square inch of cross-sectional area.
- Main Circuit Breaker. The main disconnect device shall be a molded case circuit breaker.
- Branch Circuit Breakers. Group-mounted, molded case circuit breakers shall be front accessible and front connectable. The circuit breakers shall be mounted in the main distribution panel to permit installation, maintenance, and testing without reaching over any lineside bussing. The circuit breakers shall be removable by the disconnection of only the load side cable terminations, and all line and load side connections shall be individual to each circuit breaker. No common mounting brackets or electrical bus connectors shall be acceptable. Lineside circuit breaker connections shall be jaw type plug-on. Each circuit breaker shall be furnished with an externally operable mechanical means to trip the circuit breaker.
- Nameplates. Engraved nameplates shall be furnished for all main and feeder circuits with designations and circuit numbers. The Contractor shall provide a Master Nameplate giving voltage and ampere rating, short circuit rating, manufacturer's name, general order number, and item number. All nameplates shall have black lettering on a white background.
- Manufacturers. Acceptable manufacturers shall be Gus Berthold Electric Co., Siemens, Eaton, Erickson Electric Equipment Co., Square D, or approved equal.
- AC Lightning Protection Systems. The Contractor shall provide surge protection devices at the entrance of the 120/208 volts distribution system as shown on the Plans. The surge protection devices shall be rated for 240 kA per UL 1449 as manufactured by Joslyn number 1455-85-MN or approved equal.

Engine-Generator Set

- The engine generator set shall be capable of delivering the kW rating specified at sea level and capable of delivering the kW rating specified at the installed location after consideration of applicable de-rating factors.
- General. The engine generator and all major items of auxiliary equipment shall be manufactured by U.S. manufacturers currently engaged in the production of such equipment. The engine and the generator shall be furnished by the same manufacturer.
 1. The unit shall be factory assembled, tested by the engine-generator set manufacturer, and shall be shipped to the job site by his/her authorized dealer having a service facility within proximity of project location.
 2. The engine-generator set shall be sized such that the engine shall be capable of driving the generator at the 50KW/62.5KVA rating specified after de-rating for the range of temperatures expected during operation. The generator shall be designed to have a rated capacity with 50 percent solid state loads.
 3. The engine-generator set shall be direct-coupled unit. Belt or gear-driven units are not acceptable.
- Engine. The engine shall be a water-cooled in line or V-type, four-stroke cycle, spark ignited. Two (2) stroke cycle engines are not acceptable. The engine shall be able to operate on natural gas only (no diesel fuel allowed) with a minimum of 1000 Btu per cubic foot. The engine shall be equipped with filters for fuel, lube oil, and intake air; lube oil cooler; and gear-driven water pump.
 1. The engine governor shall be isochronous frequency regulation from no load to full rated load. The unit shall be mounted on a special wide structural steel sub-base and shall be provided with suitable spring vibration isolators as recommended by the manufacturer. Engine safety shut-off switches for high water temperature, low oil pressure, over-speed and over-crank shall be provided with pre-alarm type switches for low oil pressure warning, high water temperature warning, low coolant level, and low water temperature.
 2. Gas pressure regulators and gas solenoid valves shall be engine-mounted and shall be connected to the engine with flexible gas connection which shall be a minimum of 18 inches long and shall be as recommended by the engine generator equipment manufacturer. The solenoid valve coil shall be rated for the generator starting battery voltage.
- Generator. The generator shall be sized by the manufacturer for standby service with a maximum temperature rise of 105°C and shall be rated 50KW/62.5KVA at 0.8 power factor. The generator shall be 120/208 volts, 3-phase, 4-wire, 60 Hertz, at 1800 RPM. The generator shall be capable of supplying 110 percent of rated nameplate KW for two (2) hours out of 24 hours.
 1. The load shall be a maximum of 50 percent solid state. The generator shall be sized to allow for heating effects of non-linear loads of 50 percent of its service rating. The specified KW shall be for continuous electrical service during interruption of normal utility source with 50 percent solid state type load. These ratings must be substantiated by the manufacturer's standard published curves. Special ratings or maximum ratings are not acceptable.

2. The generator shall be a three-phase, single bearing, synchronous type built to NEMA standards. Class F insulation shall be used on the stator and rotor, and no materials that will support fungus growth shall be used. The generator shall incorporate reactive droop compensation for parallel operation and shall include a re-settable thermal protector for exciter/regulator protection against extended low power factor loads.
 3. A generator-mounted volts-per-hertz-type exciter/regulator shall be provided to match the characteristics of the engine-generator set. Voltage regulation shall include three-phase sensing and shall be plus or minus 0.5 percent from no load to full load. Readily accessible voltage droop, voltage level, and voltage gain controls shall be provided. Voltage level adjustment shall be a minimum of plus or minus five (5) percent. Solid-state regulator module shall be shock-mounted and epoxy-encapsulated for protection against vibration and atmospheric deterioration.
 4. The generator shall incorporate permanent magnet generator (PMG) excitation to sustain 250 percent short circuit current and provide immunity to SCR loads which may exceed 50 percent of total system load.
- Cooling System. The engine-generator set shall be provided with a radiator mounted on the unit and shall be sized to maintain rated engine-generator set capacity with an ambient temperature of 40°C. The radiator shall be equipped with ethylene glycol anti-freeze for protection down to -40°C.
 1. The Contractor shall provide a full-sized heavy gage sheet metal duct connecting the cowling on the radiator discharge to the wall mounted motorized damper. The ductwork sheet metal gages and general construction shall comply with the latest edition of the HVAC ductwork construction standards prepared by the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).
 2. A heavy neoprene coated glass fabric flexible duct connection shall be used to make the connection to the radiator cowling. The fabric shall be noncombustible and the coating fire retardant complying with UL 214 and accepted by the NFPA.
 - Exhaust System. An exhaust silencer shall be provided which shall include required flexible exhaust fittings, properly sized and installed in accordance with equipment manufacturer's recommendation. The silencer shall be mounted independently so that its weight is not supported by engine. Exhaust pipe size shall be sufficient to ensure that exhaust back pressure does not exceed maximum limitations specified by the engine-generator set manufacturer. Silencer shall be critical hospital grade. Acceptable manufacturers shall be Maxim or approved equal.
 1. The Contractor shall provide calcium silicate piping insulation on the exhaust piping, including fittings and flanges, per ASTM C533.
 2. The exhaust piping insulation shall be finished with an aluminum jacket.
 - Automatic Starting System. The Contractor shall provide a DC electric starting system with positive engagement drive. Motor voltage shall be as recommended by the engine-generator set manufacturer.
 1. Fully automatic engine-generator set start-stop controls in generator control panel shall be provided. The controls shall provide safety shutdown for low oil pressure, high water temperature, over-speed, and over-crank. A manual reset and two (2) auxiliaries normally open/normally closed, Form C contacts for activating accessory items shall be provided. The controls shall include 4-cycle cranking as herein specified.

2. A lead acid storage battery set of heavy-duty engine-generator starting type shall be provided. Battery voltage shall be compatible with starting system. Battery set shall be of sufficient capacity to provide for five (5) successive starts without recharging, consisting of ten (10) seconds per start at a temperature of 10°C. All necessary battery cables and clamps shall be provided. Battery set shall be provided with fill caps. Battery set shall be located on a mounting base at side of engine and provided with a thermostatically controlled heater.
3. A current limiting battery charger shall be furnished to automatically recharge batteries. The charger shall be compatible with the battery set, and shall include overload protection, silicon diode full wave rectifiers, voltage surge suppressors, DC ammeter, and fused AC input. Amperage output shall be no less than five (5) amperes. Battery charger shall be rated for 120 volt, AC input. Battery charger shall be installed in the engine-generator set enclosure.
4. Unit-mounted thermal circulation type jacket water heaters incorporating a thermostatic switch shall be furnished to maintain engine jacket water at 32°C with an ambient temperature of 8°C. A second thermostatic switch shall be furnished to ensure the jacket water temperature does not exceed 50°C. Each jacket water heater shall be rated for 120 volts, single-phase AC input.
- Generator Control Panel. The Contractor shall provide a generator-mounted NEMA Type 12 dead front, 14-gauge steel control panel. The control panel shall be installed with shock-absorbing mounts and shall contain, but not be limited to, one (1) voltmeter, one (1) ammeter, and one (1) frequency meter. The following equipment shall also be provided by the Contractor:
 1. One (1) ammeter-voltmeter selector switch with "OFF" position.
 2. Automatic starting controls system.
 3. Voltage level adjustment rheostat.
 4. Five (5) sets of dry contacts, normally open/normally closed, Form C, shall be provided for remote alarms and for louver operation. All contacts shall be wired to terminal blocks.
 5. Ethernet network interface
 6. Control panel shall be provided with a set of individual alarm circuits and with a common reset alarm switch for the following:
 - a. Low water temperature pre-alarm
 - b. High water temperature pre-alarm
 - c. High water temperature shutdown
 - d. Low oil pressure pre-alarm
 - e. Low oil pressure shutdown
 - f. Over-speed shutdown
 - g. Over-cranking shutdown
 - h. Function switch not in automatic
 - i. Low coolant level
 - j. Oil pressure gauge
 - k. Water temperature
 - l. Elapse time meter
 - m. Ground bus
 - n. Current transformers as required
 - o. Potential transformers as required

7. Indicating lights shall be provided for low oil pressure, high water temperature, over-speed and over-crank.
8. Four-position function switch marked "auto", "manual", "off-reset", and "stop".
9. A flashing light shall be included to indicate function switch is not in "automatic position".
10. Generator Main Circuit Breaker. A molded case type circuit breaker shall be installed on the output of the generator to operate both manually for normal switching functions and automatically during overload and short circuit conditions. The circuit breaker shall have an interrupting capacity of 22,000 amperes at 208 volts. Each circuit breaker shall be provided with a 120-volt AC shunt trip coil to operate as a manually closed electrically opened device.

Engine-generator set shall be manufactured by Cummins Power Generation, Generac, MTU Onsite Energy, Kohler, Caterpillar Inc., or approved equal.

Automatic and Non-Automatic Transfer Switches

- Transfer switches shall be suitable for 120/208 volt, 3-phase, 4-wire service.
- Switches. Three (3) switches are required as follows:
 1. An automatic/bypass isolation switch 3-pole, rated 200 amperes
 2. A manual operated (non-automatic), 3-pole rated 200 amperes
 3. A manual operated (non-automatic), 3-pole rated 30 amperes
- The automatic transfer/bypass isolating type switch shall be air break, double throw, load interrupter type, electrically operated but mechanically held in both normal and emergency positions.
- Main Contacts. The main contacts and current carrying parts shall be insulated for 600V.
- Current Rating. The current rating shall be a 24-hour continuous rating for the switch in a non-ventilated enclosure for all classes of loads including resistance, tungsten lamp, ballast, and inductive. Temperature rise shall conform to NEMA standards.
- Switch Operators. Switch operators shall be single solenoid or motor-operated devices momentarily energized by the source to which load is transferred.
- Transfer Time. Transfer time in either direction shall not exceed 1/2 second.
- Transfer Switch. The transfer switch shall have contacts for signal to start the engine generator after loss of normal utility power. The transfer switch shall be furnished without integral over-current or short circuit protection.
- Main Contacts. Both the normal and standby main contacts shall be surfaced with a silver alloy and protected by arcing contacts and magnetic blow-outs for each pole.
- The thermal capacity of main contacts shall be no less than 20 times continuous duty. In either position, the normal and standby main contacts shall be mechanically locked in position by the operating linkage. The auxiliary contacts shall be attached to and actuated by the same shaft as the main contacts.
- The transfer switch shall have a withstand rating of 65,000 symmetrical rms amperes at 208V at 80% power factor for a duration of cycles without contact separation or damage.
- The main and auxiliary contacts, operators, coils, springs, and control elements shall be removable from the front without removing the switch from the enclosure or disconnecting the main power cables.

- Non-automatic transfer switches shall be provided for power and control to permit the use of an external generator(s) in the event of failure of the indoor permanent generator.
- Manually operated non-automatic transfer switches (NTS) with number of poles, voltage and current ratings as shown on the drawings shall be provided. The contact transfer time in either direction shall not exceed one-sixth (1/6) of a second.
- Where neutral conductors must be switched as shown on the Plans, the NTS shall be provided with fully rated overlapping neutral transfer contacts. The neutrals of each power source shall be connected together only during the transfer and retransfer operation and remain connected together until power source to which transfer, or retransfer is being made. The overlapping neutral transfer contacts shall not overlap for a time duration greater than 100 milliseconds. A non-overlapping neutral transfer (fourth) pole shall not be acceptable.
- When neutral conductors are to be solidly connected as shown on the drawings, a neutral conductor terminal plate with fully rated AL-CU pressure connectors shall be provided.
- Automatic Transfer Switch (ATS). The automatic transfer switch shall be as manufactured and assembled by the Automatic Switch Company, model number 962. The automatic transfer switch shall be provided with the following accessories:
 1. An unloaded running time delay for engine generator cool-down which shall be field adjustable from 0 to 30 minutes and shall be factory set at five minutes.
 2. A test switch mounted on the enclosure door to simulate failure of the normal power source and to test the operation of the transfer switch.
 3. An auxiliary contact to close when the normal source is below 80 percent of rated voltage.
 4. The auxiliary contact to open when the normal source is below 80 percent of rated voltage.
 5. The transfer switch shall be provided with a green signal light to indicate when the switch is connected to the normal source and a red signal light to indicate when the switch is connected to the emergency source.
 6. Three (3) auxiliary contacts closed on normal and three (3) auxiliary contacts closed on emergency service.
 7. The transfer switch shall be provided with six (6) relay contacts to initiate starting of the engine generator. Three (3) contacts shall close, and three (3) contacts shall open when the normal power fails. The contacts shall be gold plated for low voltage service.
 8. An override switch mounted on the enclosure door to hold the transfer switch indefinitely connected to the standby power source regardless of condition of the normal power source.
 9. In-phase monitor controls for transfer and retransfer of motor loads so that inrush currents do not exceed normal starting currents and to avoid nuisance tripping of circuit protective devices and mechanical damage to motors and driven equipment. Transfer shall be made when two (2) sources have a phase angle difference of less than +/- 5 degrees.
 10. Three (3) contacts that open three (3) seconds before transfer operation and close three (3) seconds after transfer. Contacts shall operate on transfer in either direction.
- Bypass/Isolation Switch. A bypass/isolation switch shall be provided to electrically bypass and isolate the transfer switch. Bypass and isolation shall be possible under all conditions, including when the automatic transfer switch is removed from service. The switch shall be operable by one (1) person by movement of a maximum of two (2) handles at a common dead front panel. An interlock shall be provided which shall energize to unlock the bypass switch to prevent bypassing to a dead source.

- Electrical capabilities and ratings of the bypass/isolation switch shall be compatible with those of the associated automatic transfer switch. The automatic transfer switch and bypass/isolation switch shall be mounted in a common NEMA Type 1 enclosure. The transfer switch and bypass/isolation switch shall be mounted in separate compartments.
- Load Connection. Operation of the bypass handle shall connect the load directly to the normal or standby source, using load interrupter contacts to momentarily interrupt the load. Provision shall be included to assure continuity of auxiliary circuits necessary for operation of the system. A red indicating light mounted on the enclosure shall be energized when the transfer switch is bypassed. If power is lost while in bypass position, bypass to alternate source shall be possible without re-energization of the automatic transfer switch service and load connections.
- Live Power Connections. Operation of the handle shall isolate all live power connections to the transfer switch without interrupting the load. Interlocking shall be provided in the bypass/isolation switch to eliminate personnel-controlled sequence of operation and to prevent operation to the isolation position until the bypass function is completed. Provisions shall be included to padlock the handle in the isolated position. The isolation blades shall be visible in the isolated position.
- Mechanically Held Non-Automatic Transfer Switch (NTS). The non-automatic transfer switch shall be as manufactured and assembled by the Automatic Switch Company, model number 486. The NTS shall be enclosed in a NEMA Type 1 enclosure and shall be externally operated by a single quick-break/quick-make mechanism on the outside of the enclosure. The non-automatic transfer switch shall be provided with the following accessories:
 1. One (1) set of auxiliary contacts shall be provided rated 10 amperes, 480VAC, consisting of one (1) contact closed when the NTS is connected to each source. Also, one (1) set of signal lights to indicate when the NTS is connected to each source shall be provided.
 2. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented blow-on construction for high withstand current capability and be protected by separate arcing contacts. NTS's utilizing components of molded-case circuit breakers, contactors, or parts thereof which have not been intended for continuous duty, repetitive switching, or transfer between two (2) active power sources are not acceptable.
 3. Inspection of all contacts (movable and stationary) shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. A manual operating handle shall be provided for maintenance purposes. The handle shall permit the operator to stop the contacts at any point throughout the entire travel to properly inspect and service the contacts when required.
 4. The NTS unit shall be mechanically held. The switch shall be positively locked and unaffected by voltage variations or momentary outages so that constant value and temperature rise at the contacts is minimized for maximum reliability and operating life. The switch shall be mechanically interlocked to ensure only one (1) of two (2) possible positions.
- Each automatic transfer/bypass isolation and non-automatic switch shall be the product of one (1) manufacturer and be completely factory-interconnected and tested so that only the service and load connections to the bypass isolation switch are required for field installation. Interconnections within the automatic transfer switch, bypass switch and isolation switch shall be by silver-plated copper bus bar.

- A visual position indicator shall be provided to indicate bypass isolation switch positions. A prominent and detailed instruction plate shall be provided for convenient operation. Enclosure construction shall be in accordance with UL and NEMA standards for industrial controls.

Electrical Identification

- Electrical equipment labeling shall conform to the latest Intelligent Transportation Systems (ITS) Labeling Guide as published by the Illinois Tollway.
- The Contractor shall provide white with black core laminated phenolic nameplates with 3/8-inch lettering etched through outer covering. Each nameplate shall be fastened with stainless steel screws to each piece of equipment.
- All major electrical equipment shall be identified, this includes disconnect switches, panels, switches, etc. Disconnect switches serving feeders and over-current protective devices mounted in a switchboard shall be so identified. Embossed self-adhering plastic tape labels shall not be used.
- Cable/wire markers shall be installed on both ends of all conductors. All wire and feeder cables shall be labeled with wire markers in all junction boxes, pull boxes, control panels, panelboards, switchboards, etc. Cable and wire markers shall be per TIA-606 Standard for labeling telecommunication equipment and be approved by the Illinois Tollway. The markers shall be attached to all cables were entering or leaving a conduit run. Cable designation and circuit use shall appear on the tag.

Acceptable manufacturers shall be Brady, Panduit, 3-M, Thomas and Betts, or approved equal.

Transformer Foundation

- The Contractor shall furnish all materials and construct a concrete foundation for a pad-mounted utility transformer for electric service to the toll plaza building as shown on the Plans and as required by this Section.
- All materials shall conform to the requirements of the following Section/Article of the Standard Specifications:

Item	Section/Article
Portland Cement.....	1020
Reinforcement Bars.....	1006.10(a)
Anchor Rods.....	1006.09

Motor Voltage Operation

- Unless otherwise noted, AC motors under 1/2 horsepower shall be 115 volts AC, single-phase, 60 hertz. Motors 1/2 horsepower and larger shall be 200 volts AC, three-phase, 60 hertz for use on a 208-volt system.
- AC motor type enclosure and other design requirements shall be as specified in this Special Provision.

CONSTRUCTION REQUIREMENTS

The Contractor shall closely coordinate his/her work and submittals with the Engineer. This includes, but is not limited to, the following:

Pre-Procurement Documentation Approval

- Within 10 business days from the Notice to Proceed (NTP), the Contractor shall submit to the Engineer for review and approval through Illinois Tollway Web Based Program Management (WBPM) system, a detailed schedule showing dates for: product submittals and approvals; request for device configuration by the Illinois Tollway, if required; construction/installation; testing; burn-in period; and warranty of each system component. This detailed schedule shall be included in the Baseline Schedule, as required per Illinois Tollway Supplemental Specifications Article 108.02.
- Within 10 business days from the Notice to Proceed (NTP), the Contractor shall submit to the Engineer for review and approval a completed Contractor Submittal Checklist.
- Materials and installation shall conform to the applicable codes and standards.
- Material data information shall include, but not be limited to, installation drawings, schematic wiring, single line diagrams, lighting panel schedules, conduit and cable schedules, grounding, symbols and legends, etc.
- The equipment manufacturers' schematic diagrams shall be "JIC" ladder type.
- The equipment manufacturers' wiring diagrams shall show terminal blocks for external wiring.
- The equipment manufacturers' internal point to point and external wiring diagrams between cubicles, panels and components within the equipment line up shall be provided.
- The Contractor must obtain approval of the schedule, model cut sheets, wiring diagrams, and calculations from the Engineer prior to purchasing any equipment and subsequently performing the installation per the approved documents, Plans, and specifications.

Shop drawings submittal shall include, but not limited to, the following items:

- Power and Data Wires and Cables
- Receptacles and Switches
- Panelboards
- Uninterruptible Power Supply Systems
- Transformers
- Disconnect Switches
- Contactors
- LED Lights
- Emergency Lighting Units
- Cable Tray
- Engine-Generator
- Automatic and Manual Transfer/Bypass Switches
- Photoelectric Cell
- Data Logger Camera System

- Equipment Racks
- Card Reader Equipment
- Special Cables
- Video Power Junction Boxes
- Service Entrance Equipment

Shop drawings shall consist of a complete list of materials including manufacturer's descriptive and technical literature, model cuts, drawings, installation instructions, mounting details, single line and control schematic diagrams of equipment, where applicable.

Additional shop drawing submittal requirements for the toll plaza electrical work components are as follows:

- Card Access System:
 1. Product data and model cuts information shall also be submitted for:
 - a. Card readers
 - b. Card reader terminal controller
 - c. Card reader smart terminal interface
 - d. Card access programmer
 2. A complete list of materials including manufacturer's descriptive and technical literature, model cuts, drawings, and installation instruction. Shop drawings shall include, but not be limited to, the following:
 - a. Special fabricated component which are not a manufactured standard product
 - b. Plan drawings indicating the location of all product data indicating material proposed, connections, raceway requirements, power supply requirements, the methods of construction and all log penetrations
 - c. Mounting details
 - d. Parts list
- Engine-Generator Set:
 1. Product data and model cuts information shall also be submitted for:
 - a. Engine
 - b. Generator
 2. A complete list of materials including manufacturer's descriptive and technical literature, model cuts, drawings, and installation instruction. Shop drawings shall include, but shall not be limited to, the following:
 - a. Plan, front view, and rear elevations of engine generator which shall include outline of control panel, battery, battery charger, radiator, entrance and exit conduits, piping and other accessories.
 - b. Plan, front view, and rear elevations of engine generator which shall include outline of control panel, battery, battery charger, radiator, entrance and exit conduits, piping and other accessories.
 - c. Mounting-base details. All dimensions for rough-in work at site shall be provided. The shop drawing shall show channel iron mounting base that shall be provided as part of this Special Provision.
 - d. The shop drawings shall show details of bus, connections, terminals, etc., including complete ground bus arrangement and ground connections.

- e. Single line diagram of equipment, control schematic diagrams, and relay and metering schematic diagrams shall be provided. The engine data shall include manufacturer of engine, number of cylinders, piston displacement, piston speed, brake mean effective horsepower, etc.
 - f. Connection diagrams for internal and external wiring of equipment and control console shall be included.
 - g. Interconnection diagrams shall show wiring to equipment. The terminal block points shall be clearly identified for external wiring that shall be routed in or out of equipment. The wiring diagrams shall provide adequate space at terminal blocks for addition of cable and wire designations for external wiring to be routed in or out of equipment.
 - h. Bills of material shall include all items with model cuts describing electrical and physical characteristics of each item.
 - i. The Contractor shall submit, for record and distribution, prior to shipment of equipment, copies of each of following for the natural gas engine generator assembly:
 - All shop drawings as finally reviewed and any factory assembly modifications
 - Recommended installation and storage instructions with any special instructions
 - j. The Contractor shall submit three (3) sets of Instruction Manuals for record and distribution after installation of equipment.
 - k. Instruction manuals shall include the descriptive bulletins and operation leaflets for diesel engine generator set, protective relays, operating switches and maintenance procedures for circuit breakers, and other components furnished with equipment:
 - Each instruction manual shall be in a three (3) ring hard binder with tabbed sections. Binder cover shall have project name and equipment name. Lettering shall be block type and shall be a minimum height of 1/2 inch.
 - Each instruction manual shall contain the as-built drawings (including wiring diagrams, schematics and parts exploded views, etc.), complete operating and instruction manuals, spare parts lists, certified test documents, and other special data required for this equipment.
 - As-built drawings larger than 8-1/2 inch by 11 inch shall be fan folded.
 - l. Spare parts bulletins shall be included with model cuts for each item.
 - m. Certified test reports shall include assembly and sub-assembly test and inspection reports.
 - n. The Contractor shall submit sufficient copies of any shop drawings and other data sheets that were revised or modified during installation. These will be inserted in previously submitted instruction manuals.
- Automatic and Non-Automatic Transfer Switches:
 1. Product data and model cuts information shall also be submitted for:
 - a. Automatic Transfer Switch (ATS)
 - b. Non-Automatic Transfer Switch (NTS)
 - c. Bypass/Isolation Switch
 - d. Load Connection
 - e. Live Power Connections

2. A complete list of materials including manufacturer's descriptive and technical literature, model cuts, drawings, and installation instruction. Shop drawings shall include, but shall not be limited to, the following:
 - a. Plan, front and rear elevations, section views and mounting details of the ATS and NTS switches. Shop drawings shall show the internal barriers.
 - b. Shop drawings shall include, but shall not be limited to, the steel wide flange and channel iron mounting base details. Dimensions for rough-in work at the site shall be provided. The shop drawings shall show the channel iron mounting base which shall be provided as part of this Special Provision and shipped separately to meet the pouring schedules.
 - c. The drawings shall show the details of bus, connections, terminals, etc., including, but not limited to, the complete ground bus arrangement and enclosure ground connections.
 - d. Single-line diagram of equipment, control schematic diagrams, and relay diagrams shall be provided.
 - e. Wiring Diagrams.
 - f. Connection diagrams for the wiring of equipment shall be included.
 - g. Interconnection diagrams shall show the wiring to equipment. The terminal block points shall be clearly identified for the external wiring which shall be routed in or out of the cubicles. The wiring diagrams shall provide adequate space for the addition of cable and wire designations for the external wiring to be routed in or out of the equipment at the terminal blocks.
 - h. Bill of material shall include items with model cuts describing the electrical and physical characteristics of each item.
 - i. Recommended installation and storage instructions with any special instructions shall be provided.
 - j. Instruction booklets shall include, but shall not be limited to, descriptive bulletins and operation leaflets for the protective relays, control relays, operating switches and maintenance procedures.
 - k. Each instruction manual shall be in a three-ring hard binder with tabbed sections. The binder cover shall have the project name and equipment name. The lettering shall be block type and shall be a minimum height of 1/2 inch.
 - l. Each instruction manual shall contain the as-built drawings, complete operating and instruction manuals, spare parts lists, certified test documents, and other special data required for this equipment.
 - m. The as-built drawings larger than 8-1/2 inch by 11 inch shall be fan-folded.
 - n. Spare parts bulletins shall be included with model cuts for each item.
 - o. Certified test reports shall include assembly and subassembly test and inspection reports.
 - p. The Contractor shall submit ten (10) copies of any shop drawings and other data sheets that were revised or modified during installation. These will be inserted in the previously submitted instruction manuals.

Pre-Installation Requirements

- Thirty (30) days prior to the scheduled field installation of the toll plaza electrical system, the Contractor shall notify the Engineer of the anticipated delivery date of any toll plaza component, to the Illinois Tollway Central Administration (CA) Building for configuration and labeling prior to installation by the Contractor. The Contractor shall provide a form to the Engineer during acceptance of the equipment at CA showing the equipment, each equipment specific serial number, and the field location of each piece of equipment. This form will be signed by both the Engineer and the Contractor.
- Equipment and material shall be delivered to the job site or storage facility in its original containers and shall be suitably sheltered from any adverse element and mechanical injury. The equipment and material shall be readily accessible for inspection until installed. Items subject to moisture damage shall be stored in dry heated spaces. Manufacturer's directions shall be followed in the delivery, handling, storage, protection, installation and operation of all equipment and materials.
- The Contractor shall coordinate with the Engineer the movement of heavy machinery, equipment and heavy parts thereof brought into or onto the building or premises.
- The Contractor shall secure and pay for all required permits, governmental fees, taxes and licenses necessary for the proper execution and completion of the Work.

The Contractor shall notify the Engineer of any proposed materials or apparatus believed to be inadequate, unsuitable, in violation of laws, ordinances, rules or regulations of authorities.

INSTALLATION

General

- The Contractor shall perform all Work with trained mechanics of the particular trade involved in a neat and workmanlike manner as approved by the Engineer.
- Materials and installation shall comply with codes, laws and ordinances of Federal, State, and local governing bodies having jurisdiction. Should any work performed by the Contractor be deemed by the Engineer non-compliant with the applicable building codes, State and Federal laws, local ordinances, industry standards and utility company regulations, changes for compliance shall be completed by the Contractor at no additional cost to the Illinois Tollway.
- In the event of any conflict between building codes, State and Federal laws, local ordinances, utility company regulations, and the contract documents, the most stringent code shall govern.
- All equipment and materials acquired for this Project shall conform to any acts, laws, rules and regulations of the following organizations:

1. National Electrical Code (ANSI/NFPA70)
2. National Electrical Safety Code (NESC/ANSI C2)
3. American National Standards Institute (ANSI)
4. National Fire Protection Association (NFPA)
5. Institute of Electrical and Electronics Engineers (IEEE)
6. Insulated Cable Engineers Association (ICEA)
7. National Electrical Manufacturers Association (NEMA)
8. Illuminating Engineering Society of North America (IESNA)
9. Underwriters Laboratories Inc. (UL)
10. Canadian Standards Association (CSA)
11. Occupational Safety and Health Administration (OSHA)
12. Motorola R56

- Unless otherwise specified herein in these special provisions, all equipment and materials acquired and installed under this contract must comply with all applicable requirements of the latest edition of the Standard Specifications.
- The Contractor shall perform all Work in cooperation with other trades and schedule to allow speedy and efficient completion of the Project.
- The Contractor shall furnish other trades with advance information on locations and sizes of frames, boxes, sleeves and openings needed for the Work, and also furnish information and shop drawings necessary to permit trades affected to install their work properly and without delay.
- Where there is evidence that work of one (1) trade will interfere with the work of other trades, all trades shall assist in working out space conditions to make satisfactory adjustments and shall be prepared to submit and revise coordinated shop drawings and installation drawings.
- Work installed before coordinating with other trades so as to cause interferences with the work of such other trades shall be changed as directed by the Engineer to correct such condition without additional cost to the Illinois Tollway.
- Minor changes in the locations of outlets, fixtures and equipment shall be made prior to rough-in at the direction of the Engineer and at no additional cost to the Illinois Tollway.
- The Contractor shall cooperate with other trades and coordinate the Work to eliminate conflicts with other work.
- Locations of electrical outlets, lighting panels, cabinets, equipment, etc. are approximate and exact locations shall be determined by the Contractor at the Project site.
- The Contractor shall refer to Contract Documents for details, reflected ceiling plans, and large scale plans.
- The Contractor shall protect the materials and work of other trades from damage during installation of the Work provided under this Contract.
- The Contractor shall install equipment in accordance with approved shop drawing and equipment manufacturer's recommendations.
- All equipment shall be installed with workspace clearances as required by applicable codes, and to permit maintenance and replacement of components. The Contractor shall adjust the location of equipment to accommodate the installation in accordance with field conditions encountered.

- Equipment furnished shall have the manufacturer's name, address, and model number and rating on the manufacturer's nameplate securely affixed in a conspicuous place. The nameplate of a distributing agent is not acceptable. Code ratings, labels or other data, including any that are die-stamped into the surface of the equipment, shall be placed in a visible location.

Equipment Noise Limitation

- Noise levels of electrical devices and equipment shall be within acceptable limits as established by NEMA or other valid noise rating agencies. The Illinois Tollway's acceptance will be based on practical and reasonable considerations of occupancy requirements.
- The Contractor shall check and tighten the fastenings of sheet metal plates, covers, doors, and trims to prevent vibration and chatter under normal conditions of use.
- Transformers and lamp ballasts shall be designed and rated for "quiet" operation.
- The Contractor shall remove and replace any individual electrical item or device that is found to produce a sound energy output exceeding that of other identical devices installed on this Project.

Transmission of Vibration

- Electrical equipment, conduit, and fittings shall not be mounted to or supported by elements subject to vibration except by methods that shall prevent transmission of vibration thereof.
- Where flexible conduit lengths are utilized as a mean of isolating equipment and conduit systems vibration, care shall be exercised to assure continuity of ground throughout. Flexible conduit lengths shall be kept to a minimum.

Protection

- The Contractor shall protect conduit and cable tray openings against the entrance of foreign matter by means of plugs or caps.
- The Contractor shall cover fixtures, materials, equipment, and devices furnished or installed under this Contract or otherwise protect against damage, before, during, and after installation.
- Fixtures, materials, equipment, or devices damaged prior to final acceptance of the Work shall be restored to their original condition or replaced.
- Equipment shall be inherently safe and moving parts shall be secured appropriately.

Equipment Bases

- The Contractor shall furnish and install concrete pedestals, bases, pads, curbs, anchor blocks, anchor bolts, slab inserts, channels, etc., for installation of electrical equipment and apparatus that is floor-mounted.
- Concrete pads shall be six (6) inches high, unless otherwise indicated on the Plans, complete with steel reinforcing and necessary bolts, anchors, etc. Where concrete pad is set directly on concrete floor, dowels in floor to tie base to floor shall be provided. These pads shall be extended at least four (4) inches beyond the equipment outline on all four (4) sides, unless otherwise indicated on the drawings.

Hangers

- The Contractor shall furnish and install adequate supports for all equipment, either suspended from the construction above, or by means of struts to the construction below.
- The Contractor shall furnish and install straps, clamps, threaded rods, turnbuckles and anchors and all miscellaneous specialties for the attachment of hangers and supports to the structure. Conduit hangers for single conduit threaded rod supports shall be a maximum of seven (7) feet long. Threaded rod supports shall be sized in accordance with the hanger manufacturer's requirements.

Sleeves

- The Contractor shall furnish and install sleeves where conduits pass through walls as required by the Plans, and/or as directed by the Engineer.
- Sleeves shall be 18 gauge galvanized sheet metal or plastic, as approved by code, of sufficient length to finish flush with finished surfaces at both ends of sleeves. Sleeves shall be not less than one (1) inch larger than outside diameter of conduit.
- Where conduits pass through floors on grade or exterior walls, the Contractor shall caulk sleeves with non-hardening sealant at both ends to ensure waterproofing around the conduit.
- Sleeves shall be set true to line level plumb and position and shall be so maintained during construction.
- Where sleeves pass through fire rated walls or floors, suitable fire stopping shall be provided.
- Where sleeves are provided in poured concrete, the Contractor shall inspect each sleeve during and after concrete is poured to ensure proper position and to correct any deviation.

Painting

- All electrical equipment not specified for factory finish painting under other Special Provision Items shall be painted as specified herein.

Patching

- The Contractor shall provide all cutting and patching of building materials required for the installation of the Work herein specified. No structural members shall be cut without the approval of the Engineer. Roof deck is considered a structural member. Approved cutting shall be done with concrete saws or core drills.
- Patching shall be provided by mechanics of the particular trade involved and done in a neat and workmanlike manner.

Cleaning

- All rubbish and debris shall be collected, removed from the jobsite, and disposed of legally on daily basis. The Contractor shall ensure the installation environment is free of any construction debris, packing materials or any other debris that may cause a safety/trip hazard. All floors shall be kept in a broom clean condition.
- In addition to using preventative measures, such as, keeping conduits capped, keeping gaskets intact and covers/doors closed on boxes and enclosures, and covering equipment as needed; the Contractor shall clean the inside of the conduits as required before pulling wires and cables. The Contractor shall clean the interiors of equipment enclosures, lighting fixtures, light standards and panels as needed before installing field mounted equipment and devices. The Contractor shall clean the interiors and exteriors of all enclosures, fixtures, and panels as needed or as directed by the Engineer.
- After completion of the electrical installations, the entire system shall be thoroughly cleaned to remove all foreign materials from the conduits, boxes and enclosures, equipment, lighting fixtures, light standards, panels, cords, etc.
- Cleaned shall mean the thorough removal of, but not limited to, dust, dirt, oil, grease, cement, plaster, welding spatters and paint spatters. All cleaning agents and methods shall be in accordance with the electrical equipment manufacturers' recommendations and subject to approval of the Engineer.

Conduit

- The conduit system shall be installed complete with all accessories, fittings, and boxes, in an approved and workmanlike manner to provide proper raceways for electrical conductors. Conduit shall be installed concealed or exposed as shown.
- Exposed conduit runs shall be installed true, plumb, parallel with or at right angles to adjacent structural members, and must present an orderly, neat and workmanlike appearance.
- Field bends shall be carefully made to prevent conduit damage or reduction in internal areas. Field bends shall be made with proper tools for the size and type of conduit being used. The bending radius shall be not less than six (6) times the nominal diameter of the conduit, with carefully matched bends on parallel runs to present a neat appearance. The number of crossovers shall be kept to a minimum. In addition to the above requirements, all cables installed in conduits requiring bends shall adhere to the allowable bend radius per the cable manufacturer specifications and any additional requirements per the device manufacturer for which the cable is used.

- All conduits cut on the job shall be carefully reamed after threading to remove burrs. All field cut threads shall be tapered. No running threads shall be permitted. All field cut threads on steel conduit shall be given a coat of zinc dust in oil, or other approved compound.
- All threaded joints shall be watertight and ensure a low resistance ground path in the conduit system.
- All conduits shall be carefully cleaned before and after installation and all inside surfaces shall be free of imperfections likely to injure the cable. After installation of complete runs, all conduits shall be snaked with an approved tube cleaner equipped with an approved cylindrical mandrel of a diameter not less than 85 percent of the nominal diameter of the conduit. Any conduits through which the mandrel will not pass shall be removed and replaced. After snaking, the ends of the dead-ended conduits shall be protected with standard malleable metal caps to prevent the entrance of water or other foreign matter.
- Lines of nylon or polypropylene, propelled by carbon dioxide or compressed air, shall be used to snake or pull wire and cable into conduits. Flat steel tapes or sparks tapes may be used where GRS conduit runs are shorter than 50 feet. Steel cables are not acceptable.
- Where conduits are connected to boxes or equipment enclosures, drilled holes or full-size knockout openings shall provide electrical continuity for grounding and shall be assured by the use of bonding type locknuts. Where connections are at eccentric knockouts, jumper type grounding bushings and wire jumpers shall be installed.
- At pull boxes and junction boxes that have any box dimension in excess of 18 inches and having a total of more than four (4) conduit terminations, jumper-type grounding bushings shall be installed on conduit ends and jumper wires shall be installed to bond all conduits and to bond conduits to boxes.
- Conduit bends that are crushed or deformed in any way shall not be installed.
- Conduit systems shall be installed, with fittings, double locknuts and bushings, and made up tight to ensure ground continuity throughout the system.
- Conduit connections to NEMA Type 3R, NEMA Type 4, and NEMA Type 4X enclosures shall terminate in a threaded hub with an insulated throat to provide a positive seal, an electrical ground and a watertight connection. Each hub shall be OZ/Gedney Type CH-T, or approved equal.
- As far as practicable, conduit shall be pitched slightly to drain to the outlet boxes, or otherwise installed to avoid trapping of condensate. Where necessary to secure drainage, a breather-drain fitting shall be installed in the boxes or fittings at low points. Each breather drain fitting shall be manufactured by Cooper Crouse-Hinds Co., Appleton Electric Co., or approved equal.
- Conduit shall not run through columns or beams unless so specifically detailed on the installation drawings.
- Where installed in the concrete slab, the conduit shall be placed in the center of slab and no closer than three (3) diameters from adjacent conduits. The maximum outside diameter of conduits in slab shall be no greater than 1/3 of slab thickness. The conduit shall be installed in the middle 1/3 of the slab.
- Where installed in pads or concrete islands the conduit shall be placed in the locations shown on the Plans.
- Joints for conduit installed in pads, concrete slabs and islands shall be made watertight. Tape is not acceptable.

- Conduit openings shall be temporarily plugged with metal caps to exclude water, concrete, plaster, and other foreign material.
- Conduits embedded in concrete shall be blocked and braced in place by use of adequate conduit separators to prevent displacement during the placing of concrete. The Contractor shall be held responsible for proper position of conduits and shall rearrange any conduit that may be displaced while concrete is placed. In addition to the above requirement, all embedded conduits shall be clearly labeled at both ends for clear and proper conduit run identification.
- Conduits run in floor slabs or islands shall be a minimum of one (1) inch in size, and as shown on the Plans.
- The number of 90-degree bends shall be limited to three (3) or a total of 270 degrees including all offsets, sweeps, kicks, etc. This shall be between panelboards, switchboards, pull boxes, outlet boxes, fittings, or between outlet to fitting including bends located immediately adjacent to outlet or fittings. The maximum run without pull boxes shall be 150 feet.
- All wiring systems shall be "pullable" and use of "BX" is prohibited.
- Conduits entering free standing panels, and free-standing control cubicles shall be fitted with jumper type insulated grounding bushings, bonded together and to the structure of the enclosure by a continuous bonding wire.
- Conduits and concrete type boxes, masonry boxes, and other flush mounted boxes shall be installed concealed in masonry walls, plaster walls, dry wall and concrete walls.
- All concealed conduits shall be placed in walls, floors, or islands at the proper time, in accordance with the progress of the structural work.
- When work is not in progress, open ends of conduit and fittings shall be securely closed so that no water, earth or other substance will enter.
- Pull cords shall be installed in empty conduits. All conduits with cables installed shall have a pull cord installed in the event of the need for future use.
- Conduit shall be terminated at the conduit connection points of electric motors, devices, and equipment. Terminations of conduits at such locations shall permit direct wire connections to the motors, electrical devices, or other equipment.
- Conduit connections shall be made with rigid conduit if the equipment is fixed and not subject to adjustment, mechanical movement, or vibration. Rigid conduit connections shall have union fittings, to permit removal of equipment without cutting or breaking the conduit.
- Conduit connections shall be made with approved flexible metallic conduit if the equipment is subject to adjustment, mechanical movement, or vibration. Flexible conduit connections shall be watertight.
- All conduits run underground and under pavements or in concrete shall be PVC conduit unless noted otherwise on the Plans. Coilable Non-Metallic Conduit (CNC – HDPE SDR 11) shall be utilized for fiber optic cable and power runs as shown on the Plans.
- All underground raceways shall have a minimum depth of 33 inches below the finished grade unless otherwise indicated on the Plans. Raceways under pavement shall be installed at a minimum depth of 45 inches below the top of pavement to avoid conflicts with the underdrain unless otherwise indicated on the Plans or directed by the Engineer.
- The minimum size conduit shall be 3/4 inch, unless otherwise indicated.

Wires and Cables-600 Volts

- All cable and wire shall be installed in conduit or cable tray. Conduits shall be swabbed to remove any debris or accumulated moisture before cables or wires are pulled in. No splices shall be permitted between terminals, except at approved junction or terminal box points, as required by Code for pull lengths. Cable and wire runs shall be looped through pull boxes without cutting and splicing where possible.
- Feeders shall be installed with the sizes as indicated on the Plans and shall be connected as required for the proper operation of the equipment they serve.

Splices and Terminations

- No splicing shall be permitted except in junction boxes. Terminations shall be made with compression type connectors and lugs. The lug manufacturer's recommended tools shall be used. Mechanical type fittings shall not be acceptable. Lugs shall be one (1) or two (2) hole, color keyed. Lug bolting shall include flat washer, beveled washer, and a locknut.
- Each cable splice shall be covered with either a cold shrink connector insulator or heat shrink connector insulator. The insulator material shall be rated for 1000 volts and shall be rated for direct burial installation.
- All splices and pigtail connections for indoor lighting and receptacle wire for cable sizes 10 AWG and smaller may be made up with pre-insulated spring connectors, 3M Company "Scotchlock," Ideal Industries, Inc., wire nuts, or approved equal.
- Splices for cable sizes 8 AWG and larger shall be butt splice type consisting of long barrel copper only type compression connector. Each connector shall have internal cable stops and color-coded for proper die size and number of crimps. Acceptable manufacturers shall be Anderson Model Type VHS, Burndy Model Type YS, Panduit Model Type SCL, or approved equal.

Special Cable and Associated Hardware (if required)

- The Contractor shall provide the equipment and personnel, as recommended by the manufacturer, for uncoiling, feeding, gripping, pulling, and terminating of the cable. Cable pull lengths shall not exceed the maximum pull tensions as recommended by the manufacturer or 200 pounds maximum whichever is less. In addition to the requirement for cable length the Contractor shall follow NEC standards on allowable conduit fill ratios.
- Sufficient slack/loops shall be left in pull boxes and hand-holes to allow for thermal expansion and contraction.
- The Contractor shall purchase and use the proper specialized tools for stripping jackets, coring and assembling the cable connectors and splice connectors.
- After all Work has been completed, tested and accepted by the Engineer, one (1) complete set of these tools shall become the property of the Illinois Tollway.
- All Cat6 cable shall be installed without splices from the field equipment to the termination cabinet. Three (3) feet of cable shall be left at the equipment housing end. If the cable cannot be coiled in the housing, the end shall be sealed with a shrink wrap end cap and left exposed. The cable from field equipment shall have six (6) feet coiled in the termination cabinet.

- Shielded Cable Grounding. Shielded control and data cables shall have the shields grounded at one end. The shield shall be insulated from the conductors, equal to that of the original cable insulation, at each splice. Shielded power cables shall have shields grounded at the load ends. Shielded data cables shall have shields grounded at the Data Cabinet or source ends. Shields shall be insulated from the conductors.

Toll Equipment Wiring and Requirements

- The Contractor shall furnish and install all single and multi-conductor toll equipment cable as shown on the Plans and as required by this Section. The Contractor shall make all final wiring connections of cable unless specifically identified by this Section or the Plans as being terminated by the Illinois Tollway.
- The Contractor shall inform the Engineer in writing when the new conduits have been installed in the islands or from the control building or cabinets to the lanes. A time of five (5) working days shall be allowed by the Contractor during which time the conduits for the new lanes will be checked by the Engineer to isolate errors. Underground loop conduits and rebar, located in CRC sections need to be inspected by the Tollway Integrator for correct quantity, location, and depth. Five day notice is required.
- Following this period and after the control buildings and toll collection lanes have been cleaned of construction debris and all items from the Pre-Integrator Checklist have been satisfied, the Illinois Tollway will commence the installation of the toll equipment. A period of three (3) business days per each low-speed lane of toll equipment will be allocated for installation. A total of ten (10) working days must be allocated for each AET high-speed zone. If multiple AET zones are present, the project schedule must show non-overlapping durations of installation work for each zone.
- Upon completion of the Toll Equipment installation, one (1) day of Toll Equipment Certification testing and three (3) weeks back-office testing shall be made available to the Illinois Tollway. This time must be reflected in the contractor's schedule and must occur before any zones can be opened for revenue collection. During Toll Equipment Certification testing, the contractor shall ensure that the zone 200 feet upstream and downstream is swept clean of any debris and closed off to all traffic.
- Data cables shall be marked at both ends by the Contractor, indicating the lane number to which they have been pulled.
- Cable ends shall be sealed to prevent moisture/water entry.
- Ten feet of each cable shall be coiled above the island and protected at each lane
- Power and control terminations at the Automatic Toll Collection Equipment installed by the Illinois Tollway will be by the Illinois Tollway.
- Terminal strips in the prefabricated building shall be furnished and installed by the Contractor as shown on the Plans.
- All wire terminations shall be made with terminals approved by the Engineer.
- Crimping of terminations on wire shall be made with the proper crimping tool.
- All terminations and final connections of the data cable shall be as shown on termination drawings provided by the Illinois Tollway during Construction.
- All wiring shall be dressed in a professional manner with each section of each cable running without crossing other cables and sections.

- After all new cable and wire has been installed, each conductor shall be tested for insulation resistance and electrical continuity.
- At any time that testing for the lane is taking place; the Contractor shall have a licensed electrician in attendance so that any error or wiring problems shall be resolved as they occur.

Pull Boxes and Junction Boxes

- Pull boxes and junction boxes shall be installed as shown on the Plans and shall be supported independently from the conduit system. The Contractor shall add pull boxes where needed even though not shown on the Plans to ensure that finished cable will not be damaged.

Outlet Boxes

- Outlet boxes shall generally be four (4) inches square or octagonal as indicated on the Plans.
- In masonry walls, where conduit is installed concealed, each outlet box shall be square cut masonry boxes.
- In concrete walls and floor slabs, where conduit is installed concealed, boxes shall be suitable and constructed for installation in concrete.
- In exposed work, surface outlet boxes shall be used for switches and receptacles. The NEMA Type shall be as described in this Section.
- Outlet boxes for use with rigid conduit shall be of the threaded hub, malleable iron cast metal type, with malleable iron cast covers and gaskets.
- In finished plaster walls, drywall, etc., raised device covers on outlet boxes shall be provided.
- Where 1-1/4 inch conduit is required, the box size shall be a minimum of 4-11/16 inches square.
- Proper covers on boxes mounted flush shall be provided.
- All ceiling outlets shall have adequate supports and shall be equipped with adequate devices to carry and mount the light fixtures provided fixtures do not weigh more than five (5) pounds.
- Orientation of outlet boxes for single and multiple gang light switches and convenience receptacles shall be such that the devices shall be installed in accordance with the wiring device installation.
- An outlet box shall be provided at each location requiring one (1).
 1. Outlet box locations as shown on the Plans shall be considered as approximate only.
 2. Exact locations shall be determined from the Plans or from field instructions. The Contractor shall coordinate box locations with the work of other trades.
 3. Each outlet box shall be installed true and plumb, so that the covers or plates shall be level, and at uniform elevations for the type of outlets contained.
 4. A plaster ring shall be installed for each outlet to provide horizontal mounting.
 5. Each outlet box shall be supported independently from the conduit system.
 6. Boxes for toggle switches and pilot lights at doorways shall be located at the strike side of the door.

- There shall be no more openings made in any box than are required for the conduits entering same. Depths of boxes shall be such as to allow for easy wire pulling and proper installation of wiring devices. Where extra openings occur, proper closures shall be installed.
- Switches and receptacles shall be ganged in a common box only as indicated on the Plans.

Device Boxes

- Fixtures that weigh more than five (5) pounds shall be supported independently of the outlet box. Surface mounted wall bracket fixtures (concealed conduit) shall have four (4) inch square sheet steel box with plaster ring as required for the fixture.
- Ceiling outlets and wall bracket outlets (exposed conduit) in dry locations shall have four (4) inch sheet steel octagon box with 3/8 inch fixture stud.
- Outlet boxes on exposed conduit run in wet or damp locations shall have four (4) inch cast box with threaded hubs and gasketed covers.

Wiring Devices

- All wiring devices shall be installed in cast FS boxes with FS covers and extra-duty die-cast weatherproof covers outdoors. The Contractor shall install equipment in strict accordance with approved shop drawings and equipment manufacturer's recommendations.
- The Contractor shall adjust the location of equipment to accommodate Work in accordance with field conditions encountered.
- The Contractor shall install each convenience receptacle with grounding pole on bottom when mounted vertically or on right when mounted horizontally.
- The Contractor shall install plates on all switch and receptacle outlets and shall install blank plates on all boxes without wiring devices.
- The Contractor shall install devices and plates level.
- Each switch shall be mounted four (4) feet above finished floor and each receptacle shall be installed 1 foot six (6) inches above finished floor, unless otherwise shown on the Plans.
- The Contractor shall test complete wiring device installations to assure proper operation.

Cable Trays – Aluminum

- Cable trays shall be supported from the main structure of the buildings and shall be installed in strict accordance with the approved shop drawings, manufacturer's instructions, and NEMA VE-2.
- The Contractor shall install channels with rods, nuts, channel nuts with springs, flat washers, and other miscellaneous hardware to support the cable tray from the ceiling.
- The Contractor shall provide cable tray cover openings for cables entering and leaving through the top. Each opening shall have a non-metallic grommet for each cable. Each cable tray cover shall be a maximum of 18 inches in length where that cover section has a cable opening.

Panelboards

- Surface mounted panelboards shall be supported and mounted away from walls with "C" shaped galvanized steel channel.
- Minimum separation between equipment and wall shall be one (1) inch. Panelboards shall be installed clear of all openings with swinging or moving doors, partitions or access panels. Each panelboard and control equipment enclosure shall be mounted with top a maximum of 6 feet - 6 inches above finished floor unless shown otherwise on the Plans.
- Each cabinet shall be thoroughly cleaned and bonderized before painting. Painting shall consist of enamel or lacquer over a rust inhibitor, ANSI 61 light gray color.

Local Control

- Local control equipment shall be installed clear of all openings with swinging or moving doors, partitions or access panels.
- Disconnect switches and circuit breakers shall be installed 5 feet, 0 inches above finished floor unless shown otherwise on the Plans.
- The Contractor shall test complete local control installations to assure proper operation and correct sizing of all motor overload units and/or fuses.

Building Lighting Fixtures

- The Contractor shall furnish and install lighting fixtures. Lights shall be installed as the work progresses. At the time of acceptance of the work, any broken, or inoperative lights shall be replaced by the Contractor at no additional cost to the Illinois Tollway.
- Each light fixture shall be complete with necessary fittings, LED drives, etc. Fixtures shall be wired with colored wires to indicate the polarity.
- Each lighting fixture shall be rigidly supported from the building construction and shall include, but not be limited to, suspension hangers' devices and miscellaneous steel, brackets, as required for fixture support.
- Suspended fixtures shall be hung on ball and cushion swivel flexible fixture hangers, as manufactured by Appleton Electric Co., or approved equal which shall be furnished by the Contractor and shall be adjusted as necessary during installation to ensure that fixtures in the same room or area are a uniform height from the floor. Mounting height shall be as specified, detailed, or noted on the drawings.

Card Access System

- The Contractor shall provide required coordination between the Card Access System and the prefabricated building to ensure any newly furnished prefabricated building structures shall readily accept the installation of the Card Access System.
- All sequence of operations and programming information shall be approved by the Engineer prior to installation.
- The Contractor shall install cables, raceways and outlet boxes required for a complete card access system. All readers shall be flush or semi-flush mounted as indicated on the Plans.

Fire Alarm System

- The Contractor shall furnish and install a fire alarm and detection system, analog, and electrically supervised. The system shall be fully tested and placed into operation. The system shall be in accordance with applicable codes and standards specified herein.
- This work shall include, but not be limited to, providing the following:
 1. Alarm initiating devices
 2. Alarm indicating devices
 3. Manual stations
 4. Connections to the Hirsch Access Control System
- Power service to the panel and equipment shall be served from the facility's 120 Volt AC, single phase power system. The Contractor shall provide a circuit breaker in the emergency power panel and provide conduit and wire to the panel and equipment as required.
- The following items shall be zoned individually and shall be monitored and annunciated individually:
 1. Each detector
 2. Each Pull Station
- Wiring between fire alarm system and component shall be in accordance with the manufacturer's wiring requirements and codes as stated herein. Code requirements shall take precedence in case of conflicts.
 1. Wiring shall be in metallic raceways.
 2. Wires shall have permanent wire marker at each termination to identify the wire.
- Final connections between system wiring shall be made under the supervision of the manufacturer's service technician as herein specified.
- Wiring splices shall not be permitted.
- Terminal strips shall have labeled wire numbers.

Uninterruptible Power Supply (UPS) System – 8 KVA

The UPS equipment shall be installed in the toll plaza building as shown on the Plans and recommended by the manufacturer.

Equipment Racks

- Prior to the installation of the equipment racks the Contractor shall verify the location and arrangement of equipment with the Engineer.
- The Contractor shall install equipment racks, in accordance with the equipment manufacturer's written instructions, and in compliance with applicable requirements of NEC and UL standards. It shall be the Contractor's responsibility to note the wiring of the equipment and to connect for proper operation.
- A sample equipment racks installation plan is as detailed below:
 1. For the toll plaza building, Contractor shall provide
 - a. New Local and Backbone Fiber rack
 - b. New Lane Control rack
 - c. New I-Pass Reader rack
 - d. New spare rack
- Contractor shall provide new Single Mode Fiber Patch Panels as shown on the Drawings and specified herein.

Data Logger or Security Camera Video Power Junction Box

- The data logger or security video junction box shall be supported and mounted away from the wall inside the toll plaza building with galvanized steel strut support system.
- The minimum separation between the equipment and the wall shall be one (1) inch.
- The junction box shall be mounted with the top a maximum of 6 feet 6 inches above the finished floor.

Data Logger Camera, Video System, and Fiber Optic Equipment

- The Plans only depict general location(s) of the cameras. Final camera locations are to be approved by Business Systems and the Engineer prior to installation.
- The Contractor shall aim the camera such that it will provide total viewing of the area to be monitored.
- The video system shall be installed as indicated on the Plans, in accordance with equipment manufacturer's written instructions, within recognized industry practices, and in compliance with applicable requirements of NEC and UL standards.
- Cables shall be installed as indicated on the Plans. Cables shall be labeled at both ends as to which camera they serve, per TIA-606 Standard for labeling telecommunication equipment. All cables, as they enter the toll plaza building, shall be surge protected before they are terminated on the end devices.
- The Contractor shall install furnish and install all material, equipment and accessories, necessary to provide a fully operational fiber optic system as shown on the Plans in accordance with the manufacturer's recommendation utilizing qualified personnel for installing, terminating and testing the fiber optic cables and accessories necessary for a complete and operational fiber optic cable system.
- All components shall be installed in the appropriate rack(s) as listed above, or as directed by the Engineer. All interconnecting cables shall be installed in a neat and workmanlike manner. Cables shall be supported between devices.
- All cables shall be identified at both ends per EIA/TIA Standard TIA-606 for labeling telecommunication components and per Illinois Tollway labeling standards.

Front and Rear Violation Enforcement System (VES) Camera Video Power Junction Box

- The VES camera video junction box shall be supported and mounted away from the wall inside the toll plaza building with galvanized steel strut support system.
- The minimum separation between the equipment and the wall shall be one (1) inch.
- The junction box shall be mounted with the top a maximum of 6 feet 6 inches above the finished floor.

Service Entrance Equipment

- The Contractor shall install a main service disconnect circuit breaker and main distribution panel as shown on the Plans.
- The Contractor shall furnish and install secondary feeder from the ComEd pad mounted transformer secondary to the main distribution panel via the outdoor utility metering equipment and main service disconnect.
- The main service-disconnect and connection shall be installed in accordance with the NEC and manufacturer's requirements. Metering cabinet shall be furnished and installed by the Contractor.
- The Contractor shall also install the secondary duct including the secondary cables via the utility metering cabinet to the main disconnect switch in the control building and shall provide the conduit/trench and backfilling for the transformer ground grid encircling the pad.
- Related Work by ComEd. Work shown below shall be completed by ComEd and is not considered to be part of Contractor's work:
 1. Primary service cables and terminations to the transformer
 2. Pad mounted transformer
 3. Pole mounted transformer (if applicable).
 4. Meter and control transformer.
 5. Ground grid, ground rods and terminations for the pad mounted transformer.

Engine-Generator Set

- The Contractor shall make arrangement with the equipment manufacturer for a qualified factory trained Service Engineer to provide technical direction for installation and final adjustments of equipment. This work shall be provided by the Contractor at no additional cost to the Illinois Tollway. The Service Engineer shall certify that equipment has been installed in accordance with equipment manufacturer's recommendations. The Service Engineer shall be available as long as his/her services are requested, but in any case he/she shall be required for a minimum of two (2) full eight (8)-hour working days.
- Semi-flexible couplings shall be provided between generator and engine and protective guards shall be provided over moving parts. Steel spring dampening vibration isolators shall be provided between rail base and floor.
- The generator control panel shall be installed with shock-absorbing mounts. Main circuit breaker shall be mounted close to engine generator unit.
- The gas line shall be installed complete per manufacturer's recommendation. The muffler shall be installed horizontally as close as practical to the ceiling of the generator room. The exhaust pipe wall thimble shall be installed per the manufacturer recommendations.
- The engine generator set equipment shall be installed complete and operational. Final adjustments to equipment shall include verification of proper mechanical operation, verification of instrument operation and setting of circuit breakers, relays and devices.
- The generator exhaust pipe, insulation wrap, and ductwork/louvers shall be installed prior to field testing the generator.

Automatic and Non-Automatic Transfer Switches

- The Contractor shall make arrangement with the equipment manufacturer for a qualified factory trained Service Engineer to provide technical direction for installation and final adjustments of equipment. This work shall be provided by the Contractor at no additional cost to the Illinois Tollway. The Service Engineer shall certify that equipment has been installed in accordance with equipment manufacturer's recommendations. The service engineer shall be available as long as his/her services are requested, but in any case he/she shall be required for a minimum of one (1) full eight (8)-hour working day for each automatic transfer switch.
- Each wall-mounted automatic transfer switch shall be supported from the wall with C-shaped galvanized steel channel.
- The minimum separation between the equipment and the wall shall be one (1) inch.
- Final adjustments to the equipment shall include, but shall not be limited to, verification of the proper mechanical operation, verification of the instrument operation and setting of the protective relays and devices.
- The following operational features shall be observed to facilitate proper installation of the switches:
 1. When the voltage on any phase of the normal source is reduced to 80 percent of rated voltage or after normal source failure for one (1) second, a pilot contact shall be closed to initiate starting of the standby plant.
 2. When the normal source of power is delivering less than 90 percent of the rated voltage and/or 95 percent of rated frequency, the load shall be transferred to the emergency source. In the event the normal source voltage will be restored to 90 percent and the rated frequency to 95 percent prior to the emergency source achieving 90 percent of rated voltage and 95 percent of rated frequency, transfer shall not occur. The engine generator shall continue to run for the full unloaded time sequence.
 3. When the normal source has been restored to 90 percent of the rated voltage of all phases, the load shall be re-transferred to the normal source after a time delay of five (5) minutes. The standby plant shall run for five (5) minutes unloaded and then automatically shut down and be ready to start upon the next failure of the normal source. Each timer shall have an adjustable time delay range from 0 to 30 minutes.
 4. If the standby source fails at any time while carrying the load, the retransfer to the normal source shall be instantaneous upon restoration of the normal source on all phases.
 5. Low voltage on the normal source shall close a N.O. pilot contact after an adjustable time delay period of one (1) to three (3) seconds. Pilot contact shall actuate starting system of the engine generator set.
 6. Engine starting contacts shall be gold plated. A minimum of six (6) contacts shall be supplied.
 7. After retransfer to the normal source, the engine generator plant shall run for five (5) minutes unloaded and then automatically shut down and be ready to start when next failure of the normal source occurs.
 8. Time delay relays shall reset automatically.
 9. All solid state controls shall have surge protection.
 10. A 15 second maximum non-adjustable time delay on transfer to standby shall be provided.

Electrical Identification

- The Contractor shall provide identification markings on each circuit breaker, disconnect switch, contactor, and motor starters.
- The identification markings shall include feeder name, number, phase, and item identification of equipment controlled.
- The Contractor shall provide white with black core laminated phenolic nameplates with 3/8 inch lettering etched through outer covering. Each nameplate shall be fastened with stainless steel screws to each piece of equipment.
- All major electrical equipment shall be identified, which shall include disconnect switches, panels, switches, etc. Disconnect switches serving feeders and over-current protective devices mounted in a switchboard shall be so identified. Embossed self-adhering plastic tape labels shall not be accepted.
- The Contractor shall provide a typewritten directory with frame and plastic face of circuits in lighting and power panels and shall provide panel identification in black alkyd paint stenciled inscriptions on inside of door, directly above centerline of directory frame, or on vertical and horizontal centerline of doors without directory frames.
- The Contractor shall provide on-device nameplates for local toggle switches, toggle switch type manual starters, pilot lights, and other electrical items whose function is not readily apparent, engraved suitable inscriptions on laminate phenolic nameplates describing equipment controlled or indicated. Each nameplate shall be fastened with a minimum of two (2) self-tapping stainless-steel screws. This shall not change NEMA rating of enclosure.
- For wire, cable and bus identification, each wire and each cable shall be labeled at terminals and at all accessible points in equipment, panel-boards, manholes, hand-holes, and pull boxes. Cable/wire markers of wrap-around self-adhesive type, with factory or mechanically printed numbers, letters, and symbols shall be used.
- All conductors shall be tagged in cabinets at time wires are pulled in and tested and markers shall not be removed for any reason. Cable/wire markers shall be installed on both ends of all conductors.
- Cable and wire markers must be per TIA-606 Standard for labeling telecommunication equipment and be approved by the Illinois Tollway. The markers shall be attached to all cables were entering or leaving a conduit run. Cable designation and circuit use shall appear on the tag.

Transformer Foundation

- Concrete foundations must be constructed in accordance with applicable provisions of Sections 501 and 617 of the Standard Specifications and this Special Provision.
- All foundation surfaces upon or against which concrete is to be placed must be free from standing water, mud and debris.
- The sub-base, to be constructed in accordance with applicable provisions of Section 301 of the Standard Specifications, shall be six (6) inches thick, CA-6 aggregate over which concrete will be placed. Install anchor bolts as directed by the utility company or as per their requirements.
- Excavated material unsuitable for backfill or surplus excavation shall be disposed of as specified in Article 202.03 of the Standard Specifications.
- Concrete shall be cured before the transformer is installed.

Grounding System Requirement

- The entire power and lighting systems shall be permanently and effectively grounded in accordance with the latest issue of the National Electrical Code and Motorola R56. The items covered shall include but not be limited to panels, motor frames, lighting fixtures, monotubes, toll equipment racks, plaza building, and associated switches and other exposed, non-current carrying parts of the electrical equipment and as shown on the Plans.
- Continuity of ground shall be maintained throughout the conduit systems. Where continuity is not maintained, the Contractor shall furnish and install a ground wire into the conduit system to maintain ground continuity as required by the National Electrical Code.
- Ground bushings and jumpers shall be used wherever normal conduit termination does not ensure continuity of ground. Concealed or inaccessible grounding connections shall be made with exothermic process. Unless otherwise shown on the Plans, accessible grounding connections shall be bolted or clamp type. Soldered connections shall NOT be permitted in the grounding system. Grounding connections made below grade shall include the installation of waterproof tape.
- Grounding conductors shall be protected from mechanical damage and shall be supported in an approved manner. Where ground conductors are run in conduit or other raceway, the ground conductor shall be bonded to the conduit or raceway at each end.
- The equipment ground conductor shall be distinct and separate from the system neutral ground conductor and shall not be used as a load current-carrying conductor. The conductor shall be electrically and mechanically continuous from the distribution equipment ground bus to the equipment to be grounded. The conductor shall provide a low impedance path for line-to-ground fault currents and bond all non-current carrying enclosures together including raceways, fixtures, receptacles, panels, controls, motors, disconnect switches, and exterior lighting standards.
- Where building type conductors are installed in a raceway, the equipment ground conductor shall have a minimum size conductor of 12 AWG copper. Where green insulation is not available, on large size cable, black insulation shall be used and shall be identified with green colored tape at each junction box or device enclosure.
- All metallic conduits, including rigid electrical metallic tubing and flexible conduits shall be connected at each end to the equipment ground conductor utilizing a conduit grounding bushing, O-Z type BL, or approved equal.
- Switchboards, panelboards and panels shall be provided with an equipment ground bus (including lug or screw terminals) and shall be securely bonded to the enclosure. Junction boxes and other enclosures (sizes above five (5) inches by five (5) inches) shall utilize an equipment ground bus or lug as required to securely bond the equipment ground conductor to the enclosure.
- Light fixtures, receptacles and motors shall be securely connected to the equipment ground conductor.
- Bolts, nuts, and washers utilized to connect the ground conductor to motors, equipment or enclosures shall be bronze, cadmium plated steel, or other non-corrosive material.
- The system neutrals, for grounded transformers, shall be a white insulated current-carrying conductor over which unbalanced neutral load currents may flow. The neutral conductor shall originate at the grounded secondary of each transformer. The secondary ground of each transformer shall be bonded to the enclosure and then be connected to the electrical power system ground via a ground conductor run with the power conductors.

- Single Point Ground System shall be installed by the Contractor as shown on the Plans.
- The single point ground system shall consist of ground wire and single point ground bus.
- The single point ground bus shall consist of a 1/4 inch thick by two (2) inches wide by six (6) feet long (minimum) copper bar installed near the Automatic Transfer Switch (ATS).
- Panelboard grounds, UPS system grounds, terminal strip interconnect center ground bars, and other equipment grounds shall be connected to this single point ground bus as shown on the Plans. The single point ground bus shall be connected to the building ground loop with a size 4/0 AWG green insulated ground cable. Each connection shall be made using an exothermic process. This service entrance ground shall comply with the NEC and the local utility requirements.
- If applicable, install ground rod at the outdoor cabinets. Connect a size 6 AWG from rod to each ground bus in each cabinet. Cabinets are to be grounded to the bus.
- Grounding conductors, other than bus bars, shall be stranded copper wire with type XHHW green, 600 volt rated insulation, sized and installed in accordance with Code requirements, and as noted on the Plans.
- Ground rods shall be 3/4 inch diameter solid stainless steel, ten (10) feet long, unless noted otherwise. The maximum resistance of a driven ground rod shall not exceed five (5) ohms. If this resistance rating cannot be obtained with a single ground rod, a sufficient number of additional rods shall be installed, not closer than six (6) feet on centers. All connections to the ground rod shall be made inside a ground well. The ground well shall not be placed in pavement. Exothermic weld connections shall be made to the ground rod. Ground rods shall be located in the ground loop outside the building perimeter. Stainless steel ground rods shall be formed of an austenitic stainless steel of the 18 percent chromium, 8 percent nickel type (UL 467-2004, section 9.2.6).
- Buried ground cable shall be solid bare tinned copper.

TESTING

The Contractor shall be required to perform the following tests after the installation of the toll plaza electrical equipment. The Contractor shall use the test plans within this special provision to conduct the following tests in the presence of the Engineer.

- Product Validation Certification
- Site Test
- Electrical and Communication Tests
 1. General
 2. Card Access System
 3. Data Logger Camera, Security Camera
 4. Fiber Connector Panel
 5. Video System
 6. Local Control
 7. Engine-Generator Set
 8. Automatic and Non-Automatic Transfer Switches
 9. UPS
 10. Wire and Cable – 600 Volts
 11. Wiring Devices
 12. Fire Alarm System
 13. Grounding Electrode System

- Pre-Integrator Site Inspection
- System Test
- 30-Day Burn-in Period
- Final System Acceptance and Training

Product Validation Certification

- For each of the toll plaza electrical equipment items listed below, the Contractor must obtain from the manufacturer a product validation certification illustrating that the manufacturer has followed their quality processes and verifies that the product meets the requirements of this special provision.
- This certificate must be submitted to the Engineer for review and approval for the Product Validation Certification:
 1. Panelboards
 2. Local controls
 3. Building Lighting Fixtures
 4. Card Access System
 5. Fire Alarm System
 6. Uninterruptible Power Supply (UPS) System – 8 KVA
 7. All Video Systems
 8. Engine Generator Set
 9. Automatic and Non-Automatic Transfer Switches

Site Test

- The purpose of the Site Test is to have the Contractor demonstrate to the Engineer that all toll plaza electrical and communication equipment has been installed, connected, labeled, and configured correctly as per Plans, the manufacturers' requirements and the contract requirements.
- For the Site Test to be accepted, the Contractor must demonstrate:
 1. The installation has been performed as per Plans, as per the manufacturer's recommendations and in accordance with the contract requirements.
 2. All connections were made tight and cannot be dislodged by incidental contact from the Engineer.
 3. All equipment inside the toll plaza has been properly labeled as per the Illinois Tollway's Intelligent Transportation Systems (ITS) Labeling Guide (located on the Illinois Tollway website).
 4. All CCTV security cameras have been tested in the presence of the Engineer to verify that a clear (no visible distortion) camera video stream can be viewed, and that the camera can be panned, tilted, and zoomed. The Contractor records the camera's performance on the CCTV Camera Site Test form provided within this Special Provision.
 5. The Grounding Electrode System Test has been fully completed and demonstrates that the resistance to ground is 5 ohms or less, was witnessed and signed by the Engineer and provided to the Illinois Tollway ITS GEC via the WBPM system.
 6. The Site Acceptance Test plan, provided by the Illinois Tollway, has been fully completed successfully, witnessed and signed by the Engineer and provided to the Illinois Tollway via the WBPM system.

Electrical and Communication Test

- General:
 1. The Contractor shall furnish all meters, instruments, cable connections, equipment or apparatus necessary for performing all tests.
 2. Electrical Test shall cover the tests and checks that shall be made on all electrical equipment and wiring to ensure compliance with the applicable codes and standards and with the Plans, Special Provisions and Contract requirements. Whenever possible, all checks and tests shall be made just prior to energizing the equipment or circuits and shall be coordinated with the field schedule and field conditions.
 3. Before testing and energizing a system, all necessary precautions shall be taken to ensure the safety of personnel and equipment. All conductors and all electrical equipment shall be properly insulated and enclosed. All enclosures for conductors and equipment shall be properly grounded. Insulation resistance measurements must have been made and approved on all conductors and energized parts of electrical equipment.
 4. The following tests are required but shall not be limited to this list. Tests will be supervised and witnessed by the Engineer:
 - a. Proper phase rotation
 - b. Short circuits
 - c. Improper grounds
 - d. Power and control electrical circuits for circuit continuity and function test
 5. The Contractor shall check and test all transformers, power panels, feeders, power and control cables, connections, and motors to assure correct phase sequence and rotation. Phase sequence shall be A-B-C as follows:
 - a. Top to bottom, left to right and front to rear when facing protective or disconnecting mechanism.
 - b. Phasing shall be accomplished by using distinctive colors for various phases, as indicated in this Special Provision.
 6. After wires and cables are in place and connected to devices and equipment, the system shall be tested for short circuits, improper grounds, and other faults. If fault condition is present, the trouble shall be rectified, and the wiring system shall be re-tested.
 7. Phase conductors, if shorted, grounded or at fault shall be removed, shall be replaced and the wiring system shall be re-tested.
 8. A voltage test shall be made at each lighting panel, distribution panel and at the last device on each circuit at full load. If drop in potential exceeds three (3) percent, the Contractor shall correct the condition by locating the ground or high resistance splice or connection and retest.
 9. Any wiring device, electrical apparatus, or lighting fixture grounded or shorted on any integral "live" part, shall be removed and the trouble rectified by replacing the defective parts or materials.
 10. Upon completion of the toll plaza electrical work, the Contractor shall place the entire installation in operation, test for proper function, and show systems and equipment to be free of defects. Motors and driven equipment shall not be run until properly lubricated. The Contractor shall test and record motor maximum load amperage and terminal voltage when uncoupled and coupled for each motor.

11. The Engineer will conduct from time to time such tests as may be required to any part of the equipment to determine if it is installed in accordance with these Special Provisions. The Contractor shall extend to the Engineer all facilities to this end and shall furnish skilled or unskilled help required. All tests shall be witnessed by the Engineer and three (3) copies of the verified test results shall be given to the Engineer promptly upon completion of a test.
12. The Contractor shall provide assistance to the various equipment manufacturers' field engineers as required in the testing and adjusting of the electrical power and control equipment. Cooperation of the Contractor shall be such that a minimum of time is required for equipment testing.
13. A log shall be maintained for all tests. This log shall be certified before completion of the job, both as to test value and date of test.
14. Any faults in the work performed by the Contractor or in materials or equipment furnished by the Contractor shall be corrected or replaced promptly by the Contractor at no additional cost to the Illinois Tollway.
15. Any faults in materials or equipment furnished by the Contractor which are the result of careless, incompetent or improper handling or installation by the Contractor shall be corrected or replaced promptly by the Contractor at no additional cost to the Illinois Tollway.
16. All tests shall be made and certification of the tests shall be submitted to the Engineer. If any failures occur during the tests, the Contractor shall replace the faulty item and retest.
17. The contractor shall coordinate with the UPS manufacturer for final commissioning of the UPS in accordance with the requirements of the manufacturer's warranty.
18. All electrical tests shall be recorded on the following forms:

<u>Form Number</u>	<u>Description</u>
FORM 1306-ET – 1	MULTIPLE CONDUCTOR CABLE MEGGER TEST, 300 VOLTS OR LESS
FORM 1306-ET – 2	SINGLE and MULTIPLE CONDUCTOR POWER CABLE MEGGER TEST, 600V or LESS

FORM 1306-ET – 1

MULTIPLE CONDUCTOR CABLE MEGGER TEST, 300 VOLTS AND LESS

WIRING - SIGNAL AND COMMUNICATION CABLE:

Testing shall be performed before connecting the cables to the terminals at either end. Continuity of each conductor shall be checked at this time.

Each conductor shall be checked with a 500 volt megger to ground, with all other conductors in the cable and shield, grounded. The minimum acceptable megger resistance shall be 50 Megohms for each conductor to ground.

DATE _____
 PROJECT NAME _____
 FEEDER NUMBER _____ LOCATION _____
 FROM MANHOLE _____ TO MANHOLE _____
 CABLE SIZE _____ CABLE LENGTH _____
 NUMBER OF CONDUCTORS _____ INSULATION TYPE _____
 MANUFACTURER _____ LINE VOLTAGE _____
 TEMPERATURE _____ HUMIDITY _____
 MEGGER TYPE _____ SERIAL NUMBER _____
 TEST VOLTAGE _____ MULTIPLIER _____
 REMARKS _____

CONDUCTOR NO.	MEGOHMS		CONTINUITY		CONDUCTOR NO.	MEGOHMS		CONTINUITY	
	C/C	C/S	PASS	FAIL		C/C	C/S	PASS	FAIL

TEST PERFORMED BY: _____
 Signature Date

TEST WITNESSED BY: _____
 Signature Date

FORM 1306-ET – 2

SINGLE AND MULTIPLE CONDUCTOR POWER CABLE MEGGER TEST, 600 VOLTS AND LESS

WIRING - FEEDER CIRCUITS

Testing shall be performed before connecting the cable to the terminals at either end. Continuity of each conductor shall be checked at this time.

Each conductor shall be checked with a 1000 volt megger to ground, with all other conductors in the cable and shield, grounded. The minimum acceptable megger resistance shall be 250 Megohms for each conductor to ground.

DATE _____
 PROJECT NAME _____
 FEEDER NUMBER _____ LOCATION _____
 FROM _____ TO _____
 CABLE SIZE _____ CABLE LENGTH _____
 NUMBER OF CONDUCTORS _____ INSULATION TYPE _____
 MANUFACTURER _____ LINE VOLTAGE _____
 TEMPERATURE _____ HUMIDITY _____
 MEGGER TYPE _____ SERIAL NUMBER _____
 TEST VOLTAGE _____ MULTIPLIER _____
 REMARKS _____

If applicable, all shields must be properly grounded prior to testing.

Cable No.	MEGOHMS Phase A	MEGOHMS Phase B	MEGOHMS Phase C

TEST PERFORMED BY: _____
 Signature _____ Date _____

TEST WITNESSED BY: _____
 Signature _____ Date _____

- Card Access System Test:
 1. The card access system test shall be conducted the Contractor in the presence of the Engineer. The following operational features must be observed during the test:
 - a. When a card is read at a reader, the facility code is verified at the reader, and the card number and issue level are sent to the central controller. If the reader is equipped with a keypad, a four (4) or five (5)-digit PIN number may be entered and verified at the reader.
 - b. The cardholder may enter a special duress code that will grant access and, at the same time, alert security personnel at the central controller or a remote location.
 - c. If access is granted, the central controller shall send a signal to the appropriate reader to activate the door lock and light the green visual indicator.
 - d. If access is denied, the central controller shall send a signal to the appropriate reader to light the red visual indicator and not activate the door lock.
 - e. In the event of power failure, the door locking device shall fail secure (locked position).
 - f. The system shall be capable of accepting a pushbutton contact, located in the secured area to release the door locking mechanism via its local door processing unit.
 - g. The readers shall monitor door status via a door or lock contact and shall report an alarm when the door is not closed and locked, and when the door is forced open.
 - h. All readers shall provide a red and green visual indicator for granted and denied access, and tamper detection capability.
 - i. Outdoor readers shall be supplied with special weather-resistant housings.
 - j. The intelligent terminal controller shall store from 4,000 up to 20,000 random card numbers, programmable individually or in blocks.
 - k. In the event the intelligent terminal controller receives card information not stored in its memory, it shall pass the information to the central controller for verification.
 - l. The central controller shall download to the intelligent terminal controller all access parameters necessary for it to control access at its readers and full reporting of alarms.
- Data Logger Cameras, Security Cameras, and Fiber Connector Panel Test:
 1. The complete system shall be installed and tested as an assembly after individually testing and determining the operation of the components. Test results shall be submitted to the Engineer for approval.
 2. The Contractor shall demonstrate that the units will pan, tilt, and zoom on command, will produce a clear and defined image at the monitors, will select and record specific images on command, and that the heater/blower assembly in the outdoor housing functions as required to ensure reliable cold and/or inclement weather operation.
- Video System Test:
 1. Upon completion of installation of the video system, and after circuitry has been energized, the Contractor shall test the system to demonstrate capability and compliance with requirements.
 2. Subsequent to connecting wires and cables, the Contractor shall energize the system circuitry and demonstrate functioning of equipment in accordance with requirements.
 3. Upon completion of the installation the Contractor shall arrange with the Engineer a demonstration of the system's operation and maintenance.

- Local Control Test:
 1. The Contractor shall test complete local control installations to assure proper operation and correct sizing of all motor overload units and/or fuses.

- Engine-Generator Set Test:
 1. Factory Testing:
 - a. The equipment shall be completely assembled, wired, adjusted and tested at the factory. Rigid inspection before and after assembly shall assure correctness of design and workmanship. After assembly the generator set shall be tested for operation under simulated conditions.
 - b. A complete set of tests shall be performed at the factory. Tests shall include manufacturer's standard and commercial tests, and specific tests as specified, and a complete simulated operational test of equipment to guarantee successful operation.
 - c. Prior to acceptance of equipment, it shall be tested to show that it is free of any defects and shall start automatically while subjected to full load through use of dry type load banks utilized for this purpose at facility of the local generator set supplier.
 - d. The engine generator set shall be tested at the factory as follows:
 - All safety and shutdown devices shall be set and tested.
 - Load run of set shall consist of not less than one (1) hour at 50 percent of rated load, one (1) hour at 75 percent of rated load, and four (4) hours at 100 percent of rated load. Load shall be continuous.
 - Complete check of set, including appurtenances, for satisfactory performance during testing.
 - Voltage and frequency variations during steady state operation and one (1) stop application of full rated load shall be recorded.
 - Voltage and frequency variation shall be measured by a light-beam oscillograph, or by other suitable recording instruments approved by the Illinois Tollway.
 2. Factory Witness Testing:
 - a. The Engineer as a part of the Contract may witness the tests of the engine generator covered by this Special Provision at any time during manufacturing, assembling and/or testing.
 - b. The Contractor shall provide the Engineer with advance notice of a minimum of two (2) weeks prior to schedule of factory testing.
 3. Field Testing:
 - a. The generator exhaust pipe, insulation wrap, and ductwork/louvers shall be installed prior to field testing the generator.
 - b. After installation and a reasonable run-in period, and prior to final inspection, the Contractor shall test engine generator set in presence of the Engineer.
 - c. The tests shall demonstrate proper operation of the engine generator set, including automatic starting and picking up of load.
 - d. The engine generator set shall be operated for one (1) hour at 75 percent load and two (2) hours at a full rated load.

- e. All instruments, test equipment (including load bank), fuel, lube oil, and personnel that are required for tests shall be furnished by the Contractor.
 - f. Representatives of the engine generator set manufacturer shall furnish certification in writing that the set has been properly installed and trial operation has been satisfactory. Certification shall be submitted to the Engineer in triplicate before final acceptance.
- Automatic and Non-Automatic Transfer Switches Test:
 - 1. Automatic Transfer Switch Test
 - a. A test switch mounted on the enclosure door to simulate failure of the normal power source and to test the operation of the transfer switch.
 - b. The transfer switch shall be provided with a green signal light to indicate when the switch is connected to the normal source and a red signal light to indicate when the switch is connected to the emergency source.
 - c. The bypass/isolation switch shall be operable by one (1) person by movement of a maximum of two (2) handles at a common dead front panel.
 - d. Operation of the bypass handle shall connect the load directly to the normal or standby source, using load interrupter contacts to momentarily interrupt the load.
 - e. If power is lost while in bypass position, bypass to alternate source shall be possible without re-energization of the automatic transfer switch service and load connections.
 - f. It shall be possible to test the automatic transfer switch with isolation contacts closed and load bypassed without interrupting power to the load.
 - g. Electrical capabilities and ratings of the bypass/isolation switch shall be compatible with those of the associated automatic transfer switch.
 - 2. Non-Automatic Transfer Switch Test
 - a. The switch shall be mechanically interlocked to ensure only one (1) of two (2) possible positions.
 - b. Inspection of all contacts (movable and stationary) shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors.
 - c. A manual operating handle shall be provided for maintenance purposes. The handle shall permit the operator to stop the contacts at any point throughout the entire travel to properly inspect and service the contacts when required.
- Wire and Cable-600 Volts Test:
 - 1. 600 volt insulated wires and cables shall be factory tested prior to shipment in accordance with ICEA Standards for the insulation specified.
 - 2. The following 600 volt wires and cables, size 6 AWG and larger, shall be tested after installation but before final connections are made.
 - 3. Incoming power feeder from the utility transformer to the Main Distribution Panelboard.
 - 4. Feeders to and from the Automatic Transfer Switch.
 - 5. All feeders to 208/120 volt panelboards.
 - 6. For the above listed wires and cables, a DC high potential test voltage, as specified in ICEA, shall be applied for a period, as specified in the Standard, between all conductors specified in the Standard, between all conductors in the same conduit and between each conductor to ground.

- Wiring Devices Test:
 1. The Contractor shall test complete wiring device installations to assure proper operation.
- Fire Alarm System Test:
 1. Fire alarm wiring shall be checked for grounds, opens, and shorts prior to termination at panels.
 2. The minimum resistance to ground or between any two (2) conductors shall be ten (10) Megohms:
 - a. Test equipment in accordance with the requirements of NFPA 72H and in the presence of the Engineer.
 - b. Conduct any other tests as recommended by the equipment manufacturer.
- Grounding Electrode System Test:
 1. Grounding electrode system tests shall employ the services of an independent and qualified testing service company, hired and paid for by the Contractor, specializing in electrical and ground system testing.
 2. The Contractor shall submit the independent testing service company's qualifications to the Engineer for approval. Acceptable independent testing company shall be, Fortier Testing and Sales Company, or approved equal.
 3. The testing of the grounding systems shall be conducted by employing the 3-point Fall-of-Potential method with a null balance instrument.
 4. The test meter shall be Fluke, Megger, AEMC, or approved equal.
 5. The two (2)-point method of ground system testing shall only be used where there is no or insufficient "open earth" area to use the 3-point Fall-of-Potential method. All ground system tests shall be performed in accordance with the procedures outlined in the Instruction Manuals of the ground system test equipment.
 6. Individual ground rods when tested separately shall be isolated from all metallic connections, such as from the ground rod to other grounded structures and electrical system neutrals.
 7. Multiple ground rod grids shall be isolated from all metallic connections, such as from grid under test to other grounded structures and electrical system neutrals.
 8. The grounding electrode system test shall be conducted in the presence of the Engineer. The test results shall be recorded on FORM 1306-A and submitted to the Engineer via the WBPM system.

FORM 1306-A

GROUND ROD RESISTANCE TO EARTH TEST RECORD

1. DATE _____
2. PROJECT NAME _____
3. LOCATION OF TEST _____
4. DRAWING NO. _____
5. GROUND ROD TYPE _____
DIAMETER _____
LENGTH _____
6. TEST METHOD _____
INSTRUMENT TYPE _____
SERIAL NO. _____
7. REQUIRED MAXIMUM RESISTANCE TO EARTH _____
8. MEASURED RESISTANCE TO EARTH ROD 1 _____
 ROD 2 _____
 ROD 3 _____

TEST PERFORMED BY: _____
Signature

TEST WITNESSED BY: _____
Signature

Pre-Integrator Site Inspection and ETCC Equipment Tests

The following checklists outline all site test requirements that shall be completed in an Open Road Tolling (ORT) or All Electronic Tolling (AET) zone before the zone can be populated with electronic tolling equipment by the Illinois Tollway's Integrator. This checklist is acceptable for use with Mainline ORT/ AET zones and Ramp ORT / AET zones utilizing an enclosure or building.

Specifics regarding quantity, size, and locations for conduits and cabling are detailed in Plans and this special provision document for the contract. This checklist must be completed, dated, and signed prior to scheduling equipment for integration.

PRE-INTEGRATOR SITE INSPECTION CHECKLIST

ORT / AET Pre-Integrator Checklist			
Roadway: _____	Plaza: _____	Date: ____ / ____ / ____	
Illinois Tollway Representative: _____			
Contractor Representative: _____			
<i>Plaza Building Requirements</i>			
	Task / Item	Date Verified	Verification by
<input type="checkbox"/>	Building erected meeting the following requirements: weather tight and dust free.		
<input type="checkbox"/>	Heat exchanger and/or thermostat installed and in proper working order.		
<input type="checkbox"/>	Computer racks to be installed, powered, and properly tied into the grounding system.		
<input type="checkbox"/>	Power and lighting is present and on.		
<input type="checkbox"/>	Fiber optic cable present and terminated at both ends and fully tested and accepted.		
<input type="checkbox"/>	Normal power panels and receptacles installed with the appropriate terminations, in accordance with Plans.		
<input type="checkbox"/>	UPS power panel, receptacles, and unit installed with the appropriate terminations, in accordance with Plans.		

<input type="checkbox"/>	Power and data cables for security cameras are present. (See special provisions and Plans for additional detail.)		
<input type="checkbox"/>	Conduits for power are present allowing interconnect to monotube.		
<input type="checkbox"/>	Conduits for data are present allowing interconnect to monotube.		
<input type="checkbox"/>	VES camera cabling from ORT zone is present with appropriate labeling.		
<input type="checkbox"/>	Antenna coax cables from entry monotube are properly feed to reader with appropriate labeling.		
<i>ORT / AET Zone Requirements</i>			
	Task / Item	Date Verified	Verification by
<i>Grounding Requirements</i>			
<input type="checkbox"/>	Ground Rods with connections to toll plaza ground system present		
<input type="checkbox"/>	Ground testing documentation completed showing a resistance to ground of 5 Ohms or less.		
<input type="checkbox"/>	Ground present on monotube(s), properly connected to the toll plaza grounding system.		
	Task / Item	Date Verified	Verification by
<i>Monotubes</i>			
<input type="checkbox"/>	Foundations present for entry and exit monotubes containing the correct number of conduits (See Plans for additional detail).		
<input type="checkbox"/>	Monotubes properly erected with hand holes on the downstream portion of the monotube.		
<input type="checkbox"/>	Equipment support structure present, level, and correctly located. This is inclusive of mounting pipes for VES cameras and AVI antennas. (See Plans for additional detail.)		
<input type="checkbox"/>	Power cables pulled through monotube. (See Plans and special provisions for additional detail.)		

<input type="checkbox"/>	Video data cables pulled through monotube. (See guide drawing and special provisions for additional detail.)		
<input type="checkbox"/>	Antenna coaxial cables pulled through monotube. (See guide drawing and special provisions for additional detail.)		
	Task / Item	Date Verified	Verification by
<i>Pavements, Pads, and Barriers</i>			
<input type="checkbox"/>	After Contractor has placed loop conduit in all lanes, he/she shall get final approval of Illinois Tollway prior to concrete pour. Contractor shall give Illinois Tollway five (5) business days to complete inspection. Contractor shall fix any items noted by Illinois Tollway during their inspection.		
<input type="checkbox"/>	ORT Tolling section (inclusive of shoulders and travel lanes) is present with CRC pavement utilizing reinforcement lowered at least 6" from the surface of the pavement. (Refer to special provisions and Plans for additional detail.)		
<input type="checkbox"/>	Loop conduits are present in the correct locations, cut flush to pavement and capped with duct seal.		
<input type="checkbox"/>	After CRC pavement has been poured, there shall be a minimum of 7 days of cure time.		
<input type="checkbox"/>	Barrier wall is present between monotubes containing appropriate conduits, connections, and junction boxes.		
<input type="checkbox"/>	In-barrier junction boxes are present with a minimum of 18" of separation between boxes.		
<input type="checkbox"/>	VES Wash enclosure pad is present having been poured and cured in compliance with guide drawings and special provisions. (Not applicable to locations containing a prefabricated building)		

ETCC EQUIPMENT CHECKLIST

The following checklist outlines all Integrator Equipment for various lane types. This checklist is acceptable for use with ramp new build and upgrade contracts. Specifics regarding quantity, size, and locations are detailed in guide drawings and these special provisions document for each project.

<h2>Integrator Equipment Checklist</h2>			
Roadway: _____	Plaza-Lane(s): _____	Date: ____ / ____ / ____	
Illinois Tollway Representative: _____			
ETCC Representative: _____			
<i>ORT/AET</i>			
	Task / Item	Date Verified	Verification by
<i>ORT/AET Zone</i>			
<input type="checkbox"/>	Loops cut and installed properly with L, Q, and R readings within the appropriate ranges.		
<input type="checkbox"/>	In Barrier Junction Box connections properly spliced and sealed		
<input type="checkbox"/>	Loop Quantum system properly installed and tuned to appropriate levels		
<input type="checkbox"/>	Antenna properly installed in center of lane with correct pitch, connections, and optimally tuned.		
<input type="checkbox"/>	Rear cameras correctly mounted, aligned, and focused with power and data connections present and working.		
<input type="checkbox"/>	Front cameras correctly mounted, aligned, and focused with power and data connections present and working		
<input type="checkbox"/>	AVI reader and modules correctly installed and configured		
<input type="checkbox"/>	Data Logger camera and unit correctly installed, aligned, and configured.		

Computer Room / ORT cabinets			
<input type="checkbox"/>	Lane Controller A and B properly installed, configured, and powered		
<input type="checkbox"/>	Failover module installed and configured with the correct connections		
<input type="checkbox"/>	Loop rack and loop cards properly installed, configured, and powered.		
<input type="checkbox"/>	Communication switch present, configured, and operating.		
<input type="checkbox"/>	Plaza Host Server present configured properly for the particular toll plaza.		

System Test

The System Test demonstrates that the field devices can be operated at the TOC utilizing the Traffic Information Management System (TIMS) software. The System Test will be conducted by the Illinois Tollway.

For the System Test to begin, the Contractor shall notify the Engineer in writing (via the WBPM system), within 5-Days prior to the start of System Testing, stating the toll plaza electrical equipment is ready for integration into the Illinois Tollways Traffic Information Management System (TIMS) software.

System Acceptance of the CCTV:

- Successfully complete a pre-final walk-through with the Illinois Tollway's ITS General Engineering Consultant (GEC).
- Contact the TOC operations manager, after the five (5)-Day request from above, to request that the CCTV camera site is tested for:
 - Clear video without any distortion and interference/noise.
 - Pan, Tilt, Zoom, automatic/manual iris, automatic/manual focus, and camera pre-set capabilities.
 - Accurate CCTV camera data transmission from each CCTV camera site to TIMS.
- Receive written approval (via the WBPM system) from the Engineer and the TOC operations manager verifying the communications connectivity and data transmission are within the Illinois Tollway requirements, and that the System Test has passed and the 30-Day Burn-In Period has immediately started.

30-Day Burn-in Period

The purpose of the 30-Day Burn-in Period demonstrates that the toll plaza CCTV cameras communicate 100% of the time to the TIMS software is being received during the duration of the test.

For the 30-Day Burn-in Period to be accepted, the Contractor shall:

- Demonstrate that all toll plaza electrical components operated properly during the 30-Day Burn-in Period and without any failure notification(s). For every one (1) day the Contractor is required to mitigate/fix a problem, an additional one (1) day per testing will be added to the 30-Day test.
- Receive written approval from the Engineer verifying the 30-Day Burn-In period has been successfully completed. Where applicable, the TOC Manager will provide the Engineer with a Burn-in Test Log at the end of successful completion.

Final System Acceptance and Training

- Final acceptance of the toll plaza electrical work installation will be made after satisfactory completion of the required “Burn-in” Test periods of all applicable electrical and communication elements. The final inspection of the entire system will be performed by the Engineer in the presence of a representative of the Contractor.
- Final acceptance of all work associated with this pay item will be made after:
 1. Successful completion of the project final walk-through by the Illinois Tollway’s ITS General Engineering Consultant (GEC).
 2. Submission (via the WBPM system) and written approval by the Engineer of all Record Drawings and Warranty documents including an electronic computer file (Microstation and PDF) including a sketch of each major electrical and communication element assembly, and user/operator manuals GPS to the Engineer.
- The Contractor shall provide three (3) hard and three (3) electronic (PDF) copies of each of the operation and maintenance manuals of all installed equipment to the Engineer for approval.
- If required by the Illinois Tollway, the Contractor shall conduct two (2) training classes for up to eight (8) Illinois Tollway approved personnel on the toll plaza electrical and communication systems. The training shall cover both classroom and field training and provide a detail review of all major electrical and communication equipment, all enclosure components, connections, wiring, and required maintenance of the system. Training schedule shall be coordinated with the Engineer. Training shall be included as part of the payment of this item.
- Additional training requirements for toll plaza electrical work components are as follows:
 1. Engine-Generator Set:
 - a. The equipment manufacturer shall provide factory trained technicians at job site to provide training for the Illinois Tollway's Personnel in proper operation and maintenance of equipment.
 - b. A minimum of two (2) visits at four (4) hours each visit (eight (8) man-hours) shall be provided.
 2. Automatic and Non-Automatic Transfer Switches:
 - a. The equipment manufacturer shall provide factory-trained technicians at the job site to provide adequate training for the Illinois Tollway's personnel in the proper operation and maintenance of the equipment.
 - b. The training classes shall be done at on-site locations selected by the Engineer.
- Notification of Final Acceptance will be sent to the Contractor in writing (via the WBPM system) by the Engineer.

WARRANTY

The toll plaza electrical and communication systems with associated components shall be warranted and guaranteed against defects and/or failure in design, materials and workmanship within the warranty period stated elsewhere in this special provision. The Contractor shall submit the warranty terms as part of each material item's shop drawing submittal for approval.

The warranty shall provide that, in the event of a malfunction during the warranty period, the defective system component shall be replaced with a new component by the manufacturer or his/her representative within five (5) working days.

Any component that, in the opinion of the Engineer, fails three (3) times prior to the expiration of the warranty shall be judged as unsuitable and shall be replaced by the device manufacturer or representative with a new component of the same type at no additional cost to the Illinois Tollway. The unsuitable component shall be permanently removed from the project. A failure shall also be defined as the field device becoming unable to comply with all applicable standards.

Additional warranty requirements for toll plaza electrical work components are as follows:

- **Uninterruptible Power Supplies (UPS):**
The Contractor shall provide a manufacturer's warranty against defects in design, materials, workmanship, and performance for the UPS units within the warranty period.
- **Engine-Generator Set:**
 1. The Contractor shall provide a warranty within the warranty period stated elsewhere in this special provision on components, complete engine-generator and instrumentation panel, and labor. Multiple warranties for individual components (engine, generator, controls, etc.) will not be acceptable. The Contractor shall promptly repair or replace all defective equipment at no cost to the Illinois Tollway during the warranty period.
 2. The Contractor shall provide on-site service within 24 hours of notice from the Illinois Tollway. During repair of any individual equipment item, the Contractor shall provide loaner equipment, at no cost to the Illinois Tollway, for failures that cause loss of system use or of significant accessory function. Such service shall continue, at no charge to the Illinois Tollway, within the warranty period.

Method of Measurement. This work will not be measured for payment.

Basis of Payment. This work will be paid for at the Contract lump sum price for PLAZA ELECTRICAL WORK, at the Toll Plaza Building performed in accordance with the Plans and Special Provisions.

CONTROL BUILDING FOUNDATION, 14' X 32'

Description. The work shall consist of constructing the foundation and floor slab for a prefabricated ramp toll plaza building in accordance with the plans.

Materials.

Materials shall be according to the following articles of division 1000-materials.

Item	Article Section
Portland Cement Concrete (Class SI)	1020
Reinforcement Bars	1006.10
Conduit	1088.10
Structural Steel	1006.04

Construction Requirements.

Each foundation shall be considered in accordance with the drawings. If the foundation is located in soils classified as Types 1, 2, 3, or 4, the disposal of the excavated surplus material shall be according to the Tollway special provision for "Disposal of Regulated Substances and Uncontaminated Soils." For the foundation, the horizontal limits for structure excavation shall be a vertical plane 2 ft from the edge of the footing foundation. The depth of excavation shall be to the top of the original ground surface or to the top of the foundation, whichever is less. Disposal of soil excavated outside the limited specified above will not be measured for payment.

All required reinforcement shall be firmly secured in place in the forms prior to placement of concrete. Conduits and cable duct sleeves shall be capped to prevent the entry of concrete or other foreign material during placement and finishing operations. Anchor bolts will be provided and installed by the contractor during installation of the prefabricated ramp toll plaza building.

Method of Measurement. This work will be measured for payment in units of each.

Basis of Payment. This work shall be paid for at the Contract price per each for CONTROL BUILDING FOUNDATION, 14' X 32' in accordance with the plans, which payment shall be full compensation for furnishing all labor, equipment, supplies and materials, and performing all operation necessary to complete this work as shown and specified herein.

For foundation soils which are shown on the plans as Type 1 soils, or which are later re-classified as Type 1 soils, the disposal of the surplus material will be measured and paid for as NON-SPECIAL WASTE DISPOSAL (TYPE 1).

Excavation and backfill required will not be measured separately for payment but will be considered as included in the contract unit price for CONTROL BUILDING FOUNDATION, 14' X 32'.

PRE-CAST CONCRETE PLAZA CONTROL BUILDING (ILLINOIS TOLLWAY)

Effective: May 13, 2024

Description. This work shall consist of furnishing and installing a prefabricated pre-cast concrete plaza control building 12' x 30' outside dimensions by 9' clear inside height manufactured by Thermo Bond Buildings, Inc., (800-356-2686 www.thermobond.com) prefabricated pre-cast concrete Plaza Control Building at locations shown in the contract plans, Illinois Tollway Supplemental Specification, details shown in the plans, and as directed by the Engineer.

Other manufacturer's prefabricated buildings that meet or exceed specifications must submit test reports and proposal details at least 10 working days after the notice to proceed. Substitute products not approved by the Engineer and the Illinois Tollway Facility Manager will not be allowed and shall be replaced by the Contractor with approved products at no additional cost to the Illinois Tollway.

- (a) The Contractor shall be responsible for coordinating and monitoring the material lead time, schedule of construction, and installation of the building.
- (b) The factory-built prefabricated pre-cast concrete building shall be supplied in accordance with project plans and specifications. The building shall be delivered to the job site and installed by the Contractor. The Contractor shall provide all lifting cables and hardware needed to off-load and set up the building.
- (c) The Contractor shall also make the final connections and test the system with the public utility power feed, as specified later in this document.
- (d) The Contractor shall be responsible for coordinating and allowing full access to the Plaza Control Building by others (Illinois Tollway Tolling Integrator). Access shall be provided to these contractors to allow them to install the tolling equipment and associated conduit/cabling.

Submittals

- (a) Shop drawings showing dimensions, sizes, thickness, materials, finishes and methods of assembly in accordance with the requirements of the project shall be submitted for approval by the Engineer.
- (b) Submit building and framing plans, including bill of materials, interior and exterior elevations, and miscellaneous wall and roof details. Plans shall be sealed by an Illinois Licensed Structural Engineer.
- (c) Submit the Manufacturer's technical data for all building hardware and equipment. All work shall be fabricated and erected in accordance with the Manufacturer's drawings. Any fabrication or construction done prior to the review and approval by the Engineer shall be at the Contractor's risk. All corrections shall be made at no additional cost to the Illinois Tollway.
- (d) Complete installation instructions shall be provided to the Engineer for the entire system, including full sets of maintenance manuals, as-built drawings, and parts list.
- (e) An operations manual shall be provided including a comprehensive section on troubleshooting for the HVAC system.
- (f) Precast panels. Submittals shall be in conformance with Article 105.04 of the Illinois Tollway Supplemental Specifications except as modified herein.
 1. Product technical data including:

- a. Manufacturer's mix design and material certifications for aggregate and cement type used to precast wall panels and posts.
- b. Manufacturer's installation instructions.
 2. A 4'x4' sample of the concrete form liner pattern and texture of each type, including special shapes to show a range of colors, textures, finishes, and dimensions. Submit a separate set of sample panels approximately 2'x2' from the stain manufacturer to establish application procedures, color and appearance to the Illinois Tollway's Engineer for review and approval.
 3. The Contractor shall submit concrete mix designs in conjunction with the submittal of the Shop Drawings which shall include mix designs for proposed concrete mixes for each class and type of concrete to be used, and indicating where each mix design is to be used. The mix design submittal shall include product data on all materials used in the mix, material sources and material testing. All mix designs for Portland Cement Concrete shall be in accordance with Section 1020 of the Standard Specifications. The Contractor shall consider in his schedule a 14-calendar day period from the date the submittal is received by the Engineer to the expected date of return with comment. This 14-day period shall be considered with any resubmittal, and such resubmittals shall not be considered cause for an extension of time to the Contract.
 4. Manufacturer's certification that precast panels that are to be furnished meet or exceed the specifications.
 5. Qualifications of testing lab and technician.
 6. Test results for all concrete testing.

Quality assurance

Installer Qualifications: Employ only experienced craftsmen, skilled in the installation of specified products.

Contractor Quality Control: The contractor shall employ a quality control service whose services shall include performing material evaluation tests, designing concrete mixes and performing quality control inspection and testing for structural precast concrete work. Coordinate submission of information to Quality Control Service for mix design requirements and of results to Engineer. Verify welding qualifications and test records of welding procedures and personnel to be employed on work for compliance with requirements of Contract Documents.

Welding Qualifications: Qualify welding procedures and personnel meeting requirements of AWS D1.1 and AWS D1.4, as applicable, prior to commencement of welding operations for the work specified. Qualification of welding personnel shall not exceed 6 months at commencement of welding operations for work, unless Contractor submits an affidavit stating welding personnel, since qualification, has been continuously engaged in welding processes to be performed during the course of work. Qualification shall remain in effect for the duration of work, unless there is reason on part of Quality Control Service to question ability of welding personnel. Verification of qualification of welding personnel required for work shall be performed by Quality Control Service at expense of Contractor, at no addition cost to the Illinois Tollway.

References The building and its systems shall comply with the following:

1. 2024 International Building Code (IBC).
2. 2024 International Mechanical Code.
3. 2021 International Energy Conservation Code.
4. 2023 National Electrical Code.
5. ACI 301 - Specifications for Structural Concrete for Buildings.
6. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
7. ACI 311 - Recommended Practice for Concrete Inspection.
8. ACI 318 - Building Code Requirements for Reinforced Concrete, including Commentary.
9. ACI 347 - Recommended Practice for Concrete Formwork.
10. AISC - Code of Standard Practice for Steel Buildings and Bridges.
11. AISC - Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings, including Commentary.
12. AWS D1.1 - Structural Welding Code - Steel.
13. AWS D1.4 - Structural Welding Code - Reinforcing Steel.
14. CRSI - Manual of Standard Practice.
15. CRSI - Handbook.
16. CRSI - Recommended Practice for Placing Reinforcing Bars.
17. PCI - Design Handbook, Precast and Prestressed Concrete.
18. PCI MNL-116 - Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products, including Commentary.

Materials

Description

These specifications and details are based on the prefabricated pre-cast concrete plaza control building.

Pre-Fabricated Control Building:

- (a) The building shall be a pre-assembled, pre-cast concrete paneled, non-combustible building. The plaza control building shall be a 12' x 30' dimensions by 9' clear inside height and shall have two rooms separated by a 2-hour fire-rated wall. One room, approximately 8' wide x 12' long will contain the Generator Set and the other room will contain the power and communications equipment for tolling, roadway lighting, and ITS operations called "Equipment Room".
- (b) The pre-cast concrete wall, roof, and floor panels shall be a single unit (no mid-panel joints allowed).
- (c) Each room shall have its own means of entry. There will be one single door, minimum 3' wide x 7' high, for the Equipment Room and one double door with a removable center post, minimum 6' wide x 7' high, for the Generator Room.

Fabrication.

A. Precast Concrete Walls, Roof, and Floor

The walls, roof, and floor shall be precast concrete elements meeting the following.

- 1) Concrete Materials
 - a) Portland Cement: ASTM C150, Type I or Type III.
 - b) Nominal Weight Concrete - Coarse Aggregates:
 - i) General: Hard, durable, uncoated, clean; selected, graded and washed.
 - ii) Quality: ASTM C33, Coarse Aggregate, except for the following limitations:
 - iii) Free of substances causing staining or reactions with cement, and of soluble salts and other substances which can cause stains on exposed concrete.
 - iv) Have at least 5 years of historical experience of satisfactory durability.
 - v) Pit or bank-run gravel is not acceptable.
 - vi) Option: Local aggregate not complying with ASTM C33, but which has shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the engineer.
 - vii) Type: Aggregate type, shape, gradation and color shall be as required to produce the required surface finish.
 - viii) Maximum Aggregate Size: Not larger than one-fifth of the narrowest dimension between sides of forms, one-third of the depth of slabs, nor three-fourths of the minimum clear spacing between individual reinforcing bars or bundles of bars.
 - c) Normal Weight Concrete - Fine Aggregate:
 - i) General: Hard, durable, sharp, clean, material sand; selected, graded and washed.
 - ii) Quality: ASTM C33, Fine Aggregate, except for the following limitations:
 - iii) Other:
 - iv) Free of substances causing staining or reactions with cement, and of soluble salts and other substances which can cause stains on exposed concrete.
 - v) Have at least 5 years of historical experience of satisfactory durability.
 - vi) Dune sand, bank run sand and manufactured sand are not acceptable.
 - vii) Option: Local aggregate not complying with ASTM C33, but which has shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the Engineer.
 - viii) Type: Aggregate type, shape, gradation and color shall be as required to produce the required surface finish.
 - d) Lightweight Concrete Aggregates: ASTM C330
 - e) Water: Potable, fresh, clean and clear meeting requirements of ASTM C94; free of unusual or objectionable smell or taste, and deleterious substances which impair strength, durability, compatibility and appearance of concrete and embedded steel.

- f) Admixtures:
- i) General: Provide admixtures produced by established reputable manufacturers and use in compliance with the instructions of the manufacturer. Do not use admixtures that have not been incorporated and tested in accepted concrete mixes, unless otherwise authorized in writing by the Engineer.
 - ii) Air-Entraining Admixture: ASTM C260.
 - iii) Water-Reducing Admixture: ASTM C494, Type A.
 - iv) Calcium Chloride: Do not use calcium chloride, including admixtures with chloride ion content.
- 2) Concrete Mixes. Prepare design mixes for each type of concrete required. Design mixes may be prepared by an independent testing facility or by qualified precast manufacturing plant personnel, at the option of the precast manufacturer. Ingredients, consistency and water-cement ratio shall meet the requirements of ACI 301. The mixture shall be of quality that will produce the required precast concrete unit with the required finish.
- a) Normal Weight Concrete Mix: Normal weight concrete consisting of Portland cement, normal weight aggregates, admixtures and water to produce the following properties:
 - i) Compressive Strength: 5,000 pounds per square inch minimum at 28 days.
 - ii) Total Air Content: 4 percent minimum and 6 percent maximum.
 - iii) Pretensioned Release Strength: 3,500 pounds per square inch.
 - b) Lightweight Concrete Mix: Lightweight concrete consisting of Portland cement, lightweight aggregates, admixtures and water to produce the following properties:
 - i) Compressive Strength: 5,000 pounds per square inch minimum at 28 days.
 - ii) Total Air Content: 4 percent minimum and 6 percent maximum.
 - iii) Air Dry Density: 90 to 115 pounds per cubic foot.
 - iv) Prestressed Release Strength: 3,500 pounds per square inch.
 - c) Design Mixes:
 - i) General: Prepare design mixes for each type and strength of concrete required. Design mixes shall be prepared by precast pretensioned concrete manufacturing plant personnel.
 - ii) Design Method: Proportion mixes by either laboratory trial batch or field experience methods, using materials to be employed on the work for each type of concrete required, meeting requirements of ACI 211.1 or 211.2. Cure compression test cylinders using the same methods as will be used for precast concrete work.
 - iii) Reports: Submit written reports to the Engineer of proposed concrete mix designs as specified under Article - Submittals, of this Section.
 - d) Adjustment to Concrete Mixes. Mix design adjustments may be requested when characteristics of materials, job conditions, weather, test results, or other circumstances warrant. Laboratory test data for revised mix designs and strength results must be submitted to and accepted by the Engineer before using in the work.

- e) Admixtures:
 - i) Use air-entraining admixture in concrete meeting instructions of the manufacturer.
 - ii) Use water-reducing admixture meeting instructions of the manufacturer. Admixtures to increase cement dispersion or provide increased workability for low-slump concrete may be used subject to the acceptance of the Engineer.
 - iii) Use amounts as recommended by the admixture manufacturer for climatic conditions prevailing at the time of placing. Adjust quantities of admixtures as required to maintain quality control.

- 3) Mixes
 - a) Plant Mix Concrete:
 - i) Mix materials for concrete in a drum-type batch machine mixer. For mixers of one cubic yard or smaller capacity, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after all ingredients are in mixer, before any part of the batch is released. For mixers of capacity larger than one cubic yard, increase the minimum 1-1/2 minutes of mixing time by 15 seconds for each additional cubic yard or fraction thereof.
 - ii) Provide a batch ticket for each batch discharged and used in work, indicating project identification name and number, date, mix type, mix time, quantity and amount of water introduced.

 - b) Ready-Mix Concrete: Meet requirements of ASTM C94 and the following:
 - i) Delete references for allowing additional water to be added to the batch for material with insufficient slump. The addition of water to the batch will not be permitted.
 - ii) During hot weather or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required. When air temperature is between 85 and 90 degrees Fahrenheit, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 degrees Fahrenheit, reduce mixing and delivery time to 60 minutes.

- 4) Tolerances:
 - a) Fabricated Dimensional Tolerances: Meet tolerance requirements of PCI MNL-116 for finish products, except as follows:
 - i) General: Units shall be straight and true. Bowed or deformed units will not be accepted.
 - ii) Length: Plus or minus 3/8 inch.
 - iii) Overall Width: Plus or minus 1/4 inch.
 - iv) Depth: Plus or minus 1/4 inch.
 - v) Position of Blockouts and Inserts: Within 3/8 inch of required centerline.
 - vi) Horizontal Deviation from Straight Line: 1/8 inch in 10 feet; total not to exceed 3/8 inch (10 mm).
 - vii) Twist End to End: 1/4 degree.

- b) Installed Dimensional Tolerances: Meet tolerance requirements of PCI MNL-116 for erection, except as follows:
 - i) Variations from Plumb: 1/4 inch in any 20-foot run or story height; 1/2 inch total in any 40-foot or longer run.
 - ii) Variations from Level or Elevation: 1/4 inch in any 20-foot run; 1/2 inch in any 40-foot run; total plus or minus 1/2 inch at any location.
 - iii) Variation from Position in Plan: Plus or minus 1/2 inch maximum at any location.
 - iv) Offsets in Alignment of Adjacent Members at Any Joint: 1/16 inch in any 10-foot run; 1/4 inch maximum.

- 5) Other Materials
 - a) Reinforcing Materials:
 - i) Reinforcing Bars: ASTM A615, Grade 60, minimum.
 - ii) Reinforcing Bars - Hot Dip Zinc coated: ASTM A767, Class II, hot-dip zinc coated after fabrication, including bending.
 - iii) Low-Alloy Steel Reinforcing Bars: ASTM A706.
 - iv) Welded Wire Fabric: ASTM A185, flat sheet.
 - v) Welded Deformed Steel Welded Wire Fabric: ASTM A497, flat sheet.
 - vi) Steel Wire: ASTM A82, plain, cold-drawn, steel
 - (a) Supports for Reinforcement:
 - (b) Provide support for reinforcement, including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing, meeting recommendations of CRSI.
 - (c) Provide supports with legs that are hot-dip zinc-coated and plastic-protected (CRSI, Class 1), or stainless steel (CRSI, Class 2).
 - (d) Steel Shapes, Bars and Plates: ASTM A36.
 - vii) Anchor Bolts: ASTM A307, low-carbon steel bolts, regular hexagon nuts and carbon steel washers.
 - viii) Finish of Steel Units: Hot-dip zinc coated meeting requirements of ASTM A123. Apply coatings after fabrication.

 - b) Form Release Agent. Water-resistant chemical barrier to prevent concrete bonding or sticking to forms and not affect surfaces of concrete. Agent to be non-petroleum base and non-staining, and not harmful to concrete on formwork, not deteriorate from ambient conditions, not transfer to or penetrate the concrete surface and not affect adhesion of sealant or penetration of water repellent coating.

 - c) Metal Embedments:
 - i) Provide metal embedments in precast concrete for door openings, anchor plates and assemblies for supporting or connection of other work, curb angles and other like items.
 - ii) Embedments, after fabrication and before being embedded in concrete, shall be either hot-dipped zinc coated or prime painted on all surfaces as specified, whether exposed or concealed in completed work.
 - iii) Exterior embedments shall be hot-dipped zinc coated, except for overhead door opening frames. Other embedments shall be prime painted.

6) Quality Assurance\Quality Control:

- a) Strength of Units: The strength of precast units will be considered potentially deficient if manufacturing processes fail to meet any requirement which may affect the strength of precast units, including the following conditions:
 - i) Failure to meet compressive strength test requirements.
 - ii) Reinforcement not conforming to specified fabrication requirements.
 - iii) Concrete curing, and protection of precast units against extremes in temperature, not as specified.
 - iv) Precast units damaged during handling, transportation, and placement.
- b) Testing Precast Units: When there is evidence that the strength of precast concrete units do not meet the requirements of Contract Documents, the Quality Control Service will take cores drilled from hardened concrete for compressive strength determination, meeting requirements of ASTM C42 and as follows:
 - i) Take at least 3 representative cores for precast units of suspect strength, from locations directed by the Engineer.
 - ii) Test cores in a saturated-surface-dry condition meeting requirements of ACI 318 if the concrete will be wet during the use of the completed structure.
 - iii) Test cores in an air-dry condition meeting requirements of ACI 318 if the concrete will be dry during the use of the completed structure.
 - iv) The strength of concrete for each series of cores will be considered satisfactory if the average compressive strength is at least 85 percent of 28-day design compressive strength.
- c) Test results will be made in writing on the same day that tests are made, with copies to the Engineer, Contractor and precast manufacturer. Include in test reports identification designation and type of member or members represented by core tests, design compressive strength, compression breaking strength and type of break (corrected for the length-diameter ratio), the direction of applied load to the core with respect to the horizontal plan of concrete as placed, and moisture condition of the core at the time of testing.
- d) Patching: Where core test results are satisfactory and precast units are acceptable for use in work, fill core holes solid with patching mortar, and finish to match adjacent concrete surfaces.
- e) Fabricator must provide Tollway Quality Assurance a minimum of 1 week's notification prior to starting fabrication to coordinate onsite inspection.

B. Door and Frame:

- 1) The doors shall be 16-GA Insulated Steel with full weather stripping and be equipped with a pick plate lock guard, hydraulic door closer(s) with hold open, drip cap, lever handsets, chrome heavy-duty ball bearing with non-removable pin hinges and thresholds. The doors must also include provisions to produce an open-door alarm. Doors must close tightly and not leave any gaps. A rain drip trim, same as above, shall also be installed at the base of each door to prevent water or wet snow from entering the plaza control building.
- 2) The doors and frames shall comply with the Steel Door Institute "Recommended Specifications for Standard Steel Doors and Frames", (SDI-100) Level 3 and Physical Performance Level A and as herein specified.
- 3) Design clearances between door and frame shall conform to the requirements of section 2.1.8 Design Clearances of the "Specifications for Standard Steel Door and Frames (SDI-100)".
- 4) Both doors in the generator room shall be active with a removable center post (mullion).
- 5) The threshold shall be extruded aluminum with a vertical leg to seal against the back of the door to prevent wind-driven rain from entering under the door and also to prevent an insect infestation inside the room. The threshold shall provide a weathertight seal between the door and threshold and the threshold and the floor. Flat thresholds are NOT allowed.
- 6) Scheduled Lock Series and Design: Schlage ND80JD RH0626 IC, fail secure, 24 V, storeroom function, interchangeable core.
- 7) Electric Strikes: BHMA A 156.31; Grade 1 with faceplate to suit lock and frame.
 - a) Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on schedule or comparable product by one of the following:
 - i) Folger Adam Electric Door Controls; an ASSA ABLOY Group company.
 - ii) Von Duprin; an Ingersoll-Rand company.
- 8) Key System: Schlage Everest Primus Level 3, patented keyway, interchangeable core throughout. Keys, key blanks, and cylinders are available only from the factory, not available from after-market key blank manufacturers nor to dealers for stock. Properly executed signature card required for factory order of key system components. For estimate use factory GMK charge. Hardware supplier is to initiate and conduct meeting(s) with the Engineer and Illinois Tollway to determine the system structure and furnish Illinois Tollway's written approval of the system.
 - a) Construction Keying: Furnish temporary keyed-alike cylinders/cores. Remove at substantial completion and install permanent cylinders/cores in the Engineer's presence. Demonstrate that the construction key no longer operates.
 - b) Temporary cylinders/cores remain Supplier's property.
 - c) Re-combine: Entire project at no extra expense to Illinois Tollway if missing construction keys.

- d) Key Cylinders: Utility patented 6-pin solid brass construction.
- e) Cylinders/Cores: Keyed at the factory of the lock manufacturer where permanent records are maintained.
- f) Permanent Keys: Secured shipment direct from point of origination to Engineer.
 - i) For Estimate: 3 keys per lock or cylinder, 5 master keys per group, 5 grand master keys, 3 control keys.
- g) Biting List: Secured shipment direct from point of origination to Engineer upon completion.
- 9) The doors shall be secured by a CARD ACCESS SYSTEM as described in the PLAZA ELECTRICAL WORK special provision.
- 10) The door and door trim shall be painted Dark Bronze with a fast-cure corrosion-resistant epoxy finish. The interior of all exterior walls and ceiling shall be white FRP with white trim, and the interior wall shall be painted with 2 coats of white oil-based primer and 2 coats of white oil-based paint.

C. Building Design Criteria:

- 1) Roof Design:
 - a) The roof shall be a double-pitched roof with the ridge mid-span and running parallel with the long dimension of the building, minimum pitch to be $\frac{1}{2}$ " per foot, manufactured of lightweight precast concrete.
 - b) The roof finish shall be white 100% pure high solids liquid silicone elastomeric roof coating.
 - c) Roof Overhang - Standard 4" on each of the four walls.
 - d) Bird deterrent spikes shall be 24" long x 8" wide, glue-down, stainless steel bird spikes with a minimum 10-year warranty.
 - e) Interior furring of the ceiling shall be composed of $\frac{3}{4}$ " paneling (11/16 OSB w/.30 FRP coating Class "C" minimum) on 4" 16 gauge galvanized 50ksi z-furring @ 16" o.c.
- 2) Floor design:
 - a) The floor finish system of the generator room shall be a slip-resistant & oil-resistant epoxy coating.
 - b) Floor color shall be light to medium gray. Submit a color sample for approval.
 - c) Equipment room to have 12" x 12" vinyl composition tiles. Submit a color sample for approval.
- 3) Exterior Walls Design:
 - a) Interior furring of the exterior walls shall be composed of $\frac{3}{4}$ " paneling (11/16 OSB w/.30 FRP coating Class "C" minimum) on 4" 16 gauge galvanized 50ksi z-furring @ 16" o.c.
 - b) The exterior finish shall be a medium-grade stone aggregate. The color shall be Ozark brown or approved equal. The sample shall be submitted to the Engineer for approval.
 - c) All panel joints shall be sealed with an industrial-grade one-part polyurethane sealant to ensure watertight joints. All joints between joining pre-cast elements shall be preloaded with a bed of sealant prior to placement of adjacent elements.

- d) All through-wall openings for air louvers, generator air intake hood, and air exhaust hood exhaust fan shall have proper through-wall flashing all around the opening from the exterior face of the pre-cast concrete panel and extending all the way into the interior face of the finished wall panels to prevent water intrusion inside the plaza control building. Using a single bead of approved sealant caulk as the only means to seal each wall opening is not allowed.
- e) Stainless steel junction boxes installed on the outside walls of the plaza control building shall have their front door opening from right to left when facing the junction box and have their hinge installed vertically on the left side of each junction box.

4) Interior Walls Design:

Interior wall shall be composed of a base layer 5/8" type X gypsum wallboard or veneer base applied parallel or at right angles to each side of 4" 16 gauge galvanized 50ksi studs @16" o.c. with 1 1/4" type W drywall screws 12" o.c. Face layer 5/8" type X gypsum wallboard or veneer base applied parallel or at right angles to each side of 4" 16 gauge galvanized steel studs @16" o.c. with 1 7/8" type W drywall screws 12" o.c. and offset 6" from screws in the base layer. Joints staggered 16" each layer and side. (Load-Bearing).

- a) The interior walls shall be 3/4" paneling with 11/16 OSB W/.30 FRP coating Class "C" minimum.
- b) The ceiling shall be 3/4" paneling with 11/16" OSB W/.30 FRP coating Class "C" minimum.
- c) All seams and corners shall be trimmed out. The baseboard shall be finished with a black continuous 4" high vinyl cove base at both rooms.
- d) Wall Liner and ceiling shall be reinforced as required for equipment support.
- e) Plywood backing panels: equipment backing panels shall meet DOC PS 1, exposure 1, C-D plugged, fire retardant treated, in thickness indicated or, if not indicated, not less than 1/2 inch nominal thickness.

5) Insulation:

- a) Floor: The floor shall be insulated for a total value of R-23.
- b) Wall: The walls shall be insulated for a total value of R-19.
- c) Roof: The roof shall be insulated for a total value of R-48.

6) Anchor bolts and hold-down clamps shall be provided.

7) The plaza control building identification sign panel mounted to the outside of the building shall be according to the details shown in the plans.

D. Electrical:

- 1) Provided and installed by the Contractor. Conduit, conductors, junction boxes and miscellaneous electrical components required to install and interconnect electrical equipment included in this special provision shall conform to the material and installation requirements of PLAZA ELECTRIC WORK special provision.

2) Electrical Equipment Grounding:

- a) Install insulated equipment grounding conductors with all feeders and branch circuits.
 - i) Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70
 - ii) Feeders and branch circuits.
 - iii) Lighting circuits.
 - iv) Receptacle circuits.
 - v) Single-phase motor and appliance branch circuits.
 - vi) Three-phase motor and appliance branch circuits.
 - vii) Flexible raceway runs.
 - viii) Armored and metal-clad cable runs.
- b) Air-Duct Equipment Circuits: Install insulated equipment grounding conductors to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- c) Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate the conductor from the raceway and panelboard grounding terminals. Terminate at the equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.
- d) Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from the supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where the raceway enters the enclosure and install a separate insulated equipment grounding conductor. Isolate the conductor from the raceway and from panelboard grounding terminals. Terminate at the equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

E. Lighting:

- 1) Provided and installed by the Contractor.
- 2) External (security): Furnish and install six (6) weatherproof, vandal-resistant light fixtures. See plans and PLAZA ELECTRICAL WORK special provision.
- 3) All other lighting shall be provided and installed in accordance with PLAZA ELECTRIC WORK special provision.

F. Communications and Infrastructure: Furnish and install Telco boards, floor and wall penetrations for electric, fiber optic cables, card readers, door alarms and smoke alarms.

G. Cable Tray: Ceiling mounted cable trays shall be furnished and mounted 92 inches above the finished floor. See Plaza Electrical Work special provision.

H. General Heating, Ventilation and Air Conditioning:

- 1) Equipment Room: Provide two-stage air conditioners with a solid-state dual unit lead/lag controller. The second air conditioner shall be a 100% backup. Each air conditioner shall be a one-piece packaged unit, factory assembled, precharged, prewired, UL listed, ARI certified and designed for coastal grade outdoor application. Air conditioner refrigerant shall be R410A. Model Based on Bard WA4S3 / WL4S2. Installation of the units shall be as per the manufacturer's recommendations.
 - a) Materials: The units shall be constructed with a minimum of 20 GA galvanized steel, 1-inch thick glass fiber insulation, painted rolled steel or galvanized steel fans.
 - b) Cabinet, casing and frame: Access openings for all fan motors, compressor and controls, insulated cooling section, top of sloped away from the building, rain flashing at top of a cabinet, full-length side mounting bracket, bottom metal mounting bracket. Unit shall be finished with beige color baked enamel that can withstand 1000-hour salt spray exposure testing.
 - c) Refrigerant section: Compressors shall be high-efficiency scroll two-stage hermetic type, suction and discharge gauge ports, internal vibration isolation. Coils shall be seamless copper mechanically bonded to aluminum fins.
 - d) Condenser fan motors: Condenser fan motor shall be heavy-duty, inherently protected, non-reversing, permanently lubricated bearings. Controls - anti-cycle relay (5 minutes), compressor control module - adjustable 30-second to 5-minute delay on break, lockout for high and/or low-pressure controls, 2-minute time bypass of low-pressure control. Unit shall have low ambient control capable of operation down to 0 deg. F and outdoor thermostat with compressor cut-off; adjustable 0 deg. to 50 deg. F.
 - e) Cooling Capacity at 75/62 -90 degrees shall be 45,500 BTUH, EER 11, and 1500 CFM for the second stage and 34,000 BTUH at 1100 CFM for the first stage. IPLV 13.9.
 - f) Supplemental Electric Heater in Air Conditioner: 5 KW capacity at 208V/3PH/60HZ.
 - g) Supply fan section: supply fans shall be double-width, double-inlet centrifugal type, forward curved, and solid steel shafts. Filter section: adjustable filter rack for the installation of 2-inch fiberglass pleated throwaway filters, and filter section shall be provided with access doors for filter removal. Motors shall be a variable speed ECM type.
 - h) Supply air grille: aluminum construction, individually adjustable vertical and horizontal blades.
 - i) Return air grille: aluminum construction, 30-degree horizontal fixed blades.
 - j) HVAC Unit Controller: Air conditioners shall operate from a two-stage wall-mounted controller furnished with a unit. Heating setpoint: 40 degrees F (adjustable). Cooling setpoint: 85 degrees F (adjustable). The controller shall operate both A/C units and utilize 24V power from the HVAC units. The controller shall provide lead/lag operation of each A/C unit with runtime. The controller shall include an Ethernet CAT6 patch cable connection to the Cisco network switch (switch provided by others). Model based on Bard MC4001-AC.
 - k) Electrical: Factory wired in accordance with NEC requirements, 208 V, 3 PH single point power terminal strip, system service switch, control circuit fuse, individually fused supply and return fan motors, compressor and condenser fan motor branch circuits, 24 V control transformer, and disconnect switch.
 - l) The evaporator condenser water drain shall be clear tubing that extends at the bottom of the HVAC assembly up to the concrete slab outside the plaza control building.

I. Generator Room:

- 1) Two 48-inch by 48-inch insulated motorized louvers with sheet metal weather hoods as shown on plans. The actuator shall be spring return for opening. Louver and actuator operation shall conform to NFPA 110. All rain hoods shall have a radiused top and full 90 degrees sweep.
- 2) Flashing shall be permanently attached to the wall all around the weather hoods to prevent water intrusion into the wall/floor of the plaza control building.
- 3) The intake weather hood shall have a hinged bottom panel to accept a removable 1/2" thick polyester mesh filter. This material is available in rolls. A disposable air filter shall prevent dust and insects from entering into the generator room. The exhaust manifold shall have a stainless-steel mesh grid to prevent rodent access. The air intake hood and air exhaust hood shall be a semi-circular shape with air opening facing the ground.
- 4) Electric Unit Heater: Nominal 2 kW, 208V, 1 PH, unit heater shall be factory provided and installed. Provide unit heater with built in controls, mounting bracket, and adjustable digital thermostat (generator room). Design based on a Indeeco ULI 924U02000VA.
- 5) Direct Drive Exhaust Fan: Propeller wall-mounted exhaust fan with damper, insect screen, speed control and disconnect switch. Minimum capacity of 782 CFM at 25" SP, 1/6 HP motor at 115 V, 1-phase, 60 Hz. The insect screen shall be a removable stainless-steel screen. Design based on Greenheck model #CW-090HP-VG/AX.
- 6) Wall Exhaust thimble and fuel line nipple.

I. Rodent Control:

- 1) An automatic rat and mouse trap shall be furnished and installed on the outside corner of the generator room. The unit shall include all mounting hardware.
- 2) The automatic mouse trap shall be a CO2 operated unit with a counter. The unit shall be a model A24 from the Automatic Trap Company, Inc. Automatictrap.com.
- 3) Furnish the unit with 2 spare CO2 canisters and a replacement mouse lure.

J. Lightning Protection System Components:

- 1) Comply with UL 96 and NFPA 780.
- 2) Roof-Mounted Air Terminals: NFPA 780, Class I, copper unless otherwise indicated. Quantity (4) at 4 feet apart.
- 3) Single-Membrane, Roof-Mounted Air Terminals: Designed specifically for single-membrane roof system materials. Comply with requirements in roofing Sections.
- 4) Main and Bonding Conductors: Copper.
- 5) Ground Loop Conductor: The same size and type as the main conductor except tinned.
- 6) Ground Rods: Copper-clad steel, 3/4 inch in diameter by 10 feet long.

CONSTRUCTION REQUIREMENTS

Prefabricated Building Design:

- (a) Structural Calculations and associated plans shall conform to the latest edition of the International Building Code (IBC) industry standards unless other standards are specified by the Illinois Tollway:

- (b) The following Design Criteria shall be the minimum used for prefab buildings:
 - (1) Roof Load = 100 PSF
 - (2) Wind Load = 120 MPH
 - (3) Floor Live Load = 200 PSF
 - (4) Seismic Design Category B
 - (5) Roof Impact Resistance: minimum resistance shall be 220 foot-pounds with no damage to either the exterior or interior of the roof or control building. This load can happen due to snow removal from the road being pushed onto the plaza control building structure.
 - (6) Air Infiltration: There shall be no air infiltration of the plaza control building when measured before installation of any through-the-wall, floor or roof items when exposed to winds of 50 mph.
- (c) Structural design calculations for the building shall be prepared and sealed by a licensed State of Illinois Structural Engineer and shall be submitted to the Engineer for approval before fabrication.
- (d) The building shall be entirely factory assembled and shipped as a 1-piece unit.
- (e) Doors shall be installed and fastened to maintain alignment with frames to achieve maximum operational effectiveness and appearance. Doors shall be adjusted to maintain perimeter clearances as specified in Section 2.1.8 of the Specifications for Standard Steel Doors and Frames (SDI-100).

First Unit Factory Visual Inspection

The Contractor (or the Contractor's pre-cast concrete plaza control building manufacturer) shall completely assemble one plaza control building which includes all equipment, modules, components and complete all internal wiring (including labeling), then provide 5 business days' notice that this plaza control building assembly is ready for inspection. The Contractor shall have one set of contract plans and two sets of shop drawings on-site to be redlined with any discrepancies noted. One set of redlines shall be submitted to the Illinois Tollway.

The Contractor shall follow the Illinois Tollway ITS Labeling Guidelines Manual for all labeling of components. The manual can be found on the Illinois Tollway's website.

In place of the Factory Visual Inspection, the Contractor shall obtain from the plaza control building manufacturer a product validation certification illustrating that the manufacturer has followed their quality processes and verifies that the unit meets the specifications for operations. This certificate must be submitted to the Engineer for review and approval for the Factory Visual Inspection acceptance.

Inspection:

- (a) All finished products shall be inspected by a Quality Control Inspector to ensure the product has been manufactured in compliance with specifications and plans. Approved products shall be marked as such. If repairs are required, they shall be performed and re-inspected before the product is approved and goes to inventory.
- (b) The exterior light fixtures shall be inspected and tested before shipment. Inspection and testing results shall be documented and signed by the inspector. The inspection checklist shall be filed in the project file.

- (c) Doors must close tight with no gaps. Walls must be investigated for any air leaks, which must be repaired before building will be accepted. Light entry testing shall be performed inside the building with all lights turned off. No light shall enter the building from the outside.
- (d) The following tests shall be performed as a minimum:
 - 1. Continuity test
 - 2. Operational test

Delivery and Installation:

- (a) Before starting work, the Contractor/Manufacturer shall submit for review and approval a Lifting, and Placement Plan and Procedures to the Engineer for approval detailing the proposed methods of lifting the Precast structure to ready the unit for transport. It shall include the location(s), and type(s) of equipment to be used. The Contractor, Manufacturer or Supplier responsible for this work shall retain the services of an Illinois Licensed Structural Engineer, experienced in the analysis and preparation of Lifting, Transport, and Placement Plan and Procedures, for the completion of the plaza control building. The submittals shall be in accordance with the Illinois Tollway Special provision for "Erection of Structures". Lane closures required for the unloading and placement of the Precast Concrete plaza control building shall be completed under allowable hours contained in the Maintenance of Traffic special provision.
- (b) The Contractor/Manufacturer shall submit for review and approval a Transport Plan and Procedures to the Engineer for approval detailing the proposed methods of transporting the Precast structure and the amount, location(s), and type(s) of equipment and protection devices to be used to prevent the precast unit against cracking during transport.
- (c) The product shall be loaded in a manner to prevent damage from occurring during shipment.
- (d) The product shall be installed in accordance with the prefabricated manufacturer's recommended procedures. A building shall be handled in such a manner at the job site that the building is not damaged by equipment and excessive stresses. Lift gear, rigging, etc. shall be as specified by the manufacturer.
- (e) Seal all wall and floor penetrations with fire-stopping and rodent barrier. Flashing and caulk shall also be used for wall penetrations to prevent any water entering the building. Floor penetrations shall be sealed with non-shrink grout around conduits.
- (f) Manufacturer shall provide the actual weight of the entire plaza control building prior to delivery to the installation site.

Warranty:

- (a) The warranty shall not deprive the Illinois Tollway of other rights or remedies that the Illinois Tollway may have under other provisions of the Contract Documents and is in addition to and runs concurrently with other warranties made by the Contractor under requirements of the Contract Documents.

- (b) The Prefabricated building shall carry a ten (10) year warranty from defects in materials and workmanship. All buyout components (air conditioners, lighting devices, ventilation fans, heaters, motorized louvers, etc.) shall carry warranties passed through from the actual manufacturers or a one-year warranty, whichever is greater. The contractor shall supply the Engineer with all the necessary warranty registration cards for said appliances prior to final acceptance.
- (c) Contractor shall issue a written warranty on all material, labor, and workmanship for a minimum of one year after Final Acceptance unless otherwise modified in this document.

Method of Measurement This work will not be measured for payment.

Basis of Payment This work will be paid for at the contract lump sum price for PRECAST CONCRETE PLAZA CONTROL BUILDING, at the location shown on the plans. Payment shall be full compensation for all labor, equipment, supplies, materials, quality control, inspection, transportation, and installation of the plaza control building on site, including all operations necessary to complete this work as shown on the plans and as specified herein.

VES WASH SINGLE CABINET, SYSTEM WITH NITROGEN GENERATOR (ILLINOIS TOLLWAY)

Effective: August 20, 2012

Revised: April 24, 2024

DESCRIPTION

This work shall consist of furnishing, installing, and testing a complete VES Wash Single Cabinet System with Nitrogen Generator per the contract plans and specifications, and as directed by the Engineer.

Labeling of various equipment/enclosure/cables/conduit and tubing, as per the Illinois Tollway ITS Labeling Guidelines Manual (located on the Illinois Tollway website) and/or other referenced standards, is included and shall be paid for under this pay item.

MATERIALS

Description. This special provision and plans are based on a complete VES Wash Single Cabinet System with Nitrogen Generator manufactured by ECD Electrical Control Distributors 1000 Meyer Drive, Crystal Lake, IL 60014 (800) 947-0868.

Other manufacturers' VES Wash Single Cabinet System with Nitrogen Generator that meet or exceed specifications must submit test reports and proposal details at least 10 business days after notice to proceed (NTP). Substitute products not approved by the Engineer and the Illinois Tollway Business System will not be allowed and shall be replaced by the Contractor with approved products at no additional cost to the Illinois Tollway.

The main components of the system are as described below. All other ancillary connection cables, brackets, enclosure and other items required for the installation of a fully functional VES Wash Single Cabinet System with Nitrogen Generator are included under this pay item. The VES Wash Single Cabinet System with Nitrogen Generator specified equipment and ancillary material shall meet the requirement of this special provision and shall also be in accordance with the VES Wash Single Cabinet System with Nitrogen Generator Bill of Materials (BOM) table and details as shown in the contract plans. The Contractor shall also furnish VES Wash Single Cabinet System with Nitrogen Generator spare parts in accordance with the recommendation of the VES Wash Single Cabinet System with Nitrogen Generator manufacturer and with the spare parts table shown in the contract plans.

The equipment components furnished under this special provision shall conform to the latest applicable standards of IEEE, ANSI, and NEMA as well as appropriate requirements of the latest NEC and OSHA. All equipment and materials shall also have UL labels. Equipment that does not have UL labels must be submitted by the Contractor to the Engineer for acceptance.

- VES Wash Single Cabinet System with Nitrogen Generator produced by ECD company model # NS-CMP-SY-I-0100 or approved equal by the Engineer and the Illinois Tollway Business System
- NEMA 4X stainless steel cabinet 60"Hx36"Wx16"D (Hoffman model WS603616SS) with pad locking handle (Hoffman #WSHPL) and mounting brackets (Hoffman #CMFKSS) for installation inside remote plaza control building.
- Manifold assembly ECD Company model # NG-33300100
- Pressure regulator ECD Company model # NG-5000131
- Replacement particulate filter ECD Company model # NG-ECD-00100
- H2O knockout ECD Company model # 4601000-60
- Nitrogen generator ECD Company model # NG-3002000-60
- Nitrogen valve system ECD Company model # NG-ECD-00200
- Liquid valve system ECD Company model # NG-ECD-00201
- Liquid pump ECD Company model # NG-ECD-00300
- Washer fluid pressure tank ECD Company model # NG-ECD-00350
- System control ECD Company model # NG-ECD-01101
- Pneumatic pump ECD Company model # NG-ECD-00310
- Nitrogen tank ECD Company model # NG-ECD-00311
- Regulators, Connectors, and Fittings
- Equipment Surfaces, Components, Mounting Brackets and Hardware
- Spray Nozzle and Mounting Brackets
- Valves and Solenoids
- Electric Cables
- Conduit and Fittings
- Control Panels, and Junction Boxes
- DIN Rails
- Main Breakers and Circuit Breakers
- Ground and Neutral Bars
- Quick Disconnect
- Electrical Outlets
- Nylon Tubing
- Ancillary VES Wash Single Cabinet System with Nitrogen Generator items
- CAT-6 indoor cable

The following are the specific material requirements for the major system components described above.

- **Washer Fluid Pressure Tank.** Washer fluid pressure tank shall model NG-ECD-00350 manufactured by ECD company. The system manufacturer may choose to use a different washer fluid pressure tank to fit the space available within the enclosure. Any substitute product recommended by the system manufacturer shall be approved by the Engineer before it is integrated into the single cabinet system. The washer fluid tank, in conjunction with other VES wash system components, shall provide pressurized washer fluid to the VES cameras in the wash cycle. The tank shall be secured and integrated within the VES Wash Single Cabinet as shown on the contract plans.
- **High Pressure Nitrogen Tank.** High pressure nitrogen tank shall be model NG-32300201 as manufactured by ECD company. The tank, in conjunction with other VES Wash system components, shall provide pressurized nitrogen to the VES cameras in the dry cycle. The nitrogen tank shall be secured and integrated within the VES Wash Single Cabinet System as indicated on the contract plans.
- **Nitrogen Generator.** The nitrogen generator shall be model NG-3002000-60 manufactured by ECD company shall be integrated within the VES Wash Single Cabinet as shown on the contract plans. The nitrogen generator shall be able to build up the nitrogen gas pressure to 100 PSI in the high-pressure nitrogen tank. The nitrogen generator shall be able to generate 20 SCFM at 100 psi with 96% to 99% purity.
- **System Controller:** The VES Wash Single Cabinet System with Nitrogen Generator system controller shall be model NG-ECD-01101 as manufactured by ECD company. The controller shall:
 - Deliver high pressure washer fluid at each VES camera mounted on the entry and exit monotubes in the wash cycle.
 - Generate and deliver high-pressure nitrogen gas at each VES camera mounted on the entry and exit monotubes in the dry cycle.
 - Allow automatic and manual operation of the system.
 - Allow configurable wash cycle (washer fluid) and dry cycle (high-pressure nitrogen) times.
 - Log operational data of VES camera ID and the start time of the wash-dry cycle at the respective VES camera.
 - Monitor the washer fluid level in washer fluid pressure tank.
 - Monitor the nitrogen generation and storage levels in the high-pressure nitrogen tank.
- **Regulator, Connectors, and Fittings.** All regulators, connectors, T-junction fittings, ball valves and other required system components as indicated on the contract plans shall be furnished by the Contractor to provide a complete functional system.
- **Equipment Surfaces, Components, Mounting Brackets and Hardware.** All equipment surfaces, system components, mounting brackets and hardware, with the exception of the manifold valves, shall be fabricated from stainless steel unless otherwise indicated on the contract plans.
- **Spray Nozzle and Mounting Brackets.** Spray nozzles shall be made of hardened stainless steel composition and shall provide protection against corrosion. The spray nozzle mounting brackets shall be adjustable laser flat stainless steel with dimensions as shown in the contract plans.

- **Valves and Solenoids.** All manifold valves, including solenoids shall be manufactured by ECD company as indicated on the contract plans.
- **Electrical Enclosures, Control Panels, and Junction Boxes.** All enclosures, control panels, and junction boxes shall be stainless steel, NEMA rating as indicated on the contract plans. For indoor installation the enclosure shall be stainless steel NEMA 4X rating.
- **Conduit and Fittings.** All conduit and fittings shall be heavy wall rigid PVC coated hot-dipped galvanized steel. The conduit shall be in accordance with Section 1088 of the Illinois Tollway Supplemental Specifications.
- **Washer Fluid.** The Contractor shall provide 50 gallons of washer fluid manufactured by Splash (catalog no. G1582165 or approved equal) to be used during system testing and normal operations.
- **Data Connection.** The system controller shall provide Ethernet interface and following functions: programming, Modbus TCP/IP, UDP/IP, integrated Web server, DHCP, FTP server, SNMP client.
- **Logic controller.** The logic controller shall provide fast transient interference voltages (burst), in accordance with IEC 61000-4-4, zone B, criterion B. Communication lines shall be shielded: 1kV. High energy transient voltages (surge): Communication lines shielded: 1kV.
- **Ancillary VES Wash System Items.** Materials for ancillary VES wash system items required for the installation of a completely functional system shall be provided in accordance with the following:

Materials in accordance with the Illinois Tollway Supplemental Specifications:

<u>Item</u>	<u>Section/Article</u>
Underground Raceways.....	810
Grounding.....	806
Wire and Cable.....	1066
Stainless Steel Junction Box.....	1088.04

CONSTRUCTION REQUIREMENTS

VES Wash Single Cabinet System shall have a rigid conduit installed from the cabinet to the wall of the building allowing air supply to the Nitrogen filters installed in the cabinet. Conduit shall be equipped with air inlet grill with mesh to prevent rain, bugs, or rodents to enter the conduit.

Data Connection: Data connection to the system controller shall be via CAT 6 indoor rated cable. Controller configuration (IP address and lane configuration) shall be assigned by Illinois Tollway Business System network engineer and shall be requested by the Contractor prior to factory acceptance.

VES camera tubing: Camera tubing from the VES wash control cabinet to the VES cameras mounted on the monotubes must withstand a minimum burst pressure of 200 psi. Depending number of VES cameras installed, as indicated on the contract plans, the camera tubing shall run continuously from the manifold valves in the VES Wash Single Cabinet to the camera nozzle without any intermediate splices. The Contractor shall determine the length of nylon tubing required for each of the VES cameras on-site. Contractor to test each tubing line per the VES Wash System Tubing Air Proof Test Procedure included in this special provision.

The Contractor shall closely coordinate his work and submittals with the Engineer. This coordination includes, but not limited to, the following:

Pre-Procurement Documentation Approval

- Within ten (10) business days from the Notice to Proceed (NTP), the Contractor shall submit to the Engineer for his review and approval, a detailed schedule showing dates for: product submittals and approvals; device configuration by the Illinois Tollway, if required; construction/installation; testing; burn-in period; and warranty of each VES Wash Single Cabinet System with Nitrogen Generator. This detailed schedule shall be included in the project schedule, as required per Illinois Tollway Supplemental Specifications Article 108.02.
- Within ten (10) business days from NTP, the Contractor shall submit to the Engineer for his review and approval a completed Contractor submittal checklists and material cutsheets with associated submittals.
- Before furnishing and/or installing any product that is a substitution for a specified item, the Contractor shall furnish proof of product equality to the Engineer and to the Illinois Tollway Business System. After which, the Engineer's written approval must be obtained before work can proceed.

The Contractor shall make all submissions through the Illinois Tollway's Web Based Program Management (WBPM) system to the Engineer, and shall obtain approval of the schedule, catalog cut sheets, cabinet wiring diagrams, and calculations from the Engineer prior to purchasing any equipment and subsequently, performing the installation per the approved documents, contract plans, and specifications.

Pre-Installation Requirements

Thirty (30) days prior to the scheduled field installation of the VES Wash Single Cabinet System with Nitrogen Generator, the Contractor shall notify the Engineer of the anticipated delivery date of any VES Wash Single Cabinet System with Nitrogen Generator component to the jobsite.

VES Wash Single Cabinet System with Nitrogen Generator Installation

Installation of the VES Wash Single Cabinet System with Nitrogen Generator equipment shall be in accordance with this special provision, the contract plans, approved shop drawings, manufacturers' recommendations, and shall conform to all local building code, laws, rules and regulations for the jurisdiction within which this project shall be located. Additional installation requirements are as follows:

- The VES Wash Single Cabinet System with Nitrogen Generator shall be capable of washing the lens window of each VES camera installed on the monotubes. The system shall be designed to operate remotely to activate the wash cycle and dry cycle for each of the VES cameras separately. A maximum of two VES cameras can be cleaned simultaneously, to ensure system pressure of the washer fluid is consistently maintained to 100 PSI at each VES camera. Washer fluid shall be provided from high pressure washer fluid pressure tank located in the VES Wash Single Cabinet and mixed with nitrogen gas at 100 PSI.
- The remote mode of operation of the system as installed by the Contractor shall enable the Illinois Tollway's VES Wash Single Cabinet System with Nitrogen Generator operator to control the wash of each VES camera individually. This system shall enable the operator to control the mode of operation (either fluid wash or nitrogen dry) along with the duration of the wash and dry time via electronic controls and solenoid valves mounted inside the VES Wash Single Cabinet. The remote control of the VES Wash Single Cabinet System with Nitrogen Generator shall have an Ethernet interface to the Illinois Tollway's All Electronic Tolling (AET) network switch installed in the plaza building.
- The Contractor shall provide and install all required conduit, fittings, tubing from the VES Wash Single Cabinet System to each of the VES cameras. All fittings shall be weatherproof and not allow any liquid to enter into any enclosures or junction boxes. For outdoor installations, all penetrations into the main enclosure shall be made at the bottom of the enclosure so as to prevent water from dripping down and accumulating from the top of the enclosure. If penetrations are required to be made on the side of the enclosures, they shall be properly sealed to prevent moisture and water from entering the enclosures.
- The Contractor shall provide the 120VAC feed to the VES Wash Single Cabinet System with Nitrogen Generator from a 120VAC power distribution panel located in the main breaker panel inside the plaza building. Electric cable of the size shown on the contract plans shall be utilized from the main breaker panel to the VES Wash Single Cabinet System with Nitrogen Generator. All penetrations through the enclosure for the 120VAC feed shall be properly sealed and weather tight.
- Wire labels within enclosures shall use the slide on Grafoplast marking system at both ends of each wire. Wrap around wire labels, or clip-on Grafoplast tags are not acceptable.
- All 120VAC internal wiring within each subpanel shall utilize #16 AWG red SIS wire. All internal ground wiring shall be properly sized for the circuit it is serving, utilizing green conductors.
- The Contractor shall provide properly rated fuses for all fuse blocks and IFM modules listed on the VES Wash Single Cabinet System with Nitrogen Generator BOM table shown in the contract plans plus a 10% spare quantity for each fuse type and rating.

- Wiring to the following devices shall utilize #12 AWG cables: internal lights.
- All vinyl tubing shall be firmly connected to the nozzle so that there are no leaks or disconnections when the system is operated at the system pressure of 100 psi. To prevent degradation and cracking of the vinyl fluid lines, all exposed tubing, as it exits the conduit on the monotube and connects to the spray nozzle, shall be completely enclosed within the silicone sleeve as indicated in the contract plans.
- The Contractor shall install the nozzle bracket on the camera front window using stainless steel nut and bolt combination. The position of the mounting hardware on the nozzle brackets shall be such that the nozzle position relative to the VES camera front window can be easily adjusted by loosening the bolt and sliding the bracket forward or backward as required.
- The nozzle bracket shall be positioned in front of the camera front window housing such that the fluid stream from the nozzle hits the top half of the lens window, as observed from the ground level.
- All switches and tubing shall be labeled with a permanent labeling mechanism to be approved by the Engineer.
- The Contractor is required to supply, install, and terminate 3/C #16 SO cables from the electrical enclosure to each solenoid within the main enclosure.
- Upon completion of work, finish surfaces shall be free of tool marks, scratches, blemishes, and stains.
- The Contractor shall coordinate with the manufacturer to have a manufacturer's representative on-site to supervise the complete installation and commissioning of the equipment and to provide support during site testing. It is mandatory that the contractor engage the manufacturer of the VES Wash Single Cabinet System with Nitrogen Generator to be present at every step of the VES Wash System installation, during commissioning and during all phases of site testing and system testing.

TESTING

The Contractor shall be required to perform the following tests after the installation of the VES Wash Single Cabinet System with Nitrogen Generator. The Contractor shall use the test plans within this special provision to conduct the following tests in the presence of the Engineer.

- Factory Acceptance Test
- Site Inspection and Initial Startup Test
- VES Wash System Tubing Air Proofing Test
- Subsystem Test
- System Functional Test
- 30-Day "Burn-in" Period
- Final System Acceptance

Factory Acceptance Test

The VES Wash Single Cabinet System with Nitrogen Generator vendor shall be responsible for conducting Factory Acceptance Tests under the supervision of the Contractor and the Engineer on all system components at the VES Wash System vendor's manufacturing facility. The vendor shall provide five (5) copies of all Factory Acceptance Test procedure for the Engineer's approval (via WBPM) at least thirty (30) days prior to the day the tests are to begin. The test procedures shall include the sequence in which the tests will be conducted. The test procedures shall have the Engineer's approval (via WBPM) prior to submission of equipment for tests. The system vendor shall furnish data forms containing all of the data taken, as well as quantitative results for all tests. The data forms shall be signed by an authorized representative (company official) of the equipment vendor. At least one (1) copy of the data forms shall be sent to the Engineer. The VES Wash Single Cabinet System with Nitrogen Generator manufacturer shall be responsible for providing the test fixtures and test instruments for all of the tests.

The Engineer (along with Illinois Tollway personnel) reserves the right to witness the Factory Demonstration Tests at the vendor's manufacturing facility. All tests shall be conducted in accordance with the approved test procedures. All equipment shall pass the following individual tests:

- Examination Tests: All equipment shall be examined carefully to verify that the materials, design, construction, markings and workmanship comply with the requirements of this special provision and with the approved material cut sheets submitted at the beginning of the contract.
- Continuity Tests: The wiring shall be checked to determine conformity with the requirements of the appropriate paragraphs in this special provision.
- Operational Test: All equipment shall be operated long enough to permit equipment temperature stabilization, and to check and record an adequate number of performance characteristics to ensure compliance with the requirements of this special provision.
- Consequences of Factory Acceptance Test Failure: If any VES Wash Single Cabinet System with Nitrogen Generator component fails to pass the Factory Acceptance Test, the unit(s) shall be corrected, and the test successfully repeated.

In lieu of the Factory Visual Inspection, and only if approved by the Engineer, the Contractor can obtain from the manufacturer a product validation certification illustrating that the manufacturer has followed their quality processes and verifies that the VES Wash Single Cabinet System with Nitrogen Generator unit meets the specifications for operations. This certificate must be submitted to the Engineer for review and approval for the Factory Visual Inspection acceptance.

Site Inspection and Initial Startup Test

The Contractor with the technical support of the manufacturer of the VES Wash Single Cabinet System with Nitrogen Generator shall perform site inspection and initial startup tests at each VES Wash Single Cabinet with Nitrogen Generator System location in accordance with the test procedures detailed herein, the contract plans, and as recommended by the various equipment manufacturers. This requirement is meant to confirm that all site equipment has been installed and connected properly.

The following test procedures must be carried out by the Contractor in the presence of the Engineer:

- Inspect the quality and tightness of all vinyl tube and liquid/air pipe connections, specifically connection points of the vinyl tubing and the nozzle connectors. Refer to the VES Wash System Tubing Air Proof Test Procedure attached to this special provision.
- Check all power supply voltages and outputs.
- Connect devices to power sources.
- Verify installation of manifolds, solenoids, switches, nozzles, electric conduit, junction boxes, vinyl tubing is as per plan.
- Verify that the main VES Wash Single Cabinet System is leveled and secured.
- Prior to pressurizing the system, the Contractor shall verify that the control switches energize the respective solenoids to which they are connected.

Upon successful completion of this test, the Contractor shall open the regulator valves on the washer fluid and the nitrogen tank to the system operating pressure, as specified in the plans. The control switches on the VES Wash Single Cabinet System with Nitrogen Generator shall then be turned on to initiate a wash/dry cycle for each of the VES cameras at the site being tested.

VES Wash System Tubing Air Proofing Test

The objective of this test is to verify the nylon tubing, furnished and installed on-site by the Contractor from each camera manifold valve in the main VES wash system cabinet, located in the plaza building, to the corresponding spray nozzle at each VES camera installed on the monotube, is leak-free and is able to maintain the system operating pressure of 100 PSI.

The test is to be performed by the Contractor, in presence of the Engineer, as per the following procedure:

- Plug the nylon tubing at spray nozzle end (located at the VES camera on the monotube) using clamp, nipple, and end plug.
- At the end section of the tubing inside the plaza building, connect the tube with nipple using clamp to a pressure gage, non-return valve, and ball valve, so the contractor will be able to monitor the pressure gage during the air pressure test.
- Using an air compressor, set the air pressure to 125 PSI.
- The air proofing test of each nylon tuning run shall be done separately, one at a time.
- Start the air compressor and increase the air pressure inside the tube to 125 PSI +/- 5 PSI.
- Once the air pressure inside the tube reaches 125 PSI, close the air output valve, stop the air compressor and measure the air pressure loss for 2 minutes. The maximum allowable air pressure loss within 2 minutes of pressurization is 10 PSI.
- After 2 minutes of pressurization, measure the residual line pressure in the tube. The tube is considered airtight if the residual pressure is above 110 PSI.
- Repeat this test procedure for each tubing run from the main VES wash cabinet to the camera spray nozzle.

Contractor shall measure and record the air proofing test results in the VES Wash System Tubing Air Proof Test Results form included in these Special Provisions.

Subsystem Test

The Contractor shall perform subsystem tests, in the presence of the Engineer, at each VES Wash Single Cabinet System with Nitrogen Generator location in accordance with the test procedures detailed herein, the contract plans, and as recommended by the various equipment manufacturers. This requirement is meant to confirm that all system level site equipment has been installed and connected properly.

- Each manifold valve shall be turned on and off individually to check for proper flow of washer fluid or nitrogen gas from the manifold valves to the nozzles on the VES camera brackets. The nylon tubes and pipes shall be checked for breaks, leakage and kinks and any defective system components shall be replaced and retested.
- If the system is pressured with an internal high pressure nitrogen tank, the Contractor shall, using suitable means and methods, verify that there is no nitrogen leakage in the high pressure nitrogen lines specifically at the connectors and regulators. If leaks are detected, the Contractor shall take appropriate steps, including replacing the component(s) determined to be the cause, and retest for leakage in the nitrogen lines until it is confirmed by the Engineer that no more leaks exist.

System Functional Test

The VES Wash Single Cabinet System with Nitrogen Generator functional test shall be in accordance with the various equipment manufacturer recommendations and as approved by the Engineer. The following procedures shall be carried out by the Contractor during the test:

- System testing shall be executed by the Contractor, under supervision of the VES Wash Single Cabinet System vendor's representative, at each location in the presence of the Engineer. The Contractor must demonstrate proper operation of the equipment as intended and certify in writing that the set-up and performance is in full compliance with the specifications.
- Testing and adjustment of all system controls and safety, and replacement of damaged and malfunctioning controls and equipment. Any adjustments to the system components, including but not limited to adjusting nozzle position, checking for leaks and other system malfunctions, as directed by the Engineer shall be done by the Contractor during the Final System Acceptance testing.
- Measurement and recording of all voltages and amperages after all electrical circuitries have been energized.
- Functional Testing:
 - After installation of the VES Wash Single Cabinet System with Nitrogen Generator unit is completed, provide a system performance test to determine the minimum and maximum quantity of wash fluid used in a typical wash cycle and provide a written report.
 - The VES Wash Single Cabinet System with Nitrogen Generator equipment shall be tested to verify that the work is in conformance with the requirements of the Specifications.
- Repair or replace malfunctioning equipment. Retest as specified above after repairs or replacements are made.

30-Day “Burn-In” Period

The purpose of the 30-Day Burn-in Period is to demonstrate the full capabilities of the VES Wash Single Cabinet System with Nitrogen Generator.

For the 30-Day Burn-in Period to be accepted, the Contractor shall:

- Demonstrate, through the activation of the high-pressure wash and dry cycle, a minimum of two (2) times during the burn-in period, that all system components operated properly and without any failure. There should be a minimum gap of two weeks provided between the activation cycles. Testing will be performed by Illinois Tollway representatives who are trained in using the equipment. The Contractor shall notify the Engineer, in writing, of the scheduled start date of the test 14 calendar days prior to the commencement of said test. The 30-Day Burn-in Period shall not be performed without prior written acceptance from the Engineer.
- For every one (1) day the Contractor is required to mitigate/fix a problem, an additional one (1) day per testing will be added to the 30-Day test. The system may be shut down for purposes of testing and correcting identified deficiencies. Any VES wash system part or component replacement shall restart the 30-day test at Day one (1).
- Receive written approval from the Engineer verifying the 30-Day Burn-In period has been successfully completed.

Final System Acceptance

Final acceptance of the work associated with the installation of the VES Wash Single Cabinet System with Nitrogen Generator will be made after satisfactory completion of the required “Burn-in” Test period and on the basis of the final inspection of the entire system. The final inspection of each system will be performed by the Engineer in the presence the Contractor. Final acceptance of all work associated with this pay item will be made after:

- Successful completion of the project final walk-through by the Illinois Tollway’s General Engineering Consultant (GEC).
- Submission (via WBPM) and written approval by the Engineer of all user/operator manuals, record drawings and warranty documents.
- The Contractor shall provide three (3) hard and three (3) electronic (PDF) copies of each of the operation manual, test procedures and maintenance manuals to the Engineer.
- Notification of Final Acceptance will be sent to the Contractor in writing (via WBPM) by the Engineer.

All “as-built” documents shall be submitted to the Engineer at the time of Final Acceptance and include electronic files. The Contractor shall provide a copy of the operation and maintenance manuals for the VES Wash Single Cabinet System with Nitrogen Generator.

ON-SITE ASSISTANCE

When requested, within one (1) year of Final Acceptance, the Contractor shall provide on-site assistance in adjusting any and/or all operation parameters as directed by the Engineer. The Contractor shall provide up to three (3) requested visits to the project site, per each location for this purpose at no additional cost to the Illinois Tollway.

WARRANTY

The VES Wash Single Cabinet System with Nitrogen Generator and associated components shall be warranted and guaranteed against all defects and/or failure in design, materials and workmanship within the warranty period. The Contractor shall submit the warranty terms as part of each material item's shop drawing submittal for approval.

The warranty of the VES Wash System is listed in the Illinois Tollway Warranty Special Provision. The warranty shall provide that, in the event of a malfunction during the warranty period, the defective system component shall be repaired or replaced with a new component by the manufacturer or representative within five (5) working days.

Any component that, in the opinion of the Engineer, fails three (3) times prior to the expiration of the warranty will be judged as unsuitable and shall be replaced by the Contractor with a new component of the same type at no additional cost. The unsuitable component shall be permanently removed from the project. A failure shall also be defined as the field device becoming unable to comply with all applicable standards.

The warranty shall provide that, in the event of any issues with the Contractor's workmanship, as noted by the Tollway, which adversely affects the operational functionality of the VES Wash Single Cabinet System with Nitrogen Generator unit as intended/designed, the Contractor shall be responsible to rectify the issue to the satisfaction of the Tollway. All related costs shall be the responsibility of the Contractor.

Any repairs made by the Contractor shall be documented and that documentation shall be returned with the warranty repaired units. This documentation shall include an explanation of the exact repairs made and identification of parts replaced by part number.

METHOD OF MEASUREMENT

This work will not be measured for payment.

BASIS OF PAYMENT

This work will be paid at the contract lump sum price for VES CAMERA WASH SYSTEM, SINGLE CABINET, NITROGEN GENERATOR, which payment shall constitute full compensation for the work specified.

The payment to the Contractor will adhere to the following schedule:

- Seventy-five percent (75%) of the contract unit price will be paid by the Engineer at completion of the System Functional Test of the VES Wash Single Cabinet System with Nitrogen Generator. Written (via WBPM) approval from the Engineer of acceptance of the System Functional Test is required before payment is released.
- Fifteen percent (15%) of the contract unit price will be paid after the acceptance of the Final System Acceptance by the Engineer in the presence of the Contractor. Written (via WBPM) approval from the Engineer that Final Acceptance is required before payment is released.
- Ten percent (10%) of the contract unit price will be paid upon receipt of submission and approval of all system documentation (As-builts, cabinet drawings and warranties).

VES Wash System Tubing Air Proofing Test Results

Information

PROJECT NAME AND LOCATION: _____

TEST DATE: _____

CONTRACTOR REPRESENTATIVE: _____

CM REPRESENTATIVE: _____

Note: For each tube, the Contractor shall record the residual air pressure after 2 minutes of pressurization. The tube will be considered airtight if the residual air pressure is minimum 110 PSI after 2 minutes of pressurization.

Lane / Shoulder No.	VES Camera Location	Pass	Fail
Lane 1	FRONT VES Camera Tubing		
	REAR VES Camera Tubing		
Lane 2	FRONT VES Camera Tubing		
	REAR VES Camera Tubing		
Lane 3	FRONT VES Camera Tubing		
	REAR VES Camera Tubing		
Lane 4	FRONT VES Camera Tubing		
	REAR VES Camera Tubing		
Lane 5	FRONT VES Camera Tubing		
	REAR VES Camera Tubing		
Lane 6	FRONT VES Camera Tubing		
	REAR VES Camera Tubing		
Shoulder 1	FRONT VES Camera Tubing		
	REAR VES Camera Tubing		
Shoulder 2	FRONT VES Camera Tubing		
	REAR VES Camera Tubing		

Contractor Representative Signature:

Date:

Engineer's Signature:

Date:

Comments:

ITS DEVICE TESTING REQUIREMENTS (ILLINOIS TOLLWAY)

Effective: March 1, 2020

Revised: March 1, 2022

Description. This special provision describes the common testing requirements for a new ITS device installation.

CONSTRUCTION REQUIREMENTS

Testing. The Contractor shall be required to perform the following tests after the installation of the ITS device. The Contractor shall use the test plans within this special provision to conduct the following tests in the presence of the Engineer.

- First Unit Factory Visual Inspection (If required)
- Site Test
- System Test
- 30-Day Burn-in Period
- Final System Acceptance and Training

Devices (except for DMS signs) which fail any stage of testing due to hardware failure shall be replaced by the contractor under the manufacturer's warranty, not repaired in the field.

First Unit Factory Visual Inspection (When required). The Contractor (or the Contractor's equipment fabricator) shall completely assemble one unit which includes all equipment, modules, components and complete all internal wiring (including labeling), then provide 5 business days' notice that this assembly is ready for inspection. The Contractor shall have one set of contract plans and two sets of shop drawings on site to be redlined with any discrepancies noted. One set of redlines shall be submitted to the Illinois Tollway. The Contractor shall follow the Illinois Tollway ITS Labeling Guidelines Manual for all labeling of components. The manual can be found on the Illinois Tollway's website.

In lieu of the Factory Visual Inspection, the Contractor shall obtain from the manufacturer a product validation certification illustrating that the manufacturer has followed their quality processes and verifies that the unit meets the specifications for operations. This certificate must be submitted to the Engineer for review and approval for the Factory Visual Inspection acceptance.

Site Testing. The purpose of the Site Test is to have the Contractor demonstrate to the Engineer that all device components have been installed, connected, labeled, and configured correctly as per contract plans and as per the manufacturer's requirements, utilizing quality workmanship. This installation shall result in the reviewing of accurate (per manufacturers specification) functionality of the device at the site before being connected to the Illinois Tollway switch and communications system.

The Site Test shall be performed in conjunction with all associated equipment installed at a common site, including but not limited to the following elements. A Site Test shall not be performed at the element or component level. Site Tests shall be performed for all relevant elements at a common site, meeting any Site Test requirements specified for each element, which may include:

- CLOSED CIRCUIT TELEVISION (CCTV) CAMERA, ITS ASSEMBLY
- MICROWAVE VEHICLE DETECTION SYSTEM (MVDS), ITS ASSEMBLY
- WIRELESS IN-PAVEMENT VEHICLE DETECTION SYSTEM
- ITS POLE MOUNTED ENCLOSURE, ITS ASSEMBLY (CCTV or MVDS)
- DYNAMIC MESSAGE SIGN (WALK-IN)
- DYNAMIC MESSAGE SIGN (FRONT ACCESS)
- WIRELESS COMMUNICATIONS, ITS ASSEMBLY
- STATIC SIGN FLASHING BEACON ASSEMBLY INSTALLATION
- SOLAR POWERED GENERATOR ASSEMBLY
- CO-LOCATED SOLAR POWERED GENERATOR ASSEMBLY
- ITS ELEMENT SITE GROUNDING
- MONOPOLE CLOSED CIRCUIT TELEVISION (CCTV) CAMERA TOWER ASSEMBLY
- VIDEO POWER JUNCTION BOX

For the Site Test to be accepted, the Contractor shall demonstrate to the Engineer that:

- The installation has been performed as per contract plans and as per the manufacturer's recommendations.
- All enclosure components demonstrate correct input and/or output voltages when powered/unpowered.
- The enclosure is attached/orientated to the pole and properly grounded (where applicable).
- All conduit and raceway entry points have been sealed with duct seal to prevent the intrusion of insects, rodents, pests, and debris.
- All connections are tight and cannot be dislodged by incidental contact from the Engineer.
- All equipment inside the enclosure shall be properly labeled as per the Illinois Tollway ITS Labeling Guidelines Manual (located on the Illinois Tollway website).
- Power up each component to verify that it is wired correctly.
- Grounding System testing meet requirements.

System Test. The System Test demonstrates that the field devices can be operated at the Traffic Operations Center (TOC) utilizing the Traffic Information Management System (TIMS) software. The System Test will be conducted by the Illinois Tollway.

For the System Test to begin, the Contractor shall notify the Engineer in writing (via the WBPM system), within 5-Days prior to the start of System Testing, stating the site is ready for integration into the Illinois Tollway's Traffic Information Management System (TIMS) software.

The Engineer and the ITS Integrator will provide written approval (via the WBPM system) verifying the communications connectivity and data transmission are within the Illinois Tollway requirements, that the System Test has passed, and the 30-Day Burn-In Period has immediately started.

The Illinois Tollway ITS Integrator will complete the System Test within 2 weeks of notification from the Engineer requesting that all sites be tested.

30-Day Burn-in Period. The purpose of the 30-Day Burn-in Period demonstrates that the device communicates 100% of the time to the TIMS software is being received during the duration of the test.

For the 30-Day Burn-in Period to be accepted, the Contractor shall demonstrate to the Engineer that the Engineer, Traffic Operations Center (TOC) Manager, Operations Manager, Illinois Tollway ITS Maintenance Manager have not submitted any trouble tickets or written (via email or the Illinois Tollway's WBPM system) failure notifications within the 30-Day period.

Failure notification shall include, but not be limited to:

- Any ITS enclosure and associated field devices power or communication error(s).
- Data accuracy below the manufacturer's specification.
- Any ITS enclosure and associated field devices configuration errors.
- Any operations anomaly that the Contractor cannot explain or rectify.

For every one (1) day the Contractor is required to mitigate/fix a problem, an additional one (1) day per testing will be added to the 30-Day test.

The Contractor shall schedule and complete a pre-final walkthrough with the Illinois Tollway's ITS General Engineering Consultant (GEC) to occur during the Burn-in Period.

The Illinois Tollway ITS Integrator or the TOC Manager will provide written approval upon successful completion of the 30-Day Burn-in period.

Final System Acceptance and Training. The final inspection of the device will be performed by the Engineer in the presence of a representative of the Contractor. Final acceptance of all work associated with this pay item will be made after:

- Successful completion of the project final walk-through by the Illinois Tollway's ITS GEC.
- Submission (via the WBPM system) and written approval by the Engineer of all Record Drawings and Warranty documents including an electronic computer file (MicroStation and PDF) including a sketch of each ITS element assembly, user/operator manuals, listing each device's location, identification number, wireless channel information and GPS coordinates to the Engineer.
 - The Contractor shall provide three hard and three electronic (PDF) copies of each of the operation and maintenance manuals to the Engineer for approval.
 - The Contractor shall add a new or updated laminated cabinet wiring diagram to each enclosure.
- Notification of Final Acceptance will be sent in writing (via the WBPM system) by the Engineer.

Basis of Payment. The cost of testing, troubleshooting, repair, and replacement of any components or devices shall be included in the cost of the corresponding ITS device pay item and no further payment shall be considered or paid to the contractor.

ITS SECURITY CLOSED CIRCUIT TELEVISION (CCTV) CAMERA (ILLINOIS TOLLWAY)

Effective: March 1, 2019

Revised: March 1, 2024

Description. This work shall consist of furnishing, installing, calibrating and testing a Security Closed Circuit Television (CCTV) camera per the plans and as directed by the Engineer, as part of an Illinois Tollway security system.

The work under this special provision shall be in association with the installation of a video power junction box, electrical service, grounding and cabling.

Materials. The main components of the system are as described below. All other ancillary connection cables, brackets, and other items required for the installation of a fully functional CCTV security camera assembly are included under this specification.

PTZ HD IP Camera. The PTZ CCTV security camera shall be one of the following approved models:

- Axis (Model Q6315-LE) – 60 W Midspans PoE (with 512 GB SD card)
- Axis (Model Q6318-LE) – 60 W Midspans PoE (with 512 GB SD card)

PTZ Camera Mounting Hardware. PTZ Axis cameras shall be wall (or pole) mounted with an Axis T91L61 (part# 5801-721) mounting arm.

Fixed HD IP Camera. The fixed CCTV security camera shall be Axis P3268-LVE or approved equal.

Fixed Camera Mounting Hardware. Fixed Axis cameras shall be wall mounted with an Axis P3268-LVE mounting bracket or pole mounted with an Axis T91B47 pole mount.

Cabling. All camera models shall be furnished with an Outdoor Rated 4 Pair 23 AWG 1000BASE-T CAT6 Cable, manufactured by Beldon, model number 7953A, length up to 290 feet as required. Use of an ethernet signal booster is prohibited.

Power Injectors. PoE model CCTV cameras shall be furnished with a 120VAC 60W rated PoE injector (Axis T8154) recommended by the CCTV manufacturer. See the attached checklist for approved model number.

If the manufacturer provides a PoE injector included with the camera differs from the model to be installed, the contractor shall provide this spare injector to the Illinois Tollway as stock.

Surge Suppression. PoE CCTV camera models shall be furnished with a CAT6 Surge Protection Device (SPD) to protect against power surges in the communication cable. The surge suppression device shall be by Axis model number T8061.

CONSTRUCTION REQUIREMENTS

The Contractor shall closely coordinate the proposed work prescribed under this special provision with the Engineer. This includes, but is not limited to, the following:

Pre-Procurement Documentation Approval. The Contractor shall submit for approval to the Engineer, within 10 business days from Notice to Proceed (NTP), a detailed schedule showing dates for: product submittals and approvals; device configuration by the Illinois Tollway; construction/installation; calibration; testing; burn-in period; and warranty of each CCTV security camera. This detailed schedule shall be included in the project schedule, as required per Illinois Tollway Supplemental Specifications Article 108.02. Schedules for each CCTV security camera to be deployed within the larger construction contract and shall be staggered based on resources to be employed.

The Contractor shall submit for approval to the Engineer, within 10 business days from NTP, a completed Contractor Submittal Checklist and associated submittals.

The Contractor shall make all submissions to the Engineer through the Illinois Tollway Web Based Program Management (WBPM) system.

The Contractor must obtain approval of the schedule, catalog cut sheets, cabinet wiring diagrams, and calculations from the Engineer prior to purchasing any equipment and subsequently performing the installation per the approved documents, contract plans, and specifications.

Pre-Installation Requirements. Thirty (30) days prior to the scheduled field installation of each CCTV camera, the Contractor shall provide a form to the Engineer listing the specific serial number and field location of each camera. This form shall be signed by both the Engineer and the Contractor.

When there are less than 5 units requiring programming, the Illinois Tollway will elect to have the contractor deliver the CCTV(s) to the Illinois Tollway's Central Administration (CA) Building for configuration and labeling prior to installation by the Contractor. The contractor shall deliver the cameras at least thirty (30) days prior to the scheduled field installation. The Contractor shall provide an A-14 form to the Engineer during acceptance of the cameras at CA showing the equipment, each equipment specific serial number, and the field location of each piece of equipment. This form will be signed by both the Engineer and the Contractor. The Contractor shall take possession of the devices from the Illinois Tollway upon notification by the Engineer of configuration and labeling completion.

When 5 or more units need programming, the Illinois Tollway will program the cameras at a location determined by the contractor. At least thirty (30) days prior to the scheduled field installation, the contractor shall provide notice to the Tollway to schedule the programming. The contractor shall have all units ready for programming at the same time.

CCTV Security Camera Installation. The Contractor shall install the CCTV security camera on the mounting arm, as noted on the plans or as per the manufacturers' recommendations, including the mounting height and orientation/aiming. The CCTV security camera shall be aligned such that there are no obstructed views.

All camera materials, conduit, wire, circuit breakers, brackets, etc. shall be installed as shown on the plans, per manufacturer recommendation, and as directed by the Engineer. This includes all items and workmanship required to successfully pass the Site Test stated within this special provision.

The Contractor shall follow the Illinois Tollway ITS Labeling Guidelines Manual for all labeling of components. This shall include a label on the PoE injector showing the last two octets of the camera's IP address. The manual can be found on the Illinois Tollway's website.

Testing. The Contractor shall be required to perform testing according to the special provision ITS Device Testing Requirements using the attached checklists and as modified below.

Modifications to First Unit Factory Visual Inspection

A First Unit Factory Visual Inspection is required for the CCTV camera assembly only when the submitted device differs from the models specified.

Modifications to Site Testing. This installation shall result in the reviewing of accurate (per manufacturers specification) video and camera control at the site before being connected to the Illinois Tollway switch and communications system.

For the Site Test to be accepted, the Contractor shall demonstrate to the Engineer that all camera(s) have been tested in the presence of the Engineer to verify that a clear (no visible distortion) camera video stream can be viewed and that the camera can be panned, tilted and zoomed, and that the 512 GB SD card is detected and can record a one minute test video. The Contractor records the cameras performance on the CCTV Camera Site Acceptance Test form attached to this special provision. The form is signed by the Engineer.

Modifications to System Test. System Acceptance of the CCTV:

- Contact the TOC Manager, after the 5-Day request from above, to request that the CCTV camera site is tested for:
 - Clear video without any distortion and interference/noise.
 - Pan, Tilt, Zoom, automatic/manual iris, automatic/manual focus, and camera pre-set capabilities.
 - Accurate CCTV camera data transmission from the CCTV camera site to TIMS.

Warranty. All CCTV security camera and associated components shall be warrantied and guaranteed against defects and/or failure in design, materials, and workmanship within the warranty period. The Contractor shall submit the warranty terms as part of each material item's shop drawing submittal for approval.

The warranty shall provide that, in the event of a malfunction during the warranty period, the defective system component shall be replaced with a new component by the manufacturer or his/her representative.

Any system component that, in the opinion of the Engineer, fails three (3) times prior to the expiration of the warranty will be judged as an unsuitable system and shall require the entire system be replaced by the device manufacturer or representative with a new system of the same type at no additional cost to the Illinois Tollway. The unsuitable system shall be permanently removed from the project. A failure shall also be defined as the field device becoming unable to comply with all applicable standards at the time of original construction.

All manufacturer's equipment warranties shall be included in the maintenance manuals for the subject equipment. The manufacturer's warranty shall be in accordance with the contract special provision "WARRANTY (Illinois Tollway)".

Method of Measurement. This work will be measured for payment in units of each.

Basis of Payment. This work will be paid for at the contract unit price per each for ITS SECURITY CCTV CAMERA.

The payment to the Contractor will adhere to the following schedule:

Ten percent (10%) of the contract unit price will be paid upon receipt of submission and approval of all product submittal documentation, calculations, and shop drawings.

Eighty percent (80%) of the contract unit price will be paid by the Engineer at completion of the Site Test of the CCTV security camera location. Written (via the WBPM system) approval from the Engineer of acceptance of the Site Test is required before payment is released.

Ten percent (10%) of the contract unit price will be paid after the acceptance of the Final System Acceptance and Training by the Engineer in the presence of the Contractor. Written (via the WBPM) approval from the Engineer that Final Acceptance is required before payment is released.

ITS SECURITY CCTV CAMERA

PAY ITEM # JT13282
 Contract #
 e-Builder Submittal Package #:
 e-Builder Submittal Date:
 Reviewed By (CM Staff Name):
 Review Date:

SUBMITTAL STATUS
 APPROVED
 APPROVED AS NOTED
 REJECTED

LOCATION OF REFERENCE	DETAIL SHEET ITEM	ITEM DESCRIPTION	APPROVED MANUFACTURER	APPROVED MODEL No.	SUBMITTED AS SPECIFIED?	PROPOSED EQUIVALENT DETAILS		
						MANUFACTURER	MODEL No.	NOTES
AXIS PTZ (POE)								
SPEC. PROV.		CCTV CAMERA	AXIS	Q6315-LE (prime) or Q6155-E (alternate)				
SPEC. PROV.		MOUNTING ARM	AXIS	TQ6501-E				
SPEC. PROV.		MicroSD Card	AXIS	AXIS Surveillance Card 512 GB				
FIXED (POE)								
SPEC. PROV.		CCTV CAMERA	AXIS	P3375-VE				
SPEC. PROV.		MOUNTING ARM	AXIS	P33-VE (wall mount), T31E47 (pole mount)				
COMMON ITEMS								
SPEC. PROV.		POE INJECTOR	AXIS	T8154				
SPEC. PROV.		OUTDOOR RATED 4PR 23AWG 1000BASE-T CAT6 CABLE	BELDEN	7953A OR APPROVED EQUAL				
SPEC. PROV.		CAT6 POE+ SURGE SUPPRESSOR	AXIS	T8061				

CCTV Security Camera Site Acceptance Test



1. INTRODUCTION

Site Acceptance Testing verifies that the installed CCTV security camera(s) are fully operational at each device site, prior to connection to the field Cisco switch. This document provides the Site Acceptance Test procedure for CCTV security cameras.

2. PROCEDURE

From the Contractors IP camera tester, access the CCTV security camera(s) IP address. Verify that the image is received. Also, verify that the camera can be controlled and all control functions are operational.

3. DEFINITIONS

Test	Action / Results
Image	Video Received at the site
Pan Right	Pans the camera to the right
Pan Left	Pans the camera to the left
Tilt Up	Tilts the camera up
Tilt Down	Tilts the camera down.
Zoom In	Zooms the camera in
Zoom Wide	Zooms the camera out
Variable Speed	Holding down a control button causes the camera to move faster
Auto Focus	Pressing FOCUS NEAR and FAR buttons manually overrides auto-focus
Iris Override	Pressing IRIS OPEN and CLOSE buttons manually overrides auto-iris

CCTV security camera Site Acceptance Test Form



Project Number and Name: _____

Route (Circle One): I-88 / I-90 / I-94 / I-294 / I-355 / IL 390 / I-490

Mile Post: _____ Direction (Circle One): NB / SB / EB / WB / Median

Latitude: _____ Longitude: _____

Date / Time: _____ Camera Type: _____

Camera Brand: _____ Camera Model: _____

PoE++ Brand: _____ PoE++ Model: _____

Function	Pass	Comment
Image	<input type="checkbox"/>	_____
Pan Right	<input type="checkbox"/>	_____
Pan Left	<input type="checkbox"/>	_____
Tilt Up	<input type="checkbox"/>	_____
Tilt Down	<input type="checkbox"/>	_____
Zoom In	<input type="checkbox"/>	_____
Zoom Wide	<input type="checkbox"/>	_____
Variable Speed	<input type="checkbox"/>	_____
Auto Focus	<input type="checkbox"/>	_____
Iris Override	<input type="checkbox"/>	_____
Preposition Pan	<input type="checkbox"/>	_____
Preposition Tilt	<input type="checkbox"/>	_____

Preposition Zoom

- One minute recording demonstrated on 512 GB SD card.
- Attach a screenshot of the web interface to the test form.

Additional Comments: _____

Test Conducted By: _____ Date: _____
 Engineer*: _____ Date: _____

* The Site Test shall not be official until the Engineer signs and dates this sheet. The Illinois Tollway will not accept any form that is not signed by both the Test Conductor and the Engineer.

CONCRETE FILLED PIPE BOLLARDS

Description. This work shall consist of all labor, materials, equipment, and performing all operations in connection with furnishing and installing concrete filled pipe bollards as shown on the Plans and/or as directed by the Engineer.

Materials. The bollards shall be constructed of schedule 80 steel pipe. All steel pipe shall be galvanized by the hot-dipped process according to AASHTO M 111.

Prior to installation, galvanized steel pipe shall be painted. The requirements of Article 506.09 of the Standard Specifications shall apply except as modified below.

- a) Method of surface preparation - ASTM D6386-16a; method of surface preparation, cleaning, and degreasing of galvanized materials must be compatible with the coating manufacturer's requirements.
- b) Primer and intermediate coat - Polyamidoamine epoxy, 2.0-3.0 mil dry film thickness each coat.
- c) Top coat - Aliphatic acrylic polyurethane, 2.0-3.0 mil dft.

Installation. The bollards shall be installed plumb and centered in a concrete encasement according to the details shown on the plans.

The Portland cement concrete used for the concrete encasement and to fill the inside of the steel pipe shall be in accordance with Section 1020 of the Standard Specifications.

The concrete encasement shall be the drilled shaft type and constructed according to Section 516 of the Standard Specifications. The submittal requirements as stated Article 516.04 shall not apply.

Method of Measurement. This work will be measured for payment, complete in place, in units of each concrete filled pipe bollard installed.

Basis of Payment. This work will be paid for at the contract unit price per each, for CONCRETE FILLED PIPE BOLLARDS.

HANDHOLE FOR FIBER OPTIC CABLE, TORSION ASSIST (ILLINOIS TOLLWAY)

Effective: March 1, 2020

Revised: December 8, 2023

Description. This work shall consist of furnishing and installing a precast polymer concrete handhole with torsion-assist frame and cover or standard cover, for use with single or multimode optic fiber, of the dimensions specified in the Plans. This work shall be in association with installation of Locator Tracer Wire and Locate Posts for Fiber Optic Cable.

Materials. The handhole materials shall be according to Article 1088.05 of the Illinois Tollway Supplemental Specifications, be comprised of polymer concrete and steel, and conform to ANSI/SCTE 77 Tier 22. The handhole body and cover shall be made of composite concrete. The cover frame shall be made of steel (for torsion assist). The bottom of the handhole shall be open to allow for conduit entry.

The handhole body, frame, and cover shall have a vertical design/test loading of 22,500/33,750 lbs. respectively. The cover shall have a permanently recessed logo that reads "TOLLWAY FIBER", or as otherwise shown in the Plans. The cover shall have two 1/2-in x 4-in pull slots. The lid surface shall have a minimum coefficient of friction of 0.50 in accordance with ASTM C-1028.

Torsion assist handhole covers shall be secured with two stainless steel penta-head bolts and washers. The Contractor shall furnish a matching penta-head "lock tool" for each handhole to the Engineer for providing future entry into the handhole.

Interior mounting support assemblies, recommended by the manufacturer and approved by the Engineer, shall be provided for securing conduit, fiber optic cable, and splice closures. The support assemblies shall be made from stainless steel. The support assemblies shall be anchored to the walls of the handhole using stainless steel hardware. All mounting components shall be electrically bonded together.

Handholes shown to be installed on cantilevered platform structures shall be furnished with galvanized steel angle brackets and other hardware necessary to secure the handhole to the structure. The Contractor shall submit shop drawings to the Engineer for approval prior to installing handholes.

CONSTRUCTION REQUIREMENTS

Grounding. An 8 foot long and 5/8" diameter copper-clad steel ground rod shall be furnished with each handhole. A No. 6 AWG Type XHHW, solid, green, insulated ground wire shall be furnished for connection to a Locate Post for Fiber Optic Cable and be exothermically welded to the ground rod. When the handhole is to be installed on structure, grounding shall be installed with all components as shown in the Plans as part of fully grounded system.

Bedding. A French drain shall be provided to allow water egress from the bottom of the handhole and to prevent animal entry. The French drain shall be constructed from coarse aggregate, CA-5 or CA-7 Class A, as specified in Section 1004.05 of the Standard Specifications.

Installation. Installation of the handhole shall be in accordance with Section 814 of the Illinois Tollway Supplemental Specifications and as shown on the Plans. The Contractor shall excavate soil as required for installation of the handhole. The location of the handhole shall be excavated so that the top surface of the handhole shall be 1 in. above the finished grade. The excavation shall be deep enough to accommodate the depth of the handhole and French drain. In order to permit the conduit, elbows, or any couplers to properly enter into the handhole and to permit proper compaction of the backfill material, the excavation shall be made to at least 6 inches, but no greater than 9 inches, greater than the outside edge of the handhole. If the handhole is located in soils classified as Types 1, 2, 3, or 4, the disposal of the excavated surplus material shall be according to the Tollway special provision for "Disposal of Regulated Substances."

Torsion assist handholes shall be installed with the hinged sides perpendicular to the slope.

The French drain shall be installed with a minimum depth of 12" below the base of the handhole. All conduit shown on the Plans to enter the handhole shall be arranged prior to installation of the handhole and shall enter the handhole from the bottom. Conduit shall not enter the handhole through sidewalls. Conduit shall be secured to the handhole interior mounting assemblies for training conduit and cable.

After the handhole has been placed, the contractor shall backfill around the handhole with coarse aggregate, of the same material as the French drain, and other suitable fill material as shown on the Plans. The surface conditions shall be restored to match the existing surroundings unless covered elsewhere by project specific site restoration plans.

Handholes to be installed on cantilevered structures shall be done per the approved method previously submitted to the Engineer. Handholes shall be secured to the structure such that they will be free from movement induced by structural vibrations caused by roadway traffic and other outside forces. Handholes on structure shall be provided with means of drainage.

Handholes shall be grounded as shown on the Plans and Standard Drawing L1. All interior components of the handhole shall be properly bonded and grounded according to manufacturer specifications. All Locate Posts and Locator Tracer Wires wire connection shall be made at the time of handhole installation. The handhole shall be thoroughly cleaned of any accumulation of silt, debris, or foreign matter of any kind.

Method of Measurement. This work will be measured for payment in units of each.

Basis of Payment. This work will be paid for at the contract unit price per each for HANDHOLE FOR SINGLE MODE FIBER OPTIC CABLE of the type specified.

CABLE MARKER SIGN WITH POST FOR SINGLE MODE FIBER OPTIC CABLE (ILLINOIS TOLLWAY)

Effective: March 1, 2018

Revised: June 1, 2024

Description. The Contractor shall furnish and install Cable Marker Sign Locate post, Cable Marker Sign Warning post and/or Warning sign for identifying locations of fiber optic cable as shown on the plans or as directed by the Engineer.

Material. Cable marker locate and/or warning sign posts for optic fiber cable shall be made of non-conductive high-density polymer and shall be integrally orange in color with an orange cap with black graphic and lettering on two sides. All colors shall be stabilized against ultraviolet light such that they will not fade under continuous exposure to direct sunlight. The marker shall retain dimensional stability in temperatures ranging between -40°F and 175°F. Each post shall be able to withstand a single vehicle impact at 45 MPH and return to within 10 degrees of vertical within 60 seconds.

CONSTRUCTION REQUIREMENTS

Installation. A LOCATE POST with cable marking sign shall be installed next to every Illinois Tollway optic fiber handhole. A 2 inch ID conduit will be installed from the Optic Fiber handhole to the locate post. The Locate post will have a removeable top exposing seven (7) ½ inch stainless steel bolt lugs with locking washer and nut. A #6 (green) ground wire shall be connected to the top lug in the locate post through the connecting conduit to the optic fiber handhole and connected to the ground rod. Locate/tracer wires will be labeled and connected to the other six (6) locate lugs.

Note: In the event there are two or more handhole for fiber optic installed in close proximity not exceeding twenty feet to each other then only one Locate Post can be used to connect the ground wire of the three fiber optic handholes.

Warning posts with cable marking signs shall be installed at mid-distance between every two locate posts.

WARNING SIGNS [optic fiber] shall be made of aluminum and installed on fences and sound walls every 200 feet wherever the buried optic fiber conduit path is within 10 feet of the fence or sound wall. All signs on fencing shall be installed using stainless steel TY-Raps, on wooden sound walls with stainless steel screws, and on the concrete sound walls with expanding anchors and stainless steel screws.

For duct marker installations at splice points, posts shall be connected to the fiber splice cases and the armored cable with a #6 ground wire in innerduct as indicated on the Plans. Cable markers shall be installed at the same time or immediately after the installation of underground conduits and handholes for identification of underground infrastructure.

Locate and warning posts shall have emergency contact information, route number, and mile post.

Locate/tracer wire shall be tested per manufacturer's recommendations and the results shall be provided to the Engineer for review and approval.

Method of Measurement. This work will be measured in units of each for the number of Posts, Signs and Markers that are placed and accepted.

Basis of Payment. Payment will be made per each for Locate post and Warning post locations as shown on the plans or as approved by the Engineer. Payment will be considered full compensation for all work, materials, and equipment required to place the markers at the locations shown on the plans, details, or as directed by the Engineer.

FIBER OPTIC CABLE, SINGLE MODE (ILLINOIS TOLLWAY)

Effective: March 1, 2019

Revised: March 1, 2023

Description. This work shall consist of furnishing Illinois Tollway approved Single Mode fiber cable as directed in the project plans. Installing, splicing, and testing the fiber optic cable as well as other ancillary components as required to complete the fiber optic cable installation as shown in the plans and as directed by the Engineer. All ancillary components shall be included in the cost of the fiber optic cable and will not be paid for separately.

Materials. Materials shall be in accordance with following.

Fiber Optic Cable. Ensure that the optical fiber used conforms to the requirements of the United States Department of Agriculture Rural Utilities Service (RUS) standard 7 CFR 1755.900 and this Specification.

The provided fiber optic cable shall:

- Be armored, dry-filled, loose-tube, dispersion-unshifted, single-mode fiber (SMF) with low water peak, gel free, and suitable for underground (i.e., in conduit) and aerial outside plant installation or ISP rated fiber as project required.
- Ribbon fiber must be approved by the Illinois Tollway
- Meet or exceed the following standards:
 - Telecommunications Industry Association (TIA) and Electronic Industries Alliance (EIA) TIA/EIA-492-CAAB,
 - U.S. Department of Agriculture Rural Utilities Service (RUS) 7 CFR 1755.900,
 - Telcordia GR-20,
 - International Electrotechnical Commission (IEC) 60793-2-50 Type B1.3,
 - American National Standards Institute/ ANSI/ICEA S-87-640-1999
 - International Telecommunication Union ITU-T G.652.D requirements.

- Be constructed with buffer tubes and shall not exceed a maximum attenuation for SMF of 0.4 decibels per kilometer (dB/km) at a wavelength of 1,310 nanometers (nm) and an attenuation of 0.3 dB/km at a wavelength of 1,550 nm.
- Be splice-compatible with the Illinois Tollway's existing SMF.
- Require no electronic equipment for dispersion compensation between new and existing fiber.
- Be continuous and of the same material.
- Be free of surface imperfections and inclusions.
- Be only furnished with commercial off the shelf materials, equipment, and components.
- All fiber optic core glass be from the same manufacturer and do not adhere to each other.

In addition, fiber optic cables shall meet or exceed the following requirements:

Geometry	
	Cladding Diameter: 125 μ m, \pm 0.7 μ m
	Core-to-Cladding Concentricity: \leq 0.5 μ m
	Cladding Noncircularity: \leq 0.7%
	Mode Field Diameter: 1,550 nm; 10.4 μ m, \pm 0.5 μ m
	Coating Diameter: 245 μ m, \pm 5 μ m
	Colored Fiber Nominal Diameter: 250 \pm 15 μ m
Optical	
	Cabled Fiber Attenuation: 1,310 nm, \leq 0.4 dB/km; 1,550 nm, \leq 0.3 dB/km
	Point Discontinuity: 1,310 nm, \leq 0.05 dB/km; 1,550 nm, \leq 0.05 dB/km
	Cable Cutoff Wavelength (λ_{ccf}): \leq 1,260 nm.
	Total Dispersion: 1,625 nm \leq 23.0 ps/(nm \cdot km)
	Macrobend Attenuation: Turns -100; Outer diameter (OD) of the mandrel - 60 mm, \pm 2 mm; \leq 0.05 dB at 1,550 nm
	Cabled Polarization Mode Dispersion: \leq 0.5 ps/ \sqrt km

Buffer Tubes. The fiber optic cable shall include loose buffer tubes that isolate internal optical fibers from outside forces and provide protection from physical damage as well as water ingress and migration. Buffer tubes shall provide freedom of movement for internal optical fibers and allow for expansion and contraction of the cable without damage to internal optical fiber. Fiber shall not adhere to the inside of the tube. Buffer tubes shall permit intentional scoring and breakout without damage to the fiber. Each fiber optic cable buffer tube shall contain 12 fibers per tube unless otherwise shown in the Plans. The buffer tubes shall be resistant to external forces and shall meet the buffer tube cold bend and shrink back requirements of 7 CFR 1755.900.

Color Code. The marking and color-coding of the fibers and buffer tubes shall conform to the EIA/TIA-598-B standard. Colors shall be permanent and stable during temperature cycling, and not subject to fading or smearing onto each other or into the water-blocking material or cause the fibers to stick together. Fibers shall be colored with UV curable inks that remain clearly distinguishable as the intended color.

Strength Member. The fiber optic cable shall contain a dielectric glass reinforced plastic (GRP) central strength member and dielectric outside strength member to prevent buckling of the cable and provide tensile strength. The fiber optic cable shall withstand a dynamic pulling tension of 600 lbs. without damage to any components of the fiber optic cable. The central member shall be over coated with a thermoplastic when required to achieve dimensional sizing to accommodate buffer tubes/fillers.

Water Blocking Compound. The fiber optic cable shall contain a dry water-blocking material to prevent the ingress of water within the outer cable jacket. The water-blocking materials shall be non-nutritive, dielectric, and homogeneous, and free from dirt and foreign matter. This yarn will preclude the need for other water-blocking material; the buffer-tube shall be gel-free. The optical fibers shall not require cleaning before placement into a splice tray or fan-out kit.

Dry water-blocking material for fiber optic cables shall be used for either aerial or underground installations. Dry water-blocking compound shall be applied longitudinally around the outside of the central buffer tubes. All cables shall be constructed with water blocking material that complies with the requirements of the EIA/TIA-455-81 B standard and is subjected to water penetration tests as defined in the EIA/TIA-455-82B standard.

Ripcord. The cable shall contain at least one ripcord under the sheath. The ripcord shall permit the removal of the sheath by hand or with pliers.

Filler. Fillers or rods may be included in the cable core to lend symmetry to the cable cross section if required. Fillers shall be placed so that they do not interrupt the consecutive positioning of the buffer tubes. In dual layer cables, any fillers shall be placed in the inner layer. Fillers shall be nominally 0.1 inch in outer diameter.

Outer Jacket. The fiber optic cable shall be jacketed with medium density polyethylene (MDPE) that is free of blisters, cracks, holes, and other deformities. The nominal jacket thickness shall be a minimum of 0.03 inches. Jacketing material shall be applied directly over the tensile strength members (as required) and water swellable tape. The outer jacket shall provide UV protection and shall not promote the growth of fungus.

The cable shall meet all specified requirements under the following conditions:

- Shipping/storage temperature: -40°F to +158°F (-40°C to +70°C)
- Installation temperature: -22°F to +158°F (-30°C to +70°C)
- Operating temperature: -40°F to +158°F (-40°C to +70°C)
- Relative humidity from 0% to 95%, non-condensing

The jacket shall contain the cable manufacturer's name, fiber type, fiber count, date of manufacture, and the sequential cable lengths marked in feet. Ensure that the actual length of the cable is within 1% of the length indicated by the marking. Legible marking with contrasting color to that of the cable jacket shall be provided.

Cable Performance Requirements. The fiber optic cable manufacturer shall provide documentation and certify that the fiber optic cable complies with the following EIA-455-xxx Fiber Optic Test Procedures (FOTP) (Note that, as represented below, FOTS-x is specified in EIA-455-x, e.g., FOTP-3 is specified in EIA-455- 3):

- When tested in accordance with FOTP-3, *"Procedure to Measure Temperature Cycling Effects on Optical Fibers, Optical Cable, and Other Passive Fiber Optic Components,"* the change in attenuation at extreme operational temperatures (-40°F and +158°F) shall not exceed 0.15 dB/km at 1550 nm for single-mode fiber.
- When tested in accordance with FOTP-82, *"Fluid Penetration Test for Fluid-Blocked Fiber Optic Cable,"* a one-meter length of unaged cable shall withstand a one-meter static head or equivalent continuous pressure of water for one hour without leakage through the open cable end.
- When tested in accordance with FOTP-81, *"Compound Flow (Drip) Test for Filled Fiber Optic Cable,"* the cable shall exhibit no flow (drip or leak) of filling and/or flooding material at 158°F. This test shall only apply to gel-filled cables.
- When tested in accordance with FOTP-41, *"Compressive Loading Resistance of Fiber Optic Cables,"* the cable shall withstand a minimum compressive load of 125 lbf/in (220 N/cm) applied uniformly over the length of the sample. The 125 lbf/in (220 N/cm) load shall be applied at a rate of 0.1 in (2.5 mm) per minute. The load shall be maintained for a period of 1 minute. The load shall then be decreased to 63 lbf/in (110 N/cm). Alternatively, it is acceptable to remove the 125 lbf/in (220 N/cm) load entirely and apply the 63 lbf/in (110 N/cm) load within five minutes at a rate of 0.1 in (2.5 mm) per minute. The 63 lbf/in (110 N/cm) load shall be maintained for a period of 10 minutes. Attenuation measurements shall be performed before release of the 63 lbf/in (110 N/cm) load. The change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fiber.
- When tested in accordance with FOTP-104, *"Fiber Optic Cable Cyclic Flexing Test,"* the cable shall withstand 25 mechanical flexing cycles around a sheave diameter not greater than 20 times the cable diameter. The change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fiber.
- When tested in accordance with FOTP-25, *"Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies,"* except that the number of cycles shall be two at three locations along a one-meter cable length and the impact energy shall be at least 4.4 Nm (in accordance with ICEA S-87-640)", the change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fiber.

- When tested in accordance with FOTP-33, "*Fiber Optic Cable Tensile Loading and Bending Test*," using a maximum mandrel and sheave diameter of 560 mm, the cable shall withstand a rated tensile load of 600 lbf (2670N) and residual load of 30% of the rated installation load. The axial fiber strain shall \leq 60% of the fiber proof level after completion of 60-minute conditioning and while the cable is under the rated installation load. The axial fiber strain shall be \leq 20% of the fiber proof level after completion of 10 minute conditioning and while the cable is under the residual load. The change in attenuation at residual load and after load removal shall not exceed 0.15 dB at 1550 nm for single mode fiber.
- When tested in accordance with FOTP-85, "*Fiber Optic Cable Twist Test*," a length of cable no greater than 2 meters shall withstand 10 cycles of mechanical twisting. The change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fiber.
- When tested in accordance with FOTP-37, "*Low or High Temperature Bend Test for Fiber Optic Cable*," the cable shall withstand four full turns around a mandrel of s 20 times the cable diameter after conditioning for four hours at test temperatures of -30°C and +60°C. Neither the inner or outer surfaces of the jacket shall exhibit visible cracks, splits, tears, or other openings. The change in attenuation shall not exceed 0.30 dB at 1550 nm for single mode fiber.

Fiber Optic Connection Hardware. All fiber optic connection hardware (splice enclosures, organizers, cable end preparation tools etc.) and procedures shall be compatible with the fiber optic cable and shall be approved by the Engineer. Depending on the size of the fiber optic cables, two separate types of fiber optic connection hardware shall be used as follows:

Fiber Optic Connection Hardware, Type 1 shall be used when splicing fiber optic cables less than or equal to 288 fiber count. Type 1 fiber optic connection hardware setup shall include the following components:

- Splice Enclosure {TE Connectivity P/N FOSC450-D6-6-NT-0-D6V or approved equivalent) with (6) Splice Trays {TE Connectivity P/N FOSC-ACC-D-TRAY-48 or approved equivalent)

Fiber Optic Connection Hardware, Type 2 shall be used when splicing fiber optic cables greater than 288 fiber count. Type 2 fiber optic connection hardware setup shall include the following components:

- Splice Enclosure {TE Connectivity P/N FOSC600-D8-B-NT-0-D4V or approved equivalent) with (3) Splice Trays {TE Connectivity P/N FOSC-ACC-D-TRAY-RIBN-24 or approved equivalent)

Splice enclosures and splice trays shall meet the following minimum requirements as below.

Splice Enclosures. All optical fiber splices in the field shall be contained within a splice enclosure. The enclosures provide storage for splices, fiber, and buffer tubes and restores the mechanical and environmental integrity of the fiber optic cable, encases the sheath opening in the cable, and organizes and stores optical fiber. All hinges and latching devices shall be stainless steel and the enclosure shall be airtight and prevent water intrusion. The splice enclosure shall be able to accommodate pressurization and the ability to be reentered without requiring specialized tools or equipment. The enclosure shall provide fiber and splice organizers including splice trays and strain relief. The splice enclosure shall be hermetically sealed to protect internal components from environmental hazards such as moisture, insects, and UV light.

The splice enclosure shall provide space for future expansion equal to 100% of the initial utilization. Fiber optic cable penetration end caps shall be provided to accommodate a minimum installation of two trunk fiber optic cables and two fiber optic drop cables. The enclosure end caps shall be factory-drilled to the proper diameter to accept and seal the fiber optic cable entries. The cable entry locations shall be able to accommodate an assortment of cables with outside diameters ranging from 0.45 inches to 0.55 inches, plus 10%, without jeopardizing the waterproof characteristics of the enclosure. (All splice enclosures must be properly grounded as required to an accepted grounding bar or ground rod with green colored grounding wire of 4mm or #6 ground wire)

In addition, fiber optic splice enclosures shall meet the following requirements:

Mechanical
Resist compression deformation to a maximum of 400 pounds.
Withstand an impact energy to a maximum of 40 foot-pounds at 0°F.
Axial Tension: 100 pounds for 30 minutes.
Cable Torsion: ten 90-degree rotations.
Cable Flexing: ten 90-degree bends.
Environmental
Hydrostatic Pressure Head: Up to 70kPa (10 pounds per square inch).
Withstand 40 freeze/thaw temperature cycles.
Ultraviolet resistant during a maximum 30-day exposure in compliance with the requirements detailed in the ASTM B 117 standard.
Chemical
Withstand a 90-day exposure to solutions of 3% sulfuric acid, 0.2 normal of sodium hydroxide, 10% Igepal, kerosene, and be fungus resistant as required in the ASTM G21 standard.

Splice Trays. The splice trays shall be securely attached and accessible and provide sufficient storage for the fiber cable. The splice trays shall provide access to individual fibers without disrupting other fibers in the tray. The splice trays shall hold the buffer tubes rigidly in place and provide protection for fusion splices. The Contractor shall ensure that the raceway accommodates the minimum bend radius of the fiber. The splice trays shall allow visible inspection of the fiber and include a cover with a locking mechanism to hold it in place.

Cable Terminations. All fiber splicing and terminations shall be done at locations shown on the plans or as directed by the Engineer. No other splices in the field shall be allowed without written direction from the Illinois Tollway.

Fiber splicing in the field shall be done in in-ground splice enclosures specified in this document. Fiber terminations in the field cabinets shall be done as shown on the plans and as directed by the Engineer.

Fiber splicing, terminations and network connections inside plaza buildings shall be done on proposed fiber optic connector panels (Corning System Part No. CCHE-CP12-72) in the proposed local fiber connector housing (Corning System Part No. CCH-04U). The connector housing panel shall be installed in the 19" equipment racks in the plaza buildings, as shown on the plans. The Contractor shall verify and procure adequate number of connector panels in the each of the plaza buildings in the contract limits, to accommodate all the fiber splices shown on the plans.

Any new connector panels procured shall be Corning System Part No. CCHE-CP12-72 compatible with the proposed connector housing (Corning System Part No. CCH-04U).

The Contractor shall use Type SC or LC connectors only, as specified in the Plans or as directed by the Engineer. The optical connectors shall comply with the following:

- All connectors shall be factory installed LC or SC compatible connectors. Field installed connectors shall not be allowed.
- Maximum attenuation 0.4dB, typical 0.2dB.
- No more than 0.2dB increase in attenuation after 1000 insertions.
- Attenuation of all connectors will be checked and recorded at the time of installation with an insertion test minimum 5 times checked with an OTDR.
- Terminated fibers as shown on the plans shall be connectorized at each end as directed by the Engineer. Unterminated fibers shall be capped and coiled neatly in the splice tray.
- Applicable fiber strands, as shown on the plans, shall be terminated at a fiber patch panel. The contractor shall coordinate with the Engineer before any fibers are connected to Illinois Tollway network equipment. No additional terminations or splicing shall be done by the contractor without direction from the Illinois Tollway.

- Unused fibers will be protected with a plastic cap to eliminate dust and moisture.
- Termination shall be facilitated by splicing factory OEM pigtails on the end of the bare fiber utilizing the fusion splicing method. The maximum splice loss shall not be greater than 0.1 dB per event, as defined elsewhere in this document. The splice loss shall be tested at the time of splicing.
- Pigtailed shall be a minimum of (10) ten feet (3 meters) in length, unless otherwise approved by the Engineer.

All connectors shall comply with the TIA/EIA -568-A and TIA/EIA-604 standards, as applicable, and are tested according to the Telcordia/Bellcore GR326-CORE standard. When tested according to the TIA and EIA's Fiber Optic Test Procedure (FOTP)-171 (TIA/EIA-455-171), ensure that the connectors test to an average insertion loss of less than or equal to 0.4 dB.

Buffer Tube Fan-out Kits. A buffer tube fan-out kit shall be installed when fiber optic cables are terminated. The kit shall be compatible with the fiber optic cable being terminated and shall be color-coded to match the optical fiber color scheme. The buffer tube fan-out kit shall support 12 fiber strands, and the output tubing and the fiber strands contained therein shall be of sufficient length for routing and attachment of fiber optic cable to connected electronics or as directed by the Engineer. The kit and the connectors shall be supplied by the same manufacturer.

Pre-terminated Connector Assemblies (Pigtailed). Pre-terminated cable assemblies shall consist of fiber optic cables with factory-installed connectors on one end of the cable and an un terminated optical fiber on the other. The pre-terminated connector assemblies shall be installed with fusion splices. All buffer tubes and fibers shall be protected once the attachment of pre terminated connector assemblies is complete. In addition, the pigtailed shall comply with the following:

- The pigtailed shall consist of a section of single fiber, jacketed cable equipped with optical connectors at one end.
- The factory installed connector furnished as part of the pigtail shall meet or exceed the requirements for approved connectors specified herein.
- The fiber portion of each pigtail shall have optical properties identical to the optical cable furnished under the contract.

Handling, Packaging, and Quality Assurance. All cabled optical fibers shall be 100% attenuation tested. The attenuation of each fiber shall be provided with each cable reel. The cable manufacturer shall be TL 9000 registered.

Cable End Sealing. The fiber optic cable ends shall be capped or sealed to prevent the entry of moisture during shipping, handling, storage, and installation. One end of the fiber optic cable shall be equipped with flexible pulling eyes.

Protective Wrap. The fiber optic cable shall be shipped and stored with a protective wrap or other approved mechanical reel protection device over the outer turns of the fiber optic cable on each reel. The wrap shall be weather resistant and protect the cable reel from environmental hazards. The cable reel shall remain wrapped until cable is to be installed.

Packaging, Shipping & Receiving: The packaging and delivery of fiber optic cable reels shall comply with the following minimum requirements:

1. Cable is shipped on reels of marked continuous length.
2. Each cable is shipped on a separate, strongly constructed reel designed to prevent damage to the cable during shipment and installation.
3. Each reel has a minimum of 6 feet on each end of the cable available for testing.
4. All fiber optic cable reels must be inspected upon arrival to ensure NO visible signs of damage to the fiber and the fiber is continuous and free from damage.
5. No point discontinuities greater than 0.1 dB per reel.
6. The Contractor is responsible for all fiber accepted until the fiber is installed and tested and accepted by the Illinois Tollway

In addition, the manufacturer shall provide on each reel a weather resistant reel tag attached identifying the reel and cable. The reel tag shall include the following information:

- Cable Number
- Gross Weight
- Shipped Cable Length in Meters/Feet
- Job Order Number
- Product Number
- Customer Order Number
- Date Cable was Tested
- Manufacturer Order Number
- Cable Length Markings
 - Top (inside end of cable)
 - Bottom (outside end of cable)

The reel (one flange) marking shall include:

- Manufacturer
- Country of origin
- An arrow indicating proper direction of roll when handling
- Fork lift-handling illustration
- Handling Warnings.

On delivery, each cable shall be accompanied by a cable data sheet which shall include the following information:

- Manufacturer Cable Number
- Manufacturer Product Number
- Manufacturer Factory Order Number
- Customer Name
- Customer Cable Number
- Customer Purchase Order Number
- Mark for Information
- Ordered Length
- Maximum Billable Length
- Actual Shipped Length
- Measured Attenuation of Each Fiber as required by the EIA/TIA-455-61 standard
- Factory test results performed prior to shipping.

The cable shall then be OTDR tested on the reel by the Contractor to verify that no strands were damaged during shipment and the measured attenuation matches the cable data sheet.

The cable shall be capable of withstanding a minimum-bending radius of 20 times its outer diameter during installation and 10 times its outer diameter during operation without changing the characteristics of the optical fibers.

Ball Markers. Ball markers shall be installed inside of handholes containing a splice case at locations shown on the plans or as directed by the Engineer. There shall be one ball marker per handhole. The ball markers shall be 3M model number EMS Ball Marker 1401-XR, or approved equal.

CONSTRUCTION REQUIREMENTS

Experience Requirements. Personnel involved in the installation, splicing and testing of the fiber optic cables shall meet the following requirements:

- A minimum of three (3) years-experience in the installation of fiber optic cables, including fusion splicing, terminating and testing single mode fibers.
- Install two systems where fiber optic cables are outdoors in conduit and where the systems have been in continuous satisfactory operation for at least two years. The Contractor shall submit as proof, photographs or other supporting documents, and the names, addresses and telephone numbers of the operating personnel who can be contacted regarding the installed fiber optic systems.

- One fiber optic cable system (which may be one of the two in the preceding paragraph), which the Contractor can arrange for demonstration to the Illinois Tollway representatives and the Engineer, if required.

Installers shall be familiar with the cable manufacturer's recommended procedures for installing the cable. This shall include knowledge of splicing procedures for the fusion splicer being used on this project and knowledge of all hardware such as breakout (furcation) kits and splice closures. The Contractor shall submit documented procedures to the Engineer for approval and to be used during inspection.

Installation in Conduit / Raceways. Fiber shall be installed by pulling or blowing, as described below.

Pulling. Prior to installation, the Contractor shall provide a cable-pulling plan. The plan shall include the following information:

- Blowing conduit first with compressed air removes water and sediment and insures the conduit is clear of major obstructions.
- Identify where each cable will enter the underground system and the direction of each pull.
- When pulling fiber cable, the manufacturer's maximum rated pull tension must not be exceeded. Lubricant will be used for all pulls to lessen the friction from the conduit and damage to the fiber cable. If the maximum tension rating is reached the Contractor will dig that location exposing the conduit, opening the conduit making a temporary pull point coiling the fiber in a figure eight, then completing the pull to the next hand hole. The Contractor will then reseal the conduit with a split coupling sleeve/connector.
- Identify locations where the cable is pulled out of a handhole, coiled in a figure eight, and pulled back into the hand hole.
- The plan shall address the physical protection of the cable during installation and during periods of downtime.
- Identify the location of fiber slack storage locations. A minimum of 50 feet of fiber must be left neatly coiled in each handhole and a minimum of 100 feet of fiber neatly coiled in each splice point handhole or manhole
- Identify the locations of splices.
- Identify distances between fiber access points and crossings.
- Cable safety is the responsibility of the Contractor. Cones, tape and warning signs will be placed around all ground openings, handholes, and exposed fiber.

The cable-pulling plan shall be provided to the Engineer and shall be approved, prior to the start of installation. The Engineer's approval shall be for the operation on the freeway and does not include an endorsement of the proposed procedures. The Contractor is responsible for the technical adequacy of the proposed procedures.

During cable pulling operations, the Contractor shall ensure that the minimum bending of the cable is maintained during the unreeling and pulling operations. Unless specified otherwise by the fiber optic cable manufacturer, the outside bend radius of the cable during installation shall be no less than 20 times the outside diameter of the fiber optic cable. Entry guide chutes shall be used to guide the cable into the handhole conduit ports. Lubricating compound shall be used to minimize friction. Corner rollers (wheels), if used, shall not have radii less than the minimum installation-bending radius of the cable. A series array of smaller wheels can be used for accomplishing the bend if the cable manufacturers specifically approve the array.

If figure-eight techniques are used during cable installation, the cable shall be handled manually and stored on the ground. The cable shall be placed on tarps to prevent damage from gravel, rocks, or other abrasive surfaces. Tarps should also be used in muddy conditions to keep the cable clean. Enough area to accommodate the cable length to be stored and sufficient personnel to maintain the required minimum-bending diameter as well as avoid kinking or otherwise damaging the cable shall be provided. If the cable has been made into a figure-eight in preparation for a forward feed, the figure-eight must be flipped over to access the outside cable end. Sufficient personnel shall be provided to avoid kinking the cable as the figure-eight is flipped over. When removing the cable from the figure-eight, use care to avoid kinking the cable and violating the minimum-bending diameter.

Power assisted or figure-eight eliminator equipment, which is used to eliminate manual figure-eight procedures, shall not be used unless specifically allowed by the cable manufacturer in writing.

The pulling tension shall be continuously measured and shall not be allowed to exceed the maximum tension specified by the manufacturer of the cable. A dynamometer or in line tensiometer shall be used to monitor tension in the pull-line near the winch. This device must be visible to the winch operator or used to control the winch. The pulling system shall have an audible alarm that sounds whenever a pre-selected tension level is reached. Tension levels shall be recorded continuously and shall be given to the Engineer as well as included in the record drawing package.

The use of a breakaway link (swivel) shall be used to ensure that the maximum tension of the cable is not exceeded. Breakaway links that react to tension at the pulling eye shall not be used in lieu of tension measuring devices. All pulling equipment and hardware which will contact the cable during installation must maintain the cable's minimum bend radius. Equipment including sheaves, capstans, bending shoes, and quadrant blocks shall be designed for use with fiber optic cable.

The cable shall be pulled into the conduit as a single component, absorbing the pulling force in all tension elements. The central strength member and Aramid yarn shall be attached directly to the pulling eye during cable pulling. "Basket grip" type attachments, which only attach to the cable's outer jacket, shall not be permitted. A breakaway swivel, rated at 95% of the cable manufacturer's approved maximum tensile loading, shall be used on all pulls. When simultaneously pulling fiber optic cable with other cables, separate grooved rollers shall be used for each cable.

Blowing. To minimize the exposure of the backbone cable and to facilitate the longer lengths of fiber optic cable, the Contractor shall use a "blown cable" (pneumatically assisted) technique to place the fiber optic cable. Either the high airspeed blowing (HASS) method or the piston method shall be used. When using the HASS method, the volume of air passing through the conduit shall not exceed 600 cubic feet per minute or the conduit manufacturer's recommended air volume, whichever is more restrictive.

When using the piston method, the volume of air passing through the conduit shall not exceed 300 cubic feet per minute or the conduit manufacturer's recommended air volume, whichever is more restrictive. A Compressed air cooler shall be used when ambient air temperatures reach 90°F or more.

Tracer Wire. Tracer wire is required by the Illinois Tollway, as shown in the plans, a tracer wire shall be installed with the fiber optic conduit run. The tracer wire shall be a direct burial next to the fiber conduit not to exceed 3". Rated number 12 AWG solid, copper core soft drawn high strength tracer wire. The wire shall have a minimum 380-pound average tensile break strength. The wire shall have a 30 mil high density orange polyethylene (HDPE) jacket complying with ASTM-D-1248, and a 30-volt rating. The tracer wire shall be installed as per Illinois Tollway standards and supplemental standard specifications.

Connection devices used shall be as approved by the tracer wire manufacturer, except wire nuts of any type are not acceptable and shall not be used.

Fiber Optic Cable Reel Testing Requirements (Fiber Optic Incoming Inspection by Contractor). All fibers shall be tested bi-directionally at both 1310 nm and 1550 nm with both an Optical Time Domain Reflectometer (OTDR) and a power meter with an optical source. For testing, intermediate breakout fibers may be concatenated and tested end-to-end. Any discrepancies between the measured results and these specifications will be resolved to the satisfaction of the Engineer.

The Contractor shall test all fibers for continuity, events above 0.1 dB, and total attenuation of the cable. The test procedure shall be as follows:

A Certified Technician utilizing an Optical Time Domain Reflectometer (OTDR) and Optical Source/Power Meter shall conduct the installation test. The test equipment used shall have been calibrated within the year. Documentation shall be provided. The Technician is directed to conduct the test using the standard operating procedures defined by the manufacturer of the test equipment. All fibers installed shall be tested in both directions.

A fiber ring or fiber box, commonly known as a launch kit, shall be used to connect the OTDR to the fiber optic cable under test at both the launch and receive ends. The tests shall be conducted at 1310 and 1550 nm for all fibers, bi-directionally.

At the completion of the test, the Contractor shall provide copies of the documentation of the test results to the Engineer. All test results shall be provided on or the day following the test date. The Contractor shall tabulate the test results in the attached spreadsheet and submit to the Engineer and Illinois Tollway for final review and approval. Screenshots of the test results shall not be accepted. A minimum of 5 working (7 calendar) days shall be allowed for Illinois Tollway to review the test results.

Three (3) copies of the test documentation shall be submitted electronically, and shall include the following:

Cable & Fiber Identification:

- Cable ID
- Cable Location – beginning and end-point
- Fiber ID, including tube and fiber color
- Wavelength
- Date and Time
- Operator Name
- Setup Parameters
- Pulse width (OTDR)
- Refractory index (OTDR)
- Range (OTDR)
- Scale (OTDR)

Setup Option chosen to pass OTDR “deadzone”

Test Results shall include:

- OTDR Test results - Including the raw test results file and the results in a .pdf format.
- Total Fiber Trace
- Measured Length (Cable Marking)
- Total Length (OTDR)
- Optical Source/Power Meter Total Attenuation (dB/km)
- Splice Loss/Gain
- Events > 0.10 dB
- OTDR Fiber Trace Viewer Software details

Sample Power Meter Tabulation:

Power Meter Measurements (dB)									
Location		Fiber No.	Cable Length	A to B		B to A		Bidirectional Average	
A	B			1310 nm	1550 nm	1310 nm	1550 nm	1310 nm	1550 nm
		1							
		2							
		3							
Maximum Loss									
Minimum Loss									

A copy of the test equipment manufacturer's software to read the test files, OTDR and power, shall be provided to the Illinois Tollway.

The following shall be the criteria for the acceptance of the cable:

The test results shall show that the dB/km loss does not exceed +3% of the factory test or 1% of the cable's published production loss. However, no event shall exceed 0.10 dB. If any event is detected above 0.10 dB, the Contractor shall replace or repair the fiber including that event point.

The total loss of the cable (dB), less events, shall not exceed the manufacturer's production specifications as follows: 0.4 dB/km at 1310 nm and 0.3 dB/km at 1550 nm.

If the total loss exceeds these specifications, the Contractor shall replace or repair the cable run at the no additional cost to the Illinois Tollway, both labor and materials.

Construction Documentation Requirements. The contractor shall submit the following documentation.

Installation Practices for Outdoor Fiber Optic Cable Systems. The Contractor shall examine the proposed cable plant design. At least one month prior to starting installation of the fiber optic cable plant, the Contractor shall prepare, and submit electronically to the Engineer for review and approval, the Contractor's "Installation Practices for Outdoor Fiber Optic Cable Systems" manual. This manual shall address the Contractor's proposed practices covering all aspects of the fiber optic cable plant. This submittal shall include all proposed procedures, list of installation equipment, and splicing and test equipment. Test and quality control procedures shall be detailed as well as procedures for corrective action.

Operation and Maintenance Documentation. After the fiber optic cable plant has been installed, an electronic copy of the complete set of Operation and Maintenance Documentation shall be provided. The documentation shall, at a minimum, include the following:

- Complete and accurate as-built diagrams showing the entire fiber optic cable plant including locations of all splices.
- Final copies of all approved test procedures
- Complete performance data of the cable plant showing the losses at each splice location and each terminal connector.
- Complete parts list including names of vendors.

Installation Testing Requirements. The optic fiber cable shall be tested after installation and prior to any splices to the main backbone fiber. The test results shall be provided to the Engineer and the Illinois Tollways Optic Fiber Manager for review and approval.

The Engineer shall be present to witness all fiber testing. The Contractor shall submit detailed test procedures for approval by the Engineer. All fibers (terminated and un-terminated) shall be tested bi-directionally at both 1310 nm and 1550 nm with both an Optical Time Domain Reflectometer (OTDR) and a power meter with an optical source. For testing, intermediate breakout fibers may be concatenated and tested end-to-end. Any discrepancies between the measured results and these specifications will be resolved to the satisfaction of the Engineer.

Fibers which are not to be terminated shall be tested with a temporary fusion spliced pigtail fiber. **Mechanical splice or bare fiber adapters shall not be accepted.**

Upon completion of the cable installation, splicing, and termination, the Contractor shall test all fibers for continuity, events above 0.1 dB, and total attenuation of the cable. The test procedure shall be as follows:

A Certified Technician utilizing an Optical Time Domain Reflectometer (OTDR) and Optical Source/Power Meter shall conduct the installation test. The test equipment used shall have been calibrated within the year. Documentation shall be provided. The Technician is directed to conduct the test using the standard operating procedures defined by the manufacturer of the test equipment. All fibers installed shall be tested in both directions.

A fiber ring or fiber box, commonly known as a launch kit, shall be used to connect the OTDR to the fiber optic cable under test at both the launch and receive ends. The tests shall be conducted at 1310 and 1550 nm for all SMF fibers bi-directionally.

At the completion of the test, the Contractor shall provide copies of the documentation of the test results to the Engineer. All test results shall be provided on or the day following the test date. The Contractor shall tabulate the test results in a spreadsheet format and submit to the Engineer and Illinois Tollway for final review and approval. Screenshots of the test results shall not be accepted. A minimum of 5 working (7 calendar) days shall be allowed for the Illinois Tollway to review the test results.

Three (3) copies of the test documentation shall be submitted electronically, and shall include the following:

Cable & Fiber Identification:

- Cable ID
- Cable Location – beginning and end-point
- Fiber ID, including tube and fiber color
- Wavelength
- Date and Time
- Operator Name
- Setup Parameters
- Pulse width (OTDR)
- Refractory index (OTDR)
- Range (OTDR)
- Scale (OTDR)
- Setup Option chosen to pass OTDR “deadzone”

Test Results shall include:

- OTDR Test results - Including the raw test results file and the results in a .pdf format.
- Total Fiber Trace
- Measured Length (Cable Marking)
- Total Length (OTDR)
- Optical Source/Power Meter Total Attenuation (dB/km)
- Splice Loss/Gain
- Events > 0.10 dB
- OTDR Fiber Trace Viewer Software details

Sample Power Meter Tabulation:

Power Meter Measurements (dB)									
Location		Fiber No.	Cable Length	A to B		B to A		Bidirectional Average	
A	B			1310 nm	1550 nm	1310 nm	1550 nm	1310 nm	1550 nm
		1							
		2							
Maximum Loss									
Minimum Loss									

A copy of the test equipment manufacturer's software to read the test files, OTDR and power, shall be provided to the Illinois Tollway. These results shall also be provided in tabular form, see sample below:

Sample OTDR Summary				
Cable Designation:	<i>TCF-IK-03</i>	OTDR Location:	<i>Pump Sta. 67</i>	Date: <i>111/00</i>
Fiber Number	Event Type	Event Location	Event Loss (dB)	
			1310 nm	1550 nm
<i>1</i>	<i>Splice</i>	<i>23500 Ft.</i>	<i>.082</i>	<i>.078</i>
<i>1</i>	<i>Splice</i>	<i>29000 Ft.</i>	<i>.075</i>	<i>.063</i>
<i>2</i>	<i>Splice</i>	<i>29000 Ft.</i>	<i>.091</i>	<i>.082</i>
<i>3</i>	<i>Splice</i>	<i>26000 Ft.</i>	<i>.072</i>	<i>.061</i>
<i>3</i>	<i>Bend</i>	<i>27000 Ft.</i>	<i>.010</i>	<i>.009</i>

The following shall be the criteria for the acceptance of the cable:

The test results shall show that the dB/km loss does not exceed +3% of the factory test or 1% of the cable's published production loss. However, no event shall exceed 0.10 dB. If any event is detected above 0.10 dB, the Contractor shall replace or repair the fiber including that event point.

The total loss of the cable (dB), less events, shall not exceed the manufacturer's production specifications as follows: 0.4 dB/km at 1310 nm and 0.3 dB/km at 1550 nm.

If the total loss exceeds these specifications, the Contractor shall replace or repair the cable run at no additional cost to the Illinois Tollway, both labor and materials.

Splicing Requirements. All optical fiber splicing shall be performed using the fusion splicing technique, and according to the latest version of the manufacturer's cable installation procedures; industry accepted installation standards, codes, and practices; or as directed by the Engineer. A fusion splice machine shall be used to splice all optical fiber. All splicing equipment shall be cleaned and calibrated according to the manufacturer's recommendations prior to each splicing session at each location.

All splices shall match fiber and buffer tube colors unless shown otherwise in the Plans. Where a fiber cable is to be accessed for lateral or drop signal insertion, only the buffer tube containing the fiber to be accessed shall be opened and only the actual fiber to be accessed shall be cut. If a fiber end is not intended for use, the fiber shall be cut to a length equal to that of the fiber to be used and neatly laid into the splice tray. Any fibers exposed during splicing shall be treated with a protective coating and placed in a protective sleeve or housing to protect the fiber from damage or contaminants.

All splicing shall be performed as shown on the plans. All splice locations must be identified in the Record Drawings. Fusion splices shall not be paid for separately and shall be included in the cost of fiber cable installation.

The splice loss for a SMF fusion splice shall not exceed a maximum bidirectional average of 0.1 dB per splice. Any splices that exceed allowable attenuation shall be repaired or replaced at no cost to the Illinois Tollway.

Any ancillary components required to complete installation include but not limited to:

- Fiber Optic Jumpers Cables/Patch Cords
- Fiber Optic Pigtails
- Fiber Optic Fusion Splices
- Buffer Tube Fan-Out Kits
- Moisture and Water Sealants

Transfer of Ownership for Fiber Optic Facilities. The Engineer shall follow the below procedure to request for the Tollway to resume beneficial use of the active fiber and accept locating & maintenance responsibilities from the contractor.

- The Engineer shall coordinate final walkthrough within 48 hours of splice completion and shall provide as-built/red line drawings for the complete fiber optic system construction within the Contract.
- Illinois Tollway Fiber Optic Maintenance Vendor (ITFOV) shall be allowed five (5) calendar days to schedule their representative on site for walkthrough and perform required testing.
- The Engineer shall ensure the contractor resolve (if any) issues identified during the walkthrough.

The Illinois Tollway will accept ownership and maintenance responsibilities of the fiber optic cable (FOC) system at the recommendation of the ITFOV.

Slack Storage of Fiber Optic Cables. Included as a part of this item, slack fiber shall be supplied as necessary to allow splicing the fiber optic cables in a controlled environment, such as a splicing van or tent. After splicing has been completed, the slack fiber shall be stored underground in handholes in accordance with the fiber optic cable manufacturer's guidelines. Fiber optic cable slack shall be 100 feet for each cable at each splice location. Fiber optic cable slack shall be 50 feet for each cable at access points where splicing is not involved. If the inner duct is cut, the ends of the inner duct should extend beyond the first vertical rack so they can be secured at that point. This slack shall be measured for payment.

Fiber optic cable shall be tagged inside handholes as per the "Illinois Tollway ITS Labeling Guidelines" manual. The manual is available on the Illinois Tollway website.

Method of Measurement. Fiber optic cable will be measured for payment in feet in place installed and tested. Fiber optic cable will be measured horizontally and vertically between the changes in direction, including slack cable. The entire lengths of cables installed in buildings will be measured for payment. Fusion splices will not be measured for payment.

Fiber optic connection hardware will be measured for payment per each.

Basis of Payment. This work will be paid for at the contract unit price per lineal foot for FIBER OPTIC CABLE, SINGLE MODE, ARMORED or AERIAL fiber of the type, size, and number of fibers specified, installed, tested and accepted by the Illinois Tollway. Fusion splices will not be paid for separately and will be included in the cost of fiber cable installation. Payment will not be made until the cable is installed, spliced, tested and accepted by the Illinois Tollway in compliance with these special provisions.

Fiber optic connection hardware will be paid for at the contract unit price each for FIBER OPTIC CONNECTION HARDWARE, TYPE1 and FIBER OPTIC CONNECTION HARDWARE, TYPE 2 which will include all work described herein.

NETWORK EQUIPMENT (ILLINOIS TOLLWAY)

Effective: March 1, 2021

Description. This work shall consist of furnishing, installing, and testing IT network equipment, coordinating with the Engineer and the Tollway personnel to configure/provision the network equipment, installation of provisioned network equipment in the plaza buildings and providing integration support, per the contract plans and as directed by the Engineer, as part of a fully functional communication network node.

Network equipment connection and integration into the Tollway IT fiber optic network will be done by others.

The work under this special provision shall be performed at the proposed toll plaza location within the contract limits, listed below:

- Plaza 31

Materials. The Contractor shall procure the following network equipment configurations. No substitutions shall be allowed unless it is approved, in writing, by the Tollway. Installation of these network configurations in the plaza building noted herein, shall be as shown on the plans.

NETWORK EQUIPMENT, TYPE 1				
Item No.	Vendor	Model No.	Item Description	Quantity
1	CISCO	C9300-48U-A	Catalyst 9300 48-port modular uplinks, UPOE, Network Advantage	1
2	CISCO	C9300-DNA-A-48-5Y	C9300 Cisco DNA Advantage, 48-port, 5 Year Term license	1
3	CISCO	S9300UK9-1612	Cisco Catalyst 9300 XE 16.12 UNIVERSAL	1
4	CISCO	PWR-C1-1100WAC-P	1100W AC 80+ platinum Config 1 Power Supply	1
5	CISCO	PWR-C1-1100WAC-P/2	1100W AC 80+ platinum Config 1 Secondary Power Supply	1
6	CISCO	C9300-NM-8X	Catalyst 9300 8 x 10GE Network Module	1
7	CISCO	CAB-TA-NA	North America AC Type A Power Cable	2
8	CISCO	STACK-T1-50CM	StackWise-480 50cm Stacking Cable	1
9	CISCO	CAB-SPWR-30CM	Catalyst 3850 StackPower Cable 30cm	1
10	CISCO	CON-SNT-C93004UA	SNTC-8X5XNBD Cisco Catalyst 9300 48 Port (Extended service agreement)	1

NETWORK EQUIPMENT, TYPE 2				
Item No.	Vendor	Model No.	Item Description	Quantity
1	CISCO	C9300-24U-A	Catalyst 9300 24-port modular uplinks, UPOE, Network Advantage	1
2	CISCO	C9300-DNA-A-24-5Y	C9300 Cisco DNA Advantage, 24-port, 5 Year Term license	1
3	CISCO	S9300UK9-1612	Cisco Catalyst 9300 XE 16.12 UNIVERSAL	1
4	CISCO	PWR-C1-1100WAC-P	1100W AC 80+ platinum Config 1 Power Supply	1
5	CISCO	PWR-C1-1100WAC-P/2	1100W AC 80+ platinum Config 1 Secondary Power Supply	1
6	CISCO	C9300-NM-8X	Catalyst 9300 8 x 10GE Network Module	1
7	CISCO	CAB-TA-NA	North America AC Type A Power Cable	2
8	CISCO	STACK-T1-50CM	StackWise-480 50cm Stacking Cable	1
9	CISCO	CAB-SPWR-30CM	Catalyst 3850 StackPower Cable 30cm	1
10	CISCO	CON-SNT-C93002UA	SNTC-8X5XNBD Cisco Catalyst 9300 24 Port (Extended service agreement)	1

The Contractor shall procure the following single mode fiber optic duplex jumpers for network equipment connections and provide them to the Engineer. No substitutions shall be allowed unless it is approved, in writing, by the Tollway. No network equipment connections shall be performed by the Contractor.

FIBER OPTIC CONNECTOR, SC-LC, SINGLE MODE DUPLEX		
Vendor	Model No.	Item Description
CORNING	047202R5Z20002M	SC-LC DUPLEX, Single Mode Fiber Optic Jumper, 2M

The Contractor shall procure the following types of single mode fiber optic transceivers to connect the network equipment to the Tollway fiber trunk cables. The Contractor shall be responsible for the safekeeping of all the fiber optic transceivers, till the time they are installed in the network switches, as noted on the plans. No substitutions shall be allowed unless it is approved, in writing, by the Tollway.

FIBER OPTIC TRANSCEIVER, TYPE 1		
Vendor	Model No.	Item Description
CISCO	GLC-LH-SMD=	1000BASE-LX/LH SFP transceiver module, MMF/SMF, 1310nm, DOM

FIBER OPTIC TRANSCEIVER, TYPE 2		
Vendor	Model No.	Item Description
CISCO	SFP-10G-LR=	10GBASE-LR SFP Module

CONSTRUCTION REQUIREMENTS

The Contractor shall closely coordinate with the Engineer for notifying Tollway personnel and installation of the network equipment in the plaza buildings noted herein. This includes, but is not limited to, the following:

Pre-Procurement Meeting and Documentation Approval

- The Contractor shall submit for approval to the Engineer, within 10 business days from NTP, a detailed schedule showing dates for: product submittals and approvals; network equipment provisioning and configuration by the Illinois Tollway; construction/installation; warranty of each network equipment configuration and fiber optic transceiver type. This detailed schedule shall be included in the project schedule, as required per Illinois Tollway Supplemental Specifications Article 108.02.
- Schedules for each network equipment to be deployed within the larger construction contract and shall be staggered based on resources to be employed.
- The Contractor shall make all submissions to the Engineer through the Illinois Tollway Web Based Program Management (WBPM).
- The Contractor must obtain approval of the schedule, catalog cut sheets and equipment installation details from the Engineer prior to purchasing any equipment and subsequently performing the installation per the approved documents, contract plans, and specifications.
- All software, licensing and support agreements shall be registered with the Illinois Tollway.

Pre-Installation Requirements

- The Contractor shall notify the Engineer fourteen (14) days prior to ordering the specified network equipment and other material specified herein.
- Thirty (30) days prior to the scheduled field installation of network equipment, the Contractor shall notify the Engineer of the anticipated delivery date of any network equipment to the Illinois Tollway Central Administration (CA) Building for configuration/provisioning and attaching a Illinois Tollway Property Tag (asset control M label) prior to installation by the Contractor, the IT unit and inventory administrator.
 - The Contractor shall provide a form to the Engineer during acceptance of the equipment at CA showing the equipment, each equipment specific serial number, and the field location of each piece of equipment. This form will be signed by both the Engineer and the Contractor.
 - The Illinois Tollway shall have a minimum of 10 business days to configure/provision the network equipment.
 - The Contractor shall take possession of the devices from the Illinois Tollway upon notification by the Engineer of configuration/provisioning completion and attachment of the Illinois Tollway Property tag.

Network Equipment Installation

- The Contractor shall install the network equipment in the equipment racks inside the plaza buildings, as noted on the plans or as per the manufacturer's recommendations.
- The Contractor shall install the fiber optic transceivers in the network equipment and leave them capped, as shown on the plans. All connections to the Tollway fiber optic trunk cables shall be done by Tollway.
- The Contractor shall provide the single mode fiber optic jumpers to the Tollway for final network equipment connections, as specified herein.
- The Contractor shall follow the Illinois Tollway ITS Labeling Guide for all labeling of components. The manual can be found on the Illinois Tollway's main website.

Testing. The following tests are required to be performed by the Contractor after the installation of the IT network equipment in the plaza buildings.

- Site Test

Site Testing. The purpose of the Site Test is to have the Contractor demonstrate to the Engineer that all network equipment and related components, configured/provisioned by Tollway, have been installed and labeled correctly as per contract plans and as per the manufacturer's requirements, utilizing quality workmanship before being connected to the Illinois Tollway switch and communications system.

All final connections to the network equipment shall be done by Tollway personnel.

For the Site Test to be accepted, the Contractor shall demonstrate to the Engineer that:

- The installation has been performed as per contract plans and as per the manufacturer's recommendations.
- All connections are tight and cannot be dislodged by incidental contact.
- All network equipment and components have been properly labeled as per the Illinois Tollway ITS Labeling Guide (located on the Illinois Tollway website).

System tests and Final Acceptance tests after the installation of the network equipment shall be performed by the Tollway. If any network equipment or component, noted herein, is deemed defective or fails the system test, the Contractor shall replace the item(s) at no additional cost to the Tollway, as specified.

For the IT network, the Tollway shall be responsible for integrating the network equipment into the Tollway communication network and establish communication to the equipment over the fiber optic backbone. The Contractor's representative shall be available on-site during the integration work.

Warranty. All network equipment and related components shall be warranted and guaranteed against defects and/or failure in design, materials and workmanship for a minimum of one (1) year from the date of Final System Acceptance, as recorded by the Engineer. The Contractor shall submit the warranty terms as part of the shop drawing submittal for each material item.

The warranty shall provide that, in the event of a malfunction during the warranty period, the defective system component shall be replaced with a new component by the manufacturer or his/her representative within five (5) business days.

Any component that, in the opinion of the Engineer, fails three (3) times prior to the expiration of the warranty will be judged as unsuitable and shall be replaced by the device manufacturer or representative with a new component of the same type at no additional cost to the Illinois Tollway. The unsuitable component shall be permanently removed from the project. A failure shall also be defined as the field device becoming unable to comply with all applicable standards.

Any repairs made by the device manufacturer or representative shall be documented and that documentation shall be returned with the warranty repaired units. This documentation shall include an explanation of the exact repairs made and identification of parts replaced by part number and circuit number.

The warranty period shall not begin until the date that the Illinois Tollway issues final acceptance to the project, as recorded by the Engineer.

Method of Measurement. The work for NETWORK EQUIPMENT will be measured in units of each.

The work for FIBER OPTIC TRANSCEIVER will be measured in units of each.

The work for FIBER OPTIC CONNECTOR, SC-LC, SINGLE MODE DUPLEX will be measured in units of each.

Basis of Payment. This work will be paid for at the contract unit price per each for network equipment of the type noted, as shown in the plans.

This work will be paid for at the contract unit price per each for fiber optic transceiver of the type noted, as shown in the plans.

Fiber optic connectors will be paid for at the contract unit price per each for fiber optic connector, SC-LC, single mode duplex, as shown on the plans.

The payment to the Contractor will adhere to the following schedule:

Twenty percent (20%) of the contract unit price will be paid upon receipt of submission and approval of all product submittal documentation and shop drawings.

Eighty percent (80%) of the contract unit price will be paid at completion of the installation of the provisioned IT network equipment at the plaza locations, as shown on the plans, and accepted by the Engineer. Written (via WBPM) approval from the Engineer that all local site tests have been accepted is required before payment is released.

SUBGRADE AGGREGATE (ILLINOIS TOLLWAY)

Effective: October 29, 2012

Revised: April 6, 2022

Description. This work shall consist of furnishing, transporting, placing, compacting and finishing an aggregate subgrade on the finished subgrade in accordance with this special provision and to the lines, dimensions, and cross sections shown on the Plans, and as required by the Engineer. Subgrade aggregate consists of porous granular embankment (PGE) aggregate and a dense graded capping aggregate. The specified thickness of subgrade aggregate will include 3-inches of capping aggregate on the top (thickness varies under shoulders) and PGE below the capping aggregate to the specified depth.

Materials. The materials used for SUBGRADE AGGREGATE shall consist of the following:

If recycled aggregate is used for this application, work shall be in accordance with the Illinois Tollway Special Provision for Production of Recycled Aggregate, including completion of the Illinois Tollway A-60 Form “Material Management Plan for Production of Recycled Aggregate”.

Porous Granular Embankment (PGE)

The coarse aggregate for PGE shall be crushed stone, crushed blast furnace slag, crushed gravel, or crushed concrete. Crushed concrete shall have no more than 5% RAP. Virgin steel slag aggregates and other expansive materials as determined through testing by the Illinois Tollway will not be permitted. The coarse aggregate for PGE shall consist of sound durable particles with no more than 5% deleterious material as per Illinois Test Procedure (ITP) 203 in the IDOT Manual of Aggregate Quality Test Procedures.

Gradation testing of PGE shall follow Tollway Testing Procedure (TTP) 003 in the Illinois Tollway Manual of Modified Test Procedures. When the coarse aggregate for PGE thickness is nine inches or greater, the coarse aggregate gradation shall be as follows:

<u>Sieve Size</u>	<u>Percent Passing</u>
8 inches	100
6 inches	97±3
4 inches	90±10
2 inches	45±15
#4	15±15
#200	4±4

When the coarse aggregate for PGE thickness is less than nine inches, the coarse aggregate gradation shall be as follows:

<u>Sieve Size</u>	<u>Percent Passing</u>
5 inches	100
4 inches	85±15
2 inches	45±15
#4	15±15
#200	4±4

Capping Aggregate

The coarse aggregate for the 3-inch lift of capping aggregate shall consist of sound durable particles with less than 5% deleterious material (as per ITP 203) with a gradation of CA-6 for processed material from an approved source with the Contractor having the option to use screened RAP from an approved source. Virgin steel slag aggregates and other expansive materials as determined through testing by the Illinois Tollway will not be permitted.

The RAP shall have less than 10% concrete content and shall meet the following requirements. Gradations may be performed dry, without the need for washing per ASTM C 136.

- 1) The material shall have 100% passing the 1.5-inch sieve and be well graded down through fines.
- 2) The material shall be determined as well graded by calculating the Coefficient of Uniformity (Cu) and Coefficient of Curvature (Cc) per ASTM D2487, with required Cu ≥ 4.0 , and Cc ≥ 1.0 and ≤ 3.0 .

CONSTRUCTION REQUIREMENTS

The SUBGRADE AGGREGATE shall be placed in two layers. The top layer shall consist of a 3-inch variable nominal thickness top lift of capping. The thickness of the capping aggregate under asphalt shoulders will vary as a result of shoulder pavement thicknesses and shoulder surface or shoulder subgrade slope requirements as shown on the Plans. The maximum lift thickness of the capping aggregate shall be 4 inches. If used as the capping aggregate, the RAP shall be separated and stockpiled before use. The bottom lift shall consist of the PGE material, with minimum thickness being the total thickness for the specified SUBGRADE AGGREGATE item minus the 3-inch lift of capping aggregate. Maximum lift thickness of the PGE shall be 12 inches. A vibratory roller meeting the requirements of Article 1101.01(g) of the Standard Specifications shall be used to roll each lift of material to obtain the desired keying or interlock and necessary compaction. The Engineer will verify that adequate keying has been obtained.

The capping aggregate shall be installed as soon as possible and within seven days of PGE placement. Material removed during underdrain installation shall not be incorporated into the work as subgrade aggregate.

If CA-6 is used as capping aggregate, placement and compaction of the capping aggregate shall be in accordance with Article 311.05(a) of the Standard Specifications. If RAP is used as capping aggregate, the capping aggregate shall be tested and controlled for compaction using the percent growth curve method as defined below.

The Contractor shall perform a growth curve at the beginning of placement of the capping aggregate. If the aggregate or base condition changes, the Engineer reserves the right to request an additional growth curve and supporting tests at no additional cost to the Illinois Tollway.

Compaction of the growth curve shall commence immediately after the course is placed. The growth curve, consisting of a plot of lbs./cu ft. vs. number of passes with the project vibratory roller, shall be developed. This curve shall be established by use of a nuclear gauge. Tests shall be taken after each pass until the highest lbs./cu ft. is obtained. A new growth curve is required if the breakdown roller used on the growth curve is replaced with a new roller during production.

The Contractor will establish a target density for its Quality Control nuclear gauge from the growth curve location. The target density 95%-102% shall apply only to the specific QC gauge used. If additional QC gauges are to be used to determine density specification compliance, the Contractor shall establish a unique minimum allowable target density from the growth curve location for each gauge. Quality Assurance will test a minimum of 20% of QC required testing frequency.

All lifts shall be compacted to an average density of not less than 95 percent nor greater than 102 percent of the target density obtained on the growth curve. The average density shall be based on tests representing one day's production.

Quality Control density tests shall be performed at randomly selected locations within ¼ mile intervals. In no case shall more than one half day's production be completed without density testing being performed.

If the Contractor is not controlling the compaction process and is making no effort to take corrective action, the operation shall stop as directed by the Engineer.

After fine grading or trimming of the capping aggregate, the Contractor shall perform a final proof roll to be witnessed and approved by the Engineer to verify the stability of the subgrade aggregate.

Method of Measurement. This work will be measured for payment in cubic yards, of the thickness specified.

Basis of Payment. This work will be paid at the contract unit price per cubic yard for SUBGRADE AGGREGATE of the thickness specified.

SEEDING, CLASS 2E SALT TOLERANT ROADSIDE MIX (SPECIAL)

Description. The work shall consist of preparing the seed bed, transporting, furnishing and placing the seed and other materials required in seeding operations on shoulders, slopes, and other locations, as shown on the plans, or as directed by the Engineer. This work shall be performed in accordance with Section 250 of the Standard Specifications except as herein modified.

Add the following to Article 250.06 (a) (5) Bare Earth Seeding:

“Contractor shall make a minimum of 2 passes in opposite directions when mechanically seeding to ensure even coverage.

Broadcast seeding will be allowed as approved by the Engineer and/or on slopes steeper than 1:3 (V: H) or in inaccessible areas. When broadcast seeders are used, the individual seeds comprising the seeding mixture shall be sown separately or in similar size groupings unless otherwise approved by the Engineer.

Immediately after seed is sown, Erosion Control Blanket shall be installed in accordance with Section 251 of the Standard Specifications.”

Add the following to Table 1 of Article 250.07 Seed Mixtures:

Class-Type = Seeding, Class 2E Salt Tolerant Roadside Mix (Special)

SEEDING, CLASS 2E SALT TOLERANT ROADSIDE MIX (SPECIAL)

<u>Botanical Name</u>	<u>Common Name</u>	<u>lb/acre</u>
<i>Festuca arundinacea</i> 'Falcon IV'	Falcon IV Tall Fescue	40.0
<i>Festuca arundinacea</i> 'Inferno'	Inferno Tall FescueE	20.0
<i>Festuca arundinacea</i> 'Titan Ltd.'	Titan Ltd. Tall FescueE	20.0
<i>Festuca rubra</i> 'Aruba'	Aruba Creeping Red Fescue	20.0
<i>Festuca rubra</i> 'Audobon'	Audobon Creeping Red Fescue	30.0
<i>Festuca tricophylla</i> 'Reliant 4'	Reliant 4 Haed Fescue	40.0
<i>Lolium perenne</i> 'Goalkeeper 2'	Goalkeeper 2 Perennial Rye	50.0
<i>Puccinellia distans</i> 'Fulfs' or 'Salty'	Fulfs Distans Alkaligrass	60.0
	Total	280.0

Seeding time shall be between April 1st and June 15th or August 1st and November 1st.

If substitutions are requested for any Tall Fescue (*Festuca spp.*) varieties or Perennial Ryegrass (*Lolium perenne*) varieties due to lack of availability at time of procurement, the Contractor shall submit validation that the alternate seed varieties are within the same species, hardy selections for the site conditions, and have greater than 90% viable endophytic levels, for approval by the Engineer.”

Method of Measurement. This work shall be measured for payment in acres of SEEDING, CLASS 2E SALT TOLERANT ROADSIDE MIX (SPECIAL).

Basis of Payment. This work will be paid for at the contract unit price per acre for SEEDING, CLASS 2E SALT TOLERANT ROADSIDE MIX (SPECIAL).

SEEDING, CLASS 4F NATIVE GRASS, LOW PROFILE MIX (SPECIAL)

Description. The work shall consist of preparing the seed bed, transporting, furnishing and placing the seed and other materials required in seeding operations on slopes and other areas, as shown on the plans, or as directed by the Engineer. This work shall be performed in accordance with Section 250 of the Standard Specifications except as herein modified.

Add the following to Article 250.06 (a) (6) Bare Earth Seeding:

Seeding, Class 4F Native Grass, Low Profile Mix (Special) shall be sown with a rangeland type grass drill.

Seeding, Class 4F Native Grass, Low Profile Mix (Special) shall include >90% Pure Live Seed (PLS).

Seeding, Class 4F Native Grass, Low Profile Mix (Special) shall be combined with compatible endomycorrhizal inoculants such as AM 120 Mycorrhizal Inoculum (or comparable). The inoculants shall contain a diverse mixture of glomales fungal species (Glomus spp.) in pelletized form. Applicable rate shall be 40 lbs per acre.

Contractor shall make a minimum of 2 passes in opposite directions when drill seeding to ensure even coverage.

Immediately after seed is sown, Erosion Control Blanket shall be installed in accordance with Section 251 of the Standard Specifications.

Add the following to Table 1 of Article 250.07 Seed Mixtures:

Class-Type = Seeding, Class 4F Native Grass, Low Profile Mix (Special)

SEEDING, CLASS 4F NATIVE GRASS, LOW PROFILE MIX (SPECIAL)

<i>Botanical Name</i>	<i>Common Name</i>	<i>lb/acre</i>
<i>Agropyron trachycaulum</i>	<i>Slender Wheat Grass</i>	5.0
<i>Bouteloua curtipendula</i>	<i>Side-Oats Grama</i>	10.0
<i>Elymus Canadensis</i>	<i>Canada Wild Rye</i>	2.0
<i>Koeleria macrantha</i>	<i>June Grass</i>	1.0
<i>Schizachyrium scoparium</i>	<i>Little Bluestem</i>	15.0
<i>Chasmanthium latifolium</i>	<i>Northern Sea Oats</i>	2.0
<i>Lolium perenne 'Goalkeeper 2'</i>	<i>Goalkeeper 2 Perennial Rye</i>	15.0
	<i>Grass Subtotal</i>	50.0
<i>Lolium multiflorum</i>	<i>ANNUAL RYEGRASS (Cover Crop)</i>	40.0
	<i>Cover Subtotal</i>	40.0
	<i>Total</i>	90.0

Seeding time shall be between May 1st to June 15th and September 15th to November 1st.

Method of Measurement. This work shall be measured for payment in acres of SEEDING, CLASS 4F NATIVE GRASS, LOW PROFILE MIX (SPECIAL).

Basis of Payment. This work will be paid for at the contract unit price per acre for SEEDING, CLASS 4F NATIVE GRASS, LOW PROFILE MIX (SPECIAL).

GRANULAR SUBBASE, SPECIAL (ILLINOIS TOLLWAY)

Effective: April 2, 2012

Revised: April 6, 2022

Description. This work shall consist of furnishing, transporting, placing, compacting and finishing granular subbase aggregate materials on the finished soil subgrade as shown on the plans and be performed as in accordance with Section 311 of the Standard Specifications, except as modified herein, or as directed by the Engineer.

Materials. Replace Article 1004.04 of the Standard Specifications with the following:

The aggregate for Granular Subbase, Special shall consist of sound durable particles with less than 5% deleterious material (as per Illinois Test Procedure 203 in the IDOT Manual of Aggregate Quality Test Procedures) with a gradation of CA-6 for processed material from an approved source with the Contractor having the option to use screened Reclaimed Asphalt Pavement (RAP) from an approved source. Virgin steel slag aggregates and other expansive materials as determined through testing by the Illinois Tollway will not be permitted.

The RAP shall have less than 10% concrete content and shall meet the following requirements. Gradations may be performed dry, without the need for washing per ASTM C 136.

- 1) The material shall have 100% passing the 1.5-inch sieve and be well graded down through fines.
- 2) The material shall be determined as well graded by calculating the Coefficient of Uniformity (Cu) and Coefficient of Curvature (Cc) per ASTM D2487, with required Cu ≥ 4.0 , and Cc ≥ 1.0 and ≤ 3.0 .

If recycled aggregate is used for this application, work shall be in accordance with the Illinois Tollway Special Provision for Production of Recycled Aggregate, including completion of the Illinois Tollway A-60 Form "Material Management Plan for Production of Recycled Aggregate."

CONSTRUCTION REQUIREMENTS

Subgrade preparation, subbase placement and compaction, and finishing shall be in accordance with Articles 311.04 through 311.07 of the Standard Specifications except as follows:

Placement and compaction of Granular Subbase, Special shall be in accordance with Article 311.05(a) of the Standard Specifications. If RAP is used as Granular Subbase Special, the aggregate shall be tested and controlled for compaction using the percent growth curve method as defined below.

The Contractor shall perform a growth curve at the beginning of placement. If the aggregate or base conditions change, the Engineer reserves the right to request an additional growth curve and supporting tests at no additional cost to the Illinois Tollway.

Compaction of the growth curve shall commence immediately after the course is placed. The growth curve, consisting of a plot of lb/cu ft vs. number of passes with the project vibratory roller, shall be developed. This curve shall be established by use of a nuclear gauge. Tests shall be taken after each pass until the highest lb/cu ft is obtained. A new growth curve is required if the breakdown roller used on the growth curve is replaced with a new roller during production.

The Contractor will establish a target density for its Quality Control nuclear gauge from the growth curve location. The target density 95-102% shall apply only to the specific QC gauge used. If additional QC gauges are to be used to determine density specification compliance, the Contractor shall establish a unique minimum allowable target density from the growth curve location for each gauge. Quality Assurance will test a minimum of 20% of QC required testing frequency.

All lifts shall be compacted to an average density of not less than 95 percent nor greater than 102 percent of the target density obtained on the growth curve. The average density shall be based on tests representing one day's production.

Quality Control density tests shall be performed at a minimum of one randomly selected location within one half day's production intervals.

If the Contractor is not controlling the compaction process and is making no effort to take corrective action, the operation shall stop as directed by the Engineer.

Method of Measurement. This work will be measured and computed in cubic yards from cross-sections taken before and after placement of the material.

Basis of Payment. This work will be paid at the contract unit price per cubic yard for GRANULAR SUBBASE, SPECIAL.

DIAMOND GRINDING FOR CONTINUOUSLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT AND SHOULDER (SPECIAL) (ILLINOIS TOLLWAY)

Effective: October 23, 2023

Description. This work shall consist of diamond grinding of continuously reinforced portland cement concrete pavement and shoulder (special) and up to 15 ft. of adjacent pavement as shown in the plans to establish adequate skid resistance and smoothness. The diamond grinding shall occur before any loop installation in the tolling zone.

Equipment. Equipment shall be according to the following.

- (a) Diamond Grinder. The grinding device shall be a self-propelled machine with multiple diamond saw blades. Diamond blades or diamond impregnated cylinder rings must be mounted on an arbor head that is a minimum of 4 ft. wide and the diamond saw blades shall be gang mounted on the grinding head at a rate of 50 to 60 blades per foot. The device must be capable of grinding the surface in the longitudinal direction without causing spalling or other damage at cracks, joints and other locations. Excessive ravels, aggregate fractures, spalls, or disturbance of the transverse and/or longitudinal joints will not be permitted. The device must be capable of correcting the pavement profile and providing proper transverse cross slope. The device must be configured such that it does not encroach on traffic movement outside of the work area in adjacent lanes.

The equipment shall have a positive means of vacuuming the grinding residue from the pavement surface, leaving the surface in a clean, near-dry condition. The slurry shall be disposed of according to Article 202.03.

CONSTRUCTION REQUIREMENTS

After all components have cured, the pavement and shoulder shall be ground over its entire length and width in a longitudinal direction. Each longitudinal grinding pass shall be a nominal 1/4 in. When the pavement thickness noted on the plans can be maintained, as a minimum, additional removal thickness may be permitted.

The grinding process shall produce a surface that is true to grade and uniform in appearance with longitudinal line-type texture. The line-type texture shall contain corrugations parallel to the outside pavement edge and present a narrow ridge corduroy type appearance. The peaks of the ridges shall be 1/8 in. +/- 1/16 in. higher than the bottom of the grinding with evenly spaced ridges. The vertical difference between longitudinal passes shall be 1/8 in. maximum. The grinding in the adjacent pavement shall be diminished uniformly to zero.

Grinding shall be continuous through all joints. All expansion joints shall be protected from damage or contact with the grinding slurry.

In order to match the outside edge of the pavement, adjacent paved areas, including but not limited to shoulders, curb and gutter, tapers, etc., shall be ground to minimize vertical projections.

Method of Measurement. This work will be measured for payment in place and the area computed in square yards of diamond grinding performed.

Basis of Payment. This work will be paid for at the contract unit price per square yard for DIAMOND GRINDING FOR CONTINUOUSLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT AND SHOULDER (SPECIAL).

CONTINUOUSLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT AND SHOULDER (SPECIAL) (ILLINOIS TOLLWAY)

Effective: February 8, 2012

Revised: March 1, 2023

Description. This work shall consist of constructing a continuously reinforced portland cement concrete (CRC) pavement on a prepared subgrade or subbase in accordance with Sections 420 and 421 of the Standard Specifications, as shown in the plans, or through other referenced contract special provisions except as modified herein. This Special Provision is pertinent to only the portions of CRC pavement and shoulder located at Open Road Tolling (ORT) plazas.

Materials. Materials shall be according to Article 420.02 of the Standard Specifications, except as modified herein:

Replace Article 420.02(a) of the Standard Specifications with the following:

Concrete supplied for the concrete pavement and shoulder under this special provision will be an Illinois Tollway Class TL mix designed in accordance with the Illinois Tollway Special Provision for Portland Cement Concrete.

Equipment. Equipment shall be according to Article 420.03 of the Standard Specifications.

CONSTRUCTION REQUIREMENTS

Continuously reinforced concrete pavement shall be constructed according to Articles 420.04 through 420.18 of the Standard Specifications and the following.

- (a) Reinforcement. The pavement reinforcement shall be constructed according to Articles 508.03 through 508.09. The placement tolerance for individual reinforcement bars shall be ± 0.5 inch vertically and ± 1.0 inch horizontally. Reinforcement supplied for the pavement shall be according to the Illinois Tollway Special Provision for Reinforcement Bars.
- (b) Joints. The longitudinal and transverse joints shall be constructed as specified in the contract according to Article 420.05 with the following exceptions.

- (1) Longitudinal Sawed Joints. The tie bars in longitudinal sawed joints shall be positioned on the prepared subbase prior to concrete placement and shall either be supported on approved assemblies or securely tied to the underside of the longitudinal bars of the pavement reinforcement.
- (2) Transverse Construction Joints. Transverse construction joints shall be made at the end of each day or when an interruption in the concreting operation of 30 minutes or more occurs, provided the length of pavement laid from the last joint is 12 ft or more and the distance from the construction joint to the nearest bar-lap is at least 3 1/2 ft.

The transverse construction joint shall be formed by means of a suitable split header board conforming to the cross section of the pavement, accurately set and securely held in place in a plane perpendicular to the surface of the pavement. The pavement reinforcement bars shall extend continuously through the split in the header board and shall be supported beyond the joint by steel chair supports. The header board shall be kept clean without oil. Excess mortar material accumulated at the front of the paver shall be wasted and not incorporated into the pavement at the joint. Before paving operations are resumed, the header board shall be removed, any concrete or mortar that may have leaked through the holes or split in the header shall be chipped from the face of the joint and removed, all surplus concrete on the subgrade or subbase shall be cleared away, and any irregularities in the subgrade or subbase shall be corrected. The fresh concrete shall be deposited directly against the old and shall be consolidated with a hand vibrator inserted into the concrete and worked along the entire length of the joint. Transverse construction joints shall not be edged or sealed.

The pavement areas adjacent to both sides of a transverse construction joint shall receive additional consolidation from hand vibrators inserted into the concrete and the surface shall be refinished. These areas shall extend at least 10 ft from the joint.

- (c) Final Finish. Type B final finish shall be used in accordance with Article 420.09 (e)(2). The pavement shall not be tined. The pavement shall be diamond ground for smoothness and skid resistance in accordance the Tollway Special Provision for Diamond Grinding for Continuously Reinforced Portland Cement Concrete Pavement and Shoulder (Special). The diamond grinding shall occur before any loop installation in the tolling zone. Loops shall not be cut into the pavement until 7 days after concrete placement.

Remove Article 420.10 of the Standard Specifications.

Replace Article 420.13 of the Standard Specifications with the following:

420.13 Opening to Traffic. The concrete pavement shall not be opened to construction vehicles meeting legal axle weights (legal loads) until an in-place compressive strength of a minimum of 2,500 psi as determined by Illinois Tollway Test Procedure (TTP) 014 Estimating Concrete Strength by Maturity. The wheels of any construction vehicle shall not travel within 1 foot of any free edge of the pavement until a minimum of 3,000 psi as determined by TTP 014.

The concrete pavement shall not be opened to public traffic until an in-place compressive strength of a minimum of 3,500 psi as determined by TTP 014 or until a minimum compressive strength of 3,500 psi as tested in accordance with Illinois Modified AASHTO T 22 and 7 days after placement.

TTP 014 shall not be used in place of random sampling requirements for strength acceptance. Compressive strength for ultimate strength acceptance shall be a minimum of 3,500 psi at 7 days and tested in accordance with Illinois Modified AASHTO T 22. Test cylinders shall be made and cured in accordance with Illinois Modified AASHTO T 23. Strength shall be defined as the average of two 6 x 12 in. cylinder breaks.”

Method of Measurement. This work will be measured for payment as follows.

- (a) Contract Quantities. The requirements for the use of contract quantities shall conform to Article 202.07(a).
- (b) Measured Quantities. Continuously reinforced portland cement concrete pavement will be measured for payment in place and the area computed in square yards. The width will be the width of pavement as shown on the plans.

Reinforcement bars will be measured for payment in square yards. The quantity of reinforcement bars will be the computed square yards of surface area of the pavement in which the pavement reinforcement is installed.

Protective coat 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 CONTINUOUSLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT AND SHOULDER (SPECIAL) of the thickness specified.

Reinforcement bars will be paid for at the contract unit price per square yard for PAVEMENT REINFORCEMENT of the pavement thickness specified.

PROTECTIVE COAT will be paid for at the contract unit price per square yard for PROTECTIVE COAT

SLEEPER SLAB (ILLINOIS TOLLWAY)

Effective: February 12, 2020

Description. This work shall consist of constructing a 10 inch thick, load-bearing concrete slab with reinforcement at the locations specified in the plans in accordance with the details shown in the plans and the requirements described herein.

Materials. Materials shall be according to the following.

<u>Item</u>	<u>Article/Section</u>
(a) Portland Cement Concrete	1020
(b) Reinforcement Bars	1006.10

Polyethylene sheeting shall be in accordance with ASTM Standard Specification D4801 - 08.

The Sleeper Slab shall be constructed of Class PV or Class SI concrete.

CONSTRUCTION REQUIREMENTS

The slab shall be constructed on undisturbed soil or compacted subgrade. The slab shall be constructed by excavating/removing the base materials (HMA and aggregate) to a length and depth equivalent to the planned length and thickness of the slab. The slab, should be placed on a 5 inch layer of crushed compacted base to support the slab and provide a stable construction platform. The slab shall be constructed to the same slope and cross section as the pavement. Where staging is required, the pavement reinforcement shall include bar splicers.

Prior to construction of the Transition Approach Slab, a 10 mil thick Polyethylene sheet shall be placed between the sleeper slab and overlying PCC pavement. The Polyethylene sheet shall extend a minimum 6 inches beyond the edge of the sleeper slab.

The top surface of the slab shall be given a smooth finish with a steel trowel. The sleeper slab shall be cured and protected according to Article 1020.13(a)(1), Article 1020.13(a)(2), and Article 1020.13(a)(5).

Method of Measurement This work will be measured for payment from end to end along the center of the slab at the nominal width shown on the plans and area calculated in square yards.

Basis of Payment. This work will be paid for at the contract unit price per square yard for SLEEPER SLAB.

TELEVISION INSPECTION OF SEWER (ILLINOIS TOLLWAY)

Effective: May 29, 2015

Revised: February 12, 2020

Description. This work shall consist of the inspection and video televising sewers, taking photos, locating drainage structures, and furnishing written reports of the sewers, as shown in the Plans. The work shall be completed in accordance with the National Association of Sewer Service Contractors (NASSCO) Pipeline Assessment & Certification Program (PACP).

CONSTRUCTION REQUIREMENTS

The Contractor shall perform one pass of a hydraulic flusher to remove loose debris. Should additional cleaning be required, as determined by the Engineer on the basis of the initial pass, that work will be paid for separately.

Television equipment shall be remote controlled from above ground by a skilled technician controlling the camera. The camera shall be a pan and tilt color unit with sufficient lighting for inspection of the sewer. If the contractor has cameras with an automatic iris, they shall use them for all mainline televising; otherwise lighting shall be manually adjusted so no glares, bright spots, etc. are recorded. The contractor shall pan and tilt up each lateral that is in the main and up and around the entire manhole where the inspection is ending. The camera shall be pulled through the sewer line in either direction at a speed not greater than 30 feet per minute, stopping as necessary to permit proper documentation of the sewer's condition. If the camera is submerged due to a sag or dip in the pipe, a high velocity jet shall be utilized to pull water from the camera lens. If, during the inspection operations the inspection camera will not pass through the entire manhole section, the contractor shall reset his equipment so that the inspection can begin at the opposite manhole. If the contractor is unable to televise the entire manhole-to-manhole segment, he shall notify the Engineer prior to abandoning the attempt. Payment will be based on only the length televised with no additional cost to the Illinois Tollway for the extra setups.

The view seen by the television camera shall be transmitted to a monitor located inside a mobile TV studio, which has the capabilities to produce a transmittable digital copy. The contractor's mobile studio shall be large enough to accommodate at least two people for the purpose of viewing the monitor while the inspection is in progress. The Engineer shall have access to view the television screen at all times.

Pipe identification and location shall be displayed on the video at the beginning and end of each segment for a minimum of 15 seconds. The pipe location and information shall include: Pipe identification, Starting drainage structure location with station and offset, Ending drainage structure location with station and offset, Material, Pipe Size, Date, and Length. If the segment is reversed, the display shall say "Reversal" to differentiate the video from the original run. The date and pipe length counter shall be displayed for the entire length of sewer segment. The contractor shall display all pipe spalling, obtrusions, or obstructions, for a minimum of five seconds.

Inspection reports shall be prepared for each line segment televised. A separate inspection report shall be included where segments are abandoned and a reverse TV is required. Each inspection report shall include the following information:

- a) Illinois Tollway logo
- b) Contractor logo
- c) Unit number
- d) Pipe identification
- e) Roadway name/route
- f) Direction of Traffic
- g) Nearest cross street
- h) Starting drainage structure (number, station and offset)
- i) Ending drainage structure (number, station and offset)
- j) Total length
- k) Pipe Material
- l) Pipe Shape
- m) Pipe Size
- n) Pipe joint length
- o) Manufactured Year
- p) Flow direction
- q) Surveyor's name (name & certification number)
- r) Date Recorded
- s) Weather
- t) Pre-cleaning
- u) Date cleaned
- v) Drainage structure condition & type of construction
- w) Location of all service connections
- x) Location & description of all PACP items
- y) Report generation date
- z) Page number

The contractor shall produce an electronic copy of the inspection report (pdf), video files, and spreadsheet summarizing all inspection records. The electronic data shall be provided to the Engineer via upload to the Illinois Tollway WBPM system contract folder: 03 Construction - 08 Reports and Logs - 05 Sewer Television Reports.

Method of Measurement. This work will be measured for payment in feet, based on only the length televised and regardless of the diameter of the sewer being televised.

Basis of Payment. This work will be paid for at the contact unit price per foot for TELEVISION INSPECTION OF SEWER, regardless of the diameter of the sewer being televised.

ANTI-CLIMB ORNAMENTAL FENCE

Description. This work shall consist of furnishing and installing ANTI-CLIMB ORNAMENTAL FENCE system as shown on the Plans and specified herein.

The Contractor shall provide a total ANTI-CLIMB ORNAMNETAL FENCE system. The system may be used in conjunction with the ANTI-RAM BARRIER system. See Contract drawings for locations utilizing the ANTI-RAM BARRIER in conjunction with the ANTI-CLIMB ORNAMENTAL FENCE. The system shall include all components (i.e. cables, supports, panels, posts, and hardware) required.

Construction Requirements.

Quality Assurance

- A. The Contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

References

- ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
- ASTM B117 – Practice for Operating Salt-Spray (Fog) Apparatus.
- ASTM D523 – Test Method for Specular Gloss.
- ASTM D714 – Test Method for Evaluating Degree of Blistering in Paint.
- ASTM D822 – Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.
- ASTM D1654 – Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
- ASTM D2244 – Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
- ASTM D2794 – Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- ASTM D3359 – Test Method for Measuring Adhesion by Tape Test.
- ASTM F2408 – Ornamental Fences Employing Galvanized Steel Tubular Pickets.

Submittals

- A. Product Data: Submit manufacturer's product literature for proposed system. The manufacturer's literature shall be submitted prior to installation.
- B. Shop drawings shall be in scale large enough to clearly show all layers. Include dimensions of fabricated work, reference dimensions to the structure, show type, size and spacing of fasteners, with material thickness and finishes; provide a plan layout with erection sequence and notations of coordination required with other trades. Work shall not begin until the shop drawings have been reviewed and approved by the Engineer. Submit with the shop drawings with the review comments by the manufacturer's technical department.
- C. Submit copies of independent laboratory tests and mill certifications on the performance data for the panels, anchor clips, and fasteners to meet the performance and materials requirements of this specification as indicated in this section. Manufacturer's certification letters will not be accepted in lieu of the specified independent laboratory tests, mill certifications.

- D. Prior to completion, submit quality control data certifying that materials furnished for the project are the same make and manufacture as those tested.

Product Handling And Storage

- A. Comply with manufacturer's recommendations for delivery, storage and handling.
- B. If the construction site is not prepared to receive the anti-climb ornamental fence and gate and material at the agreed ship date, the Contractor shall be responsible to provide a safe, dry and easily accessible storage area on or off the premises. Additional labor costs for double handling will be the responsibility of the Contractor and no additional compensation will be allowed.

Materials.

Manufacturer

- A. Provide ANTI-CLIMB ORNAMENTAL FENCE system subject to compliance with the design and performance requirements of this specification. ANTI-CLIMB ORNAMENTAL FENCE manufacturers shall include the following:
 - 1. The ANTI-CLIMB ORNAMENTAL FENCE design may be utilized in conjunction with ANTI-RAM BARRIER.
 - 2. Manufacturers of anti-climb fencing systems used in conjunction with DOD-USACE anti-ram barrier systems. Manufacturer with minimum 15 years' experience in manufacturing of anti-climb fencing systems of the type required for the project.
- B. The entire anti-climb ornamental system and all associated panels, gates, accessories, fittings, and fasteners shall be obtained from a single source.

Material

- A. Steel material for cable-supporting framework and fence panels (i.e., panels, rails and posts) shall be galvanized prior to forming and shall conform to the requirements of ASTM A924/A924M, with a minimum yield strength of 45,000 psi (310 MPa). The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.90 oz/ft² (276 g/m²), Coating Designation G-90.
- B. Material for corrugated pales shall be a nominal 2.75" x 0.75" x 14 Ga. The cross-sectional shape of the rails shall conform to the manufacturer's rail design using a nominal 2" x 2" x 11 Ga. Pre-drilled holes in the rail shall be spaced 6" on center, providing a pale airspace of no greater than 3.25". Tamperproof fasteners shall be used to fasten each pale to rail at every intersection. Fence posts and gate posts shall meet the minimum size requirements of Table 1.

Table 1 – Minimum Sizes for Posts	
<u>Fence Posts</u>	<u>Panel Height</u>
4" x 2.75" x 11 Ga. I-Beam	10'
<u>Gate Leaf</u>	<u>Gate Height</u>
	10'
Up to 4'	4" x 11 Ga.
4'-1" to 6'	4" x 11 Ga.
6'-1" to 8'	6" x 3/16"
8'-1" to 10'	6" x 3/16"
10'-1" to 12'	6" x 3/16"
12'-1" to 16'	8" x 1/4"

- C. Fasteners shall be in accordance with Article 1006.08 of the Standard Specifications.
- D. Concrete footings and foundations shall be of Class SI concrete meeting the requirements of section 1020 of the Standard Specifications. The footings shall be constructed to the depths as recommended by the fence system manufacturer. The top of the all footings shall be 3-inches above the ground line, or as recommended by the fence system manufacturer, and shall be troweled to a smooth finish with a slope to drain away from the posts. Post, braces and other units shall be centered in the footings. Anti-ram barrier shall not be erected until the concrete encasement around the posts has cured for at least seven days.

Fabrication

- A. Fabrication shall be completed according to Article 505.04 and Section 506 of the Standard Specifications.
- B. Rails and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets. Post flange shall be pre-punched to accept rail to post attachment. Post web shall be punched providing a clear opening for interior of rails to align throughout the entire system.
- C. Grommets shall be inserted into the pre-punched holes in the rails and pickets shall be inserted through the grommets so that predrilled picket holes align with the internal upper raceway of the rails.
- D. The manufactured galvanized framework shall be painted with an epoxy intermediate coat and aliphatic urethane finish coat meeting the requirements of Articles 1008.05(d) and (e) of the Standard Specification.

All paint materials for the shop and field shall be supplied by the same manufacturer, and samples of components submitted for approval by the Engineer before use. Paint storage, mixing, and application shall be according to Section 506 of the Standard Specifications and the paint manufacturer's written instructions and product data sheets. In the event of a conflict, the Contractor shall advise the Engineer and comply with the Engineer's written resolution. Until a resolution is provided, the most restrictive conditions shall apply.

Shop Application of the Paint System. The areas to be painted shall receive one full coat of an epoxy intermediate coat and one full coat of an aliphatic urethane finish coat. The film thickness of each coat shall be according to Article 506.09(f)(2).

The painted framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2 instead of stating all metal parts shall be coated black per the manufacturer's standards. All metal parts and accessories shall be coated black per the manufacturer's standards. After erection is completed, all barrier and fencing under the Contract will be inspected by the Engineer, and all parts of the barrier and fencing (including bolts, nuts, and accessories), from which the coating has been abraded so that the base metal is exposed, shall be repaired with manufacturer's recommendation, or approved by the Engineer. Reference Section FENCE INSTALLATION AND MAINTENANCE for cuts and abrasions occurring in the field.

Table 2- Coating Performance Requirements		
<u>Quality Characteristics</u>	<u>ASTM Test Method</u>	<u>Performance Requirements</u>
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 3,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact resistance over 60-inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

- E. Completed sections (i.e., panels) shall be capable of supporting a 400-pound load applied at midspan without permanent deformation. Panels shall be biasable to a 30-degree change in grade.
- F. Swing gates shall be fabricated using 2" sq. x 12 ga. rail, 2" sq. x 12 ga. gate ends, and 2.75" x 0.75" x 0.075 pales. Gates that exceed 6' in width shall have a 2" sq. x 11 ga. intermediate upright. All rail and upright intersections shall be joined by welding. All pale and rail intersections shall also be joined by welding.
- G. Pedestrian swing gates shall be self-closing, having a gate leaf no larger than 48" width. Integrated hinge-closer set (2 qty) shall be ADA compliant that shall include a variable speed and final snap adjustment with compact design (no greater than 5" x 6" footprint). Hinge-closer set (2 qty) shall be tested to a minimum of 500,000 cycles and capable of self-closing gates up to a maximum gate weight of 260 pounds and maximum weight load capacity of 1,500 pounds. Hinge-closer device shall be externally mounted with tamper-resistant security fasteners, with full range of adjustability, horizontal (0.5" – 1.375") and vertical (0 – 0.5"). Maintenance free hinge-closer set shall be tested to operate in temperatures of negative 20 F to 200 F degrees, and swings to negative 2 degrees to ensure reliable final lock engagement.

- H. Double Vehicular Gates shall be installed with concrete gate keeper assembly with lockable drop rods. All hinges, latches, locks, and other apparatuses shall be installed per manufacturer's recommendations.

Execution.

Preparation

- A. All new installation shall be laid by the Contractor in accordance with the plans.

Installation

- A. Fence post spacing shall be according to the manufacturer's recommendation spaced according to, plus or minus ¼". For installations that must be raked to follow sloping grades, the post spacing dimension must be measured along the grade. Fence panels shall be attached to the line and end posts with fasteners supplied by the manufacturer. Attachment to corner post shall be made using brackets and fasteners supplied by the manufacturer.
- B. The Contractor shall conduct its operations to avoid damages to all public utility and Illinois Tollway services, facilities, and structures that may be found in the vicinity of construction in accordance with Article 107.20 of the Illinois Tollway Supplemental Specifications.
- C. Before installing anti-climb ornamental fence system, all necessary site clearing shall be performed according to Section 201 of the Standard Specifications, and as directed by the Engineer. Such clearing shall be conducted in a manner to leave intact valuable trees and selective native growth.
- D. Anti-climb ornamental fence shall be installed per manufacturer's recommendation and shop drawings. Posts, fence panels, brackets, cabling and fasteners shall be installed according to installation instructions and drawings.

Fence Installation And Maintenance

- A. When cutting/drilling rails or posts, adhere to the following steps to seal the exposed steel surfaces:
1. Remove all metal shavings from cut area.
 2. Apply zinc-rich primer to thoroughly cover cut edge and/or drilled hole; let dry.
 3. Apply 2 coats of custom finish paint matching fence color.
- B. Manufacturer's spray cans or paint pens shall be used to prime and finish exposed surfaces; it is recommended that paint pens be used to prevent overspray.
- C. Field welding shall not be permitted unless previously authorized by the Engineer.

Gate Installation

- A. Gate posts shall be spaced according to the manufacturers' gate drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected. Type and quantity of gate hinges shall be based on the application; weight, height, and number of gate cycles. The manufacturers' gate drawings shall identify the necessary gate hardware required for the application. Gate hardware shall be provided by the manufacturer of the gate and shall be installed per the manufacturer's recommendations.

Cleaning

- A. The Contractor shall clean the jobsite thoroughly to ensure it is left neat and free of any debris caused by the installation of the cable system.

Method of Measurement. This work will be measured for payment, complete in place, as specified herein:

ANTI-CLIMB ORNAMENTAL FENCE, 10' HT will be measured for payment in feet for fence erected, including footing foundations, from center to center of end or terminal posts and will exclude lengths occupied by pedestrian and vehicular gates.

ANTI-CLIMB ORNAMENTAL FENCE GATE, 10' HT, 6' PEDESTRIAN GATE will be measured for payment in units of each for gates erected, including footing foundations and will exclude lengths occupied by the ANTI-CLIMB ORNAMENTAL FENCE, 10' HT and vehicular gates.

ANTI-CLIMB ORNAMENTAL FENCE GATE, 10' HT, 12' DOUBLE VEHICULAR GATE will be measured for payment in units of each for gates erected, including footing foundations and will exclude lengths occupied by the ANTI-CLIMB ORNAMENTAL FENCE, 10' HT and pedestrian gates.

Basis of Payment. This work will be paid at the contract unit price per foot for ANTI-CLIMB ORNAMENTAL FENCE, 10' HT and at the contract unit price per each for ANTI-CLIMB ORNAMENTAL FENCE GATE, 10' HT, 6' PEDESTRIAN GATE and ANTI-CLIMB ORNAMENTAL FENCE GATE, 10' HT, 12' DOUBLE VEHICULAR GATE.

ANTI-RAM BARRIER

Description. This work shall consist of furnishing and installing ANTI-RAM BARRIER system as shown on the Plans and specified herein.

The Contractor shall provide a total ANTI-RAM BARRIER system in conjunction with the ANTI-CLIMB ORNAMENTAL FENCE. The barrier shall comply with DOD-USACE "K4" rating as shown on the Plans and specified herein. The system shall include all components (i.e., cables, supports, panels, posts, and hardware) required.

Construction Requirements.

Quality Assurance

- A. The Contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

References

- ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
- ASTM B117 – Practice for Operating Salt-Spray (Fog) Apparatus.
- ASTM D523 – Test Method for Specular Gloss.
- ASTM D714 – Test Method for Evaluating Degree of Blistering in Paint.
- ASTM D822 – Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.
- ASTM D1654 – Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
- ASTM D2244 – Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
- ASTM D2794 – Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- ASTM D3359 – Test Method for Measuring Adhesion by Tape Test.
- ASTM F2656 – Standard Test Method for Vehicle Crash Testing of Perimeter Barriers.
- Federal Specification RR-W-410E / Wire Rope and Strand.
- ASTM F2408 – Ornamental Fences Employing Galvanized Steel Tubular Pickets.

Submittals

- A. Product Data: Submit manufacturer's product literature for proposed system. The manufacturer's literature shall be submitted prior to installation.
- B. Shop drawings shall be in scale large enough to clearly show all layers. Include dimensions of fabricated work, reference dimensions to the structure, show type, size and spacing of fasteners, with material thickness and finishes; provide a plan layout with erection sequence and notations of coordination required with other trades. Work shall not begin until the shop drawings have been reviewed and approved by the Engineer. Submit with the shop drawings with the review comments by the manufacturer's technical department.
- C. Submit copies of independent laboratory tests, mill certifications, and calculations by a Structural Engineer licensed in the State of Illinois certifying structural performance data on the panels, anchor clips, and fasteners to meet the structural testing and performance and materials requirements of this specification as indicated in this section.
- D. Manufacturer's certification letters will not be accepted in lieu of the specified independent laboratory tests, mill certifications, and calculations by a registered Structural Engineer.
- E. Prior to completion, submit quality control data certifying that materials furnished for the project are the same make and manufacture as those tested.

Product Handling And Storage

- A. Comply with manufacturer's recommendations for delivery, storage and handling.
- B. If the construction site is not prepared to receive the anti-ram barrier equipment and material at the agreed ship date, the Contractor shall be responsible to provide a safe, dry and easily accessible storage area on or off the premises. Additional labor costs for double handling will be the responsibility of the Contractor and no additional compensation will be allowed.

Materials.

Manufacturer

- A. Provide ANTI-RAM BARRIER system subject to compliance with the design and performance requirements of this specification. ANTI-RAM BARRIER manufacturers shall include the following:
 1. The ANTI-RAM BARRIER design is to be utilized in conjunction with ANTI-CLIMB ORNAMENTAL FENCE system.
 2. Other acceptable manufacturers of DOD-USACE anti-ram barrier: manufacturer with minimum 15 years' experience in manufacturing of anti-ram barriers of the type required for the project.
- B. The entire anti-ram barrier system and all associated panels, gates, accessories, fittings, and fasteners shall be obtained from a single source.

Material

- A. Steel material for cable-supporting framework and fence panels (i.e., panels, rails and posts) shall be galvanized prior to forming and shall conform to the requirements of ASTM A924/A924M, with a minimum yield strength of 45,000 psi (310 MPa). The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.90 oz/ft² (276 g/m²), Coating Designation G-90.
- B. Material for fence panel pickets shall be 1" square x 14 Ga. tubing. The fence panel rails shall conform to the manufacturer's requirements with a minimum double wall design with outside cross-section dimensions of 1.75" square and a minimum thickness of 14 Ga. Picket holes in the rail shall be spaced 4.715" o.c. Picket retaining rods shall be 0.125" diameter galvanized steel. High quality PVC grommets shall be supplied to seal all picket-to-rail intersections. The cross-sectional shape of the rails shall conform to the manufacturer's rail design, a nominal 2" x 2" x 11 Ga. Tamperproof fasteners shall be used to fasten each fence panel to post bracket and rail to post connections. Posts shall conform to the manufacturer's I-Beam design with a nominal 3" x 2.75" x 12 Ga.
- C. Fasteners shall be in accordance with Article 1006.08 of the Standard Specifications.
- D. The cable material shall be Independent Wire-Rope Core (IWRC) wire rope conforming to Federal Specification RR-W-410D, 6 x 36 Warrington Seale, preformed, right regular lay, medium lubrication, Extra Improved Plow Steel (EIPS), with a breaking strength of 103,400 pounds. Cable diameter shall be 1 inch.
- E. Concrete footings and foundations shall be of Class SI concrete meeting the requirements of section 1020 of the Standard Specifications. The footings shall be constructed to the depths shown in the Plans. The top of the all footings shall extend slightly above the ground line and shall be troweled to a smooth finish with a slope to drain away from the posts. Post, braces and other units shall be centered in the footings. Anti-ram barrier shall not be erected until the concrete encasement around the posts has cured for at least seven days.
- F. All excess excavation from the footings shall be disposed of in a manner satisfactory to the Engineer. All such disposal shall be at no additional cost to the Department.
- G. Prior to anti-ram barrier construction, all necessary earthwork shall be performed in accordance with Sections 202 and 516 of the Standard Specifications.

Fabrication

- A. Fabrication shall be complete according to Article 505.04 and Section 506 of the Standard Specifications.
- B. Rails and posts shall be pre-cut to specified lengths. Post flange shall be pre-punched to accept rail to post and fence panel to post bracket attachment. Post web shall be punched providing a clear opening for interior of rails to align throughout the entire system for affixing conduit, video cabling, IDS wiring, and other components for a complete systems integration. Rails shall be attached to I-beam post flange providing a bracket-less design at each intermediate post.
- C. Fence panel pickets and rails shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets. Pickets shall be predrilled to accept retaining rods. Grommets shall be inserted into the pre-punched holes in the rails and pickets shall be inserted through the grommets so that predrilled picket holes align with the internal upper raceway of the rails. Retaining rods shall be inserted into each rail so that they pass through the predrilled holes in each picket.
- D. The manufactured galvanized framework shall be painted with an epoxy intermediate coat and aliphatic urethane finish coat meeting the requirements of Articles 1008.05(d) and (e) of the Standard Specification.

All paint materials for the shop and field shall be supplied by the same manufacturer, and samples of components submitted for approval by the Engineer before use. Paint storage, mixing, and application shall be according to Section 506 of the Standard Specifications and the paint manufacturer's written instructions and product data sheets. In the event of a conflict, the Contractor shall advise the Engineer and comply with the Engineer's written resolution. Until a resolution is provided, the most restrictive conditions shall apply.

Shop Application of the Paint System. The areas to be painted shall receive one full coat of an epoxy intermediate coat and one full coat of an aliphatic urethane finish coat. The film thickness of each coat shall be according to Article 506.09(f)(2).

The painted framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2 instead of stating all metal parts shall be coated black per the manufacturer's standards. All metal parts and accessories shall be coated black per the manufacturer's standards. After erection is completed, all barrier and fencing under the Contract will be inspected by the Engineer, and all parts of the barrier and fencing (including bolts, nuts, and accessories), from which the coating has been abraded so that the base metal is exposed, shall be repaired with manufacturer's recommendation, or approved by the Engineer. Reference Section FENCE INSTALLATION AND MAINTENANCE for cuts and abrasions occurring in the field.

Table 2- Coating Performance Requirements		
<u>Quality Characteristics</u>	<u>ASTM Test Method</u>	<u>Performance Requirements</u>
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 3,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

- D. The manufactured fence panel shall be capable of meeting the vertical load, horizontal load, and infill performance requirements for Industrial weight fences under ASTM F2408.

Execution.

Preparation

- A. The Contractor shall indicate the location of barrier line with suitable stakes. Stake intervals shall not exceed 500 feet or line of sight.
- B. The Contractor shall conduct its operations to avoid damages to public utility and Illinois Tollway services, facilities, and structures that may be found in the vicinity of construction in accordance with Article 107.20 of the Illinois Tollway Supplemental Specifications.
- C. Prior to installing anti-ram barrier system, all necessary site clearing shall be performed according to Section 201 of the Standard Specifications, and as directed by the Engineer. Such clearing shall be conducted in a manner to leave intact valuable trees and selective native growth. An adequate clearance on both sides of the cable barrier line is required.
- D. The Contractor for this work shall provide documentation from the product manufacturer indicating they have been trained on installation practices for anti-ram barrier systems by the product manufacturer. Documentation shall be provided with submittal documents.

Installation

- A. The erection of specific portions or lengths of anti-ram barrier may be more essential to the needs of the Illinois Tollway than other portions or lengths. The Engineer will designate these segments of priority installations and the Contractor shall conduct his/her operations as to give priority to the erection of such segments or lengths. Priority installations shall be included in the unit price for the pay item and no additional compensation will be allowed.
- B. Anti-ram barrier shall be installed per manufacturer's recommendations and shop drawings. Fence panels, brackets, cabling, and fasteners shall be installed according to installation instructions and drawings. Posts shall be installed per shop drawings and installation instructions.

Fence Installation And Maintenance

- A. When cutting/drilling rails or posts, adhere to the following steps to seal the exposed steel surfaces:
 - 1. Remove all metal shavings from cut area.
 - 2. Apply zinc-rich primer to thoroughly cover cut edge and/or drilled hole; let dry.
 - 3. Apply 2 coats of custom finish paint matching fence color.
- B. Manufacturer's spray cans or paint pens shall be used to prime and finish exposed surfaces; it is recommended that paint pens be used to prevent overspray.

Cleaning

- A. The Contractor shall clean the jobsite thoroughly to ensure it is left neat and free of any debris caused by the installation of the cable system.

Method of Measurement. This work will be measured for payment, complete in place, in units as specified herein:

ANTI-RAM BARRIER, TYPE K4 will be measured for payment in feet for barrier erected, including footing foundations, from center to center of end or terminal posts and will exclude lengths occupied by pedestrian gates. The measure length of barrier will be basis of payment for payment of cable, line posts, panel rails, picket retaining rods, and all connections required to erect the barrier.

Basis of Payment. This work will be paid at the contract unit price per foot for ANTI-RAM BARRIER, TYPE K4.

REMOVE AND RELOCATE SIGN

Description. This work shall consist of removing and relocating sign panels along with their telescoping sign supports and bases, metal posts and wood posts according to the applicable portions of Section 724 of the Standard Specifications except as modified herein. This work does not include the removal or relocation of ground mounted sign supports or overhead sign structures.

Revise Article 724.03 of the Standard Specifications to read:

“Installation of relocation signs shall be according to Illinois Tollway Supplemental Specifications Article 720.04.”

Add the following to Article 724.03 of the Standard Specifications:

“The sign panel(s) and supporting channels installed on new ground mounted sign supports and concrete foundations shall be according to Illinois Tollway Supplemental Specifications Section 727 and 734.”

Method of Measurement. This work will be measured for payment in square feet according to Illinois Tollway Supplemental Specifications Article 720.05.

Basis of Payment. This work will be paid for at the contract unit price per square foot for REMOVE AND RELOCATE SIGN, of the type specified.

New telescoping steel sign supports and bases, metals posts and wood posts when required will be paid for according to the Illinois Tollway Supplemental Specifications Articles 728.06, 731.04, 729.05, 730.06, 727.08 and 734.05 respectively.

MULTI-POLYMER PAVEMENT MARKINGS (ILLINOIS TOLLWAY)

Effective: October 20, 2008

Revised: December 8, 2023

Description. This work shall consist of the furnishing and application of a durable, long life multi-polymer pavement marking system. The binder portion of the system is to be applied to the road surface at 20 mils \pm 1 mil in thickness on concrete/asphalt pavements and 25 mils \pm 1 mil on open grade pavement (or according to Engineers and manufacturers recommendation); and into which reflective media is applied by means of pressurized applicator in accordance with the requirements stated in this specification.

Materials. All materials used to formulate a system for hot-spray applications of permanent multi-polymer pavement markings shall conform to the requirements specified herein.

A. Multi-Polymer Resins

a) Physical Properties of the Mixed Compound:

The multi-polymer pavement marking material shall consist of a 100 percent solid two part system formulated and designed to provide a simple volumetric mixing ratio of two components (must be two volume(s) of Component A and one volume(s) of Component B). No volatile solvents or fillers will be allowed. The multi-polymer resin shall be as follows:

- **Multi-Polymer Content (Component A).** The multi-polymer content of the multi-polymer resin shall be tested according to ASTM D 1652 and calculated as the weight per multi-polymer equivalent (WPE) for both white and yellow. The multi-polymer content shall be determined on a pigment free basis and shall meet the target value provided by the manufacturer's certification and approved by the Illinois Tollway. A tolerance of plus or minus 50 of WPE will be applied to the target value to establish the acceptance range.
- **Amine Value (Component B).** The amine value of the curing agent shall be determined according to ASTM D2074. The total amine value shall be less than 530.

The system shall be formulated as a Long Life Pavement Marking System capable of providing an average of 6 years performance. The Long Life Pavement Marking System shall be free of TMPTA (trimethylolpropane-triacrylate), free of toxic heavy metal (lead, chromium, cadmium, and other toxic heavy metals as defined by the U.S. EPA), and free of other such multi functional monomers.

Material composition of the mixed compound shall be as follows:

Material Requirements		
Tests	ASTM Testing Method	Requirements
Density (Gallon Weight)	D1475	±0.30 lb./gal
Viscosity (Krebs-Stormer)	D562	±7 KU
Viscosity (Cone & Plate)		±0.5 Poises
Grind	D1210	Not Less than the Standard
% Weight Non-Volatile Matter	D2369	±1.0%
% Pigment (white & yellow)	D2371	±3.0%
% Volume Non-Volatile Matter	D2697	±5.0%
Infrared Spectrum	-	Both component A and component B shall be analyzed to verify for control purposes that materials submitted for use are of an identical formulation as originally approved. Deviations as determined by comparison with the original sample shall be cause for rejection.
Trifunctional or Multifunctional Monomers	-	0%
Isocyanate	-	0%

The Manufacturer must provide target composition values for the following testing determinations: Theoretical (Mixed) Density, Percent Pigment, Volume Solids (non-volatile matter), Dry Time at 70F & 40F, Weight Solids (non-volatile matter), Epoxide Content, Amine Content, Viscosity Stormer, Fineness of Grind, Daylight Reflectance, Weathering Resistance, Adhesion to Concrete, Hardness. Acceptance ranges will be established based on target composition values.

b) Pigmentation:

The pigment composition shall be as follows:

Pigment Composition	Percent by Weight	
	Minimum	Maximum
White:		
Titanium Dioxide Rutile (94% minimum purity, ASTM D 476, Type III)	18.0	25.0
Multi-Polymer Resin	75.0	86.0
Yellow:		
Organic Non-Lead Yellow	10.0	15.0
Titanium Dioxide (ASTM D 476, Type III)	4.0	9.0
Multi-Polymer Resin	75.0	86.0

The entire pigment composition shall consist of titanium dioxide.

c) Toxicity:

Upon heating to application temperature, the material shall not exude fumes which are toxic or injurious to persons or property. Upon curing the materials should be completely inert with all components fully reacted and environmentally safe.

d) Daylight Reflectance:

The testing method shall follow the requirements of ASTM D2244. Chromaticity and reflectance requirements shall be as follows:

Federal 595 Color		Chromaticity Coordinates								Daylight directional reflectance (Y)
		1		2		3		4		
		x	y	x	y	x	y	x	y	
White	17855	.302	.344	.325	.344	.302	.320	.325	.320	80 min.
Yellow	33538	.543	.472	.475	.472	.543	.425	.475	.425	50 min.

e) Weathering Resistance:

The multi-polymer compound, both white and yellow, must be applied to 2 sets of 3"x 6" aluminum panels at 20 ± 1 mil in thickness, one set with no glass spheres and one set with glass spheres as specified herein (must ensure 50/50 distribution of Type A and Type B beads for this will impact the results of this test) and expose the prepared samples in a Q.U.V. Environmental Testing Chamber, as described in ASTM G-53, and they shall conform to the following requirements. The testing method shall follow the requirements of ASTM D4587. (The test shall be conducted for 75 hours at 122°F, 4 hours humidity and 4 hours U.V., in alternating cycles. The prepared panels shall be cured at 77°F for 72 hours prior to exposure.) The color of the white multi-polymer material shall not be darker than Federal Standard No. 595A-17855. The color of the yellow multi-polymer material shall be reasonably close to Federal Standard No. 595A-13415.

f) Dry Time:

The multi-polymer resin compounds, when properly applied with the required gradations and bead application rates per gallon, shall cure to a no-track condition, when tested in accordance with ASTM D 711, within 240 minutes at 40 degrees F and not more than 35 minutes at temperature 70 degrees F.

g) Adhesion to Pavement (Concrete and Asphalt):

The multi-polymer system markings must perform for an average of 6 years. The testing method shall follow the requirements of ASTM D7234. The cured pavement marking materials, when tested according to ACI Method 503, shall have such a higher degree of adhesion to the specified concrete (compressive strength, 4,000 psi minimum) or asphalt surface such that there shall be a 100% substrate failure in the performance of this test. The prepared specimens shall be conditioned at room temperature ($75^{\circ}\text{F} \pm 2^{\circ}\text{F}$) for a minimum of 24 hours and a maximum of 72 hours prior to the performance of the tests indicated.

h) Hardness:

The multi-polymer paint pavement marking material, when tested according to ASTM D 2240, shall have a Shore D Hardness from 75 to 95. The samples shall be allowed to cure at room temperature (75 ± 2 degrees F) for a minimum of 24 hours and a maximum of 72 hours prior to performing the indicated tests.

i) Abrasion:

The abrasion resistance shall be evaluated on a Taber Abrader with a 1,000 gram load and CS-17 wheels. The duration of the test shall be 1,000 cycles. The wear index shall be calculated based on ASTM D4060, and the wear index for the dual component material shall not be more than 100 milligrams. The test shall be performed on cured samples of material which have been applied, without glass beads, at a film thickness of 0.020 ± 0.0005 inches to code S-16 stainless steel plates. The samples shall be allowed to cure at room temperature (75 ± 2 degrees F) for a minimum of 24 hours and a maximum of 72 hours prior to performing the indicated tests.

j) Accelerated Life-Cycle Aging Test: The material must not show any evidence of blistering, bubbling, or delaminating when submitted to test method ATR-931. Results of the test shall be provided by the manufacturer during the approval process.

k) Thermal compatibility:

The mixed hybridized polymer system must have thermal compatibility and tensile strength requirements of 4500-6500 psi, such that, it is compatible with asphalt and Portland cement concrete under all weather conditions.

l) Delineation profile:

To enhance better profile of the marking by minimizing splattering and improved bead embedment the viscosity of the mixed Component A and Component B of the hybridized polymer system shall be greater than 4500cP at 75°F .

m) Reflective Media. The reflective media shall meet the following requirements:

i) First Drop Glass Beads. The first drop glass beads shall be tested by the standard visual method of large glass spheres adopted by the Illinois Department of Transportation. The beads shall have a silicone, moisture resistant coating and meet the following sieve requirements:

U.S. Standard Sieve Number	Sieve Size	% Passing By Weight (mass)
12	1.70 mm	95-100
14	1.40 mm	75-95
16	1.18 mm	10-47
18	1.00 mm	0-7
20	850 µm	0-5

ii) Second Drop Glass Beads. The second drop glass beads shall meet the requirements of Article 1095.07 of the Standard Specifications for Type B.

n) Packaging:

Glass beads shall be delivered in approved moisture proof bags or weather resistant bulk boxes. Each carton shall be legibly marked with the manufacturer, specifications and type, lot number, and the month and year the glass beads were packaged. The letters and numbers used in the stencils shall be a minimum of ½ in. in height.

- a. Moisture Proof Bags. Moisture proof bags shall consist of at least five ply paper construction unless otherwise specified. Each bag shall contain 50 lb. net.
- b. Bulk Weather Resistance Boxes. Bulk weather resistance boxes shall conform to the Federal Specification PPP-8-640D Class II or latest revision. Boxes are to be weather resistant, triple wall, fluted, corrugated-fiber board. Cartons shall be strapped with two metal straps. Straps shall surround the outside perimeter of the carton. The first strap shall be located approximately 2 in. from the bottom of the carton and the second strap shall be placed approximately in the middle of the carton. All cartons shall be shrink wrapped for protection from moisture. Cartons shall be lined with a minimum 4 mil polyester bag and meet Interstate Commerce Commission requirements. Cartons shall be approximately 38 x 38 in., contain 2000 lb of glass beads and be supported on a wooden pallet with fiber straps.

The material shall be shipped to the job site in substantial containers and shall be plainly marked with the manufacturer's name and address, the name and color of the material, date of manufacture, and batch number.

o) Verification:

Prior to approval and use of the multi-polymer pavement marking materials, the manufacturer shall submit 1 – quart samples and/or a notarized certification of an independent laboratory, together with the results of all tests, stating these materials meet the requirements as set forth herein. The certification test report shall state the lot tested, manufacturer's name, brand name of the multi-polymer and date of manufacture. In addition, all multi-polymer components shall be pre-approved for use on the project under the following conditions:

- Documentation of acceptable performance as certified by a Department of Transportation of surface-applied field performance of 100,000 ADT for 6 consecutive years to the standards of this specification.
- Any changes in formulation, physical or chemical properties of the approved multi-polymer resin needed to be explained in writing and submit to the Illinois Tollway within 30 days for reevaluation and approval process. The documentation shall include the Material Safety Data Sheets (MSDS).

Equipment. Application crew and equipment for the placement of reflectorized pavement marking shall be approved by the Pavement Marking Material Manufacturer to perform such operations.

In general, the applying equipment shall be mobile, truck mounted and self contained pavement marking machine, specifically designed to apply resin materials and reflective glass spheres in continuous and skip line patterns. The applying equipment shall be maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. In addition, the truck mounted unit shall be provided with accessories to allow for the marking of legends, symbols, crosswalks and other special patterns.

The mobile applicator shall include the following features:

1. The mobile applicator shall provide individual material reservoirs, or space, for the storage of Component A and Component B of the resin composition.
2. The applicator shall be equipped with heating equipment of sufficient capacity to maintain the individual resin components at the manufacturer's recommended temperature and produce the required amount of heat at the mixing head & gun tip and maintain those temperatures with the tolerances recommended by the resin manufacturer for spray application.
3. The applicator shall be equipped with adequate individual tanks for the storage and dispensing of Size I and Size II glass spheres and black aggregate.
4. The applicator shall be equipped with individual dispensers for the simultaneous application of Type A and Type B glass beads respectively. Each dispenser shall be capable of applying beads at a minimum rate of 20 pounds per gallon of the resin composition. The applied combined total of both types of beads should be a maximum of 25 lbs./gal. (12 to 13 lbs. of each type).

5. The applicator shall be equipped with individual metering devices or pressure gauges, on the proportioning pumps (one indicator per pump) as well as stroke counters to monitor gallon usage. All such devices shall be visible to the Engineer.
6. The applicator shall be equipped with all the necessary spray equipment, mixers, compressors and other appurtenances to allow for the placement of reflectorized pavement marking system in a simultaneous sequence of operations.
7. Each application equipment must have a proven mixing system for proper mixing of the two components.
8. Each mobile applicator must be equipped with a completely enclosed flush and purge system to clean the lines and the guns without exuding any of the solution into the environment.

The Contractor shall provide an accurate temperature-measuring device(s) that shall be capable of measuring the pavement temperature prior to application of the material, the material temperature at the gun tip and the material temperature prior to mixing.

INSTALLATION REQUIREMENTS

A. Surface Preparation:

Clean the surface by a method approved by the Engineer to remove all dirt, grease, debris, glaze, laitance and any other contaminants that may hinder the adhesion of the system to the surface with minimum or no damage to the pavement surface. New Portland cement concrete pavements shall be water, shot or sand blasted clean to remove all latents. New pavements shall be grooved where required by design in accordance with the Illinois Tollway Supplemental Specifications for grooving for recessed pavement markings followed by blast cleaning. Whenever grinding/grooving, scarifying, sandblasting, shot blasting or other operations are performed, the debris generated must be contained through vacuum type equipment or equivalent and the work shall be conducted in such a manner that the finished pavement surface is not damaged or left in a pattern that will mislead or misdirect the motorist.

When these operations are completed the pavement surface shall first be power broomed and then blown off with compressed air to remove residue and debris resulting from the cleaning work. All such debris must be properly contained especially when removing yellow paint lines and disposed of in the appropriate manner.

Removal and cleaning work shall be a continuous moving operation and conducted in such a manner as to control and minimize airborne dust, and similar debris so as to prevent a hazard to motor vehicle operation or nuisance to property.

Care shall be taken on bituminous and portland cement concrete surface when performing removal and cleaning work to prevent damage to transverse and longitudinal joint sealers.

B. Limits of Work:

Cleaning and surface preparation work shall be confined to the surface area specified for the application of pavement marking materials; or the surface area of existing pavement markings that are specified for removal on the plans, or as directed by the Engineer.

Surface preparation work includes cleaning for lines or cleaning for letters and symbols. Lines will be meant to include: Solid lines, broken lines, dotted lines, channelizing lines, barrier lines, stop lines, crosswalk lines and crossbars.

When lines are cleaned, the area of preparation will be the width of the new pavement marking, or existing line, plus one (1) inch on each side. When letters and symbols are cleaned the area of preparation will be sufficiently large to accommodate the new marking, or to remove the existing marking. Markings shall be applied to the cleaned surfaces on the same calendar day. If this cannot be accomplished, the surface shall be re-cleaned prior to applying the markings. No new marking, line or symbols shall be applied on any pavement that has not been properly prepared as per this specification and until the Engineer approves the cleaning.

C. Removal of Concrete Curing Compounds:

On new portland cement concrete pavements, cleaning operations shall not begin until a minimum of 10 days after the placement of concrete. The extent of the blasting work and/or grooving shall be to clean and prepare the concrete surface such that:

- a. There is not visible evidence of curing compound on the peaks of the textured concrete surface.
- b. There are no heavy puddled deposits of curing compound in the valleys of the textured concrete surface.
- c. All remaining curing compound is intact; all loose and flaking material is removed.
- d. The peaks of the textured pavement surface are rounded in profile and free of sharp edges and irregularities.
- e. The extent of the removal should be as such to insure the laitance is removed on both old as well as new concrete.

D. Removal of Existing Pavement Markings:

Existing pavement marking shall be cleaned for the purpose of:

- a. Preparing the pavement surface for the application of a new multi-polymer pavement marking in the same location as the existing markings of a different type.

- b. To remove existing markings that are in good condition which, if allowed to remain, will interfere with or otherwise conflict with newly applied marking patterns.

It shall be understood that in this context cleaning means the removal of an existing marking. It is not intended that all deteriorated existing pavement markings be removed. Example: If a new marking is applied to an unmarked "gap" in a broken line and the existing broken line pattern is worn or deteriorated, as determined by the Engineer, to the extent that it is not misleading or confusing to the motorist, the existing markings do not require removal.

Existing pavement markings that are to be totally replaced with a multi-polymer marking shall be cleaned to the extent that 95% to 100% of the existing marking is removed. Removal operations shall be conducted in such a manner that no more than moderate color and/or surface texture change results on the surrounding pavement surface.

The determination of acceptable removal will be made by judgment of the Engineer.

- c. Existing multi-polymer pavement markings to be recapped shall be cleaned via approved light grinding or blasting operations to the extent that all loose/flaky marking materials are removed as well as oil, dirt, etc. that may contaminate the application of the new marking material. A complete removal of the existing multi-polymer pavement markings is not necessary provided that it has been established to the Engineers' satisfaction that the existing markings are well bonded to the substrate and will not compromise the new markings. Recapping of existing markings will be limited to application over only long-life markings (TMPTA or other multifunctional monomer free systems) after verification with manufacturer and limited to one recapping event. A minimum of 20 mil of the liquid multi-polymer material is required for recapping before application of the glass beads.

- E. Remove excess oils on asphalt pavements:

Removal of excess oils on SBR Latex, SBS, and SMA polymer/GTR modified asphalts shall require the following procedure (for any other type of polymer modified asphalts contact the pavement marking manufacturer for recommendations):

Remove excess oils exposing the top of the aggregates using approved light grinding or blast cleaning operations. Care shall be taken when performing this work to prevent gouging of the pavement and damage to the transverse and longitudinal joints.

- F. Application:

The pavement marking system shall be applied through special machinery designed to precisely meter the two components in the ratio of proportion recommended by the material manufacturer. This equipment shall also comply with the previous specifications. The application of and combination of reflective media (glass beads and/or reflective elements) shall be applied at a rate specified by the manufacturer.

The edge of the center line or lane line shall be offset a minimum distance of 2 in. (50 mm) from a longitudinal crack or joint. Edge lines shall be approximately 2 in. (50 mm) from the edge of pavement. The finished center and lane lines shall be straight, with lateral deviation of any 10 ft. line not to exceed 1 in.

G. Atmospheric Conditions:

The pavement marking shall only be applied during conditions of dry weather and on subsequently dry pavement surfaces at the specified minimum uniform wet thickness according to the manufacturer's installation instructions. At the time of installation, the pavement surface temperature and the ambient temperature shall be above 45°F. For application at temperatures below 50°F, the hybridized polymer manufacturer shall be contacted for guidance. The Engineer shall determine the atmospheric conditions and pavement surface conditions that produce satisfactory results.

H. Application Temperatures:

Both components shall be brought to the temperature condition recommended by the manufacturer prior to mixing and spraying.

At any time throughout the duration of the project, the Contractor shall provide free access to his/her application equipment for inspection by the Engineer, his/her authorized representative, or the materials representative.

Notification. The Contractor shall notify the Engineer 72 hours prior to the placement of the markings in order that he/she can be present during the operation. At the time of notification, the Contractor shall provide the Engineer the manufacturer and lot numbers of multi-polymer material and reflective media that will be used.

Inspection and Performance Requirements. The multi-polymer pavement markings will be inspected according to Article 780.12 of the Standard Specifications. The initial inspection will occur by October 15 or 30 days after placement, whichever is later.

Final inspection will follow a winter performance period and will occur between April 1 and May 30. Lane line, edgeline, and centerline pavement markings shall provide effective delineation, presence, and retroreflectivity as noted below. During the inspection period, the Engineer will make such observations and measurements as necessary to determine conformance with these performance requirements.

- A. The pavement markings shall meet the following Minimum Retroreflectivity Requirements:
- B.

Performance Retroreflectivity Criteria mcd/m ² /lux	
White	Yellow
325	275

Retroreflectivity requirements shall be measured with a handheld or mobile retroreflectometer that meets the requirements of ASTM E 1710. Performance criteria apply to the average retroreflectance over a 0.1 mile section. Any 0.1 mile section that does not meet this requirement shall be replaced within 30 days, weather permitting.

- C. The pavement markings shall meet or exceed 95% present and intact. Evaluation of presence and intact shall be made on 25' sections and averaged for 0.1 mile sections. Any 0.1 mile section that does not meet this requirement shall be replaced within 30 days, weather permitting.

Packaging and Shipment. The pavement marking materials shall be shipped to the jobsite in strong substantial containers. Individual containers shall be plainly marked with the following information:

- a. Name of Product
- b. Lot Number
- c. Batch Number
- d. Date of Manufacture
- e. Quantity
- f. Mixing proportions
- g. Safety information
- h. Manufacturer's Name and Address

Reflective media shall be shipped in moisture resistant bags. Each bag shall be marked with name and address of the manufacture and the name and net weight of the material with a clear indication of what type of coating is present on the beads.

Sampling and Acceptance.

- A. **Certification of Compliance:**
The material manufacturer shall furnish a notarized certification that the material complies with the provisions of this specification. It shall not be inferred that the provisions of a certification of compliance waives Illinois Tollway inspection, sampling or testing.
- B. **Laboratory Samples:** Promptly after execution of the contract, the contractor shall notify the Engineer of the sources of material he/she expects to use. The material manufacturer shall furnish samples of the hybridized polymer materials as may be required by the Engineer, a minimum of ten days before the date of intended use of these materials.
- C. **Infrared Spectra:** A copy of the infrared spectra of each component on each lot number shall be supplied by the manufacturer along with the certification papers. This infrared spectra will be on record with the Illinois Tollway to serve as a quality control measure for the future supply of this system to the Illinois Tollway.

Qualification.

A. Qualifying a Manufacturer:

The Manufacturer must have expertise providing a pavement marking material that meets this specification with a documented performance history to include:

- a. Verifiable installations: proof of successful installations of at least 6 years old covering a minimum of 200,000 feet in 4 states in North America inclusive of climates having high UV exposure and high snow fall/plowing (seasonal snow fall >36 inches). Documentation of installations of similar climatic and traffic conditions shall be provided to the Illinois Tollway for material approval.
- b. The manufacturer will have demonstrated field performance in the locale of proposed application for a minimum of 12 months.
- c. Production facilities; 2 geographically separate locations minimum
- d. Compliance with EPA regulations
- e. A Verifiable ISO 9001 certified Q.C. Program

B. Qualifying a Contractor:

Multi-polymer pavement markings shall only be applied by Contractors on the IDOT list of Approved Contractors, listed under the Modified Urethane Pavement Marking sub-category, maintained by the Engineer of Operations and in effect on the date of advertisement for bids.

In order for an installer of such pavement marking material to be approved, the following document must be submitted:

- a. A certificate from a pre-approved manufacturer of such pavement marking materials, certifying that such a contractor has functional, appropriate equipment to install the pavement marking material of choice. The certification must be submitted to the Illinois Tollway for review and approval prior to the installation of the pavement marking.

Method of Measurement. Lines will be measured for payment in place, in feet of multi-polymer pavement marking lines applied and accepted, measured in place.

Measurement of the multi-polymer letters, numbers, and symbols conforming to the sizes and dimensions specified will be the total area in square feet (square meter) calculated from the following unit areas

LETTERS SQ. FT. (SQ. M.)									
SIZE	A	B	C	D	E	F	G	H	I
6 ft	3.1	4.0	2.7	3.4	3.3	2.6	3.3	3.4	1.5
(1.8 m)	(.28)	(.37)	(.25)	(.31)	(.31)	(.24)	(.31)	(.31)	(.14)
8 ft	5.5	7.1	4.8	6.1	5.9	4.7	5.8	6.0	2.6
(2.4 m)	(.51)	(.66)	(.45)	(.57)	(.55)	(.44)	(.54)	(.56)	(.24)
SIZE	J	K	L	M	N	O	P	Q	R
6 ft	2.1	3.1	2.2	4.2	4.0	3.4	3.0	3.6	3.6
(1.8 m)	(.20)	(.28)	(.20)	(.39)	(.37)	(.31)	(.28)	(.33)	(.33)
8 ft	3.7	5.7	3.8	7.4	7.1	6.0	5.3	6.3	6.3
(2.4 m)	(.34)	(.53)	(.45)	(.69)	(.65)	(.56)	(.49)	(.59)	(.59)
SIZE	S	T	U	V	W	X	Y	Z	
6 ft	3.2	2.2	3.2	2.7	4.2	2.7	2.2	2.9	
(1.8 m)	(.30)	(.20)	(.30)	(.25)	(.39)	(.25)	(.20)	(.26)	
8 ft	5.7	3.8	5.6	4.8	7.3	4.8	3.9	5.1	
(2.4 m)	(.53)	(.35)	(.52)	(.45)	(.68)	(.45)	(.36)	(.47)	

NUMBERS SQ. FT. (SQ. M.)					
SIZE	1	2	3	4	5
6 ft	1.5	3.3	3.3	2.9	3.5
(1.8 m)	(0.14)	(0.31)	(0.31)	(0.26)	(0.33)
8 ft	2.6	5.8	5.8	5.1	6.1
(2.4 m)	(0.24)	(0.54)	(0.54)	(0.47)	(0.57)
SIZE	6	7	8	9	0
6 ft	3.5	2.2	3.8	3.5	3.4
(1.8 m)	(0.33)	(0.20)	(0.35)	(0.33)	(0.31)
8 ft	6.2	3.8	6.7	6.1	6.0
(2.4 m)	(0.58)	(0.35)	(0.62)	(0.58)	(0.56)

SYMBOLS SQ. FT. (SQ. M.)	LARGE SIZE	SMALL SIZE
Through Arrow	11.5 (1.07)	6.5 (0.60)
Left or Right Arrow	15.6 (1.47)	8.8 (0.82)
Combination Left or Right and Through Arrow	26.0 (2.42)	14.7 (1.37)
Railroad "X" 20 feet (6.1 m)	54.0 (5.02)	--

Basis of Payment. Payment for this work will be made at the contract unit price per foot of applied line width for MULTI-POLYMER PAVEMENT MARKING – LINE of thickness specified, and per square foot for MULTI-POLYMER PAVEMENT MARKING, LETTERS AND SYMBOLS.

PAVEMENT MARKING AND MARKER REMOVAL (ILLINOIS TOLLWAY)

Effective: September 27, 2006

Revised: February 25, 2022

This work shall consist of removing existing pavement markings and raised pavement lane markers according to Section 783 of the Standard Specifications except as modified herein.

Revise Article 783.02 of the Standard Specifications to read:

“783.02 Equipment. Equipment shall be according to the requirements of the following Articles of Section 1100 of the IDOT Standard Specifications – Equipment.

Replace Article 1101.12 with below:

Water Blaster with Vacuum Recovery. The water blaster shall remove the stripe from the pavement using a high pressurized water spray with a vacuum recovery system to provide a clean, almost dry surface, without the use of a secondary cleanup process. The removal shall be to the satisfaction of the Engineer. The equipment shall contain a storage system that allows for the storage of the wastewater while retaining the debris. The operator shall be in immediate control of the blast head. Water blasting shall be used only when the air temperature is a minimum of 32 °F and rising.

Revise the first paragraph of Article 783.03(a) to read:

“(a) Pavement Markings. The existing pavement markings on permanent pavements shall be removed from the pavement by a method that does not materially damage the surface or texture of the pavement or surfacing. Very small particles of tightly adhering existing markings may remain in place, if in the opinion of the Engineer, complete removal of the small particles will result in pavement surface damage. Any damage to the pavement or surfacing caused by pavement marking removal shall be repaired by the Contractor at his/her own expense by methods acceptable to the Engineer. Where blast cleaning is used for the removal of pavement markings, care should be taken to protect all vehicular traffic from damage. Removal by Hydro blasting shall be required on new permanent pavement. Removal by shot blasting or grinding shall be allowed only on temporary short life pavements or on existing permanent pavements as approved by the Engineer.”

Revise Article 783.06 to read:

783.06 Basis of Payment. This work will be paid for at the contract unit price per each for RAISED PAVEMENT LANE MARKER REMOVAL, RAISED PAVEMENT LANE MARKER, REFLECTOR REMOVAL or at the contract unit price per square foot for PAVEMENT MARKING REMOVAL by means of shot blasting or grinding, or at the contract unit price per square foot for WATERBLAST PAVEMENT MARKING REMOVAL WITH VACUUM RECOVERY.

UNDERGROUND CONDUIT, COILABLE NON-METALLIC CONDUIT, SDR 11 (ILLINOIS TOLLWAY)

Effective: April 1, 2016
Revised: October 23, 2023

Description. This work shall consist of furnishing and installing coilable non-metallic conduit, fittings, and accessories, as part of a raceway bored and pulled in place, plowed, trenched, or pulled in sleeves.

Material. The conduit shall be a solid-wall high density polyethylene (HDPE) duct intended for underground use and can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties or performance.

The conduit shall meet the requirements of the following standards:

- American Society for Testing and Materials (ASTM) D 3350, minimum cell class of PE334480 C or E in conformance with Standards D3350 and F2160 of the American Society for Testing and Materials (ASTM).
- National Electrical Manufacturers Association (NEMA) Standard TC 7 (2013) for Smooth Wall Coilable Electrical Polyethylene Conduit

The coilable non-metallic SDR-11 conduit properties shall conform to the nominal dimensions shown in the table below:

Nom. Duct Diameter (in)	Nom. Outside Diameter (in)	Nom. Inside Diameter (in)	Min. Wall Thickness (in)
1	1.315	1.055	0.120
1 ¼	1.660	1.338	0.151
1 ½	1.900	1.533	0.173
2	2.375	1.917	0.216
2 ½	2.875	2.322	0.261
3	3.500	2.825	0.318
4	4.500	3.633	0.409
6	6.625	5.348	0.602

CONSTRUCTION REQUIREMENTS

The Contractor shall closely coordinate the work prescribed under this special provision with the Engineer. This includes, but is not limited to, the following:

Pre-Procurement Documentation Approval. The Contractor shall obtain approval of the conduit installation schedule and catalog cut sheets from the Engineer prior to purchasing, and subsequently performing the installation per the approved documents, contract plans, and specifications.

The Contractor shall make all submissions to the Engineer through the Illinois Tollway Web Based Program Management (WBPM) system.

Conduit Installation

GENERAL

- Coilable non-metallic conduit larger than 3 inches shall be machine straightened to remove the longitudinal curvature and ovality caused by coiling the conduit onto reels. The conduit straightening process shall not deform the cross-section of the conduit.
- If the trench is located in soils classified as Types 1, 2, 3, or 4, the disposal of the surplus material shall be according to the Tollway special provision for "Disposal of Regulated Substances and Uncontaminated Soils".
- Maximum Deflection: Fiber optic conduit runs shall not exceed 90-degrees of total deflection.
- The Contractor shall install in all empty conduits, underground or above grade, a $\frac{5}{8}$ inch woven polyester toneable pull tape with a minimum tensile strength of 1200 lbs.-force. When multiple underground conduits are installed in the same trench, the toneable pull tape may be installed in only one conduit designated last for cable installation. A non-toneable pull tape with a minimum tensile strength of 1200 lbs.-force shall be installed in all remaining conduits. All pull tapes shall have six (6) feet of extra slack extending from each end of the conduit and shall be secured before the conduit ends are plugged.
- Underground cable marking tape shall be installed in accordance with Article 810.04 (a) of the Standard Specifications.

IN DUCT PACKAGE

- The conduit shall be installed in continuous lengths without splicing. Conduit bends shall be made manually to prevent conduit damage or possible reduction to the inside diameter of the conduit.
- All underground raceways shall have a minimum depth of 33 inches below finished grade unless otherwise indicated on the contract plans. All raceways installed beneath pavement shall have a minimum depth of 45 inches below the top of pavement to avoid conflicts with the underdrain system unless otherwise indicated on the plans or directed by the Engineer.

PLOWED

- Plowing shall be done with equipment capable of feeding the conduit through the plow. Equipment which pulls the conduit behind a bullet-nose plow will not be allowed except by written approval of the Engineer. The plow shall be capable of plowing a cavity and placing the conduit to the specified depth in a single operation without kinking or otherwise damaging the conduit. The conduit shall be round and free of kinks when fed into the plow and placed in the ground. Pulling of the conduit within the plowed cavity will not be allowed.
- Where another circuit is plowed in parallel to the first, the distance between the two shall not be less than 1 foot nor more than 2 feet.

BORED AND PULLED IN PLACE

- Conduit shall be installed with the use of an auger. Conduit in the subgrade of the proposed improvement shall extend a minimum of 2 feet beyond the edge of proposed pavement, stabilized shoulder, or paved median.
- Areas disturbed by the auguring operation shall be restored to their original condition as directed by the Engineer.

PULLED IN SLEEVES

- Pulled in Sleeves: Conduit shall be pulled in sleeves underground or attached to structure for roadway crossing or bridge transition when noted on the plans.

CONDUIT PROOFING AND TESTING

- All conduits shall be cleaned by wire brush mandrel to remove all dirt and other foreign materials and install compression plugs on both end of the conduit until conductors are installed. The Contractor shall record the results on the Conduit Test form attached to this special provision and provide it to the Engineer for review and acceptance.
- The wire-brush mandrel and solid aluminum mandrel shall be SIGNED BY BOTH the Contractor and the Engineer and submitted via the WBPM system for approval.
- Performance Tests: Conduit test procedures and test results shall meet the requirements of NEMA Standard No. TC 7 and ASTM F2160 Sections 4 and 5. Certified copies of the test report shall be submitted to the Engineer prior to the installation of the conduit.
- All conduits installed under this contract, the Contractor shall proof the conduit system with a solid aluminum mandrel, as per the Table below, to remove any obstruction or debris. The Contractor shall perform the conduit proofing in the presence of the Engineer. The Contractor shall apply a pressure of 100 – 110 psi to the conduit, close the air output valve and stop compressor, and measure air pressure loss. The maximum allowable air pressure loss within 2 minutes of pressurization is 20 psi. The Contractor shall record results on the Conduit Test form attached to this special provision. The form is signed by the Engineer and submitted via the WBPM system.

Conduit Size (in)	Mandrel Diameter (in)	Minimum Mandrel Length (in)	Maximum Mandrel Length (in)	Proof (%)
1	0.60	1.0	4	80
1 ¼	0.86	1.5	4	80
1 ½	1.12	1.8	4	80
2	1.62	2.4	6	80
2 ½	2.0	2.75	7	80
3	2.5	3.25	8	80
4	3.5	4.25	8	85
6	5.5	6.25	10	85

Method of Measurement. This work will be measured for payment in feet.

Basis of Payment. This work will be paid for at the contract unit price per foot for UNDERGROUND CONDUIT, COILABLE NONMETALLIC CONDUIT, SDR 11 of the size specified.

Conduit Testing Form							
Date: _____		Route: _____		Direction: _____			
Starting Station: _____			Ending Station: _____				
Starting Mile Post: _____			Ending Mile Post: _____				
Conduit #	Conduit Color Marking (Color/Stripe)	Conduit Size (In.)	Cleaned (Swabbed)	Pressure Test Starting Pressure (PSI)	Pressure Test End Pressure (PSI)	Pull Cord Installed	Capped
1						<input type="checkbox"/>	<input type="checkbox"/>
2						<input type="checkbox"/>	<input type="checkbox"/>
3						<input type="checkbox"/>	<input type="checkbox"/>
4						<input type="checkbox"/>	<input type="checkbox"/>
5						<input type="checkbox"/>	<input type="checkbox"/>
6						<input type="checkbox"/>	<input type="checkbox"/>
7						<input type="checkbox"/>	<input type="checkbox"/>
8						<input type="checkbox"/>	<input type="checkbox"/>
9						<input type="checkbox"/>	<input type="checkbox"/>
10						<input type="checkbox"/>	<input type="checkbox"/>
11						<input type="checkbox"/>	<input type="checkbox"/>
12						<input type="checkbox"/>	<input type="checkbox"/>
13						<input type="checkbox"/>	<input type="checkbox"/>
14						<input type="checkbox"/>	<input type="checkbox"/>
15						<input type="checkbox"/>	<input type="checkbox"/>
16						<input type="checkbox"/>	<input type="checkbox"/>
17						<input type="checkbox"/>	<input type="checkbox"/>
18						<input type="checkbox"/>	<input type="checkbox"/>
19						<input type="checkbox"/>	<input type="checkbox"/>
20						<input type="checkbox"/>	<input type="checkbox"/>
21						<input type="checkbox"/>	<input type="checkbox"/>
22						<input type="checkbox"/>	<input type="checkbox"/>
23						<input type="checkbox"/>	<input type="checkbox"/>
24						<input type="checkbox"/>	<input type="checkbox"/>
25						<input type="checkbox"/>	<input type="checkbox"/>
26						<input type="checkbox"/>	<input type="checkbox"/>
27						<input type="checkbox"/>	<input type="checkbox"/>
28						<input type="checkbox"/>	<input type="checkbox"/>
29						<input type="checkbox"/>	<input type="checkbox"/>
30						<input type="checkbox"/>	<input type="checkbox"/>
Contractor: _____							
Engineer: _____							

GROUND MOUNTED LIGHT POLE, GALVANIZED STEEL, WITHOUT MAST ARM

Effective: June 30, 2017

Revised: March 1, 2022

Description. This work shall consist of furnishing and installing a galvanized steel pole and all hardware and accessories per the contract plans and as required for the intended use of the pole. This work shall also include the installation of rodent protection material between the base of the pole and pole foundation, as well as vibration dampening devices.

Materials. Material shall be according to contract plan details and Section 1069 of the Illinois Tollway Supplemental Specifications.

Q-Set 250 shall be utilized for the rodent protection material.

CONSTRUCTION REQUIREMENTS

Construction shall be according to Section 830 of the Illinois Tollway Supplemental Specifications.

Installation of the Q-Set 250 shall follow the manufacturer guidelines and the following:

- Once cables are installed through the ITS element pole and before the pole is bolted to the anchor plat on the helix foundation, along with the steel mesh the Contractor is required to install a cap at the bottom opening of the ITS element pole to prevent the composite backfill from spilling out of the opening.
- Once capped, the steel pole shall be bolted to the anchor plate using specified installation methods.
- The Contractor shall then mix and prepare the composite backfill (Q-Set 250) as per the manufacturer's recommendation in the presence of the Engineer. Before the composite backfill starts expanding, the mix shall be quickly poured into the steel pole through the handhole access door. As the composite backfill expands during the curing process, the contractor is to ensure that the inner pole remains accessible through the handhole access door. The handhole shall remain accessible after the composite backfill material achieves its fully cured strength. At no time shall the handhole access be blocked or obstructed by the composite filler.

The pole shall be designed to withstand wind induced vibrations in the shaft so that no damage occurs to the shaft, or any attached ITS element and/or the component parts. The pole shall be coordinated with all electronic devices to be free of susceptibility to harmful harmonics and vibrations. A dampening device, as an integral part of the shaft, shall be installed in the shaft to alleviate such vibrations in all ITS poles. Pole deflection and loading compliance, certified by the manufacturer, shall be noted on the pole submittal. The proposed vibration dampening device shall be included with the Contractor's submittal.

Method of Measurement. This work will be measured in units of each.

Basis of Payment. This work will be paid for at the contract unit price per each for GROUND MOUNTED LIGHT POLE, GALVANIZED STEEL, WITHOUT MAST ARM, of the mounting height specified.

RELOCATE EXISTING LIGHTING UNIT, SPECIAL

Description. This work shall consist of relocating an existing lighting unit in accordance with Section 844 of the Standard Specifications.

Materials. Materials used shall be according Sections 830 and 838 of the Illinois Tollway Supplemental Specifications. New pole mounting hardware shall be used.

Installation. Light pole installation shall be as per Article 844.03 (b) of the Standard Specifications and Article 830.03 of the Illinois Tollway Supplemental Specifications

CONSTRUCTION REQUIREMENTS

Construction shall be according to Sections 830 and 838 of the Illinois Tollway Supplemental Specifications.

Method of Measurement. This work will be measured in units of each.

Basis of Payment. This work will be paid for at the contract unit price per each for RELOCATE EXISTING LIGHTING UNIT, SPECIAL, for complete removal of each existing lighting unit and reinstallation on a new foundation.

MAINTAIN LIGHTING SYSTEM

Description. This work shall consist of providing the maintenance of lighting requirements in accordance with Section 846 of the Illinois Tollway Supplemental Specifications except as modified herein.

Materials. Material used to maintain lighting system shall be according to applicable Sections of the Illinois Tollway Supplemental Specifications.

Revise Article 846.13 to read:

Method of Measurement. This Work will be measured for payment in calendar month or fraction thereof for MAINTAIN LIGHTING SYSTEM. The contractor shall demonstrate to the satisfaction of the Engineer that the lighting system is operational prior to submitting a pay request. Failure to do so will be grounds for denying the pay request. Calendar months or fraction thereof in which the lighting systems are not maintained and not operational will not be paid.

Revise Article 846.14 to read:

Basis of Payment. This work will be paid for at the contract unit price per calendar month or fraction thereof for MAINTAIN LIGHTING SYSTEM.

LOCATE/TRACER WIRE FOR OPTIC FIBER CONDUIT RACEWAYS (ILLINOIS TOLLWAY)

Effective: March 1, 2020
Revised: March 12, 2021

Description. This work shall consist of furnishing and installing a direct buried Locate / Tracer wire with all underground optic fiber Coilable non-metallic Conduit, Bundle or Duct path, and accessories, as part of a trenched, plowed, or bored Tollways optic fiber conduits planned raceway. The tracer wire’s purpose of is to carry an electronic signal for use in locating underground conduit and optic fiber.

Material. The tracer wire shall be single conductor 12 AWG insulated with high-molecular weight polyethylene (HMWPE) specifically for use in direct burial applications. HMWPE shall be rugged and durable with excellent moisture and abrasion resistance.

1. LOCATE TRACER WIRE
 - a. 30-mil high density orange polyethylene jacket with 30-volt rating
2. LOCATOR TRACER WIRE, DIRECTIONAL BORE
 - a. 45-mil high density orange polyethylene jacket with 30-volt rating

AWG 12 Conductors	Breaking Pounds Hard (min)	Insulated Thickness 30v	Nominal Overall Diameter 30v	Approx. Shipping Wgt (Lbs./1000ft.)
Solid Copper	340	0.030"	0.14"	27
Steel Core Copper Clad	1150	0.045"	0.17"	25

CONSTRUCTION REQUIREMENTS

The Contractor shall closely coordinate the work prescribed under this special provision with the Engineer. This includes, but is not limited to, the following:

Pre-Procurement Documentation Approval. The Contractor shall obtain approval of the conduit installation schedule and locate wire catalog cut sheets from the Engineer prior to purchasing, and subsequently performing the installation per the approved documents, contract plans, and specifications. The Contractor shall make all submissions to the Engineer through the Illinois Tollway Web Based Program Management (WBPM) system.

Locate Wire Installation

- LOCATE/TRACER WIRE for all trenched or plowed installations of optic fiber shall be solid copper.
- LOCATE/TRACER WIRE, DIRECTIONAL BORE for all bored optic fiber installations shall be steel core copper clad.
- The locate wire shall be installed with the optic fiber conduit in continuous lengths without splicing. All bends shall be made manually to prevent damage to the locate wire.

- Connection devices used shall be as approved by the tracer wire manufacturer, except wire nuts of any type are not acceptable and shall not be used.
- Trenched: The direct bury locate wire shall be uncoiled and placed in the trench on top of the optic fiber conduit. Periodically attach the locate wire to the exterior of the conduit using ty-raps or Velcro.
- Plowing: The plow shall be capable of plowing a cavity and placing the locate wire next to the conduit to the specified depth in a single operation without kinking or otherwise damaging the locate wire.
- Duct Package: The locate tracer wire shall be placed on the top center of the duct package.
- Directional Boring: The locator trace wire is installed in the bore path, outside the conduit(s).
- All trace wire will be terminated to a locate post located at each end of a fiber path and at every lateral or splice handhole.
- Where fiber conduit paths diverge, a locate/trace wire shall be installed for each path.

Method of Measurement. This work will be measured for payment in feet.

Basis of Payment. This work will be paid for at the contract unit price per foot for LOCATOR TRACER WIRE or LOCATOR TRACER WIRE, DIRECTIONAL BORE.

DECOMMISSIONING AND DISPOSAL OF SEWAGE SYSTEM

Description. This work shall consist of the complete removal and disposal of the existing septic systems for the Illinois Toll Plaza 31 building which includes removal of septic tanks, septic system sewer pipes, clean outs, control panels, conduits, cables, distribution boxes, lift stations, seepage fields and any other related items as shown on the Plans or as directed by the Engineer, in accordance with all applicable federal, state, and local rules and regulations.

This work shall also include the Contractor's filing for and subsequent obtaining of all permits, if required, for the removal of the existing sanitary septic systems.

Existing Information. There are two manholes located along the northwest side of Ramp F for the concrete septic tank. Based on existing plans, the approximate location of the septic system which includes the pipes, clean outs, control panel, cables, distribution box, lift station, and gravel trench seepage field are reflected on the Existing Demolition plan sheets. The estimated location of the previously abandoned septic tank is also shown on the Plans. The completeness of the information is not guaranteed and is to be used solely at the Contractor's risk. No additional payment to account for conditions found in the field will be made.

Construction Requirements. The Contractor shall locate and remove all portions of the existing sanitary septic system, including but not limited to, all connecting pipes, clean outs, control panels conduits, cables, distribution boxes, lift stations, seepage fields, tanks, etc. to the satisfaction of the Engineer.

The Contractor shall perform clearing, grubbing and excavation necessary to perform the removal work.

The Contractor shall remove the contents of each septic tank found. The disposal of the tanks and undesirable material (liquid and solid waste material) shall be done in a manner which meets the current standards of the Cook County Health Department, Illinois Environmental Protection Agency, and to the satisfaction of the Engineer. The Contractor shall also comply with the applicable provisions of the Illinois Department of Public Health Private Sewage Disposal Code Section 905.40(f). The removal and disposal of the tanks shall be performed by a professional licensed septic tank removal company/contractor at a location approved by the Engineer.

Following the removal of the septic systems, the Contractor shall backfill the voids with suitable material approved by the Engineer and compacted with acceptable fill to the original ground surface.

Method of Measurement. The work under this item as described herein will not be measured separately.

Earth excavation necessary to perform the removal of the septic tank systems will not be measured for payment.

Basis of Payment. This work will be paid at the lump sum contract unit price for DECOMMISSIONING AND DISPOSAL OF SEWAGE SYSTEM. This price shall be full compensation for removing, hauling, backfilling, compacting, furnishing all materials, labor, equipment and for any preparation, dumping fees and proper disposal, including any excavation of unsuitable materials, as well as any incidentals necessary to complete the work shown on the Plans and as specified.

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.”

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."

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.

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (DBE)

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 **13.00%** 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.

ILLINOIS WORKS APPRENTICESHIP INITIATIVE – STATE FUNDED CONTRACTS (BDE)

Effective: June 2, 2021

Revised: April 2, 2024

Illinois Works Jobs Program Act (30 ILCS 559/20-1 et seq.). For contracts having an awarded contract value of \$500,000 or more, the Contractor shall comply with the Illinois Works Apprenticeship Initiative (30 ILCS 559/20-20 to 20-25) and all applicable administrative rules. The goal of the Illinois Apprenticeship Works Initiative is that apprentices will perform either 10% of the total labor hours actually worked in each prevailing wage classification or 10% of the estimated labor hours in each prevailing wage classification, whichever is less. Of this goal, at least 50% of the labor hours of each prevailing wage classification performed by apprentices shall be performed by graduates of the Illinois Works Pre-Apprenticeship Program, the Illinois Climate Works Pre-Apprenticeship Program, or the Highway Construction Careers Training Program.

The Contractor may seek from the Department of Commerce and Economic Opportunity (DCEO) a waiver or reduction of this goal in certain circumstances pursuant to 30 ILCS 559/20-20(b). The Contractor shall ensure compliance during the term of the contract and will be required to report on and certify its compliance. An apprentice use plan, apprentice hours, and a compliance certification shall be submitted to the Engineer on forms provided by the Department and/or DCEO.

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES (BDE)

Effective: January 1, 2024

Revised: April 1, 2024

Revise the first paragraph of Article 669.04 of the Standard Specifications to read:

“669.04 Regulated Substances Monitoring. Regulated substances monitoring includes environmental observation and field screening during regulated substances management activities. The excavated soil and groundwater within the work areas shall be managed as either uncontaminated soil, hazardous waste, special waste, or non-special waste.

As part of the regulated substances monitoring, the monitoring personnel shall perform and document the applicable duties listed on form BDE 2732 “Regulated Substances Monitoring Daily Record (RSMDR).”

Revise the first two sentences of the nineteenth paragraph of Article 669.05 of the Standard Specifications to read:

“The Contractor shall coordinate waste disposal approvals with the disposal facility and provide the specific analytical testing requirements of that facility. The Contractor shall make all arrangements for collection, transportation, and analysis of landfill acceptance testing.”

Revise the last paragraph of Article 669.05 of the Standard Specifications to read:

“The Contractor shall select a permitted landfill facility or CCDD/USFO facility meeting the requirements of 35 Ill. Admin. Code Parts 810-814 or Part 1100, respectively. The Department will review and approve or reject the facility proposed by the Contractor based upon information provided in BDE 2730. The Contractor shall verify whether the selected facility is compliant with those applicable standards as mandated by their permit and whether the facility is presently, has previously been, or has never been, on the United States Environmental Protection Agency (U.S. EPA) National Priorities List or the Resource Conservation and Recovery Act (RCRA) List of Violating Facilities. The use of a Contractor selected facility shall in no manner delay the construction schedule or alter the Contractor's responsibilities as set forth.”

Revise the first paragraph of Article 669.07 of the Standard Specifications to read:

“**669.07 Temporary Staging.** Soil classified according to Articles 669.05(a)(2), (b)(1), or (c) may be temporarily staged at the Contractor's option. All other soil classified according to Articles 669.05(a)(1), (a)(3), (a)(4), (a)(5), (a)(6), or (b)(2) shall be managed and disposed of without temporary staging to the greatest extent practicable. If circumstances beyond the Contractor's control require temporary staging of these latter materials, the Contractor shall request approval from the Engineer in writing.

Topsoil for re-use as final cover which has been field screened and found not to exhibit PID readings over daily background readings as documented on the BDE 2732, visual staining or odors, and is classified according to Articles 669.05(a)(2), (a)(3), (a)(4), (b)(1), or (c) may be temporarily staged at the Contractor's option.”

Add the following paragraph after the sixth paragraph of Article 669.11 of the Standard Specifications.

“The sampling and testing of effluent water derived from dewatering discharges for priority pollutants volatile organic compounds (VOCs), priority pollutants semi-volatile organic compounds (SVOCs), or priority pollutants metals, will be paid for at the contract unit price per each for VOCS GROUNDWATER ANALYSIS using EPA Method 8260B, SVOCs GROUNDWATER ANALYSIS using EPA Method 8270C, or RCRA METALS GROUNDWATER ANALYSIS using EPA Methods 6010B and 7471A. This price shall include transporting the sample from the job site to the laboratory.”

Revise the first sentence of the eight paragraph of Article 669.11 of the Standard Specifications to read:

“Payment for temporary staging of soil classified according to Articles 669.05(a)(1), (a)(3), (a)(4), (a)(5), (a)(6), or (b)(2) to be managed and disposed of, if required and approved by the Engineer, will be paid according to Article 109.04.”

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)
	<i>Festuca rubra</i> ssp. <i>rubra</i> (Creeping Red Fescue)	40 (50)
1A Salt Tolerant Lawn Mixture 1/	Kentucky Bluegrass	60 (70)
	Perennial Ryegrass	20 (20)
	<i>Festuca rubra</i> ssp. <i>rubra</i> (Creeping Red Fescue)	20 (20)
	<i>Festuca brevipilla</i> (Hard Fescue)	20 (20)
	<i>Puccinellia distans</i> (Fults Saltgrass or Salty Alkaligrass)	60 (70)
1B Low Maintenance Lawn Mixture 1/	Turf-Type Fine Fescue 3/	150 (170)
	Perennial Ryegrass	20 (20)
	Red Top	10 (10)
	<i>Festuca rubra</i> ssp. <i>rubra</i> (Creeping Red Fescue)	20 (20)
2 Roadside Mixture 1/	<i>Lolium arundinaceum</i> (Tall Fescue)	100 (110)
	Perennial Ryegrass	50 (55)
	<i>Festuca rubra</i> ssp. <i>rubra</i> (Creeping Red Fescue)	40 (50)
	Red Top	10 (10)
2A Salt Tolerant Roadside Mixture 1/	<i>Lolium arundinaceum</i> (Tall Fescue)	60 (70)
	Perennial Ryegrass	20 (20)
	<i>Festuca rubra</i> ssp. <i>rubra</i> (Creeping Red Fescue)	30 (20)
	<i>Festuca brevipilla</i> (Hard Fescue)	30 (20)
	<i>Puccinellia distans</i> (Fults Saltgrass or Salty Alkaligrass)	60 (70)
3 Northern Illinois Slope Mixture 1/	<i>Elymus canadensis</i> (Canada Wild Rye) 5/	5 (5)
	Perennial Ryegrass	20 (20)
	Alsike Clover 4/	5 (5)
	<i>Desmanthus illinoensis</i> (Illinois Bundleflower) 4/ 5/	2 (2)
	<i>Schizachyrium scoparium</i> (Little Bluestem) 5/	12 (12)
	<i>Bouteloua curtipendula</i> (Side-Oats Grama) 5/	10 (10)
	<i>Puccinellia distans</i> (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 Slope Mixture 1/	Perennial Ryegrass
<i>Elymus canadensis</i> (Canada Wild Rye) 5/		20 (20)
<i>Panicum virgatum</i> (Switchgrass) 5/		10 (10)
<i>Schizachyrium scoparium</i> (Little Blue Stem) 5/		12 (12)
<i>Bouteloua curtipendula</i> (Side-Oats Grama) 5/		10 (10)
<i>Dalea candida</i> (White Prairie Clover) 4/ 5/		5 (5)
<i>Rudbeckia hirta</i> (Black-Eyed Susan) 5/		5 (5)
Oats, Spring		50 (55)

Class – Type	Seeds	lb/acre (kg/hectare)
4 Native Grass 2/ 6/	<i>Andropogon gerardi</i> (Big Blue Stem) 5/	4 (4)
	<i>Schizachyrium scoparium</i> (Little Blue Stem) 5/	5 (5)
	<i>Bouteloua curtipendula</i> (Side-Oats Grama) 5/	5 (5)
	<i>Elymus canadensis</i> (Canada Wild Rye) 5/	1 (1)
	<i>Panicum virgatum</i> (Switch Grass) 5/	1 (1)
	<i>Sorghastrum nutans</i> (Indian Grass) 5/	2 (2)
	Annual Ryegrass	25 (25)
	Oats, Spring	25 (25)
	Perennial Ryegrass	15 (15)
4A Low Profile Native Grass 2/ 6/	<i>Schizachyrium scoparium</i> (Little Blue Stem) 5/	5 (5)
	<i>Bouteloua curtipendula</i> (Side-Oats Grama) 5/	5 (5)
	<i>Elymus canadensis</i> (Canada Wild Rye) 5/	1 (1)
	<i>Sporobolus heterolepis</i> (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)
<u>Species:</u>		<u>% By Weight</u>
<i>Calamagrostis canadensis</i> (Blue Joint Grass)		12
<i>Carex lacustris</i> (Lake-Bank Sedge)		6
<i>Carex slipata</i> (Awl-Fruited Sedge)		6
<i>Carex stricta</i> (Tussock Sedge)		6
<i>Carex vulpinoidea</i> (Fox Sedge)		6
<i>Eleocharis acicularis</i> (Needle Spike Rush)		3
<i>Eleocharis obtusa</i> (Blunt Spike Rush)		3
<i>Glyceria striata</i> (Fowl Manna Grass)		14
<i>Juncus effusus</i> (Common Rush)		6
<i>Juncus tenuis</i> (Slender Rush)		6
<i>Juncus torreyi</i> (Torrey's Rush)		6
<i>Leersia oryzoides</i> (Rice Cut Grass)		10
<i>Scirpus acutus</i> (Hard-Stemmed Bulrush)		3
<i>Scirpus atrovirens</i> (Dark Green Rush)		3
<i>Bolboschoenus fluviatilis</i> (River Bulrush)		3
<i>Schoenoplectus tabernaemontani</i> (Softstem Bulrush)		3
<i>Spartina pectinata</i> (Cord Grass)		4

Class – Type	Seeds	lb/acre (kg/hectare)
5	Forb with	Annuals Mixture (Below)
	Annuals Mixture 2/ 5/ 6/	Forb Mixture (Below)
		1 (1)
		10 (10)
	Annuals Mixture - Mixture not exceeding 25 % by weight of any one species, of the following:	
	<i>Coreopsis lanceolata</i> (Sand Coreopsis)	
	<i>Leucanthemum maximum</i> (Shasta Daisy)	
	<i>Gaillardia pulchella</i> (Blanket Flower)	
	<i>Ratibida columnifera</i> (Prairie Coneflower)	
	<i>Rudbeckia hirta</i> (Black-Eyed Susan)	
	Forb Mixture - Mixture not exceeding 5 % by weight PLS of any one species, of the following:	
	<i>Amorpha canescens</i> (Lead Plant) 4/	
	<i>Anemone cylindrica</i> (Thimble Weed)	
	<i>Asclepias tuberosa</i> (Butterfly Weed)	
	<i>Aster azureus</i> (Sky Blue Aster)	
	<i>Symphotrichum leave</i> (Smooth Aster)	
	<i>Aster novae-angliae</i> (New England Aster)	
	<i>Baptisia leucantha</i> (White Wild Indigo) 4/	
	<i>Coreopsis palmata</i> (Prairie Coreopsis)	
	<i>Echinacea pallida</i> (Pale Purple Coneflower)	
	<i>Eryngium yuccifolium</i> (Rattlesnake Master)	
	<i>Helianthus mollis</i> (Downy Sunflower)	
	<i>Heliopsis helianthoides</i> (Ox-Eye)	
	<i>Liatris aspera</i> (Rough Blazing Star)	
	<i>Liatris pycnostachya</i> (Prairie Blazing Star)	
	<i>Monarda fistulosa</i> (Prairie Bergamot)	
	<i>Parthenium integrifolium</i> (Wild Quinine)	
	<i>Dalea candida</i> (White Prairie Clover) 4/	
	<i>Dalea purpurea</i> (Purple Prairie Clover) 4/	
	<i>Physostegia virginiana</i> (False Dragonhead)	
	<i>Potentilla arguta</i> (Prairie Cinquefoil)	
	<i>Ratibida pinnata</i> (Yellow Coneflower)	
	<i>Rudbeckia subtomentosa</i> (Fragrant Coneflower)	
	<i>Silphium laciniatum</i> (Compass Plant)	
	<i>Silphium terebinthinaceum</i> (Prairie Dock)	
	<i>Oligoneuron rigidum</i> (Rigid Goldenrod)	
	<i>Tradescantia ohiensis</i> (Spiderwort)	
	<i>Veronicastrum virginicum</i> (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)
	<u>Species:</u>	<u>% By Weight</u>
	<i>Aster novae-angliae</i> (New England Aster)	5
	<i>Echinacea pallida</i> (Pale Purple Coneflower)	10
	<i>Helianthus mollis</i> (Downy Sunflower)	10
	<i>Heliopsis helianthoides</i> (Ox-Eye)	10
	<i>Liatris pycnostachya</i> (Prairie Blazing Star)	10
	<i>Ratibida pinnata</i> (Yellow Coneflower)	5
	<i>Rudbeckia hirta</i> (Black-Eyed Susan)	10
	<i>Silphium laciniatum</i> (Compass Plant)	10
	<i>Silphium terebinthinaceum</i> (Prairie Dock)	20
	<i>Oligoneuron rigidum</i> (Rigid Goldenrod)	10
5B Wetland Forb 2/ 5/ 6/	Forb Mixture (see below)	2 (2)
	<u>Species:</u>	<u>% By Weight</u>
	<i>Acorus calamus</i> (Sweet Flag)	3
	<i>Angelica atropurpurea</i> (Angelica)	6
	<i>Asclepias incarnata</i> (Swamp Milkweed)	2
	<i>Aster puniceus</i> (Purple Stemmed Aster)	10
	<i>Bidens cernua</i> (Beggarticks)	7
	<i>Eutrochium maculatum</i> (Spotted Joe Pye Weed)	7
	<i>Eupatorium perfoliatum</i> (Boneset)	7
	<i>Helenium autumnale</i> (Autumn Sneezeweed)	2
	<i>Iris virginica shrevei</i> (Blue Flag Iris)	2
	<i>Lobelia cardinalis</i> (Cardinal Flower)	5
	<i>Lobelia siphilitica</i> (Great Blue Lobelia)	5
	<i>Lythrum alatum</i> (Winged Loosestrife)	2
	<i>Physostegia virginiana</i> (False Dragonhead)	5
	<i>Persicaria pensylvanica</i> (Pennsylvania Smartweed)	10
	<i>Persicaria lapathifolia</i> (Curlytop Knotweed)	10
	<i>Pycnanthemum virginianum</i> (Mountain Mint)	5
	<i>Rudbeckia laciniata</i> (Cut-leaf Coneflower)	5
	<i>Oligoneuron riddellii</i> (Riddell Goldenrod)	2
	<i>Sparganium eurycarpum</i> (Giant Burreed)	5
6 Conservation Mixture 2/ 6/	<i>Schizachyrium scoparium</i> (Little Blue Stem) 5/ <i>Elymus canadensis</i> (Canada Wild Rye) 5/ Buffalo Grass 5/ 7/ Vernal Alfalfa 4/ Oats, Spring	5 (5) 2 (2) 5 (5) 15 (15) 48 (55)
6A Salt Tolerant Conservation Mixture 2/ 6/	<i>Schizachyrium scoparium</i> (Little Blue Stem) 5/ <i>Elymus canadensis</i> (Canada Wild Rye) 5/ Buffalo Grass 5/ 7/ Vernal Alfalfa 4/ Oats, Spring <i>Puccinellia distans</i> (Fults Saltgrass or Salty Alkaligrass)	5 (5) 2 (2) 5 (5) 15 (15) 48 (55) 20 (20)
7 Temporary Turf Cover Mixture	Perennial Ryegrass Oats, Spring	50 (55) 64 (70)

Notes:

- 1/ Seeding shall be performed when the ambient temperature has been between 45 °F (7 °C) and 80 °F (27 °C) 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 °F (7 °C) for a minimum of seven (7) consecutive days and ending when the ambient temperature exceeds 80 °F (27 °C) 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 KNO₃ 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.”

SHORT TERM AND TEMPORARY PAVEMENT MARKINGS (BDE)

Effective: April 1, 2024

Revised: April 2, 2024

Revise Article 701.02(d) of the Standard Specifications to read:

“(d) Pavement Marking Tapes (Note 3)1095.06”

Add the following Note to the end of Article 701.02 of the Standard Specifications:

“Note 3. White or yellow pavement marking tape that is to remain in place longer than 14 days shall be Type IV tape.”

Revise Article 703.02(c) of the Standard Specifications to read:

“(c) Pavement Marking Tapes (Note 1)1095.06”

Add the following Note to the end of Article 703.02 of the Standard Specifications:

“Note 1. White or yellow pavement marking tape that is to remain in place longer than 14 days shall be Type IV tape.”

Revise Article 1095.06 of the Standard Specifications to read:

“1095.06 **Pavement Marking Tapes.** Type I white or yellow marking tape shall consist of glass spheres embedded into a binder on a foil backing that is precoated with a pressure sensitive adhesive. The spheres shall be of uniform gradation and distributed evenly over the surface of the tape.

Type IV tape shall consist of white or yellow tape with wet reflective media incorporated to provide immediate and continuing retroreflection in wet and dry conditions. The wet retroreflective media shall be bonded to a durable polyurethane surface. The patterned surface shall have approximately 40 ± 10 percent of the surface area raised and presenting a near vertical face to traffic from any direction. The channels between the raised areas shall be substantially free of exposed reflective elements or particles.

Blackout tape shall consist of a matte black, non-reflective, patterned surface that is precoated with a pressure sensitive adhesive.

- (a) Color. The white and yellow markings shall meet the following requirements for daylight reflectance and color, when tested, using a color spectrophotometer with 45 degrees circumferential/zero degree geometry, illuminant D65, and two degree observer angle. The color instrument shall measure the visible spectrum from 380 to 720 nm with a wavelength measurement interval and spectral bandpass of 10 nm.

Color	Daylight Reflectance %Y
White	65 min.
Yellow *	36 - 59

*Shall match Aerospace Material Specification Standard 595 33538 (Orange Yellow) and the chromaticity limits as follows.

x	0.490	0.475	0.485	0.530
y	0.470	0.438	0.425	0.456

- (b) Retroreflectivity. The white and yellow markings shall be retroreflective. Reflective values measured in accordance with the photometric testing procedure of ASTM D 4061 shall not be less than those listed in the table below. The coefficient of retroreflected luminance, R_L , shall be expressed as average millicandelas/footcandle/sq ft (millicandelas/lux/sq m), measured on a 3.0 x 0.5 ft (900 mm x 150 mm) panel at 86 degree entrance angle.

Coefficient of Retroreflected Luminance, R_L , Dry					
Type I			Type IV		
Observation Angle	White	Yellow	Observation Angle	White	Yellow
0.2°	2700	2400	0.2°	1300	1200
0.5°	2250	2000	0.5°	1100	1000

Wet retroreflectance shall be measured for Type IV under wet conditions according to ASTM E 2177 and meet the following.

Wet Retroreflectance, Initial R _L	
Color	R _L 1.05/88.76
White	300
Yellow	200

- (c) Skid Resistance. The surface of Type IV and blackout markings shall provide a minimum skid resistance of 45 BPN when tested according to ASTM E 303.
- (d) Application. The pavement marking tape shall have a precoated pressure sensitive adhesive and shall require no activation procedures. Test pieces of the tape shall be applied according to the manufacturer's instructions and tested according to ASTM D 1000, Method A, except that a stiff, short bristle roller brush and heavy hand pressure will be substituted for the weighted rubber roller in applying the test pieces to the metal test panel. Material tested as directed above shall show a minimum adhesion value of 750 g/in. (30 g/mm) width at the temperatures specified in ASTM D 1000. The adhesive shall be resistant to oils, acids, solvents, and water, and shall not leave objectionable stains or residue after removal. The material shall be flexible and conformable to the texture of the pavement.
- (e) Durability. Type IV and blackout tape shall be capable of performing for the duration of a normal construction season and shall then be capable of being removed intact or in large sections at pavement temperatures above 40 °F (4 °C) either manually or with a roll-up device without the use of sandblasting, solvents, or grinding. The Contractor shall provide a manufacturer's certification that the material meets the requirements for being removed after the following minimum traffic exposure based on transverse test decks with rolling traffic.
- (1) Time in place - 400 days
 - (2) ADT per lane - 9,000 (28 percent trucks)
 - (3) Axle hits - 10,000,000 minimum

Samples of the material applied to standard specimen plates will be measured for thickness and tested for durability in accordance with ASTM D 4060, using a CS-17 wheel and 1000-gram load, and shall meet the following criteria showing no significant change in color after being tested for the number of cycles indicated.

Test	Type I	Type IV	Blackout
Minimum Initial Thickness, mils (mm)	20 (0.51)	65 (1.65) ^{1/} 20 (0.51) ^{2/}	65 (1.65) ^{1/} 20 (0.51) ^{2/}
Durability (cycles)	5,000	1,500	1,500

1/ Measured at the thickest point of the patterned surface.

2/ Measured at the thinnest point of the patterned surface.

The pavement marking tape, when applied according to the manufacturer's recommended procedures, shall be weather resistant and shall show no appreciable fading, lifting, or shrinkage during the useful life of the marking. The tape, as applied, shall be of good appearance, free of cracks, and edges shall be true, straight, and unbroken.

(f) Sampling and Inspection.

- (1) Sample. Prior to approval and use of Type IV pavement marking tape, the manufacturer shall submit a notarized certification from an independent laboratory, together with the results of all tests, stating that the material meets the requirements as set forth herein. The independent laboratory test report shall state the lot tested, the manufacturer's name, and the date of manufacture.

After initial approval by the Department, samples and certification by the manufacturer shall be submitted for each subsequent batch of Type IV tape used. The manufacturer shall submit a certification stating that the material meets the requirements as set forth herein and is essentially identical to the material sent for qualification. The certification shall state the lot tested, the manufacturer's name, and the date of manufacture.

- (2) Inspection. The Contractor shall provide a manufacturer's certification to the Engineer stating the material meets all requirements of this specification. All material samples for acceptance tests shall be taken or witnessed by a representative of the Bureau of Materials and shall be submitted to the Engineer of Materials, 126 East Ash Street, Springfield, Illinois 62704-4766 at least 30 days in advance of the pavement marking operations."

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."

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%”

SUBMISSION OF PAYROLL RECORDS (BDE)

Effective: April 1, 2021

Revised: November 2, 2023

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, social security number, last known address, telephone number, email address, classification(s) of work actually performed, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof), daily and weekly number of hours actually worked in total, deductions made, and actual wages paid.

The Contractor and each subcontractor shall submit certified payroll records to the Department each week from the start to the completion of their respective work, except that full social security numbers, last known addresses, telephone numbers, and email addresses shall not be included on weekly submittals. Instead, the payrolls need only include an identification number for each employee (e.g., the last four digits of the employee’s social security number). 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.”

IDOT TRAINING PROGRAM GRADUATE ON-THE-JOB TRAINING SPECIAL PROVISION

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.

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.”

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.

WOOD SIGN SUPPORT (BDE)

Effective: November 1, 2023

Add the following to Article 730.02 of the Standard Specifications:

“(c) Preservative Treatment1007.12”

Revise the first paragraph of Article 730.03 of the Standard Specifications to read:

“730.03 **General.** Wood sign supports shall be treated. When the 4 x 6 in. (100 x 150 mm) posts are used, they shall be modified to satisfy the breakaway requirements by drilling 1 1/2 in. (38 mm) diameter holes centered at 4 and 18 in. (100 and 450 mm) above the groundline and perpendicular to the centerline of the roadway.”

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.”

MENTOR-PROTÉGÉ PROGRAM

Effective: June 1, 2007 Revised: February 1, 2013

Eligibility. This contract is eligible for the Department's Mentor-Protégé Program for those bidders with an approved Mentor-Protégé Development Plan.

In order for a Mentor-Protégé relationship to be recognized as part of this contract, the Protégé shall be used as a subcontractor and a Mentor-Protégé Agreement for Contract Assistance and Training shall be fully executed and approved. The Mentor-Protégé Agreement for Contract Assistance and Training shall be completed on the form provided by the Department and submitted with the DBE Utilization Plan for approval by the Department. If approved, the Mentor-Protégé Agreement for Contract Assistance and Training shall become part of the contract. In the event the Mentor-Protégé Agreement for Contract Assistance and Training is not approved, the contract shall be performed in accordance with the DBE Utilization Plan exclusive of the Agreement.

DBE Goal Reduction. The DBE participation goal set for this contract may, at the discretion of the Department, be reduced according to the Mentor-Protégé Program Guidelines when the Protégé is used as a subcontractor. When submitting the DBE Utilization Plan, the bidder shall indicate whether the Protégé will be used as a subcontractor and to what extent.

Quarterly Reports. The Mentor shall submit quarterly progress reports as outlined in the Mentor-Protégé Program Implementation document. The reports shall indicate the progress toward each of the Plan's stated goals. The reports shall be signed by an authorized principal of each firm and submitted to the Engineer of Construction.

Failure to timely submit reports, or submission of incomplete reports may result in dissolution of relationship.

Reimbursement of Mentor Expenses. The direct and indirect expenses of the Mentor, as detailed in the approved Mentor-Protégé Agreement for Contract Assistance and Training will be reimbursed by the Department.

PROJECT LABOR AGREEMENT

Effective: May 18, 2007

Revised: August 1, 2019

Description. The Illinois Project Labor Agreements Act, 30 ILCS 571, states that the State of Illinois has a compelling interest in awarding public works contracts so as to ensure the highest standards of quality and efficiency at the lowest responsible cost. A project labor agreement (PLA) is a form of pre-hire collective bargaining agreement covering all terms and conditions of employment on a specific project that is intended to support this compelling interest. It has been determined by the Department that a PLA is appropriate for the project that is the subject of this contract. The PLA document, provided below, only applies to the construction site for this contract. It is the policy of the Department on this contract, and all construction projects, to allow all contractors and subcontractors to compete for contracts and subcontracts without regard to whether they are otherwise parties to collective bargaining agreements.

Execution of Letter of Assent. A copy of the PLA applicable to this project is included as part of this special provision. As a condition of the award of the contract, the successful bidder and each of its subcontractors shall execute a "Contractor Letter of Assent", in the form attached to the PLA as Exhibit A. The successful bidder shall submit a Subcontractor's Contractor Letter of Assent to the Department prior to the subcontractor's performance of work on the project. Upon request, copies of the applicable collective bargaining agreements will be provided by the appropriate signatory labor organization at the pre-job conference.

Quarterly Reporting. Section 37 of the Illinois Project Labor Agreements Act requires the Department to submit quarterly reports regarding the number of minorities and females employed under PLAs. To assist in this reporting effort, the Contractor shall provide a quarterly workforce participation report for all minority and female employees working under the PLA of this contract. The data shall be reported on Construction Form BC 820, Project Labor Agreement (PLA) Workforce Participation Quarterly Reporting Form available on the Department's website <http://www.idot.illinois.gov/Assets/uploads/files/IDOT-Forms/BC/BC%20820.docx>.

The report shall be submitted no later than the 15th of the month following the end of each quarter (i.e., April 15 for the January – March reporting period). The form shall be emailed to DOT.PLA.Reporting@illinois.gov or faxed to (217) 524-4922.

Any costs associated with complying with this provision 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.

**Illinois Department of Transportation
PROJECT LABOR AGREEMENT**

This Project Labor Agreement (“PLA” or “Agreement”) is entered into this _____ day of

_____, 2024, by and between the Illinois Department of Transportation (“IDOT” or “Department”) in its proprietary capacity, and each relevant Illinois AFL-CIO Building Trades signatory hereto as determined by the Illinois AFL-CIO Statewide Project Labor Agreement Committee on behalf of each of its affiliated members (individually and collectively, the “Unions”). This PLA shall apply to Construction Work (as defined herein) to be performed by IDOT’s Prime Contractor and each of its subcontractors of whatever tier (“Subcontractor” or “Subcontractors”) on Contract No. 62U90(hereinafter, the “Project”).

ARTICLE 1 - INTENT AND PURPOSES

- 1.1 This PLA is entered into in accordance with the Project Labor Agreement Act (“Act”, 30 ILCS 571). It is mutually understood and agreed that the terms and conditions of this PLA are intended to promote the public interest in obtaining timely and economical completion of the Project by encouraging productive and efficient construction operations; by establishing a spirit of harmony and cooperation among the parties; and by providing for peaceful and prompt settlement of any and all labor grievances or jurisdictional disputes of any kind without strikes, lockouts, slowdowns, delays, or other disruptions to the prosecution of the work. The parties acknowledge the obligations of the Contractors and Subcontractors to comply with the provisions of the Act. The parties will work with the Contractors and Subcontractors within the parameters of other statutory and regulatory requirements to implement the Act’s goals and objectives.
- 1.2 As a condition of the award of the contract for performance of work on the Project, IDOT’s Prime Contractor and each of its Subcontractors shall execute a “Contractor Letter of Assent”, in the form attached hereto as Exhibit A, prior to commencing Construction Work on the Project. The Contractor shall submit a Subcontractor’s Contractor Letter of Assent to the Department prior to the Subcontractor’s performance of Construction Work on the Project. Upon request copies of the applicable collective bargaining agreements will be provided by the appropriate signatory labor organization consistent with this Agreement and at the pre-job conference referenced in Article III, Section 3.1.

- 1.3 Each Union affiliate and separate local representing workers engaged in Construction Work on the Project in accordance with this PLA are bound to this agreement by the Illinois AFL-CIO Statewide Project Labor Agreement Committee which is the central committee established with full authority to negotiate and sign PLAs with the State on behalf of all respective crafts. Upon their signing the Contractor Letter of Assent, the Prime Contractor, each Subcontractor, and the individual Unions shall thereafter be deemed a party to this PLA. No party signatory to this PLA shall, contract or subcontract, nor permit any other person, firm, company, or entity to contract or subcontract for the performance of Construction Work for the Project to any person, firm, company, or entity that does not agree in writing to become bound for the term of this Project by the terms of this PLA prior to commencing such work and to the applicable area-wide collective bargaining agreement(s) with the Union(s) signatory hereto.
- 1.4 It is understood that the Prime Contractor(s) and each Subcontractor will be considered and accepted by the Unions as separate employers for the purposes of collective bargaining, and it is further agreed that the employees working under this PLA shall constitute a bargaining unit separate and distinct from all others. The parties hereto also agree that this PLA shall be applicable solely with respect to this Project, and shall have no bearing on the interpretation of any other collective bargaining agreement or as to the recognition of any bargaining unit other than for the specific purposes of this Project.
- 1.5 In the event of a variance or conflict, whether explicit or implicit, between the terms and conditions of this PLA and the provisions of any other applicable national, area, or local collective bargaining agreement, the terms and conditions of this PLA shall supersede and control. For any work performed under the NTL Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower Agreement, the National Agreement of the International Union of Elevator Constructors, and for any instrument calibration work and loop checking performed under the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians, the preceding sentence shall apply only with respect to Articles I, II, V, VI, and VII.

- 1.6 Subject to the provisions of paragraph 1.5 of this Article, it is the parties' intent to respect the provisions of any other collective bargaining agreements that may now or hereafter pertain, whether between the Prime Contractor and one or more of the Unions or between a Subcontractor and one or more of the Unions. Accordingly, except and to the extent of any contrary provision set forth in this PLA, the Prime Contractor and each of its Subcontractors agrees to be bound and abide by the terms of the following in order of precedence: (a) the applicable collective bargaining agreement between the Prime Contractor and one or more of the Unions made signatory hereto; (b) the applicable collective bargaining agreement between a Subcontractor and one or more of the Unions made signatory hereto; or (c) the current applicable area collective bargaining agreement for the relevant Union that is the agreement certified by the Illinois Department of Labor for purposes of establishing the Prevailing Wage applicable to the Project. The Union will provide copies of the applicable collective bargaining agreements pursuant to part (c) of the preceding sentence to the Prime Contractor. Assignments by the Contractors or Subcontractors amongst the trades shall be consistent with area practices; in the event of unresolved disagreements as to the propriety of such assignments, the provisions of Article VI shall apply.
- 1.7 Subject to the limitations of paragraphs 1.4 to 1.6 of this Article, the terms of each applicable collective bargaining agreement as determined in accordance with paragraph 1.6 are incorporated herein by reference, and the terms of this PLA shall be deemed incorporated into such other applicable collective bargaining agreements only for purposes of their application to the Project.
- 1.8 To the extent necessary to comply with the requirements of any fringe benefit fund to which the Prime Contractor or Subcontractor is required to contribute under the terms of an applicable collective bargaining agreement pursuant to the preceding paragraph, the Prime Contractor or Subcontractor shall execute all "Participation Agreements" as may be reasonably required by the Union to accomplish such purpose; provided, however, that such Participation Agreements shall, when applicable to the Prime Contractor or Subcontractor solely as a result of this PLA, be amended as reasonably necessary to reflect such fact. Upon written notice in the form of a lien of a Contractor's or Subcontractor's delinquency from any applicable fringe benefit fund, IDOT will withhold from the Contractor's periodic pay request an amount sufficient to extinguish any delinquency obligation of the Contractor or Subcontractor arising out of the Project.
- 1.9 In the event that the applicable collective bargaining agreement between a Prime Contractor and the Union or between the Subcontractor and the Union expires prior to the completion of this Project, the expired applicable contract's terms will be maintained until a new applicable collective bargaining agreement is ratified. The wages and fringe benefits included in any new applicable collective bargaining agreement will apply on and after the effective date of the newly negotiated collective bargaining agreement, except to the extent wage and fringe benefit retroactivity is specifically agreed upon by the relevant bargaining parties.

ARTICLE II – APPLICABILITY, RECOGNITION, AND COMMITMENTS

- 2.1 The term Construction Work as used herein shall include all “construction, demolition, rehabilitation, renovation, or repair” work performed by a “laborer or mechanic” at the “site of the work” for the purpose of “building” the specific structures and improvements that constitute the Project. Terms appearing within quotation marks in the preceding sentence shall have the meaning ascribed to them pursuant to 29 CFR Part 5 and Illinois labor laws.
- 2.2 By executing the Letters of Assent, Prime Contractor and each of its Subcontractors recognizes the Unions signatory to this PLA as the sole and exclusive bargaining representatives for their craft employees employed on the jobsite for this Project. Unions who are signatory to this PLA will have recognition on the Project for their craft.
- 2.3 The Prime Contractor and each of its Subcontractors retains and shall be permitted to exercise full and exclusive authority and responsibility for the management of its operations, except as expressly limited by the terms of this PLA or by the terms and conditions of the applicable collective bargaining agreement.
- 2.4 Except to the extent contrary to an express provision of the relevant collective bargaining agreement, equipment or materials used in the Project may be pre-assembled or pre-fabricated, and there shall be no refusal by the Union to handle, transport, install, or connect such equipment or materials. Equipment or materials delivered to the job-site will be unloaded and handled promptly without regard to potential jurisdictional disputes; any such disputes shall be handled in accordance with the provisions of this PLA.
- 2.5 The parties are mutually committed to promoting a safe working environment for all personnel at the job-site. It shall be the responsibility of each employer to which this PLA applies to provide and maintain safe working conditions for its employees, and to comply with all applicable federal, state, and local health and safety laws and regulations.
- 2.6 The use or furnishing of alcohol or drugs and the conduct of any other illegal activity at the job-site is strictly prohibited. The parties shall take every practical measure consistent with the terms of applicable collective bargaining agreements to ensure that the job-site is free of alcohol and drugs.
- 2.7 All parties to this PLA agree that they will not discriminate against any employee based on race, creed, religion, color, national origin, union activity, age, gender or sexual orientation and shall comply with all applicable federal, state, and local laws.

- 2.8 In accordance with the Act and to promote diversity in employment, IDOT will establish, in cooperation with the other parties, the apprenticeship hours which are to be performed by minorities and females on the Project. IDOT shall consider the total hours to be performed by these underrepresented groups, as a percentage of the workforce, and create aspirational goals for each Project, based on the level of underutilization for the service area of the Project (together "Project Employment Objectives"). IDOT shall provide a quarterly report regarding the racial and gender composition of the workforce on the Project.

Persons currently lacking qualifications to enter apprenticeship programs will have the opportunity to obtain skills through basic training programs as have been established by the Department. The parties will endeavor to support such training programs to allow participants to obtain the requisite qualifications for the Project Employment Objectives.

The parties agree that all Contractors and Subcontractors working on the Project shall be encouraged to utilize the maximum number of apprentices as permitted under the terms of the applicable collective bargaining agreements to realize the Project Employment Objectives.

The Unions shall assist the Contractor and each Subcontractor in efforts to satisfy Project Employment Objectives. A Contractor or Subcontractor may request from a Union specific categories of workers necessary to satisfy Project Employment Objectives. The application of this section shall be consistent with all local Union collective bargaining agreements, and the hiring hall rules and regulations established for the hiring of personnel, as well as the apprenticeship standards set forth by each individual Union.

- 2.9 The parties hereto agree that engineering consultants and materials testing employees, to the extent subject to the terms of this PLA, shall be fully expected to objectively and responsibly perform their duties and obligations owed to the Department without regard to the potential union affiliation of such employees or of other employees on the Project.
- 2.10 This Agreement shall not apply to IDOT employees or employees of any other governmental entity.

ARTICLE III - ADMINISTRATION OF AGREEMENT

- 3.1 In order to assure that all parties have a clear understanding of the PLA, and to promote harmony, at the request of the Unions a post-award pre-job conference will be held among the Prime Contractor, all Subcontractors and Union representatives prior to the start of any Construction Work on the Project. No later than the conclusion of such pre-job conference, the parties shall, among other matters, provide to one another contact information for their respective representatives (including name, address, phone number, facsimile number, e-mail). Nothing herein shall be construed to limit the right of the Department to discuss or explain the purpose and intent of this PLA with prospective bidders or other interested parties prior to or following its award of the job.
- 3.2 Representatives of the Prime Contractor and the Unions shall meet as often as reasonably necessary following award until completion of the Project to assure the effective implementation of this PLA.
- 3.3 Any notice contemplated under Article VI and VII of this Agreement to a signatory labor organization shall be made in writing to the Local Union with copies to the local union's International Representative.

ARTICLE IV - HOURS OF WORK AND GENERAL CONDITIONS

- 4.1 The standard work day and work week for Construction Work on the Project shall be consistent with the respective collective bargaining agreements. In the event Project site or other job conditions dictate a change in the established starting time and/or a staggered lunch period for portions of the Project or for specific crafts, the Prime Contractor, relevant Subcontractors and business managers of the specific crafts involved shall confer and mutually agree to such changes as appropriate. If proposed work schedule changes cannot be mutually agreed upon between the parties, the hours fixed at the time of the pre-job meeting shall prevail.
- 4.2 Shift work may be established and directed by the Prime Contractor or relevant Subcontractor as reasonably necessary or appropriate to fulfill the terms of its contract with the Department. If used, shift hours, rates and conditions shall be as provided in the applicable collective bargaining agreement.
- 4.3 The parties agree that chronic and/or unexcused absenteeism is undesirable and must be controlled in accordance with procedures established by the applicable collective bargaining agreement. Any employee disciplined for absenteeism in accordance with such procedures shall be suspended from all work on the Project for not less than the maximum period permitted under the applicable collective bargaining agreement.

- 4.4 Except as may be otherwise expressly provided by the applicable collective bargaining agreement, employment begins and ends at the Project site; employees shall be at their place of work at the starting time; and employees shall remain at their place of work until quitting time.
- 4.5 Except as may be otherwise expressly provided by the applicable collective bargaining agreement, there shall be no limit on production by workmen, no restrictions on the full use of tools or equipment, and no restrictions on efficient use of manpower or techniques of construction other than as may be required by safety regulations.
- 4.6 The parties recognize that specialized or unusual equipment may be installed on the Project. In such cases, the Union recognizes the right of the Prime Contractor or Subcontractor to involve the equipment supplier or vendor's personnel in supervising the setting up of the equipment, making modifications and final alignment, and performing similar activities that may be reasonably necessary prior to and during the start-up procedure in order to protect factory warranties. The Prime Contractor or Subcontractor shall notify the Union representatives in advance of any work at the job-site by such vendor personnel in order to promote a harmonious relationship between the equipment vendor's personnel and other Project employees.
- 4.7 For the purpose of promoting full and effective implementation of this PLA, authorized Union representatives shall have access to the Project job-site during scheduled work hours. Such access shall be conditioned upon adherence to all reasonable visitor and security rules of general applicability that may be established for the Project site at the pre-job conference or from time to time thereafter.

ARTICLE V – GRIEVANCE PROCEDURES FOR DISPUTES ARISING UNDER A PARTICULAR COLLECTIVE BARGAINING AGREEMENT

- 5.1 In the event a dispute arises under a particular collective bargaining agreement specifically not including jurisdictional disputes referenced in Article VI below, said dispute shall be resolved by the Grievance/Arbitration procedure of the applicable collective bargaining agreement. The resulting determination from this process shall be final and binding on all parties bound to its process.
- 5.2 Employers covered under this Agreement shall have the right to discharge or discipline any employee who violates the provisions of this Agreement. Such discharge or discipline by a contractor or subcontractor shall be subject to Grievance/Arbitration procedure of the applicable collective bargaining agreement only as to the fact of such violation of this agreement. If such fact is established, the penalty imposed shall not be disturbed. Work at the Project site shall continue without disruption or hindrance of any kind as a result of a Grievance/Arbitration procedure under this Article.

- 5.3 In the event there is a deadlock in the foregoing procedure, the parties agree that the matter shall be submitted to arbitration for the selection and decision of an Arbitrator governed under paragraph 6.8.

ARTICLE VI –DISPUTES: GENERAL PRINCIPLES

- 6.1 This Agreement is entered into to prevent strikes, lost time, lockouts and to facilitate the peaceful adjustment of jurisdictional disputes in the building and construction industry and to prevent waste and unnecessary avoidable delays and expense, and for the further purpose of at all times securing for the employer sufficient skilled workers.

- 6.2 A panel of Permanent Arbitrators are attached as addendum (A) to this agreement. By mutual agreement between IDOT and the Unions, the parties can open this section of the agreement as needed to make changes to the list of permanent arbitrators.

The arbitrator is not authorized to award back pay or any other damages for a miss assignment of work. Nor may any party bring an independent action for back pay or any other damages, based upon a decision of an arbitrator.

- 6.3 The PLA Jurisdictional Dispute Resolution Process (“Process”) sets forth the procedures below to resolve jurisdictional disputes between and among Contractors, Subcontractors, and Unions engaged in the building and construction industry. Further, the Process will be followed for any grievance or dispute arising out of the interpretation or application of this PLA by the parties except for the prohibition on attorneys contained in 6.11. All decisions made through the Process are final and binding upon all parties.

DISPUTE PROCESS

- 6.4 Administrative functions under the Process shall be performed through the offices of the President and/or Secretary-Treasurer of the Illinois State Federation of Labor, or their designated representative, called the Administrator. In no event shall any officer, employee, agent, attorney, or other representative of the Illinois Federation of Labor, AFL- CIO be subject to any subpoena to appear or testify at any jurisdictional dispute hearing.

- 6.5 There shall be no abandonment of work during any case participating in this Process or in violation of the arbitration decision. All parties to this Process release the Illinois State Federation of Labor (“Federation”) from any liability arising from its action or inaction and covenant not to sue the Federation, nor its officers, employees, agents or attorneys.

- 6.6 In the event of a dispute relating to trade or work jurisdiction, all parties, including the employers, Contractors or Subcontractors, agree that a final and binding resolution of the dispute shall be resolved as follows:
- (a) Representatives of the affected trades and the Contractor or Subcontractor shall meet on the job site within two (2) business days after receiving written notice in an effort to resolve the dispute. (In the event there is a dispute between local unions affiliated with the same International Union, the decision of the General President, or his/her designee, as the internal jurisdictional authority of that International Union, shall constitute a final and binding decision and determination as to the jurisdiction of work.)
 - (b) If no settlement is achieved subsequent to the preceding Paragraph, the matter shall be referred to the local area Building & Construction Trades Council, which shall meet with the affected trades within two (2) business days subsequent to receiving written notice. In the event the parties do not wish to avail themselves of the local Building & Construction Trades Council, the parties may elect to invoke the services of their respective International Representatives with no extension of the time limitations. An agreement reached at this Step shall be final and binding upon all parties.
 - (c) If no settlement agreement is reached during the proceedings contemplated by Paragraphs "a" or "b" above, the matter shall be immediately referred to the Illinois Jurisdictional Dispute Process for final and binding resolution of said dispute. Said referral submission shall be in writing and served upon the Illinois State Federation of Labor, or the Administrator, pursuant to paragraph 6.4 of this agreement. The Administrator shall, within three (3) days, provide for the selection of an available Arbitrator to hear said dispute within this time period. Upon good cause shown and determined by the Administrator, an additional three (3) day extension for said hearing shall be granted at the sole discretion of the Administrator. Only upon mutual agreement of all parties may the Administrator extend the hearing for a period in excess of the time frames contemplated under this Paragraph. Business days are defined as Monday through Friday, excluding contract holidays.
- 6.7 The primary concern of the Process shall be the adjustment of jurisdictional disputes arising out of the Project. A sufficient number of Arbitrators shall be selected from list of approved Arbitrators as referenced Sec. 6.2 and shall be assigned per Sec. 6.8. Decisions shall be only for the Project and shall become effective immediately upon issuance and complied with by all parties. The authority of the Arbitrator shall be restricted and limited specifically to the terms and provisions of Article VI and generally to this Agreement as a whole.

- 6.8 Arbitrator chosen shall be randomly selected based on the list of Arbitrators in Sec. 6.2 and geographical location of the jurisdictional dispute and upon his/her availability, and ability to conduct a Hearing within two (2) business days of said notice. The Arbitrator may issue a “bench” decision immediately following the Hearing or he/she may elect to only issue a written decision, said decision must be issued within two (2) business days subsequent to the completion of the Hearing. Copies of all notices, pleadings, supporting memoranda, decisions, etc. shall be provided to all disputing parties and the Illinois State Federation of Labor.

Any written decision shall be in accordance with this Process and shall be final and binding upon all parties to the dispute and may be a “short form” decision. Fees and costs of the arbitrator shall be divided evenly between the contesting parties except that any party wishing a full opinion and decision beyond the short form decision shall bear the reasonable fees and costs of such full opinion. The decision of the Arbitrator shall be final and binding upon the parties hereto, their members, and affiliates.

In cases of jurisdictional disputes or other disputes between a signatory labor organization and another labor organization, both of which is an affiliate or member of the same International Union, the matter or dispute shall be settled in the manner set forth by their International Constitution and/or as determined by the International Union’s General President whose decision shall be final and binding upon all parties. In no event shall there be an abandonment of work.

- 6.9 In rendering a decision, the Arbitrator shall determine:
- (a) First, whether a previous agreement of record or applicable agreement, including a disclaimer agreement, between National or International Unions to the dispute or agreements between local unions involved in the dispute, governs;
 - (b) Only if the Arbitrator finds that the dispute is not covered by an appropriate or applicable agreement of record or agreement between the crafts to the dispute, he shall then consider the established trade practice in the industry and prevailing practice in the locality. Where there is a previous decision of record governing the case, the Arbitrator shall give equal weight to such decision of record, unless the prevailing practice in the locality in the past ten years favors one craft. In that case, the Arbitrator shall base his decision on the prevailing practice in the locality. Except, that if the Arbitrator finds that a craft has improperly obtained the prevailing practice in the locality through raiding, the undercutting of wages or by the use of vertical agreements, the Arbitrator shall rely on the decision of record and established trade practice in the industry rather than the prevailing practice in the locality; and,

(c) Only if none of the above criteria is found to exist, the Arbitrator shall then consider that because efficiency, cost or continuity and good management are essential to the well being of the industry, the interests of the consumer or the past practices of the employer shall not be ignored.

(d) The arbitrator is not authorized to award back pay or any other damages for a mis-assignment of work. Nor may any party bring an independent action for back pay or any other damages, based upon a decision of an arbitrator.

6.10 The Arbitrator shall set forth the basis for his/her decision and shall explain his/her findings regarding the applicability of the above criteria. If lower ranked criteria are relied upon, the Arbitrator shall explain why the higher-ranked criteria were not deemed applicable. The Arbitrator's decision shall only apply to the Project. Agreements of Record, for other PLA projects, are applicable only to those parties signatory to such agreements. Decisions of Record are those that were either attested to by the former Impartial Jurisdictional Disputes Board or adopted by the National Arbitration Panel.

6.11 All interested parties, as determined by the Arbitrator, shall be entitled to make presentations to the Arbitrator. Any interested labor organization affiliated to the PLA Committee and party present at the Hearing, whether making a presentation or not, by such presence shall be deemed to accept the jurisdiction of the Arbitrator and to agree to be bound by its decision. In addition to the representative of the local labor organization, a representative of the labor organization's International Union may appear on behalf of the parties. Each party is responsible for arranging for its witnesses. In the event an Arbitrator's subpoena is required, the party requiring said subpoena shall prepare the subpoena for the Arbitrator to execute. Service of the subpoena upon any witness shall be the responsibility of the issuing party.

Attorneys shall not be permitted to attend or participate in any portion of a Hearing.

The parties are encouraged to determine, prior to Hearing, documentary evidence which may be presented to the Arbitrator on a joint basis.

6.12 The Order of Presentation in all Hearings before an Arbitrator shall be

- I. Identification and Stipulation of the Parties
- II. Unions(s) claiming the disputed work presents its case
- III. Union(s) assigned the disputed work presents its case
- IV. Employer assigning the disputed work presents its case
- V. Evidence from other interested parties (i.e., general contractor, project manager, owner)
- VI. Rebuttal by union(s) claiming the disputed work
- VII. Additional submissions permitted and requested by Arbitrator
- VIII. Closing arguments by the parties

- 6.13 All parties bound to the provisions of this Process hereby release the Illinois State Federation of Labor and IDOT, their respective officers, agents, employees or designated representatives, specifically including any Arbitrator participating in said Process, from any and all liability or claim, of whatsoever nature, and specifically incorporating the protections provided in the Illinois Arbitration Act, as amended from time to time.
- 6.14 The Process, as an arbitration panel, nor its Administrator, shall have any authority to undertake any action to enforce its decision(s). Rather, it shall be the responsibility of the prevailing party to seek appropriate enforcement of a decision, including findings, orders or awards of the Arbitrator or Administrator determining non-compliance with a prior award or decision.
- 6.15 If at any time there is a question as to the jurisdiction of the Illinois Jurisdictional Dispute Resolution Process, the primary responsibility for any determination of the arbitrability of a dispute and the jurisdiction of the Arbitrator shall be borne by the party requesting the Arbitrator to hear the underlying jurisdictional dispute. The affected party or parties may proceed before the Arbitrator even in the absence or one or more stipulated parties with the issue of jurisdiction as an additional item to be decided by the Arbitrator. The Administrator may participate in proceedings seeking a declaration or determination that the underlying dispute is subject to the jurisdiction and process of the Illinois Jurisdictional Dispute Resolution Process. In any such proceedings, the non-prevailing party and/or the party challenging the jurisdiction of the Illinois Jurisdictional Dispute Resolution Process shall bear all the costs, expenses and attorneys' fees incurred by the Illinois Jurisdictional Dispute Resolution Process and/or its Administrator in establishing its jurisdiction.

ARTICLE VII - WORK STOPPAGES AND LOCKOUTS

- 7.1 During the term of this PLA, no Union or any of its members, officers, stewards, employees, agents or representatives shall instigate, support, sanction, maintain, or participate in any strike, picketing, walkout, work stoppage, slow down or other activity that interferes with the routine and timely prosecution of work at the Project site or at any other contractor's or supplier's facility that is necessary to performance of work at the Project site. Hand billing at the Project site during the designated lunch period and before commencement or following conclusion of the established standard workday shall not, in itself, be deemed an activity that interferes with the routine and timely prosecution of work on the Project.

7.2 Should any activity prohibited by paragraph 7.1 of this Article occur, the Union shall undertake all steps reasonably necessary to promptly end such prohibited activities.

7.2.A No Union complying with its obligations under this Article shall be liable for acts of employees for which it has no responsibility or for the unauthorized acts of employees it represents. Any employee who participates or encourages any activity prohibited by paragraph 7.1 shall be immediately suspended from all work on the Project for a period equal to the greater of (a) 60 days; or (b) the maximum disciplinary period allowed under the applicable collective bargaining agreement for engaging in comparable unauthorized or prohibited activity.

7.2.B Neither the PLA Committee nor its affiliates shall be liable for acts of employees for which it has no responsibility. The principal officer or officers of the PLA Committee will immediately instruct, order and use the best efforts of his office to cause the affiliated union or unions to cease any violations of this Article. The PLA Committee in its compliance with this obligation shall not be liable for acts of its affiliates. The principal officer or officers of any involved affiliate will immediately instruct, order or use the best effort of his office to cause the employees the union represents to cease any violations of this Article. A union complying with this obligation shall not be liable for unauthorized acts of employees it represents. The failure of the Contractor to exercise its rights in any instance shall not be deemed a waiver of its rights in any other instance.

During the term of this PLA, the Prime Contractor and its Subcontractors shall not engage in any lockout at the Project site of employees covered by this Agreement.

7.3 Upon notification of violations of this Article, the principal officer or officers of the local area Building and Construction Trades Council, and the Illinois AFL-CIO Statewide Project Labor Agreement Committee as appropriate, will immediately instruct, order and use their best efforts to cause the affiliated union or unions to cease any violations of this Article. A Trades Council and the Committee otherwise in compliance with the obligations under this paragraph shall not be liable for unauthorized acts of its affiliates.

7.4 In the event that activities in violation of this Article are not immediately halted through the efforts of the parties, any aggrieved party may invoke the special arbitration provisions set forth in paragraph 7.5 of this Article.

- 7.5 Upon written notice to the other involved parties by the most expeditious means available, any aggrieved party may institute the following special arbitration procedure when a breach of this Article is alleged:
- 7.5.A The party invoking this procedure shall notify the individual designated as the Permanent Arbitrator pursuant to paragraph 6.8 of the nature of the alleged violation; such notice shall be by the most expeditious means possible. The initiating party may also furnish such additional factual information as may be reasonably necessary for the Permanent Arbitrator to understand the relevant circumstances. Copies of any written materials provided to the arbitrator shall also be contemporaneously provided by the most expeditious means possible to the party alleged to be in violation and to all other involved parties.
 - 7.5.B Upon receipt of said notice the Permanent Arbitrator shall set and hold a hearing within twenty-four (24) hours if it is contended the violation is ongoing, but not before twenty-four (24) hours after the written notice to all parties involved as required above.
 - 7.5.C The Permanent Arbitrator shall notify the parties by facsimile or any other effective written means, of the place and time chosen by the Permanent Arbitrator for this hearing. Said hearing shall be completed in one session. A failure of any party or parties to attend said hearing shall not delay the hearing of evidence or issuance of an Award by the Permanent Arbitrator.
 - 7.5.D The sole issue at the hearing shall be whether a violation of this Article has, in fact, occurred. An Award shall be issued in writing within three (3) hours after the close of the hearing, and may be issued without a written opinion. If any party desires a written opinion, one shall be issued within fifteen (15) days, but its issuance shall not delay compliance with, or enforcement of, the Award. The Permanent Arbitrator may order cessation of the violation of this Article, and such Award shall be served on all parties by hand or registered mail upon issuance.
 - 7.5.E Such Award may be enforced by any court of competent jurisdiction upon the filing of the Award and such other relevant documents as may be required. Facsimile or other hardcopy written notice of the filing of such enforcement proceedings shall be given to the other relevant parties. In a proceeding to obtain a temporary order enforcing the Permanent Arbitrator's Award as issued under this Article, all parties waive the right to a hearing and agree that such proceedings may be ex parte. Such agreement does not waive any party's right to participate in a hearing for a final order of enforcement. The Court's order or orders enforcing the Permanent Arbitrator's Award shall be served on all parties by hand or by delivery to their last known address or by registered mail.

- 7.6 Individuals found to have violated the provisions of this Article are subject to immediate termination. In addition, IDOT reserves the right to terminate this PLA as to any party found to have violated the provisions of this Article.
- 7.7 Any rights created by statute or law governing arbitration proceedings inconsistent with the above procedure or which interfere with compliance therewith are hereby waived by parties to whom they accrue.
- 7.8 The fees and expenses of the Permanent Arbitrator shall be borne by the party or parties found in violation, or in the event no violation is found, such fees and expenses shall be borne by the moving party.

ARTICLE VIII – TERMS OF AGREEMENT

- 8.1 If any Article or provision of this Agreement shall be declared invalid, inoperative or unenforceable by operation of law or by any of the above mentioned tribunals of competent jurisdiction, the remainder of this Agreement or the application of such Article or provision to persons or circumstances other than those as to which it has been held invalid, inoperative or unenforceable shall not be affected thereby.
- 8.2 This Agreement shall be in full force as of and from the date of the Notice of Award until the Project contract is closed.
- 8.3 This PLA may not be changed or modified except by the subsequent written agreement of the parties. All parties represent that they have the full legal authority to enter into this PLA. This PLA may be executed by the parties in one or more counterparts.
- 8.4 Any liability arising out of this PLA shall be several and not joint. IDOT shall not be liable to any person or other party for any violation of this PLA by any other party, and no Contractor or Union shall be liable for any violation of this PLA by any other Contractor or Union.
- 8.5 The failure or refusal of a party to exercise its rights hereunder in one or more instances shall not be deemed a waiver of any such rights in respect of a separate instance of the same or similar nature.

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Addendum A

IDOT Slate of Permanent Arbitrators

1. Bruce Feldacker
2. Thomas F. Gibbons
3. Edward J. Harrick
4. Brent L. Motchan
5. Robert Perkovich
6. Byron Yaffee
7. Glenn A. Zipp

Execution Page

Illinois Department of Transportation

Stephen Travia, Director of Highways Project Implementation

Vicki L. Wilson, Director of Finance & Administration

Michael S. Prater, Chief Counsel

Omer Osman, Secretary (Date)

Illinois AFL-CIO Statewide Project Labor Agreement Committee, representing the Unions listed below:

(Date)

List Unions:

Exhibit A - Contractor Letter of Assent

(Date)

To All Parties:

In accordance with the terms and conditions of the contract for Construction Work on [Contract No. 62U90], this Letter of Assent hereby confirms that the undersigned Prime Contractor or Subcontractor agrees to be bound by the terms and conditions of the Project Labor Agreement established and entered into by the Illinois Department of Transportation in connection with said Project.

It is the understanding and intent of the undersigned party that this Project Labor Agreement shall pertain only to the identified Project. In the event it is necessary for the undersigned party to become signatory to a collective bargaining agreement to which it is not otherwise a party in order that it may lawfully make certain required contributions to applicable fringe benefit funds, the undersigned party hereby expressly conditions its acceptance of and limits its participation in such collective bargaining agreement to its work on the Project.

(Authorized Company Officer)

(Company)

STORM WATER POLLUTION PREVENTION PLAN



Storm Water Pollution Prevention Plan



Route	Marked Route	Section Number
FAI 190	I-190	FAI 90 23 TBR
Project Number	County	Contract Number
C-91-175-23	Cook	62U90

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

Jose Rios 4.9.2024

Print Name	Title	Agency
Jose Rios	Regional Engineer	Illinois Department of Transportation

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 is located along Ramp F from Jane Addams Memorial Tollway EB I-190 and Tri-State Tollway SB I-294 to WB I-190/Mannheim Road. Latitude 41° 59' 11" N; Longitude 87° 52' 11" W; Section 4; Township 40 N; Range 12 E. The gross and net length of the project is 130 feet (0.025 miles).

The design, installation, and maintenance of BMPs at these locations are within an area where annual erosivity (R value) is less than or equal to 160. Erosivity is less than 5 in all two-week periods between October 12 and April 15, which would qualify for a construction rainfall erosivity waiver under the US Construction General Permit requirements. At these locations, erosivity is highest in spring to autumn, April 16 - October 11.

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:

This work consists of constructing a new ramp toll plaza and demolition of the existing Toll Plaza 31 which is within Illinois Tollway jurisdiction. The new toll plaza will be constructed along the ramp from EB I-190/SB I-294 to WB I-190, northeast from the existing location.

The improvement includes a control building at new toll plaza, electrical work at the plaza, ramp reconstruction, erosion control and protection, special waste excavation, earth excavation and embankment, removal of existing improvements, miscellaneous storm sewers, removal of existing sanitary septic systems, pavement marking and signage, communication tower, roadway lighting, traffic control and protection, maintaining ITS, urban enhancements and all incidental collateral work necessary to complete the improvements as shown on the Plans and as described herein.

The project will be completed in five construction stages including a pre-stage. Drainage improvements will include installation of new storm sewer along Ramp F. This project does not include any in-stream work.

The project includes installation, maintenance, and removal of temporary erosion and sediment control measures including erosion control blanket, protection of trees, temporary erosion control seeding, temporary mulching, dust control watering, silt fence, storm drain inlet protection, stabilized construction entrances, and stabilized flow lines. Permanent stabilization is included in the contract and consists of seeding and sodding. The permanent stabilization shall be installed as soon as an area will no longer be needed for construction access or traffic.

C. Provide the estimated duration of this project:

10 months

D. The total area of the construction site is estimated to be 3.23 acres.

The total area of the site estimated to be disturbed by excavation, grading or other activities is 3.23 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:

Existing C = 0.43 and Proposed C = 0.44

F. List all soils found within project boundaries; include map unit name, slope information, and erosivity:

Based upon the U.S. Department of Agriculture web-based soils mapping information, a description of the existing soil conditions and soil types within the projects are summarized below:

1. The primary soil type within the new proposed toll plaza area is Orthents, clayey, rolling (805D) with Erosion Factor K=0.32.
2. For the area at where the toll plaza building and canopy to be removed, the soil type consists of urban land (533); Orthents, clayey, nearly level (805A) with Erosion Factor K=0.32; and Orthents, clayey, rolling (805D) with Erosion Factor K=0.32.

G. If wetlands were delineated for this project, provide an extent of wetland acreage at the site; see Phase I report:

No wetlands were identified on site.

H. Provide a description of potentially erosive areas associated with this project:

Potentially erosive areas are along the side slope areas along EB I-190/SB I-294 to WB I-190 Ramp (Ramp F).

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.):

Pre-stage:

Remove guardrail, gutter, drainage structures, and lighting where it conflicts with proposed temporary pavement. Construct temporary pavement along west side of Ramp E. Install temporary erosion control as shown on the Plans.

Stage 1:

Construct Ramp F proposed pavement, left shoulder, and temporary pavement. Install temporary erosion control as shown on the Plans.

Stage 2:

Remove temporary pavement along west side of Ramp E. Construct Ramp E right lane plaza pavement, right shoulder, concrete barriers, overhead sign foundation, gutter, guardrail, drainage structures and storm sewers, light poles, permanent grading, and erosion control.

Stage 3:

Remove temporary pavement along east side of Ramp F. Construct gutter, guardrail, concrete barriers, toll plaza building and foundation, communication tower, parking lot, permanent grading, and permanent erosion control measures.

Connect the Tollway fibers between new toll plaza to existing handhole along NB I-294. Upon completion of fiber and underground conduit installation and connection, restore impacted ground to the original state.

After the completion of the new toll plaza and all electric toll (AET) lanes are operational, remove median concrete island, mill and overlay the existing pavement, and construct butt joints at the existing Toll Plaza 31. Begin demolishing plaza canopy on the left side and complete permanent grading and erosion control measures.

Stage 4:

Remove the remaining median islands, mill and overlay the existing pavement, and construct butt joints at the existing Toll Plaza 31. Remove remaining plaza canopy, toll plaza building, sidewalk, parking lot, sanitary septic system, and other miscellaneous items shown on the plans. Perform grading and restore impacted area with permanent erosion control measures. Install permanent pavement markings at the completion of Stage 4 and re-stripe pavement marking near the existing Toll Plaza area to accommodate a lane drop and install all necessary signage.

Stage 4A:

Shift right temporary concrete barrier to remain along existing Ramp F.

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:

The drainage system which receive stormwater discharge from the project is owned by Illinois State Toll Highway Authority (ISTHA).

L. The following is a list of General NPDES ILR40 permittees within whose reporting jurisdiction this project is located:

Illinois State Toll Highway Authority (ISTHA) / IDOT / Cook County / City of Chicago / City of Chicago Department of Aviation (CDA) / Village of Rosemont

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:

The area east of EB I-190/SB I-294 to WB I-190 Ramp (Ramp F) drains to the existing 30" RCP pipe under the ramp which outlets to the Willow Creek Ditch and then to Willow Creek. The area west of EB I-190/SB I-294 to WB I-190 Ramp (Ramp F) drains to the Willow Creek Ditch and then to Willow Creek. Willow Creek ultimately flows into the Des Plaines River.

Willow Creek and the Des Plaines River are not listed as Biologically Significant Streams by the 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.

Existing trees that will not be impacted during construction will need to be protected as shown in the plans. On the right side of Ramp F where the side slope is steeper than 1:3, it will be stabilized with heavy duty erosion control blanket.

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.

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:

Willow Creek segment IL_GO-01 is listed on the 2022 IEPA 303(d) list as impaired in the aquatic life use by cadmium, dissolved oxygen, and total phosphorus.

The Des Plaines River segment IL_G-15 is listed on the 2022 IEPA 303(d) list as impaired in the following uses:

- aquatic life use impaired by unknown cause, total phosphorus, and sedimentation/siltation
- fish consumption use impaired by mercury and polychlorinated biphenyls (PCBS)
- primary contact use impaired by fecal coliform

The Des Plaines River segment IL_G-28 is listed on the 2022 IEPA 303(d) list as impaired in the following uses:

- aquatic life use impaired by unknown cause, chloride, dissolved oxygen, and total phosphorus
- fish consumption use impaired by mercury and polychlorinated biphenyls (PCBS)
- primary contact use impaired by fecal coliform

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 erosion and sediment control practices as described in the following section and shown on the Erosion and Sediment Control Drawings will be installed and maintained by the Contractor. These practices will also be observed by the Resident Engineer and if necessary, instruction will be given to the Contractor to provide additional erosion and sediment control measures.

The potential that construction activities performed onsite will impact the impaired Des Plaines River and Willow Creek is reduced by the construction BMPs (perimeter erosion barrier, temporary erosion control seeding, temporary erosion control blanket, inlet filters, etc.) in this plan. It is unlikely for there to be quantities of soluble phosphorus, fluoride, mercury, zinc, or PCBs discharged. Portable toilets will be placed away from inlets and water courses. Chloride will discharge, especially during winter application of ice melters required for safety.

Provide a description of the location(s) of direct discharge from the project site to the 303(d) water body:

The area east of EB I-190/SB I-294 to WB I-190 Ramp (Ramp F) drains to the existing 30" RCP pipe under the ramp which outlets to the Willow Creek Ditch and then to Willow Creek. The area west of EB I-190/SB I-294 to WB I-190 Ramp (Ramp F) drains to the Willow Creek Ditch and then to Willow Creek. Willow Creek ultimately flows into the Des Plaines River.

Provide a description of the location(s) of any dewatering discharges to the MS4 and/or water body:

The design and implementation of dewatering systems as needed to construct facilities included in this contract are the responsibility of the Contractor. At the start of construction the Contractor will be required to submit a dewatering plan which includes a description and location of dewatering discharges.

Applicable Federal, Tribal, State, or Local Programs

Floodplain

Historic Preservation

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:

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:

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:

Threatened and Endangered Species/Illinois Natural Areas (INAI)/Nature Preserves

Other

Wetland

P. The following pollutants of concern will be associated with this construction project:

- | | |
|--|---|
| <input checked="" type="checkbox"/> Antifreeze / Coolants | <input checked="" type="checkbox"/> Solid Waste Debris |
| <input checked="" type="checkbox"/> Concrete | <input checked="" type="checkbox"/> Solvents |
| <input checked="" type="checkbox"/> Concrete Curing Compounds | <input checked="" type="checkbox"/> Waste water from cleaning construction equipments |
| <input checked="" type="checkbox"/> Concrete Truck Waste | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> Fertilizers / Pesticides | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> Paints | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> Petroleum (gas, diesel, oil, kerosene, hydraulic oil / fluids) | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> Soil Sediment | <input type="checkbox"/> 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:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Erosion Control Blanket / Mulching | <input type="checkbox"/> Temporary Turf (Seeding, Class 7) |
| <input type="checkbox"/> Geotextiles | <input checked="" type="checkbox"/> Temporary Mulching |
| <input checked="" type="checkbox"/> Permanent Seeding | <input type="checkbox"/> Vegetated Buffer Strips |
| <input type="checkbox"/> Preservation of Mature Seeding | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> Protection of Trees | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> Sodding | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> Temporary Erosion Control Seeding | <input type="checkbox"/> Other (Specify) _____ |

Describe how the stabilization practices listed above will be utilized during construction:

Refer to the Erosion and Sedimentation Control staging plan sheets for the contract specific stabilization practices called out for temporary conditions during construction. Where possible, temporary and permanent stabilization of the initial stage should be completed before work is moved to subsequent stages. Stabilization controls runoff volume and velocity, peak runoff rates and volumes of discharge to minimize exposed soil, disturbed slopes, sediment discharges from construction, and provide for natural buffers and minimization of soil compaction. Existing vegetated areas where disturbance can be avoided will not require stabilization.

Protection of Trees - Areas of trees, shrubs and other woody vegetation designated to remain undisturbed during any stage of construction shall be protected. Clearly delineate protected areas prior to clearing/grubbing or other soil disturbing activities. Tree protection shall be high visibility plastic fence or other approved material that can last through the duration of the protection period. Tree protection shall be located outside the drop line of the tree or trees to be preserved and in no case closer than 5 feet to the trunk of any tree. Refer to ISTHA Drawing Standard K1.

Temporary Erosion Control Seeding - This item will be applied to all bare areas every seven days to minimize the amount of exposed surface areas. Earth stockpiles shall be temporarily seeded if they are to remain unused for more than 14 days. Within the construction limits, areas which may be susceptible to erosion as determined by the Engineer shall remain undisturbed until full scale construction is underway to prevent unnecessary soil erosion. Bare and sparsely vegetated ground in highly erodible areas as determined by the Engineer shall be temporarily seeded at the beginning of construction where no construction activities are expected within seven days, regardless of when permanent stabilization is anticipated.

Temporary Mulching - Mulch is applied to temporary erosion control seeding at disturbed areas on slopes 1:3 (V:H) or flatter to allow for the seeding to take hold in the ground and grow. Without the mulching, the seeding will be displaced by wind and rain and therefore would not grow. Mulch will be paid separately from temporary seeding and shall conform to Section 251 of the Standard Specifications. Mulch Method 2 and surface roughening should be applied to slopes for temporary stabilization prior to seasons when temporary seed will not germinate, for example in mid-July or in winter.

Temporary Erosion Control Blanket - Erosion control blankets are applied to protect exposed soil surfaces against erosion due to rainfall or flowing water. Erosion control blankets are proposed at slopes greater than 1:3 (V:H) and in areas of concentrated flows.

Describe how the stabilization practices listed above will be utilized after construction activities have been completed:

Refer to the Permanent Erosion and Sedimentation Control plan sheets for the contract specific stabilization practices used for permanent conditions after construction activities. All areas disturbed by construction will be stabilized with permanent seeding with erosion control blanket or sodding. Stabilization controls runoff volume and velocity, peak runoff rates and volumes of discharge to minimize exposed soil, disturbed slopes, and provides natural buffers and minimization of soil compaction. Existing vegetated areas where disturbance can be avoided will not require stabilization.

Permanent Seeding - Seeding, Class 2E Salt Tolerant Roadside Mix and Seeding, Class 4F Native Grass, Low Profile Mix will be installed per ISTHA specifications to areas where there will be no more disturbances. The seeding will keep the soil from eroding due to natural conditions (wind, rain, etc).

Erosion Control Blanket - Erosion control blankets will be installed over all areas to be permanently seeded to protect slopes from erosion. It will be installed over the permanent seeding to allow the seeding to take hold in the ground and grow. Without protection, the seeding will be displaced by wind and rain.

Sodding - Sod is a stabilization of fine graded disturbed areas using a continuous cover of grass sod. It shall be applied at disturbed areas where it requires immediate cover for erosion protection or sediment control, residential or commercial areas where quick establishment or aesthetics are factors, locations where surface water concentrates, areas adjacent to drop inlets or in swales, or all other areas where seeding is not appropriate but an immediate vegetative cover is required. Irrigate sod according to Article 252.08

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.

- | | |
|--|---|
| <input type="checkbox"/> Aggregate Ditch | <input checked="" type="checkbox"/> Stabilized Construction Exits |
| <input type="checkbox"/> Concrete Revetment Mats | <input type="checkbox"/> Stabilized Trench Flow |
| <input checked="" type="checkbox"/> Dust Suppression | <input type="checkbox"/> Slope Mattress |
| <input type="checkbox"/> Dewatering Filtering | <input type="checkbox"/> Slope Walls |
| <input type="checkbox"/> Gabions | <input checked="" type="checkbox"/> Temporary Ditch Check |
| <input type="checkbox"/> In-Stream or Wetland Work | <input type="checkbox"/> Temporary Pipe Slope Drain |
| <input type="checkbox"/> Level Spreaders | <input type="checkbox"/> Temporary Sediment Basin |
| <input type="checkbox"/> Paved Ditch | <input type="checkbox"/> Temporary Stream Crossing |
| <input type="checkbox"/> Permanent Check Dams | <input type="checkbox"/> Turf Reinforcement Mats |
| <input checked="" type="checkbox"/> Perimeter Erosion Barrier | <input checked="" type="checkbox"/> Other (Specify) <u>Stabilized Flow Line</u> |
| <input type="checkbox"/> Permanent Sediment Basin | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Retaining Walls | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Riprap | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Rock Outlet Protection | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Sediment Trap | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> Storm Drain Inlet Protection | <input type="checkbox"/> Other (Specify) _____ |

Describe how the structural practices listed above will be utilized during construction:

Refer to the Erosion and Sedimentation Control plan sheets for the contracts for the specific stabilization practices called out for temporary and permanent conditions.

- Dust suppression: Dust suppression shall be implemented using a spray application of water as necessary to control fugitive dust emissions. Repetitive treatment will be applied as needed to accomplish dust control when temporary dust control measures are used. A water truck will be present on site (or available) for sprinkling/irrigation to limit the amount of dust leaving the site. Watering will be applied daily (or more frequently) to be effective.

- Perimeter Erosion Barrier (Silt Fence): As soon as reasonable access is available to all locations where water drains away from the project, silt fence shall be installed as called out in this plan and directed by the Engineer. Silt fences shall be placed at the locations indicated on the Erosion and Sediment Control Plans and other locations where it is deemed necessary to filter sediment from storm runoff. Silt fence shall not be installed in areas of concentrated flow such as across ditches. Silt fence should only be used as perimeter erosion barrier in areas where the work area is higher than the perimeter. The use of silt fence at the top of the slope/elevations higher than the work area should always be avoided. If necessary, temporary fence should be utilized in these locations (where the top of slope/elevation is higher than the work area) in lieu of silt fence. The fence is designed to retain sediment-laden water to allow settlement of suspended soils before filtering through the mesh fabric for discharge downstream. Perimeter silt fence shall be installed prior to the initiation of earth disturbing construction activities. Damage to silt fence by traffic or snow plowing should be immediately fixed by the Contractor. Silt fence will be installed around temporary topsoil stockpiles and will be installed prior to beginning stockpiling activities.

- Storm Drain Inlet Protection (Filter Fabric Inlet Protection): Fabric Inlet Protection shall be provided at all proposed drainage structures that will be receiving flow within the construction limits for the duration of construction. The primary function is to place controls in the path of flow sufficient to slow sediment laden water to allow settlement of suspended soils before discharging into the storm sewer system. Fabric inlet protection will consist of filter baskets or cover type in paved areas per Illinois Tollway Supplemental Specifications Section 280 and ISTHA Drawing Standard K1. Inlet filters shall be cleaned on a regular basis.

- Stabilized Construction Exits: Stabilized Construction Exits or Entrances will be provided by the Contractor. Vehicles and equipment will access the construction site at the designated stabilized construction entrances to control off-site tracking of sediments at locations shown on the Plans or as directed by the Engineer. Stabilized construction entrance(s) shall be constructed in conformance with the Illinois Tollway Supplemental Specifications Section 280 and ISTHA Drawing Standard K1. The rough texture of the stone helps to remove clumps of soil adhering to construction vehicle tires through the action of vibration and jarring over the rough surface and the friction of the stone matrix against soils attached to vehicle tires. Any track-out that occurs beyond the stabilized construction entrance shall be removed by wet sweeping no later than the end of the day in which the track-out occurs, or more frequently as directed by the Engineer. Periodic inspection and needed maintenance shall be provided after heavy use and each rainfall event. All work associated with installation and maintenance of concrete washouts are incidental to the contract.

- Temporary Ditch Checks: Rolled excelsior ditch checks will be placed in swales at the rate of one for every 1 foot in vertical drop, or as directed by the Engineer, in order to prevent downstream erosion.

-Stabilized Flow Line - The Contractor should provide to the RE a plan to ensure that a stabilized flow line will be provided during storm sewer construction. The use of a stabilized flow line between installed storm sewer and open disturbance will reduce the potential for the offsite discharge of sediment bearing waters, particularly when rain is forecasted so that flow will not erode. Lack of an approved plan or failure to comply will result in an ESC Deficiency Deduction. The approved plan provided by the Contractor including the installation and maintenance of the Stabilized Flow Line will be incidental to the Contract.

All erosion control products furnished shall be specifically recommended by the manufacturer for the use specified in the erosion control plan prior to the approval and use of the product. The Contractor shall submit to the Engineer a notarized certification by the producer stating the intended use of the product and that the physical properties required for this application are met or exceeded. The Contractor shall provide manufacturer installation procedures to facilitate the Engineer in construction inspection.

Describe how the structural practices listed above will be utilized after construction activities have been completed:

Once construction is completed and the vegetation has been established, the silt fence will be removed and areas disturbed by the removal will be stabilized with permanent stabilization methods as shown on the Plans.

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.

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:

There are no new impervious surfaces or new pollutant sources following completion of construction. Therefore, no permanent storm water management controls are to be provided as part of this contract.

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:

All management practices, controls and other provisions provided in this plan are in accordance with , "IDOT Standard Specifications for Road and Bridge Construction", "Tollway Supplemental Specifications", "Illinois Urban Manual", and "ISTHA Erosion Control and Landscape Manual".

The project is entirely located within the existing Illinois Tollway jurisdiction. There are no local Municipal Separate Storm Sewer System (MS4) requirements applicable to the contract.

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.

The Contractor will be responsible for the inspection, maintenance and repair of all sedimentation and erosion control measures. If the Engineer notices or is notified of an erosion or sedimentation deficiency, the Engineer will notify the Contractor to correct it. All maintenance of erosion control systems will be the responsibility of the Contractor until construction is complete and accepted by IDOT after final inspection. All Offsite Borrow, Waste, and Use areas are part of the construction site and are to be inspected according to the language in this section and Section IV.

Inspection of all erosion control measures shall be made at least once every seven days and within 24 hours of the end of each 0.5 inches or greater rainfall (including snowfall). Additionally during winter months, all measures should be checked after each significant snowmelt. Any necessary repairs or cleanup to maintain the effectiveness of said measures shall be made immediately. The project shall additionally be inspected by the Construction Field Engineer on a bi-weekly basis to determine that the erosion control efforts are in place and effective and if other erosion control work is necessary.

For work within Illinois Tollway's jurisdiction, all of the erosion and sediment control measures shall be maintained in accordance with the ISTHA Erosion Control and Landscape Manual: <https://www.illinoistollway.com/documents/20184/238191/A3Erosion+Sediment+Control+Landscape+Design+Criteria+Manual.pdf/6aeecec7-2551-4d08-bddc-3c830bd1d444?version=6.1&t=1709784971629&download=true>

In additional, the following link may also be useful for maintenance:

IDOT Erosion and Sediment Control Field Guide for Construction Inspection and IDOT's Best Management Practices - Maintenance Guide: <https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/transportation-system/manuals-guides-and-handbooks/highways/environment/erosion-and-sediment-control-field-guide-for-construction-inspection.pdf>

Illinois Urban Manual (IUM):

https://illinoisurbanmanual.org/wp-content/uploads/2019/04/IUM_FM_2013_FINAL_FINAL_11.4.13.pdf

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.



Contractor Certification Statement



Prior to conducting any professional services at the site covered by this contract, the Contractor and every subcontractor must complete and return to the Resident Engineer the following certification. A separate certification must be submitted by each firm. Attach to this certification all items required by Section II.G of the Storm Water Pollution Prevention Plan (SWPPP) which will be handled by the Contractor/subcontractor completing this form.

Route FAI 190	Marked Route I-190	Section Number FAI 90 23 TBR
Project Number C-91-175-23	County Cook	Contract Number 62U90

This certification statement is a part of SWPPP for the project described above, in accordance with the General NPDES Permit No. ILR10 issued by the Illinois Environmental Protection Agency.

I certify under penalty of law that I understand the terms of the Permit No. ILR 10 that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

Additionally, I have read and understand all of the information and requirements stated in SWPPP for the above mentioned project; I have received copies of all appropriate maintenance procedures; and, I have provided all documentation required to be in compliance with the Permit ILR10 and SWPPP and will provide timely updates to these documents as necessary.

- Contractor
- Sub-Contractor

Signature		Date	
Print Name		Title	
Name of Firm		Phone	
Street Address	City	State	Zip Code
Items which this Contractor/subcontractor will be responsible for as required in Section II.G. of SWPPP			

ILLINOIS TOLLWAY FORMS

**Illinois Tollway
Warranty Form**

A-27

Contract No. and Description:

Contract Pay Item and Description:

Manufacturer:

Name

Address

Representative

Address

Telephone No.

Owner:

Name

Illinois Tollway

Address

**2700 Ogden Avenue
Downers Grove, Illinois 60515-1703**

Telephone No.

(630) 241-6800

Contractor:

Name

Address

Telephone

Warranty:

- A. The Manufacturer, identified as _____,
a _____ corporation with its principal office at**

**hereinafter called "Manufacturer" warrants to the Illinois State Toll Highway
Authority, hereinafter called the "Illinois Tollway", that, subject to the provisions**

of this document, the Manufacturer will, at its own expense, provide all labor and material necessary to repair to proper working order this item.

B. System includes:

ITEM	MAKE	MODEL	SERIAL	REMARKS

C. This warranty shall be in effect beginning _____,
(Date)
and shall continue for a period of _____.

D. In the event of a system malfunction, the Illinois Tollway shall contact the Contractor to correct the situation, in accordance with his Guaranty for Defective Work. Should the Contractor determine that the malfunction is with the manufactured equipment, he shall promptly notify the Illinois Tollway who will notify the Manufacturer if the repairs covered by the warranty are required. The notice will be sent by Certified Mail, return receipt requested, to the Manufacturer's office specified in the Manufacturer's Maintenance Manual within 30 days of discovery of defects in the system.

GENERAL CONTRACTOR

SUBCONTRACTOR

BY:

BY:

TITLE:

TITLE:

DATE:

DATE:

This warranty and any attachment has been reviewed by the General Contractor's Project Quality Manager and has been approved for use in the above referenced

project in accordance with Specification Section(s) _____
and is to be utilized as part of Contract Pay Item(s) _____

**PROJECT QUALITY
MANAGER**

**Illinois Tollway
Earthwork Construction Plan (ECP)**

A-51

The Contractor shall submit this Earthwork Construction Plan (ECP), describing the methods and manners in which earthwork and soils will be managed during construction activities. The A-51 ECP is applicable for all field personnel working in areas regulated under the special provision(s). The Regulated Substances Health and Safety Plan (RSHASP), an attachment to the A-51 ECP, shall pertain to the Contractor, Illinois Tollway representatives and any visitors at the site. After approval, the A-51 ECP shall be revised, as necessary, to reflect changed conditions in the field.

Section 1.

A. Project Information

Contract Number	Route	Mile Posts	County
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Municipality(ies)

B. Endorsement

This plan must be approved by the Contractor's Quality Manager or Project Manager to comply with the plans, specifications and special provisions for management of regulated substances during construction activities.

Print Name	Title	Company/Firm
<input type="text"/>	<input type="text"/>	<input type="text"/>

By checking this box and typing my name below, I certify this plan has been approved by the Contractor's Quality Manager or Project Manager.

Signature	Date
<input type="text"/>	<input type="text"/>

Section 2. Earthwork Management Plan

Do you plan to stockpile more than 10,000 cubic yards of excavated material within the contract limits for a time greater than 7 days? Yes No

If yes, provide a plan sheet as Attachment 1 showing locations and volume of earthwork stockpile, windrow, filling in low areas or other. Contractor will provide the duration of the stockpile at each location by stage.

When the Contractor proposes to stockpile excavated material outside the contract limits or off Tollway right-of-way, the Contractor shall obtain and file with the Engineer permission in writing, from the property owner, for the use of the property for this purpose in accordance with 107.22 of the Supplemental Specifications. The Contractor shall provide a plan sheet as Attachment 1 showing locations and volume of earthwork stockpile, windrow, filling in low areas or other. Contractor will provide the duration of the stockpile at each location by stage.

Describe earthwork stockpile management by contract stage. Include how different waste streams, reuse types, suitable vs. unsuitable soil will be kept separate.

Mark all of the following earthwork items which differed from the contract quantities. (update throughout contract)

- Earth Excavation Rock Excavation

- | | |
|--|---|
| <input type="checkbox"/> Furnished Excavation | <input type="checkbox"/> Topsoil Furnish and Place, 4" |
| <input type="checkbox"/> Removal and Disposal of Unsuitable Material | <input type="checkbox"/> Non-Special Waste Disposal, Type 1 |
| <input type="checkbox"/> Structure Excavation | <input type="checkbox"/> Hazardous Waste Disposal |
| <input type="checkbox"/> Topsoil Excavation and Placement | <input type="checkbox"/> Incidental Earth Excavation |
| <input type="checkbox"/> Topsoil Excavation and Disposal | <input type="checkbox"/> Performance based items |

For all marked items, describe preferred method of management (add attachments as necessary, such as maps, survey points and any additional information requested by the Engineer)

Do you plan to temporarily place material outside the contract excavation limits or permanently waste excess material outside the contract grade lines? Yes No

If yes, the Contractor is required to submit the A-50 process for review and approval by the Tollway.

Section 3. Experience and Qualifications (Disposal of Regulated Substances and Uncontaminated Soil special provision)

Does the contract include the Disposal of Regulated Substances and Uncontaminated Soil special provision AND more than 300 cubic yards of earthwork excavation? Yes No

If yes, complete Section 3. If no, Section 3 is not required.

A. Experience

The Contractor, or firm, herein referred to collectively as Contractor, performing the regulated substances monitoring, field screening and/or additional sampling shall be pre-qualified in Hazardous Waste (Simple or Advanced) by IDOT, or demonstrate acceptable project experience. Acceptable project experience includes, but is not limited to, having completed at least five (5) documented Leaking Underground Storage Tank (LUST); and/or five (5) Site Remediation Program (SRP) cleanups following 35 Ill. Adm. Code 734, 740 or 742 within the last ten (10) years. Acceptable qualifications shall also be demonstrated with project experience in remediation and regulated substances operations in accordance with applicable federal, State or local regulatory requirements. Documentation of qualifications shall be provided to the Engineer for evaluation and acceptance. Acceptable project documentation shall include, at a minimum, the regulatory identification numbers, project completion dates and description of the Contractor's role in the projects.

The qualified soils monitoring personnel performing work shall have a minimum of one-year of experience in roadway construction, OSHA 40-Hour HAZWOPER Training and current certification of completion for the Annual 8-Hour HAZWOPER Refresher.

Provide a list of proposed subcontractors, relevant project experience and the work that each will perform related to environmental or regulated substances services.

Company/Firm's Name

Company/Firm's Address

Contact Name

Contact Title

Phone Number

Email Address

Work To Be Performed

Personnel*	Duties	Years Related Experience	HAZWOPER 40-Hour (Y/N)	8-Hour HAZWOPER Refresher Date	8-Hour Supervisor Training (Y/N)

* Personnel includes those physically conducting soils monitoring, soil disposal and other regulated substances field activities, the person preparing the RSHASP and related duties.

Is the contractor or firm pre-qualified in Hazardous Waste by IDOT? Yes No

Hazardous Waste - Simple Hazardous Waste - Advanced

SEFC ID Number Date Approved (Not Submitted)

If not pre-qualified, complete Section 3.B.

B. Contractors and Subcontractors Completing Regulated Substance Work or Disposal of Uncontaminated Soil

Project Experience (5 projects minimum)

Project # 1 Name IEPA LCP Number

IEMA Incident Number Applicable Regulation(s)

Period Firm Worked on Project
 From Date To Date

Company/Firm's Responsibilities

Project Status (Include NFR or 4Y Date, if applicable)

Project # 2 Name IEPA LCP Number

IEMA Incident Number

Applicable Regulation(s)

Period Firm Worked on Project

From Date

To Date

Company/Firm's Responsibilities

Project Status (Include NFR or 4Y Date, if applicable)

Project # 3 Name

IEPA LCP Number

IEMA Incident Number

Applicable Regulation(s)

Period Firm Worked on Project

From Date

To Date

Company/Firm's Responsibilities

Project Status (Include NFR or 4Y Date, if applicable)

Project # 4 Name

IEPA LCP Number

IEMA Incident Number

Applicable Regulation(s)

Period Firm Worked on Project

From Date

To Date

Company/Firm's Responsibilities

Project Status (Include NFR or 4Y Date, if applicable)

Project # 5 Name

IEPA LCP Number

IEMA Incident Number

Applicable Regulation(s)

Period Firm Worked on Project

From Date

To Date

Company/Firm's Responsibilities

Project Status (Include NFR or 4Y Date, if applicable)

C. Attach resume for soils monitoring and other personnel required to have specialized training for the work to be performed as Attachment 2.

D. Contractor must attach a copy of the current certification of completion of the Annual 8-Hour HAZWOPER Refresher for each person assigned soils monitoring duties as Attachment 3. (Include personnel preparing the RSHASP)

Does the Contractor or subcontractor have any current or former ties within, adjoining or potentially affecting this construction project?

Yes No

If yes, please describe

Section 4. Soil Disposal Operation Plan (SDOP) (Disposal of Regulated Substances and Uncontaminated Soil special provision)

Does the contract include Disposal of Regulated Substances and Uncontaminated Soil special provision AND more than 300 cubic yards of earthwork excavation? Yes No

If yes, complete Section 4. If no, Section 4 is not required.

A. Mark all Earthwork Management concerns that apply.

- Soil Management
- UST Removal
- Engineered Barriers
- Groundwater Management
- Backfill Plugs

Landfill Waste Disposal Characterization Sample(s)

____ Number of Landfill Waste Disposal Characterization Samples

Other, describe below

B. Outline the procedures to mobilize all required subcontractors' materials and equipment in a timely fashion and provisions to continue work in the regulated substances areas identified in the plans and special provision.

C. Describe the methods that will be used to manage soil and/or groundwater for each regulated area. Include a description of disposal methods and name of receiving facility for regulated substances and uncontaminated soil, if applicable, or state if the material will remain on-site. If material is taken to a location other than a CCDD/USFO facility or landfill, provide an approval letter from the property owner as Attachment 4.

(Best Management Practice - copy and paste regulated substances special provision and discuss each area)

D. Provide as Attachment 5: site maps illustrating location(s) of soil and/or ground waste management areas, engineered barriers, backfilled plugs, landfill waste disposal characterization sample locations, stations and other pertinent information.

Section 5. Regulated Substances Health and Safety Plan (RSHASP) (Hazardous Waste or Disposal Type 1

Does the contract include 1) hazardous waste OR 2) non-special waste (Disposal Type 1) as defined in the Disposal of Regulated Substances and Uncontaminated Soil special provision AND more than 300 cubic yards of earthwork excavation?

Yes No

If yes, complete Section 5. If no, Section 5 is not required.

The contractor shall develop a project specific RSHASP and submit the plan as Attachment 6.

The RSHASP shall specify procedures and equipment to protect site workers and observers from hazards encountered during activities in locations containing regulated substances. **A qualified Industrial Hygienist or Health and Safety Specialist shall prepare the Regulated Substances Health and Safety Plan. The Contractor's Corporate Officer responsible for worker health and safety shall approve and sign the plan before submittal to the Illinois Tollway.**

A qualified Industrial Hygienist is defined as having a minimum of five years of experience in the industrial hygiene field, an academic degree in a related science field, and successful completion of two days of testing presented by the American Board of Industrial Hygiene. A Certified Industrial Hygienist (CIH) meets the above definition.

A qualified Health and Safety Specialist is defined as having a minimum of three years of experience in hazardous waste operations, familiar with applicable health and safety procedures and protocols and holds current training status according to 29 CFR 1910.120. This person may be a Certified Safety Professional (CSP) or an Illinois Registered Professional Engineer. A CSP has a minimum of four years of professional safety experience, has a baccalaureate degree in safety and has successfully completed the safety fundamentals examination and subsequent specialty examination presented by the Board of Certified Safety Professionals.

The Contractor's corporate officer responsible for the Contractor's health and safety program and approval of the RSHASP shall be able to identify hazards; assess employee exposure and risk; have knowledge of Occupational Safety and Health Administration (OSHA) standards, hazards correction techniques and practices, work place safety and health program requirements. This person shall also be able to effectively communicate this knowledge both orally and in writing or contract for these abilities with a qualified Industrial Hygienist or Health and Safety Specialist.

The responsibility for the implementation and enforcement of all health and safety requirements lies solely with the Contractor. The Contractor shall take all necessary precautions for the safety of, and provide the necessary protection to prevent damage, injury or loss to construction personnel performing work within the exclusion and decontamination zones. The Contractor shall ensure all workers involved in any activities within the regulated substances locations or associated with the regulated substances are conversant with all the requirements of RSHASP and have signed off and dated personal acknowledgment of the plan. The Contractor shall post copies of RSHASP at various locations throughout the work area to facilitate spontaneous review.

A. Zones. Three distinct zones (exclusion, decontamination, and support) shall apply to projects adjacent to or within documented leaking underground storage tank (LUST) incidents, or 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 in the special provision(s).

1. Exclusion Zones are the areas where contamination does or could occur. These zones have the highest inhalation exposure potential and/or a high probability of skin contact with potential contaminants/contaminated material. The exclusion zone designation shall remain until the entire excavated area has been completely backfilled. The Contractor shall ensure that neither their employees nor subcontractors execute maintenance nor repair operations on equipment located in the exclusion zone.
2. Decontamination Zones are areas established to prevent the transfer of contaminants outside the exclusion zones. This zone eliminates the possibility of the physical transfer of contaminating substances on people, equipment, or in the air to unregulated areas. A combination of decontamination, distance from active work areas, zone restrictions, and work function shall eliminate the possibility of physical transfer of contamination. This zone has the next highest inhalation hazard, but does not pose a high probability of skin contact. This zone shall contain the equipment decontamination facility, areas designated for personnel decontamination and emergency equipment.
3. Support zones shall include the remaining areas of the job site. This zone shall contain the change and shower rooms, lunch and break areas, operation direction and support facilities (including supplies, equipment storage and maintenance areas). No equipment or personnel shall enter the support zone from the exclusion zone without passing through the personnel or equipment decontamination zone. Eating, drinking, smoking, etc., shall be allowed only in this zone.

The Contractor shall ensure each worker has the proper personal protective equipment for the zone and location in which he/ she is to perform construction or material management activities. The Contractor shall be responsible for providing all personal protective equipment required by the Illinois Tollway and Contractor personnel. The Contractor shall define the provisions for personal protective equipment in the RSHASP.

The Contractor, through the RSHASP, shall determine the appropriate level of protection. The Contractor shall ensure the appropriate protective equipment is being used during activities in the exclusion zone and decontamination zone. The Contractor shall notify the Engineer of any variations from the defined levels of protection as stipulated in the Contractor's health and safety plan in writing before implementation of the modifications.

B. Decontamination. All personnel who have participated in construction or soil management activities within the exclusion zone shall go through decontamination. Additionally, the Contractor shall perform a wet and/or dry decontamination

process on excavation and construction equipment as specified when equipment is in contact with contaminated material. No equipment or vehicle shall track visible material from a contaminated facility.

1. **Personnel Decontamination.** All outer protective clothing used by personnel who contact contaminated material while in the exclusion zone shall be collected in plastic bags and placed in leak-proof sealable containers, such as 55 gal (208 L) open-top drums. The Contractor shall transport all containers to a secure staging area for temporary storage. The Contractor shall inform the Engineer of the time and manner of disposal of containers containing contaminated protective clothing. The Contractor shall be responsible for transporting and disposing of the containers. The Contractor shall be responsible for ensuring the personnel decontamination portion of this zone contains clean, unused 6 mil (150 micron) polyethylene sheeting.
2. **Equipment Decontamination.**
 - a. **Dry Decontamination.** The Contractor shall perform dry decontamination on equipment that has contacted material classified as a non-special waste, special waste or hazardous waste before moving that equipment to any other location, whether the new location is contaminated or uncontaminated. Dry equipment decontamination shall consist of the removal of material from excavation and construction equipment parts, such as shovels, wheel tracks, and buckets. During dry decontamination, the Contractor shall ensure that removed contaminated material does not contact the ground surface. The Contractor shall place all contaminated material removed during dry decontamination with contaminated material of similar classification and dispose of it with other excavated material from the facility location.
 - b. **Wet Decontamination.** The Contractor shall perform the wet decontamination process when construction/soil management activities associated with non-special waste, special waste, or hazardous waste are followed by construction/soil management activities associated with uncontaminated excavation or fill material. If the Engineer observes residual and/ or non-special waste, special waste or hazardous waste material during the initial (or subsequent) inspection of equipment, the Engineer will require the Contractor to perform either wet and/or dry decontamination before approving equipment for use at another location. Before departure from the project area, all equipment and vehicles contacting contaminated material shall be wet decontaminated by the Contractor.

Personnel shall perform all wet equipment decontamination within the decontamination zone on equipment decontamination pad(s). The Contractor shall be responsible for the construction and maintenance of the decontamination pad(s) and for all equipment, materials and personnel. The pad(s) shall be designed to prevent loss of decontamination liquids to the surrounding environment through vertical infiltration and/or surface runoff from any part of the pad(s).

The Contractor shall place all removed wastes from the decontamination pad(s) in leak-proof containers and store temporarily in a secure staging area. The Contractor shall containerize the solids separate from the liquids. The Contractor shall be responsible for the transport and disposal of all waste generated from the decontamination process.

- C. **Health and Safety Training.** The Contractor shall indicate the designated environmental professional and the project safety officer responsible for monitoring activities within designated exclusion or decontamination zones have successfully completed the initial 40-hour Health and Safety Training Course and are current with refresher training pursuant to applicable federal, State and/or local standards, including OSHA requirements under 29 CFR 1910.120 (HAZWOPER). The personnel required to have training in accordance with 29 CFR 1910.120 shall have certifications of completion for the Annual 8-Hour HAZWOPER Refresher with them on the jobsite while working in areas regulated under the special provision(s). The designated environmental professional responsible for monitoring activities shall also have successfully completed an additional 8-Hour Supervisor Training Course pursuant to applicable federal, State and/or local standards, including OSHA requirements under 29 CFR 1910.120. The Contractor is responsible for ensuring that other contractor and subcontractor personnel required to be trained under 29 CFR 1920.120 have received required training and updates.

D. Medical Exams. The Contractor shall indicate all personnel in his/her work force who are required to have the training described in Section 5C of this form have received and passed a current medical examination as required under applicable federal, State and/or local standards. The Contractor is responsible for ensuring that other contractor and subcontractor personnel subject to medical monitoring under 29 CFR 1910.120 have received and passed a current medical examination under applicable federal, State and/or local standards.

RSHASP is attached: Yes No

Are medical exams for field personnel required under 29 CFR 1910.120? Yes No

If yes, are medical exams current for field personnel? Yes No

Section 6. Regulated Substances Erosion Control Plan (RSECP) (Hazardous Waste or Disposal Type 1)

Does the contract include 1) hazardous waste OR 2) non-special waste (Disposal Type 1) as defined in the Disposal of Regulated Substances and Uncontaminated Soil special provision AND more than 300 cubic yards of earthwork excavation? Yes No

If yes, complete Section 6. If no, Section 6 is not required.

The Contractor shall prevent flow of precipitation storm water into excavated areas that contain regulated substances. The Contractor shall divert all storm water away from the exclusion and decontamination zones using appropriate storm water erosion control methods.

Provide a description of how the Contractor plans to prevent precipitation storm water flowing into excavated areas and how all storm water will be diverted away from the exclusion and decontamination zones.

Failure to use appropriate measures to divert storm water will subject the Contractor to removing and properly containing the water at their own expense. The Contractor shall provide pumps and collect standing water from the excavation before continuing removal activities or other construction activities. The Contractor shall collect the removed water, place it in leak-proof storage containers and store it in a secure staging area for future testing by the Contractor. The Contractor shall ensure the storage containers have access points to facilitate sampling. The Contractor shall inform the Engineer about management and disposal requirements for the water following the evaluation of the analytical results.

Provide a description of the Contractor's plan to collect, transfer, test, store and dispose of potentially impacted water from construction areas.

The Contractor shall control and minimize the release of dust during non-special waste, special waste or hazardous waste removal activities. The Contractor may use water or acceptable chemicals to control dust emissions. Within the RSECP, the Contractor shall include a description of intended dust control measures.

Provide a description of the Contractor's plan for dust control measures.

**Illinois Tollway
Earthwork Final Construction Report (EFCR)**

A-53

The Contractor shall prepare and submit one hard copy and one electronic copy of the A-53 Earthwork Final Construction Report (EFCR) to the Construction Manager (CM) describing the earthwork related activities conducted during the life of the project. The A-53 EFCR shall describe the methods and manners in which all soils including hazardous waste, non-special waste, uncontaminated soil and soils reused on site were managed during construction activities.

Section 1.

A. Project Information

Contract Number	Route	Mile Posts	County
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Municipality(ies)

B. Endorsement

Print Name	Title	Company/Firm
<input type="text"/>	<input type="text"/>	<input type="text"/>

By checking this box and typing my name below, I certify 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, true, accurate and complete.

Signature	Date
<input type="text"/>	<input type="text"/>

C. Contractors and Subcontractors Completing Earthwork

List personnel and firm name that performed earthwork on the project. (Hit "Tab" to add more names and companies)

Name	Company/Firm
<input type="text"/>	<input type="text"/>

Section 2. Final Site Condition

Is excess material from this contract left in place within the Tollway right-of-way and outside the contract grade lines?
 Yes No

If yes, the Contractor will attach a previously approved A-50.

Section 3. Background

Does the contract include Disposal of Regulated Substances and Uncontaminated Soil special provision AND more than 300 cubic yards of earthwork excavation? Yes No

If yes, complete Section 3. If no, Sections 3 is not required.

A. Mark all Earthwork Management concerns that were addressed. Soil Management

- UST Removal
- Engineered Barriers
- Groundwater Management
- Backfill Plugs
- Landfill Waste Disposal Characterization Sample(s)

___ Number of Landfill Waste Disposal Characterization Samples

Other, describe below

1. Contractor shall provide a narrative discussing the regulated substances concern applied to the project and how they were addressed. (Best Management Practice - List each Regulated Substances Special Provision and how the material was managed)

B. Describe the measures taken to mark, monitor, handle and dispose of soil and/or groundwater containing regulated substances to prevent further migration of regulated substances and to protect workers.

1. Were there any deviations of the management of soils and/or groundwater from the contract Regulated Substances Special Provisions?
 Yes No

2. If yes, describe the deviation(s) from the special provision.

3. If yes, provide a copy of the prior written documentation from the CM allowing a deviation from the special provision as Attachment 2.

C. Provide copies of plan sheet excerpts showing the areas containing the regulated substances as defined in the contract special provisions with delineation of actual removal boundaries. Backfill plugs (unit/location) and all other regulated substances management concerns identified in Section 3.A.1. of this A-53 EFCR, if applicable, shall also be shown on plan sheets as well as the stationing and offsets. This information shall be provided as Attachment 3.

D. Provide the field sampling and testing results collected by the Contractor for landfill characterization and disposal as Attachment 4. In the event unexpected regulated substances were encountered, additional field sampling and testing results used to identify the nature and extent of the regulated substances shall be provided as Attachment 4A. This attachment shall also include the date the amended A-51 Earthwork Construction Plan (ECP) was submitted to the Illinois Tollway and the date that the Illinois Tollway accepted the amended A-51 ECP.

E. Provide copies of waste manifests for special or hazardous waste disposal. This information shall be provided as Attachment 5. Provide a comprehensive summary table of all soil removal associated with special or hazardous waste disposal. The table shall include the following: date removed, generator ID number, manifest tracking number, waste

profile number, designated facility name, station and offsets and weight in tons.

- F.** Provide copies of disposal tickets (identified by stationing and offsets) for all CCDD and non-special waste disposal. This information shall be provided as Attachment 6. Provide a comprehensive summary table of all soil removal associated with CCDD and non-special waste disposal. The table shall include the following: date removed, ticket ID, receiving facility name, profile number, station and offsets and weight in tons.
- G.** Provide any additional information relevant to earthwork activities not described in the above sections (e.g., technical data sheets, well abandonment forms, drawings, photographs, groundwater discharge permit application and approval, when applicable, etc).

ASBESTOS INFORMATION

Wight

2500 North Frontage Road
Darien, IL 60561
630.969.7000
Fax 630.969.7979

November 28, 2008

Ms. Angela La Porte
Illinois State Toll Highway Authority
One Authority Drive
Downers Grove, Illinois 60515

Re: Asbestos Consulting Services

Dear Ms. La Porte,

On November 24, 2008, Wight and Company, under contract with the Illinois State Toll Highway Authority (ISTHA), completed the re-inspection for asbestos containing materials (ACM) and suspect ACM throughout Toll Plaza 31 (O'Hare-West Plaza), located Southbound on the North Tri-State Tollway (I-190) in Park Ridge, Illinois. Areas inspected in the buildings included all rooms, closets, hallways, and stairways. This letter report summarizes inspection procedures and conclusions determined for your consideration and inclusion in the Asbestos Management Plan.

INSPECTION PROCEDURES

Wight and Company reviewed any existing asbestos Management Plan available to ensure its compliance with the Occupational Safety and Health Administration (OSHA) and any other federal, state, and local regulations. Based on the information provided in the Management Plan, specific procedures were utilized to update the current Management Plan. A state-licensed Asbestos Inspector performed a visual reassessment of all known and suspect friable and non-friable ACM at the ISTHA facility to verify its condition and determine if any health hazard is present. Wight personnel examined any existing ACM present at the ISTHA facility with the maintenance staff on-site to familiarize and instruct the staff with the practices and procedures outlined in the Management Plan. The inspector then prepared this update letter for submission to ISTHA's Designated Person to be maintained on file as an appendix to the Management Plan report.

ASBESTOS CONDITION DETERMINATION

According to the previous Management Plan for this facility, three (3) homogeneous materials were identified as asbestos-containing. They are as follows:

- Homogeneous Area 02: Mudded Joint Packings on Domestic Water Lines
- Homogeneous Area 07: 12" x 12" White Floor Tile and Mastic
- Homogeneous Area 09: Roof Flashing

Since the original inspection that identified this material as ACM, this plaza has participated in no change or renovation, and remains in the same condition. All of the pre-existing materials still exist in this building. As a result, the ACM still remains in this plaza, and as such, no change is necessary to the Management Plan.

REGULATORY REQUIREMENTS

If ACM was identified in this report, and if it will be disturbed through future maintenance, renovation, or demolition activities, it will be subject to the requirements set forth in all applicable federal, state, and local regulations. The following notices, permits, and licenses are necessary for abatement work as of the date of this report. The contractor is cautioned to verify these requirements as applicable to the final project scope and confirm that no new requirements exist.

Local Air Quality Board

Written notification is required by the Illinois Environmental Protection Agency (IEPA) at least ten (10) working days prior to the beginning of any asbestos abatement project activities on regulated ACM where the quantities are at least 160 square feet, 260 linear feet, or 35 cubic feet. IEPA is the state contact for the federal EPA's National Emissions Standards for Hazardous Air Pollutants (NESHAP) on these matters.

Illinois Department of Public Health

Written notification is required by the Illinois Department of Public Health (IDPH) at least two (2) working days prior to the beginning of any asbestos abatement project activities on friable and non-friable ACM whose quantities exceed 3 square feet or 3 linear feet, but do not exceed 160 square feet or 260 linear feet.

Permits

The contractor must obtain all county and/or local municipal permits or licenses required for asbestos abatement work prior to beginning any asbestos abatement project activities on regulated ACM.

Licenses

The contractor must maintain current licenses as required by the IDPH and Illinois Department of Transportation (IDOT) for the removal, transporting, disposal, or other regulated activity involved ACM for the duration of the project.

CONCLUSION

Areas inspected at the ISTHA facility Toll Plaza 31 (O'Hare-West Plaza), located Southbound on the North Tri-State Tollway (I-190) in Park Ridge, Illinois included all rooms, closets, hallways, and stairways.

Since the original inspection that identified this material as ACM, this plaza has participated in no change or renovation, and remains in the same condition. All of the pre-existing materials still exist in this building. As a result, the ACM still remains in this plaza, and as such, no change is necessary to the Management Plan.

If you have any questions, please do not hesitate to contact me at (630) 969-7000.

Sincerely,



Steven R. Szereidy
Industrial Hygienist
Building Environmental Services

ACM SUMMARY TABLE ILLINOIS STATE TOLL HIGHWAY AUTHORITY TOLL PLAZA 31 (O'HARE-WEST PLAZA) PARK RIDGE, ILLINOIS NOVEMBER 24, 2008				
Homogeneous Area Designation	Material Description	Material Location	Approximate Quantity	ACM Condition Change (Yes/No)
02	Mudded Joint Packings on Domestic Water Lines	Mechanical Room	20 fittings	No
		Closet	2 fittings	
		Room Behind the Closet	5 fittings	
		Women's Restroom	12 fittings	
		Men's Restroom	12 fittings	
		Northeast Room	2 fittings	
		Southeast Room	4 fittings	
07	12"x12" White Floor Tile and Mastic	Radio Room	130 square feet	No
		CTS Room	170 square feet	
09	Roof Flashing	Roof	200 linear feet	No



January 22, 2003

Illinois State Toll Highway Authority
One Authority Drive
Downers Grove, IL 60515-1703

Attention: Mr. John R. Mortenson
Maintenance Resource Administrator

Reference: Asbestos Consulting Services Contract MIP-92-979

Dear Mr. Mortenson:

As requested, we are pleased to submit the attached asbestos reinspection report for Plaza 31 – O'Hare West

ASBESTOS MANAGEMENT PLAN – Plaza 31 – O'Hare West

SCOPE OF SERVICES

1. PSI reviewed existing asbestos management plans to ensure their compliance with OSHA and other local, state, and federal regulations.
2. PSI inspected each ISTHA site that has a management plan to physically verify the current conditions of known asbestos containing materials.
3. PSI will review the management plans with the Toll Highway Authority maintenance staff to familiarize them with the existing conditions in their facility and the practices and procedures outlined in the management plan.
4. PSI will provide electronic copies of each management plan and update letter on CD-ROM in Adobe Acrobat format. One CD will be provided for each site.

GENERAL MANAGEMENT PLAN UPDATE

Section 1 page 9 – In addition to the EPA guidelines for asbestos floor tile maintenance, ISTHA employees should also follow the "Recommended Practices For The Removal Of Resilient Floor Coverings" pamphlet published by the Resilient Floor Covering Institute. This pamphlet is available from the Resilient Floor Covering Institute, 401 East Jefferson Street, Suite 102, Rockville, MD 20850, (301) 340-8580

REGULATORY UPDATE

If the asbestos-containing materials identified in this report will be disturbed through future maintenance, renovation or demolition activities, they will be subject to the requirements set forth in all applicable local, state, and federal regulations.

Prior to the initiation of a large project that would involve abatement, a detailed engineering cost estimate and project design is recommended. The engineering cost estimate will incorporate such variables as scheduling and phasing of the project, the size and extent of the project, seasonal factors, operational factors and other restrictions, respiratory protection, alternate abatement options, and type of replacement material. These are considerations that were not included in this scope of work or were unknown at the time of development of budgetary estimate. An engineering cost estimate would also include professional fees, such as for project design, project management, air monitoring and other expenses such as construction supervision.

The following notices, permits and licenses are necessary for abatement work as of the date of this report. The contractor is cautioned to verify these requirements as applicable to the final project scope and confirm that no new requirements exist.

LOCAL AIR QUALITY BOARD

Written notification is required by the Illinois Environmental Protection Agency at least 10 working days prior to beginning any asbestos abatement project activities on regulated asbestos-containing materials where the quantities are at least 160 square feet, 260 linear feet, or 35 cubic feet. IEPA is the state contact for the federal EPA (NESHAP) on these matters.

IDPH

Written notification is required by the Illinois Department of Public Health (IDPH) at least two (2) working days prior to beginning any asbestos abatement project activities on friable or non-friable asbestos-containing materials whose quantities exceed 3 square feet or 3 linear feet, but do not exceed 160 square feet or 260 linear feet.

PERMITS

Contractor must obtain all county and/or local municipal permits or licenses required for asbestos abatement work.

LICENSES

Contractor must maintain current licenses as required by the Illinois Department of Public Health (IDPH) and Illinois Department of Transportation (IDOT) for the removal, transporting, disposal, or other regulated activity.

SITE SPECIFIC INFORMATION

Based on the information provided in the previous Management Plan the following procedure was used to update the management plan.

Three year reinspection program:

An accredited inspector conducted a reinspection of all friable and non-friable asbestos-containing materials.

1. The inspector visually reinspect and reassessed the condition of all friable asbestos-containing materials and shall reevaluate the friability of all asbestos-containing materials that were previously considered non-friable.
2. Prepare reinspection update letter for submission to the Authority's Designated Person to be maintained on file as an appendix to the management plan report.

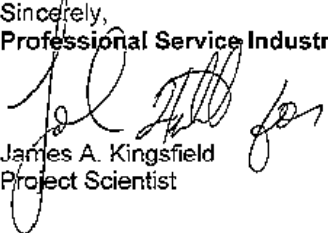
At the time of the asbestos reinspection the previously identified areas of ACM were in the following condition.


Homogenous Area #	Material Description	Material Change Yes*/No
02	Mudded joint packings (MJP's) on domestic water lines	NO
07	12" X 12" white floor tile and mastic	NO
09	Roof flashing	NO

*See attached Data

PSI is pleased to provide this update letter in accordance with our agreement. If you have any questions or require any additional information, please feel free to call PSI at 708-236-0270.

Sincerely,
Professional Service Industries, Inc.


James A. Kingsfield
Project Scientist


Brendan Quealy, EI
Department Manager

ASBESTOS MANAGEMENT PLAN

PLAZA 31- O'HARE WEST
TRI-STATE TOLLWAY
MILE POST 40.5 WESTBOUND

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

One Authority Drive
Downers Grove, Illinois 60515

Project No. MIP-92-538A

February, 1997

PROFESSIONAL SERVICE INDUSTRIES

520 East 22nd Street
Lombard, Illinois 60148
(630)691-1490
(630)691-9982 Fax

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Volume 2

Appendix C **Preliminary Asbestos Inspection & Management Plan**

Prepared by: Professional Services Industries
520 East 22nd Street
Lombard, Illinois 60148

**INTRODUCTION and
APPOINTMENT OF THE DESIGNATED PERSON**

The purpose of the Asbestos Management Plan is to provide the Authority personnel with general information covering occupational exposure to airborne asbestos fibers and to implement procedures and practices to keep known asbestos-containing materials in good condition. The plan highlights the requirements of applicable state and federal regulations, specifically Occupational Safety and Health Administration (OSHA) regulations governing workers and is intended to assist the Authority in its compliance efforts.

The State of Illinois Capital Development Board recommends that an O&M Program be instituted by State agencies in all State-owned buildings.

The Authority shall appoint a Designated Person to implement the Management Plan for this facility. If necessary, an assistant Designated Person may be appointed. The Designated Person shall:

1. Be in good health with no respiratory impairment, have an asbestos worker's medical exam and be approved by the agency fit to wear a respirator. It is preferable that the individual be a non-smoker.
2. Be knowledgeable about the building(s) and its mechanical systems.
3. Be the "Building Engineer" or "Head of Maintenance" or in a position to be informed about all repair and renovation activities within the building.
4. Be on call for emergencies which may occur after normal working hours.
5. Have successfully completed IDPH approved "Contractor Supervisor" and "Inspector" training courses.

THE DESIGNATED PERSON FOR THIS FACILITY IS:

Name: _____ Date Appointed: _____
Title: _____ Home Phone: _____
Address: _____ Phone: _____

GENERAL BUILDING DESCRIPTION

Toll Plaza 31 - O'Hare West is located on the Tri-State Tollway westbound at Mile Post 40.5.

The facility campus consists of one building, employee complex, and toll plaza.

The employee complex consists of a one-story concrete block structural steel building with a flat, tar built-up roof.

The employee complex is heated by a radiant hot water system supplied by a boiler system located in the mechanical room.

ASBESTOS DETECTION AND ABATEMENT HISTORY

In June, 1995, an asbestos survey for friable and non-friable asbestos-containing materials (ACM) was performed. This initial survey identified nine homogeneous sampling areas throughout this facility. This study revealed that the following asbestos-containing materials were present:

- Homogeneous area 2
Mudded joint packing (MJP) on domestic water lines
- Homogeneous area 7
12"x12" white floor tile and mastic
- Homogeneous area 9
Roof flashing

ASBESTOS HAZARD ASSESSMENT NARRATIVE

In April, 1995, Professional Service Industries was retained by the Authority to reevaluate the condition of the friable and non-friable asbestos-containing materials that remain in the facility and to update the asbestos management recommendations for those materials that tested positive for asbestos.

For the three remaining homogeneous areas that contain asbestos, a hazard assessment has been performed to aid in the implementation of an asbestos control program. It elaborates on the findings of the inspection, addressing friable and non-friable asbestos-containing materials, as well as, friable and non-friable suspect materials which have been assumed to contain asbestos.

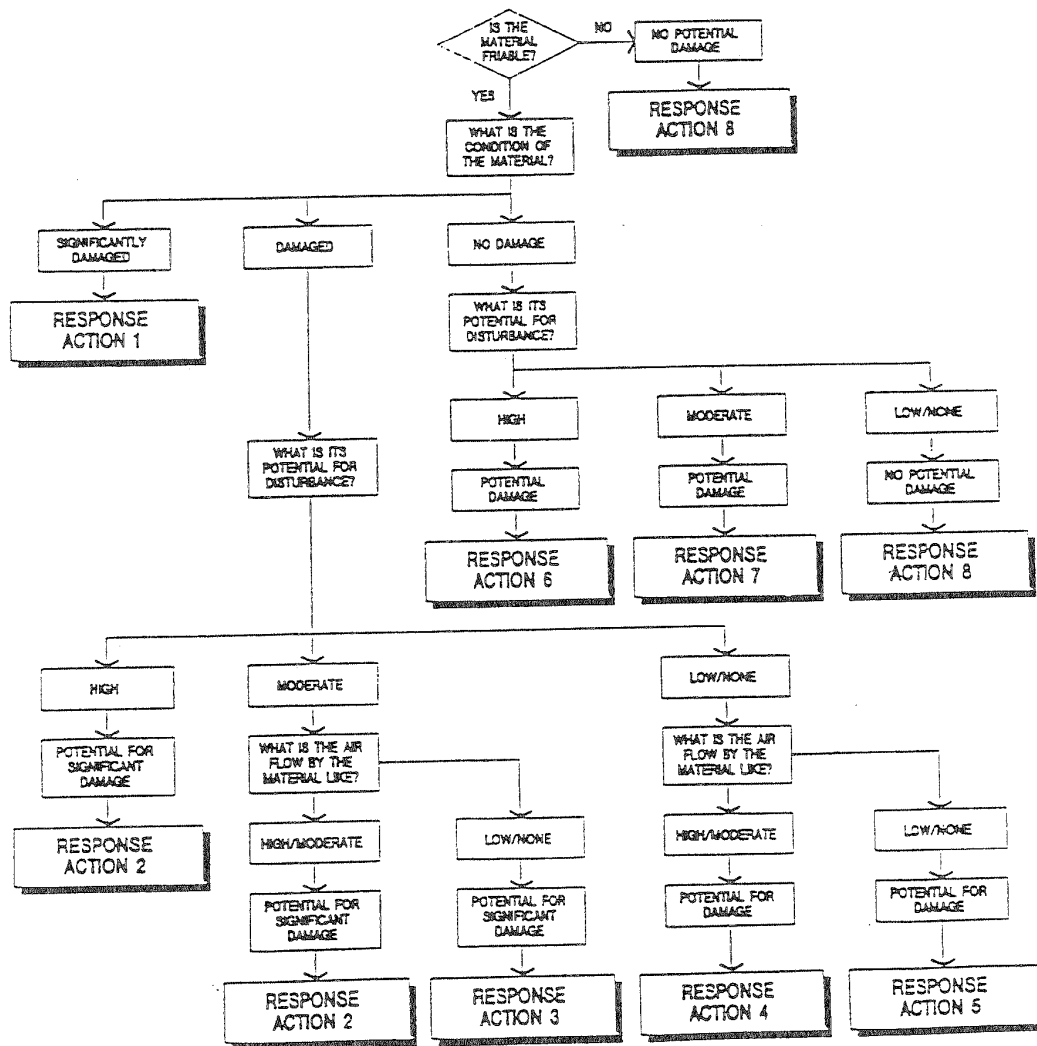
These assessments provide recommended short and long-term actions to be taken by the Authority to protect building occupants. These assessments are based on the characteristics of each homogeneous area and salient conditions of each material.

The following criteria have been evaluated in determining the hazard assessment of each material. They include, but are not limited to:

- Friability;
- Physical damage sustained by material;
- Extent of damage;
- Exposed surface area;
- Physical barriers to the material;
- Future potentials for disturbance;
- Disturbance influenced by vibration; and
- Potential for air erosion

After evaluating these characteristics, this information was applied to the Response Action Decision Tree to derive a response action number. These response action numbers correspond to response actions that should be taken to properly manage the material.

DECISION TREE



RESPONSE ACTION KEY

Response Action 1

Remove and relocate all non-fixed items from the area and limit access to the area to only personnel that have proper asbestos exposure training. Remove the material as soon as possible. Enclosure or encapsulation of the material may be sufficient if these methods will contain the material. Repair of thermal system insulation is allowed if feasible and safe. O&M is required for all friable asbestos-containing materials.

Response Action 2

Remove and relocate all non-fixed items from the area and limit access to the area to only personnel that have proper asbestos exposure training. Remove as soon as possible, or repair the material to correct the damage and reduce potential for disturbance. O&M is required for all friable asbestos-containing materials.

Response Action 3

Remove, enclose, encapsulate, or repair the material to correct the damage. Take steps to reduce potential for future disturbance. Schedule removal when practical and cost-effective. O&M is required for all friable asbestos-containing materials.

Response Action 4

Limit access to the area to only personnel that have proper asbestos exposure training, as directed by the Designated Person. Take steps to reduce potential for future disturbance. Schedule removal when practical and cost-effective. O&M is required for all friable asbestos-containing materials.

Response Action 5

Take steps to reduce potential for future disturbance. Schedule removal when practical and cost-effective. The response action number indicated the priority for removal of this material. O&M is required for all friable asbestos-containing materials.

Response Action 6

Take preventive measures to reduce potential for future disturbance. The response action number indicated the priority for removal of this material. O&M is required for all friable asbestos-containing materials.

Response Action 7

Maintain this material in place under an O&M program. The response action number indicated the priority for removal of this material. O&M is required for all friable asbestos-containing materials.

Response Action 8

Maintain this material in place under an O&M program. Maintain material until major renovation or demolition requires removal of the material or until hazard assessment factors for this material change.

RESPONSE ACTION SUMMARY & RECOMMENDATIONS

Material Description..... Mudded Joint Packings (MJP's) on domestic water lines

Response Action..... 7

Reference Drawing Drawing No. 2

Approximately 35 Mudded Joint Packings (MJP's) on non-suspect domestic water lines, 30% chrysotile, have been identified as asbestos-containing material. The Mudded Joint Packings (MJP's) on non-suspect domestic water lines are located on the main floor of the employee complex building.

With proper maintenance this insulation can remain in place until major renovation or demolition requires removal of the materials, or until hazard assessment factors for these materials change. We also recommend that the Authority take steps to prevent or avoid contact with this insulation.

RESPONSE ACTION SUMMARY & RECOMMENDATIONS

Material Description..... 12"x12" white floor tile and mastic
Response Action..... 7
Reference Drawing Drawing No. 2

Approximately 300 square feet of 12"x12" white floor tile and mastic, tile 3% chrysotile, mastic 15% chrysotile, has been identified as asbestos-containing material. The 9"x9" white floor tile and mastic is located on the second floor of the employee complex building, is in good condition, and is a non-friable material.

We recommend that the Authority maintain this material in place until major renovation or demolition requires removal of the material, or until hazard assessment factors for this material change. It is important to note that not all of the floor tile surfaces at this facility tested positive for asbestos. However, because all types of floor tiles are within close proximity to the asbestos-containing floor tile mastic, all floor surfaces should be treated as asbestos-containing materials for floor maintenance purposes.

We further recommend that the guidelines for asbestos-containing floor tile maintenance procedures, included in this Section, be implemented throughout the facility in order to maintain the integrity of asbestos-containing materials and non-asbestos floor surfaces.

RESPONSE ACTION SUMMARY & RECOMMENDATIONS

Material Description..... Roof flashing
Response Action..... 7
Reference Drawing Drawing No. 3

Approximately 20 0 linear feet of roof flashing (10% chrysotile) has been identified as asbestos-containing material. The roof flashing is located around the entire perimeter and all roof vents throughout the exterior roof surface. The material is in good condition and is a non-friable material.

We recommend that the Authority maintain this material in place until major renovation or demolition requires removal of the material, or until hazard assessment factors for this material change. When maintaining these materials, the least abrasive techniques should be used.

For example, when these flashings have to be removed and repaired as a maintenance activity, they should be moistened and remain wet to inhibit the release of asbestos fibers. Furthermore, when a flashing has to be removed and replaced, it should only be cut or removed using hand tools to minimize abrading the flashings.

EPA GUIDELINES FOR ASBESTOS FLOOR TILE MAINTENANCE

In November, 1989, a television station in Washington, D.C. produced and aired a three-part series on vinyl asbestos tile (VAT) maintenance. Portions of this series, including a segment on "routine maintenance activities" in schools, were then broadcast on NBC nation-wide. Following this broadcast, the Environmental Assistance Division (AD) of the EPA received numerous telephone calls from concerned parents, school staff, government officials, consultants, etc. about the specter of asbestos exposure to school children and maintenance personnel. In response to these inquiries, the EAD produced the "EPA Guidelines for Vinyl Asbestos Floor Tile Maintenance". These recommendations have been offered in response to the many inquiries concerning proper VAT maintenance:

1. Avoid Stripping Floors - Stripping floors should be done as infrequently as possible - perhaps once or twice per year depending on circumstances. the frequency should be carefully considered as floor maintenance schedules or contracts are written or renewed.
2. Properly Train Staff - Custodial or maintenance staff who strip the floors should be trained to operate properly and safely the machines, pads, and floor care chemicals used at the facility.
3. Follow Appropriate Work Practices - Custodial or maintenance staff who strip the floors should follow appropriate work practices, such as those recommended here, under informed supervision. Directions from floor tile and floor wax product manufacturers on proper maintenance procedures should be consulted.
4. Strip Floor While Wet - The floor should be kept adequately wet during the stripping operation. **Do not perform dry stripping.** Prior to machine operation, an emulsion of chemical stripper and water is commonly applied to the floor with a mop to soften the wax or finish coat. After stripping, before application of the new wax, the floor should be thoroughly cleaned while wet.
5. Run Machine At Slow Speed - If the machine used to remove the wax or finish coat has variable speeds, it should run at slow speed (about 175 to 190 rpm) during the stripping operation.
6. Select The Least Abrasive Pads Possible - The EPA recommends that the machine be equipped with the least abrasive pad possible to strip wax or finish coat from asbestos-containing floors.
7. Do Not Overstrip Floors - Stop stripping when the old surface coat is removed. Overstripping can damage the floor and may cause the release of asbestos fibers. Do not operate a floor machine with an abrasive pad on unwaxed floors.

Remember, improperly removing asbestos-containing floor covering could result in the release of high levels of asbestos. The EPA recommends that you leave asbestos-containing floor covering in place, provided the material is in good condition.

REQUIREMENTS OF THE DESIGNATED PERSON

The Illinois State Toll Highway Authority shall appoint a Designated Person to implement the Management Plan. If necessary, an assistant Designated Person may be appointed. The Designated Person shall:

1. Be in good health with no respiratory impairment, have an asbestos worker's medical exam and be fit to wear a respirator. It is preferable that the individual be a non-smoker.
2. Be knowledgeable about the building(s) and its mechanical systems.
3. Be the "Building Engineer" or "Head of Maintenance" or in a position to be informed about all repair and renovation activities within the building.
4. Be on call for emergencies which may occur after normal working hours.
5. The Designated Person shall receive training concerning the following:
 - a. Health effects of asbestos
 - b. Methods of detecting, identifying and assessing asbestos-containing materials
 - c. Response actions
 - d. How to implement an asbestos management plan
 - e. Federal and State regulations concerning asbestos
6. The following are the duties of the Designated Person:
 - a. Ensure the Management Plan is available for inspection and that notification is sent in accord with this Section.
 - b. Post warning labels in accord with this Section.
 - c. Ensure all custodial and maintenance employees are trained in accord with this Section.
 - d. Document and maintain records of inspections, reinspection, and implement response actions in accord with the Management Plan.
 - e. Maintain records in accord with this Management Plan.
 - f. Perform periodic surveillance's and schedule reinspections in accord with this Section.
 - g. Ensure that cleaning is performed in accord with this Section of the Management Plan.

II-1

- h. Provide employees and workers who may come in contact with asbestos with information in accord with this Section.
- i. Document and take appropriate action for any fiber release in accord with this Section of the Management Plan .

PERIODIC SURVEILLANCE & REINSPECTION PROGRAM

SIX-MONTH PERIODIC SURVEILLANCE

At least once every six months after the Management Plan is in effect, the Authority's Designated Person shall give direction to conduct periodic surveillance in each building that contains asbestos-containing materials.

This periodic surveillance shall include a visual inspection of all areas that are identified as asbestos-containing materials or assumed asbestos-containing materials in the Management Plan. The individual conducting the periodic surveillance need not be a licensed inspector, but shall be trained to conduct the surveillance.

The individual performing the periodic surveillance shall visually inspect all areas that are identified in the Management Plan as asbestos-containing materials. The following items should be noted during the reinspection.

1. The evaluator shall note any change of general condition, water damage, delamination, decay, vandalism, impaction or other disturbances (either large or small disturbances) of the asbestos-containing materials.

If changes have occurred, the Authority's Designated Person shall contact a Management Planner if any change has occurred. All response actions shall be selected by the licensed Management Planners and designed by licensed Project Designers.

2. Additional periodic surveillance shall be conducted whenever repairs, renovations, or other activities are conducted in areas containing asbestos-containing materials or assumed asbestos-containing materials.
3. The inspector shall record the date of the surveillance and his or her name on the "Six-month Periodic Surveillance" form in Appendix A of the Management Plan. As these forms are completed, they should be placed on files as an appendix to this report.

THREE YEAR REINSPECTION PROGRAM

At least once every three years after the Management Plan is in effect, an independent accredited inspector shall conduct a reinspection of all friable and non-friable asbestos-containing materials.

This reinspection shall include a visual inspection of all areas that are identified as asbestos-containing materials or assumed asbestos-containing materials and reevaluation of the assessments stated in the Management Plan. The individual conducting the periodic surveillance shall be an IDPH licensed inspector.

1. The inspector shall visually reinspect and reassess the condition of all friable asbestos-containing materials and shall reevaluate the friability of all asbestos-containing materials that was previously considered non-friable.
2. Each reinspection report shall be submitted to the Authority's Designated Person and maintained on file as an appendix to this report.

NOTIFICATION & MANAGEMENT PLAN AVAILABILITY

ANNUAL NOTIFICATION OF BUILDING OCCUPANTS

The Authority's Designated Person shall ensure that all building occupants are notified of the following on an annual basis:

1. The existence and type of asbestos-containing material in the building.
2. The location and availability of the Management Plan.
3. Updates on response actions, reinspection, and surveillance activities that are planned or in progress.
4. The name, address, and telephone number of the Designated Person.

Notification shall be implemented as follows:

1. Upon implementation of this Management Plan, the enclosed notification shall be forwarded to the facility's principal point-of-contact, appropriate union stewards, and will be published in the Authority's newsletter.
2. Each year an updated notification shall be sent to the facility's principal point-of-contact, appropriate union stewards, and will be published in the Authority's newsletter.
3. A copy of the current annual notification shall be included in the general information packet given to each new employee at that facility.

AVAILABILITY OF THE MANAGEMENT PLAN

A copy of the Management Plan shall be maintained at the Authority's administrative offices. Appendix B of this Management Plan, "Standard Operating Procedures for Maintenance of Asbestos-Containing Material at Plaza 31 - O'Hare West Tri-State tollway, Mile Post 40.5, Westbound", is available at the facility. The Management Plan is available during normal business hours with cost or restriction for inspection by representatives of EPA, the State, the public, and all persons notified. A reasonable fee may be charged for copies of the Management Plan.

WARNING LABELS & POSTINGS

The Authority's Designated Person shall ensure that warning labels are attached immediately adjacent to or on any friable and non-friable asbestos-containing materials located in routine maintenance areas, such as boiler rooms and janitor's closets, and at access panels to tunnels, crawlspaces, or ceilings which enclose any friable or non-friable asbestos-containing materials.

1. All labels shall be in prominent, visible locations until the asbestos-containing material is removed. The warning label shall read, in print which is readily visible because of large size or bright color, as follows either:

CAUTION: ASBESTOS. HAZARDOUS. DO NOT DISTURB WITHOUT PROPER TRAINING AND EQUIPMENT. (USEPA)

- OR -

DANGER: CONTAINS ASBESTOS FIBERS. AVOID CREATING DUST. CANCER & LUNG DISEASE HAZARD. (OSHA)

2. Access to routine maintenance areas that contain asbestos-containing material shall be limited to authorized trained individuals. Locations and placement of these labels shall be documented by the Authority's Designated Person.

SHORT-TERM WORKER NOTIFICATION

The Authority's Designated Person shall ensure that all short-term workers, such as telephone and alarm installers, repair workers, exterminators, etc. shall meet with the Building Supervisor to receive information regarding asbestos-containing materials located throughout the building.

1. The facility's Building Supervisor shall describe the type and location of asbestos-containing materials in the area where the worker will be required to go.
2. The Building Supervisor shall instruct the worker to avoid damaging the asbestos-containing materials and shall obtain the signature of the worker on a form which stated the following:
 - a. That the worker has been informed that asbestos-containing materials exists in the area where the work is to be performed.
 - b. The type of asbestos-containing materials (e.g. floor tile, ceiling tile, plaster, insulation, etc.).
 - c. That the worker will avoid damaging the asbestos-containing materials in any way, including but limited to drilling, abrading, cutting, etc.
 - d. The name of the worker, the company employing him/her, the nature of the work, and the date.
3. When workers require entry into an area where friable damaged asbestos-containing material is located and to which access is restricted, the Building Supervisor shall obtain the signature of the worker on a comprehensive release form which states the following:
 - a. That the worker has been informed that the designated areas contain friable damaged asbestos-containing materials.
 - b. That access to the area is restricted to persons with asbestos training who are wearing respiratory protection at all times.
 - c. That the worker understands that asbestos is a recognized health hazard, and that asbestos fibers can cause lung disease and cancer.
 - d. That the worker assumes full responsibility for his/hew own protection and welfare when entering the restricted area, and that he/she will hold the agency harmless from any injury claim related to asbestos exposure.
 - e. The name of the worker, the company employing him/her, the nature of the work, and the date.

EMPLOYEE AWARENESS TRAINING REQUIREMENTS

The Authority's Designated Person shall ensure that all members of the maintenance and custodial staff who work in a building that contains asbestos-containing materials shall receive awareness training of at least two hours, whether or not they are required to work with the asbestos-containing materials. New custodial and maintenance employees shall be trained within 60 days after commencement of employment.

This training shall include, but not be limited to:

1. Information regarding asbestos and its various uses and forms.
2. Information on the health effects associated with asbestos exposure.
3. Locations of asbestos-containing materials, identified throughout each building in which they work.
4. Recognition of damage, deterioration and delamination of asbestos-containing materials.
5. Name and telephone number of the Designated Person and the availability and location of the Management Plan.
6. The two hour training for new employees will be provided by qualified staff members who have asbestos training (e.g. Supervisor and/or another staff member assigned by the Authority) and who have comprehensive knowledge of the buildings.

EXTENDED EMPLOYEE AWARENESS TRAINING

The Authority's Designated Person shall ensure that all members of the maintenance and custodial staff who conduct any activities that will result in the disturbance of asbestos-containing materials shall receive additional training.

1. At least two maintenance workers shall receive the three-day Illinois asbestos worker training course and shall become licensed. These individuals shall perform all clean-up, repair, and emergency asbestos removal procedures, (including removal of floor tile) which may be required.
2. Staff members who may be required to work in areas of the building where friable asbestos-containing materials may be disturbed during the normal performance of their work, and to which access is restricted, shall receive the fourteen-hour training as required under AHERA or the three-day asbestos worker training.

The Authority shall provide the Designated Person with the training necessary to fulfill all required tasks. Periodic updates will be required.

A. Basic knowledge as required in AHERA shall include:

1. Health effects of asbestos.
2. Detection, identification, and assessment of asbestos-containing materials.
3. Options for controlling asbestos-containing materials.
4. Asbestos management programs.
5. Relevant federal and state regulations concerning asbestos, including those of the Occupational Safety and Health Administration, U.S. Department of Labor, the U.S. Department of Transportation, and the U.S. Environmental Protection Agency.

B. The Designated Person shall attend the following courses and all associated refresher courses, and shall successfully pass all course examinations:

1. Practices and Procedures in Asbestos Control, including additional coursework for "Contractor Supervisor" certification (five days), or other course which qualifies participants as "competent person" under OSHA; and/or

RESPONSE PROCEDURES FOR ASBESTOS DISTURBANCE & ABATEMENT WORK

EPA and OSHA have severe penalties for improper disturbance, removal, or disposal of asbestos-containing materials. Therefore, the following sections are to be implemented, as directed by the Authority's Designated Person, as required in response to the disturbance, maintenance, and removal of asbestos-containing materials.

EMERGENCY FIBER RELEASE EPISODES

Custodial and maintenance workers shall immediately report, in writing the Authority's Designated Person, the presence of debris, water or physical damage to the asbestos-containing materials, or any evidence of possible fiber release. The Authority's Designated Person shall then assess the scope of the situation, and advise the Authority with respect to the steps to be implemented in response to the episode.

The Authority's Designated Person shall classify the emergency fiber release episode into one of the following categories, and follow the procedures outlined for each category.

- A. **STOCKPILED MATERIALS** - The disruption of asbestos-containing materials or materials suspected to be asbestos-containing materials that have not been installed, or asbestos-containing materials that has been stored and abandoned in place, but has not been properly disposed.
- B. **CLEANING SALIENT AREAS OF DAMAGE** - Maintenance activities that involve the clean-up and repair of up to one square foot or one linear foot of asbestos-containing materials dust or debris.
- C. **SMALL-SCALE DISTURBANCES** - Maintenance activities that involve the removal, repair, and clean-up of three linear feet or three square feet of asbestos-containing materials.
- D. **LARGE-SCALE DISTURBANCES** - Maintenance activities that involve the removal, repair, and clean-up of asbestos-containing materials in excess of three linear feet or three square feet.

The Authority shall direct the Designated Person to call an abatement contractor or assign a trained in-house team to clean up debris and make repairs as soon as possible. If a contractor is used, a company shall be selected and retained by contract for quick response action as needed. The Authority's Designated Person shall complete the appropriate fiber release episode documents, provided in Appendix A of this Management Plan.

STOCKPILED MATERIALS

If the Authority's Designated Person suspects that stockpiled materials contain asbestos, or that stockpiled asbestos-containing material has been disturbed, the Authority should:

- A. Not use such materials for facility maintenance.
- B. Not move or dispose of material until authorized to do so by the Authority's Designated Person.
- C. Place warning signs in accord with the Management Plan.
- D. Cover the stockpiled materials with one layer of 6-mil plastic sheeting.
- E. Complete the forms in Appendix A, as required by the Management Plan, and maintain them on file with the Management Plan.

This includes 9"x9" floor tile, 12"x12" floor tile, ceiling panels, ceiling tile, boiler and fitting gaskets, roping for boiler gaskets, thermal insulations such as aircell or magnesium block, bags of asbestos insulation mix and "transite" asbestos cement board.

Depending on the size and circumstances, the Authority may either authorize trained personnel from the Authority to properly dispose of the material or conduct an abatement project. In some instances, the Authority may instruct that the asbestos waste be stored in a secured area until the facility can be inspected.

CLEANING SALIENT AREAS OF DAMAGE

From time to time, during the course of routine building use and maintenance, salient or isolated areas of damage may be detected on asbestos-containing materials. If such disturbances are identified, and the disturbance is less than 1 linear foot or 1 square foot in size, the Authority or the Authority's Designated Person may implement the following procedures:

- A. Clean all areas of the building where friable asbestos-containing materials, damage of significantly damaged thermal system insulation asbestos-containing materials, or friable suspected asbestos-containing materials are present at least once after the completion of the inspection and before the initiation of any response action, other than O&M activities or repair.
- B. Additional cleaning shall be performed if recommended by the Management Planner as part of a response action.
- C. The cleaning procedures are to include the following:
 - 1. The workers performing the cleaning shall be licensed, and equipped with 1/2-face, dual cartridge, high efficiency air purifying respirators, at a minimum.
 - 2. The cleaning is to be performed using a combination of wet mopping or wiping and HEPA vacuuming.

3. Irregular surfaces, such as curtains, books, furniture and carpeting should be cleaned using HEPA equipped vacuum cleaners. Many manufacturers offer several "nozzles" to make HEPA vacuuming of irregular surfaces less difficult. Carpet may be steam cleaned.
4. Dispose of waste generated during this activity as asbestos-containing materials.
5. Complete the forms found in Appendix A for each cleaning and include in the Management Plan.

SMALL-SCALE DISTURBANCES

The Authority's Designated Person is to use the following procedures for small-scale maintenance activities (less than 3 linear feet or 3 square feet which repairs asbestos-containing materials, disturbs asbestos-containing materials, dust or debris, or disturbance of asbestos-containing materials is possible).

- A. The Authority's Designated Person is to obtain approval from the Authority before beginning work. All work shall be performed by licensed workers and be supervised by a licensed supervisor.
- B. Schedule the work after normal working hours (nights or weekends), if possible, or control access to the work area. Doors shall be locked from the inside and signs posted to prevent unauthorized persons from entering the work area (e.g. "MAINTENANCE WORK IN PROGRESS, DO NOT ENTER"; or, if the asbestos levels are high enough to trigger the OSHA Rule (the PEL or higher), "DANGER - ASBESTOS: CANCER AND LUNG DISEASE HAZARD; AUTHORIZED PERSONNEL ONLY; RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THE AREA"). Note, emergency exits must remain in operation.
- C. The air handling system shall be shut off or temporarily modified to prevent the distribution of fibers from the work site to other areas in the building. Be sure that the electrical system is disconnected prior to misting.
- D. Workers shall wear NIOSH-approved respirators with HEPA filters and protective clothing, including a body suit, hood, boots, and gloves. Workers must wear personal monitors as required by OSHA unless previous experience with the same asbestos-containing materials and similar operations indicates that fiber levels are likely to be less than the PEL.
- E. A 6-mil polyethylene plastic dropcloth shall be placed beneath the location of the maintenance work, extending at least 10 feet beyond all sides of the work site. (In the case of entry into the space above a suspended ceiling the work site would be the area of the panels moved to gain access.)

Alternatively, a rectangular enclosure constructed of 6-mil plastic on a frame can be positioned underneath the maintenance area to inhibit the spread of fibers from fallen asbestos-containing materials. (Mobile enclosures of this type are available commercially.)

- F. If entry to the space above a suspended ceiling is necessary, the panels shall be moved carefully with as little movement as possible. The air above the opening, the top of the moved panel and all panels surrounding the opening, and the asbestos-containing materials likely to be disturbed shall be misted with a fine spray of amended water. Misting of the air helps to settle quickly. Cleaning ceiling panels with a HEPA vacuum cleaner is also effective as long as care is taken not to vibrate panels and disturb the asbestos-containing materials.
- G. Thermal System Repairs.
1. Many times thermal insulation can be easily repaired to prevent further release of asbestos fibers. Repairs can be made by licensed workers as follows:
 - a. Spray the damaged area with a light coating of penetrating encapsulant.
 - b. Fill any gouges or depressions with fiberglass or palm grade encapsulant.
 - c. Wrap or cover damaged area with a self-setting lagging or lagging set in one coat of bridging encapsulant.
 - d. Paint damaged area with two coats of bridging encapsulant.
 - e. Paint damaged area with two coats of bridging encapsulant.
 2. Self-setting lagging will not properly adhere if wetted with an amended water. These methods can also be utilized for repairing open ends of pipe insulation repair of fitting insulation.
- H. The maintenance renovation work form in this Section shall be completed by the Authority's Designated Person for each area repaired. Air monitoring is required for any activity which approaches thirty minutes, unless all applicable procedures indicated in Appendix G of OSHA 1926.58 - Work Practices and Engineering Controls for Small Scale, Short-Duration Asbestos Renovation and Maintenance Activities Non-Mandatory are followed.
- I. Glovebag Procedures
1. The asbestos-containing insulation on piping shall be removed using IDPH glovebag techniques as necessary for the repairs. Perform all glovebag procedures using a NIOSH-approved PAPR respirator, mini-enclosure, and negative air.
 2. If a bag is ruptured during the repairs, work shall stop, the area should be sealed off, and all procedures recommended for large-scale asbestos removal shall be followed.
 3. Plastic sheets (6-mil polyethylene) shall be cut and taped around any thermal insulation which might be disturbed. The plastic shall be misted with amended water before taping it shut. The plastic shall be taped to itself to avoid damaging the insulation.

During the course of the work, small pieces of asbestos-containing materials shall be collected by the HEPA-vacuum. This is best accomplished by placing the vacuum hose adjacent to the asbestos-containing materials being disturbed. Larger pieces shall be placed in a labeled plastic bag.

- J. Upon completion of the work, any visible debris on the top of the suspended ceiling, on the drop cloth, on the floor, or anywhere else shall be collected by cleaning with a HEPA vacuum.
- K. All equipment and tools shall be wiped with damp cloths or HEPA-vacuumed.
- L. The plastic sheet shall be wiped with a damp cloth, carefully folded, and discarded as asbestos waste.
- M. All debris, vacuum bags, and filters shall be discarded in sealed and labeled plastic bags as asbestos waste.
- N. Workers shall vacuum their disposable suits before leaving the work site (or remove and discard them as asbestos waste and put on a clean disposable suit), and proceed to a remote decontamination area with shower facilities. Workers are to shower with their respirators on and clean their respirators while in the shower.
- O. Install non-asbestos containing material to replace removed asbestos-containing materials.

LARGE-SCALE DISTURBANCES

Maintenance activities which involve removal of three linear or square feet or more of asbestos-containing materials (e.g. several valves need attention in a utility room or block insulation needs to be removed for boiler repair) are large disturbances and shall be performed by IDPH licensed Asbestos Contractors and designed by an IDPH licensed asbestos project designer.

The Authority's Designated Person is to use the following procedures for large-scale disturbances. Prior to implementing these measures, the Designated Person is to notify the Authority and receive approval from the Authority prior to implementing these procedures

A. General Project Requirements

- 1. Any abatement project or maintenance activity where removal may exceed three square feet or three linear feet must be designed by an IDPH licensed project designer, conducted by an IDPH licensed abatement contractor, and overseen by IDPH licensed personnel.
- 2. The EPA must be notified in accord with NESHAP should the quantities of asbestos-containing materials be excess of 160 linear feet, 260 square feet, and/or 1 cubic yard.
- 3. USEPA, IEPA, OSHA, and applicable IDPH requirements are to be followed.
- 4. All projects must be designed by an IDPH licensed project designer and have IDPH licensed Asbestos Project Manager to observe the abatement and IDPH licensed air sampling professional perform air sampling.

5. Asbestos removal activities are to be performed by and IDPH licensed contractor.
6. Staff performing the work must be IDPH licensed workers and supervised by an IDPH licensed supervisor.
7. The Asbestos Abatement Contractor must have a medical surveillance and respirator program in accord with this Section for all employees working with asbestos.

B. Regulatory Requirements

Federal and Illinois laws and regulations that apply to asbestos abatement work are similar regardless of the size or the value of the work. The Authority should not undertake projects or contract for asbestos abatement services under "local bidding" or "emergency" circumstances without assured quality control. These procedures are provided to assist in that regard.

1. All projects except small projects must be designed by a licensed Project Designer.
2. The Authority's Designated Person shall ensure that all Federal, State, and local regulations with respect to permitting, removal, waste disposal requirements are followed.
3. All response actions, including enclosure or encapsulation of asbestos-containing materials, must be conducted and supervised by an IDPH licensed person.
4. The Authority's Designated Person shall ensure that prior written notice is provided to EPA.
5. The Authority's Designated Person shall document all activities, including the Asbestos Project Manager's (APM) and Air Sampling Professional's (ASP) daily reports, and clearance air tests results and shall insert the record drawings which indicate the exact locations of any removal, encapsulation, or enclosure of asbestos-containing materials in the building's Management Plan.
6. The Authority's Designated Person should be thoroughly familiar with the Response Action Contractor's indemnification act.

C. Removal of Intact Non-Friable Asbestos-Containing Materials

Non-friable materials when removed intact pose little danger of asbestos fiber release. These procedures are issued to ensure worker protection and emission control during removal of all non-friable materials including the following materials:

Transite type materials such as roofing, siding, piping, sheeting, and cooling tower baffles; fire brick; stucco siding; and floor tile and other miscellaneous floor coverings.

Non-friable materials do not require the use of licensed contractors, but it is required that the Authority or a knowledgeable Construction Section Engineer supervise the project and the work be completed by asbestos workers licensed by IDPH. Roofing projects do not require workers to be licensed by IDPH.

1. Regulated Area

The Authority's Designated Person shall ensure that the Asbestos Abatement

Contractor performing the removal of intact, non-friable asbestos-containing materials establish a regulated area where non-friable asbestos-containing materials are to be removed, renovated, or repaired. The regulated areas shall be demarcated in a manner that minimizes the number of persons within the area and protects persons outside the area from exposure to air-borne concentrations of asbestos in excess of the permissible limit. Access to the regulated areas shall be limited to authorized persons. Those workers performing the removal shall not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated areas.

2. Tools

All powered tools, or high speed abrasive disc saws must be equipped with engineering controls that eliminate dust before they can be used for work related to asbestos. Compressed air can be used to remove asbestos only when it is used in conjunction with an enclosed ventilation system designed to capture the dust created by the compressed air.

3. Air Monitoring

- a. State and Federal regulations require that all employers ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 f/cc as an 8-hour time weighted average Permissible Exposure Limit (PEL) or in excess of 1.0 f/cc as averaged over a sampling period of 30 minutes Excursion Limit(EL).
- b. Air monitoring must be completed for each non-friable asbestos abatement project. The air monitoring shall be completed by an independent IDPH licensed air sampling professional (ASP) employed by the Engineer (where an Engineer or Construction Section Engineer is involved).
 - i. A minimum of three background samples shall be taken prior to the start of the work.
 - ii. Determinations of an employee's exposure shall be made from breathing zone air samples that are representative of both the 30-minute short-term exposure (Excursion Limit) and the 8-hour time weighted average of each employee.
 - Representative 8-hour Time Weighted Average (TWA) employee exposure shall be determined on the basis of one or more samples representing full-shift exposure for employees in each work area.
 - Representative 30-minute short-term employee exposures shall be determined on the basis of one or more samples representing 30-minute exposures associated with operations that are most likely to provide exposures above the excursion limit for employees in each work area.
 - iii. In addition to the breathing zone air samples at least one sample each shall be taken daily in the following areas:

- Work area
 - Outdoors in a zone not suspected to be contaminated to be used as a background sample.
 - If the material being removed is adjacent to an intake of a ventilation system that must remain in operation during the removal, two samples shall be taken within the ventilated area.
 - If any interior work area tests indicate an air-borne asbestos fiber level above 0.1 f/cc additional air samples shall be taken in any area where contamination is possible and work shall be stopped until work methods have been reviewed and revised to control fiber release. If any of the samples taken from the areas defined in subsection (iii) or in possible contaminated areas where the PEL exceeds 0.1 f/cc State and Federal regulations require that all employers ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 f/cc as an 8-hour time weighted average Permissible Exposure Limit (PEL) or in excess of 1.0 f/cc as averaged over a sampling period of 30 minutes Excursion Limit (EL) these areas shall be cleaned by HEPA vacuum or wet wiping.
- iv. If any of the interior air tests taken above indicate an air-borne asbestos fiber level above 0.01 f/cc and are above the initial background levels, the ASP shall have the employees clean the area by wet wiping and retest the area for clearance taking a minimum of two air samples. Once all tests fail below 0.01 f/cc, the area may be occupied.
- v. Upon completion of the removal interior work areas shall be cleaned using HEPA vacuum or wet methods. Clearance testing will not be required.
4. Respirators
- Any time the PEL or excursion limit is exceeded or upon request of the worker, the employer shall provide the worker with a respirator and protective clothing and must provide decontamination facilities. Whenever respirators are used or required the employer must be able to provide evidence of worker training and respirator and medical surveillance programs. Whenever the PEL is exceeded, the site shall be posted with the following information: DANGER, ASBESTOS CANCER AND LUNG DISEASE HAZARD, AUTHORIZED PERSONNEL ONLY, RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA.
5. "Wet" Removal
- Materials shall be kept damp using a surfactant during removal and shall be thoroughly wetted using a surfactant prior to disposal. Materials shall be handled to minimize breaking. Enclosed chutes may be used for lowering thoroughly wetted roofing materials to ground level.

D. Floor Tile Removal Procedures

II-17

1. The USEPA recommends that asbestos-containing floor tiles and mastics remain in place if the material is in good condition or can be adequately sealed.

Removal of these materials should only be done at the end of the material's life or whenever remodeling dictates. Improper removal of asbestos-containing floor tiles and mastics could result in the release of asbestos fibers.
2. Asbestos floor tile removal methods: Follow Small Disturbance procedures for area preparation. All asbestos-containing materials removed must be thoroughly wetted and double-bagged in 6-mil properly labeled poly bags. Areas where the tile cannot be removed intact with methods such as given below must be completed as an asbestos abatement project.
 - a. Heat - This procedure is applicable for small areas or single tiles. Apply heat with propane torch or heat gun. Keep moving to prevent burning. Lift tile with wide blade putty knife. Heat mastic and scrape away excess.
 - b. Dry ice - This procedure is applicable for small area. CAUTION: thermal gloves are required for handling the dry ice to prevent frostbite. Apply large piece of dry ice to area to be remove. Move over tile to be removed. Popping sound indicates loosening of tile. Remove mastic with heat as above.
 - c. Water - This procedure is applicable for larger areas but may not be appropriate for wood floors. Prepare water by adding surfactant (wetting agent). Spray on area until heavy coverage occurs.

Cover with plastic for 8 to 24 hours. Check for looseness. If not loose apply more water. If loose, raise tile with wide putty knife or long handled scraper using care not to break tiles. Remove mastic using heat.
3. If it is necessary to remove mastic, extreme caution shall be utilized. Many mastic removers and solvents including the Citrus Turpene varieties, have a very low "Flash Point Rating" (less than 140 degrees Fahrenheit) and a very low "Lower Explosive Limit (less than one percent concentration in air).

This means that less than one percent of the product's vapor needs to be in the air to create an explosive atmosphere. These products represent a fire and explosion hazard in confined spaces which normally occur during the removal of asbestos containing materials. Also, some solvents may be carcinogenic and may be solvent to the plastic bags usually used for containing asbestos waste. Some solvents have a strong odor and may cause nausea. Both a vapor filter and an asbestos filter may be required for air purifying respirators. All work utilizing mastic removers shall be conducted while the building is unoccupied.
4. It is recommended that the use of mastic removers and solvents be limited to very small quantities or only products that have a flash point of 200 degrees Fahrenheit or higher be used.
5. Federal and State laws require the Authority to obtain the Material Safety Data Sheet of all products used. The Authority must also comply with employee right to know laws.

SIX MONTH PERIODIC SURVEILLANCE OF ASBESTOS CONTAINING MATERIALS

Building Name: _____ Room Number: _____

Building Number: _____ Room Name: _____

Type of Asbestos-Containing Material:

1. Sprayed-on or troweled on ceilings or walls.
2. Sprayed-on or troweled on structural members.
3. Insulation on pipes, tanks, or boiler.
4. Other (describe): _____

Has the material been encapsulated _____, enclosed _____, neither _____

Assessment - Note location of Asbestos-Containing Material and any changes in condition:

Photograph any areas that have changes and attach photo to this report.

1. Air plenum, air shaft, or air stream: _____

2. Physical damage: _____

3. Water damage: _____

4. Deterioration: _____

5. Accessibility of the material: _____

6. Activity near the material: _____

7. Other observations (including the condition of the encapsulant or enclosure, if any): _____

NAME: _____ SIGNATURE: _____ DATE: _____
(Person completing surveillance)

NOTE: Retain this form for three years after the next reinspection. Attach to the Management Plan.

PURPOSE: This form is used by the Authority's Designated Person, or an inspector appointed by the Authority's Designated Person, every six months to document the present condition of the asbestos-containing materials throughout the facility.

INSTRUCTIONS:

The heading on each surveillance form should be filled out completely.

The type of asbestos-containing material being surveyed, and whether the material has been encapsulated and/or enclosed should be noted.

When observing the asbestos-containing material each of these seven assessment factors are to be considered.

The inspector should respond to each assessment factor and comment on each factor accordingly.

Finally, the form should be signed and dated by the person performing the periodic inspection.

SIX MONTH PERIODIC SURVEILLANCE OF ASBESTOS CONTAINING MATERIALS

Building Name: MAINT BLDG M-4 Room Number: 102
 Building Number: — Room Name: BOILER ROOM

Type of Asbestos-Containing Material:

1. Sprayed-on or troweled on ceilings or walls.
2. Sprayed-on or troweled on structural members.
3. 3 Insulation on pipes, tanks, or boiler.
4. Other (describe): _____

Has the material been encapsulated _____, enclosed _____, neither

Assessment - Note location of Asbestos-Containing Material and any changes in condition:

Photograph any areas that have changes and attach photo to this report.

1. Air plenum, air shaft, or air stream: NO CHANGE
2. Physical damage: MISSING + CRUMBLING C. BASE
3. Water damage: NO CHANGE
4. Deterioration: CRUMBLING C. BASE + AROUND FLANGES
5. Accessibility of the material: NO CHANGE
6. Activity near the material: NO CHANGE
7. Other observations (including the condition of the encapsulant or enclosure, if any):
PLASTER BARRIER IN NEED OF REPAIR.

NAME: JACK HAMMER SIGNATURE: Jack Hammer DATE: 9/8/94
(Person completing surveillance)

NOTE: Retain this form for three years after the next reinspection. Attach to the Management Plan.

ANNUAL NOTIFICATION LETTER

Date: _____

Dear Employee:

Tollway Building Facility _____ has been inspected for asbestos-containing building materials by a licensed inspector. In addition, an Asbestos Management Plan has been prepared by a licensed management planner. The Inspection Report and Management Plan are on file in the facility office and are available for public review during business hours.

The reports state that asbestos-containing materials have been found. The condition and type of the asbestos are shown in the individual reports.

Copies of these reports are available upon notification of the facility administrator and payment of a fee to cover copying costs.

Sincerely,

for the Illinois State Toll Highway Authority

Note: Maintain this record indefinitely with the Management Plan.

PURPOSE: This form is used by the Authority, or the Authority's Designated Person, to notify Authority employees regarding the presence of asbestos-containing materials in the facility.

INSTRUCTIONS:

The text and content should not be altered without approval from the Authority or the Authority's Designated Person.

The form should be printed or reproduced on Authority letterhead, then signed.

ANNUAL NOTIFICATION LETTER

Date: 9/8/94

Dear Employee:

Tollway Building Facility M-6 has been inspected for asbestos-containing building materials by a licensed inspector. In addition, an Asbestos Management Plan has been prepared by a licensed management planner. The Inspection Report and Management Plan are on file in the facility office and are available for public review during business hours.

The reports state that asbestos-containing materials have been found. The condition and type of the asbestos are shown in the individual reports.

Copies of these reports are available upon notification of the facility administrator and payment of a fee to cover copying costs.

Sincerely,

Jack Hammer
for the Illinois State Toll Highway Authority

NOTIFICATION OF SHORT-TERM WORKERS

Date: _____

Building/Facility: _____

It is our intent that asbestos-containing building materials in this building is in no way disturbed by your work. By signing this form, you are acknowledging that:

1. You have been instructed to avoid damaging the asbestos-containing material;
2. You have been notified of the type and location of asbestos-containing material in the area in which you will be working; and that
3. You are not to damage the asbestos-containing material in any way, including but not limited to, drilling, abrading, cutting, etc.

Area of work in the building: _____

Specific location and type of asbestos-containing material in this area: _____

Name of Company: _____

Address: _____

Phone: _____

Name (Print): _____

Signature: _____

NOTE: This form is used to be completed by temporary or short-term workers. This form should be completed by the worker prior to the start of their work. This form may be copied on to Authority letterhead, and kept indefinitely on file with the Management Plan.

PURPOSE: This form is used by the Authority, or the Authority's Designated Person to notify short-term workers (i.e., contractors, contract workers, or temporary/part-timeworkers) about areas of the facility where asbestos-containing materials are present and to advise them not to disturb the asbestos-containing material during the course of their work.

INSTRUCTIONS:

Describe in detail the area(s) of the facility where their work is to take place.

Describe in detail the type(s) of asbestos-containing materials that are at this location and the condition of these materials.

The closing of this form should be completed in its entirety by the individual and/or company performing this work.

NOTIFICATION OF SHORT-TERM WORKERS

Date: 9/8/01

Building/Facility: M-5

It is our intent that asbestos-containing building materials in this building is in no way disturbed by your work. By signing this form, you are acknowledging that:

1. You have been instructed to avoid damaging the asbestos-containing material;
2. You have been notified of the type and location of asbestos-containing material in the area in which you will be working; and that
3. You are not to damage the asbestos-containing material in any way, including but not limited to, drilling, sanding, cutting, etc.

Area of work in the building: FIRE CHASE BETWEEN WOMEN'S RESTROOM & WOMEN'S LOCKER ROOM

Specific location and type of asbestos-containing material in this area: ACM DRY & FITTING INSULATION INCLUDE SUSPECT ACM DRYING MATERIAL IN THE FIRE CHASE

Name of Company: Ace Plumbing

Address: 1410 SWEETGATE BLVD
SOLENTREE IL 60001

Phone: 312/555-5124

Name (Print): JACK HANMER

Signature: Jack Hanmer

COMPREHENSIVE RELEASE FORM

Date: _____

Illinois State Toll Highway Authority

Building/Facility: _____

Restricted Area: _____

I have been informed by the Authority that the area to which I have requested access contains friable damaged asbestos-containing material and that, at present, entry into this area is restricted to persons with asbestos training who are wearing respiratory protection.

I acknowledge that I am aware that asbestos is a recognized health hazard and that airborne asbestos fibers can cause lung disease and cancer when inhaled. Therefore, I am prepared to protect myself against exposure to asbestos fibers according to OSHA and recognized industry standards by avoiding creating dust through the disturbance of friable asbestos-containing material and wearing a NIOSH approved respirator while I am in the restricted area.

I hereby affirm that I accept full responsibility for protecting myself against asbestos exposure and agree to hold the Illinois State Toll Highway Authority harmless for any injury claim I may have in the future which is related to asbestos exposure.

Name of Company: _____

Address: _____

Phone: _____

Name (Print): _____

Signature: _____

NOTE: This form is used to be completed by contractors, when their work involves access into a restricted area. This form should be completed by the contractor prior to the start of their work. This form may be copied on to Authority letterhead, and kept indefinitely on file with the Management Plan for this facility.

PURPOSE: This form is used by the Authority, or the Authority's Designated Person, to notify Contractors about areas of the facility that are restricted, due to the presence of damaged, friable asbestos-containing materials, and that they are responsible for their own monitoring and protection during the course of their work in such areas.

INSTRUCTIONS:

Describe in detail the area(s) of the facility where their work is to take place.

The text and content of the letter should not be altered without approval from the Authority or the Authority's Designated Person.

The closing of this form should be completed in its entirety by the individual and/or company performing this work.

COMPREHENSIVE RELEASE FORM

Date: 9/2/02

Illinois State Toll Highway Authority

Building/Facility: MAINTENANCE FACILITY M-1

Restricted Area: BOILER ROOM

I have been informed by the Authority that the area to which I have requested access contains friable damaged asbestos-containing material and that, at present, entry into this area is restricted to persons with asbestos training who are wearing respiratory protection.

I acknowledge that I am aware that asbestos is a recognized health hazard and that airborne asbestos fibers can cause lung disease and cancer when inhaled. Therefore, I am prepared to protect myself against exposure to asbestos fibers according to OSHA and recognized industry standards by avoiding creating dust through the disturbance of friable asbestos-containing material and wearing a NIOSH approved respirator while I am in the restricted area.

I hereby affirm that I accept full responsibility for protecting myself against asbestos exposure and agree to hold the Illinois State Toll Highway Authority harmless for any injury claim I may have in the future which is related to asbestos exposure.

Name of Company: Ace Plumbing

Address: 1410 SHERIDAN BLVD.
SKOKIE, IL 60077

Phone: 312/555-5231

Name (Print): Jack Hammer

Signature: Jack Hammer

ILLINOIS STATE TOLL HIGHWAY AUTHORITY
TWO HOUR AWARENESS TRAINING PROGRAM

Date: _____

Location: _____

Instructor: _____

Printed Name	Signature
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____
9. _____	_____
10. _____	_____
11. _____	_____
12. _____	_____
13. _____	_____
14. _____	_____
15. _____	_____
16. _____	_____
17. _____	_____

NOTE: This form is used to record attendance at mandatory awareness training seminars for maintenance workers. This form should be checked against personnel records from time-to-time to ensure all maintenance employees have received this training. This form may be copied on to Authority letterhead, and kept indefinitely on file with the Management Plan.

PURPOSE: This form is used by the Authority, or the Authority's Designated Person, to register the attendance of workers, employees, and building occupants to a recommended two hour training seminar regarding facilities that containing asbestos materials.

INSTRUCTIONS:

The heading on the attendance roster should be filled out completely.

Each attendee should fill in their name legibly (either printed or signed).

ILLINOIS STATE TOLL HIGHWAY AUTHORITY
TWO HOUR AWARENESS TRAINING PROGRAM

Date: 4/2/02
Location: M-6
Instructor: [Signature]

	Printed Name	Signature
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____
11.	_____	_____
12.	_____	_____
13.	_____	_____
14.	_____	_____
15.	_____	_____
16.	_____	_____
17.	_____	_____

ILLINOIS STATE TOLL HIGHWAY AUTHORITY
EXTENDED EMPLOYEE TRAINING PROGRAM

Facility Name _____
Employee Name _____
Employee Job Title _____
Completion Date of Training _____
Course Title _____
Course Provider and Location of Training _____

Number of Hours Completed in Training _____
Signature of Employee _____
Authority's Representative _____
Date _____
Attach copy of course completion certificate.

MEDICAL

Date: _____
Provider: _____
Approved for Respirator Use: Yes () No ()

(authorized Authority signature)

(employee's signature)

Note: Maintain these records for 30 years after employment ceases, and maintain on file with the Management Plan.

PURPOSE: This form is used by the Authority, or the Authority's Designated Person, to document Authority employees that elect to or that have been assigned to maintain asbestos-containing materials at their assigned facility or throughout the ISTHA facility system.

INSTRUCTIONS:

The heading of this form should be filled out completely.

Specific information such as the training course title, number of credit hours, and course date should be placed in this section.

The employee, the Authority's Designated Person and/or representative are to sign and date the form.

When or if the employee has been issued a respirator, OSHA requires that the employee have an annual physical to test their ability to wear a respirator. The information regarding the results of this physical should be entered onto the form.

The employee, the Authority's Designated Person and/or representative are to sign and date the form.

ILLINOIS STATE TOLL HIGHWAY AUTHORITY
EXTENDED EMPLOYEE TRAINING PROGRAM

Facility Name M-6
Employee Name Jack Hauke
Employee Job Title MAINTENANCE TECH II
Completion Date of Training 8/22/02
Course Title Asbestos Worker Training
Course Provider and Location of Training Mackinac Valley Tech

Number of Hours Completed in Training 40
Signature of Employee Jack Hauke
Authority's Representative Paul Lopez
Date 9/8/02

Attach copy of course completion certificate

MEDICAL

Date 8/22/02
Provider ENVIRONMENT ; CHICAGO, IL
Approved for Respirator Use: Yes () No ()

Paul Lopez
(authorized Authority signature)
Jack Hauke
(employee's signature)

MAINTENANCE/RENOVATIONWORK

This three-part form is used by the Authority's Designated Person to document alterations, repairs, or restoration of the facility when asbestos-containing materials may be incidental to this work.

Building Name: _____ Room Number: _____

Building Number: _____ Room Name: _____

1. Exact location of area involved (homogeneous area(s), location within room, etc.) _____

Starting Date: _____ Completion Date: _____

2. Is asbestos present in the area in which you intend to do work?

Yes ___ No ___ (If no, complete page 1 only and attach to Management Plan.)

If yes:

Worker's Initials

- A. Worker informed asbestos-containing materials exist _____
- B. Type of asbestos-containing materials present _____
- C. Worker agrees to avoid damaging asbestos-containing materials in any way including but not limited to, drilling, abrading, cutting, etc. _____

3. Is area restricted? Yes ___ No ___

If yes:

- A. Worker informed area contains friable damaged asbestos-containing materials _____
- B. Access restricted to persons wearing respiratory equipment at all times. _____
- C. Worker understands that asbestos is a recognized health hazard and that asbestos fibers can cause lung disease and cancer. _____
- D. Worker assumes full responsibility for own protection and welfare when entering the restricted area and will hold the Facility harmless from any injury claim related to asbestos exposure. _____

INSTRUCTIONS:

The heading of each record form should be filled out completely.

Describe in detail the area(s) of the facility where their work is to take place, the type(s) of asbestos-containing materials that are present at this location, and the condition of these materials.

If asbestos-containing material was present in the area of the work, the worker or supervisor for the worker crew is to initial the indicated line items, indicating that they have been notified as to the presence of asbestos-containing material in work area.

If asbestos-containing material was present in the area of the work, and this area is restricted due to the condition of the asbestos-containing material, the worker or supervisor for the worker crew is to initial the indicated line items, indicating that they have been notified as the presence of asbestos-containing material in their work area, and the special conditions regarding this work.

MAINTENANCE/RENOVATIONWORK	
This <u>three-part</u> form is used by the Authority's Designated Person to document alterations, repairs, or restoration of the facility when asbestos-containing materials may be incidental to this work.	
Building Name: <u>MAINTENANCE BLDG. M-4</u>	Room Number: <u>102</u>
Building Number: <u> </u>	Room Name: <u>BOLLER ROOM</u>
1. Exact location of area involved (homogeneous area(s), location within room, etc.) <u>SE CORNER OF ROOM, 10" DOMESTIC WATER SUPPLY, CEMENTITIOUS PIPE FITTINGS INSULATION, AREA M4-4</u>	
Starting Date: <u>10/4/94</u>	Completion Date: <u>10/4/94</u>
2. Is asbestos present in the area in which you intend to do work? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (If no, complete page 1 only and attach to Management Plan.) If yes:	
A. Worker informed asbestos-containing materials exist	Worker's Initials <u> JH </u>
B. Type of asbestos-containing materials present	<u> JH </u>
C. Worker agrees to avoid damaging asbestos-containing materials in any way including but not limited to, drilling, abrading, cutting, etc.	<u> JH </u>
3. Is area restricted? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes:	
A. Worker informed area contains friable damaged asbestos-containing materials	<u> JH </u>
B. Access restricted to persons wearing respiratory equipment at all times.	<u> JH </u>
C. Worker understands that asbestos is a recognized health hazard and that asbestos fibers can cause lung disease and cancer.	<u> JH </u>
D. Worker assumes full responsibility for own protection and welfare when entering the restricted area and will hold the Facility harmless from any injury claim related to asbestos exposure.	<u> JH </u>

MAINTENANCE/RENOVATION WORK (continued)

4. Asbestos control methods to be used (i.e., glovebag, HEPA vacuum, wet methods, etc.)

5. Protective equipment to be used (respirators, coveralls, etc.) _____

6. If asbestos-containing material is to be removed, provide the name and location of storage or disposal site of the asbestos-containing material.

7. **NAME OF EACH WORKER**

PRINT	SIGNATURE	IDPH LICENSE #
-------	-----------	----------------

_____	_____	_____
-------	-------	-------

_____	_____	_____
-------	-------	-------

_____	_____	_____
-------	-------	-------

_____	_____	_____
-------	-------	-------

8. **FOR WORK TO BE COMPLETED BY CONTRACTORS:**

Employer _____

Address _____

Print Name _____

Worker's Signature _____

9. Accepted by (Designated Person) _____ Date _____

INSTRUCTIONS:

If asbestos-containing material was disturbed or altered during this work specific information such as fiber control measures, personal protection measures, and disposal information are to be noted, as indicated on the form.

During this work the name and license number of each worker that comes into contact with asbestos-containing material are to be recorded, as indicated.

The closing on this form should be completed in its entirety by the individual and/or company performing this work.

MAINTENANCE/RENOVATION WORK (continued)

4. Asbestos control methods to be used (i.e., glovebag, HEPA vacuum, wet methods, etc.)
FITTING REMOVED BY GLOVE BAG METHOD.

5. Protective equipment to be used (respirators, coveralls, etc.)
PAPR, TYVEK COVERALLS

6. If asbestos-containing material is to be removed, provide the name and location of storage or disposal site of the asbestos-containing material.
REMOVED BY CONTRACTOR TO HIS DISPOSAL SITE

7. NAME OF EACH WORKER

PRINT	SIGNATURE	IDPH LICENSE #
<u>FORK LIFT</u>	<u>Fork Lift</u>	<u>100-9291</u>
_____	_____	_____
_____	_____	_____

8. FOR WORK TO BE COMPLETED BY CONTRACTORS:

Employer ACE ASBESTOS REMOVAL

Address 1410 SOMEPLACE BLVD., SOMEWHERE, IL

Print Name FORK LIFT

Worker's Signature Fork Lift

9. Accepted by (Designated Person) Jack Hammer Date 10/4/94

Page 2 of 3

MAINTENANCE/RENOVATION WORK (continued)

10. Complete this part if air samples are required.

Name of ASP: _____ License # _____

Signature: _____

Locations of samples collected: _____

Date samples collected: _____

Name and address of Laboratory: _____

Date of Analysis: _____

Results of Analysis: _____

Method of Analysis: PCM _____ TEM _____

Name of Analyst: _____

Signature: _____

Attach copy of NVLAP certification.

Note: Retain this form for thirty years after the completion of work. If asbestos is present, retain for thirty years after the worker's employment separation. Attach to the Management Plan.

INSTRUCTIONS:

If asbestos-containing material was disturbed or altered during this work, and air samples were taken by the Authority and/or the workers, this information is to be noted, as indicated on the form.

Information such as the credentials of the individual taking and analyzing the air samples, the results of the air sample analysis, method of analysis, and name of the analyst are to be recorded.

MAINTENANCE/RENOVATION WORK (continued)

10. Complete this part if air samples are required

Name of ASP: Paul Bell License # 100-242
Signature: Paul Bell

Locations of samples collected: Basement area of Form W. Two
wood boxes and ceiling board near back wall
East Wing

Date samples collected: 10/6/01

Name and address of Laboratory: The Laboratory
1001 Wood Sawyer Ct.
Southlake, TX 75081

Date of Analysis: 10/9/01

Results of Analysis: Asbestos less than 0.01 f/l

Method of Analysis: PCM TEM

Name of Analyst: Paul Bell
Signature: Paul Bell

Attach copy of NVLAP certification.

FIBER RELEASE EPISODE REPORT

The presence of debris, water, or physical damage to asbestos containing materials, or any evidence of fiber release, shall be immediately reported to the Authority.

Building Name: _____ Room Number: _____

Building Number: _____ Room Name: _____

1. Homogeneous area designation of fiber release: _____

2. Date: _____ Reported by (print) _____

3. Description of episode _____

4. Was the asbestos-containing material cleaned up according to IDPH approved procedures
Yes ___ No ___

5. Name and location of storage or disposal site of asbestos-containing material: _____

6. Results of air clearance testing: _____

Name of ASP _____ IDPH license no. _____

Attach copies of air sampling data, if required.

NAMES OF PEOPLE PERFORMING WORK

PRINT	SIGNATURE	IDPH WORKERS LICENSE #
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

SIGNED: _____ DATE: _____

for the Illinois State Toll Highway Authority

PURPOSE: This form is used by the Authority, or the Authority's Designated Person, to document an event when asbestos-containing materials have been disturbed, and record the measures taken to abate the event.

INSTRUCTIONS

The heading on each episode report should be filled out completely.

Describe in detail the area(s) of the facility where their work is to take place, the type(s) of asbestos-containing material disturbed, and a brief description of the fiber release event.

Describe in detail the measures taken to abate the event.

For this work, the name and license number of each worker who comes into contact with asbestos-containing material are to be recorded, as indicated.

Finally, the form should be signed and dated by the person supervising this work on behalf of the Authority.

FIBER RELEASE EPISODE REPORT		
The presence of debris, water, or physical damage to asbestos containing materials, or any evidence of fiber release, shall be immediately reported to the Authority.		
Building Name:	<u>MAINTENANCE BLDG. M-1</u>	Room Number: <u>104</u>
Building Number:	<u>-</u>	Room Name: <u>FOREMAN'S OFFICE</u>
1.	Homogeneous area designation of fiber release: <u>M 1-4</u>	
2.	Date: <u>10/19/94</u>	Reported by (print) <u>JACK HAMMER</u>
3.	Description of episode <u>AIRCELL PIPE INSULATION DAMAGED BY CONTACT W/DESK CHAIR CONTACT</u>	
4.	Was the asbestos-containing material cleaned up according to IDPH approved procedures Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>OFFICE WAS VACATED, DEBRIS WAS VACUUMED</u> <u>END OF INSULATION WAS REPAIRED</u>	
5.	Name and location of storage or disposal site of asbestos-containing material: <u>REMOVED BY CONTRACTOR TO DISPOSAL FACILITY</u>	
6.	Results of air clearance testing: <u>ALL SAMPLES BELOW 0.01 f/cc</u> Name of ASP _____ IDPH license no. <u>100-392</u> Attach copies of air sampling data, if required.	
NAMES OF PEOPLE PERFORMING WORK		
PRINT	SIGNATURE	IDPH WORKERS LICENSE #
<u>FORK LIET</u>	<u>Fork Lielt</u>	<u>100-9291</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
SIGNED: <u>Jack Hammer</u>	DATE: <u>10/4/94</u>	
for the Illinois State Toll Highway Authority		

**Standard Operating Procedure for
Maintenance of Asbestos-Containing
Materials at Plaza 31 O'Hare West
Tri-State Tollway
Mile Post 40.5 Westbound**

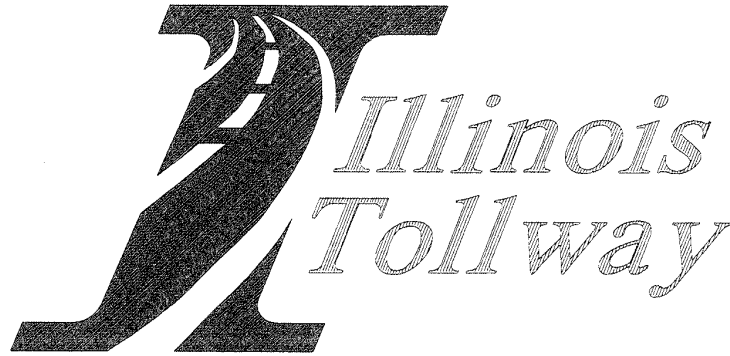
for the ILLINOIS STATE TOLL HIGHWAY AUTHORITY



February, 1997

**Standard Operating Procedure for
Maintenance of Asbestos-Containing
Materials at Plaza 31 O'Hare West
Tri-State Tollway
Mile Post 40.5 Westbound**

for the ILLINOIS STATE TOLL HIGHWAY AUTHORITY



February, 1997

POLICY STATEMENT

This "Standard Operating Procedure for Maintenance of Asbestos-Containing Materials at Plaza 31 - O'Hare West Tri-State Tollway, Mile Post 40.5, Westbound", is intended to be a working document which will serve as a guide to staff, employees, occupants and visitors in minimizing the risk of exposure to asbestos fibers. The Illinois State Toll Highway Authority (the Authority) recognizes the serious health hazards associated with asbestos fibers. The Authority has conducted an inspection of this facility in order to determine whether asbestos is present, and if so, where the asbestos is located.

This document, a subsection of the "Asbestos Management Plan for Plaza 31 - O'Hare West Tri-State Tollway, Mile Post 40.5, Westbound", sets forth the recommended response actions for the asbestos-containing materials that remain within the facility. Further, where required, an Operations & Maintenance (O&M) Program has been established, which will be implemented by the "Designated Person" for the Authority.

The Authority shall appoint a Designated Person to implement the Management Plan for this facility. The Designated Person is knowledgeable about the facility's mechanical systems, location and condition of asbestos-containing materials, and is on-call for emergencies which may occur after normal working hours.

**IN THE EVENT THAT ASBESTOS-CONTAINING MATERIALS
ARE:**

1. **Present in a location where preventive maintenance and/or unscheduled maintenance activities are being performed;**

-or-

2. **Asbestos-Containing Materials have been disturbed, or are suspected of being disturbed;**

**CONTACT THE DESIGNATED PERSON FOR THIS
FACILITY IMMEDIATELY**

THE DESIGNATED PERSON FOR THIS FACILITY IS:

Name: _____ Date Appointed: _____
Title: _____ Home Phone: _____
Address: _____ Phone: _____

NOTIFICATION OF BUILDING OCCUPANTS &
AVAILABILITY OF THE MANAGEMENT PLAN

The Authority's Designated Person shall ensure that all building occupants are notified of the following on an annual basis:

1. The existence and type of asbestos-containing materials in the building.
2. The location and availability of the Management Plan.
3. Updates on response actions, reinspection, and surveillance activities that are planned or in progress.
4. The name, address, and telephone number of the Designated Person.

Notification shall be implemented as follows:

1. Upon implementation of this Management Plan, the enclosed notification shall be forwarded to the facility's principal point-of-contact, appropriate union stewards, and will be published in the Authority's newsletter.
2. Each year, an updated notification shall be sent to the facility's principal point-of-contact, appropriate union stewards, and will be published in the Authority's newsletter.
3. A copy of the annual notification shall be included in the general information packet given to each new employee at that facility.

Two copies of the Management Plan shall be maintained: one copy at the Authority's administrative offices and one copy at the facility. The Management Plan is available, during normal business hours, without cost or restriction, for the inspection by representatives of EPA, the state, the public, and all persons notified. A reasonable fee may be charged for copies of the Management Plan.

SUMMARY OF ASBESTOS -CONTAINING MATERIALS

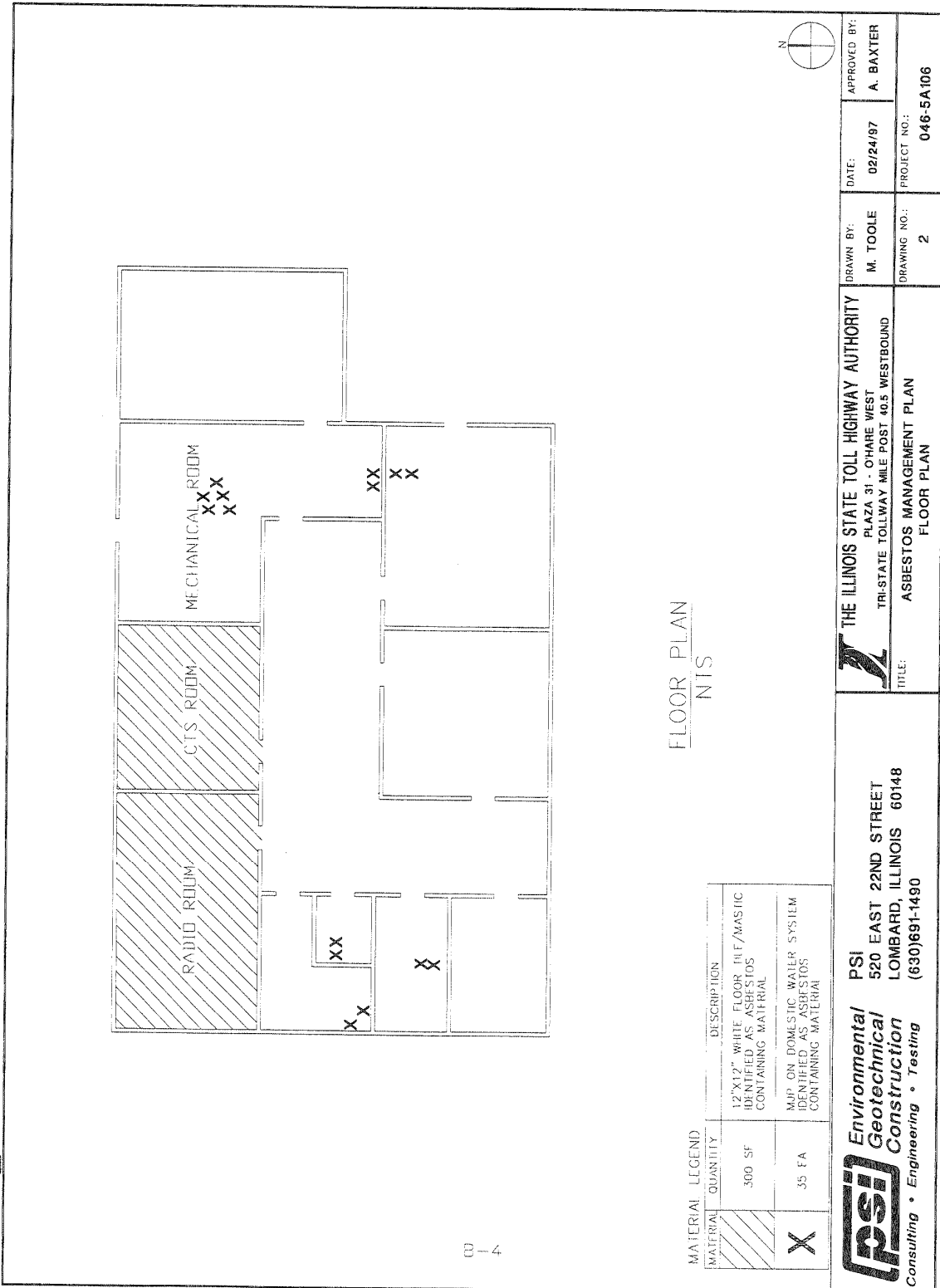
In June, 1995 an asbestos survey for friable and non-friable asbestos-containing materials was performed. The following pages describe the type of materials throughout this facility found to contain asbestos.

Mudded Joint Packings (MJP's) on domestic water lines

The Mudded Joint Packings (MJP's) on domestic water lines identified as asbestos are located throughout the main floor of the employee complex building.



This photo illustrates homogenous group 2 - Mudded Joint Packings (MJP's) on domestic water lines. The drawing on the following page demonstrates the location of asbestos-containing Mudded Joint Packings (MJP's) throughout the facility.



MATERIAL	LEGEND	QUANTITY	DESCRIPTION
		300 SF	12"X12" WHITE FLOOR TILF/MASTIC IDENTIFIED AS ASBESTOS CONTAINING MATERIAL
		35 EA	MAP ON DOMESTIC WATER SYSTEM IDENTIFIED AS ASBESTOS CONTAINING MATERIAL

PSI
Environmental Geotechnical Construction
 Consulting • Engineering • Testing

520 EAST 22ND STREET
 LOMBARD, ILLINOIS 60148
 (630)691-1490

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
 PLAZA 31 - OHARE WEST
 TRI-STATE TOLLWAY MILE POST 40.5 WESTBOUND

TITLE: ASBESTOS MANAGEMENT PLAN
 FLOOR PLAN

APPROVED BY: A. BAXTER
 DATE: 02/24/97
 PROJECT NO.: 046-5A106

DRAWN BY: M. TOOLE
 DRAWING NO.: 2

SUMMARY OF ASBESTOS -CONTAINING MATERIALS

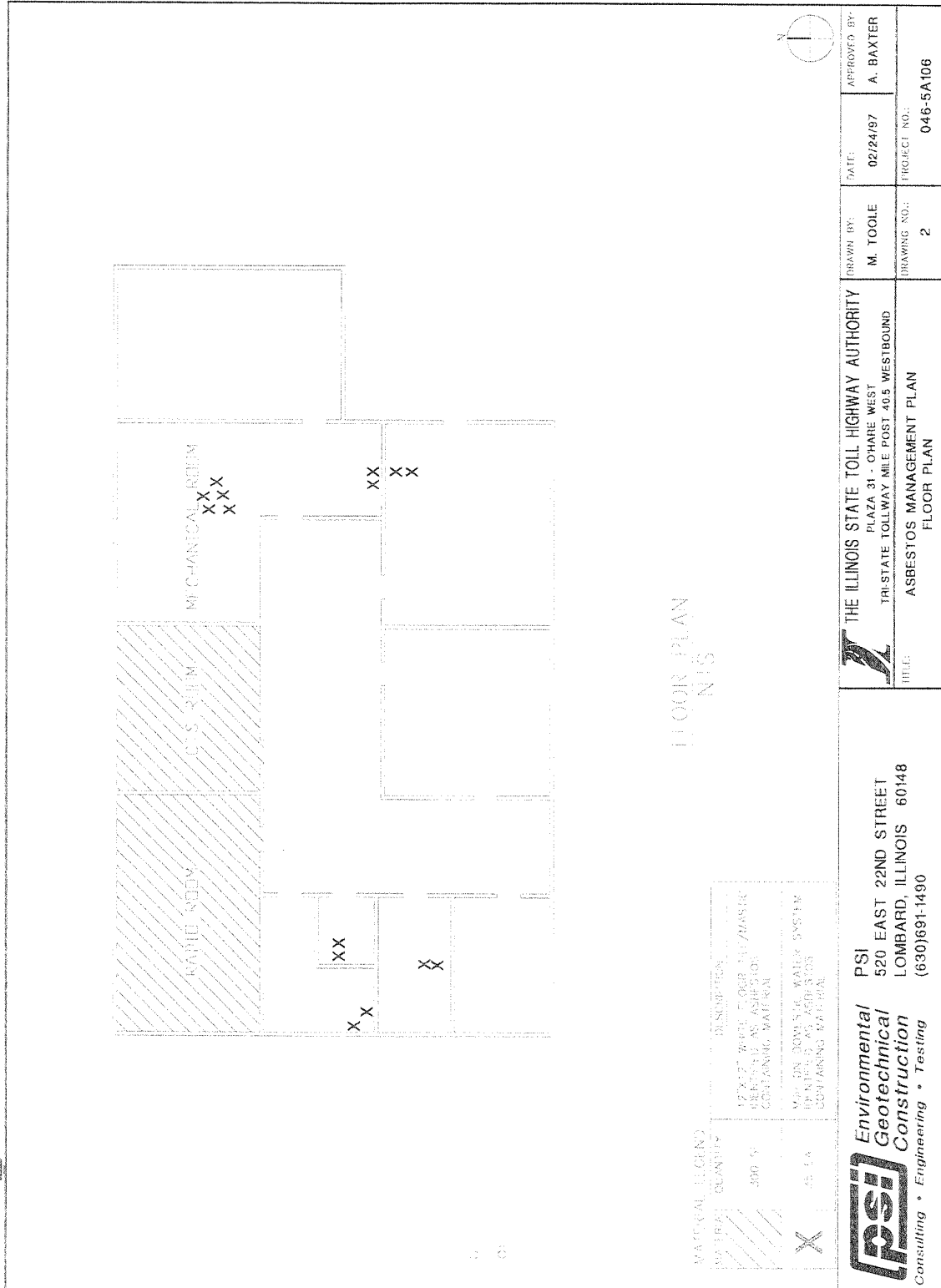
In June, 1995 an asbestos survey for friable and non-friable asbestos-containing materials was performed. The following pages describe the type of materials throughout this facility found to contain asbestos.

12"x12" White floor tile and mastic

The 12"x12" white floor tile and mastic identified as asbestos is located on the main floor of the employee complex building



This photo illustrates homogenous group 7 - 12"x12" white floor tile and mastic. The drawing on the following page demonstrates the location of asbestos-containing 12"x12" white floor tile and mastic throughout the facility.

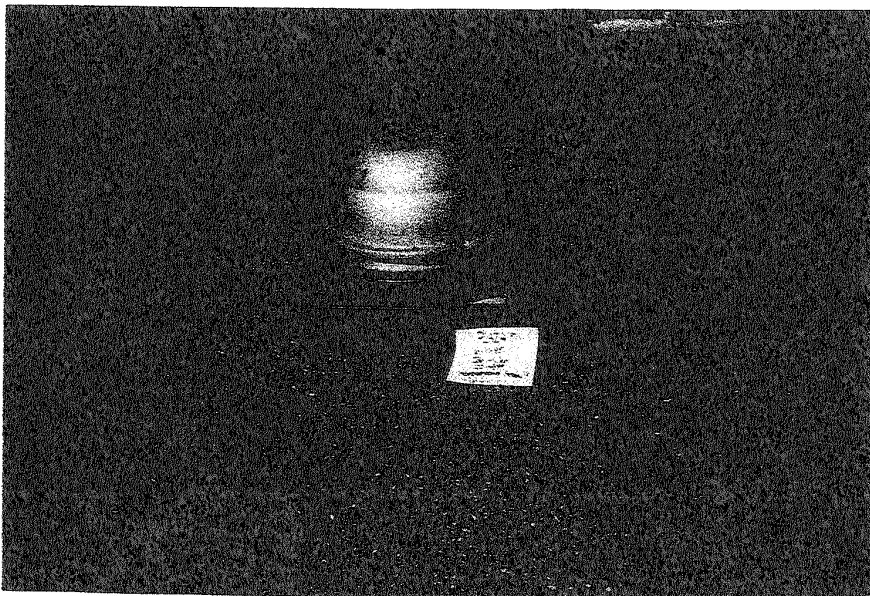


SUMMARY OF ASBESTOS -CONTAINING MATERIALS

In June, 1995 an asbestos survey for friable and non-friable asbestos-containing materials was performed. The following pages describe the type of materials throughout this facility found to contain asbestos.

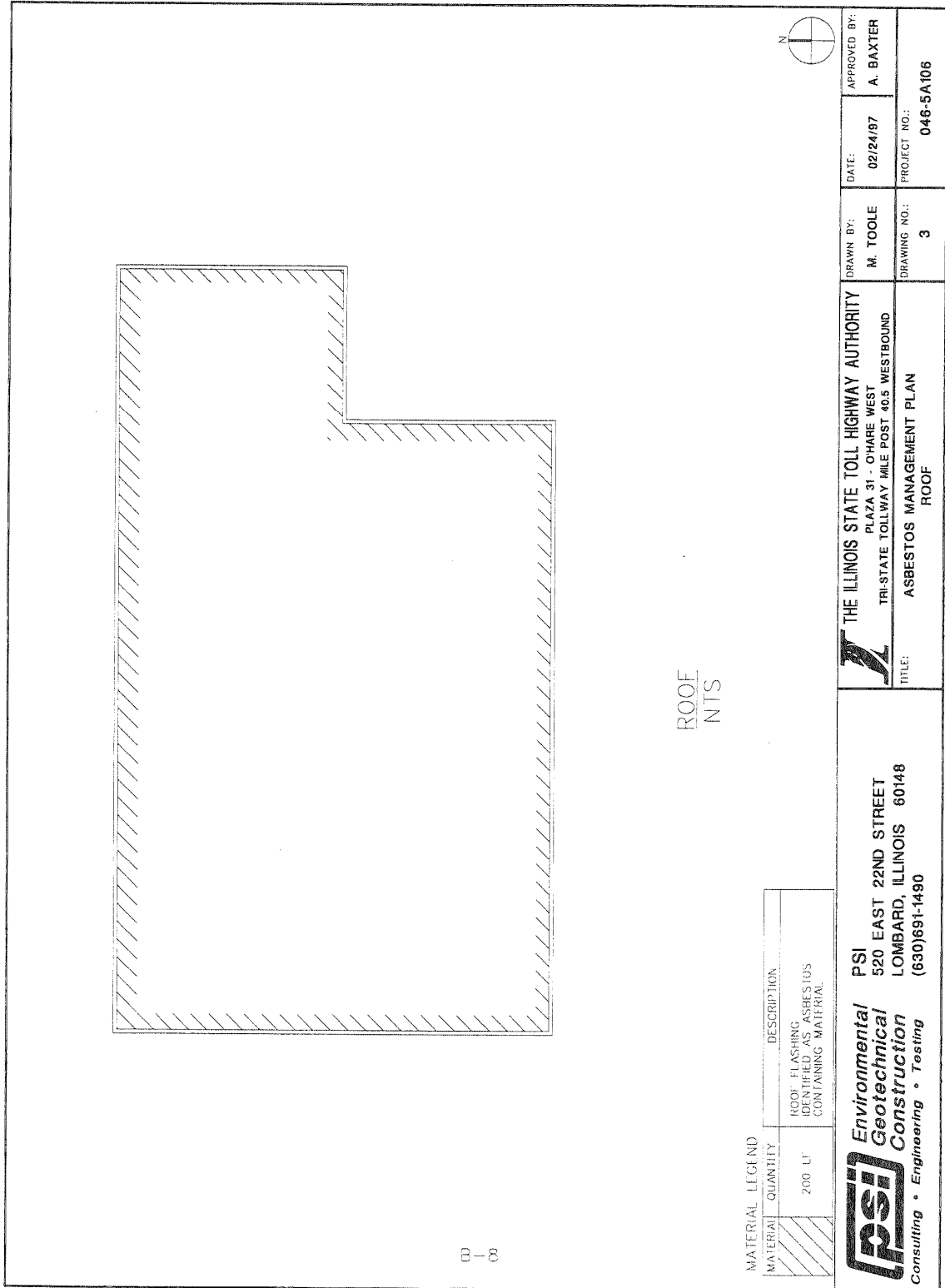
Roof flashing

The roof flashing identified as asbestos-containing material is located around the entire perimeter and all roof vents throughout the exterior roof surface.



This photo illustrates homogenous group 9 - roof flashing. The drawing on the following page demonstrates the location of asbestos-containing roof flashing throughout the facility.

B-7



ROOF
 NTS

MATERIAL LEGEND

MATERIAL	QUANTITY	DESCRIPTION
	200 LF	ROOF FLASHING IDENTIFIED AS ASBESTOS CONTAINING MATERIAL

PSI
Environmental
Geotechnical
Construction
 Consulting • Engineering • Testing

PSI
 520 EAST 22ND STREET
 LOMBARD, ILLINOIS 60148
 (630)691-1490



THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
 PLAZA 31 - O'HARE WEST
 TRI-STATE TOLLWAY MILE POST 40.5 WESTBOUND
 ASBESTOS MANAGEMENT PLAN
 ROOF

APPROVED BY: A. BAXTER	DATE: 02/24/97
DRAWN BY: M. TOOLE	DRAWING NO.: 3
PROJECT NO.: 046-5A106	

**RESPONSE PROCEDURES FOR
ASBESTOS DISTURBANCES**

If asbestos-containing materials or materials that are suspected to be asbestos-containing materials have been disturbed, **NOTIFY YOUR SUPERVISOR OR MAINTENANCE FOREMAN IMMEDIATELY!!** Your supervisor and/or maintenance shop foreman will then contact the Authority's Designated Person. The Authority's Designated Person shall have the authority and the training to assess the extent of the situation, and implement the proper response action.

UNDER NO CIRCUMSTANCES ARE YOU TO TAKE ACTION, CLEAN, REMOVE OR DISPOSE OF ASBESTOS-CONTAINING MATERIALS! EPA and OSHA have severe penalties for improper disturbance, removal or disposal of asbestos-containing materials. Until the Authority's Designated Person has assessed the situation, your supervisor and/or maintenance shop foreman are to implement the following procedures.

Restrict entry into the area and post signs to prevent entry into the area by persons other than those necessary to perform the response action.

Shut off the air-handling system to prevent the distribution of fibers to other areas in the building.

**ANY RESPONSE ACTIONS MUST BE IMPLEMENTED BY THE AUTHORITY
THROUGH THE AUTHORITY'S DESIGNATED PERSON FOR THIS FACILITY.**

THE DESIGNATED PERSON FOR THIS FACILITY IS

Name:	_____	Date Appointed:	_____
Title:	_____	Home Phone:	_____
Address:	_____	Phone:	_____



Wight & Company
wightco.com
.....
2500 North Frontage Road
Darien, IL 60561
.....
P 630.969.7000
F 630.969.7979

October 20, 2014

Mr. Bryan A. Wagner
Environmental Policy and Program Manager
Illinois State Toll Highway Authority
One Authority Drive
Downers Grove, Illinois 60515

Re: Asbestos Consulting Services
Asbestos Re-inspection of the Plaza 31 Facility

Dear Mr. Wagner,

On September 22, 2014, Wight and Company, under contract with the Illinois State Toll Highway Authority (ISTHA), completed the re-inspection for asbestos containing materials (ACM) and suspect ACM throughout Toll Plaza 31 (O'Hare-West Plaza), located Southbound on the North Tri-State Tollway (I-190) in Park Ridge, Illinois. Areas inspected in the buildings included all rooms, closets, hallways, and stairways. This letter report summarizes inspection procedures and conclusions determined for your consideration and inclusion in the Asbestos Management Plan.

INSPECTION PROCEDURES

Wight and Company reviewed any existing asbestos Management Plan available to ensure its compliance with the Occupational Safety and Health Administration (OSHA) and any other federal, state, and local regulations. Based on the information provided in the Management Plan, specific procedures were utilized to update the current Management Plan. A state-licensed Asbestos Inspector performed a visual reassessment of all known and suspect friable and non-friable ACM at the ISTHA facility to verify its condition and determine if any health hazard is present. Wight personnel examined any existing ACM present at the ISTHA facility with the maintenance staff on-site to familiarize and instruct the staff with the practices and procedures outlined in the Management Plan. The inspector then prepared this update letter for submission to ISTHA's Designated Person to be maintained on file as an appendix to the Management Plan report.

ASBESTOS CONDITION DETERMINATION

According to the previous Management Plan for this facility, two (2) homogeneous materials were identified as asbestos-containing. They are as follows:

- Homogeneous Area 02: Mudded Joint Packings on Domestic Water Lines
- Homogeneous Area 07: 12" x 12" White Floor Tile and Mastic

Since the original inspection that identified this material as ACM, this plaza has participated in no change or renovation, and remains in the same condition. All of the pre-existing materials still exist in this building. As a result, the ACM still remains in this plaza, and as such, no change is necessary to the Management Plan.

REGULATORY REQUIREMENTS

If ACM was identified in this report, and if it will be disturbed through future maintenance, renovation, or demolition activities, it will be subject to the requirements set forth in all applicable federal, state, and local regulations. The following notices, permits, and licenses are necessary for abatement work as of the date of this report. The contractor is cautioned to verify these requirements as applicable to the final project scope and confirm that no new requirements exist.

Local Air Quality Board

Written notification is required by the Illinois Environmental Protection Agency (IEPA) at least ten (10) working days prior to the beginning of any asbestos abatement project activities on regulated ACM where the quantities are at least 160 square feet, 260 linear feet, or 35 cubic feet. IEPA is the state contact for the federal EPA's National Emissions Standards for Hazardous Air Pollutants (NESHAP) on these matters.

Illinois Department of Public Health

Written notification is required by the Illinois Department of Public Health (IDPH) at least two (2) working days prior to the beginning of any asbestos abatement project activities on friable and non-friable ACM whose quantities exceed 3 square feet or 3 linear feet, but do not exceed 160 square feet or 260 linear feet.

Permits

The contractor must obtain all county and/or local municipal permits or licenses required for asbestos abatement work prior to beginning any asbestos abatement project activities on regulated ACM.

Licenses

The contractor must maintain current licenses as required by the IDPH and Illinois Department of Transportation (IDOT) for the removal, transporting, disposal, or other regulated activity involved ACM for the duration of the project.

CONCLUSION

Areas inspected at the ISTHA facility Toll Plaza 31 (O'Hare-West Plaza), located Southbound on the North Tri-State Tollway (I-190) in Park Ridge, Illinois included all rooms, closets, hallways, and stairways.

Since the original inspection that identified this material as ACM, this plaza has participated in no change or renovation, and remains in the same condition. All of the pre-existing materials still exist in this building. As a result, the ACM still remains in this plaza, and as such, no change is necessary to the Management Plan.

If you have any questions, please do not hesitate to contact me at (630) 969-7000.

Sincerely,



Roger Genschoreck
Senior Project Manager
Building Environmental Services

.....
wightco.com
.....

ACM SUMMARY TABLE ILLINOIS STATE TOLL HIGHWAY AUTHORITY TOLL PLAZA 31 (O'HARE-WEST PLAZA) PARK RIDGE, ILLINOIS September 22, 20104				
Homogeneous Area Designation	Material Description	Material Location	Approximate Quantity	ACM Condition Change (Yes/No)
02	Mudded Joint Packings on Domestic Water Lines	Mechanical Room	20 fittings	No
		Closet	2 fittings	
		Room Behind the Closet	5 fittings	
		Women's Restroom	12 fittings	
		Men's Restroom	12 fittings	
		Northeast Room	2 fittings	
		Southeast Room	4 fittings	
07	12"x12" White Floor Tile and Mastic	Radio Room	130 square feet	No
		CTS Room	170 square feet	

.....
 wightco.com

REVISIONS TO THE ILLINOIS PREVAILING WAGE RATES

The Prevailing rates of wages are included in the Contract proposals which are subject to Check Sheet #5 of the Supplemental Specifications and Recurring Special Provisions. The rates have been ascertained and certified by the Illinois Department of Labor for the locality in which the work is to be performed and for each craft or type of work or mechanic needed to execute the work of the Contract. As required by Prevailing Wage Act (820 ILCS 130/0.01, et seq.) and Check Sheet #5 of the Contract, not less than the rates of wages ascertained by the Illinois Department of Labor and as revised during the performance of a Contract shall be paid to all laborers, workers and mechanics performing work under the Contract. Post the scale of wages in a prominent and easily accessible place at the site of work.

If the Illinois Department of Labor revises the prevailing rates of wages to be paid as listed in the specification of rates, the contractor shall post the revised rates of wages and shall pay not less than the revised rates of wages. Current wage rate information shall be obtained by visiting the Illinois Department of Labor web site at <http://www.state.il.us/agency/idol/> or by calling 312-793-2814. It is the responsibility of the contractor to review the rates applicable to the work of the contract at regular intervals in order to insure the timely payment of current rates. Provision of this information to the contractor by means of the Illinois Department of Labor web site satisfies the notification of revisions by the Department to the contractor pursuant to the Act, and the contractor agrees that no additional notice is required. The contractor shall notify each of its subcontractors of the revised rates of wages.