Illinois Department of Transportation
Office of Intermodal Project Implementation / Division of Aeronautics
1 Langhorne Bond Drive / Springfield, Illinois 62707-8415

June 4, 2021

SUBJECT: Waukegan National Airport
Waukegan, Illinois
Lake County
Illinois Project Number: UGN-4848
SBG Project Number: 3-17-SBGP-156/162
Contract No. WA076
Item No. 07A, June 11, 2021 Letting
Addendum A

NOTICE TO PROSPECTIVE BIDDERS

Attached is an addendum to the plans or proposal. This addendum involves revised and/or added material.

Reason for Addendum:

The wrong Special Provisions were inadvertently included in the proposal.

To All Plan Holders:

Special Provisions Changes:

Replace the entire Special Provisions with the attached Special Provisions.

Prime contractors must utilize the enclosed material when preparing their bid and must include any changes to the Schedule of Prices in their bid.

Questions on this addendum may be directed to Kyle Peabody, P.E. of Crawford, Murphy & Tilly, Inc. at (630) 907-7024.

SECTION III

Special Provisions

CONSTRUCT PERIMETER FENCE – PHASE 5 (NORTHWEST AREA)

ILLINOIS PROJECT: UGN-4848
S.B.G. PROJECT: 3-17-SBGP-156/162

At

WAUKEGAN NATIONAL AIRPORT
WAUKEGAN, LAKE COUNTY, ILLINOIS

April 16, 2021

Prepared By:

CRAWFORD, MURPHY & TILLY, INC.
CONSULTING ENGINEERS
550 N. COMMONS DRIVE, SUITE 116
AURORA, ILLINOIS 60504
http://www.cmtengr.com

19022602.00

5/10/2021
Expires 11/30/2021

GENERAL

These Special Provisions, together with applicable Standard Specifications, Rules and Regulations, Contract Requirements for Airport Improvement Projects, Payroll Requirements and Minimum Wage Rates which are hereto attached or which by reference are herein incorporated, cover the requirements of the State of Illinois, Department of Transportation, Division of Aeronautics for the construction of the subject project at the Waukegan National Airport, Waukegan, Illinois.

GOVERNING SPECIFICATIONS AND RULES AND REGULATIONS

The "Illinois Standard Specifications for Construction of Airports" dated April 1, 2012, State of Illinois Department of Transportation, Division of Aeronautics shall govern the project except as otherwise noted in these Special Provisions. In cases of conflict with any part or parts of said specifications, the said Special Provisions shall take precedence and shall govern. When noted within the Special Provisions, the Illinois Department of Transportation "Standard Specifications for Road and Bridge Construction", Adopted April 1, 2016, shall also apply.

The "Illinois Standard Specifications for Construction of Airports" dated April 1, 2012 can be obtained from the Illinois Department of Transportation, Division of Aeronautics website at https://www.idot.illinois.gov/doing-business/procurements/engineering-architectural-professional-services/Consultants-Resources/index or from the Division of Aeronautics.

INDEX TO SPECIAL PROVISIONS

DIVISION I – GENERAL PROVISIONS

SECTION 40 – SCOPE OF WORK

40-05 MAINTENANCE OF TRAFFIC

ADD:

The Contractor shall be responsible for cleaning and maintaining all haul roads and use a pick-up type sweeper on all pavements and adjacent roadways utilized in hauling operations when material is tracked onto said pavement. **The Contractor shall have a sweeper on site and maintain all pavements clear of dirt and debris at all times or as requested by the Resident Engineer**. If the Contractor fails to comply with the Standard Specifications, Contract Plans or these Special Provisions concerning traffic control, the Resident Engineer shall execute such work as may be deemed necessary to correct deficiencies and the cost thereof shall be deducted from compensation due or which may become due the Contractor under the contract. The Contractor shall be responsible for supplying, maintaining and moving all barricades required for construction. The cost thereof shall not be paid for separately but shall be considered incidental to the contract unit prices.

The Airport Manager, following consultation with the Resident Engineer, will give proper notice to the nearest Flight Service Station and the Airways Facilities Chief of the Federal Aviation Administration prior to the beginning of construction. The Contractor shall furnish a flagger in radio control with the Air Traffic at any time the active taxiways or airfield pavement are crossed or used for a haul road. The Contractor shall supply his own radios. The cost thereof shall not be paid for separately but shall be considered incidental to the contract unit prices.

The Contractor shall not be entitled to any extra compensation due to delays or inconveniences caused by said necessary methods, procedures, and measures to protect air traffic.

The Airport Manager shall retain the authority to change the phasing of the work and/or the sequence of construction.

The Contractor shall not have access to any part of the active airfield (runway, taxiway or apron) for all equipment or personnel without the approval of the Airport Manager or the Airport Manager's authorized representative coordinated through the Resident Engineer.

40-09 AIRPORT OPERATIONS DURING CONSTRUCTION

ADD:

a. Construction Activity and Aircraft Movements

For construction activity to be performed in areas other than active operational areas, the storage and parking of equipment and materials, when not in use or about to be installed, shall not encroach upon active operational areas. In protecting operational areas, the minimum clearances maintained for runways shall be in conformance with Part 77 of the Federal Aviation Regulations.

All construction operations shall conform to the plans and in accordance with AC 150/5370-2 (Latest Edition) Operational Safety on Airports During Construction.

b. Limitations On Construction

(1) Open flame welding or torch cutting operations shall be prohibited, unless adequate fire and safety precautions are provided.

(2) Open trenches, excavations and stockpiled material near any pavements shall be prominently marked with red flags and lighted by light units during hours of restricted visibility and/or darkness.

(3) Stockpiled material shall be constrained in a manner to prevent movement resulting from aircraft blast or wind conditions.

(4) The use of explosives shall be prohibited.

(5) Burning shall not be allowed.

c. Debris

Waste and loose material capable of causing damage to aircraft landing gears, propellers, or being ingested in jet engines shall not be placed on active aircraft movement areas. Material tracked on these areas shall be removed continuously during the work project. The Contractor shall provide garbage cans in employee parking areas and storage areas for debris.

SECTION 50 – CONTROL OF WORK

50-06 CONSTRUCTION LAYOUT

RESPONSIBILITY OF THE RESIDENT ENGINEER

DELETE:

Paragraphs A and B and replace with the following:

A. The Resident Engineer will locate and reference three (3) control points within the limits of the project.

B. A benchmark has been established along the project outside of construction lines.

ADD:

M. It is not the responsibility of the Resident Engineer to check the correctness of the Contractor's stakes or forms, except as provided herein; however, any errors that are apparent shall be immediately called to the Contractor's attention, and he shall be required to make the necessary correction before the stakes are used for construction purposes.

RESPONSIBILITY OF THE CONTRACTOR

ADD:

H. The Contractor shall immediately notify the Resident Engineer of conflicts or discrepancies with the established control points.

I. Construction layout shall not be paid for separately but shall be considered incidental to the pay item for which the layout is required.

J. The Contractor shall layout all property corners and staking between property corners.

50-10 INSPECTION OF WORK

ADD:

The Contractor shall provide portable flood lighting for nighttime construction. Sufficient units shall be provided so that work areas are illuminated to a level of five horizontal foot candles. The lighting levels shall be calculated and measured in accordance with the current standards of the Illumination Engineering Society. Lights shall be positioned so as not to interfere with Airport operations.

50-12 LOAD RESTRICTIONS

ADD:

Access to the construction work area is limited to the haul routes as shown in the plans. The use of existing airfield pavements by the Contractor’s construction traffic, including all haul traffic, is limited to the hauling routes shown in the plans. Use of existing airfield pavement other than as shown in the plans is prohibited. **Any damage to existing airfield pavement due to construction traffic operating**

within or beyond the approved work limits, hauling within or outside of the approved haul/access routes and construction traffic operating in prohibited areas shall be repaired by the Contractor at his own expense to the satisfaction of the Owner.

Contractor shall obtain written permission from the Airport Owner to use any airfield pavements.

The Contractor shall not be allowed to use FAA access roads at any time.

50-16 FINAL INSPECTION

ADD:

All work on the punch list shall be considered part of the contract and shall be considered incidental to the completion of the contract. If the Contractor believes that an item listed on the punch list is beyond the scope of the contract, the Contractor shall notify the Engineer in writing prior to commencing work on the punch list item in question. Any punch list items completed by the Contractor without such written notification shall be considered incidental to the contract and shall not be eligible for payment unless determined otherwise by the Engineer and Owner.

50-18 PLANS AND WORK DRAWINGS

REVISE the fifth paragraph to read:

Shop drawings submitted by the Contractor for materials and/or equipment to be provided as a part of the contract shall be reviewed by the Project Engineer for substantial conformance of said materials and/or equipment, to contract requirements. Shop drawings shall be fully descriptive, complete and of sufficient detail for ready determination of compliance.

REVISE the last paragraph to read:

The following information shall be clearly marked on each shop, working, and layout drawing, catalog cut, pamphlet specifications sheet, etc., submitted.

PROJECT LOCATION:	**Waukegan National Airport**
PROJECT TITLE:	**Construct Perimeter Fence – Phase 5**
PROJECT NUMBERS	**IL Project: UGN-4848** **SBG Project: 3-17-SBGP-156/162**
CONTRACT ITEM:	**(i.e. AR ITEM 602 - Bituminous Prime Coat)**
SUBMITTED BY:	**(Contractor/Subcontractor Name)**
DATE:	**(Date Submitted)**

SECTION 60 – CONTROL OF MATERIALS

60-01 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS

ADD: After the last paragraph

The Contractor shall certify all materials contained in the contract. Certification documentation shall be submitted to the Resident Engineer. It shall be the sole responsibility of the Contractor to ensure the delivery of adequate and accurate documentation prior to the delivery of the materials.

If, upon delivery and incorporation of any materials, the Contractor has failed to provide the necessary submittals as required by Sections 50-18, 60-01, 60-03 and 60-11 of the Standard and Special Provisions, the pay item shall not be included on the Construction Progress Payment report until such submittals have been furnished.

60-03 CERTIFICATION OF COMPLIANCE

ADD:

Additional requirements are specified in Section 60-11 Certification of Materials.

60-11 CERTIFICATION OF MATERIALS

ADD:

The Contractor shall certify all materials incorporated into the contract. Certification documentation shall be submitted to the Resident Engineer. It shall be the **sole** responsibility of the Contractor to ensure the submittal of adequate and accurate documentation in order to satisfy the contract material certification requirements **prior** to the delivery of the materials. Materials without certification or those with certification that demonstrates the materials do not meet the requirements of the plans and specifications shall be considered nonconforming and subject to the provisions of Section 50-02.

As a guide to the certification process and requirements, the Contractor shall use the Illinois Department of Transportation/Division of Aeronautics MANUAL FOR DOCUMENTATION OF AIRPORT MATERIALS dated April 1, 2010 or latest edition including any addendums. Copies of this manual are available by contacting Mr. Mike Wilhelm-Division of Aeronautics at (217) 785-4282 or from their website at: "http://www.idot.illinois.gov/doing-business/procurements/construction-services/contractors-resources/index".

The cost of providing the required material documentation and certifications shall not be paid for separately, but shall be considered incidental to the associated item.

All sheets of all submittals shall contain the following information:

PROJECT LOCATION:	**Waukegan National Airport**
PROJECT TITLE:	**Phase 2 – Install Security/Wildlife 10' Fencing**
PROJECT NUMBERS:	**Illinois Project: UGN-4848**
	SBG Project: 3-17-SBGP-156/162
CONTRACT ITEM:	**(i.e., AR901510 Seeding)**
SUBMITTED BY:	**(Contractor/Subcontractor Name)**
DATE:	**(Date of Submittal)**

SECTION 70 – LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

70-17 CONTRACTOR'S RESPONSIBILITY FOR UTILITY SERVICE AND FACILITIES OF OTHERS

ADD:

Special care shall be taken on all operations, and particularly near pavement edges, to avoid damage to edge lights and all underground electrical cable on the airport. The approximate location of existing underground cable is shown on drawings. Any airfield lights or cable that are broken and require replacement because of the Contractor's operations will be replaced by the contractor at his own expense.

Any airfield cable repairs or replacement to any part of the electrical system made necessary by the Contractor's operations will be made by him in the manner specified in Sections 108 and 125 at no cost to the airport. Cost of replacement to be borne by the Contractor shall include any expense incurred in locating as well as repairing or replacing damaged parts of the system by the owning agency.

It shall be the Contractor's responsibility to locate and protect all airport-owned utilities within the construction limits. This includes all electrical cables, storm sewer, drain tile, sanitary sewer and water main.

Special attention is necessary when working near FAA power and control cables. Any FAA utility that is damaged or cut during construction shall be repaired immediately. FAA requires that any damaged cable be replaced in its entirety, from power/control source to the equipment/service. Splices of any kind will not be permitted. Exposures of any FAA cables must be done by hand digging or hydro-excavation. No additional compensation will be made for locating, replacement or repair of FAA facilities or cables but, shall be incidental to the contract.

When FAA cables are required to be located, or the contractor is planning on working on or around FAA cables, conduits or equipment, a 10 working day advanced notice shall be given to the FAA before any such markings are required. Once FAA marks the cables, the contractor will be required to survey the FAA utilities so they can be replaced during construction without remarking by the FAA. This shall be incidental to the contract. The FAA personnel are only available from 9 am to 3 pm, Monday through Friday with advanced notice.

Should any utilities or cables require location, the following people shall be contacted:

WAUKEGAN NATIONAL AIRPORT

Utility Service or Facility	Contact (Person)	Contact (Phone)
AT&T – Telephone Cables	J.U.L.I.E. (Joint Utility Locating Information for Excavators)	1-800-892-0123
ComEd - Electric Cables	J.U.L.I.E. (Joint Utility Locating Information for Excavators)	1-800-892-0123
NICOR - Gas Lines	J.U.L.I.E. (Joint Utility Locating Information for Excavators)	1-800-892-0123
FAA Control and Communication Cables	FAA Sector Office	1-630-587-7801

70-26 CONTRACTOR'S RESPONSIBILITY FOR SAFETY DURING CONSTRUCTION

ADD the following after Item D.:

E. Provide a safety officer/construction inspector trained in airport safety to monitor construction activities.

F. Restrict movement of construction vehicles to construction areas with flagging and barricading, erecting temporary fencing, or providing escorts, as appropriate or as shown in plans.

G. Ensure that no construction employees, employees of subcontractors or suppliers, or other persons enter any part of the aircraft operations area from construction site unless authorized.

SECTION 80 – PROSECUTION AND PROGRESS

80-03 NOTICE TO PROCEED

ADD:

The Notice to Proceed will not be given until all materials are certified by the Contractor to be available and on hand and meeting the Buy American requirements per the Contract Documents.

The Contractor is required to provide a safety plan compliance document (SPCD). The SPCD shall be in conformance with the current edition of the FAA Advisory Circular 150/5370-2. The SPCD shall be submitted for review no later than the pre-construction meeting. The notice to proceed will not be issued until the SPCD is received and reviewed by the Airport.

80-05 LIMITATION OF OPERATIONS

ADD:

The Contractor shall not have access to any part of the active airfield (aprons, runways or taxiways) for any equipment or personnel without the prior approval of the Airport Manager.

A description of work in all construction phases/work areas, Contractor work restrictions, and a description of associated completion milestones and work durations for each phase/work area shall be as shown in the Construction Activity Plan notes in the plans. Closure dates required beyond the number awarded will be as determined by the Airport and claims for delay due to scheduling conflicts with the Airport and its tenants will not be considered.

The airfield pavements shall be opened for traffic no later than the timeframes indicated in the Construction Activity Plan notes in the plans. Should the Contractor fail to reopen the airfield pavements at the aforementioned time, liquidated damages in accordance with the amounts listed in the plans will be assessed and subtracted from any moneys due the Contractor.

80-13 CONTRACTOR'S ACCESS TO AIRFIELD

ADD:

The Contractor shall not have access to any part of the active airfield pavements (runways, aprons, or taxiways, and associated safety areas) for any equipment or personnel without the approval of the Airport Manager. All access to active runway and taxiway pavements shall we coordinated with the Airport Manager. *Access to the referenced pavements without the Airport Manager's approval may result in a determination of an airfield incursion with associated fines.*

Unattended construction access and unauthorized access to the airfield shall be fined in accordance with the fines noted in the plans in the construction phasing notes. Gate guards shall have mobile telephone communications at all times and shall be required to provide a daily visitor log to the airport at the weekly coordination meetings.

SECTION 90 – MEASUREMENT AND PAYMENT

90-05 PAYMENT FOR EXTRA AND FORCE ACCOUNT WORK

ADD the following to subsection B.7. Statements:

All statements of the cost of force account work shall be furnished to the Engineer not later than 60 days after completion of the force account work. If the statement is not received within the specified time frame, all demands for payment for the extra work are waived and the Division, Airport Owner and Local Sponsor are released from any and all such demands. It is the responsibility of the Contractor to ensure that all statements are received within the specified time regardless of the manner or method of delivery.

DIVISION II – PAVING CONSTRUCTION DETAILS

ITEM 150510 – ENGINEER'S FIELD OFFICE

CONSTRUCTION METHODS

150-2.1

REVISE:

Paragraph (G) to the following:

(G) One (1) electric water cooler dispenser capable of dispensing cold and hot water and a supply of water bottles as needed.

Paragraph (I) to the following:

(I) One (1) All-in-One multifunction printer (including maintenance and operating supplies) capable scanning, copying and printing prints up to a half size (11"X 17") with Wi-Fi and Ethernet capabilities.

DELETE:

Paragraphs (H), (J), and (K)

ADD:

(N) One first-aid cabinet fully equipped.
(O) One (1) 800 Watt, 0.8 cubic foot microwave oven.
(P) One (1) Coffee Maker
(Q) Solid waste disposal consisting of two (2) 28-quart waste baskets and an outside trash container of sufficient size to accommodate a weekly provided pick-up service.
(R) One (1) internet Wi-Fi hotspot with service for use by the Resident Engineer with a minimum advertised download speed of up to 768 Kbps and a minimum advertised upload speed of up to 384 Kbps. The type of internet access device chosen by the Contractor shall allow a minimum of six (6) simultaneous Wi-Fi enabled devices use of the internet connection.

.

BASIS OF PAYMENT

150-3.1

REVISE the second sentence of the second paragraph to the following:

Communication equipment and service charges will be included in the contract unit price per lump sum for Engineer's Field Office. This price shall include all utility costs and shall reflect the salvage value of the building or buildings, equipment, and furniture which remain the property of the Contractor after release by the Engineer, except the Project Engineer's firm will pay that portion of the monthly communication costs, when combined, exceed $250.

Payment will be made under:

ITEM AR150510 ENGINEER'S FIELD OFFICE PER LUMP SUM

ITEM 150520 – MOBILIZATION

BASIS OF PAYMENT

150-3.1

REVISE:

Paragraph (C) to the following:

C. When fifty percent of the original contract is earned, an additional 20 percent of the pay item will be paid.

ADD:

D. When 90 percent of the adjusted contract value is earned, an additional 15 percent of the pay item will be paid along with any bid amount in excess of six percent of the original contract amount up to 95% of the pay item.

E. The remaining 5 percent of the pay item will be paid upon final acceptance of the project by the Engineer. Final acceptance includes satisfactory completion of all punch list items in accordance with written instruction from the engineer as well as acceptance of all final documentation.

Payment will be made under:

ITEM AR150520 MOBILIZATION PER LUMP SUM

ITEM 151 – CLEARING AND GRUBBING

DESCRIPTION

151-1.1

REVISE Paragraph 2 to read:

Clearing shall consist of the cutting and removal of all trees, stumps, brush, logs, hedges, and other loose or projecting material within designated wetland areas for temporary crossings. The grubbing of stumps and roots will not be required.

CONSTRUCTION METHODS

151-2.1 GENERAL

REVISE Paragraph 1 to read:

The areas to be cleared and grubbed under this item shall be staked on the ground by the Contractor and approved by the Resident Engineer prior to beginning work. The clearing and grubbing shall be done at a satisfactory distance in advance of the grading operations. Unless otherwise specified, no cutting or trimming of trees shall occur between April 1 and September 30, both days inclusive, due to potential impact to the Indiana Bat and Northern Long-Eared Bat, which is protected by the Endangered Species Act of 1973. If otherwise specified, the Contractor shall verify that the required permits have been obtained prior to the commencement of tree cutting or trimming operations.

DELETE Paragraph 2.

REVISE Paragraph 3 to read:

Clearing and grubbing of trees, when so designated, shall consist of the cutting and removal of isolated single trees, stumps or isolated groups of trees. The cutting of all the trees of this classification shall be in accordance with the requirements for the particular area being cleared, or as shown on the plans, or as directed by the Engineer.

ADD:

Burning of cleared trees and other materials shall not be allowed on Airport property.

151-2.2 CLEARING

REVISE Paragraph 1 to read:

The Contractor shall clear the staked or indicated area of all objectionable materials. Trees unavoidably falling outside the specified limits must be cut up, removed, and disposed of in satisfactory manner. In order to minimize damage to trees that are to be left standing, trees shall be felled toward the center of area being cleared. The Contractor shall preserve and protect from injury all trees not to be removed. The trees, stumps, and brush shall be cut flush with the original ground surface to accommodate temporary crossing mat requirements. The grubbing of stumps and roots will not be required. Heavy equipment, which can damage the ground surface which leaves ruts larger than 3-inches shall not be used in clearing operations.

151-2.3 CLEARING AND GRUBBING

REVISE 1st Sentence of Paragraph 1 to read:

In areas proposed by the Contractor and approved by the Resident Engineer to be cleared and grubbed, all stumps, roots, buried logs, brush and other unsatisfactory materials shall be removed.

ADD:

Subgrade materials required to fill holes and level areas at the completion of clearing and grubbing shall be provided by the Contractor at no additional cost to the contract. These materials shall be compacted in a manner acceptable to the Resident Engineer.

METHOD OF MEASUREMENT

151-3.1

ADD:

Isolated bushes and trees having a butt diameter of 6-inches or less, measured at a point 4.5 feet above the ground level at the tree, will be considered a sapling and will not be measured for payment. Clearing of the saplings and isolated bushes will be incidental to the contract.

BASIS OF PAYMENT

151-4.2

REVISE to the following:

Payment shall be made at the contract unit price for clearing and grubbing of isolated trees. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

ADD:

Payment will be made under:

ITEM AR151420	**CLEARING TREES 0-2.5' BUTT. DIA.**	**PER EACH**
ITEM AR151450	**CLEARING AND GRUBBING**	**PER ACRE**

ITEM 152 – EXCAVATION AND EMBANKMENT

DESCRIPTION

152-1.1

REVISE: 3rd paragraph to the following:

When the volume of the excavation exceeds that required to construct the embankments to the grades indicated, the excess shall be removed from the Airport. When the volume of excavation is not sufficient for constructing the fill to the grades indicated, the deficiency shall be supplied from borrow sources at locations within the airport or other authorized areas.

CONSTRUCTION METHODS

152-2.2 EXCAVATION

DELETE: Paragraphs 9, 10 and Table 1.

ADD:

Compaction in all cut and fill areas shall be to the satisfaction of the Resident Engineer.

152-1.2 CLASSIFICATION

DELETE the second, third and fourth paragraphs.

152-1.3 CLEAN CONSTRUCTION OR DEMOLITION DEBRIS

PROJECT CONDITIONS

A. Prior to bidding, the bidder shall make a site visit to become familiar with the current conditions. He shall also determine the accessibility and assess safety measures that will be necessary to perform the contract work.

B. Material Sampling and Analysis:

1. The Contractor shall provide his own sampling and analysis in compliance with applicable laws, prior to offsite disposal of all materials and prior to offsite fill materials hauled to the Airport. These costs shall be borne by the Contractor at no additional expense to the Owner.

REGULATORY REQUIREMENTS

A. The Contractor shall comply with all applicable local, state and federal laws and regulations with regard to material removal, handling and disposal, and shall pay all assessed costs and fees.

B. The Contractor shall comply with the Illinois Environmental Protection Act, as amended by Public Act 096-1416 that was signed in to law on July 30, 2010, Public Act 097-0137 that was signed in to law on July 14, 2011, and all applicable amendments of the Illinois Environmental Protection Act.

SUBMITTALS

A. Contractor shall submit a Clean Construction or Demolition Debris (CCDD) & Soil Removal and Disposal Plan to the Engineer. Submit the following as a minimum:

1. A list of all construction or demolition debris anticipated to be generated requiring disposal.
2. The anticipated quantity (both in tons and in cubic yards) of construction or demolition debris to be disposed of and identification of disposal facility including address and contact information.
3. The anticipated quantity (both in tons and in cubic yards) of surplus soil to be disposed of, and identification of disposal facility including address and contact information.

CCDD testing shall be by the Contractor, as a minimum, the Contractor shall submit the following:

1. Proposed Testing Program to establish that the surplus soil and offsite fill materials hauled to the Airport are uncontaminated, for compliance with the requirements of the Illinois Environmental Protection Act. Include details of intended testing program, and rate of sampling (number of samples based on total quantity of surplus soil generated).
2. Credentials of the testing Lab that will perform the testing, and credentials of the Illinois Licensed Professional Engineer or Illinois Licensed Professional Geologist that will complete all required certification forms.
3. Results of the Proposed Testing Program.
4. If further CCDD testing is deemed necessary by the Contractor's chosen disposal facility, the Contractor shall complete this testing at no additional cost to the contract.

GENERAL

A. The following work shall be included:

1. Removal, handling and legal offsite disposal of all construction or demolition debris generated from all contract work, considering it to be clean construction or demolition debris (CCDD).
2. Removal, handling and legal offsite disposal of surplus soil generated from all contract work, considering it to be uncontaminated.
3. Debris and surplus soil disposal shall include any onsite drying of the material as required, so that the material will pass the paint-filter test as per Method 9095B in USEPA's publication SW 846, prior to transportation.
4. Any costs and fees for legally-permitted-facilities accepting clean construction or demolition debris (CCDD), and/or uncontaminated surplus soil.
5. Additional sampling and testing of surplus soil and offsite fill materials hauled to the Airport to establish that it is uncontaminated, and certification to that effect by an Illinois Licensed Professional Engineer or an Illinois Licensed Professional Geologist using Form LPC-663, both as required by law and as required by the site accepting the material.
6. Any other applicable work, costs and fees as required by local, state and federal laws.

MATERIAL CHARACTERIZATION FOR OFFSITE DISPOSAL

A. Costs for any and all testing, sampling, laboratory analysis or any other document that is required by the recipient of the material (disposal site) to establish that the material is uncontaminated, shall be borne by the Contractor at no additional expense to the Owner.

METHOD OF MEASUREMENT

152-3.1, 3.2 and 3.3

ADD:

Excavation required for fence and gate post foundations, buried fence, gate pads and regrading of the groundline adjacent to the fence shall not be measured for payment but shall be considered incidental to its associated pay item.

Excavation necessary for drainage grading improvements, and aggregate placement in the wetland shall be measured for payment per cubic yard as Unclassified Excavation.

Topsoil Stripping shall be measured and paid for as Unclassified Excavation.

Shoulder fill, embankment fill and all other miscellaneous fills shall not be measured for payment but shall be incidental to the Unclassified Excavation pay item.

Excess excavation to be disposed off of Airport property shall not be measured for payment but shall considered incidental to the Unclassified Excavation pay item.

152-3.2 and 3.3

DELETE: These Sections.

BASIS OF PAYMENT

152-4.1, 4.2, 4.3 and 4.4

DELETE: These Sections.

ADD:

Clean Construction or Demolition Debris (CCDD) removal and disposal, topsoil placement, shoulder fill and embankment fill shall not be paid for separately, but shall be included in the unit bid price for “Unclassified Excavation”.

Payment shall be made at the cubic yard contract unit price for "Unclassified Excavation." This price shall be full compensation for furnishing all materials, labor, equipment, tools, disposal and incidentals necessary to complete the item.

Payment will be made under:

ITEM AR152410 UNCLASSIFIED EXCAVATION PER CUBIC YARD

ITEM 152540 – SOIL STABILIZATION FABRIC

CONSTRUCTION METHODS

152-3.1

ADD:

Soil Stabilization Fabric shall be delivered to the jobsite in such a manner as to facilitate handling and incorporation into the work without damage. Material shall be stored in such a manner as to prevent exposure to direct sunlight and damage by other construction activities.

ADD:

152-3.2

Prior to the installation of the soil stabilization fabric, the application surface shall be cleared of debris and sharp objects. In the case of subgrades, all wheel tracks or ruts in excess of 75 mm (3 inches) in depth shall be graded smooth or otherwise filled with soil to provide a reasonably smooth surface. Soil stabilization fabric may be installed on the application surface either by hand or by mechanical methods, provided that the fabric is not torn or the surface rutted.

152-3.3

Soil stabilization fabric of insufficient width or length to fully cover the specified area shall be lapped, or sewn. The minimum laps for lap only areas are 600 mm (24 inches) and for sewn areas are 100 mm (4 inches). If sewn, the seam strength shall be equal to or exceed the minimum grab tensile strength of the fabric when tested wet.

152-3.4

The crushed aggregate subbase shall be constructed to the width and depth required on the plans. 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. Placement of material on the soil stabilization fabric shall be accomplished by spreading dumped material off of previously placed material with a bulldozer blade or endloader, in such a manner as to prevent tearing or shoving of the fabric. Dumping of material directly on the fabric will only be permitted to establish an initial working platform. No vehicles or construction equipment shall be allowed on the fabric prior to placement of the crushed aggregate subbase. The granular material shall be placed to the full required thickness and compacted to the satisfaction of the Resident Engineer before any loaded trucks are allowed on the area covered.

152-3.5

Soil stabilization fabric which is damaged during installation or subsequent placement of granular material due to failure of the Contractor to comply with these provisions, shall be repaired or replaced at the Contractor's expense, including costs of removal and replacement of the granular material. Torn fabric may be patched in place by cutting and placing a piece of the same fabric over the tear. The dimensions of the patch shall be at least 600 mm (2 ft.) larger than the tear in each direction, and shall be weighted or otherwise secured to prevent the granular material from causing lap separation.

BASIS OF PAYMENT

152-5.1

ADD:

Payment will be made under:

ITEM AR152540 SOIL STABILIZATION FABRIC	**PER SQUARE YARD**

ITEM 156000 – EROSION CONTROL

MATERIALS

156-2.1 SILT FENCE

Revise the Section to the following:

Silt fence shall consist of a continuous barrier. The barrier shall be constructed with one of the following:

A. SILT FILTER FENCE. This fence shall either be a prefabricated silt fence or fabricated onsite meeting the dimensional requirements and details shown in the plans. The fabric for silt filter fence shall be a woven fabric meeting the requirements of AASHTO M 288 for unsupported silt fence with less than 50 percent geotextile elongation.

B. ROLLED EXCELSIOR. Rolled excelsior shall consist of an excelsior fiber filling totally encased inside netting and sealed with metal clips or knotted at the ends. The fiber density shall be a minimum of 1.24 lb/cu ft based on a moisture content of 22 percent at manufacturing. The netting shall be composed of a polyester or polypropylene material which retains 70 percent of its strength after 500 hours of exposure to sunlight. The maximum opening of the net shall be 1 x 1 in.

C. URETHANE FOAM/GEOTEXTILE. Urethane foam/geotextile shall be triangular shaped having a minimum eight of 10 in in the center with equal sides and a minimum 20 in. base. The triangular shaped inner material shall be a low density urethane foam. The outer cover shall be a woven geotextile fabric placed around the inner material and allowed to extend beyond both sides of the triangle a minimum of 18 in.

(1) The geotextile shall meet the following properties:

Property	Value	Test Method
Grab Tensile Strength lb	124 min.	ASTM D 4632
Grab Elongation @ break (%)	15 min.	ASTM D 4632
Burst Strength psi	280 min.	ASTM D3786
AOS (Sieve No.)	30 min.	ASTM D 4751
UV Resisteance (500 Hours) (%)	80 min.	ASTM D 4355

(2) The urethane foam shall meet the following properties:

Property	Value	Test Method
Density, lb/cu ft	0.9 – 1.1	ASTM D 3574
Tensile Strength, psi	10 min.	ASTM D 3574
Elongation, %	125 min.	ASTM D 3574
Tear resistance, lb/in.	1.25.	ASTM D 3574

156-2.4 TEMPORARY MULCH

ADD:

Temporary mulch shall be light-duty hydraulic mulch.

156-2.8 EXCELSIOR BLANKETS

(a) Excelsior Blanket. Excelsior blanket shall consist of a machine produced mat of wood excelsior of 80 percent, 6 in. (150 mm) or longer fiber length. The wood from which the excelsior blanket is cut shall be properly cured to achieve adequately curled and barbed fibers.

The blanket shall be of consistent thickness, with the fiber evenly distributed over the entire area of the blanket. The excelsior blanket shall be covered on the top side with a 90-day biodegradable extruded plastic mesh netting having an approximate minimum opening of 5/8 x 5/8 in. (16 x 16 mm) to an approximate maximum opening of 2 x 1 in. (50 x 25 mm). The netting shall be substantially adhered to the excelsior blanket by a knitting process using biodegradable thread or by an applied degradable adhesive. The netting shall also be entwined with the excelsior blanket for maximum strength and ease of handling.

The excelsior blanket shall also be according to the following:

Parameter	Value
Minimum Width	24 ± 1 in. (600 ± 25 mm)
Weight (Mass)	0.63 lb/sq yd (0.34 kg/sq m) ± 10 %

The excelsior blanket shall be smolder resistant and shall withstand the following test. The excelsior blanket specimen shall not flame or smolder for more than a distance of 12 in. (300 mm) from a spot where a lighted cigarette is placed on the surface of the blanket.

The manufacturer shall furnish a certification with each shipment of excelsior blanket stating the number of rolls furnished and that the material complies with these requirements.

(b) Wire Staples are not allowed for use on the project.

(c) Wood Stakes. Hardwood blanket anchors shall be approximately 7 in. (180 mm) long from neck of hook to tip of anchor. The wood shall not break during installation. The anchor shall have a 1/2 in. (13 mm) curving hook to hold the blanket in place.

CONSTRUCTION METHODS

156-3.7 EROSION CONTROL BLANKET

ADD:

Erosion control blanket may be placed using either excelsior blanket or knitted straw blanket. Within 24 hours of seed placement, blanket shall be placed on the areas specified. Prior to placing the blanket, the areas to be covered shall be relatively free of rocks or clods over 1 1/2 in. (40 mm) in diameter, and sticks or other foreign material which will prevent the close contact of the blanket with the seed bed. If, as a result of rain, the prepared seed bed becomes crusted or eroded, or if eroded places, ruts, or depressions exist for any reason, the Contractor shall rework the soil until it is smooth and reseed such areas which are reworked.

After the area has been properly shaped, fertilized, and seeded, the blanket shall be laid out flat, evenly, and smoothly, without stretching the material. The excelsior and knitted straw blankets shall be placed so that the netting is on the top and the fibers are in contact with the soil. The heavy-duty blankets shall be placed so that the heavy duty extruded plastic mesh is on the bottom.

For placement in ditches, the erosion control blanket shall be applied parallel to the centerline of the ditch so that there are no longitudinal seams within 2 ft (600 mm) of the bottom centerline of the ditch. The blanket shall be toed in on the upslope edge and shingled or overlapped with the flow.

On slopes, the blanket shall be applied either horizontally or vertically to the contour, toed in on the upslope edge, and shingled or overlapped with the flow.

When placed adjacent to pavements, blankets shall be toed in along the edge of shoulder.

Anchoring the blankets shall be according to the manufacturer's specifications.

156-3.8 INLET PROTECTION

ADD:

Inlet filter sediment traps shall be placed in all proposed and existing inlets and catch basins as shown on the plans or as directed by the Resident Engineer.

156-3.10

ADD:

In the event that temporary erosion and pollution control measures are ordered by the Engineer due to the Contractor's negligence or carelessness, the work shall be performed by the Contractor at no additional cost to the Owner.

METHOD OF MEASUREMENT

156-4.1

DELETE: This section.

156-4.2

DELETE: This section.

156-4.3

REVISE: This section to read:

Temporary Mulching shall not be measured for payment, but shall be considered incidental to the contract.

156-4.4

DELETE: This section.

156-4.5

DELETE: This section.

156-4.6

ADD:

Erosion Control Blanket to be paid for shall be the number of square yards measured in place and accepted by the Resident Engineer.

156-4.7

ADD:

The Concrete Washout shall not be measured for payment but shall be considered incidental to the project.

BASIS OF PAYMENT

156-5.1

REVISE: This section to read:

Payment will be made at the contract unit price per square yard for Erosion Control Blanket. This price shall be full compensation for furnishing all materials for all preparation and installation of these materials, including excavation, placement, tie-down stakes, staples, maintenance, and removal and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made at the contract unit price per each for Inlet Protection. This price shall be full compensation for furnishing all materials for all preparation and installation of these materials, including excavation, placement, tie-down stakes, staples, maintenance, and removal and for all labor, equipment, tools, and incidentals necessary to complete this item.

The temporary seed pay item shall be used and paid for if a winter shutdown or extended shutdown period (3 months or more) is necessary to complete the project.

Temporary mulching shall not be measured for payment. It shall be considered incidental to the contract.

Payment will be made under:

ITEM AR156510	**SILT FENCE**	**PER LINEAR FOOT**
ITEM AR156520	**INLET PROTECTION**	**PER EACH**
ITEM AR156530	**TEMPORARY SEEDING**	**PER ACRE**
ITEM AR156531	**EROSION CONTROL BLANKET**	**PER SQUARE YARD**

ITEM 208 – AGGREGATE BASE COURSE

DESCRIPTION

208-1.1

REVISE: This section to read:

This item shall consist of 6" aggregate base course and porous granular embankment composed of coarse aggregate as specified. It shall be constructed on a prepared subgrade underlying course in accordance with these specifications and shall conform to the dimensions and typical cross section and to the lines and grades as shown on the Plans.

CONSTRUCTION METHODS

208-3.12 DEWATERING

ADD:

Dewatering of existing excavations to place aggregate material shall be in accordance with shall be in accordance with Section 701 -3.1 of the Special Provisions

MATERIALS

208-2.3 GRADATION

ADD:

The material shall be free from vegetable matter, lumps or clay, and other objectionable or foreign substance.

When submitting materials for consideration, the Contractor shall provide written certification that the material meets the specified requirements. A written gradation shall also be furnished.

Gradation for aggregate base course shall be either IDOT CM-6 or CA-10 as outlined in Table 1.

Gradation for Porous Granular Embankment shall be one of the following gradations:

Sieve Designation	**Percentage by weight passing sieves**	
	D	**E**
	3" maximum	**2 ½" maximum**
4"		
3 inch	100	
2 ½ inch	90-100	100
2 inch	45-75	86-100
1 ½ inch	0-30	35-75
1 inch	0-6	0-16
½ inch		0-6
#4		
IDOT Gradation	**CA-1**	**CA-3**

CONSTRUCTION REQUIREMENTS

208-3.2 PREPARING UNDERLYING COURSE

DELETE: This Entire Section.

208-3.3 METHODS OF PRODUCTION

DELETE: This Entire Section.

208-3.4 PLACING

DELETE: This Entire Section.

ADD:

The porous granular embankment shall be placed in lifts no greater than one (1) foot thick or as directed by the Resident Engineer.

208-3.5 FINISHING AND COMPACTING

DELETE: Fifth sentence, first paragraph.

ADD:

Rolling the top of the porous granular aggregate material with a vibratory roller meeting the requirements of Section 1101 of the IDOT *Standard Specification for Road and Bridge Construction* should be sufficient to obtain the desired keying, interlocking and necessary compaction. The Resident Engineer shall verify that adequate keying and interlocking has been obtained. The porous granular base shall be compacted to the satisfaction of the Resident Engineer.

Capping aggregate will not be required when embankment meeting the requirements of Section 209 of the Standard Specifications or granular subbase is placed on top of the porous granular embankment. Capping aggregate (two (2) inch depth) meeting the requirements of Section 209 of the Standard Specifications will be required when embankment meeting the requirements of Section 152 of the Standard Specifications is placed on top of the porous granular embankment.

The aggregate base course shall be rolled and compacted to not less than 95% density (ASTM D2922), The Contractor shall provide recent (within the same year that the aggregate base course is constructed) representative proctor(s), in accordance with ASTM D698 for each aggregate source approved for use on the project.

DELETE: Second paragraph.

DELETE: Second sentence, third paragraph and REPLACE with:

When the rolling develops irregularities that exceed 3/8 inch when tested using an acceptable method, the irregular surface shall be loosened, refilled with the same kind of material as that used in constructing the course, and rolled again as required.

METHOD OF MEASUREMENT

208-4.1

DELETE: This Entire Section and Replace with:

The quantity of Porous Granular Embankment shall be the number of cubic yards as measured by the Engineer at the specified thickness of the material placed. If required, the thickness of PGE measured for payment will include the thickness of the capping stone.

The porous granular embankment shall be used as shown and as field conditions warrant at the time of construction. No adjustment in unit price will be allowed for an increase or decrease in quantities.

The Contractor shall furnish approved duplicate load tickets upon which is recorded the net weight of the aggregates in each truck. The Contractor shall submit one (1) load ticket to the Resident Engineer, or his/her duly authorized representative, at the job site when the truck load is incorporated into the base.

208-4.2

DELETE: This Entire Section.

208-4.3

DELETE: This Entire Section.

BASIS OF PAYMENT

208-5.1

DELETE: Entire Section.

ADD:

Porous granular embankment shall be paid for at the contract unit price per cubic yard, of which price shall be full compensation for the two (2) inch capping stone (if necessary), furnishing, spreading, compacting, watering and all incidentals related to equipment, labor and tools necessary to complete this work.

Payment will be made under:

ITEM AR208515	**POROUS GRANULAR EMBANKMENT**	**PER CUBIC YARD**
ITEM AR208606	**6” AGGREGATE BASE COURSE**	**PER SQUARE YARD**

ITEM 401 – BITUMINOUS SURFACE COURSE – SUPERPAVE (METHOD I)

(Central Plant Hot Mix)

DESCRIPTION

401-1.1

ADD: The following after the third paragraph of this section:

This project shall utilize Method I for the production, placement and acceptance of the bituminous surface course.

At the Contractor's option, an IDOT Division of Highways surface mix may be submitted for approval by the Engineer. The surface mix shall be in accordance with Section 406 Hot-Mix Asphalt Binder and Surface Course of the Illinois Department of Transportation "Standard Specifications for Road and Bridge Construction". The mix shall be a production mix from the current construction season meeting Mixture Composition:

HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50, MIX TYPE IL-9.5 mm.

COMPOSITION

401-3.2 JOB MIX FORMULA

ADD: The following after the third paragraph of this section:

Table 1 Superpave Design Criteria for Automobile, Entrance Roads and Parking Lots shall apply.

CONSTRUCTION METHODS

401-4.12 JOINTS

ADD: The following as the sixth paragraph of this section:

If at any time during the surface course paving operation, it becomes necessary to end a paving lane at a location other than the new finished pavement edge because of ending a day's paving, machinery breakdown, etc., the lane end will be sawed back a sufficient distance to provide a smooth, neat appearing joint from which to resume paving. The sawed face will be painted with a tack coat and this work shall be considered incidental to Item 401, Bituminous Surface Course, and no additional compensation will be allowed.

401-4.14 SHAPING EDGES

ADD: The following as the second paragraph for this section:

All pavement edges, including the pavement ends, must be left in proper alignment, as shown on the plans. This may be accomplished by a trimming method, or, at the Contractor's option, by sawing after the paving has been completed. No additional compensation will be made if the sawing method is used.

401-4.15 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY

DELETE: All references to Method II for quantities over 2,500 tons.

BASIS OF PAYMENT

401-6.1

Payment will be made under:

ITEM AR401613 BIT. SURF. CSE. – METHOD I, SUPERPAVE PER TON

ITEM 401900 – REMOVE BITUMINOUS PAVEMENT

DESCRIPTION

401-1.1

ADD: To the second sentence.

The type of material to be removed along with approximate typical pavement section is shown on the plans. Pavement structure information was taken from airport records, data supplied by airport personnel and soil borings. The Contractor shall verify the type and thickness of material to be removed. **No extra compensation will be allowed for any variations in the pavement sections actually encountered.**

CONSTRUCTION METHODS

401-2.1

ADD:

Any damage to the pavement beyond the limits as shown on the plans shall be removed and replaced by the Contractor at his expense. These areas shall be saw cut to a uniform width.

METHOD OF MEASUREMENT

401-3.1

ADD:

If pavement or subgrade material is removed due to negligence on the part of the Contractor, the additional quantity of pavement removal and replacement of subgrade material will not be measured for payment.

BASIS OF PAYMENT

401-5.1

ADD:

Payment will be made under:

ITEM AR401900 REMOVE BITUMINOUS PAVEMENT PER SQUARE YARD

ITEM 401910 – REMOVE AND REPLACE HMA PAVEMENT

DESCRIPTION

401910-1.1

This item shall consist of bituminous pavement removal and replacement for directionally bored conduit transition to above grade as described in the plans. Pavement removal and replacement quantities are estimated. The pavement shall be compacted in accordance with these specifications and shall conform to the lines, grades, thicknesses and typical sections as shown on the plans or as directed by the Resident Engineer.

Each course shall be constructed to the depth, section or elevation required to match the existing pavement structure and shall be rolled, finished and approved prior to the placement of the next course.

MATERIALS

401910-2.1 BITUMINOUS SURFACE COURSE

Bituminous surface course shall be per Section 401 or at the Contractor's option, an IDOT Division of Highways surface mix may be submitted for approval by the Engineer. The surface mix shall be in accordance with Section 406 Hot-Mix Asphalt Binder and Surface Course of the Illinois Department of Transportation "Standard Specifications for Road and Bridge Construction". The mix shall be a production mix from the current construction season meeting Mixture Composition:

HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50, MIX TYPE IL-9.5 mm

401910-2.1 BITUMINOUS BASE COURSE

Bituminous base course shall be per Section 403 or at the Contractor's option, an IDOT Division of Highways surface mix may be submitted for approval by the Engineer. The surface mix shall be in accordance with Section 406 Hot-Mix Asphalt Binder and Surface Course of the Illinois Department of Transportation "Standard Specifications for Road and Bridge Construction". The mix shall be a production mix from the current construction season meeting Mixture Composition:

HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50

If an IDOT Division of Highways surface mix is used, the compacted lift thickness shall meet the minimum requirements specified in Article 406.06(d) of the IDOT highway "Standard Specifications for Road and Bridge Construction" but shall not exceed a maximum lift of 4-inches.

401910-2.4 BITUMINOUS TACK COAT

The bituminous tack coat shall conform to the specifications of Section 603.

CONSTRUCTION METHODS

401910-3.1

The type of material to be removed along with approximate typical pavement section is shown on the plans. Pavement structure information was taken from airport records, data supplied by airport personnel and pavement cores. The Contractor shall verify the type and thickness of material to be removed. **No extra compensation will be allowed for any variations in the pavement sections actually encountered.**

401910-3.2

The proposed pavement replacement section shall be as specified herein. Tack coat shall be applied between each lift of asphalt and on all vertical faces of the patch area.

401910-3.3

The existing pavement areas to be removed shall be done in such a manner as to prevent damage to the adjacent pavements. All edges adjacent to existing pavements shall be saw-cut full depth prior to removal, as directed by the Resident Engineer.

Any damage to the pavement beyond the limits as shown on the plans or as directed by the Resident Engineer shall be removed and replaced by the Contractor at his expense. These areas shall be saw cut to a uniform width.

401910-3.4

Pavement replacement will be as detailed on the plans and constructed in accordance to the applicable Sections 401, 403 and 603. The various materials required for pavement replacement shall be in accordance with the applicable portions of the Standard Specifications and these Special Provisions. Any damage to pavement beyond the limits as shown on the plans **shall be removed and replaced by the Contractor at his expense. These areas shall be saw cut to a uniform width.**

401910-3.5

Pavement Removal and Replacement shall be the removal of the existing pavements as shown on the plans or as directed by the Resident Engineer and the replacement pavement shall match the existing pavement thickness. The replacement pavement shall consist of bituminous surface course and bituminous base course conforming to the specifications of Section 401 and 403. The maximum lift thickness shall be 3". For full-depth patching, the existing aggregate base course shall be re-graded and compacted prior to the placement of the bituminous course. Cost of regrading and compacting to the existing base shall be incidental to the pavement removal and replacement.

401910-3.6

The existing pavement that is removed shall be disposed of off Airport property. No additional compensation will be made for hauling and disposal of any of the removed material.

401910-3.7 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY.

After the completion of compaction, the pavement will be tested for acceptance by the Resident Engineer and accepted on the basis of percent air voids in the final compacted mat. The HMA course shall be compacted to a minimum density of 93 percent (7 percent air voids) and a maximum of 99 percent (1 percent air voids) of the Maximum Theoretical Specific Gravity (ASTM D 2041). If, during construction, the density test falls below 93 percent, additional approved rollers shall be required. Failure to achieve density within these limits shall be cause for rejection of the material, as determined by the Division of Aeronautics.

One random nuclear density test shall be taken for each 250 tons of mix placed. Each nuclear density test shall be the average of five (5) nuclear tests taken as a cross-section of the pavement. The Resident Engineer shall have a nuclear gauge and qualified operator on the project when constructing this item for acceptance testing. The contractor shall have their own nuclear gauge and qualified operator onsite for quality control.

METHOD OF MEASUREMENT

401910-4.1

The area of pavement removal and replacement shall be measured by the number of square yards, satisfactorily removed, replaced and disposed of as shown on the plans or as directed by the Resident Engineer.

401910-4.2

If additional pavement or subgrade material is removed due to negligence on the part of the Contractor, the additional quantity of pavement removal and replacement of subgrade material will not be measured for payment.

401910-4.3

The bituminous surface course, bituminous base course and bituminous tack coat will not be measured separately for payment, but will be considered incidental to REMOVE & REPLACE BIT. PAVEMENT, per square yard.

BASIS OF PAYMENT

401910-5.1

Payment for REMOVE & REPLACE BITUMINOUS PAVEMENT shall be made at the contract unit price per square yard. This price shall include full compensation for sawing, removal, disposal, replacement of asphalt materials, compaction, tack coat, including furnishing all materials, labor, tools, testing, equipment and incidentals necessary to complete this item of work.

Any grading and recompacting of existing granular base course to proper grade shall not be paid for separately but shall be considered incidental to Remove & Replace Bituminous Pavement.

Payment will be made under:

ITEM AR401910 REMOVE & REPLACE BIT. PAVEMENT PER SQUARE YARD

ITEM 403 – BITUMINOUS BASE COURSE – SUPERPAVE (METHOD I)

(Central Plant Hot Mix)

DESCRIPTION

403-1.1

ADD: The following after the third paragraph of this section:

This project shall utilize Method I for the production, placement and acceptance of the bituminous base course.

Bituminous base course shall be per Section 403 or at the Contractor's option, an IDOT Division of Highways surface mix may be submitted for approval by the Engineer. The surface mix shall be in accordance with Section 406 Hot-Mix Asphalt Binder and Surface Course of the Illinois Department of Transportation "Standard Specifications for Road and Bridge Construction". The mix shall be a production mix from the current construction season meeting Mixture Composition:

HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50

COMPOSITION

403-3.2 JOB MIX FORMULA (JMF)

ADD: The following after the third paragraph of this section:

Table 1 Superpave Design Criteria for Aircraft under 60,000 pounds shall apply.

CONSTRUCTION METHODS

403-4.11 JOINTS

Add the following paragraph to this section:

At any time during the base course paving operation it becomes necessary to end a paving lane at a location other than the proposed finished pavement edge because of ending a day's paving, machinery breakdown, etc.; the lane end will be sawed back a sufficient distance to provide a smooth, neat appearing joint from which to resume paving. The sawed face will be painted with a tack coat and this work shall be considered incidental to Item 403 Bituminous Base Course, and no additional compensation will be allowed.

403-4.12 SHAPING EDGES

ADD:

All pavement edges, including the pavement ends, must be left in proper alignment as shown on the plans. This may be accomplished by a trimming method or at the Contractor's option by sawing after the paving has been completed. No additional compensation will be made if the sawing method is used.

403-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY

DELETE: All references to Method II for quantities over 2,500 tons.

BASIS OF PAYMENT

403-6.1

Payment will be made under:

ITEM AR403613 BIT. BASE CSE. – METHOD I, SUPERPAVE PER TON

ITEM 602 – BITUMINOUS PRIME COAT

MATERIALS

602-2.1 BITUMINOUS MATERIAL

ADD:

At the Contractor's option, Penetrating Emulsified Prime (PEP) may be used. The use of PEP shall be as outlined in the IDOT "Standard Specifications for Road and Bridge Construction", Article 403.02.

CONSTRUCTION METHODS

602-3.3 APPLICATION OF BITUMINOUS MATERIAL

ADD: The following to the second paragraph:

Areas worn from hauling operations shall be re-tacked at no additional cost to the Contract.

BASIS OF PAYMENT

602-5.1

ADD:

Payment will be made under:

ITEM AR602510	**BITUMINOUS PRIME COAT**	**PER GALLON**

ITEM 603 – BITUMINOUS TACK COAT

MATERIALS

603-2.1 BITUMINOUS MATERIAL

ADD:

At the Contractor's option, Penetrating Emulsified Prime (PEP) may be used. The use of PEP shall be as outlined in the IDOT "Standard Specifications for Road and Bridge Construction", Article 403.02.

CONSTRUCTION METHODS

603-3.3 APPLICATION OF BITUMINOUS MATERIAL

ADD: The following to the second paragraph:

Areas worn from hauling operations shall be re-tacked at no additional cost to the Contract.

BASIS OF PAYMENT

603-5.1

ADD:

Payment will be made under:

ITEM AR603510 BITUMINOUS TACK COAT PER GALLON

ITEM 610 – STRUCTURAL PORTLAND CEMENT CONCRETE

DESCRIPTION

610-1.1

ADD:

This item shall consist of furnishing and installing structural concrete for fence and gate post foundations, wildlife deterrent pad, or for any other item requiring concrete shown in the plans.

CONSTRUCTION METHODS

610-3.11 PLACING CONCRETE

ADD:

Holes dug for fence and gate post foundations shall be to the depth and sizes indicated on the plans or as required by the manufacturer. The Resident Engineer shall be given the opportunity to inspect fence footings prior to concrete placement. Footings found to be insufficient in either depth or diameter shall be corrected prior to concrete placement.

METHOD OF MEASUREMENT

610-4.3

ADD:

The quantities of structural Portland Cement Concrete used for fence, gate post foundations, curb and gutter, light pole foundations, wildlife deterrent pad or for any other incidental concrete work shall not be measured for payment but shall be considered incidental to the associated pay items.

610-4.5

ADD:

Excavation required for the installation of the fence, gate post foundations, curb and gutter, light pole foundations, wildlife deterrent pad or any other incidental concrete construction shall not be measured for payment, but shall be considered incidental to the associated pay items. Excess materials shall be hauled off the Airport property at no additional cost to the contract. Backfilling along edges of exposed concrete shall be considered incidental.

BASIS OF PAYMENT

610-5.2

ADD:

No direct payment shall be made for excavation required for the placement of any Structural PC Concrete, be it excavation for fence and gate post foundations, or any other incidental concrete installation. Excavation and subgrade preparation shall be considered incidental to the contract unit prices for the respective pay items requiring excavation.

No direct payment shall be made for steel reinforcement or for joint sawing and sealing. Steel reinforcement shall be considered incidental to the associated pay items.

Structural PC concrete used for any other purpose on this project shall not be paid for, but shall be considered incidental to the associated pay items.

ITEM 620 – PAVEMENT MARKING

MATERIALS

620-2.2 PAINT

ADD:

All paint shall be waterborne. Red paint shall conform to Federal Specification TT-P-1952D, Type 1.

The paint shall contain no lead, chromium, cadmium or barium.

CONSTRUCTION METHODS

620-3.3 PREPARATION OF SURFACE

ADD:

Existing marking that is to be re-painted shall be cleaned using sand blasting or high pressure water or other methods as approved by the Engineer to remove dirt, grease, laitance, loose or flaking paint and any paint that is not bonding, at no additional cost to the contract.

620-3.9 CLEAN UP

ADD:

The Contractor shall remove from the work area all debris, waste, loose or un-adhered reflective media, and by-products generated by the surface preparation and application operations to the satisfaction of the Resident Engineer. The Contactor shall dispose of these wastes in strict compliance with all applicable state, local and federal environmental statutes and regulations.

METHOD OF MEASUREMENT

620-4.1

ADD:

The quantity of permanent markings to be paid for shall be the number of square feet of painting with the specified material **measured only once to apply two coats** in conformance with the specifications and accepted by the Engineer. Quantities will not be distinguished between different colors of paint, except that black paint shall be paid separately and does not require reflective media. Only the top coat of paint shall require reflective media.

BASIS OF PAYMENT

ADD:

Payment will be made under:

ITEM AR620520	**PAVEMENT MARKING-WATERBORNE**	**PER SQUARE FOOT**
ITEM AR620900	**PAVEMENT MARKING REMOVAL**	**PER SQUARE FOOT**

DIVISION III – FENCING

ITEM 161 – WIRE FENCE WITH STEEL POSTS

CONSTRUCTION METHODS

161-3.10 FENCE AND GATE REMOVAL

REPLACE section with:

This work shall consist of the removal and disposal of the existing Class C perimeter fence. The fence shall be completely removed including fabric, posts, top rail, miscellaneous fittings and hardware, barbed wire, tension wire and concrete foundations.

The removed material shall become the property of the Airport, except the contractor shall remove all concrete posts foundations and dispose of the foundations off of Airport property at no additional costs to the contract. The materials shall be delivered, by the Contractor, to a location specified by Airport at no additional costs to the contract.

The fence posts in turf shall be pulled, including foundations, and not cut off.

All holes shall be filled and compacted with material generated as a part of the holes for the new fence post excavation. At the Contractor's option, offsite borrow material may be supplied at no additional cost to the contract. Areas disturbed in the removal process shall be graded to original conditions, seeded and mulched at no additional cost to the contract.

The fence removal shall include removal of all gates present in the fence line. Payment for removal of the gates shall be measured by the unit removed for each gate.

All gates shall be removed and turned over to the Airport at a location on Airport property at no additional cost to the contract.

Removal of the existing fence includes removal of all fence posts. No distinction of post diameter will be made for payment purposes. The Contractor shall examine the site prior to submitting a proposal.

161-3.12 CONTRACTOR'S RESPONSIBILITY FOR UTILITY LOCATING

The location of known underground utilities is presented on the plans.

It shall be the Contractor's responsibility to determine the actual location of all utilities, including service connections to underground utilities. Prior to construction, the Contractor shall contact JULIE, FAA and Airport Maintenance. Prior to construction, the Contractor shall notify all utility companies of his operational plans. The Contractor shall make arrangements for detailed information and assistance in locating utilities. In the event an unexpected utility interference is encountered during construction, the Contractor shall immediately notify the utility company, the Owner and the Resident Engineer. Any such mains and/or services disturbed by the Contractor's operations shall be restored immediately at his expense to the satisfaction of the Owner and the Engineer.

The Contractor shall be responsible for keeping the owner advised of this plan of operations. Prior to commencing work in the general vicinity of an existing utility service or facility, the Contractor shall notify the owner of his plan of operation.

BASIS OF PAYMENT

161-5.3

ADD:

No distinction will be made between heights of removed fence for payment purposes.

Payment will be made under:

ITEM AR161900 REMOVE CLASS C FENCE PER LINEAR FOOT

ITEM 162 – CHAIN-LINK FENCES

DESCRIPTION

162-1.1

ADD:

Install new 10-foot chain link fence with 3-strands of barbed wire and 2-foot of buried fabric at the locations noted in the plans.

Existing 8-foot and 6-foot fencing materials shall **not** be incorporated into the new installation.

Remove existing electric gate operators and associated equipment as shown on the plans.

Install temporary fencing for wetland and tree protection.

Install new 3 rail split fence at the location noted in the plans

Install new high speed electric gate operators and associated power and control equipment as shown on the plans.

MATERIALS

162-2.3 FENCE POSTS, POST TOPS AND EXTENSIONS, RAILS, GATES, BRACES, STRETCHER BARS AND CLIPS

DELETE: All references to Type C steel pipe.

DELETE: Delete Section A, Subsections 3, 4, 5 and 6.

REVISE: Section A, Subsection 1 to the following:

Steel pipe, Type A shall meet ASTM F1083 schedule 40 pipe, high strength, hot-dip zinc-coated after fabrication with 1.8 ounces of zinc per square foot of coated surface area.

Line post shall be 2.875” OD and 5.80 lbs/ft.
Terminal, corner and pull posts shall be 3.5” OD and 7.58 lbs/ft.
Brace rails shall be 1.66” OD and 2.27 lbs/ft.
Intermediate rails, when required, shall be 1.66” OD and 2,27 lbs/ft
Gate posts shall be 4.0” OD and 9.12 lbs/ft

REVISE: Section A, Subsection 2 to the following:

Steel pipe, Type B shall meet ASTM F1043 pipe Group IC, having a Type B external hot-dip zinc-coated with 0.9 ounces of zinc per square foot with a clear organic overcoat. Interior coating to be Type B hot-dip zinc-coating 0.9 ounces per square foot or Type D 81% zinc pigmented coating, minimum thickness of 0.3 mils be hot-dipped galvanized conforming to the requirements of ASTM F 1083.

Line post shall be 2.875” OD and 4.64 lbs/ft.
Terminal, corner and pull posts shall be 3.5” OD and 5.71 lbs/ft.
Brace rails shall be 1.66” OD and 1.84 lbs/ft.
Intermediate rails, when required, shall be 1.66” OD and 1.84 lbs/ft
Gate posts shall be 4.0” OD and 6.56 lbs/ft

ADD to Section C, Subsection 1, Slide Gates:

Two (2) Slide gates shall be fabricated for use as an electric gate at the locations as shown on the plans. Payment for these two (2) gates shall be as a manual slide gate and a separate pay item for electric gate operator. The other slide gates shall be manual slide gates.

Gates shall be sliding type, complete with latches, stops, keepers, hinges, rollers and roller tracks, and three strands of barbed wire above the fabric. Gate posts shall consist of galvanized steel pipe of the size recommended by the gate manufacturer. The fabric shall be of the same type material as used in the fence. The gates shall be to the dimensions as shown on the plans.

Cantilever slide gates shall be constructed so as to extend across the opening specified. The height of the gates shall be identical to the fence adjacent to the gate. Gates shall be as manufactured by Tymetal Corporation, Elite Fence, or approved equal. The sag and deflection of the slide gates shall not exceed the values presented in ASTM F 1184, Type II, Class 2.

The gate shall be fabricated from aluminum alloy extrusions. The gate frame shall be reinforced or post-tensioned with galvanized tubular steel running through the full length of the top and bottom primary members. The primary members shall be oversized rectangular members, top member nominally 3” by 5”, bottom member nominally 2” by 5”. Vertical members at the ends of the frame and at 2’ centers, end to end, shall be square, not less than 1” by 1”. Spacing of vertical members shall be no greater than half the height of the gate frame. Diagonal bracing shall be installed to further stabilize the gate frame. Gate frames shall be modular sections.

The gate frame shall have a separate semi-enclosed top track of extruded aluminum alloy, which becomes an integral part of, and forms a composite structure with, the top of the gate frame. This gate frame shall be supported by two self-aligning, 4-wheel, sealed lubricant, ball bearing truck assemblies riding in the semi-enclosed track. The bottom of the support posts shall be equipped with two pairs of rubber guide wheels.

The slide gates shall be equipped with a standard latch assembly consisting of post mount catcher and a frame-mounted yoke. A mating eyelet on the catcher yoke and the frame yoke intended for a padlock to secure the gate shall be included.

The rear of the gate shall be supported in the open position.

The electric gate operator shall be high speed with minimum of 2ft/sec travel speed in both directions. Gate operator shall operate on voltage as specified on plans.

162-2.10 SIGNS

ADD:

Signs attached to the existing fence and existing gates shall be removed and reinstalled, except gate Identification signs, Warning signs and Restricted Area signs, which shall be furnished new per the plan details.

162-2.11 STEEL REINFORCEMENT

ADD:

The steel reinforcement for the wildlife deterrent barrier pad shall conform to the specifications of Section 610.

162-2.12 TEMPORARY FENCING

ADD:

The temporary construction fencing shall be a minimum of 4-foot tall snow fence or "International Orange", in color, polyethylene fence. Fence posts shall be either standard steel or wood posts with a minimum cross-sectional area of 3.0 square inches.

162-2.13 SPLIT RAIL FENCE

ADD:

The wood shall be western red cedar. The rails and posts shall be jumbo weight and 10 feet in length.

162-2.14 GATE OPERATOR

ADD:

Each gate operator shall include the following components:

1. Gates and components shall meet UL 325, Class III and/or IV
2. Minimum pump motor: one (1) hp, 3450 RPM, 56C, TEFC, operate on 208V, single phase.
3. Continuous duty cycle
4. Minimum two (2) feet per second rate of travel
5. Corrosion resistant #40 roller chain and steel gate mounting brackets, photo eye, 5-foot edge sensor and
6. Steel cover/chassis shall have a zinc rich primer and powder coated
7. All components shall have overload protection.
8. Electrical enclosure: Type 1, metal, with hinged lid gasketed for protection from intrusion of foreign objects.
9. Access interface controller board containing:
    a. Inherent entrapment sensor.
    b. Built in audible "warn before operate" system.
    c. Built in timer to close.
    d. 32 character OLED display for reporting of functions and codes.
    e. Multiple programmable output relay options.
    f. Anti-tailgate mode.
    g. Built-in power surge/lightning strike protection.
    h. Menu configuration, event logging and system diagnostics easily accessible with a PC and manufacturer's analyzation and retrieval tool.
    i. RS-232 port for connection to laptop or other computer peripheral and RS-485 connection for network interface.
    j. Electromechanical and solid state relays.
    k. Radio option outputs.
    l. 21 inputs for site specific configurations.
10. Access interface controller board containing Transformer: 75 VA, non-jumpered taps, for all common voltages.
11. Control circuit: 24 VDC.
12. Vehicle detection input for card reader.
13. Gate edge sensors to be installed such that the gate will reverse in either direction upon sensing an obstruction.

CONSTRUCTION METHODS

162-3.1 CLEARING FENCE LINE

REPLACE: In the first paragraph replace the reference of “2 feet” to “10 feet or as shown on the plans”.

ADD:

The area to be cleared and grubbed shall be delineated by the Contractor and approved by the Resident Engineer prior to commencing the work, in accordance with Item 151, Clearing and Grubbing.

162-3.2 INSTALLING POSTS

REVISE the first paragraph to the following:

All posts shall be spaced not more than 10 feet apart as shown on the plans. Terminal (end, corner, pull, and brace), line, and gate posts holes shall be augured a minimum of 70 inches below ground level. Posts shall be set in 46 inches concrete bases as shown on the plans. The remaining 24 inches above the concrete bases shall be backfilled slightly above the ground and sloped to drain

REVISE the first sentence of the fifth paragraph to the following:
All posts shall be set to a minimum depth as noted on the construction plans.

162-3.5 INSTALLING FABRIC

REVISE: Subsection C, second sentence, to read: The fastenings shall **not** be spaced more than 14 inches on centers for line posts.

ADD:

At terminal (end, corner, and pull) and gate posts the fabric shall be fastened with stretcher bars and bands. The stretcher bar and bands shall extend below the existing ground to secure the 2 feet of buried fence to the post.

All trenches that are constructed to allow the fabric installation 2 feet below the existing ground shall be backfilled and compacted to the Resident Engineer’s satisfaction.

When utilities are encountered by the buried fabric, the dog house cut in the fabric shall be made to allow installation around the utility.

At locations of small natural swales or drainage ditches and where it is not practical to have the fence conform to the general contour of the ground surface, longer posts may be used and additional fence fabric as detailed on the construction plans.

162-3.7 GENERAL

DELETE the first paragraph and REPLACE with the following:

The fence shall be constructed in accordance with the details on the plans and as specified herein using new materials, and all work shall be performed in a workmanlike manner satisfactory to the Engineer. Prior to the beginning of the work the Contractor shall locate the position of the work by establishing and marking the property line or fence line. The Contractor may request of the Engineer a copy of the Airport’s property boundary map. The Contractor shall span the opening below small natural or drainage ditches as detailed on the plans. The new fence shall be permanently tied to the terminals of existing fences. The finished fence shall be plumb, taut, true to line and ground contour,

and complete in every detail. When directed, the Contractor shall be required to stake down the chain-link fence at several points between posts.

162-3.8 INSTALLING GATES

ADD:

The Contractor shall install the proposed gates at the locations shown in the plans or as required by the Airport. Gates shall be installed to conform to manufacturer's recommendations and the details shown in the plans.

Gate installation shall include erection of the posts, fence, gate and warning and identifications signs required to provide a complete operating installation satisfactory to the owner. Signs on the existing gates other than gate identification and warning signs shall be removed from the existing gate and reinstalled on the new gate.

162-3.9 EXISTING FENCE CONNECTIONS

ADD:

Where new fence and existing fence meet, a new terminal or end post shall be installed and the new and existing fence shall be connected to the new corner post. A brace shall be required in both the new and existing fence. Connections between new and existing fence shall be considered incidental to the contract.

162-3.11 FENCE AND GATE REMOVAL

ADD:

This work shall consist of the removal and disposal of the existing 6-foot and 8-foot and Class E airport security perimeter fence. The fence shall be completely removed including fabric, posts, top rail, miscellaneous fittings and hardware, barbed wire, tension wire and concrete foundations.

The removed material shall become the property of the Airport, except the contractor shall remove all concrete posts foundations and dispose of the foundations off of Airport property at no additional costs to the contract. The materials shall be delivered, by the Contractor, to a location specified by Airport at no additional costs to the contract.

The fence posts in turf shall be pulled, including foundations, and not cut off.

All holes shall be filled and compacted with material generated as a part of the holes for the new fence post excavation. At the Contractor's option, offsite borrow material may be supplied at no additional cost to the contract.

The fence removal shall include removal of all gates present in the fence line. Payment for removal of the gates shall be measured by the unit removed for each gate.

All gates shall be removed and turned over to the Airport at a location on Airport property at no additional cost to the contract.

Removal of the existing chain link fence includes removal of all fence posts. No distinction of post diameter will be made for payment purposes. The Contractor shall examine the site prior to submitting a proposal.

162-3.13 BARBED WIRE

Three strands of barbed wire shall be installed above all fence and gates and shall be secured to the posts.

162-3.14 CONTRACTOR'S RESPONSIBILITY FOR UTILITY LOCATING

The location of known underground utilities is presented on the plans.

It shall be the Contractor's responsibility to determine the actual location of all utilities, including service connections to underground utilities. Prior to construction, the Contractor shall contact JULIE, FAA and Airport Maintenance. Prior to construction, the Contractor shall notify all utility companies of his operational plans. The Contractor shall make arrangements for detailed information and assistance in locating utilities. In the event an unexpected utility interference is encountered during construction, the Contractor shall immediately notify the utility company, the Owner and the Resident Engineer. Any such mains and/or services disturbed by the Contractor's operations shall be restored immediately at his expense to the satisfaction of the Owner and the Engineer.

The Contractor shall be responsible for keeping the owner advised of this plan of operations. Prior to commencing work in the general vicinity of an existing utility service or facility, the Contractor shall notify the owner of his plan of operation.

162-3.15 WILDLIFE DETERRENT BARRIER PAD

ADD:

Gate concrete pads shall be installed at each gate or as shown on the plans in lieu of buried fabric. The pads shall be constructed as detailed on the construction plans.

162-3.16 RESTORATION

ADD:

All areas disturbed by the Contractor's operations shall be restored to their original condition to the satisfaction of the Engineer and the Airport. The restoration shall include any necessary backfilling, grading, compacting and additional turfing required. The Contractor shall be responsible for maintaining all disturbed areas until final acceptance.

162-3.17 SECURITY AND MAINTAINING THE EXISTING AIRPORT PERIMETER FENCE LINE

ADD:

The Contractor shall also maintain the existing electrical gates in service at all times to allow access to the corporate west hangars. Contractor shall maintain barricades at all unsecured driveway gate locations or as noted in the plans.

METHOD OF MEASUREMENT

162-4.1

ADD:

Barbed wire shall not be measured separately but shall be included in the CLASS E FENCE 10' W/ 2' BURY pay item.

Temporary fence or other measures necessary to comply with Section 162-3.17 shall not be measured separately but shall be included in the CLASS E FENCE 10' W/ 2' BURY pay item.

162-4.5

ADD:

Class E Gate Removals shall be counted per each slide, swing and walkway gate removed, regardless of type, width or height of gate removed.

162-4.6

ADD:

Wildlife Deterrent Barrier – Pad shall be measured by the square foot, in-place and accepted by the Engineer.

162-4.7

ADD:

Electric Gate Operator for each gate shall be counted per each gate operator, including but not limited to concrete foundations, detector loops, detector loop cable/conduits, connection to existing or new electric service pedestal, all conduits/conductors for power and controls within the gate and all required termination, testing and labeling of all conductors. The underground power conductors and conduits are specified in and shall be paid under items 108 and 110, respectively.

162-4.7

ADD:

Temporary construction fence shall be measured from outside post to outside post and shall be the length of temporary fence actually constructed. Removal of temporary fence will not be measured for payment but will be incidental to the fence.

162-4.8

ADD:

Spilt rail fence shall be measured from outside post to outside post and shall be the length of fence actually constructed.

BASIS OF PAYMENT

162-5.1

DELETE entire Section and REPLACE with:

Payment for fence installed in turf or pavement will be made at the contract unit price per linear foot for CLASS E FENCE 10' W/ 2' BURY. This price shall be full compensation for furnishing all materials and for all preparation, erection, and installation of these materials, temporary fencing, restoration of fabric trenches, post holes, stockpiles, including grading, backfilling, seeding and mulching and for all labor, equipment, tools, and incidentals necessary to complete the item.

Barbed wire shall not be paid for separately but shall be included in the CLASS E FENCE 10' W/ 2' BURY pay item.

In addition to the bid unit price per linear foot for Class E Fence and per each for Class E Gates, fence and gates noted on the plans to be vinyl clad will have an additional payment made at the contract unit price per linear foot for VINYL FENCE UPGRADE and per each for VINYL GATE UPGRADE. The additional payment will be full compensation to include the difference in cost between Class E fence/gates with and without vinyl coating.

162-5.3

ADD:

No distinction will be made between heights of removed fence for payment purposes.

162-5.4

DELETE: Entire Section:

ADD:

Payment for concrete deterrent barrier shall be made at the contract unit price per square foot for WILDLIFE DETERRENT BARRIER – PAD. This price shall be full compensation for furnishing all concrete, reinforcement, aggregate base, other miscellaneous materials and for all preparation, excavation, erection, backfill and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

162-5.5

DELETE: Entire Section.

ADD:

Payment shall be made at the contract unit price per each for REMOVE GATE, for slide, swing and pedestrian gates regardless width, height of gate or number of leaves removed at each gate opening. This price shall be full compensation for all removals, restoration, including grading, backfilling, seeding and mulching, and disposal, and for all labor, equipment, tools, and incidentals necessary to complete this item.

162-5.6

ADD:

Payment shall be made at the contract unit price per each for ELECTRIC GATE OPERATOR, for electric slide gate regardless of size, voltage, horsepower of the gate operator This price shall be full compensation for furnishing and installation of all materials, including disconnects, circuit breakers, grounding, termination, testing and for all labor, equipment, tools, and incidentals necessary to complete this item.

162-5.7

ADD:

Payment for temporary fence installed and removed will be made at the contract unit price per linear foot for TEMPORARY CONSTRUCTION FENCE. This price shall be full compensation for furnishing all materials and for all preparation, erection, and installation of these materials, removal, restoration of post holes, including grading, backfilling, seeding and mulching and for all labor, equipment, tools, and incidentals necessary to complete the item.

162-5.8

ADD:

Payment for split rail fence installed will be made at the contract unit price per linear foot for SPLIT RAIL FENCE. This price shall be full compensation for furnishing all materials and for all preparation, erection, and installation of these materials, removal, restoration of post holes, including grading, backfilling, seeding and mulching and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

ITEM AR162216	**CLASS E MANUAL SLIDE GATE-16'**	**PER EACH**
ITEM AR162220	**CLASS E MANUAL SLIDE GATE-20'**	**PER EACH**
ITEM AR162224	**CLASS E MANUAL SLIDE GATE-24'**	**PER EACH**
ITEM AR162228	**CLASS E MANUAL SLIDE GATE-28'**	**PER EACH**
ITEM AR162401	**VINYL FENCE UPGRADE**	**PER LINEAR FOOT**
ITEM AR162402	**VINYL GATE UPGRADE**	**PER EACH**
ITEM AR162612	**CLASS E GATE 12'**	**PER EACH**
ITEM AR162810	**CLASS E FENCE 10' W/ 2' BURY**	**PER LINEAR FOOT**
ITEM AR162900	**REMOVE CLASS E FENCE**	**PER LINEAR FOOT**
ITEM AR162905	**REMOVE GATE**	**PER EACH**
ITEM AR162908	**REMOVE ELECTRIC GATE**	**PER EACH**
ITEM AR163000	**TEMPORARY CONSTRUCTION FENCE**	**PER LINEAR FOOT**
ITEM AR800170	**SPLIT RAIL FENCE**	**PER LINEAR FOOT**
ITEM AR800173	**WILDLIFE DETERRENT BARRIER – PAD**	**PER SQUARE FOOT**
ITEM AR800186	**ELECTRIC GATE OPERATOR**	**PER EACH**

DIVISION IV – DRAINAGE

ITEM 754 – CONCRETE GUTTERS, DITCHES AND FLUMES

DESCRIPTION

754-1.1

ADD:

Combination curb and gutter shall be B6.12 in compliance with IDOT Standard 606001-07 and as shown on the plans.

METHOD OF MEASUREMENT

754-4.1

ADD:

Granular bedding, reinforcement, curing and protection for combination curb and gutters shall not be measured separately but shall be considered incidental to the proposed pay item.

BASIS OF PAYMENT

754-5.1

ADD:

Payment will be made under:

ITEM AR754410	**COMB CONCRETE CURB & GUTTER**	**PER LINEAR FOOT**

DIVISION V – TURFING

ITEM 901 – SEEDING

DESCRIPTION

901-1.1

ADD:

In areas cleared and grubbed shown on the plans or as directed by the engineer, the final surface shall be smoothed, graded to drain, seeded and mulched or blanketed in accordance with these specifications. Areas disturbed by the Contractor's operations shall be restored by him at his expense.

MATERIALS

901-2.1 SEED

REVISE the seed mixture to the following:

Aeronautics Seed Mixture

SEED	MINIMUM SEED PURITY	MINIMUM GERMINATION	APPLICATION RATE (LB/ACRE)
*Tall Fescue	98%	90%	60
Annual Ryegrass	98%	90%	20
*Red Fescue	98%	85%	30
*Hard Fescue	96%	85%	30

*Seed shall be of a variety bred to contain high levels of endophyte.

If the Contractor elects to use their own seed mixture, the Contractor shall ensure seed recommended is not a hazardous wildlife attractant (must contain high endophyte variety).

ADD:

IL DOT CLASS 4A Seed Mixture

SEED	APPLICATION RATE (LB/ACRE)
Little Blue Stem	5
Side-Oats Grama	5
Canada Wild Rye	1
Prairie Dropseed	0.5
Annual Ryegrass	25
Oats, Spring	25
Perennial Ryegrass	15

IL DOT Class 4A seed mixtures may be planted between May 15th to June 30th and October 15th to December 1st.

901-2.2 LIME

DELETE: Entire Section.

ADD:
The Contractor has the option to perform a soil test, at their expense, for the on-site or plan specified topsoil sources. If the Contractor proposes an application of lime, the proposal shall be approved by the Engineer. Lime, if used, shall be at no additional costs to the contract.

901-2.3 FERTILIZER

REVISE last paragraph to read as follow:

Fertilizer shall be applied at the rates that supply the following amounts of nutrients per acre to the areas of seeding:

NUTRIENT	POUNDS PER ACRE
Nitrogen	90
Phosphorus (P205)	90
Potassium (K20)	90
Total	**270**

The Contractor has the option to perform a soil test, at their expense, to validate that the fertilizer rate specified is suitable for the on-site or plan specified topsoil sources. If the Contractor proposes an alternate mix ratio and weights, the proposal shall be approved by the Engineer. Alternate mix ratio and/or weights shall be at no additional costs to the contract.

CONSTRUCTION METHODS

901-3.2 DRY APPLICATION METHOD

DELETE: Entire Section.

ADD:

(a) Description: This work shall consist of furnishing, transporting and installing all seeds, plant or other materials required for:

1. Any remedial operations in conformance with the plans as specified in these Special Provisions or as directed by the Engineer.

(b) General Requirements: The site will be in the following condition:

1. The grade will be shaped to the elevation shown in the plans or to drain when no grades are given.
2. The topsoil will be free of clods, stones, roots, sticks, rivulets, gullies, crusting, caking and have a soil particle size of no larger than 1”.

(c) Seeding Equipment: Seeding equipment shall meet the following requirements. Any other equipment deemed necessary shall be subject to the approval of the Engineer.

1. Disc: Any disc new for the use shall be in a good state of repair with sound, unbroken blades. The disc shall be weighted if necessary to achieve the required tillage depth.
2. No-Till Planters and Drills: Rangeland type drills and no-till planters shall be designed specifically for the seeding of native grasses and forbs with depth control bands set at 1/4" to 1/8".
3. Seedbed Preparation: Seedbed preparation methods shall be approved by the Engineer. Cultivation shall be accomplished at such a time that seeding may occur immediately and without delay. No seeds shall be sown until the seedbed has been approved by the Engineer.

(d) Seeding Methods: The Contractor shall submit for approval by the Engineer a schedule for seeding and/or planting at least two weeks prior to the scheduled commencement of work. Broadcast seeders will not be allowed. Seeder will be a drill type planter or slit seeder. The Engineer shall examine and then approve any equipment to be used. Prior to starting work, all seeding equipment shall be calibrated and adjusted to sow seeds at the proper seeding rate. Equipment shall be operated in a manner to ensure complete coverage of the entire area to be seeded. The Engineer shall be notified forty-eight (48) hours prior to beginning the seeding operations. Any gaps between areas of growth greater than eight square feet shall be resown or replanted.

1. No-Till or Drill Method: Rolling of the seedbed will not be required with the use of rangeland type grass drills or no-till planters.

901-3.3 WET APPLICATION METHOD

DELETE: Entire Section.

METHOD OF MEASUREMENT

901-4.1

ADD:

Areas of seeding not showing a uniform stand of grass in density and color shall not be approved for payment. Such areas shall be reseeded to the Owner's satisfaction at the Contractor's cost.

Only those areas cleared and grubbed, as shown on the plans or as directed by the engineer, shall be measured for payment. Other areas disturbed by the Contractor's operations shall be restored by him at his expense to the satisfaction of the Resident Engineer and Airport.

All permanent seeding, eligible for payment, shall be measured as *AR90510 Seeding* regardless of seed mixture or class.

BASIS OF PAYMENT

901-5.1

ADD:

Payment will be made under:

ITEM AR901510 SEEDING PER ACRE

ITEM 905 – TOPSOILING

DESCRIPTION

905-1.1

ADD:

This item shall consist of a minimum of 4" of topsoil placed in the areas shown in the plans. In addition, the surface of all disturbed areas shall be covered with a layer of topsoil, as needed, to facilitate drainage and the growth of turf.

Topsoil shall be supplied by the Contractor from outside the boundaries of the Airport property. It shall be the Contractor's responsibility to locate and obtain the supply, subject to the approval of the Engineer.

CONSTRUCTION METHODS

905-3.1 GENERAL

DELETE the second sentence of the first paragraph.

905-3.3 OBTAINING TOPSOIL

DELETE the first paragraph and second paragraphs.

905-3.4 PLACING TOPSOIL

DELETE the first sentence of the first paragraph.

ADD:

Thickness of the topsoil shall be as shown on the plans.

METHOD OF MEASUREMENT

905-4.1, 905-4.2

DELETE: This section.

ADD:

Topsoiling shall be measured in square yards completed and accepted by the Engineer.

Areas that required topsoiling due to the Contractor rutting and disturbing the areas outside of the limits shown on the plans, and within material storage/staging areas, access/haul roads, lighting and cabling/conduit areas will not be measured for payment, but shall be considered incidental to the contract.

BASIS OF PAYMENT

905-5.1, 905-5.2

DELETE: These sections.

ADD:

Payment will be made at the contract unit price per square yard for topsoiling. This price shall be full compensation for furnishing and placing/grading all materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

ITEM AR905530 TOPSOILING PER SQUARE YARD.

ITEM 908 – MULCHING

DESCRIPTION

908-2.1 MULCH MATERIAL

REVISE: First sentence to read:

Material used for mulching shall be (D) Hydraulic Mulch, Light-Duty.

METHOD OF MEASUREMENT

908-4.1

ADD:

Only those areas shown on the plans or as directed by the engineer, shall be measured for payment. Other areas disturbed by the Contractor's operations shall be restored by him at his expense to the satisfaction of the Resident Engineer and Airport.

BASIS OF PAYMENT

908-5.1

ADD:

Payment will be made under:

ITEM AR908514	**LIGHT-DUTY HYDRAULIC MULCH**	**PER ACRE**

DIVISION VI – LIGHTING INSTALLATION

ITEM 108 – INSTALLATION OF UNDERGROUND CABLE FOR AIRPORTS

DELETE the entire specification and REPLACE with the following:

DESCRIPTON

108-1.1

This item shall consist of underground 600V cable and fiber optic cable furnished and installed in accordance with this specification at the locations and in accordance with the design, dimensions, and details shown in the plans. This item shall include the excavation and backfill of the trench, the installation of cable in trench, duct or conduit, splicing, cable marking, and testing of the installation, and all incidentals necessary to place the cable in operating condition as a completed unit to the satisfaction of the Engineer.

Installation of cable and cable in conduit as shown on the plans.

All installations shall be done at the locations shown on the plans and in accordance with these specifications. When crossing existing circuits or utilities, the Contractor will be required to hand dig the trenches for the proposed conduit, unless given approval by the Engineer.

The hand digging, trenching, or boring of conduit will be considered incidental to the contract unit price of the proposed cable and no additional compensation will be allowed.

EQUIPMENT AND MATERIALS

108-2.1 GENERAL

A. Section Includes.
   1. Copper wire rated 600V or less.
   2. Connectors, splices, and terminations rated 600V and less.
   3. Fiber Optic Cable.
   4. Connectors, splices, and terminations for fiber optic cable.

108-2.2 CABLE

A. Copper wire rated RHW-2/USE-2, 600V or less.

   1. Cable shall be 600 Volt rated, sized as indicated on the drawings. Cable shall comply with Underwriters Laboratories Standard U.L. 44 (for Type RHW-2) and U.L. 854 (for Type USE-2) and shall pass the IEEE 383, 70,000 BTU/hr and VW-1 Flame Tests. Cable insulation shall be abrasion, moisture, heat and sunlight resistant black cross-linked polyethylene (XLP). Cables shall be rated for use at 90°C in both wet and dry locations and be suitable for use in conduit, underground service entrance cable and direct burial applications..
   2. For power cable, conductor size shall not be smaller than No. 12 AWG. Control cable, conductor size shall not be less than No. 14 AWG. These limits on conductor sizes shall not apply to leads furnished by manufacturers of transformers and fixtures.
   3. Cable size, number of conductors and service voltage shall be specified in the plans.

B. Fiber Optic Cable

1. 12-Strand Single mode
2. Core Diameter: .....8.3 um nominal
3. Cladding Diameter:.....125 +/- 1 um
4. Core/Clad Concentricity Error: ..... < .5 um
5. Coating fiber diameter: .....245 +/- 10 um
6. Cladding Non-circularity: ..... <1%
7. Coating/Cladding Concentricity Error: ..... <12 um
8. Colored Fiber Diameter: ..... 254 um
9. Effective Group Index of Ref. @1310 nm: 1.466
10. Effective Group Index of Ref. @1550 nm: 1.467
11. Point Discontinuities: .....1 dB
12. Max. Fiber Loss @1310: .....7 dB/km
13. Max. Fiber Loss @1550: .....7 dB/km
14. NEC CMP rated
15. Nominal Operating Temperature –40°C to +85°C

108-2.3 GROUNDING

A. Ground rods shall be UL listed, single-piece, 3/4" diameter by 10' long copper-clad steel with minimum 10 mil copper cladding.
B. All buried connections of grounding and bonding components shall be via exothermic weld only. Clamp or compression grounding connections below grade will be rejected and replaced at Contractor's expense.
C. Grounding conductors shall be 600 volt, same insulation type as used for phase conductors, green in color unless otherwise noted.
D. **Grounding electrode conductors in contact to earth shall be bare, stranded, annealed copper. Grounding Electrode Conductors shall be the larger of that detailed on the project drawings, specified herein or as required by NEC .**

108-2.4 600V CONDUCTORS

A. Color code conductor insulation for #10 AWG or smaller conductors. Color code conductors #8 AWG or larger with colored tape or colored insulation.

14. Standard colors:

	120/240V 1 Phase 3W
Phase A	Black
Phase B	Red
Phase C	N/A
Neutral	White
Ground	Green

15. Control wiring insulation color shall be red.

B. Puling lubricant shall be used for all cables pulled through conduit. Pulling lubricant shall be UL listed, water based, polymer solution. Lubricants containing waxes, soaps or combustible materials are not acceptable. Contractor shall verify the compatibility of the selected cable pulling lubricant and cable jacket materials proposed.

C. Splices and joints shall be as described below, or approved equivalent.

1. Note that below grade splices in manholes, handholes and vaults **will not** be allowed on this project unless specifically shown on drawings. Conductors are to be pulled continuous end-to-end unless otherwise noted or directed by the Engineer in writing.

a. #8 and smaller conductors:

i. Twist-on connectors pre-filled with silicone-based sealant to protect against moisture and corrosion. Units shall be UL 486D listed as weatherproof, waterproof and suitable for direct burial. .

b. #6 and larger conductors:

ii. NSI/Polaris ISRW Series “Blue”, Ilsco Series USPA, DBK, SSK or PDSS or approved equal.

C. Electrical line marking tape shall be installed only if specifically noted on project drawings. Tape shall be minimum 5 mils thick constructed of aluminum foil encased in an impervious Mylar plastic coating. The minimum tensile strength determined in accordance with ASTM D882 is 15,000 PSI. The tape shall contain sufficient metal mass to provide detectability at depths up to 3 feet with a radio type metal locator. Tape shall be acid, alkali and corrosion resistant. Color shall be “RED”, corresponding to the standard color for electrical lines, and shall additionally be printed with “WARNING-ELECTRICAL LINE BELOW” or similar text. Line marking tape shall be as manufactured by Pro-Line Safety Products of West Chicago, Illinois or equivalent. Unless otherwise indicated on the drawings, burial depth of tape shall be approximately 18" below finish grade.

108-2.5 FIBER OPTIC TERMINATIONS

A. Fiber Optic Connectors

1. Connectors shall be ‘SC’ duplex type.

2. Optical fiber cable connectors shall be capable of terminating optical fiber glass cables with outside diameters ranging from 125 through 900 microns. Fabricate connectors with optical fiber, self-centering, axial alignment mechanisms.

3. Connections shall be made via anaerobic adhesive or mechanical (“Unicam”) fiber optic terminations.

4. The maximum optical attenuation per each mated field-installed connector pair shallnot exceed 0.75dB. The total optical attenuation through the cross connect from anyterminated optical fiber to any other terminated optical fiber shall not exceed 1.5dB.These measurements shall be performed at 5°C-23°C.

5. Connectors shall sustain a minimum of 500 mating cycles per ANSI/EIA/TIA-455-21without violating specifications. These measurements shall be performed at 5°C- 23°C.

6. The connector shall have an optical axial pull strength of 2.2N (0.5lbf) at a 0 degreeangle and an optical off axial pull strength of 2.2N (0.5lbf) at a 90 degree angle, witha maximum 0.5dB increase in attenuation for both tests when tested in accordance with ANSI/TIA/EIA-455-6B.

CONTRUCTION METHODS

108-3.1 600V CABLE INSTALLATION

A. Wire and cable shall be installed using accepted industry methods to prevent damage to conductors and insulation. Installation shall comply with all applicable sections of NEC regarding conduit fill.

B. No splices shall be permitted in conduit bodies. All splices shall be made in junction boxes, control panels and cabinets provided for that purpose as detailed or required by need.

C. Neatly train and lace wiring inside boxes, equipment, and panelboards.

D. Drawings are diagrammatic in showing circuitry routing between devices and equipment. Provide all phase conductors, neutrals, switched and unswitched legs, grounds, etc., as required for a complete and operational electrical system.

E. All 120V circuits shall have individual neutral conductors. 120V circuits with “shared” neutral conductor shall not be permitted.

G. All conductors shall be continuous without splices except at locations approved for the purposes of splicing.

H. All wire sizes shall be stranded except where specifically approved otherwise.

I. Intrinsically safe wiring shall be separated from non-intrinsically safe wiring in compliance with Article 504 of the NEC and ANSI/ISA Standard RP12.6. Intrinsically safe wiring insulation color shall be blue.

J. All circuits shall be labeled in compliance with Section 16195 - Electrical Identification.

K. Pulling eyes on conductors or a basket weave grip shall be used for pulling cable. Woven wire cable grips shall be used to pull all single conductor cable where pulling eyes are not available. Preferred method for pulling conductors is factory-installed eyes attached to conductors. All sharp points and edges on the hardware attaching the pulling rope to the cable shall be taped to prevent snagging or damaging the raceway.

L. When a cable grip or pulling eye is used for pulling, the area of the cable covered by the grip or seal plus 6 inches shall be cut off, and discarded when the pull is completed. When

pulling loops are used, the entire loop shall be cut off and discarded when the pull is completed.

M. A non-binding type of swivel, or swivel connection shall be inserted between the pulling rope and the cable pulling eye, grip or loop to prevent twisting under strain and allow for free rotation of the cable during pulling.

N. The pulling tension of any cable shall not exceed the maximum tension recommended by the cable manufacturer. Pulling mechanisms of both the manual and power types shall have the rated capacity clearly marked on the equipment. Cable shall be installed using either hand-tension or by use of specially-designed “cable-tuggers”. Any cable pulled through conduit using trucks, back-hoe’s, earthmoving equipment or similar apparatus will be rejected and will be replaced with new cable at the Contractor’s expense.

O. Break-away shear-pins or other acceptable method of tension limitation shall be utilized on mechanical pulling equipment to prevent over-stressing cable during installation. To avoid insulation damage from excessive sidewall pressure at bends, the pulling tension, in pounds at a bend, shall not exceed 300 times the radius of the bend in feet.

P. As soon as the cable is pulled into place, the pulling eyes, cable grips, or pulling loops shall be removed. On exterior pulls, the remaining cable ends shall be temporarily resealed with either a minimum of three (3) wraps of 2" Scotch #23 rubber splicing tape or heat-shrink caps. Exposed cable ends shall be wrapped in such a manner to prevent unintentional water entry. Cable ends or seals shall be installed prior to the end of the workday.

Q. Cable shall not be bent to a radius of less than 4 times the overall diameter, including installation apparatus.

R. Cable supports and securing devices shall be installed to provide adequate support without deformation of the cable jackets or insulation.

S Cables shall be routed within manholes and vaults such that adequate working space is provided within the structure for cable splicing and for the installation of future cables.

T. All damaged or rejected cable shall be removed from the project site and replaced at no additional expense to the project.

108-3.2 FIBER OPTIC INSTALLATION

A. All conduits, ducts, and manholes for FO cable systems shall be installed as shown on drawings.

B. No splices shall be permitted unless the length of cable being installed exceeds the maximum standard cable length available from manufacturer.

C. Splices shall be made using the method recommended by the cable manufacturer. Splices shall be housed in a splice enclosure and shall be encapsulated with an epoxy or ultraviolet light cured splice encapsulant. All FO splices shall be field tested at the time of splicing. Fusion splices shall have less than 0.2 dB loss, and mechanical splices shall not be used. There shall be no more than one (1) splice per kilometer in any of the FO cables excluding terminations. All field splices shall be located in cable boxes. Sufficient cable shall be provided in each splicing location to properly splice the cables, and to provide extra cable for additional splices. All cable ends shall be protected at all times with end caps except during actual splicing. During the splicing operations, means shall be provided to protect

the unspliced portions of the cable from the intrusion of moisture and other foreign matter. All splices shall be done in hand holes provided and installed by the Contractor as required.

D. For cable installed in ducts and conduit a cable lubricant compatible with the cable sheathing material shall be used on all cables pulled. Pulling fixtures shall be attached to the cable strength members. If indirect attachments are used, the grip diameter and length shall be matched to the cable diameter and characteristics. If indirect attachment is used on cables having only central strength members, the pulling forces shall be reduced to ensure that the fibers are not damaged from forces being transmitted to the strength member. DURING PULLING THE CABLE PULL LINE TENSION SHALL BE CONTINUOUSLY MONITORED, AND SHALL NOT EXCEED THE MAXIMUM TENSION AS GIVEN BY THE CABLE MANUFACTURER. The mechanical stress placed upon a cable during installation shall be such that the cable is not twisted or stretched. A cable feeder guide shall be used between the cable reel and the face of the duct or conduit to protect the cable and guide it into the duct or conduit as it is played off the reel. As the cable is played off the reel, it shall be carefully inspected for jacket defects. Precautions shall be taken during installation to prevent the cable from being kinked or crushed and that the minimum bend radius of the cable is not exceeded at any time. Cable shall be hand fed and guided through each manhole and additional lubricant shall be applied at all intermediate manholes. When practicable, the center pulling technique shall be used to lower pulling tension. That is, the cable shall be pulled from the center point of the cable run towards the end termination points. The method may require the cable to be pulled in successive pulls. If the cable is pulled out of a junction box or manhole the cable shall be protected from dirt and moisture by laying the cable on a ground covering. Dynamometers or load-cell instruments shall be used to ensure that the pulling line tension does not exceed the installation tension value specified by the cable manufacturer. The mechanical stress place upon a cable during installation shall be such that the cable is not twisted or stretched.

108-3.3 600V CABLE TESTING

A. Inspect wiring for physical damage and proper connection.

B. All wire and cable shall be tested for continuity and short circuits prior to energizing circuits. Verify proper phasing, adjust as required.

C. 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. When fault condition is present, the trouble shall be rectified, then re-tested. Where cable is found defective or damaged, it shall be removed and replaced in entirety; do not field repair. Cost for correction shall be considered incidental to the project.

D. All wiring devices and electrical apparatus furnished under this contract, when ground or shorted on any integral “live” part, shall be removed and the trouble rectified by replacing all defective parts and materials. Cost of correction is considered incidental to the project.

E. All feeder cables and other power distribution apparatus shall have a Megger resistance test conducted to determine that insulation resistance is not less than that recommended by the manufacturer, or as noted below.

Unless otherwise recommended by the manufacturer, insulation resistance testing shall meet or exceed the following on 600 Volt equipment utilizing 500 Volt resistance test instrument:

Conductors..... 50 Meg-Ohms
Motors…….5 Meg-Ohms

Switchboards, MCC's and Panelboards .... 25 Meg-Ohms
Power Transformers ..... 5 Meg-Ohms

F. Contractor shall furnish all tests and shall provide all test equipment, meters, instruments, cable connections or apparatus necessary for performing tests as specified herein. All costs for testing shall be considered incidental to this item and will not be paid for separately.

G. Examine connections to equipment for proper phase relationships. Rotate phase conductors as necessary in order to correct.

H. All motors shall be tested under Article 16220. All motors shall be tested for correct direction of rotation. Run tests on all motors shall be tested for correct direction of rotation. Run tests on all motors and verify that proper overload devices have been installed. Coordinate this task with motor supplier.

I. Testing of Ground System

1. Each and all grounded cases and metal parts associated with electrical equipment shall be tested for continuity of connection with the ground bus system by the Contractor in the presence of the Engineer or his representative.
2. All grounding electrode conductors brought in from the ground field shall be tested for satisfactory continuity and by resistance measurement between the electrical equipment ground bus and the ground field. The grounding path shall not exceed 0.010 ohms.
3. Each Ground Field shall be tested for resistance to earth a "three-terminal" or "fall-of-potential" test as described in IEEE Standard #81. As an alternate, a specially designed clamp-on instrument such as AEMC Model 3710 (now superseded by Model 6416) or 3730 (now superseded by Model 6417) may be used if found acceptable to the engineer. Based upon measured field data, the Contractor shall calculate the ground field resistance and furnish record copies to the Engineer and Owner for record. In no case shall the ground field resistance exceed 25 ohms. If the resistance is found to be higher than 25 ohms, one additional rod shall be driven with a minimum separation equal to the length of the ground rod used and connected in parallel with the rod under test.
4. Exterior ground field resistance testing shall not be measured during unusually wet weather and should be performed during normal weather and soil conditions. Any tests incorrectly performed or not performed to the satisfaction of the engineer will be repeated. Costs for all such re-testing shall be considered incidental to the project.
5. All specified maximums and minimums of this specifications must be met. Complete test records of all tests shall be made and shall show resistance values obtained and calculations of same, showing method of test and calculation.

FIBER OPTIC TESTING

A. An optical time domain reflectometer (TDR) test at 820 nanometers, of the FO cable on the reel prior to installation. The optical time domain reflectometer shall be calibrated to show anomalies of 0.2 dB as a minimum. Test data shall be recorded and furnished to the Engineer. Cable tested with losses exceeding manufacturer's acceptable levels for new cable shall be rejected.

B. A second time domain reflectometer test at 820 nanometers shall be performed on the FO cable after it is installed. The optical time domain reflectometer shall be calibrated to show anomalies of 0.2 dB as a minimum. If the optical time domain reflectometer test results are unsatisfactory, the FO cable segment is unacceptable.

C. The unsatisfactory segments of cable shall be replaced with a new segment of cable at no cost to the Owner. The new segment of cable shall then be tested to demonstrate acceptability

METHOD OF MEASUREMENT

108-4.1 MEASUREMENT

The quantity of 600V or fiber optic cable installed in conduit for new electric gate and area lighting to be paid for per linear foot installed and accepted by the Engineer.

The removal of existing cables will not be measured for payment, it shall be included in the pay item for removal of the associated item.

The quantity of 600V cable and controls/communication cables for access control system, intercom system and gate controls will not be measured for payment under Specification L-108. This work is associated with the Gate Access Control System and shall be included in the lump sum price for Item AR800188.

BASIS OF PAYMENT

108-5.1 PAYMENT

Payment for 600V and fiber optic cable in conduit for the new electric gate and area lighting will be made at the contract unit price per linear foot. This price shall be full compensation for furnishing all materials and for all preparation and installation of these materials, trenching, backfilling and compacting trenches, all connections, line marking tape and installation, fixture and cable identification tags and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

ITEM AR108404	**1/C #4 600V UG CABLE**	**PER LINEAR FOOT**
ITEM AR108408	**1/C #8 600V UG CABLE**	**PER LINEAR FOOT**
ITEM AR108410	**1/C #10 600V UG CABLE**	**PER LINEAR FOOT**
ITEM AR108412	**1/C #12 600V UG CABLE**	**PER LINEAR FOOT**
ITEM AR800178	**FIBER OPTIC CABLE**	**PER LINEAR FOOT**

ITEM 110 – INSTALLATION OF AIRPORT UNDERGROUND ELECTRICAL DUCT

DELETE the entire specification and REPLACE with the following:

110-1.1 DESCRIPTION

This item shall consist of underground electrical ducts installed in accordance with this specification at the locations and in accordance with the dimensions, designs, and details shown in the plans. This item shall include: the installation of all underground electrical ducts or underground conduits, trenching, backfilling, removal, and restoration of any paved areas; manholes, concrete encasement, mandreling installation of steel drag wires and duct markers, capping, and the testing of the installation as a completed duct system ready for installation of cables, to the satisfaction of the Engineer.

EQUIPMENT AND MATERIALS

110-2.1 GENERAL

All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when so requested by the Engineer.

110-2.2 CONDUIT

Not Used.

110-2.3 PLASTIC 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 shall be one of the following, as specified in the contract:

A. Type I – suitable for underground use either directly in the earth or encased in concrete.

B. Type II – suitable for either above ground or underground use.

Fittings and accessories for the electrical plastic conduit shall comply with all applicable requirements of NEMA Publication No. TC3.

The solvent cement used to join the conduit and fittings shall be according to ASTM D 2564.

110-2.4 PULL CORDS

Each empty conduit shown or described on the drawings shall be furnished with a pull cord to facilitate future conductor installation. Cord shall consist of non-deteriorating, non-metallic, non-cotton construction such as polyester or nylon material. Minimum tensile strength of all pull strings shall be 200#. Leave minimum of 12 inches slack at each termination or end. Any references on project drawings to “pull wire” shall be interpreted as a pull cord as described herein.

110-2.5 MOISTURE SEAL

A. When electrical conduits are installed in sleeves, core-drilled holes or box outs, seal between conduit and penetration of perimeter walls, ceilings or floors to prevent entry of water.

B. Seal conduit penetrations of roof with flashings compatible with roof design and approved by Roofing System Manufacturer and Engineer.

C. Seal annular space between conductors and conduit wall of all conduit terminations where conduit enters a building from below grade in order to block moisture migration into electrical equipment. In addition seal conduits entering electrical equipment located either interior or exterior that once installed condensation is created in the electrical equipment due the electrical system being connected to areas with a different temperature. Conduit moisture barrier material shall not harden and be compatible with both wire insulation and

conduit materials. Installed product shall be easily removed for maintenance or modifications, regardless of the length of time material has been installed. Conduit moisture seal material shall be:

1. "Hydroblock" by WaterGuard Technology Products
   16023 East Freeway
   Channelview, Texas 77530-4365
   Phone: (281) 862-0300
   Fax:: (281) 862-0314

2. American Polywater Corporation
   Polywater Duct Sealant FST-250 Series
   P.O. Box 53
   Stillwater, MN 55082
   Phone: (651) 430-2270
   Fax: (651) 430-3634

3. O-Z/Gedney
   Type DUX Water Sealing Compound.

CONSTRUCTION METHODS

110-3.1 GENERAL

The Contractor shall install underground conduits at the approximate locations indicated in the construction plans. The Resident Engineer shall indicate specific locations as the work progresses, if required to differ from the plans. Conduit shall be of the size, material, and type indicated in the plans or specifications. Where no size is indicated in the plans or specifications, the conduits shall be not less than 2 inches inside diameter or comply with the National Electrical Code based on cable to be installed, whichever is larger. All conduit lines shall be laid so as to grade toward handholes, manholes and duct ends for drainage. Grades shall be at least 3 inches per 100 feet. On runs where it is not practicable to maintain the grade all one way, the duct lines shall be graded from the center in both directions toward manholes, handholes, or conduit ends. Pockets or traps where moisture may accumulate shall be avoided.

The Contractor shall mandrel each duct. An iron-shod mandrel, not more than 1/4-inch smaller than the bore of the duct shall be pushed through each duct by means of jointed conduit rods. The mandrel shall have a leather or rubber gasket slightly larger than the duct hole.

All ducts installed shall be provided with a No. 10 gauge galvanized iron or steel drag wire for pulling the permanent wiring. Sufficient length shall be left in manholes or handholes to bend the drag wire back to prevent it from slipping back into the duct. Where spare ducts are installed, as indicated on the plans, the open ends shall be plugged with removable tapered plugs, designed by the duct manufacturers, or with hardwood plugs conforming accurately to the shape of the duct and having the larger end of the plug at least 1/4-inch greater in diameter than the duct.

All conduits shall be securely fastened in place during construction and progress of the work and shall be plugged to prevent seepage of grout, water, or dirt. Any duct section having a defective joint shall not be installed.

Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored.

Trenches for conduits may be excavated manually or with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed. Blades of road patrols or graders shall not be used to excavate the trench. The Contractor shall ascertain the type of soil or rock to be excavated before bidding. All excavation shall be considered unclassified.

110-3.2 CONDUIT WITHOUT CONCRETE ENCASEMENT

Trenches for single conduit lines shall be not less than 6 inches nor more than 12 inches wide, and the trench for 2 or more ducts installed at the same level shall be proportionately wider. Trench bottoms for conduits without concrete encasement shall be made to conform accurately to grade as to provide uniform support for the conduit along its entire length.

A layer of fine earth material, at least 4 inches thick (loose measurement) shall be placed in the bottom of the trench as bedding for the conduit. The bedding shall consist of soft dirt, sand or other fine fill, and it shall contain no particles that would be retained on a 1/4-inch sieve. The bedding material shall be tamped until firm.

Unless otherwise shown in the plans, conduits for direct burial shall be installed so that the tops of all conduits are at least 18 inches below the finished grade.

When two or more conduits are installed in the same trench without concrete encasement, they shall be spaced not less than 4 inches apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches apart in a vertical direction.

Trenches shall be opened the complete length before conduit is installed so that if any obstructions are encountered, proper provisions can be made to avoid them.

110-3.4 BACKFILLING

For conduits without concrete encasement, 8 inches of sand, soft earth, or other fine fill (loose measurement) shall be placed around the conduits and carefully tamped around and over them with hand tampers. The remaining trench may be filled with regular run of excavated material and thoroughly tamped as specified above.

All backfill and associated materials shall be considered incidental.

110-3.7 RESTORATION

Where sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by the trenching, storing of dirt, cable laying, pad construction and other work shall be restored to its original condition. The restoration shall include any necessary topsoiling, fertilizing, liming, seeding, sprigging, or mulching. All such work shall be performed in accordance with the Standard Turfing Specifications. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance.

110-3.8 DIRECTIONALLY BORED CONDUIT

A. The directional boring equipment shall consist of a directional boring rig of sufficient capacity to perform the bore and pullback the pipe, a boring fluid mixing & delivery system of sufficient capacity to successfully complete the crossing, a guidance system to accurately guide boring operations and trained and competent personnel to operate the system. All equipment shall be in good, safe operating condition with sufficient supplies, materials and spare parts on hand to maintain the system in good working order for the duration of this project.
B. The directional boring machine shall consist of a hydraulically powered system to rotate, push and pull hollow drill pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill (bore) head. The machine shall be anchored to the ground to withstand the pulling, pushing and rotating pressure required to complete the crossing. The hydraulic power system shall be self-contained with sufficient pressure and volume to power boring operations. Hydraulic system shall be free of leaks. Rig shall have a system to monitor and record maximum pull-back pressure during pull-back operations. The rig shall be grounded during boring and pull-back operations. Sufficient spares shall be kept on hand for any break-downs which can be reasonably anticipated.

C. The bore head shall be steerable by changing its rotation and shall provide the necessary cutting surfaces and boring fluid jets.
D. The Guidance System shall be of a proven type and shall be setup and operated by personnel trained and experienced with this system. The Operator shall be aware of any magnetic anomalies and shall consider such influences in the operation of the guidance system if using a magnetic system.
E. Drilling fluid shall be composed of clean water and an appropriate additive. Water shall be from a clean source with a pH of 8.5 - 10.
F. The Guidance System shall be a conventional electromagnetic sound walkover system, Magnetic Guidance System (MGS) probe or proven gyroscopic probe and interface shall be used to provide a continuous and accurate determination of the location of the drill head during the drilling operation. The guidance shall be capable of tracking at the maximum depth required and in any soil condition, including hard rock. It shall enable the driller to guide the drill head by providing immediate information to the tool face, azimuth (horizontal direction), and inclination (vertical direction).

METHOD OF MEASUREMENT

110-4.1 MEASUREMENT

The quantity of direct earth buried PVC conduit and directionally bored PVC conduit for the new electric gate and area lighting to be paid for per the number of linear feet installed, measured in place, completed, and accepted. The quantity shall also include pull string, trenching, boring and backfill.

BASIS OF PAYMENT

110-5.1 PAYMENT

Payment will be made at the contract unit price per linear foot for each type and size of PVC conduit completed and accepted. These prices shall be full compensation for furnishing all materials and for all preparation, assembly, aggregate backfill, backfill, compaction, sawcutting, replacement of pavement and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete these items. Topsoiling and seeding of the backfill and installation of pull string in spare conduits shall not be paid for separately but shall be considered incidental to the associated conduit.

Payment will be made under:

ITEM AR110011 1” DIRECTIONAL BORE	**PER LINEAR FOOT**
ITEM AR110117 1-1/2” PVC DUCT, DIRECT BURY	**PER LINEAR FOOT**
ITEM AR110201 1” PVC DUCT, DIRECT BURY	**PER LINEAR FOOT**
ITEM AR800020 1-1/2” DIRECTIONAL BORE	**PER LINEAR FOOT**

ITEM 910 – ROADWAY LIGHTING

DESCRIPTION

910106-1.1

This item shall consist of removal of existing lighting units and furnishing and installing new area light poles, brackets, LED luminaires, foundations, internal wiring, fuses, vibration dampners, photocells and all accessories required, at the locations shown on the plans or as directed by the Engineer.

EQUIPMENT AND MATERIALS

910106-2.1 LIGHT FIXTURES

Luminaries shall be LED and shall operate with 120-277V, single phase power supply as indicated on the plans. The housing shall be constructed of heavy-gauge aluminum with no seams, weld beads or any other visible disturbances on the surface of the housing. All the internal and external hardware shall be stainless steel.

The lens shall be thermal and shock resistant glass and shall be sealed to the frame and secured with four retainer clips.

The optical distribution shall be Type III Medium (T3M). Fixture light output shall be between 18,000-20,000 lumens. Color temperature shall be 4000K. The BUG rating shall be B5-U0-G4.

The LED driver shall be rated to operate between -20°F to 120°F. LED driver shall operate at 150W or less.

The fixture shall be treated, primed, baked, covered with a high solids polyester finish and baked again. The final finish shall be as selected by the Airport or as directed by the Engineer.

910106-2.2 LIGHT POLES

The proposed poles shall be 30’ tall round tapered aluminum poles fabricated from one piece aluminum with uniform wall thickness of .250". The material shall conform to ASTM A-500 grade B with minimum yield strength of 46,000 PSI. The weld shall be full length longitudinal weld. The anchor base shall be structural quality hot rolled carbon steel plate shall be welded to the shaft at top and bottom. The anchor bolts shall be provided by the pole manufacturer and shall be fabricated from commercial quality hot rolled carbon steel bar with minimum yield strength of 50,000 PSI. The top 8" of the anchor bolts shall be galvanized as detailed on the plans. The proposed poles shall be furnished with hand holes located above the base. Each pole shall be furnished with mounting hardware and vibration dampner and painted cast aluminum base covers as detailed on the plans and required by the manufacturer. The proposed poles shall be furnished with an inside and outside coating of red oxide I zinc chromate primer. The color shall be selected by the Owner.

All poles supplied shall be certified to be vibration free at all wind loads.

910106-2.3 LIGHT POLE FOUNDATIONS

Foundations for Light Pole shall be 24" diameter and extend 10' below finished grade. Reinforcing steel shall be installed as detailed on the plans.

Anchor bolts shall be supplied by the pole manufacturer and shall be installed according to his recommendations. Anchor bolts shall be "L" shaped and shall be minimum 1" diameter, 36" long with

7" "L" unless otherwise recommended by the pole manufacturer.

Foundations shall conform to the applicable sections of Item 610 of the Standard Specifications.

910106-2.4 INTERNAL WIRINGS

All fusing shall be accessible through the pole handhole for the light poles. Contractor shall provide the waterproof splices, breakaway fuse holders, fuses and other miscellaneous items necessary for a complete installation. The breakaway fuse holders and fuses shall be manufactured by Bussman or equal. All splicing of wiring from main power wiring to #10 XLP-USE wiring within pole shall be done inside the handhole at each pole. All fuses and lightning arrestors shall be within the light pole handhole.

910106-2.5 GROUND RODS

All light poles shall be furnished with a ground rod as detailed in the plans. The proposed ground rods shall be 3/4" diameter, 10' long copper clad. The top of the rod shall be buried min. 12" below finished grade. All the connections to the ground rod shall be buried min. 12" below finished grade. All the connections to the ground rods shall be one shot exothermic welding as manufactured by Cadweld or equal.

CONSTRUCTION METHODS

910106-3.1 POLES AND LUMINARIES

Poles and luminaries shall be assembled and wired on the ground, then lifted and bolted in place plumb. The pole shall be considered plumb when the center of the top is directly over the center of the base. Plumb is to be measured with a transit by the Resident Engineer.

Wiring run from luminaire to pole base shall have a strain relief clamp provided at the entry to the luminaire to prevent the wires from pulling loose from their terminals at the luminaire.
Internal wiring of poles and luminaires including fuses and waterproof splices shall be incidental to this item. Poles and luminaires shall be set on their foundations such that the luminaires aim in the direction indicated on the plans.

All proposed poles shall be grounded to ground rods. Contractor shall use one shot exothermic weld by Cadweld or equal.

910106-3.2 LIGHT POLE FOUNDATIONS

The Contractor shall be responsible for the necessary concreting and formwork to install the foundations as detailed on the plans.

The Contractor is referred to Section 610 of the Standard Specifications, which covers the proper installation of the concrete.

Foundations shall extend for 10' below finished grade or pavement.

Anchor bolts shall be set according to the bolt circle requirements of the poles supplied. They shall be so arranged that when the pole and luminaire is erected. the luminaire will be properly aimed.

910106-3.3 POWER AND CONTROL

The location of power and control materials and work to be performed shall be as indicated in the plans.

Electrical cable is covered in Section 108, The Contractor shall furnish and install identifying tags on all wires at the point where they connect to the breaker indicating which lights the wires serve. The Contractor shall stencil an identifying label on the control panel enclosure.

910106-3.4 RESTORATION

All areas disturbed by the light fixture installation storing of dirt and other work shall be restored to its original condition. The restoration shall include any necessary topsoiling, fertilizing, seeding or sodding and shall be performed in accordance with the associated specifications. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance.

910106-3.4 LIGHT POLE REMOVALS

Existing light poles and associated components shall be removed and salvaged. All salvaged items shall be turned over to the Airport. If Airport elects not to salvage all or some of the components, these components shall be disposed-of off-site by the Contractor at no additional cost to the Contract.

Existing light pole foundations to be removed shall be cut minimum 1’-0” below grade. If existing light pole foundation conflicts with new items, existing light pole foundations shall be completely removed by the Contractor at no additional cost to the Contract.

METHOD OF MEASUREMENT

910106-4.1

The quantity of light poles to be paid for under this item shall be the number of units furnished and installed ready for operation. Each unit shall consist of the light pole, luminaire with photocell, brackets, fuses, circuit breakers, connections to distribution panel, internal wiring, ground rods, light pole foundation, anchor bolts, bolt cover, and any miscellaneous items and fittings required to make the unit operational.

910106-4.1

The quantity of light poles to be removed shall be paid for under this item and shall be the number of units completely removed and transported to the Airport designated location. Each light pole removal shall include removal of the complete unit, including but not limited to luminaires, cabling, foundation and all other associated items.

BASIS OF PAYMENT

910106-5.1

Payment will be made at the contract unit price for each light pole removed and each light pole complete with LED Luminaire, photocell, electrical wiring, ground rods, circuit breaker in distribution panel, and foundation and any other accessories completed by the Contractor and accepted by the Engineer. These prices shall consist of full compensation for furnishing and material, backfilling and compacting trenches, and for all labor, equipment, tools, and incidentals necessary to complete this item.

If, upon delivery and incorporation of any materials ,the Contractor has failed to provide the necessary submittals as required by Sections 30-18, 40-01, 40-03 and 40-11 of the Standard and Special Provisions, the pay item shall not included on the Construction Progress Payment report until such submittals have been furnished.

Payment will be made under

ITEM AR800017	**LIGHT POLE WITH LED LUMANAIRE**	**PER EACH**
ITEM AR910900	**REMOVE ROADWAY LIGHT POLE**	**PER EACH**

DIVISION VIII – MISCELLANEOUS

ITEM 910000 – ROADWAY SIGNAGE

DESCRIPTION

910-1.1

This work shall consist of furnishing sign panels complete with reflectorized sign faces, legend and supplemental panels and installing them on newly erected sign supports as detailed in the plans at the locations shown or as directed by the Resident Engineer.

Work shall be in accordance with Section 720 and Section 729 of the Standard Specifications for Road and Bridge Construction and with IDOT Standards 720001-01, 720011-01 and 729001-01

MATERIALS

910-2.1

Materials shall meet the requirements of Sections 720 and 729 of the Standard Specifications for Road and Bridge Construction. Sign panels shall be as detailed in the plans.

CONSTRUCTION METHODS

910-3.1

This work shall also consist of furnishing and installing metal posts of the size and type specified, utilizing the direct burial methods as detailed in the plans.

910-3.2

Materials shall meet the requirements of Article 729 of the Standard Specifications for Road and Bridge Construction. Unless otherwise specified, only frangible galvanized posts shall be used. The post shall be Type B as designated on Illinois Department of Transportation Highway Standard 720011-01 and 729001-01.

910-3.3

The metal posts may be driven by hand or mechanical means to a minimum depth of 4 feet (Type B) measured from the ground line or as shown in the plans. The post shall be protected by suitable driving cap and if required by the Engineer, the material around the post will be compacted after driving.

Care shall be taken to avoid scratching, chipping or other damage to polyester or enamel-coated posts during handling and installation. Chips and scratches may be recoated in the field by a method meeting the coating manufacturer's recommendations except that chips and scratches totaling more than 5% of the surface area of any one post and/or more than 5% of the surface area in any one-foot segment of any one post shall be cause for rejection of the post.

If the post specified is too long, the Contractor may choose to cut the post to the required length. Any post so cut shall be installed with the cut end at the bottom.

910-3.4

Existing signs and sign posts shall be completely removed and disposed of by the Contractor off Airport property. The excavations shall be backfilled and compacted per the requirement of Section 152.

Any salvageable materials shall be saved and remain the property of the Airport. The material shall be delivered to the Airport maintenance facility.

910-3.4

Existing signs to be relocated shall be carefully removed and reinstalled at the location(s) shown in the plans or as determined by the Engineer. Any excavations required for sign removal and relocation shall be backfilled and compacted per the requirement of Section 152.

METHOD OF MEASUREMENT

910-4.1

The quantity of traffic signs installed to be paid shall be the number, per each, sign satisfactorily installed in accordance with applicable specifications and accepted by the Engineer. Sign posts and supports shall be incidental to this item. No additional compensation shall be made for additional length of posts required.

Signs shall be measured and paid for as Roadway Sign on a per each basis, regardless of sign size.

The removal of roadway signs and posts shall not be measured for payment but shall be incidental to Item AR152410.

BASIS OF PAYMENT

910-5.1

Payment shall be made at the contract unit price per each roadway sign. This price shall be full compensation for all materials, erection of all signs at proposed locations and sign removals and relocations and for all materials, labor and equipment necessary to complete the work as described herein.

Payment will be made under:

ITEM AR910200 ROADWAY SIGN PER EACH

ITEM 800188 – GATE ACCESS CONTROL SYSTEM

DESCRIPTION

800188-1 SUMMARY

Work under this section is to provide an Access Control System for a vehicle gate as described herein and/or as detailed on the project drawings. Contractor shall coordinate with Airport's security system vendor for location of all equipment and termination of all conduits.

Work under this section includes furnishing and installation of power pedestal, power panel, disconnect, ACS enclosure, conduits with pull strings, gooseneck stands, and other equipment required by Airport's security system vendor.

Gate ACS work shall also include the control wiring for new Automatic Slide Gate as detailed on the plans and specified herein, including wiring and connections to the ACS and gate operator. This work shall include miscellaneous material, equipment, and labor necessary for the work.

The contractor work shall include to furnish and install power cables to the ACS and gate operator, all conduit, one (1) card reader, mounting enclosure with gooseneck and labor necessary to provide a complete system as detailed on the plans.

The contractor work shall also include to furnish and install single-mode fiber optic cable from the existing patch panel located inside the hanger to the ACS panel as shown on the plans. Contractor shall make all fiber optic terminations inside the network room and inside the ACS panel. The fiber optic cable shall be paid under pay item for fiber optic cable.

The contractor work shall also include to furnish and install NEMA 1 enclosure inside the existing hangar with fiber optic patch panel and network switch.

800188-2 SYSTEM DESCRIPTION

A. Equipment furnished and installed by Airport's security system vendor:

1. One (1) Fiber/POE Hardened switch
3.` Four (4) Lenel x2210 Door Controllers
4. Three (3) Card Readers
5. Three (3) Video Intercoms
6. Local Access Control cabling from the Hoffman Enclosure to the four (3) readers
7. Two (2) Avigion 360-degree Cameras Mounted on Poles
8. Two (2) Avigion 360-degree Camera Licenses
9. One (1) Local Avigilon Appliance to record video
10. Mounting Hardware for all equipment supplied by Airport's security system vendor
11. Communication cabling for gate operator, card readers, intercoms and cameras for a complete and operational ACS.

B. Equipment furnished and installed by the Contractor:

1. Fiber Optic cable from hangar to the gate
2. Power pedestal with ACS enclosure, power panel, disconnect, TVSS
3. All above grade and underground conduit for ACS
4. NEMA 1 enclosure with patch panel and network switch inside existing hangar
5. All power conductors and conduits
6. One (1) Card Reader, wired for gate control
7. Card Reader/Intercom Enclosure

8. Card Reader/Intercom Gooseneck Stand as detailed on the plans
9. Bollards as detailed on the plans
10. All Fiber Optic Terminations

800188-3 TYPICAL VEHICLE GATE INTERFACE

A. The vehicle gate shall be card reader/intercom controlled for entering vehicles.

B. The vehicle gate shall be detector loop controlled for exiting vehicles.

C. Card reader/intercom/detector loop Control of Vehicle Gate

1. When the vehicle gate is in the card reader control mode of operation the vehicle driver shall be required to hold an access card up to a card reader mounted on a pedestal outside the gate to enter. Upon a valid card read the security system shall signal the vehicle gate to open.

2. Video Intercom shall be required on a pedestal outside the gate to contact personnel inside the airport if guest does not have an access card. Upon validating guest, airport personnel shall be able to signal the security system to open the vehicle gate.

D. Entry and Exit Detector Loop Control of Vehicle Gate

1. Detector loop exit (Free Exit)

a. A detector loop shall be provided by the gate contractor in the drive lane for free exit.

b. The gate contractor shall provide a pair of terminals connected to the detector loop such that when a vehicle is detected a maintained contact closure shall be placed across those terminals. When the vehicle is no longer detected the contact shall return to the open condition.

E. Remote Control of Vehicle Gate

1. The vehicle gate shall be remote controlled by the security system. Momentary gate open, maintained gate open and maintained gate close remote control shall be provided.

F. System Interface

1. To provide for vehicle gate / security system interface the gate contractor shall provide a terminal interface cabinet inside the ACS site enclosure. The terminal cabinet shall contain all terminals required to interface control of the vehicle gate to the security system.

800188-4 SUBMITTALS

A. Shop Drawings:

1. Submit in accordance with Section 50-18 of the Illinois Standard Specifications for Construction of Airports, adopted April 1, 2012.

B. Operation and Maintenance (O&M) Data:

1. Submit in accordance with Section 50-18 of the Illinois Standard Specifications for Construction of Airports, adopted April 1, 2012.

MATERIALS

800188-2.1 CONDUIT AND CABLE

A. Conduit shall be in accordance with Item 110 and shall by of the type shown on the plans.

B. 600V power cables and fiber optic cable shall be in accordance with Item 108 and shall be of the type shown on the plans.

800188-2.2 CARD READERS/INTERCOM

A. One (1) card reader and intercom to be furnished and installed by the contractor for airport personnel access.

B. Contractor shall furnish 100 access cards to the airport.

800188-2.3 CARD READER PEDESTAL ASSEMBLY

A. Contractor to furnish and install gooseneck assembly for 2ft x 2ft x 8in NEMA 4X enclosure for card readers and intercoms as detail on the plans.

B. Contractor to furnish and install 2ft x 2ft x 8in NEMA 4X enclosure to house the four (4) card readers and three (3) intercoms for gate access. Enclosure shall be mounted to goose neck assembly as detailed on the plans.

C. Paint

1. Exterior Primer. Primer used for covering exposed metal on the Intercom Pedestal Assembly shall be Polane® Primer-Sealer, gray (E65A4) in color, or an approved equal.

2. Exterior Paint. Paint used for coating the existing Intercom Pedestal Assembly shall be POLANE® T Polyurethane Enamel with a texture coat, or an approved equal. Color shall be Bright Yellow L.F. (gloss) to match the existing pedestal assemblies.

D. Contractor to furnish and installed bollards as detailed on the plans, to protect card reader assembly from vehicles.

800188-2.4 ACS SITE ENCLOSURE

A. General: The ACS Site Enclosure shall be as required by the Airport's security system vendor. The following is required as a minimum:

1) Enclosure: Enclosure shall be Stainless Steel NEMA 4X, minimum 24" x 24" x 12" or as required to house equipment, Hinged Cover with stainless steel hinge pin, pad lockable, with quarter-turn slotted latch kits, Hoffman, or equivalent. Provide interior mounting panel, with white finish. Provide door-mounted interior light. Materials of construction shall be 16 or 14 gauge (depending on size) Type 304 stainless steel.

2) Strut-type supports shall be 1-5/8" channel hot-dipped galvanized steel, Unistrut P1000-HG, or equivalent. Mounting hardware shall be stainless steel.

3) Provide Two Duplex GFCI Receptacles. Receptacles shall be rendered permanently inoperative at "end of useful life" (EOL) as defined in UL 943. All receptacles shall be rated 20 Amp with NEMA 5-20R receptacle configuration, and shall be Pass and Seymour 2095, or equivalent.

4) Loop Detectors shall be Peek 625X, or equivalent.

5) 12V Relays shall be IDEC RR2P-U-DC12V, or equivalent.

6) Surge Suppressors shall be:

   (a) Card Reader: Ditek DTK-4LVPLCR, or equivalent.

7) Wire Management inside enclosure shall be Panduit, or equivalent.

8) Conduit shall be as specified in Item 108.

9) Directional bore shall be as specified in Item 110.

CONSTRUCTION METHODS

800188-3.1

A. Install equipment in accordance with manufacturer's written instructions and approved submittals.

B. All Testing and Programming to be done by the Airport's security system vendor.

METHOD OF MEASUREMENT

800188-4.1

A. Work associated with the installation of the Gate Access Control System including all materials, equipment, labor, and incidentals shall be measured per lump sum. The Gate Access Control System pay item shall include but not limited to new card reader, access cards, gooseneck stand, access control enclosures, power pedestal, disconnect, power panel, power cables, programming, and testing.

BASIS OF PAYMENT

800188-5.1

Payment for the Gate Access Control System will be made at the contract unit price per lump sum. This work includes the, ACS controller, power supplies, ingress and egress control, bollards, card readers, enclosures, pedestals, programming and testing. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to provide a complete and functional system.

Payment will be made under:

ITEM AR800188 GATE ACCESS CONTROL SYSTEM PER LUMP SUM

APPENDIX A

IDOT DIVISION OF AERONAUTICS POLICY MEMORANDA

State of Illinois
Department of Transportation
Division of Aeronautics

POLICY MEMORANDUM

February 20, 2014	Springfield	Number: 87-2

TO: CONSULTING ENGINEERS

SUBJECT: DENSITY ACCEPTANCE OF BITUMINOUS PAVEMENTS

I. Introduction

This Policy Memorandum deals with the implementation of the bituminous density quality assurance specifications as outlined in the Standard Specifications for Construction of Airports, Sections 401-4.15 and 403-4.15.

II. Sampling

After completion of compaction and when the pavement has reached ambient temperature, the paved area shall be divided into Sublots of 500 tons per type of mix. One core sample (2 cores per sample) shall be taken from each Sublot. The longitudinal and transverse location for each sample shall be determined by use of a random number "Deck" provided by the Division. No core shall be taken closer than two (2) feet from the edge of the mat. A core extraction device shall be used to obtain all cores from the mat. All cores are to be taken by the contractor under the supervision and remain in the possession of the Engineer. It is imperative that the Engineer and the contractor realize that the cores are "money" and that improper coring, extraction, shipping and/or testing can be costly.

One mix sample per 1000 tons of mix laid shall be taken for Extraction, Maximum Specific Gravity (G_{mm}) and Air Void tests. The mix samples shall be sampled by the contractor and split in half.

The Resident Engineer shall randomly designate and send the split samples to an independent laboratory for testing. The laboratory will be verified to be ASTM- certified for all the required testing and be contracted through the Consultant. The frequency of testing split samples shall be 1 per 5000 tons. Higher frequencies may be necessary if the contractor’s tests, and/or mix quality control are inconsistent.

III. Testing

All cores shall be tested for Bulk Specific Gravity (G_{mb}) in accordance with ASTM D2726 using Procedure 10.1, "For Specimens That Contain Moisture." The Theoretical Maximum Gravity (G_{mm}) shall be determined according to ASTM D2041. From these tests the in-place air voids of the compacted pavement are calculated according to ASTM

D3203 for "dense bituminous paving mixtures." Selection of the proper G_{mm} shall be based on a running average of four (4) tests per Lot.

E.g. Lot 1 - Use the average of the two (2) tests for Lot 1.
Lot 2 - Use the average of the four (4) tests from Lots 1 and 2.
Lot 3 - Use the average of the four (4) tests from Lots 2 and 3.

NOTE: When more than four (4) Sublots are used, still use a running average of four (4) tests per Lot.

IV. Acceptance Calculations

The first step in calculating the quantities for pay is to calculate the Mean ($\overline{X}$) and the Standard Deviation (S) of the Sublot tests. From this data the Lot samples should first be tested for outliers. After consideration for outliers, the Percent Within Tolerance (PWT) and the Percent Within Limits (PWL) are calculated to determine the final pay quantities for the Lot.

EXAMPLE

1. Test Data

Lot Quantity = 2000 tons
Sublot Test 1 = 4.35 % Air Voids
Sublot Test 2 = 3.96 % Air Voids
Sublot Test 3 = 6.75 % Air Voids
Sublot Test 4 = 6.25 % Air Voids

2. Calculating the Mean and Standard Deviation

Sublot	X	$(X - \overline{X})$	$(X - \overline{X})^2$
1	4.35	-0.978	0.956
2	3.96	-1.368	1.871
3	6.75	1.422	2.022
4	6.25	0.922	0.850
Sum =	21.31		5.699

N = 4

Mean $(\overline{X})$ = 21.34 / 4 = 5.328

Variance $(S)^2 = \text{Sum}\ \frac{(X - \overline{X})^2}{3} = \frac{5.699}{3} = 1.900$

Standard Deviation $S = \sqrt{1.900} = 1.378$

3. Test for Outliers

Check for Critical "T" Values

$$T = \left|\frac{(X_1 - \overline{X})}{S}\right|^* = \left|\frac{3.96 - 5.328}{1.378}\right| = 0.99$$

* Difference between the suspect test value (X_1) and the Mean ($\overline{X}$).

If the T value exceeds the critical "T" Value in the table below and no assignable cause can be determined for the outlier, discard the suspected test measurement and obtain another random sample from the Sublot in question. If the new test exceeds the Mean ($\bar{X}$) in the same direction from the Mean as the suspected test, recalculate the T value including all tests (original test, suspected test, and new test) for an outlier and for computing final payment.

TABLE OF CRITICAL "T" VALUES

Number of observations (N)	Critical "T" Value 5% Significance Level
3	1.15
4	1.46
5	1.67
6	1.82
7	1.94
8	2.03
9	2.11
10	2.18
11	2.23
12	2.29

Based on the above table, the "T" value of 0.99 does not exceed the Critical "T" Value of 1.46 for N = 4. Therefore, the value (3.96) is not an outlier and shall be used in calculating the Lot payment.

4. Calculation of Lot Payment

To calculate the Lot Payment use the Acceptance Criteria as outlined under Item 401-4.15(c) or Item 403-4.15(c).

$$Q_L = \frac{(\bar{X} - 1)}{S} = \frac{5.328 - 1}{1.378} = 3.141$$

$$Q_u = \frac{(7 - \bar{X})}{S} = \frac{7 - 5.328}{1.378} = 1.213$$

From this data the Percentage Within Tolerance (PWT) for both the lower and upper tolerance limits is determined by Table 6 (see Item 401 Bituminous Surface Course and/or Item 403 Bituminous Base Course in the Standard Specifications) for the number (N) of samples tested.

Eq. PWT (lower) = 99.0%
PWT (upper) = 90.4%

We now calculate the Percent Within Limits (PWL) for the Lot.

PWL = [PWT (lower)] + [PWT (upper)] - 100
PWL = (99.0 + 90.4) - 100 = 89.4%

Using Table 5, the % Adjustment in Lot Quantity is:

% Adjustment = 0.5 PWL + 55.0
% Adjustment = 0.5 (89.4) + 55.0
% Adjustment = 99.7

Adjusted Quantities = % Adjustment x Lot Quantities
Adjusted Quantities = 0.997 x 2000 tons
Adjusted Quantities = 1994 tons

5. Resampling and Retesting

The contractor has the right to request the resampling and retesting of a complete Lot. This privilege is only allowed once for each Lot and must be requested in writing by the contractor within 48 hours of receiving the official report from the Engineer.

6. Reporting

After completion of the tests for each Lot, the Engineer shall complete the necessary calculations for final adjustment in quantities on the Form AER-1 and have both the Engineer and the Contractor sign the report for copying to both the FAA and IDOA.

Steven J. Long, P.E. Acting Chief Engineer

Supersedes Policy Memorandum 87-2, dated April 1, 2010

State of Illinois
Department of Transportation
Division of Aeronautics

POLICY MEMORANDUM

February 20, 2014	Springfield	Number: 87-4

TO: CONSULTING ENGINEERS

SUBJECT: DETERMINATION OF BULK SPECIFIC GRAVITY (d) OF COMPACTED BITUMINOUS MIXES

A. SCOPE

This method of test covers the determination of the bulk specific gravity and the percent air, of core samples from compacted bituminous mixtures using a saturated surface-dry procedure.

B. DEFINITIONS

1. Bulk Specific Gravity (G_{mb}) ASTM 2726 or density is the weight per unit volume (gms/cc) of a mixture in its existing state of consolidation. The volume measurement for this specific gravity will include the volume of all the aggregate, asphalt, and air spaces (voids) in the aggregate particles and between the aggregate particles.

2. Theoretical Maximum Specific Gravity (G_{mm}) ASTM 2041 is the weight per unit volume (grams/cc) of a mixture assuming complete consolidation; i.e., all the air spaces (voids) between the aggregate particles are eliminated.

3. Percent Density is a measure of the degree of compaction in relation to the Theoretical Maximum Specific Gravity.

4. Percent Air is a measure of the air voids in the compacted pavement.

C. APPARATUS

1. Balance - The balance shall be accurate to 0.1 gm throughout the operating range. It may be mechanical or electrical and shall be equipped with a suitable suspension apparatus and holder to permit weighing of the core in water while suspended from the balance. If the balance is a beam type, it shall be set up so that the core is placed in the basket that is suspended from the zero (0) end of the balance arm.

2. Water bath - The container for immersing the core in water while suspended from the balance shall be equipped with an overflow outlet for maintaining a constant water level. This water bath should be large enough to handle full-depth cores. When testing several cores at the same time, a dish-pan, sink or suitable container may be used for soaking.

D. PROCEDURE

1. Prior to testing, cores shall be sorted on a flat surface in a cool place. The sample(s) shall be brushed with a wire brush and/or other suitable means, to remove all loose and/or foreign materials, such as seal coat, tack coat, foundation material, soil, paper and foil prior to testing.

2. If a core contains binder and surface or multiple lifts, the lifts shall be separated. This may be done in the following manner:

   a. Mark the separation line between the two lifts.

   b. Place the core in a freezer for 20-25 minutes.

   c. Place a 2 or 3-inch wide chisel on the separation line and tap with a hammer. Rotate the core and continue this process until the core separates. Brush loose pieces with a wire brush if needed.

   d. Allow 2-3 hours for the core to return to ambient temperature before proceeding.

3. Prepare the water baths for soaking and weighing with water at 77° F. Water baths should be maintained at this temperature throughout testing. Saturate the cores by submerging in the water for a minimum of 20 minutes.

4. With the balance and water bath properly assembled and zeroed, suspend the sample from the balance and submerge it in the water bath. The core must be placed with the original top and bottom in a vertical position. If necessary, add sufficient water to bring the water level up to the overflow outlet. Permit any excess to overflow. Read and record the Saturated Submerged Weight. Designate this weight as (C).

5. Remove the core from the water bath and blot the excess water from the surface of the core with an absorbent cloth or other suitable material. This must be done quickly to prevent the internal water from escaping.

6. Place the core on the balance and read and record the Saturated Surface-dry Weight in air. Designate this weight as (B).

7. Place the core in a tared pan and dry in an oven. When the core is dry (less than 0.5 gm loss in one hour), record the weight and subtract the pan weight. Designate this weight as (A).

8. The following calculation is used to determine the Bulk Specific Gravity of the core.

$$G_{mb} = \frac{A}{B - C}$$

G_{mb} = Bulk Specific Gravity
A = Oven dry weight
B = Saturated surface-dry weight
C = Saturated submerged weight

E. PERCENT DENSITY

The following calculation is used to determine the percent density of the core:

$$\% \text{ Density} = 100 \times \frac{G_{mb}}{G_m}$$

m

G_{mb} = Bulk Specific Gravity
G_{mm} = Theoretical Maximum Gravity*

Note: The Theoretical Maximum Gravity (G_{mm}) is determined from the mix design until current Vacuum Pycnometer test are available.

F. PERCENT AIR. To calculate the percent air, use the following formula:

% Air = 100 - % Density

G. WEIGHT PER SQUARE YARD OF COMPACTED MIXTURE. The actual weight per square yard of a compacted mixture can be calculated by using the Bulk Specific Gravity (G_{mb}). The volume of a square yard of pavement one (1) inch thick is 0.75 cubic foot. Taking the weight of a cubic foot of water as 62.37 pounds, one square yard of compacted material, one (1) inch thick weighs:

Pounds / Sq. Yd. (1" thick) = $0.75 \times 62.37 \times G_{mb}$

Steven J. Long, P.E. Acting Chief Engineer

Supersedes Policy Memorandum 87-4, dated January 1, 2004

State of Illinois
Department of Transportation
Division of Aeronautics

POLICY MEMORANDUM

April 1, 2010	Springfield	Number 96-1

TO: CONSULTING ENGINEERS

SUBJECT: ITEM 610, STRUCTURAL PORTLAND CEMENT CONCRETE:
JOB MIX FORMULA APPROVAL & PRODUCTION TESTING.

I. This policy memorandum addresses the Job Mix Formula (JMF) approval process and production testing requirements when Item 610 is specified for an airport construction contract.

II. PROCESS

a. The contractor may submit a mix design with recent substantiating test data or he may submit a mix design generated by the Illinois Division of Highways with recent substantiating test data for approval consideration. The mix design should be submitted to the Resident Engineer.

b. The Resident Engineer should verify that each component of the proposed mix meets the requirements set forth under Item 610 of the *Standard Specifications for Construction of Airports* and/or the contract special provisions.

c. The mix design should also indicate the following information:

1. The name, address, and producer/supplier number for the concrete.
2. The source, producer/supplier number, gradation, quality, and SSD weight for the proposed coarse and fine aggregates.
3. The source, producer/supplier number, type, and weight of the proposed flyash and/or cement.
4. The source, producer/supplier number, dosage rate or dosage of all admixtures.

d. After completion of Items b and c above, the mix with substantiating test data shall be forwarded to the Division of Aeronautics for approval. Once the mix has been approved, the production testing shall be at the rate in Section III as specified herein.

III. PRODUCTION TESTING

a. One set of cylinders or beams, depending on the strength specified, shall be cast for acceptance testing for each day the mix is used. In addition, at least one slump and one air test shall be conducted for each day the mix is used. If more than 100 c.y. of the mix is placed in a given day, additional tests at a frequently of 1 per 100 c.y. shall be taken for strength, slump, and air. The concrete shall have a maximum slump of three inches (3") and minimum slump of one inches (1") when tested in accordance with ASTM C-143. The air content of the concrete shall be between 5% and 8% by volume. At no time shall the temperature of the concrete exceed 90 degrees Fahrenheit.

b. If the total proposed amount of Item 610 Structural Portland Cement Concrete as calculated by the Resident Engineer is less than 50 c.y. for the entire project, the following shall apply:
   - The Resident Engineer shall provide calculations of the quantity of Item 610 to the Division of Aeronautics.
   - One set of cylinders or beams, depending the strength specified, shall be cast for acceptance testing.
   - One air content and one slump test shall be taken for acceptance testing.
   - The concrete shall have a maximum slump of three inches (3") and minimum of one inch (1") when tested in accordance with ASTM C-143. The air content of the concrete shall be between 5% and 8% by volume. At no time shall the temperature of the concrete exceed 90 degrees Fahrenheit.

c. The Resident Engineer shall collect actual batch weight tickets for every batch of Item 610 concrete used for the project. The actual batch weight tickets shall be kept with the project records and shall be available upon request of the Department of Transportation.

Steven J. Long, P.E.
Acting Chief Engineer

Supersedes Policy Memorandum 96-1 dated January 1, 2004

State of Illinois
Department of Transportation
Division of Aeronautics

POLICY MEMORANDUM

February 20, 2014	Springfield, Illinois	Number 96-3

TO: CONSULTING ENGINEERS

SUBJECT: REQUIREMENTS FOR QUALITY ASSURANCE ON PROJECTS WITH BITUMINOUS CONCRETE PAVING

I. SCOPE

The purpose of this policy memorandum is to define to the Consulting Engineer the requirements concerning Quality Assurance on bituminous concrete paving projects. Specifically, this memo applies whenever the Contractor is required to comply with the requirements set forth in Policy Memorandum 2003-1, "*Requirements for Laboratory, Testing, Quality Control, and Paving of Bituminous Concrete Mixtures*".

II. LABORATORY APPROVAL

The Resident Engineer shall review and approve the Contractor's plant laboratory to assure that it meets the requirements set forth in the contract specifications and Policy Memorandum 2003-1. This review and approval shall be completed prior to utilization of the plant for the production of any mix.

III. QUALITY ASSURANCE DURING PRODUCTION PAVING

A. At the option of the Engineer, independent assurance tests may be performed on split samples taken by the Contractor for Quality Control testing. In addition, the Resident Engineer shall witness the sampling and splitting of these samples at the start of production and as needed throughout mix production. The Engineer may select any or all split samples for assurance testing. These tests may be performed at any time after sampling. The test results will be made available to the Contractor as soon as they become available.

B. The Resident Engineer may witness the sampling and testing being performed by the Contractor. If the Resident Engineer determines 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 Resident Engineer will promptly notify the Contractor, both verbally and in writing, of observed deficiencies. The Resident Engineer will document all witnessed samples and tests. The Resident Engineer may elect to obtain samples for testing, separate from the Contractor's Quality Control process, to verify specification compliance.

1. 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	
1/2 in.	5.0 %
No. 4	5.0 %
No. 8	3.0 %
No. 30	2.0 %
No. 200	2.2 %
Asphalt Content	0.3 %
Maximum Specific Gravity (G_{mm}) of Mixture	0.026
Bulk Specific Gravity (G_{mb}) of Gyratory Brix	0.045

2. In the event a comparison of the required plant test results is outside the above acceptable limits of precision, split or independent samples fail the control limits, an extraction indicates non-specification mix, or a continual trend of difference between Contractor and Engineer test results is identified, the Engineer will immediately investigate. The Engineer may suspend production 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 mix 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.

C. The Contractor shall be responsible for documenting all observations, records of inspection, adjustments to the mixture, test results, retest results, and corrective actions in a bound hardback field book or bound diary which will become the property of IDA upon completion and acceptance of the project. The Contractor shall be responsible for the maintenance of all permanent records whether obtained by the Contractor, the Contractor's Consultants, or the producer of bituminous mix material. The Contractor shall provide the Engineer full access to all documentation throughout the progress of the work.

Results of adjustments to mixture production and tests shall be recorded in duplicate and sent to the Engineer.

IV. ACCEPTANCE BY ENGINEER

Density acceptance shall be performed according to Policy Memorandum 87-2, or according to the acceptance procedure outlined in the Special Provisions.

Steven J. Long, P.E. Acting Chief Engineer

Supersedes Policy Memorandum 96-3, dated January 1, 2004

State of Illinois Department of
Transportation Division of
Aeronautics

POLICY MEMORANDUM

June 22, 2018	Springfield, Illinois	Number 97-2

TO: CONSULTING ENGINEERS

SUBJECT: PAVEMENT MARKING PAINT ACCEPTANCE

I. SCOPE

The purpose of this policy memorandum is to define the procedure for acceptance of pavement marking paint.

II. RESIDENT ENGINEER'S DUTIES

The Resident Engineer shall follow the acceptance procedure outlined as follows:

A. Require the contractor to furnish the name of the paint manufacturer, IDOT Test I.D. number and the Batch/Lot number proposed for use prior to beginning work. Notify the I.D.A. Materials Certification Engineer when this information is available.

B. Require the manufacturer's certification before painting begins. Check the certification for compliance to the contract specifications.

1. The certification shall be issued from the manufacturer and shall include the specification and the batch number.

2. The paint containers shall have the manufacturer's name, the specification and the batch number matching the certification.

C. If no batch number is indicated on the certification or containers, sample the paint according to the procedure for the corresponding paint type.

D. If the I.D.A. Engineer of Materials indicates that batch number has not been previously sampled and tested, sample the paint according to the procedure for the corresponding paint type. The Division of Aeronautics will provide paint cans upon request by the Resident Engineer. Samples will only be taken in new epoxy lined cans and lids so that the paint will not be contaminated. It is important to seal the sample container immediately with the paint can lid to prevent the loss of volatile solvents.

Mark the sample cans with the paint color, manufacturer's name, and batch number. The paint samples and manufacturer's certification shall be placed in the mail or delivered within 24 hours after sampling. Address or deliver the samples to the Material's Certification Engineer at:

Illinois Department of Transportation
Division of Aeronautics
One Langhorne Bond Drive
Springfield, Illinois 62707

Sampling Procedures for Each Paint Type:

1. Waterborne or Solvent Base Paints
   a. A sample consists of one one-pint cans taken per batch number. Before drawing samples, the contents of the component's container must be thoroughly mixed to make certain that any settled portion is fully dispersed.
   b. Be sure to indicate to the contractor that acceptance of material is based upon a passing test of the paint material.

2. Epoxy Paint
   a. Take separate one-pint samples of each paint component prior to marking. Before drawing samples, the contents of each component's container must be thoroughly mixed to make certain that any settled portion is fully dispersed. **Do not combine the two components or sample from the spray nozzle.**
   b. Be sure to indicate to the contractor that acceptance of material is based upon a passing test of the paint material.

III. TESTING

The paint will be tested for acceptance by the IDOT Bureau of Materials and Physical Research for conformance to the contract specifications.

Alan D. Mlacnik, P.E.
Chief Engineer

Supersedes policy memorandum 97-2 dated January 1, 2004

State of Illinois
Department of Transportation
Division of Aeronautics

POLICY MEMORANDUM

June 12, 2014	Springfield, Illinois	Number 2003-1

TO: CONTRACTORS

SUBJECT: REQUIREMENTS FOR LABORATORY, TESTING, QUALITY CONTROL, AND PAVING OF SUPERPAVE HMA CONCRETE MIXTURES FOR AIRPORTS

I. SCOPE

The purpose of this policy memorandum is to define to the Contractor the requirements concerning the laboratory, testing, Quality Control, and paving of HMA mixtures utilizing Superpave technology. References are made to the most recent issue of the Standard Specifications for Construction of Airports (Standard Specifications) and to American Society for Testing and Materials (ASTM) testing methods. The Quality Assurance and acceptance responsibilities of the Resident Engineer are described in Policy Memorandum 96-3.

II. LABORATORY

The Contractor shall provide a laboratory located at the plant and approved by the Illinois Division of Aeronautics (IDA). The laboratory shall be of sufficient size and be furnished with the necessary equipment and supplies for adequately and safely performing the Contractor's Quality Control testing as well as the Resident Engineer's acceptance testing as described in Policy Memorandum 87-2.

The effective working area of the laboratory shall be a minimum of 600 square feet with a ceiling height of not less than 7.5 feet. Lighting shall be adequate to illuminate all working areas. It shall be equipped with heating and air conditioning units to maintain a temperature of 70º F ±5ºF.

The laboratory shall have equipment that is in good working order and that meets the requirements set forth in the following ASTM test standards:

ASTM D 70	Test Method for Specific Gravity and Density of Semi-Solid Materials
ASTM C 117	Test Method for Materials Finer than 75 µm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 136	Sieve or Screen Analysis of Fine and Coarse Aggregate
ASTM C 566	Total Moisture Content of Aggregate by Drying
ASTM D 75	Sampling Aggregates
ASTM D 2041	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures

ASTM D 2172	Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
AASHTO T 308-09	Ignition Method for Determining Asphalt Content (Illinois Modified)
ASTM D 2726	Bulk Specific Gravity of Compacted Bituminous Mixtures using Saturated Surface Dry Specimens
ASTM D 3203	Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D 2950	Density of Bituminous Concrete in Place by Nuclear Method
ASTM D 4125	Asphalt Content of Bituminous Mixtures by Nuclear Method
ASTM C 127	Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate
ASTM C 128	Standard Test Method for Specific Gravity and Absorption of Fine Aggregate

The laboratory and equipment furnished by the Contractor shall be properly calibrated and maintained. The Contractor shall maintain a record of calibration results at the laboratory. The Engineer may inspect measuring and testing devices at any time to confirm both calibration and condition. If the Engineer determines that the equipment is not within the limits of dimensions or calibration described in the appropriate test method, he may stop production until corrective action is taken. If laboratory equipment becomes inoperable or insufficient to keep up with mix production testing, the Contractor shall cease mix production until adequate and/or sufficient equipment is provided.

III. MIX DESIGN SUBMITTAL

Based upon data and test results submitted by the Contractor, the Illinois Division of Aeronautics Engineer of Construction & Materials shall issue the final Job Mix Formula (JMF) approval letter that concurs or rejects the Contractor's proposed JMF. The Contractor will be required to perform the sampling and laboratory testing and develop a complete mix design, according to the following guidelines: Mix design submittals should be sent to IDA, Construction/Material Section, Attn: Certification and Mixtures Engineer. Note: Quality Control (QC) Managers shall be Level III QC/QA qualified and will be responsible for all mix designs. All Technicians obtaining samples and performing gradations shall have successfully completed the IDOT Mixture Aggregate Technician Course and Technicians performing mix design testing and plant sampling/testing shall have successfully completed the IDOT Bituminous Concrete Level 1 Technician Course under the Illinois Department of Transportation, Bureau of Materials & Physical Research QC/QA Training Program.

A. Preliminary Mix Design Submittal

Top half of the IDOT Mix Design Software Cover Sheet (QC/QA Package) should be completed for the aggregate mix design parameters and should include the following:

1. Producer name, Producer # and Producer location of each aggregate (Producers are assigned Producer numbers by IDOT Central Bureau of Materials)

2. Material code for each aggregate

3. Aggregate Gradations per ASTM C-136 (The Contractor shall obtain representative samples of each aggregate)

4. Material code for each aggregate (i.e. 022CM11, etc.)

5. Proposed Aggregate Blend (% for each aggregate) Note: Based on the gradation results, the Contractor shall select the blend percentages that comply with the Standard Specifications, Section 401/403 – 3.2 JOB MIX FORMULA, Table 2. (Appendix A)

6. Producer name, Producer #, and specific gravity of the proposed asphalt cement

7. IDOT approved PG Binder 64-22 shall be used unless otherwise specified by the IDA Engineer of Construction & Materials.

B. Mixture Design & Testing

Design Parameters

Gyrations (N_{des}) – per Standard Specifications, Section 401/403 – 3.2 (JMF), Table 1
Asphalt Content – AC% per Standard Specifications, Section 401/403 – 3.2 (JMF), Table 2
Maximum Specific Gravity – G_{mm} (ASTM D 2041)
Bulk Specific Gravity – G_{mb} (ASTM D 2726)
% air voids – V_a (ASTM D3203) per Standard Specifications, Section 401/403 – 3.2 (JMF), Table 2
VFA % – per Standard Specifications, Section 401/403 – 3.2 (JMF), Table 1

Mixture Tests

After verification and approval by IDA of the proposed design information from step A., the Contractor shall perform mixture tests on 4 gyratory brix (4 point mix design) to determine the optimum AC content for the target Air Voids.

C. Mix Design Submittal

The Preliminary JMF including all test results shall be reported to IDA, Construction/Material Section, Attn: Certification and Mixtures with the following data:

a) Aggregate & asphalt cement material codes
b) Aggregate & asphalt cement producer numbers, names, and locations
c) Percentage of each individual aggregate
d) Aggregate blend % for each sieve
e) AC Specific Gravity
f) Bulk Specific Gravity and Absorption for each aggregate
g) Summary of Superpave Design Data: AC % Mix, G_{mb}, G_{mm}, VMA, Voids (Total Mix), Voids Filled, V_{be}, P_{be}, P_{ba}, G_{se}
h) Optimum design data listing: AC % Mix, G_{mb}, G_{mm}, VMA, Voids (Total Mix), Voids Filled, G_{se}, G_{sb}

i) Percent of asphalt that any RAP will add to the mix
j) Graphs for the following: gradation on 0.45 Power Curve, AC vs. Voids (Total Mix), AC vs. Specific Gravities, AC vs. Voids Filled, AC vs. VMA

D. Mix Approval

Once the proposed JMF is reviewed and approved by IDA, a JMF approval letter will be issued to the contractor. Production of HMA is not authorized until a JMF letter has been issued. When a Test Section is specified as part of the contract, the proposed JMF shall be considered preliminary until it passes all Test Section requirements.

E. Change in Material Sources

The above procedure, III. MIX DESIGN SUBMITTAL shall be repeated for each change in source or gradation of materials.

IV. MIX PRODUCTION TESTING

The Quality Control of the manufacture and placement of HMA mixtures is the responsibility of the Contractor. The Contractor shall perform or have performed the inspection and tests required to assure conformance to contract requirements. Quality Control includes the recognition of defects and their immediate correction. This may require increased testing, communication of test results to the plant or the job site, modification of operations, suspension of HMA production, rejection of material, or other actions as appropriate. The Resident Engineer shall be immediately notified of any failing tests and subsequent remedial action. Form AER M-14 shall be reported to IDA, Construction/Material Section, Attn: Certification and Mixtures Engineer and the Resident Engineer no later than the start of the next work day. The Contractor shall provide a Quality Control (QC) Manager who will have overall responsibility and authority for Quality Control. This individual shall have successfully completed the IDOT Division of Highways HMA Concrete Level II Technician Course “HMA Proportioning and Mixture Evaluation.” In addition to the QC Manager, the Contractor shall provide sufficient and qualified personnel to perform the required visual inspections, sampling, testing, and documentation in a timely manner.

A. Gradations for Mixture Proportioning: Aggregate gradations for proportioning (ASTM C-136) are required at a minimum of one per week when mix is produced. Aggregate gradations can be either hot bin gradations for batch plants or stockpile gradations for drier drum plants. Hot bin gradations may be reported on either form AER 9 or on the Division of Highways QC/QA package "Grad 1" Tab in the Daily HMA Plant Reporting Module. Stockpile gradations shall be shown on form MI504QC from the "Print Out" Tab in the Aggregate Stockpile Module of The Division of Highways QC/QA Package.

B. Production Mixture Testing: 1 per 1000 tons of the following (if total daily quantity is < /= 200 tons (small quantity) then a mix sample is not required and this quantity may be added on to next day's total for testing. Two consecutive days without testing is not allowed.): Reflux extraction (ASTM D2172) or Ignition oven test showing gradation and AC Content, Maximum Specific Gravity (ASTM D 2041), Bulk Specific Gravity (ASTM D 2726) and % Air Voids (ASTM D 3203). Calculations of the results (including weight data) shall be shown on the "Voids 1" and "IGN & NUC AC 1" tab printouts from the Division of Highways QC/QA Package Daily HMA Plant Reporting module.

C. A certification from the quarry for the total quantity of aggregate listing the source, gradation type, and quality designation of aggregate shipped. The Aggregate Certification of Compliance (AER18) may be used by the contractor for this purpose.

D. Original asphalt shipping tickets listing the source and type of asphalt shipped.

E. Check sample tests at a rate of 1/5000 tons randomly selected by the R.E. shall be sent with an identification sheet to an independent laboratory designated by the Division of Aeronautics. If the project is < 5000 tons, 1 sample selected randomly shall be sent.

F. Bituminous Test Summary (AER 14) Note: The R.E. should make certain that the Contractor fills this form out daily (for mix production days) and distributes it daily to the Division of Aeronautics and R.E. The Contractor (QC Manager) is required to note any adjustments to the mix or to the plant (proportioning) in the "Remarks/Corrective Measures" section of the AER 14.

V. QUALITY CONTROL

A. Control Limits (Control Charts used for projects > 4000 tons per bituminous concrete pay item)

Target values shall be determined from the approved JMF. The target values shall be plotted on the control charts within the following control limits:

Control Limits

Parameter	Individual Test	Moving Avg. of 4
% Passing		
1/2 in.	± 7 %	±4 %
No. 4	±7 %	±4 %
No. 8	±5 %	±3 %
No. 30	±4 %	±2.5 %
No. 200 *	±2.0 % *	±1.0 % *
Asphalt Content	±0.45 %	±0.2 %

* No. 200 material percent's shall be based on washed samples. Dry sieve gradations (-200) shall be adjusted based on anticipated degradation in the mixing process.

B. Control Charts (Control Charts used for projects > 4000 tons per bituminous concrete pay item)

Standardized control charts shall be maintained by the Contractor at the field laboratory. The control charts shall be displayed and be accessible at the field laboratory at all times for review by the Engineer. The individual required test results obtained by the Contractor shall be recorded on the control chart immediately upon completion of a test, but no later than 24 hours after sampling. Only the required plant tests and resamples shall be recorded on the control chart. Any additional testing of check samples may be used for controlling the Contractor's processes, but shall be documented in the plant diary.

The results of assurance tests performed by the Resident Engineer will be posted as soon as available.

The following parameters shall be recorded on control charts:

1. Combined Gradation of Hot-Bin (Batch Plant) or Combined Belt Aggregate Samples (Drier Drum Plant) (% Passing 1/2 in., No. 4., No. 8, No. 30, and No. 200 Sieves)

2. Asphalt Content

3. Bulk Specific Gravity (G_{mb})

4. Maximum Specific Gravity of Mixture (G_{mm}) C.

Corrective Action for Required Plant Tests

Control Limits for each required parameter, both individual tests and the average of four tests, shall be exhibited on control charts. Test results shall be posted within the time limits previously outlined.

1. Individual Test Result. When an individual test result exceeds its control limit, the Contractor shall immediately resample and retest. If at the end of the day no material remains from which to resample, the first sample taken the following day shall serve as the resample as well as the first sample of the day. This result shall be recorded as a retest. If the retest passes, the Contractor may continue the required plant test frequency. Additional check samples should be taken to verify mix compliance.

2. Asphalt Content. If the retest for asphalt content exceeds control limits, mix production shall cease and immediate corrective action shall be instituted by the Contractor. After corrective action, mix production shall be restarted, the mix production shall be stabilized, and the Contractor shall immediately resample and retest. Mix production may continue when approved by the Engineer. The corrective action shall be documented.

   Inability to control mix production is cause for the Engineer to stop the operation until the Contractor completes the investigation identifying the problems causing failing test results.

3. Combined Aggregate/Hot-Bin. For combined aggregate/hot-bin retest failures, immediate corrective action shall be instituted by the Contractor. After corrective action, the Contractor shall immediately resample and retest. The corrective action shall be documented.

   a. Moving Average. When the moving average values trend toward the moving average control limits, the Contractor shall take corrective action and increase the sampling and testing frequency. The corrective action shall be documented.

      The Contractor shall notify the Engineer whenever the moving average values exceed the moving average control limits. If two consecutive moving average values fall outside the moving average control limits, the

Contractor shall cease operations. Corrective action shall be immediately instituted by the Contractor. Operations shall not be reinstated without the approval of the Engineer. Failure to cease operations shall subject all subsequently produced material to be considered unacceptable.

b. Mix Production Control. If the Contractor is not controlling the production process and is making no effort to take corrective action, the operation shall stop.

VI. TEST SECTION AND DENSITY ACCEPTANCE **(Note: Applies only when specified.)**

A. The purpose of the test section is to determine if the mix is acceptable and can be compacted to a consistent passing density.

A quick way to determine the compaction of the mix is by the use of a nuclear density gauge in the construction of a growth curve. An easy way to construct a growth curve is to use a good vibratory roller. To construct the curve, an area the width of the roller in the middle of the mat is chosen and the roller is allowed to make one compaction pass. With the roller stopped some 30 feet away, a nuclear reading is taken and the outline of the gauge is marked on the pavement. The roller then makes a compaction pass in the opposite direction and another reading is taken. This scenario is continued until at least two (2) passes are made past the maximum peak density obtained.

The maximum laboratory density potential of a given mix is a direct function of the mix design air voids. Whereas, the actual maximum field density is a function of the type of coarse aggregates, natural or manufactured sands, lift thickness, roller type (static or vibratory), roller and paver speed, base condition, mix variation, etc. All of these items are taken into consideration with the growth curve.

1. <u>High Density in the Growth Curve</u>. If the growth curve indicates a maximum achievable field density of between 95 to 98 percent of the Theoretical Maximum Density (D), you can proceed with the Rolling Pattern. On the other hand, if the maximum achievable density is greater than 98 percent, a quick evaluation (by use of an extractor, hot bin gradations, nuclear asphalt determination, etc.) must be made of the mix. When adjustments are made in the mix, a new growth curve shall be constructed.

2. <u>Low Density in the Growth Curve</u>. If the growth curve indicates the maximum achievable density is below 94 percent, a thorough evaluation of the mix, rollers, and laydown operations should be made. After a thorough evaluation of all factors (mix, rollers, etc.), asphalt or gradation changes may be in order as directed by the Engineer. Again, any changes in the mix will require a new growth curve. Note that the nuclear density test is a quality control tool and not an acceptance test. All acceptance testing is to be conducted by the use of cores, unless otherwise specified.

3. Acceptance of Test Section. The Contractor may proceed with paving the day after the test section provided the following criteria have been met:

   a. Four random locations (2 cores per location cut longitudinally and cored by the Contractor) will be selected by the Engineer within the test strip. All the cores must show a minimum of 94% density.

   b. All Superpave and extraction test results from mix produced for the test section must be within the tolerances required by specification.

   c. The Contractor shall correlate his nuclear gauge to the cores taken in the test section. Additional cores may be taken at the Contractor's expense for this purpose within the test section area, when approved by the Engineer.

4. Density Acceptance under Production Paving. The responsibility for obtaining the specified density lies with the Contractor. Therefore, it is important that the nuclear density gauge operator communicate with the roller operators to maintain the specified density requirements. The Contractor shall provide a qualified HMA Density Tester who has successfully completed the Department's "HMA Nuclear Density Testing Course" to run all required density tests on the job site. Density acceptance testing, unless otherwise specified, is described as follows:

   a. The Contractor shall cut cores at random locations within 500 ton sublots as directed by the Resident Engineer.

   b. The cores should be extracted so as not to damage them, since they are used to calculate the Contractor's pay.

   c. The Engineer will run preliminary G_{mb} tests on the cores to give the Contractor an indication of how compaction is running for the next day's paving.

   d. A running average of four (4) Maximum Theoretical Gravities (G_{mm}) will be used for calculating percent compaction.

   e. Final core density tests and pay calculations will be performed by the Resident Engineer and delivered to the Contractor.

   f. Should the contractor wish to resample the pavement as a result of pay calculations resulting in less than 100% payment the request must be made within 48 hours of receipt of the original payment calculation.

Steven J. Long, P.E. Acting Chief Engineer

Supersedes Policy Memorandum 2003-1 dated May 1, 2014

APPENDIX A

AGGREGATE BITUMINOUS BASE COURSE

Percentage by Weight Passing Sieves Job Mix Formula (JMF)		
Sieve Size	Gradation B Range 1” Maximum	Ideal Target
1-1/4 in.	---	---
1 in.	100	100
3/4 in.	93 – 97	95
1/2 in.	75 – 79	77
3/8 in.	64 – 68	66
No. 4	45 – 51	48
No. 8	34 – 40	37
No. 16	27 – 33	30
No. 30	19 – 23	21
No. 100	6 – 10	8
No. 200	4 – 6	5
Bitumen %: Stone	4.5 – 7.0	5.5

AGGREGATE BITUMINOUS SURFACE COURSE

Percentage by Weight Passing Sieves Job Mix Formula (JMF)		
Sieve Size	Gradation B Range ¾" Maximum	Ideal Target
1 in.	100	---
3/4 in.	100	100
1/2 in.	99 - 100	100
3/8 in.	91 - 97	94
No. 4	56 – 62	59
No. 8	36 - 42	39
No. 16	27 - 32	30
No. 30	19 - 25	22
No. 100	7 – 9	8
No. 200	5 – 7	6
Bitumen %: Stone	5.0 – 7.0	6.0