# INSTRUCTIONS

**ABOUT IDOT PROPOSALS**: All proposals are potential bidding proposals. Each proposal contains all certifications and affidavits, a proposal signature sheet and a proposal bid bond.

## PREQUALIFICATION

Any contractor who desires to become pre-qualified to bid on work advertised by IDOT must submit the properly completed pre-qualification forms to the Bureau of Construction no later than 4:30 p.m. prevailing time twenty-one days prior to the letting of interest. This pre-qualification requirement applies to first time contractors, contractors renewing expired ratings, contractors maintaining continuous pre-qualification or contractors requesting revised ratings. To be eligible to bid, existing pre-qualification ratings must be effective through the date of the letting.

## WHO CAN BID?

Bids will be accepted from only those companies that request and receive written Authorization to Bid from IDOT's Central Bureau of Construction.

## REQUESTS FOR AUTHORIZATION TO BID

Contractors wanting to bid on items included in a particular letting must submit the properly completed "Request for Authorization to Bid/or Not For Bid Status" (BDE 124) and the ORIGINAL "Affidavit of Availability: (BC 57) to the proper office no later than 4:30 p.m. prevailing time, three (3) days prior to the letting date.

**WHAT CONSTITUTES WRITTEN AUTHORIZATION TO BID?**: When a prospective prime bidder submits a "Request for Authorization to Bid or Not for Bid Status" (BDE 124) he/she must indicate at that time which items are being requested For Bidding purposes. Only those items requested For Bidding will be analyzed. After the request has been analyzed, the bidder will be issued an **Authorization to Bid or Not for Bid Report**, approved by the Central Bureau of Construction and the Chief Procurement Officer that indicates which items have been approved For Bidding. If **Authorization to Bid** cannot be approved, the **Authorization to Bid or Not for Bid Report** will indicate the reason for denial.

**ABOUT AUTHORIZATION TO BID:** Firms that have not received an Authorization to Bid or Not For Bid Report within a reasonable time of complete and correct original document submittal should contact the department as to the status. Firms unsure as to authorization status should call the Prequalification Section of the Bureau of Construction at the number listed at the end of these instructions. These documents must be received three days before the letting date.

**ADDENDA AND REVISIONS:** It is the bidder's responsibility to determine which, if any, addenda or revisions pertain to any project they may be bidding. Failure to incorporate all relevant addenda or revisions may cause the bid to be declared unacceptable.

Each addendum or revision will be included with the Electronic Plans and Proposals. Addenda and revisions will also be placed on the Addendum/Revision Checklist and each subscription service subscriber will be notified by e-mail of each addendum and revision issued.

The Internet is the Department's primary way of doing business. The subscription server e-mails are an added courtesy the Department provides. It is suggested that bidders check IDOT's website at http://www.dot.il.gov/desenv/delett.html before submitting final bid information.

***IDOT IS NOT RESPONSIBLE FOR ANY E-MAIL FAILURES.***

Addenda questions may be directed to the Contracts Office at (217)782-7806 or D&Econtracts@dot.il.gov

Technical questions about downloading these files may be directed to Tim Garman at (217)524-1624 or Timothy.Garman@illinois.gov.

# BID SUBMITTAL GUIDELINES AND CHECKLIST

In an effort to eliminate confusion and standardize the bid submission process the Contracts Office has created the following guidelines and checklist for submitting bids.

This information has been compiled from questions received from contractors and from inconsistencies noted on submitted bids. If you have additional questions please refer to the contact information listed below.

**ABOUT SUBMITTING BIDS**: It is recommended that bidders deliver bid proposals in person to ensure they arrive at the proper location prior to the time specified for the receipt of bids. Any proposals received at the place of letting after the time specified will not be read.

**STANDARD GUIDELINES FOR SUBMITTING BIDS**

- All pages should be single sided.
- Use the Cover Page that is provided in the Bid Proposal (posted on the IDOT Web Site) as the first page of your submitted bid. This page has the Item number in the upper left-hand corner and lines provided for your company name and address in the upper right-hand corner.
- Do not use report covers, presentation folders or special bindings and do not staple multiple times on left side like a book. Use only 1 staple in the upper left hand corner. Make sure all elements of your bid are stapled together including the bid bond or guaranty check (if required).
- Do not include any certificates of eligibility, your authorization to bid, Addendum Letters or affidavit of availability.
- Do not include the Subcontractor Documentation with your bid (pages 33-41). This documentation is required only after you are awarded the contract.
- Use the envelope cover sheet (provided with the proposal) as the cover for the proposal envelope.
- Do not rely on overnight services to deliver your proposal prior to 10 AM on letting day. It will not be read if it is delivered after 10 AM.
- Do not submit your Substance Abuse Prevention Program (SAPP) with your bid. If you are awarded the contract this form is to be submitted to the Division Construction Engineer at the pre-construction conference.

**Use the following checklist to ensure completeness and the correct order in assembling your bid**

☐ **Illinois Office Affidavit** (Not applicable to federally funded projects) Insert your affidavit after page 5 (if applicable).

☐ **Cover page** (the sheet that has the item number on it) **followed by your bid (the Pay Items).** If you are using special software or CBID to generate your schedule of prices, do not include the blank schedule of prices.

☐ **Page 4 (Item 10)** - Check "YES" if you will use a subcontractor(s). Include the subcontractor(s) name, address, general type of work to be performed and the dollar amount (if over $50,000). If you will use subcontractor(s) but are uncertain who or the dollar amount; check "YES" but leave the lines blank.

☐ **Page 10 (Paragraph J)** - Check "YES" or "NO" whether your company has any business in Iran.

☐ **Page 10 (Paragraph K)** – (Not applicable to federally funded projects) List the Union Local Name and number or certified training programs that you have in place. **Your bid will not be read if this is not completed.** Do not include certificates with your bid. Keep the certificates in your office in case they are requested by IDOT.

☐ **Page 11 (Paragraph L)** - A copy of your State Board of Elections certificate of registration is no longer required with your bid.

☐ **Page 11 (Paragraph M)** – Indicate if your company has hired a lobbyist in connection with the job for which you are submitting the bid proposal.

☐ **Page 12 (Paragraph C)** - This is a work sheet to determine if a completed Form A is required. It is not part of the form and you do not need to make copies for each Form A that is filled out.

☐ **Pages 14-17 (Form A)** - One Form A (3 pages) is required for each applicable person in your company. Copies of the Forms can be used and only need to be changed when the financial information changes. The certification signature and date must be original for each letting. Do not staple the forms together.

If you answered "NO" to all of the questions in Paragraph C (page 14), complete the first section (page 16) with your company information and then sign and date the Not Applicable statement on page 18.

☐ **Page 18 (Form B)** - If you check "YES" to having other current or pending contracts it is acceptable to use the phrase, "See Affidavit of Availability on file". **Ownership Certification** (at the bottom of the page) – Check N/A if the Form A you submitted accounts for 100 percent of the company ownership. Check YES if any percentage of ownership falls outside of the parameters that require reporting on the Form A. Checking NO indicates that the Form A you submitted is not correct and you will be required to submit a revised Form A.

☐ **Pages 20-21 (Workforce Projection)** - Be sure to include the Duration of the Project. It is acceptable to use the phrase "Per Contract Specifications".

☐ **Bid Bond** - Submit your bid bond using the current Bid Bond Form provided in the proposal package. The Power of Attorney page should be stapled to the Bid Bond. If you are using an electronic bond, include your bid bond number on the form and attach the Proof of Insurance printed from the Surety 2000 Web Site.

☐ **Disadvantaged Business Utilization Plan and/or Good Faith Effort** - The last item in your bid should be the DBE Utilization Plan (SBE 2026), followed by the DBE Participation Statement (SBE 2025) and supporting paperwork. If you have documentation for a Good Faith Effort, it should follow the SBE Forms.

**The Bid Letting is now available in streaming Audio/Video from the IDOT Web Site.** A link to the stream will be placed on the main page of the current letting on the day of the Letting. The stream will not begin until 10 AM. The actual reading of the bids does not begin until approximately 10:20 AM.

Following the Letting, the As-Read Tabulation of Bids will be posted by the end of the day. You will find the link on the main page of the current letting.

**QUESTIONS: pre-letting up to execution of the contract**

Contractor/Subcontractor pre-qualification---------- 217-782-3413
Small Business, Disadvantaged Business Enterprise (DBE) ---------- 217-785-4611
Contracts, Bids, Letting process or Internet downloads ---------- 217-785-7806
Estimates Unit ---------- 217-785-3483
Aeronautics ---------- 217-785-8515
IDNR (Land Reclamation, Water Resources, Natural Resources) ---------- 217-782-6302

**QUESTIONS: following contract execution**

Including Subcontractor documentation, payments ----------217-782-3413
Railroad Insurance ----------217-785-0275

**RETURN WITH BID**

# 9A

| | |
|---|---|
| Proposal Submitted By<br><br>Name | |
| Address | |
| City/State | 9 Digit Zip Code |
| Telephone No. | Fax No. |
| Federal Employer Identification No. (FEIN) | |
| Email Address | |

## Letting April 26, 2013

**NOTICE TO PROSPECTIVE BIDDERS**
**This proposal can be used for bidding purposes by only those companies that request and receive written AUTHORIZATION TO BID from IDOT's Central Bureau of Construction.**
**BIDDERS NEED NOT RETURN THE ENTIRE PROPOSAL**

# Notice to Bidders, Specifications, Proposal, Contract and Contract Bond

Illinois Department of Transportation
DIVISION OF AERONAUTICS

**Contract No. SD057**
**St. Louis Downtown Airport**
**Cahokia, Illinois**
**St. Clair County**
**Illinois Project No. CPS-4210**
**SBG Project No. 3-17-0039-B29**

**For engineering information, contact Barry Stolz, P.E. of Hanson Professional Services, Inc. at (314) 770-0467.**

**FAA rules prohibit the use of escalation clauses for materials. Therefore, the Division of Aeronautics cannot offer any material cost adjustment provisions for projects that utilize Federal funds.**

PLEASE MARK THE APPROPRIATE BOX BELOW:

☐ A Bid Bond is included.

☐ A Cashier's Check or a Certified Check is included.

**RETURN WITH BID**

Illinois Department of Transportation

# PROPOSAL

TO THE DEPARTMENT OF TRANSPORTATION

1. Proposal of _____

_____

Taxpayer Identification Number (Mandatory) _____

For the improvement identified and advertised for bids in the Invitation for Bids as:

**Contract No. SD057**
**St. Louis Downtown Airport**
**Cahokia, Illinois**
**St. Clair County**
**Illinois Project No. CPS-4210**
**SBG Project No. 3-17-0039-B29**

**Grade Ditch Parallel to Main Runway**

2. The undersigned bidder will furnish all labor, material and equipment to complete the above described project in a good workmanlike manner as provided in the contract documents provided by the Department of Transportation. This proposal will become part of the contract and the terms and conditions contained in the contract documents shall govern performance and payments.

3. **COMPLETION TIME/LIQUIDATED DAMAGES**. It being understood and agreed that the completion within the time limit is an essential part of the contract, the bidder agrees to complete the work within Base Bid: 86 calendar days; Additive Alternate 1: 4 additional calendar days, unless additional time is granted by the Engineer in accordance with the provisions of the specifications. In case of failure to complete the work on or before the time named herein, or within such extra time as may have been allowed by extensions, the bidder agrees that the Department of Transportation shall withhold from such sum as may be due him/her under the terms of this contract, the costs, as set forth below, which costs shall be considered and treated not as a penalty but as damages due to the State from the bidder by reason of the failure of the bidder to complete the work within the time specified in the contract.

| Schedule of Deductions for Each Day of Overrun in Contract Time | | | |
|---|---|---|---|
| Original Contract Amount | | Daily Charges | |
| From More Than | To and Including | Calendar Day | Work Day |
| $ 0 | $ 100,000 | $ 475 | $ 675 |
| 100,000 | 500,000 | 750 | 1,050 |
| 500,000 | 1,000,000 | 1,025 | 1,425 |
| 1,000,000 | 3,000,000 | 1,275 | 1,725 |
| 3,000,000 | 6,000,000 | 1,425 | 2,000 |
| 6,000,000 | 12,000,000 | 2,300 | 3,450 |
| 12,000,000 | And over | 5,800 | 8,125 |

A daily charge shall be made for every day shown on the calendar beyond the specified contract time in calendar days.

**RETURN WITH BID**

4. **ASSURANCE OF EXAMINATION AND INSPECTION/WAIVER.** The undersigned further declares that he/she has carefully examined the proposal, plans, specifications, supplemental and applicable recurring special provisions, addenda, form of contract and contract bond, and special provisions, and that he/she has inspected in detail the site of the proposed work, and that he/she has familiarized themselves with all of the local conditions affecting the contract and the detailed requirements of construction, and understands that in making this proposal he/she waives all right to plead any misunderstanding regarding the same.

5. **EXECUTION OF CONTRACT AND CONTRACT BOND.** The undersigned further agrees to execute a contract for this work and present the same to the department within fifteen (15) days after the contract has been mailed to him/her. The undersigned further agrees that he/she and his/her surety will execute and present within fifteen (15) days after the contract has been mailed to him/her contract bond satisfactory to and in the form prescribed by the Department of Transportation, in the penal sum of the full amount of the contract, guaranteeing the faithful performance of the work in accordance with the terms of the contract.

**6. PROPOSAL GUARANTY.** Accompanying this proposal is either a bid bond on the department form, executed by a corporate surety company satisfactory to the department, or a proposal guaranty check consisting of a bank cashier's check or a properly certified check for not less than 5 per cent of the amount bid or for the amount specified in the following schedule:

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

Bank cashier's checks or properly certified checks accompanying proposals shall be made payable to the Treasurer, State of Illinois, when the state is awarding authority; the county treasurer, when a county is the awarding authority; or the city, village, or town treasurer, when a city, village, or town is the awarding authority.

If a combination bid is submitted, the proposal guaranties which accompany the individual proposals making up the combination will be considered as also covering the combination bid.

The amount of the proposal guaranty check is _____ $(  ). If this proposal is accepted and the undersigned shall fail to execute contract bonds as required herein, it is hereby agreed that the amount of the proposal guaranty shall become the property of the State of Illinois, and shall be considered as payment of damages due to delay and other causes suffered by the State because of the failure to execute said contract and contract bonds; otherwise, the bid bond shall become void or the proposal guaranty check shall be returned to the undersigned.

**Attach Cashier's Check or Certified Check Here**

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

The proposal guaranty check will be found in the proposal for: Item _____

Airport _____

**Mark the proposal cover sheet as to the type of proposal guaranty submitted.**

**RETURN WITH BID**

7. **COMBINATION BIDS.** The undersigned further agrees that if awarded the contract for the sections contained in the following combination, he/she will perform the work in accordance with the requirements of each individual proposal comprising the combination bid specified in the schedule below, and that the combination bid shall be prorated against each section in proportion to the bid submitted for the same. If an error is found to exist in the gross sum bid for one or more of the individual sections included in a combination, the combination bid shall be corrected as provided in the specifications.

**When a combination bid is submitted, the schedule below must be completed in each proposal comprising the combination.**

**If alternate bids are submitted for one or more of the sections comprising the combination, a combination bid must be submitted for each alternate.**

**Schedule of Combination Bids**

| Combination No. | Sections Included in Combination | Combination Bid Dollars | Cents |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

8. **SCHEDULE OF PRICES.** The undersigned submits herewith, in accordance with the rules and instructions, a schedule of prices for the items of work for which bids are sought. The unit prices bid are in U.S. dollars and cents, and all extensions and summations have been made. The bidder understands that the quantities appearing in the bid schedule are approximate and are provided for the purpose of obtaining a gross sum for the comparison of bids. If there is an error in the extension of the unit prices, the unit prices shall govern. Payment to the contractor awarded the contract will be made only for actual quantities of work performed and accepted or materials furnished according to the contract. The scheduled quantities of work to be done and materials to be furnished may be increased, decreased or omitted as provided elsewhere in the contract.

9. **AUTHORITY TO DO BUSINESS IN ILLINOIS.** Section 20-43 of the Illinois Procurement Code (the Code) (30 ILCS 500/20-43) provides that a person (other than an individual acting as a sole proprietor) must be a legal entity authorized to do business in the State of Illinois prior to submitting the bid.

10. **The services of a subcontractor will be used.**

Check box Yes ☐
Check box No ☐

For known subcontractors with subcontracts with an annual value of more than $50,000, the contract shall include their name, address, general type of work to be performed, and the dollar allocation for each subcontractor. (30 ILCS 500/20-120)

_____

_____

11. **EXECUTION OF CONTRACT.** The Department of Transportation will, in accordance with the rules governing Department procurements, execute the contract and shall be the sole entity having the authority to accept performance and make payments under the contract. Execution of the contract by the Chief Procurement Officer (CPO) or the State Purchasing Officer (SPO) is for approval of the procurement process and execution of the contract by the Department. Neither the CPO nor the SPO shall be responsible for administration of the contract or determinations respecting the performance or payment there under except as otherwise permitted in the Code.

| COUNTY NAME | CODE | DIST | AIRPORT NAME | FED PROJECT | ILL PROJECT |
|---|---|---|---|---|---|
| ST CLAIR | 163 | 08 | ST. LOUIS DOWNTOWN | 3-17-0039-B29 | CP-S -4210 |

****** BASE ******

| ITEM NUMBER | PAY ITEM DESCRIPTION | UNIT OF MEASURE | QUANTITY | | UNIT PRICE DOLLARS | UNIT PRICE CENTS | | TOTAL PRICE DOLLARS | TOTAL PRICE CTS |
|---|---|---|---|---|---|---|---|---|---|
| AR108082 | 1/C #2 XLP-USE | L.F. | 1,298.000 | X | | | = | | |
| AR108108 | 1/C #8 5 KV UG CABLE | L.F. | 1,813.000 | X | | | = | | |
| AR108158 | 1/C #8 5 KV UG CABLE IN UD | L.F. | 237.000 | X | | | = | | |
| AR108258 | 2/C #8 5 KV UG CABLE IN UD | L.F. | 766.000 | X | | | = | | |
| AR108706 | 1/C #6 COUNTERPOISE | L.F. | 250.000 | X | | | = | | |
| AR108806 | 6 PAIR CONTROL CABLE | L.F. | 433.000 | X | | | = | | |
| AR110012 | 2" DIRECTIONAL BORE | L.F. | 260.000 | X | | | = | | |
| AR110014 | 4" DIRECTIONAL BORE | L.F. | 305.000 | X | | | = | | |
| AR110502 | 2-WAY CONCRETE ENCASED DUCT | L.F. | 230.000 | X | | | = | | |
| AR110504 | 4-WAY CONCRETE ENCASED DUCT | L.F. | 220.000 | X | | | = | | |
| AR110714 | ELECTRICAL MANHOLE 4' | EACH | 2.000 | X | | | = | | |
| AR110715 | ELECTRICAL MANHOLE - SPECIAL | EACH | 2.000 | X | | | = | | |
| AR150510 | ENGINEER'S FIELD OFFICE | L.S. | 1.000 | X | | | = | | |
| AR150520 | MOBILIZATION | L.S. | 1.000 | X | | | = | | |
| AR150540 | HAUL ROUTE | L.S. | 1.000 | X | | | = | | |

| ITEM NUMBER | PAY ITEM DESCRIPTION | UNIT OF MEASURE | QUANTITY | | UNIT PRICE DOLLARS | UNIT PRICE CENTS | | TOTAL PRICE DOLLARS | TOTAL PRICE CTS |
|---|---|---|---|---|---|---|---|---|---|
| AR152410 | UNCLASSIFIED EXCAVATION | C.Y. | 18,266.000 | X | | | = | | |
| AR156511 | DITCH CHECK | EACH | 15.000 | X | | | = | | |
| AR156520 | INLET PROTECTION | EACH | 12.000 | X | | | = | | |
| AR156531 | EROSION CONTROL BLANKET | S.Y. | 4,562.000 | X | | | = | | |
| AR701900 | REMOVE PIPE | L.F. | 56.000 | X | | | = | | |
| AR705506 | 6" PERFORATED UNDERDRAIN | L.F. | 80.000 | X | | | = | | |
| AR705620 | UNDERDRAIN END SECTION | EACH | 4.000 | X | | | = | | |
| AR705962 | RELOCATE UNDERDRAIN END SECTION | EACH | 2.000 | X | | | = | | |
| AR752900 | REMOVE END SECTION | EACH | 2.000 | X | | | = | | |
| AR754610 | PAVED DITCH | L.F. | 2,505.000 | X | | | = | | |
| AR901510 | SEEDING | ACRE | 15.300 | X | | | = | | |
| AR908510 | MULCHING | ACRE | 15.300 | X | | | = | | |

SUBTOTAL BASE $

***THE DEPARTMENT RESERVES THE RIGHT TO AWARD THIS CONTRACT ON THE
***BASIS OF ANY OF THE ALTERNATES OR COMBINATION THEREOF.

****** ALT 1 ******

| ITEM NUMBER | PAY ITEM DESCRIPTION | UNIT OF MEASURE | QUANTITY | | UNIT PRICE DOLLARS | UNIT PRICE CENTS | | TOTAL PRICE DOLLARS | TOTAL PRICE CTS |
|---|---|---|---|---|---|---|---|---|---|
| AS150530 | TRAFFIC MAINTENANCE | L.S. | 1.000 | X | | | = | | |
| AS610510 | STRUCTURAL PC CONCRETE | C.Y. | 8.500 | X | | | = | | |
| AS620520 | PAVEMENT MARKING-WATERBORNE | S.F. | 30.000 | X | | | = | | |
| AS620525 | PAVEMENT MARKING-BLACK BORDER | S.F. | 30.000 | X | | | = | | |
| AS800372 | BITUMINOUS & PCC PAVEMENT REMOVAL | S.Y. | 41.000 | X | | | = | | |

SUBTOTAL ALT 1 $

CONTRACT - SD057

| SUMMARY OF TOTAL ALTERNATES | | DOLLARS | CTS |
|---|---|---|---|
| TOTAL BASE | $ | | |
| TOTAL ALT 1 | $ | | |

NOTE:
*** PLEASE TURN PAGE FOR IMPORTANT NOTES ***

NOTE:

1. EACH PAY ITEM SHOULD HAVE A UNIT PRICE AND A TOTAL PRICE.

2. THE UNIT PRICE SHALL GOVERN IF NO TOTAL PRICE IS SHOWN OR IF THERE IS A DISCREPANCY BETWEEN THE PRODUCT OF THE UNIT PRICE MULTIPLIED BY THE QUANTITY.

3. IF A UNIT PRICE IS OMITTED, THE TOTAL PRICE WILL BE DIVIDED BY THE QUANTITY IN ORDER TO ESTABLISH A UNIT PRICE.

4. A BID MAY BE DECLARED UNACCEPTABLE IF NEITHER A UNIT PRICE NOR A TOTAL PRICE IS SHOWN.

## RETURN WITH BID

## STATE REQUIRED ETHICAL STANDARDS GOVERNING CONTRACT PROCUREMENT: ASSURANCES, CERTIFICATIONS AND DISCLOSURES

### I. GENERAL

**A.** Article 50 of the Code establishes the duty of all State CPOs, SPOs, and their designees to maximize the value of the expenditure of public moneys in procuring goods, services, and contracts for the State of Illinois and to act in a manner that maintains the integrity and public trust of State government. In discharging this duty, they are charged by law to use all available information, reasonable efforts, and reasonable actions to protect, safeguard, and maintain the procurement process of the State of Illinois.

**B.** In order to comply with the provisions of Article 50 and to carry out the duty established therein, all bidders are to adhere to ethical standards established for the procurement process, and to make such assurances, disclosures and certifications required by law. Except as otherwise required in subsection III, paragraphs J-M, by execution of the Proposal Signature Sheet, the bidder indicates that each of the mandated assurances has been read and understood, that each certification is made and understood, and that each disclosure requirement has been understood and completed.

**C.** In addition to all other remedies provided by law, failure to comply with any assurance, failure to make any disclosure or the making of a false certification shall be grounds for the CPO to void the contract, and may result in the suspension or debarment of the bidder or subcontractor. If a false certification is made by a subcontractor, the contractor's submitted bid and the executed contract may not be declared void unless the contractor refuses to terminate the subcontract upon the States' request after a finding that the subcontractor's certification was false.

### II. ASSURANCES

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

#### A. Conflicts of Interest

1. The Code provides in pertinent part:

Section 50-13. Conflicts of Interest.

(a) Prohibition. It is unlawful for any person holding an elective office in this State, holding a seat in the General Assembly, or appointed to or employed in any of the offices or agencies of state government and who receives compensation for such employment in excess of 60% of the salary of the Governor of the State of Illinois, or who is an officer or employee of the Capital Development Board or the Illinois Toll Highway Authority, or who is the spouse or minor child of any such person to have or acquire any contract, or any direct pecuniary interest in any contract therein, whether for stationery, printing, paper, or any services, materials, or supplies, that will be wholly or partially satisfied by the payment of funds appropriated by the General Assembly of the State of Illinois or in any contract of the Capital Development Board or the Illinois Toll Highway Authority.

(b) Interests. It is unlawful for any firm, partnership, association or corporation, in which any person listed in subsection (a) is entitled to receive (i) more than 7 1/2% of the total distributable income or (ii) an amount in excess of the salary of the Governor, to have or acquire any such contract or direct pecuniary interest therein.

(c) Combined interests. It is unlawful for any firm, partnership, association, or corporation, in which any person listed in subsection (a) together with his or her spouse or minor children is entitled to receive (i) more than 15%, in the aggregate, of the total distributable income or (ii) an amount in excess of 2 times the salary of the Governor, to have or acquire any such contract or direct pecuniary interest therein.

(d) Securities. Nothing in this Section invalidates the provisions of any bond or other security previously offered or to be offered for sale or sold by or for the State of Illinois.

(e) Prior interests. This Section does not affect the validity of any contract made between the State and an officer or employee of the State or member of the General Assembly, his or her spouse, minor child or any combination of those persons if that contract was in existence before his or her election or employment as an officer, member, or employee. The contract is voidable, however, if it cannot be completed within 365 days after the officer, member, or employee takes office or is employed.

The current salary of the Governor is $177,412.00. Sixty percent of the salary is $106,447.20.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-13, or that an effective exemption has been issued by the Board of Ethics to any individual subject to the Section 50-13 prohibitions pursuant to the provisions of Section 50-20 of the Code and Executive Order Number 3 (1998). Information concerning the exemption process is available from the Department upon request.

**B. Negotiations**

1. The Code provides in pertinent part:

Section 50-15. Negotiations.

(a) It is unlawful for any person employed in or on a continual contractual relationship with any of the offices or agencies of State government to participate in contract negotiations on behalf of that office or agency with any firm, partnership, association, or corporation with whom that person has a contract for future employment or is negotiating concerning possible future employment.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-15, and that the bidder has no knowledge of any facts relevant to the kinds of acts prohibited therein.

**C. Inducements**

1. The Code provides:

Section 50-25. Inducement. Any person who offers or pays any money or other valuable thing to any person to induce him or her not to bid for a State contract or as recompense for not having bid on a State contract is guilty of a Class 4 felony. Any person who accepts any money or other valuable thing for not bidding for a State contract or who withholds a bid in consideration of the promise for the payment of money or other valuable thing is guilty of a Class 4 felony.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-25, and that the bidder has no knowledge of any facts relevant to the kinds of acts prohibited therein.

**D. Revolving Door Prohibition**

1. The Code provides:

Section 50-30. Revolving door prohibition. CPOs, SPOs, procurement compliance monitors, their designees whose principal duties are directly related to State procurement, and executive officers confirmed by the Senate are expressly prohibited for a period of 2 years after terminating an affected position from engaging in any procurement activity relating to the State agency most recently employing them in an affected position for a period of at least 6 months. The prohibition includes, but is not limited to: lobbying the procurement process; specifying; bidding; proposing bid, proposal, or contract documents; on their own behalf or on behalf of any firm, partnership, association, or corporation. This Section applies only to persons who terminate an affected position on or after January 15, 1999.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-30, and that the bidder has no knowledge of any facts relevant to the kinds of acts prohibited therein.

**E. Reporting Anticompetitive Practices**

1. The Code provides:

Section 50-40. Reporting anticompetitive practices. When, for any reason, any vendor, bidder, contractor, CPO, SPO, designee, elected official, or State employee suspects collusion or other anticompetitive practice among any bidders, offers, contractors, proposers, or employees of the State, a notice of the relevant facts shall be transmitted to the Attorney General and the CPO.

2. The bidder assures the Department that it has not failed to report any relevant facts concerning the practices addressed in Section 50-40 which may involve the contract for which the bid is submitted.

**F. Confidentiality**

1. The Code provides:

Section 50-45. Confidentiality. Any CPO, SPO, designee, or executive officer who willfully uses or allows the use of specifications, competitive bid documents, proprietary competitive information, proposals, contracts, or selection information to compromise the fairness or integrity of the procurement, bidding, or contract process shall be subject to immediate dismissal, regardless of the Personnel code, any contract, or any collective bargaining agreement, and may in addition be subject to criminal prosecution.

2. The bidder assures the Department that it has no knowledge of any fact relevant to the practices addressed in Section 50-45 which may involve the contract for which the bid is submitted.

**G. Insider Information**

1. The Code provides:

Section 50-50. Insider information. It is unlawful for any current or former elected or appointed State official or State employee to knowingly use confidential information available only by virtue of that office or employment for actual or anticipated gain for themselves or another person.

2. The bidder assures the Department that it has no knowledge of any facts relevant to the practices addressed in Section 50-50 which may involve the contract for which the bid is submitted.

## III. CERTIFICATIONS

The certifications hereinafter made by the bidder are each a material representation of fact upon which reliance is placed should the Department enter into the contract with the bidder. Section 50-2 of the Code provides that every person that has entered into a multi-year contract and every subcontractor with a multi-year subcontract shall certify, by July 1 of each fiscal year covered by the contract after the initial fiscal year, to the responsible CPO whether it continues to satisfy the requirements of Article 50 pertaining to the eligibility for a contract award. If a contractor or subcontractor is not able to truthfully certify that it continues to meet all requirements, it shall provide with its certification a detailed explanation of the circumstances leading to the change in certification status. A contractor or subcontractor that makes a false statement material to any given certification required under Article 50 is, in addition to any other penalties or consequences prescribed by law, subject to liability under the Whistleblower Reward and Protection Act for submission of a false claim.

**A. Bribery**

1. The Code provides:

Section 50-5. Bribery.

(a) Prohibition. No person or business shall be awarded a contract or subcontract under this Code who:

(1) has been convicted under the laws of Illinois or any other state of bribery or attempting to bribe an officer or employee of the State of Illinois or any other state in that officer's or employee's official capacity; or

(2) has made an admission of guilt of that conduct that is a matter of record but has not been prosecuted for that conduct.

(b) Businesses. No business shall be barred from contracting with any unit of State or local government, or subcontracting under such a contract, as a result of a conviction under this Section of any employee or agent of the business if the employee or agent is no longer employed by the business and:

(1) the business has been finally adjudicated not guilty; or

(2) the business demonstrates to the governmental entity with which it seeks to contract, or which is signatory to the contract which the subcontract relates, and that entity finds that the commission of the offense was not authorized, requested, commanded, or performed by a director, officer, or high managerial agent on behalf of the business as provided in paragraph (2) of subsection (a) of Section 5-4 of the Criminal Code of 1961.

(c) Conduct on behalf of business. For purposes of this Section, when an official, agent, or employee of a business committed the bribery or attempted bribery on behalf of the business and in accordance with the direction or authorization of a responsible official of the business, the business shall be chargeable with the conduct.

(d) Certification. Every bid submitted to and contract executed by the State, and every subcontract subject to Section 20-120 of the Code shall contain a certification by the contractor or the subcontractor, respectively, that the contractor or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO may declare the related contract void if any certifications required by this Section are false. A contractor who makes a false statement, material to the certification, commits a Class 3 felony.

2. The contractor or subcontractor certifies that it is not barred from being awarded a contract under Section 50.5.

**B. Felons**

1. The Code provides:

Section 50-10. Felons. Unless otherwise provided, no person or business convicted of a felony shall do business with the State of Illinois or any State agency, or enter into a subcontract, from the date of conviction until 5 years after the date of completion of the sentence for that felony, unless no person held responsible by a prosecutorial office for the facts upon which the conviction was based continues to have any involvement with the business.

2. Certification. Every bid submitted to and contract executed by the State and every subcontract subject to Section 20-120 of the Code shall contain a certification by the bidder or contractor or subcontractor, respectively, that the bidder, contractor, or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO may declare the related contract void if any of the certifications required by this Section are false.

**C. Debt Delinquency**

1. The Code provides:

Section 50-11 and 50-12. Debt Delinquency.

The contractor or bidder or subcontractor, respectively, certifies that it, or any affiliate, is not barred from being awarded a contract or subcontract under the Code. Section 50-11 prohibits a person from entering into a contract with a State agency, or entering into a subcontract, if it knows or should know that it, or any affiliate, is delinquent in the payment of any debt to the State as defined by the Debt Collection Board. Section 50-12 prohibits a person from entering into a contract with a State agency, or entering into a subcontract, if it, or any affiliate, has failed to collect and remit Illinois Use Tax on all sales of tangible personal property into the State of Illinois in accordance with the provisions of the Illinois Use Tax Act. The bidder or contractor or subcontractor, respectively, further acknowledges that the CPO may declare the related contract void if this certification is false or if the bidder, contractor, or subcontractor, or any affiliate, is determined to be delinquent in the payment of any debt to the State during the term of the contract.

**D. Prohibited Bidders, Contractors and Subcontractors**

1. The Code provides:

Section 50-10.5 and 50-60(c). Prohibited bidders, contractors and subcontractors.
The bidder or contractor or subcontractor, respectively, certifies in accordance with 30 ILCS 500/50-10.5 that no officer, director, partner or other managerial agent of the contracting business has been convicted of a felony under the Sarbanes-Oxley Act of 2002 or a Class 3 or Class 2 felony under the Illinois Securities Law of 1953 or if in violation of Subsection (c) for a period of five years from the date of conviction. Every bid submitted to and contract executed by the State and every subcontract subject to Section 20-120 of the Code shall contain a certification by the bidder, contractor, or subcontractor, respectively, that the bidder, contractor, or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO shall declare the related contract void if any of the certifications completed pursuant to this Section are false.

**E. Section 42 of the Environmental Protection Act**

The bidder or contractor or subcontractor, respectively, certifies in accordance with 30 ILCS 500/50-14 that the bidder, contractor, or subcontractor, is not barred from being awarded a contract or entering into a subcontract under this Section which prohibits the bidding on or entering into contracts with the State of Illinois or a State agency, or entering into any subcontract, that is subject to the Code by a person or business found by a court or the Pollution Control Board to have committed a willful or knowing violation of Section 42 of the Environmental Protection Act for a period of five years from the date of the order. The bidder or contractor or subcontractor, respectively, acknowledges that the CPO may declare the contract void if this certification is false.

**F. Educational Loan**

1. Section 3 of the Educational Loan Default Act provides:

§ 3. No State agency shall contract with an individual for goods or services if that individual is in default, as defined in Section 2 of this Act, on an educational loan. Any contract used by any State agency shall include a statement certifying that the individual is not in default on an educational loan as provided in this Section.

2. The bidder, if an individual as opposed to a corporation, partnership or other form of business organization, certifies that the bidder is not in default on an educational loan as provided in Section 3 of the Act.

**G. Bid-Rigging/Bid Rotating**

1. Section 33E-11 of the Criminal Code of 1961 provides:

§ 33E-11. (a) Every bid submitted to and public contract executed pursuant to such bid by the State or a unit of local government shall contain a certification by the prime contractor that the prime contractor is not barred from contracting with any unit of State or local government as a result of a violation of either Section 33E-3 or 33E-4 of this Article. The State and units of local government shall provide the appropriate forms for such certification.

(b) A contractor who makes a false statement, material to the certification, commits a Class 3 felony.

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

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

2. The bidder certifies that it is not barred from contracting with the Department by reason of a violation of either Section 33E-3 or Section 33E-4.

**H. International Anti-Boycott**

1. Section 5 of the International Anti-Boycott Certification Act provides:

§ 5. State contracts. Every contract entered into by the State of Illinois for the manufacture, furnishing, or purchasing of supplies, material, or equipment or for the furnishing of work, labor, or services, in an amount exceeding the threshold for small purchases according to the purchasing laws of this State or $10,000.00, whichever is less, shall contain certification, as a material condition of the contract, by which the contractor agrees that neither the contractor nor any substantially-owned affiliated company is participating or shall participate in an international boycott in violation of the provisions of the U.S. Export Administration Act of 1979 or the regulations of the U.S. Department of Commerce promulgated under that Act.

2. The bidder makes the certification set forth in Section 5 of the Act.

**I. Drug Free Workplace**

1. The Illinois “Drug Free Workplace Act” applies to this contract and it is necessary to comply with the provisions of the “Act” if the contractor is a corporation, partnership, or other entity (including a sole proprietorship) which has 25 or more employees.

2. The bidder certifies that if awarded a contract in excess of $5,000 it will provide a drug free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance, including cannabis, is prohibited in the contractor’s workplace; specifying the actions that will be taken against employees for violations of such prohibition; and notifying the employee that, as a condition of employment on such contract, the employee shall abide by the terms of the statement, and notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after such conviction.

(b) Establishing a drug free awareness program to inform employees about the dangers of drug abuse in the workplace; the contractor’s policy of maintaining a drug free workplace; any available drug counseling, rehabilitation, and employee assistance programs; and the penalties that may be imposed upon employees for drug violations.

(c) Providing a copy of the statement required by subparagraph (1) to each employee engaged in the performance of the contract and to post the statement in a prominent place in the workplace.

(d) Notifying the Department within ten (10) days after receiving notice from an employee or otherwise receiving actual notice of the conviction of an employee for a violation of any criminal drug statute occurring in the workplace.

(e) Imposing or requiring, within 30 days after receiving notice from an employee of a conviction or actual notice of such a conviction, an appropriate personnel action, up to and including termination, or the satisfactory participation in a drug abuse assistance or rehabilitation program approved by a federal, state or local health, law enforcement or other appropriate agency.

(f) Assisting employees in selecting a course of action in the event drug counseling, treatment, and rehabilitation is required and indicating that a trained referral team is in place.

(g) Making a good faith effort to continue to maintain a drug free workplace through implementation of the actions and efforts stated in this certification.

**J. Disclosure of Business Operations in Iran**

Section 50-36 of the Code, 30ILCS 500/50-36 provides that each bid, offer, or proposal submitted for a State contract shall include a disclosure of whether or not the Company acting as the bidder, offeror, or proposing entity, or any of its corporate parents or subsidiaries, within the 24 months before submission of the bid, offer, or proposal had business operations that involved contracts with or provision of supplies or services to the Government of Iran, companies in which the Government of Iran has any direct or indirect equity share, consortiums or projects commissioned by the Government of Iran, or companies involved in consortiums or projects commissioned by the Government of Iran and either of the following conditions apply:

(1) More than 10% of the Company's revenues produced in or assets located in Iran involve oil-related activities or mineral-extraction activities; less than 75% of the Company's revenues produced in or assets located in Iran involve contracts with or provision of oil-related or mineral-extraction products or services to the Government of Iran or a project or consortium created exclusively by that government; and the Company has failed to take substantial action.

(2) The Company has, on or after August 5, 1996, made an investment of $20 million or more, or any combination of investments of at least $10 million each that in the aggregate equals or exceeds $20 million in any 12-month period, which directly or significantly contributes to the enhancement of Iran's ability to develop petroleum resources of Iran.

The terms “Business operations”, “Company”, “Mineral-extraction activities”, “Oil-related activities”, “Petroleum resources”, and “Substantial action” are all defined in the Code.

Failure to make the disclosure required by the Code shall cause the bid, offer or proposal to be considered not responsive. The disclosure will be considered when evaluating the bid, offer, or proposal or awarding the contract. The name of each Company disclosed as doing business or having done business in Iran will be provided to the State Comptroller.

**Check the appropriate statement:**

/____/ Company has no business operations in Iran to disclose.

/____/ Company has business operations in Iran as disclosed in the attached document.

**K. Apprenticeship and Training Certification (Does not apply to federal aid projects)**

In accordance with the provisions of Section 30-22 (6) of the Code, the bidder certifies that it is a participant, either as an individual or as part of a group program, in the approved apprenticeship and training programs applicable to each type of work or craft that the bidder will perform with its own forces. The bidder further certifies for work that will be performed by subcontract that each of its subcontractors submitted for approval either (a) is, at the time of such bid, participating in an approved, applicable apprenticeship and training program; or (b) will, prior to commencement of performance of work pursuant to this contract, begin participation in an approved apprenticeship and training program applicable to the work of the subcontract. The Department, at any time before or after award, may require the production of a copy of each applicable Certificate of Registration issued by the United States Department of Labor evidencing such participation by the contractor and any or all of its subcontractors. Applicable apprenticeship and training programs are those that have been approved and registered with the United States Department of Labor. The bidder shall list in the space below, the official name of the program sponsor holding the Certificate of Registration for all of the types of work or crafts in which the bidder is a participant and that will be performed with the bidder’s forces. Types of work or craft work that will be subcontracted shall be included and listed as subcontracted work. The list shall also indicate any type of work or craft job category that does not have an applicable apprenticeship or training program. **The bidder is responsible for making a complete report and shall make certain that each type of work or craft job category that will be utilized on the project as reported on the Construction Employee Workforce Projection (Form BC-1256) and returned with the bid is accounted for and listed.**

**NA-FEDERAL**

The requirements of this certification and disclosure are a material part of the contract, and the contractor shall require this certification provision to be included in all approved subcontracts. In order to fulfill this requirement, it shall not be necessary that an applicable program sponsor be currently taking or that it will take applications for apprenticeship, training or employment during the performance of the work of this contract.

**L. Political Contributions and Registration with the State Board of Elections.**

Sections 20-160 and 50-37 of the Code regulate political contributions from business entities and any affiliated entities or affiliated persons bidding on or contracting with the state. Generally under Section 50-37, any business entity , and any affiliated entity or affiliated person of the business entity, whose current year contracts with all state agencies exceed an awarded value of $50,000, are prohibited from making any contributions to any political committees established to promote the candidacy of the officeholder responsible for the awarding of the contracts or any other declared candidate for that office for the duration of the term of office of the incumbent officeholder or a period 2 years after the termination of the contract, whichever is longer. Any business entity and affiliated entities or affiliated persons whose state contracts in the current year do not exceed an awarded value of $50,000, either alone or in combination with contracts not exceeding $50,000, are prohibited from making any political contributions to any political committee established to promote the candidacy of the officeholder responsible for awarding the pending contract during the period beginning on the date the invitation for bids or request for proposals is issued and ending on the day after the date of award or selection if the entity was not awarded or selected. Section 20-160 requires certification of registration of affected business entities in accordance with procedures found in Section 9-35 of The Election Code

By submission of a bid, the contractor business entity acknowledges and agrees that it has read and understands Sections 20-160 and 50-37 of the Code, and that it makes the following certification:

**The undersigned business entity certifies that it has registered as a business with the State Board of Elections and acknowledges a continuing duty to update the registration in accordance with the above referenced statutes. If the business entity is required to register, the CPO shall verify that it is in compliance on the date the bid or proposal is due. The CPO shall not accept a bid or proposal if the business entity is not in compliance with the registration requirements.**

These requirements and compliance with the above referenced statutory sections are a material part of the contract, and any breach thereof shall be cause to void the contract under Section 50-60 of the Code. This provision does not apply to Federal-aid contracts.

**M. Lobbyist Disclosure**

Section 50-38 of the Code requires that any bidder or offeror on a State contract that hires a person required to register under the Lobbyist Registration Act to assist in obtaining a contract shall:

(i) Disclose all costs, fees, compensation, reimbursements, and other remunerations paid or to be paid to the lobbyist related to the contract,
(ii) Not bill or otherwise cause the State of Illinois to pay for any of the lobbyist's costs, fees, compensation, reimbursements, or other remuneration, and
(iii) Sign a verification certifying that none of the lobbyist's costs, fees, compensation, reimbursements, or other remuneration were billed to the State.

This information, along with all supporting documents, shall be filed with the agency awarding the contract and with the Secretary of State. The CPO shall post this information, together with the contract award notice, in the online Procurement Bulletin.

Pursuant to Subsection (c) of this Section, no person or entity shall retain a person or entity to attempt to influence the outcome of a procurement decision made under the Code for compensation contingent in whole or in part upon the decision or procurement. Any person who violates this subsection is guilty of a business offense and shall be fined not more than $10,000.

Bidder acknowledges that it is required to disclose the hiring of any person required to register pursuant to the Illinois Lobbyist Registration Act (25 ILCS 170) in connection with this contract.

☐ Bidder has not hired any person required to register pursuant to the Illinois Lobbyist Registration Act in connection with this contract.

Or

☐ Bidder has hired the following persons required to register pursuant to the Illinois Lobbyist Registration Act in connection with the contract:

Name and address of person: _____
All costs, fees, compensation, reimbursements and other remuneration paid to said person: _____
_____
_____
_____

**IV. DISCLOSURES**

**A.** The disclosures hereinafter made by the bidder are each a material representation of fact upon which reliance is placed should the Department enter into the contract with the bidder. The bidder further certifies that the Department has received the disclosure forms for each bid.

The CPO may void the bid, or contract, respectively, if it is later determined that the bidder or subcontractor rendered a false or erroneous disclosure. A contractor or subcontractor may be suspended or debarred for violations of the Code. Furthermore, the CPO may void the contract and the surety providing the performance bond shall be responsible for completion of the contract.

**B. Financial Interests and Conflicts of Interest**

1. Section 50-35 of the Code provides that all bids of more than $25,000 shall be accompanied by disclosure of the financial interests of the bidder. This disclosed information for the successful bidder, will be maintained as public information subject to release by request pursuant to the Freedom of Information Act, filed with the Procurement Policy Board, and shall be incorporated as a material term of the contract. Furthermore, pursuant to Section 5-5, the Procurement Policy Board may review a proposal, bid, or contract and issue a recommendation to void a contract or reject a proposal or bid based on any violation of the Code or the existence of a conflict of interest as provided in subsections (b) and (d) of Section 50-35.

The financial interests to be disclosed shall include ownership or distributive income share that is in excess of 5%, or an amount greater than 60% of the annual salary of the Governor, of the bidding entity or its parent entity, whichever is less, unless the contractor or bidder is a publicly traded entity subject to Federal 10K reporting, in which case it may submit its 10K disclosure in place of the prescribed disclosure. If a bidder is a privately held entity that is exempt from Federal 10K reporting, but has more than 200 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. The disclosure shall include the names, addresses, and dollar or proportionate share of ownership of each person making the disclosure, their instrument of ownership or beneficial relationship, and notice of any potential conflict of interest resulting from the current ownership or beneficial interest of each person making the disclosure having any of the relationships identified in Section 50-35 and on the disclosure form.
**The current annual salary of the Governor is $177,412.00**

In addition, all disclosures shall indicate any other current or pending contracts, proposals, leases, or other ongoing procurement relationships the bidding entity has with any other unit of state government and shall clearly identify the unit and the contract, proposal, lease, or other relationship.

2. Disclosure Forms. Disclosure Form A is attached for use concerning the individuals meeting the above ownership or distributive share requirements. A separate Disclosure Form A must be submitted with the bid for each individual meeting the above requirements. In addition, a second form (Disclosure Form B) provides for the disclosure of current or pending procurement relationships with other (non-IDOT) state agencies and a total ownership certification. **The forms must be included with each bid.**

**C. Disclosure Form Instructions**

**Form A Instructions for Financial Information & Potential Conflicts of Interest**

If the bidder is a publicly traded entity subject to Federal 10K reporting, the 10K Report may be submitted to meet the requirements of Form A. If a bidder is a privately held entity that is exempt from Federal 10K reporting, but has more than 400 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. If a bidder is not subject to Federal 10K reporting, the bidder must determine if any individuals are required by law to complete a financial disclosure form. To do this, the bidder should answer each of the following questions. A "YES" answer indicates Form A must be completed. If the answer to each of the following questions is "NO", then the NOT APPLICABLE STATEMENT on Form A must be signed and dated by a person that is authorized to execute contracts for the bidding company. Note: These questions are for assistance only and are not required to be completed.

1. Does anyone in your organization have a direct or beneficial ownership share of greater than 5% of the bidding entity or parent entity? YES _____ NO _____

2. Does anyone in your organization have a direct or beneficial ownership share of less than 5%, but which has a value greater than 60% of the annual salary of the Governor? YES _____ NO _____

3. Does anyone in your organization receive more than 60% of the annual salary of the Governor of the bidding entity's or parent entity's distributive income? (Note: Distributive income is, for these purposes, any type of distribution of profits. An annual salary is not distributive income.) YES_____ NO_____

4. Does anyone in your organization receive greater than 5% of the bidding entity's or parent entity's total distributive income, but which is less than 60% of the annual salary of the Governor? YES _____ NO _____

   (Note: Only one set of forms needs to be completed per person per bid even if a specific individual would require a yes answer to more than one question.)

A "YES" answer to any of these questions requires the completion of Form A. The bidder must determine each individual in the bidding entity or the bidding entity's parent company that would cause the questions to be answered "Yes". Each form must be signed and dated by a person that is authorized to execute contracts for your organization. **Photocopied or stamped signatures are not acceptable**. The person signing can be, but does not have to be, the person for which the form is being completed. The bidder is responsible for the accuracy of any information provided.

If the answer to each of the above questions is "NO", then the NOT APPLICABLE STATEMENT of Form A must be signed and dated by a person that is authorized to execute contracts for your company.

## RETURN WITH BID

**Form B: Instructions for Identifying Other Contracts & Procurement Related Information**

Disclosure Form B must be completed for each bid submitted by the bidding entity. *Note: Checking the NOT APPLICABLE STATEMENT on Form A does not allow the bidder to ignore Form B. Form B must be completed, checked, and dated or the bidder may be considered nonresponsive and the bid will not be accepted.*

The Bidder shall identify, by checking Yes or No on Form B, whether it has any pending contracts (including leases), bids, proposals, or other ongoing procurement relationship with any other (non-IDOT) State of Illinois agency. If "No" is checked, the bidder only needs to complete the check box on the bottom of Form B. If "Yes" is checked, the bidder must do one of the following:

Option I: If the bidder did not submit an Affidavit of Availability to obtain authorization to bid, the bidder must list all non-IDOT State of Illinois agency pending contracts, leases, bids, proposals, and other ongoing procurement relationships. These items may be listed on Form B or on an attached sheet(s). Do not include IDOT contracts. Contracts with cities, counties, villages, etc. are not considered State of Illinois agency contracts and are not to be included. Contracts with other State of Illinois agencies such as the Department of Natural Resources or the Capital Development Board must be included. Bidders who submit Affidavits of Availability are suggested to use Option II.

Option II: If the bidder is required and has submitted an Affidavit of Availability in order to obtain authorization to bid, the bidder may write or type "See Affidavit of Availability" which indicates that the Affidavit of Availability is incorporated by reference and includes all non-IDOT State of Illinois agency pending contracts, leases, bids, proposals, and other ongoing procurement relationships. For any contracts that are not covered by the Affidavit of Availability, the bidder must identify them on Form B or on an attached sheet(s). These might be such things as leases.

**RETURN WITH BID**

# ILLINOIS DEPARTMENT OF TRANSPORTATION

## Form A
## Financial Information & Potential Conflicts of Interest Disclosure

| | | |
|---|---|---|
| Contractor Name | | |
| Legal Address | | |
| City, State, Zip | | |
| Telephone Number | Email Address | Fax Number (if available) |

Disclosure of the information contained in this Form is required by the Section 50-35 of the Code (30 ILCS 500). Vendors desiring to enter into a contract with the State of Illinois must disclose the financial information and potential conflict of interest information as specified in this Disclosure Form. This information shall become part of the publicly available contract file. This Form A must be completed for bids in excess of $25,000, and for all open-ended contracts. **A publicly traded company may submit a 10K disclosure (or equivalent if applicable) in satisfaction of the requirements set forth in Form A. See Disclosure Form Instructions.**
***The current salary of the Governor is $177,412.00.***

**DISCLOSURE OF FINANCIAL INFORMATION**

**1. Disclosure of Financial Information.** The individual named below has an interest in the BIDDER (or its parent) in terms of ownership or distributive income share in excess of 5%, or an interest which has a value of more than 60% of the annual salary of the Governor. **(Make copies of this form as necessary and attach a separate Disclosure Form A for each individual meeting these requirements)**

**FOR INDIVIDUAL (type or print information)**

**NAME:** _____

**ADDRESS** _____

_____

**Type of ownership/distributable income share:**

stock _____ sole proprietorship _____ partnership _____ other: (explain on separate sheet)

% or $ value of ownership/distributable income share: _____

**2. Disclosure of Potential Conflicts of Interest.** Check "Yes" or "No" to indicate which, if any, of the following potential conflict of interest relationships apply. If the answer to any question is "Yes", please attach additional pages and describe.

(a) State employment, currently or in the previous 3 years, including contractual employment of services. Yes____ No____If your answer is yes, please answer each of the following questions.

1. Are you currently an officer or employee of either the Capitol Development Board or the Illinois State Toll Highway Authority? Yes____ No____

2. Are you currently appointed to or employed by any agency of the State of Illinois? If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, provide the name of the State agency for which you are employed and your annual salary. _____
_____

3. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor? Yes ____ No____

4. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15 % in the aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of two times the salary of the Governor? Yes____ No____

---

(b) State employment of spouse, father, mother, son, or daughter, including contractual employment for services in the previous 2 years. Yes____ No____

If your answer is yes, please answer each of the following questions.

1. Is your spouse or any minor children currently an officer or employee of the Capital Development Board or the Illinois State Toll Highway Authority? Yes____ No____

2. Is your spouse or any minor children currently appointed to or employed by any agency of the State of Illinois? If your spouse or minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, provide the name of your spouse and/or minor children, the name of the State agency for which he/she is employed and his/her annual salary. _____
   _____

3. If your spouse or any minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor? Yes____ No____

4. If your spouse or any minor children are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15% in the aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of two times the salary of the Governor? Yes____ No____

---

(c) Elective status; the holding of elective office of the State of Illinois, the government of the United States, any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois currently or in the previous 3 years. Yes____ No____

---

(d) Relationship to anyone holding elective office currently or in the previous 2 years; spouse, father, mother, son, or daughter Yes____ No____

---

(e) Appointive office; the holding of any appointive government office of the State of Illinois, the United States of America, or any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois, which office entitles the holder to compensation in excess of the expenses incurred in the discharge of that office currently or in the previous 3 years. Yes____ No____

---

(f) Relationship to anyone holding appointive office currently or in the previous 2 years; spouse, father, mother, son, or daughter. Yes____ No____

---

(g) Employment, currently or in the previous 3 years, as or by any registered lobbyist of the State government. Yes____ No____

---

(h) Relationship to anyone who is or was a registered lobbyist in the previous 2 years; spouse, father, mother, son, or daughter. Yes____ No____

---

(i) Compensated employment, currently or in the previous 3 years, by any registered election or reelection committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections Yes____ No____

---

(j) Relationship to anyone; spouse, father, mother, son, or daughter; who was a compensated employee in the last 2 years by any registered election or re-election committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections. Yes____ No____

---

**3. Communication Disclosure.**

Disclose the name and address of each lobbyist and other agent of the bidder or offeror who is not identified in Section 2 of this form, who has communicated, is communicating, or may communicate with any State officer or employee concerning the bid or offer. This disclosure is a continuing obligation and must be promptly supplemented for accuracy throughout the process and throughout the term of the contract. If no person is identified, enter "None" on the line below:

Name and address of person(s): _____

_____

_____

_____

**RETURN WITH BID**

**4. Debarment Disclosure.** For each of the persons identified under Sections 2 and 3 of this form, disclose whether any of the following has occurred within the previous 10 years: debarment from contracting with any governmental entity; professional licensure discipline; bankruptcies; adverse civil judgments and administrative findings; and criminal felony convictions. This disclosure is a continuing obligation and must be promptly supplemented for accuracy throughout the procurement process and term of the contract. If no person is identified, enter "None" on the line below:

Name of person(s): _____

Nature of disclosure: _____

_____

_____

_____

**APPLICABLE STATEMENT**

**This Disclosure Form A is submitted on behalf of the INDIVIDUAL named on previous page. Under penalty of perjury, I certify the contents of this disclosure to be true and accurate to the best of my knowledge.**

Completed by: ☐ _____ _____

Signature of Individual or Authorized Officer — Date

**NOT APPLICABLE STATEMENT**

**Under penalty of perjury, I have determined that no individuals associated with this organization meet the criteria that would require the completion of this Form A.**

**This Disclosure Form A is submitted on behalf of the CONTRACTOR listed on the previous page.**

☐ _____ _____

Signature of Authorized Officer — Date

**The bidder has a continuing obligation to supplement these disclosures under Sec. 50-35 of the Code.**

**RETURN WITH BID**

# ILLINOIS DEPARTMENT OF TRANSPORTATION

## Form B
## Other Contracts & Procurement Related Information Disclosure

| | | |
|---|---|---|
| Contractor Name | | |
| Legal Address | | |
| City, State, Zip | | |
| Telephone Number | Email Address | Fax Number (if available) |

Disclosure of the information contained in this Form is required by the Section 50-35 of the Code (30 ILCS 500). This information shall become part of the publicly available contract file. This Form B must be completed for bids in excess of $25,000, and for all open-ended contracts.

**DISCLOSURE OF OTHER CONTRACTS AND PROCUREMENT RELATED INFORMATION**

1. **Identifying Other Contracts & Procurement Related Information**. The BIDDER shall identify whether it has any pending contracts (including leases), bids, proposals, or other ongoing procurement relationship with any other State of Illinois agency: Yes _____ No _____

**If "No" is checked,** the bidder only needs to complete the signature box on the bottom of this page.

**2. If "Yes" is checked.** Identify each such relationship by showing State of Illinois agency name and other descriptive information such as bid or project number (attach additional pages as necessary). SEE DISCLOSURE FORM INSTRUCTIONS:

**THE FOLLOWING STATEMENT MUST BE CHECKED**

☐ _____ _____
Signature of Authorized Representative Date

**OWNERSHIP CERITIFICATION**

Please certify that the following statement is true if the individuals for all submitted Form A disclosures do not total 100% of ownership.

Any remaining ownership interest is held by individuals receiving less than $106,447.20 of the bidding entity's or parent entity's distributive income or holding less than a 5% ownership interest.

☐ Yes ☐ No ☐ N/A (Form A disclosure(s) established 100% ownership)

**RETURN WITH BID**

## SPECIAL NOTICE TO CONTRACTORS

The following requirements of the Illinois Department of Human Rights' Rules and Regulations are applicable to bidders on all construction contracts advertised by the Illinois Department of Transportation:

## CONSTRUCTION EMPLOYEE UTILIZATION PROJECTION

(a) All bidders on construction contracts shall complete and submit, along with and as part of their bids, a Bidder's Employee Utilization Form (Form BC-1256) setting forth a projection and breakdown of the total workforce intended to be hired and/or allocated to such contract work by the bidder including a projection of minority and female employee utilization in all job classifications on the contract project.

(b) The Department of Transportation shall review the Employee Utilization Form, and workforce projections contained therein, of the contract awardee to determine if such projections reflect an underutilization of minority persons and/or women in any job classification in accordance with the Equal Employment Opportunity Clause and Section 7.2 of the Illinois Department of Human Rights' Rules and Regulations for Public Contracts adopted as amended on September 17, 1980. If it is determined that the contract awardee's projections reflect an underutilization of minority persons and/or women in any job classification, it shall be advised in writing of the manner in which it is underutilizing and such awardee shall be considered to be in breach of the contract unless, prior to commencement of work on the contract project, it submits revised satisfactory projections or an acceptable written affirmative action plan to correct such underutilization including a specific timetable geared to the completion stages of the contract.

(c) The Department of Transportation shall provide to the Department of Human Rights a copy of the contract awardee's Employee Utilization Form, a copy of any required written affirmative action plan, and any written correspondence related thereto. The Department of Human Rights may review and revise any action taken by the Department of Transportation with respect to these requirements.

**RETURN WITH BID**

Illinois Department of Transportation

**Contract No. SD057**
**St. Louis Downtown Airport**
**Cahokia, Illinois**
**St. Clair County**
**Illinois Project No. CPS-4210**
**SBG Project No. 3-17-0039-B29**

**PART I. IDENTIFICATION**

Dept. Human Rights #_____ Duration of Project: _____

Name of Bidder: _____

**PART II. WORKFORCE PROJECTION**

A. The undersigned bidder has analyzed minority group and female populations, unemployment rates and availability of workers for the location in which this contract work is to be performed, and for the locations from which the bidder recruits employees, and hereby submits the following workforce projection including a projection for minority and female employee utilization in all job categories in the workforce to be allocated to this contract:

TABLE A

| TOTAL Workforce Projection for Contract | | | | | | | | | | | | | TABLE B: CURRENT EMPLOYEES TO BE ASSIGNED TO CONTRACT | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | MINORITY EMPLOYEES | | | | | | TRAINEES | | | | | | | |
| JOB CATEGORIES | TOTAL EMPLOYEES | | BLACK | | HISPANIC | | *OTHER MINOR. | | APPREN-TICES | | ON THE JOB TRAINEES | | TOTAL EMPLOYEES | | MINORITY EMPLOYEES | |
| | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F |
| OFFICIALS (MANAGERS) | | | | | | | | | | | | | | | | |
| SUPERVISORS | | | | | | | | | | | | | | | | |
| FOREMEN | | | | | | | | | | | | | | | | |
| CLERICAL | | | | | | | | | | | | | | | | |
| EQUIPMENT OPERATORS | | | | | | | | | | | | | | | | |
| MECHANICS | | | | | | | | | | | | | | | | |
| TRUCK DRIVERS | | | | | | | | | | | | | | | | |
| IRONWORKERS | | | | | | | | | | | | | | | | |
| CARPENTERS | | | | | | | | | | | | | | | | |
| CEMENT MASONS | | | | | | | | | | | | | | | | |
| ELECTRICIANS | | | | | | | | | | | | | | | | |
| PIPEFITTERS, PLUMBERS | | | | | | | | | | | | | | | | |
| PAINTERS | | | | | | | | | | | | | | | | |
| LABORERS, SEMI-SKILLED | | | | | | | | | | | | | | | | |
| LABORERS, UNSKILLED | | | | | | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | | | | | | |

TABLE C

| TOTAL Training Projection for Contract | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EMPLOYEES IN TRAINING | TOTAL EMPLOYEES | | BLACK | | HISPANIC | | *OTHER MINOR. | |
| | M | F | M | F | M | F | M | F |
| APPRENTICES | | | | | | | | |
| ON THE JOB TRAINEES | | | | | | | | |

FOR DEPARTMENT USE ONLY

* Other minorities are defined as Asians (A) or Native Americans (N).
Please specify race of each employee shown in Other Minorities column.

BC 1256 (Rev. 12/11/07)

**Note: See instructions on page 2**

**RETURN WITH BID**

**Contract No. SD057**
**St. Louis Downtown Airport**
**Cahokia, Illinois**
**St. Clair County**
**Illinois Project No. CPS-4210**
**SBG Project No. 3-17-0039-B29**

**PART II. WORKFORCE PROJECTION -** continued

B. Included in "Total Employees" under Table A is the total number of **new hires** that would be employed in the event the undersigned bidder is awarded this contract.

The undersigned bidder projects that: (number) _____ new hires would be recruited from the area in which the contract project is located; and/or (number) _____ new hires would be recruited from the area in which the bidder's principal office or base of operation is located.

C. Included in "Total Employees" under Table A is a projection of numbers of persons to be employed directly by the undersigned bidder as well as a projection of numbers of persons to be employed by subcontractors.

The undersigned bidder estimates that (number) _____ persons will be directly employed by the prime contractor and that (number)_____ persons will be employed by subcontractors.

**PART III. AFFIRMATIVE ACTION PLAN**

A. The undersigned bidder understands and agrees that in the event the foregoing minority and female employee utilization projection included under **PART II** is determined to be an underutilization of minority persons or women in any job category, and in the event that the undersigned bidder is awarded this contract, he/she will, prior to commencement of work, develop and submit a written Affirmative Action Plan including a specific timetable (geared to the completion stages of the contract) whereby deficiencies in minority and/or female employee utilization are corrected. Such Affirmative Action Plan will be subject to approval by the contracting agency and the **Department of Human Rights**.

B. The undersigned bidder understands and agrees that the minority and female employee utilization projection submitted herein, and the goals and timetable included under an Affirmative Action Plan if required, are deemed to be part of the contract specifications.

Company _____ Telephone Number _____

_____

Address _____

**NOTICE REGARDING SIGNATURE**

The Bidder's signature on the Proposal Signature Sheet will constitute the signing of this form. The following signature block needs to be completed only if revisions are required.

Signature: ☐ _____ Title: _____ Date: _____

Instructions: All tables must include subcontractor personnel in addition to prime contractor personnel.

Table A - Include both the number of employees that would be hired to perform the contract work and the total number currently employed (Table B) that will be allocated to contract work, and include all apprentices and on-the-job trainees. The "Total Employees" column should include all employees including all minorities, apprentices and on-the-job trainees to be employed on the contract work.

Table B - Include all employees currently employed that will be allocated to the contract work including any apprentices and on-the-job trainees currently employed.

Table C - Indicate the racial breakdown of the total apprentices and on-the-job trainees shown in Table A.

BC-1256 (Rev. 12/11/07)

**RETURN WITH BID**

## ADDITIONAL FEDERAL REQUIREMENTS

In addition to the Required Contract Provisions for Federally funded airport construction contracts, all bidders make the following certifications.

A. By the execution of this proposal, the signing bidder certifies that the bidding entity has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action, in restraint of free competitive bidding in connection with the submitted bid. This statement made by the undersigned bidder is true and correct under penalty of perjury under the laws of the United States.

B. CERTIFICATION, EQUAL EMPLOYMENT OPPORTUNITY

1. Have you participated in any previous contracts or subcontracts subject to the equal opportunity clause?
   Yes____ No____

2. If your answer is yes, have you filed with the Joint Reporting Committee, the Director of OFCC, any Federal agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements of those organizations? Yes____ No____

**RETURN WITH BID**

**Contract No. SD057**
**St. Louis Downtown Airport**
**Cahokia, Illinois**
**St. Clair County**
**Illinois Project No. CPS-4210**
**SBG Project No. 3-17-0039-B29**

PROPOSAL SIGNATURE SHEET

The undersigned bidder hereby makes and submits this bid on the subject Proposal, thereby assuring the Department that all requirements of the Invitation for Bids and rules of the Department have been met, that there is no misunderstanding of the requirements of paragraph 4 of this Proposal, and that the contract will be executed in accordance with the rules of the Department if an award is made on this bid.

Firm Name _____

(IF AN INDIVIDUAL) Signature of Owner _____

Business Address _____

_____

---

Firm Name _____

By _____

(IF A CO-PARTNERSHIP) Business Address _____

_____

Name and Address of All Members of the Firm:

_____ _____

_____ _____

---

Corporate Name _____

By _____
Signature of Authorized Representative

_____
(IF A CORPORATION) Typed or printed name and title of Authorized Representative

(IF A JOINT VENTURE, USE THIS SECTION FOR THE MANAGING PARTY AND THE SECOND PARTY SHOULD SIGN BELOW) Attest _____
Signature

Business Address _____

_____

---

Corporate Name _____

By _____
Signature of Authorized Representative

_____
(IF A JOINT VENTURE) Typed or printed name and title of Authorized Representative

Attest _____
Signature

Business Address _____

_____

If more than two parties are in the joint venture, please attach additional signature sheet

---

Illinois Department of Transportation

**RETURN WITH BID**

**Division of Aeronautics**
**Proposal Bid Bond**

Sponsor _____ Item No. _____

IL Proj. No. _____ SBG Pr. No. _____ Letting Date _____

KNOW ALL MEN BY THESE PRESENTS, That We _____

_____

as PRINCIPAL, and _____

_____ as SURETY, are held jointly, severally and firmly bound unto the SPONSOR identified above, in the penal sum of 5 percent of the total bid price, or for the amount specified in Section 6, Proposal Guaranty of the Proposal Document, whichever is the lesser sum, well and truly to be paid unto said SPONSOR, for the payment of which we bind ourselves, our heirs, executors, administrators, successors and assigns.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH, that whereas, the PRINCIPAL has submitted a bid proposal to the SPONSOR through its AGENT, the State of Illinois, Department of Transportation, Division of Aeronautics, for the improvement designated by the Transportation Bulletin Item Number and Letting Date indicated above.

NOW, THEREFORE, if the SPONSOR through its AGENT shall accept the bid proposal of the PRINCIPAL; and if the PRINCIPAL shall, and as specified in the bidding and contract documents, submit a DBE Utilization Plan that is accepted and approved by the AGENT; and if, after the award by AGENT on behalf of SPONSOR, the PRINCIPAL shall enter into a contract in accordance with the terms of the bidding and contract documents, including evidence of the required insurance coverages and providing such bond as specified with good and sufficient surety for the faithful performance of such contract and for the prompt payment of labor and material furnished in the prosecution thereof; or if, in the event of the failure of the PRINCIPAL to make the required DBE submission or to enter into such contract and to give the specified bond, the PRINCIPAL pays to the SPONSOR the difference not to exceed the penalty hereof between the amount specified in the bid proposal and such larger amount for which the SPONSOR may contract with another party to perform the work covered by said bid proposal, then this obligation shall be null and void, otherwise, it shall remain in full force and effect.

IN THE EVENT the SPONSOR acting through its AGENT determines the PRINCIPAL has failed to comply with any requirement as set forth in the preceding paragraph, then SURETY shall pay the penal sum to the SPONSOR within fifteen (15) days of written demand therefor. If SURETY does not make full payment within such period of time, the AGENT may bring an action to collect the amount owed. SURETY is liable to the SPONSOR and to the AGENT for all its expenses, including attorney's fees, incurred in any litigation in which SPONSOR or AGENT prevail either in whole or in part.

In TESTIMONY WHEREOF, the said PRINCIPAL and the said SURETY have caused this instrument to be signed by their respective officers _____ day of _____ A.D., _____ .

**PRINCIPAL**

_____
(Company Name)

By _____
(Signature & Title)

**SURETY**

_____
(Company Name)

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

**Notary Certification for Principal and Surety**

STATE OF ILLINOIS,
County of _____

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

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

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

Given under my hand and notarial seal this _____ day of _____ A.D. _____

My commission expires _____ _____
Notary Public

In lieu of completing the above section of the Proposal Bid Form, the Principal may file an Electronic Bid Bond. By signing the proposal and marking the check box next to the Signature and Title line below, the Principal is ensuring the identified electronic bid bond has been executed and the Principal and Surety are firmly bound unto the SPONSOR through its AGENT under the conditions of the bid bond as shown above.

_____ _____ _____
Electronic Bid Bond ID# Company / Bidder Name Signature and Title

AER 356B (Rev. 05/07/09)

Illinois Department of Transportation

# DBE Utilization Plan

**(1) Policy**

It is public policy that disadvantaged businesses as defined in 49 CFR Part 26 and the Special Provision shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with Federal or State funds. Consequently the requirements of 49 CFR Part 26 apply to this contract.

**(2) Obligation**

The contractor agrees to ensure that disadvantaged businesses as defined in 49 CFR Part 26 and the Special Provision have the maximum opportunity to participate in the performance of contracts or subcontracts financed in whole or in part with Federal or State funds. The contractor shall take all necessary and reasonable steps in accordance with 49 CFR Part 26 and the Special Provision to ensure that said businesses have the maximum opportunity to compete for and perform under this contract. The contractor shall not discriminate on the basis of race, color, national origin or sex in the award and performance of contracts.

**(3) Project and Bid Identification**

Complete the following information concerning the project and bid:

Route **St. Louis Downtown Airport**

Section _____

Project **CPS-4210**

County **St. Clair County**

Letting Date **April 26, 2013**

Contract No. **SD057**

Letting Item No. **9A**

Total Bid _____

Contract DBE Goal 11.0% (Percent) _____ (Dollar Amount)

**(4) Assurance**

I, acting in my capacity as an officer of the undersigned bidder (or bidders if a joint venture), hereby assure the Department that on this project my company : (check one)

☐ Meets or exceeds contract award goals and has provided documented participation as follows:

Disadvantaged Business Participation _____ percent

Attached are the signed participation statements, forms SBE 2025, required by the Special Provision evidencing availability and use of each business participating in this plan and assuring that each business will perform a commercially useful function in the work of the contract.

☐ Failed to meet contract award goals and has included good faith effort documentation to meet the goals and that my company has provided participation as follows:

Disadvantaged Business Participation _____ percent

The contract goals should be accordingly modified or waived. Attached is all information required by the Special Provision in support of this request including good faith effort. Also attached are the signed participation statements, forms SBE 2025, required by the Special Provision evidencing availability and use of each business participating in this plan and assuring that each business will perform a commercially useful function in the work of the contract.

_____
Company

By _____

Title _____

Date _____

The "as read" Low Bidder is required to comply with the Special Provision.

Submit only one utilization plan for each project. The utilization plan shall be submitted in accordance with the special provision.

Bureau of Small Business Enterprises
2300 South Dirksen Parkway
Springfield, Illinois 62764

**Local Let Projects**
Submit forms to the
Local Agency

The Department of Transportation is requesting disclosure of information that is necessary to accomplish the purpose as outlined under State and Federal law. Disclosure of this information is **REQUIRED**. Failure to provide any information will result in the contract not being awarded. This form has been approved by the State Forms Manager Center.

SBE 2026 (Rev. 11/23/09)

Illinois Department of Transportation

**DBE Participation Statement**

Subcontractor Registration _____ Letting **April 26, 2013**

**Participation Statement** Item No. **9A**

(1) Instructions Contract **SD057**

This form must be completed for each disadvantaged business participating in the Utilization Plan. This form shall be submitted in accordance with the special provision and will be attached to the Utilization Plan form. If additional space is needed complete an additional form for the firm.

(2) Work

| Pay Item No. | Description | Quantity | Unit Price | Total |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | Total | |

(3) Partial Payment Items
For any of the above items which are partial pay items, specifically describe the work and subcontract dollar amount:

(4) Commitment

The undersigned certify that the information included herein is true and correct, and that the DBE firm listed below has agreed to perform a commercially useful function in the work of the contract item(s) listed above and to execute a contract with the prime contractor. The undersigned further understand that no changes to this statement may be made without prior approval from the Department's Bureau of Small Business Enterprises and that complete and accurate information regarding actual work performed on this project and the payment therefore

_____ Signature for Prime Contractor

Title _____

Date _____

Contact _____

Phone _____

Firm Name _____

Address _____

City/State/Zip _____

_____ Signature for DBE Firm

Title _____

Date _____

Contact _____

Phone _____

Firm Name _____

Address _____

City/State/Zip _____

E _____

WC _____

The Department of Transportation is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under the state and federal law. Disclosure of this information is **REQUIRED**. Failure to provide any information will result in the contract not being awarded. This form has been approved by the State Forms Management Center.

SBE 2025 (Rev. 11/03.09)

Illinois Department of Transportation

# PROPOSALS

for construction work advertised for bids by the
Illinois Department of Transportation

| Item No. | Item No. | Item No. |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Submitted By:

| |
|---|
| Name: |
| Address: |
| |
| |
| Phone No. |

Bidders should use an IDOT proposal envelope or affix this form to the front of a 10" x 13" envelope for the submittal of bids. If proposals are mailed, they should be enclosed in a second or outer envelope addressed to:

Engineer of Design and Environment - Room 326
Illinois Department of Transportation
2300 South Dirksen Parkway
Springfield, Illinois 62764

**NOTICE**

**Individual bids, including Bid Bond and/or supplemental information if required, should be securely stapled.**

# CONTRACTOR OFFICE COPY OF CONTRACT SPECIFICATIONS

**NOTICE**

None of the following material needs to be returned with the bid package unless the special provisions require documentation and/or other information to be submitted.

**Contract No. SD057**
**St. Louis Downtown Airport**
**Cahokia, Illinois**
**St. Clair County**
**Illinois Project No. CPS-4210**
**SBG Project No. 3-17-0039-B29**

Illinois Department of Transportation

# SUBCONTRACTOR DOCUMENTATION

Public Acts 96-0795, 96-0920, and 97-0895 enacted substantial changes to the provisions of the Code (30 ILCS 500). Among the changes are provisions affecting subcontractors. The Contractor awarded this contract will be required as a material condition of the contract to implement and enforce the contract requirements applicable to subcontractors that entered into a contractual agreement with a total value of $50,000 or more with a person or entity who has a contract subject to the Code and approved in accordance with Section 80-01 of the Illinois Standard Specifications for Construction of Airports.

If the Contractor seeks approval of subcontractors to perform a portion of the work, and approval is granted by the Department, the Contractor shall provide a copy of the subcontract to the Illinois Department of Transportation's CPO upon request within 15 calendar days after execution of the subcontract.

Financial disclosures required pursuant to Section 50-35 of the Code must be submitted for all applicable subcontractors. The subcontract shall contain the certifications required to be made by subcontractors pursuant to Article 50 of the Code. This Notice to Bidders includes a document incorporating all required subcontractor certifications and disclosures for use by the Contractor in compliance with this mandate. The document is entitled State Required Ethical Standards Governing Subcontractors.

## RETURN WITH SUBCONTRACT

### STATE ETHICAL STANDARDS GOVERNING SUBCONTRACTORS

Article 50 of the Code establishes the duty of all State CPOs, SPOs, and their designees to maximize the value of the expenditure of public moneys in procuring goods, services, and contracts for the State of Illinois and to act in a manner that maintains the integrity and public trust of State government. In discharging this duty, they are charged by law to use all available information, reasonable efforts, and reasonable actions to protect, safeguard, and maintain the procurement process of the State of Illinois.

The certifications hereinafter made by the subcontractor are each a material representation of fact upon which reliance is placed should the Department approve the subcontractor. The CPO may terminate or void the contract approval if it is later determined that the bidder or subcontractor rendered a false or erroneous certification. If a false certification is made by a subcontractor the contractor's submitted bid and the executed contract may not be declared void unless the contractor refuses to terminate the subcontract upon the State's request after a finding that the subcontractor's certification was false.

Section 50-2 of the Code provides that every person that has entered into a multi-year contract and every subcontractor with a multi-year subcontract shall certify, by July 1 of each fiscal year covered by the contract after the initial fiscal year, to the responsible CPO whether it continues to satisfy the requirements of Article 50 pertaining to the eligibility for a contract award. If a contractor or subcontractor is not able to truthfully certify that it continues to meet all requirements, it shall provide with its certification a detailed explanation of the circumstances leading to the change in certification status. A contractor or subcontractor that makes a false statement material to any given certification required under Article 50 is, in addition to any other penalties or consequences prescribed by law, subject to liability under the Whistleblower Reward and Protection Act for submission of a false claim.

**A. Bribery**

1. The Code provides:

Section 50-5. Bribery.

(a) Prohibition. No person or business shall be awarded a contract or subcontract under this Code who:

(1) has been convicted under the laws of Illinois or any other state of bribery or attempting to bribe an officer or employee of the State of Illinois or any other state in that officer's or employee's official capacity; or

(2) has made an admission of guilt of that conduct that is a matter of record but has not been prosecuted for that conduct.

(b) Businesses. No business shall be barred from contracting with any unit of State or local government, or subcontracting under such a contract, as a result of a conviction under this Section of any employee or agent of the business if the employee or agent is no longer employed by the business and:

(1) the business has been finally adjudicated not guilty; or

(2) the business demonstrates to the governmental entity with which it seeks to contract, or which is signatory to the contract to which the subcontract relates, and that entity finds that the commission of the offense was not authorized, requested, commanded, or performed by a director, officer, or high managerial agent on behalf of the business as provided in paragraph (2) of subsection (a) of Section 5-4 of the Criminal Code of 1961.

(c) Conduct on behalf of business. For purposes of this Section, when an official, agent, or employee of a business committed the bribery or attempted bribery on behalf of the business and in accordance with the direction or authorization of a responsible official of the business, the business shall be chargeable with the conduct.

(d) Certification. Every bid submitted to and contract executed by the State, and every subcontract subject to Section 20-120 of the Procurement Code shall contain a certification by the contractor or the subcontractor, respectively, that the contractor or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO may declare the related contract void if any certifications required by this Section are false. A contractor who makes a false statement, material to the certification, commits a Class 3 felony.

2. The contractor or subcontractor certifies that it is not barred from being awarded a contract under Section 50.5.

**B. Felons**

1. The Code provides:

Section 50-10. Felons. Unless otherwise provided, no person or business convicted of a felony shall do business with the State of Illinois or any State agency, or enter into a subcontract, from the date of conviction until 5 years after the date of completion of the sentence for that felony, unless no person held responsible by a prosecutorial office for the facts upon which the conviction was based continues to have any involvement with the business.

2. Certification. Every bid submitted to and contract executed by the State and every subcontract subject to Section 20-120 of the Procurement Code shall contain a certification by the bidder or contractor or subcontractor, respectively, that the bidder, contractor, or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO may declare the related contract void if any of the certifications required by this Section are false.

**C. Debt Delinquency**

1. The Code provides:

Section 50-11 and 50-12. Debt Delinquency.

The contractor or bidder or subcontractor, respectively, certifies that it, or any affiliate, is not barred from being awarded a contract or subcontract under the Code. Section 50-11 prohibits a person from entering into a contract with a State agency, or entering into a subcontract, if it knows or should know that it, or any affiliate, is delinquent in the payment of any debt to the State as defined by the Debt Collection Board. Section 50-12 prohibits a person from entering into a contract with a State agency, or entering into a subcontract, if it, or any affiliate, has failed to collect and remit Illinois Use Tax on all sales of tangible personal property into the State of Illinois in accordance with the provisions of the Illinois Use Tax Act. The bidder or contractor or subcontractor, respectively, further acknowledges that the CPO may declare the related contract void if this certification is false or if the bidder, contractor, or subcontractor, or any affiliate, is determined to be delinquent in the payment of any debt to the State during the term of the contract.

**D. Prohibited Bidders, Contractors and Subcontractors**

1. The Code provides:

Section 50-10.5 and 50-60(c). Prohibited bidders, contractors and subcontractors.
The bidder or contractor or subcontractor, respectively, certifies in accordance with 30 ILCS 500/50-10.5 that no officer, director, partner or other managerial agent of the contracting business has been convicted of a felony under the Sarbanes-Oxley Act of 2002 or a Class 3 or Class 2 felony under the Illinois Securities Law of 1953 or if in violation of Subsection (c) for a period of five years from the date of conviction. Every bid submitted to and contract executed by the State and every subcontract subject to Section 20-120 of the Code shall contain a certification by the bidder, contractor, or subcontractor, respectively, that the bidder, contractor, or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO shall declare the related contract void if any of the certifications completed pursuant to this Section are false.

**E. Section 42 of the Environmental Protection Act**

The bidder or contractor or subcontractor, respectively, certifies in accordance with 30 ILCS 500/50-14 that the bidder, contractor, or subcontractor, is not barred from being awarded a contract or entering into a subcontract under this Section which prohibits the bidding on or entering into contracts with the State of Illinois or a State agency, or entering into any subcontract, that is subject to the Procurement Code by a person or business found by a court or the Pollution Control Board to have committed a willful or knowing violation of Section 42 of the Environmental Protection Act for a period of five years from the date of the order. The bidder or contractor or subcontractor, respectively, acknowledges that the CPO may declare the contract void if this certification is false.

**The undersigned, on behalf of the subcontracting company, has read and understands the above certifications and makes the certifications as required by law.**

_____
Name of Subcontracting Company

_____ _____
Authorized Officer Date

## RETURN WITH SUBCONTRACT

## SUBCONTRACTOR DISCLOSURES

**I. DISCLOSURES**

**A.** The disclosures hereinafter made by the subcontractor are each a material representation of fact upon which reliance is placed. The subcontractor further certifies that the Department has received the disclosure forms for each subcontract.

The CPO may void the bid, contract, or subcontract, respectively, if it is later determined that the bidder or subcontractor rendered a false or erroneous disclosure. A contractor or subcontractor may be suspended or debarred for violations of the Code. Furthermore, CPO may void the contract.

**B. Financial Interests and Conflicts of Interest**

1. Section 50-35 of the Code provides that all subcontracts with a total value of $50,000 or more from subcontractors identified in Section 20-120 of the Code shall be accompanied by disclosure of the financial interests of the subcontractor. This disclosed information for the subcontractor, will be maintained as public information subject to release by request pursuant to the Freedom of Information Act, filed with the Procurement Policy Board, and shall be incorporated as a material term of the Prime Contractor's contract. Furthermore, pursuant to this Section, the Procurement Policy Board may recommend to allow or void a contract or subcontract based on a potential conflict of interest.

The financial interests to be disclosed shall include ownership or distributive income share that is in excess of 5%, or an amount greater than 60% of the annual salary of the Governor, of the subcontracting entity or its parent entity, whichever is less, unless the subcontractor is a publicly traded entity subject to Federal 10K reporting, in which case it may submit its 10K disclosure in place of the prescribed disclosure. If a subcontractor is a privately held entity that is exempt from Federal 10K reporting, but has more than 400 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. The disclosure shall include the names, addresses, and dollar or proportionate share of ownership of each person making the disclosure, their instrument of ownership or beneficial relationship, and notice of any potential conflict of interest resulting from the current ownership or beneficial interest of each person making the disclosure having any of the relationships identified in Section 50-35 and on the disclosure form.
**The current annual salary of the Governor is $177,412.00.**

In addition, all disclosures shall indicate any other current or pending contracts, subcontracts, proposals, leases, or other ongoing procurement relationships the subcontracting entity has with any other unit of state government and shall clearly identify the unit and the contract, subcontract, proposal, lease, or other relationship.

2. Disclosure Forms. Disclosure Form A is attached for use concerning the individuals meeting the above ownership or distributive share requirements. A separate Disclosure Form A must be submitted with the bid for each individual meeting the above requirements. In addition, a second form (Disclosure Form B) provides for the disclosure of current or pending procurement relationships with other (non-IDOT) state agencies and a total ownership certification. **The forms must be included with each bid.**

**C. Disclosure Form Instructions**

**Form A Instructions for Financial Information & Potential Conflicts of Interest**

If the subcontractor is a publicly traded entity subject to Federal 10K reporting, the 10K Report may be submitted to meet the requirements of Form A. If a subcontractor is a privately held entity that is exempt from Federal 10K reporting, but has more than 400 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. If a subcontractor is not subject to Federal 10K reporting, the subcontractor must determine if any individuals are required by law to complete a financial disclosure form. To do this, the subcontractor should answer each of the following questions. A "YES" answer indicates Form A must be completed. If the answer to each of the following questions is "NO", then the NOT APPLICABLE STATEMENT on the second page of Form A must be signed and dated by a person that is authorized to execute contracts for the subcontracting company. Note: These questions are for assistance only and are not required to be completed.

1. Does anyone in your organization have a direct or beneficial ownership share of greater than 5% of the bidding entity or parent entity? YES _____ NO _____

2. Does anyone in your organization have a direct or beneficial ownership share of less than 5%, but which has a value greater than 60% of the annual salary of the Governor? YES _____ NO_____

3. Does anyone in your organization receive more than 60% of the annual salary of the Governor of the subcontracting entity's or parent entity's distributive income? (Note: Distributive income is, for these purposes, any type of distribution of profits. An annual salary is not distributive income.) YES _____ NO _____

4. Does anyone in your organization receive greater than 5% of the subcontracting entity's or parent entity's total distributive income, but which is less than 60% of the annual salary of the Governor? YES _____ NO _____

(Note: Only one set of forms needs to be completed per person per subcontract even if a specific individual would require a yes answer to more than one question.)

A "YES" answer to any of these questions requires the completion of Form A. The subcontractor must determine each individual in the subcontracting entity or the subcontracting entity's parent company that would cause the questions to be answered "Yes". Each form must be signed and dated by a person that is authorized to execute contracts for your organization. **Photocopied or stamped signatures are not acceptable**. The person signing can be, but does not have to be, the person for which the form is being completed. The subcontractor is responsible for the accuracy of any information provided.

If the answer to each of the above questions is "NO", then the NOT APPLICABLE STATEMENT on page 2 of Form A must be signed and dated by a person that is authorized to execute contracts for your company.

## RETURN WITH SUBCONTRACT

**Form B: Instructions for Identifying Other Contracts & Procurement Related Information**

Disclosure Form B must be completed for each subcontract submitted by the subcontracting entity. *Note: Checking the NOT APPLICABLE STATEMENT on Form A does not allow the subcontractor to ignore Form B. Form B must be completed, checked, and dated or the subcontract will not be approved.*

The Subcontractor shall identify, by checking Yes or No on Form B, whether it has any pending contracts, subcontracts, leases, bids, proposals, or other ongoing procurement relationship with any other (non-IDOT) State of Illinois agency. If "No" is checked, the subcontractor only needs to complete the check box on the bottom of Form B. If "Yes" is checked, the subcontractor must list all non-IDOT State of Illinois agency pending contracts, subcontracts, leases, bids, proposals, and other ongoing procurement relationships. These items may be listed on Form B or on an attached sheet(s). Contracts with cities, counties, villages, etc. are not considered State of Illinois agency contracts and are not to be included. Contracts or subcontracts with other State of Illinois agencies such as the Department of Natural Resources or the Capital Development Board must be included.

**RETURN WITH SUBCONTRACT**

# ILLINOIS DEPARTMENT OF TRANSPORTATION

## Form A
## Subcontractor: Financial Information & Potential Conflicts of Interest Disclosure

| | | |
|---|---|---|
| Subcontractor Name | | |
| Legal Address | | |
| City, State, Zip | | |
| Telephone Number | Email Address | Fax Number (if available) |

Disclosure of the information contained in this Form is required by the Section 50-35 of the Code (30 ILCS 500). Subcontractors desiring to enter into a subcontract of a State of Illinois contract must disclose the financial information and potential conflict of interest information as specified in this Disclosure Form. This information shall become part of the publicly available contract file. This Form A must be completed for subcontracts with a total value of $50,000 or more, from subcontractors identified in Section 20-120 of the Code, and for all open-ended contracts. **A publicly traded company may submit a 10K disclosure (or equivalent if applicable) in satisfaction of the requirements set forth in Form A. See Disclosure Form Instructions.**

***The current annual salary of the Governor is $177,412.00.***

**DISCLOSURE OF FINANCIAL INFORMATION**

**1. Disclosure of Financial Information.** The individual named below has an interest in the SUBCONTRACTOR (or its parent) in terms of ownership or distributive income share in excess of 5%, or an interest which has a value of more than 60% of the annual salary of the Governor. **(Make copies of this form as necessary and attach a separate Disclosure Form A for each individual meeting these requirements)**

**FOR INDIVIDUAL (type or print information)**

**NAME:** _____

**ADDRESS** _____

_____

**Type of ownership/distributable income share:**

stock _____ sole proprietorship _____ Partnership _____ other: (explain on separate sheet):

% or $ value of ownership/distributable income share: _____

**2. Disclosure of Potential Conflicts of Interest.** Check "Yes" or "No" to indicate which, if any, of the following potential conflict of interest relationships apply. If the answer to any question is "Yes", please attach additional pages and describe.

(a) State employment, currently or in the previous 3 years, including contractual employment of services.
Yes _____ No _____

If your answer is yes, please answer each of the following questions.

1. Are you currently an officer or employee of either the Capitol Development Board or the Illinois State Toll Highway Authority? Yes _____ No _____

2. Are you currently appointed to or employed by any agency of the State of Illinois? If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, provide the name the State agency for which you are employed and your annual salary _____
_____

3. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor? Yes _____ No _____

4. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15 % in the aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of two times the salary of the Governor? Yes _____ No _____

---

(b) State employment of spouse, father, mother, son, or daughter, including contractual employment services in the previous 2 years. Yes _____ No _____

If your answer is yes, please answer each of the following questions.

1. Is your spouse or any minor children currently an officer or employee of the Capitol Development Board or the Illinois State Toll Highway Authority? Yes _____ No _____

2. Is your spouse or any minor children currently appointed to or employed by any agency of the State of Illinois? If your spouse or minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, provide the name of your spouse and/or minor children, the name of the State agency for which he/she is employed and his/her annual salary. _____
_____

3. If your spouse or any minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of the salary of the Governor?
Yes _____ No _____

4. If your spouse or any minor children are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15 % in the aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 2 times the salary of the Governor? Yes _____ No _____

---

(c) Elective status; the holding of elective office of the State of Illinois, the government of the United States, any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois currently or in the previous 3 years. Yes _____ No _____

---

(d) Relationship to anyone holding elective office currently or in the previous 2 years; spouse, father, mother, son, or daughter. Yes _____ No _____

---

(e) Appointive office; the holding of any appointive government office of the State of Illinois, the United States of America, or any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois, which office entitles the holder to compensation in excess of the expenses incurred in the discharge of that office currently or in the previous 3 years. Yes _____ No _____

---

(f) Relationship to anyone holding appointive office currently or in the previous 2 years; spouse, father, mother, son, or daughter. Yes _____ No _____

---

(g) Employment, currently or in the previous 3 years, as or by any registered lobbyist of the State government.
Yes _____ No _____

---

(h) Relationship to anyone who is or was a registered lobbyist in the previous 2 years; spouse, father, mother, son, or daughter. Yes _____ No _____

(i) Compensated employment, currently or in the previous 3 years, by any registered election or reelection committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections. Yes _____ No _____

(j) Relationship to anyone; spouse, father, mother, son, or daughter; who was a compensated employee in the last 2 years by any registered election or re-election committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections. Yes _____ No _____

**3. Communication Disclosure.**

Disclose the name and address of each lobbyist and other agent of the bidder or offeror who is not identified in Section 2 of this form, who has communicated, is communicating, or may communicate with any State officer or employee concerning the bid or offer. This disclosure is a continuing obligation and must be promptly supplemented for accuracy throughout the process and throughout the term of the contract. If no person is identified, enter "None" on the line below:

Name and address of person(s): _____

**RETURN WITH SUBCONTRACT**

**4. Debarment Disclosure.** For each of the persons identified under Sections 2 and 3 of this form, disclose whether any of the following has occurred within the previous 10 years: debarment from contracting with any governmental entity; professional licensure discipline; bankruptcies; adverse civil judgments and administrative findings; and criminal felony convictions. This disclosure is a continuing obligation and must be promptly supplemented for accuracy throughout the procurement process and term of the contract. If no person is identified, enter "None" on the line below:

Name of person(s): _____

Nature of disclosure: _____

_____

_____

_____

**APPLICABLE STATEMENT**

**This Disclosure Form A is submitted on behalf of the INDIVIDUAL named on previous page. Under penalty of perjury, I certify the contents of this disclosure to be true and accurate to the best of my knowledge.**

Completed by: ☐ _____ _____

Signature of Individual or Authorized Officer — Date

**NOT APPLICABLE STATEMENT**

**Under penalty of perjury, I have determined that no individuals associated with this organization meet the criteria that would require the completion of this Form A.**

**This Disclosure Form A is submitted on behalf of the SUBCONTRACTOR listed on the previous page.**

☐ _____ _____

Signature of Authorized Officer — Date

**RETURN WITH SUBCONTRACT**

# ILLINOIS DEPARTMENT OF TRANSPORTATION

## Form B
## Subcontractor: Other Contracts & Procurement Related Information Disclosure

| | | |
|---|---|---|
| Subcontractor Name | | |
| Legal Address | | |
| City, State, Zip | | |
| Telephone Number | Email Address | Fax Number (if available) |

Disclosure of the information contained in this Form is required by the Section 50-35 of the Code (30 ILCS 500). This information shall become part of the publicly available contract file. This Form B must be completed for subcontracts with a total value of $50,000 or more, from subcontractors identified in Section 20-120 of the Code, and for all open-ended contracts.

**DISCLOSURE OF OTHER CONTRACTS, SUBCONTRACTS, AND PROCUREMENT RELATED INFORMATION**

**1. Identifying Other Contracts & Procurement Related Information**. The SUBCONTRACTOR shall identify whether it has any pending contracts, subcontracts, including leases, bids, proposals, or other ongoing procurement relationship with any other State of Illinois agency: Yes _____ No _____
**If "No" is checked,** the subcontractor only needs to complete the signature box on the bottom of this page.

**2. If "Yes" is checked.** Identify each such relationship by showing State of Illinois agency name and other descriptive information such as bid or project number (attach additional pages as necessary). SEE DISCLOSURE FORM INSTRUCTIONS:

**THE FOLLOWING STATEMENT MUST BE CHECKED**

☐ _____ _____
Signature of Authorized Officer Date

**OWNERSHIP CERITIFICATION**

Please certify that the following statement is true if the individuals for all submitted Form A disclosures do not total 100% of ownership.

Any remaining ownership interest is held by individuals receiving less than $106,447.20 of the bidding entity's or parent entity's distributive income or holding less than a 5% ownership interest.

☐ Yes ☐ No ☐ N/A (Form A disclosure(s) established 100% ownership)

Illinois Department of Transportation

# NOTICE TO BIDDERS

1. **TIME AND PLACE OF OPENING BIDS.** Sealed proposals for the improvement described herein will be received by the Department of Transportation at the Harry R. Hanley Building, 2300 South Dirksen Parkway in Springfield, Illinois until 10:00 o'clock a.m., April 26, 2013. All bids will be gathered, sorted, publicly opened and read in the auditorium at the Department of Transportation's Harry R. Hanley Building shortly after the 10:00 a.m. cut off time.

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

   **Contract No. SD057**
   **St. Louis Downtown Airport**
   **Cahokia, Illinois**
   **St. Clair County**
   **Illinois Project No. CPS-4210**
   **SBG Project No. 3-17-0039-B29**

   **Grade Ditch Parallel to Main Runway**

3. **INSTRUCTIONS TO BIDDERS**.

   (a) This Notice, the invitation for bids, proposal and letter of award shall, together with all other documents in accordance with Article 10-18 of the Illinois Standard Specifications for Construction of Airports, become part of the contract. Bidders are cautioned to read and examine carefully all documents, to make all required inspections, and to inquire or seek explanation of the same prior to submission of a bid.

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

4. **AWARD CRITERIA AND REJECTION OF BIDS**. This contract will be awarded within 60 calendar days to the lowest responsive and responsible bidder considering conformity with the terms and conditions established by the Department in the proposal and contract documents. The issuance of plans and proposal forms for bidding based upon a prequalification rating shall not be the sole determinant of responsibility. The Department reserves the right to determine responsibility at the time of award, to reject any or all proposals, to readvertise the proposed improvement, and to waive technicalities.

5. **PRE-BID CONFERENCE.** There will be a pre-bid conference held at N/A at the St. Louis Downtown Airport administration building. For engineering information, contact Barry Stolz, P.E. of Hanson Professional Services, Inc. at (314) 770-0467.

6. **DISADVANTAGED BUSINESS POLICY.** The DBE goal for this contract is 11.0%.

7. **SPECIFICATIONS AND DRAWINGS.** The work shall be done in accordance with the Illinois Standard Specifications for Construction of Airports, the Illinois Division of Aeronautics Supplemental Specifications and Recurring Special Provisions, the Special Provisions dated March 8, 2013 and the Construction Plans dated March 8, 2013 as approved by the Department of Transportation, Division of Aeronautics.

8. **BIDDING REQUIREMENTS AND BASIS OF AWARD.** When alternates are included in the proposal, the following shall apply:

   a. Additive Alternates

      (1) Bidders must submit a bid for the Base Bid and for all Additive Alternates.

      (2) Award of this contract will be made to the lowest responsible qualified bidder computed as follows:

      The lowest aggregate amount of (i) the Base Bid plus (ii) any Additive Alternate(s) which the Department elects to award.

      The Department may elect not to award any Additive Alternates. In that case, award will be to the lowest responsible qualified bidder of the Base Bid.

   b. Optional Alternates

      (1) Bidders must submit a bid for the Base Bid and for either Alternate A or Alternate B or for both Alternate A and Alternate B.

(2) Award of this contract will be made to the lowest responsible qualified bidder computed as follows:

The lower of the aggregate of either (i) the Base Bid plus Alternate A or (ii) the Base Bid plus Alternate B.

**9. CONTRACT TIME.** The Contractor shall complete all work within the specified contract time. Any calendar day extension beyond the specified contract time must be fully justified, requested by the Contractor in writing, and approved by the Engineer, or be subject to liquidated damages.

The contract time for this contract is Base Bid: 86 calendar days; Additive Alternate 1: 4 additional calendar days.

**10. INDEPENDENT WEIGHT CHECKS.** The Department reserves the right to conduct random unannounced independent weight checks on any delivery for bituminous, aggregate or other pay item for which the method of measurement for payment is based on weight. The weight checks will be accomplished by selecting, at random, a loaded truck and obtaining a loaded and empty weight on an independent scale. In addition, the department may perform random weight checks by obtaining loaded and empty truck weights on portable scales operated by department personnel.

**11. GOOD FAITH COMPLIANCE.** The Illinois Department of Transportation has made a good faith effort to include all statements, requirements, and other language required by federal and state law and by various offices within federal and state governments whether that language is required by law or not. If anything of this nature has been left out or if additional language etc. is later required, the bidder/contractor shall cooperate fully with the Department to modify the contract or bid documents to correct the deficiency. If the change results in increased operational costs, the Department shall reimburse the contractor for such costs as it may find to be reasonable.

By Order of the
Illinois Department of Transportation

Susan R. Shea, Ph.D.,
Director, Division of Aeronautics

ILLINOIS DEPARTMENT OF TRANSPORTATION
DIVISION OF AERONAUTICS

# REQUIRED CONTRACT PROVISIONS FOR FEDERALLY FUNDED AIRPORT CONSTRUCTION CONTRACTS

The work in this contract is included in the federal FAA Airport Improvement Program and is being undertaken and accomplished by the Illinois Department of Transportation, Division of Aeronautics and the Municipality, hereinafter called the Co-Sponsors, in accordance with the terms and conditions of a Grant Agreement between the Co-Sponsors and the United States, under the Airport and Airway Improvement Act of 1982 (Public Law 97-248; Title V, Section 501 et seq., September 3, 1982; 96 Stat. 671; codified at 49 U.S.C Section 2201 et seq.) and Part 152 of the Federal Aviation Regulations (14 CFR Part 152), pursuant to which the United States has agreed to pay a certain percentage of the costs of the Project that are determined to be allowable Project costs under the Act. The United States is not a party to this contract and no reference in this contract to FAA or representative thereof, or to any rights granted to the FAA or any representative thereof, or the United States, by the contract, makes the United States a party to this contract.

Consent of Assignment. The Contractor shall obtain the prior written consent of the Co-Sponsors to any proposed assignment of any interest in or part of this contract.

## Provisions for all Construction Contracts

### BUY AMERICAN PREFERENCE (Title 49 U.S.C., Chapter 501)

(a) The Aviation Safety and Capacity Expansion Act of 1990 provides that preference be given to steel and manufactured products produced in the United States when funds are expended pursuant to a grant issued under the Airport Improvement Program (AIP).

(b) Any and all steel products used in the performance of this contract by the Contractor, subcontractors, producers, and suppliers are required to adhere to the Illinois Steel Products Procurement Act, which requires that all steel items be of 100 percent domestic origin and manufacture. Any products listed under the Federal Aviation Administration's (FAA) nationwide approved list of "Equipment Meeting Buy American Requirements" shall be deemed as meeting the requirements of the Illinois Steel Products Procurement Act.

(c) The successful bidder will be required to assure that only domestic steel and domestically manufactured products will be used by the Contractor, subcontractors, producers, and suppliers in the performance of this contract. The North American Free Trade Agreement (NAFTA) specifically excluded federal grant programs such as the AIP. Therefore, NAFTA does not change the requirement to comply with the Buy American requirement in the Act. Exceptions to this are for products, other than steel, that:

(1) the FAA has determined, under the Aviation Safety and Capacity Expansion Act of 1990, are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality;

(2) the FAA has determined, under the Aviation Safety and Capacity Expansion Act of 1990, that domestic preference would be inconsistent with the public interest;

(3) the FAA has determined that inclusion of domestic material will increase the cost of the overall project contract by more than 25 percent; or

(4) the FAA has determined, under the Aviation Safety and Capacity Expansion Act of 1990,

(i) the cost of components and subcomponents produced in the United States is more than 60 percent of the cost of all components of the facility or equipment, and

(ii) final assembly of the facility or equipment has occurred in the United States.

The FAA must grant waivers for any items that are included in these above exceptions. Bidders can review items already approved under the FAA nationwide approved list of "Equipment Meeting Buy American Requirements" on the FAA website, which do not require a specific FAA waiver.

All waivers are the responsibility of the Contractor, must be obtained prior to the Notice to Proceed, and must be submitted to the Division of Aeronautics for review and approval before being forwarded to the FAA. Any products used on the project that cannot meet the domestic requirement, and for which a waiver prior to the Notice to Proceed was not obtained, will be rejected for use and subject to removal and replacement with no additional compensation, and the contractor deemed non-responsive.

## CIVIL RIGHTS ACT OF 1964, TITLE VI – CONTRACTOR CONTRACTUAL REQUIREMENTS (Title 49 CFR Part 21)

During the performance of this contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1.1 Compliance with Regulations. The contractor shall comply with the Regulations relative to nondiscrimination in federally assisted programs of the Department of Transportation (hereinafter, "DOT") Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

1.2 Nondiscrimination. The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

1.3 Solicitations for Subcontracts, Including Procurements of Materials and Equipment. In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

1.4 Information and Reports. The contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Co-Sponsors or the Federal Aviation Administration (FAA) to be pertinent to ascertain compliance with such Regulations, orders, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the Co-Sponsors or the FAA, as appropriate, and shall set forth what efforts it has made to obtain the information.

1.5 Sanctions for Noncompliance. In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the Co-Sponsor shall impose such contract sanctions as it or the FAA may determine to be appropriate, including, but not limited to:

a. Withholding of payments to the contractor under the contract until the contractor complies, and/or

b. Cancellation, termination, or suspension of the contract, in whole or in part.

1.6 Incorporation of Provisions. The contractor shall include the provisions of paragraphs 1 through 5 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the Co-Sponsor or the FAA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the Co-Sponsor to enter into such litigation to protect the interests of the Co-Sponsor and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

## AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, SECTION 520 - GENERAL CIVIL RIGHTS PROVISIONS (Title 49 U.S.C. 47123)

The contractor assures that it will comply with pertinent statutes, Executive orders and such rules as are promulgated to assure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or handicap be excluded from participating in any activity conducted with or benefiting from Federal assistance. This provision obligates the tenant/concessionaire/lessee or its transferee for the period during which Federal assistance is extended to the airport a program, except where Federal assistance is to provide, or is in the form of personal property or real property or interest therein or structures or improvements thereon. In these cases the provision obligates the party or any transferee for the longer of the following periods: (a) the period during which the property is used by the airport sponsor or any transferee for a purpose for which Federal assistance is extended, or for another purpose involving the provision of similar services or benefits or (b) the period during which the airport sponsor or any transferee retains ownership or possession of the property. In the case of contractors, this provision binds the contractors from the bid solicitation period through the completion of the contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.

## LOBBYING AND INFLUENCING FEDERAL EMPLOYEES (Title 49 CFR Part 20)

The undersigned bidder certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have paid or will be paid, by or behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an Officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

## ACCESS TO RECORDS AND REPORTS (Title 49 CFR Part 18.36)

The Contractor shall maintain an acceptable cost accounting system. The Co-Sponsors, the FAA, and the Comptroller General of the United States shall have access to any books, documents, paper, and records of the Contractor which are directly pertinent to the specific contract for the purposes of making an audit, examination, excerpts, and transcriptions. The Contractor shall maintain all required records for three years after the Co-Sponsor makes final payment and all other pending matters are closed.

## DISADVANTAGED BUSINESS ENTERPRISES (Title 49 CFR Part 26)

Contract Assurance (§26.13) - The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the recipient deems appropriate.

## ENERGY CONSERVATION REQUIREMENTS (Title 49 CFR Part 18.36)

The contractor agrees to comply with mandatory standards and policies relating to energy efficiency that are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Public Law 94-163)

## BREACH OF CONTRACT TERMS (Title 49 CFT Part 18.36)

Any violation or breach of terms of this contract on the part of the contractor or their subcontractors may result in the suspension or termination of this contract or such other action that may be necessary to enforce the rights of the parties of this agreement. The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

## RIGHTS TO INVENTIONS (Title 49 CFR Part 18.36)

All rights to inventions and materials generated under this contract are subject to Illinois law and to regulations issued by the FAA and the Co-Sponsors of the Federal grant under which this contract is executed.

## TRADE RESTRICTION CLAUSE (Title 49 CFR Part30)

The Contractor or subcontractor, by submission of an offer and/or execution of a contract, certifies that it:

a. is not owned or controlled by one or more citizens or nationals of a foreign country included in the list of countries that discriminate against U.S. firms published by the Office of the United States Trade Representative (USTR);

b. has not knowingly entered into any contract or subcontract for this project with a Contractor that is a citizen or national of a foreign country on said list, or is owned or controlled directly or indirectly by one or more citizens or nationals of a foreign country on said list.

c. has not procured any product nor subcontracted for the supply of any product for use on the project that is produced in a foreign country on said list.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to a Contractor or subcontractor who is unable to certify to the above. If the Contractor knowingly procures or subcontracts for the supply of any product or service of a foreign country on the said list for use on the project, the Federal Aviation Administration may direct, through the Co-Sponsors, cancellation of the contract at no cost to the Government.

Further, the Contractor agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in each contract and in all lower tier subcontracts. The Contractor may rely upon the certification of a prospective subcontractor unless it has knowledge that the certification is erroneous.

The Contractor shall provide immediate written notice to the Co-Sponsors if the Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The subcontractor agrees to provide immediate written notice to the Contractor, if at any time it learns that its certification was erroneous by reason of changed circumstances.

This certification is a material representation of fact upon which reliance was placed when making the award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous certification, the Federal Aviation Administration may direct, through this Co-Sponsor, cancellation of the contract or subcontract for default at no cost to the Government.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a Contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

## VETERAN'S PREFERENCE (Title 49 U.S.C. 47112)

In the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to Veterans of the Vietnam era and disabled veterans as defined in Section 515(c)(1) and (2) of the Airport and Airway Improvement Act of 1982. However, this preference shall apply only where the individuals are available and qualified to perform the work to which the employment relates.

## Additional Provisions for Construction Contracts Exceeding $2,000

## DAVIS BACON LABOR PROVISIONS (Title 29 Part 5)

(1) Minimum Wages.

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provision of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraph 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided*, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1)The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2)The classification is utilized in the area by the construction industry; and

(3)The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii) (B) or (C) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided*, That the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding.

The Federal Aviation Administration shall upon its own action or written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such work, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to the Federal Aviation Administration. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under paragraph 5.5(a)(3)(i) of Regulations, 29 CFR Part 5. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-

1), U.S. Government Printing Office, Washington, D.C. 20402. The prime Contractor is responsible for the submission of copies of payrolls by all subcontractors.

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor, or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be maintained under paragraph (3)(i) above and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The Contractor or subcontractor shall make the records required under paragraph (3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the (write the name of the agency) or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and Trainees

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as a apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration

shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ration permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contract will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

(5) Compliance with Copeland Act Requirements.

The Contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.

(6) Subcontracts.

The Contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR Part 5.5(a)(1) through (10) and such other clauses as the Federal Aviation Administration may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by an subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 5.5.

(7) Contract Termination: Debarment.

A breach of these contract clauses paragraphs (1) through (10) of this section may be grounds for termination of the contract and for debarment as a Contractor and a subcontractor as provided in 29 CFR Part 5.12.

(8) Compliance with Davis-Bacon and Related Act Requirements.

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by referenced in this contract.

(9) Disputes Concerning Labor Standards.

Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors ) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of Eligibility.

(i) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

## MINIMUM WAGES FOR FEDERAL AND FEDERALLY ASSISTED CONSTRUCTION CONTRACTS

This project is funded, in part, with Federal-aid funds and, as such, is subject to the provisions of the Davis-Bacon Act of March 3, 1931, as amended (46 Sta. 1494, as amended, 40 U.S.C. 276a) and of other Federal statutes referred to in a 29 CFR Part 1, Appendix A, as well as such additional statutes as may from time to time be enacted containing provisions for the payment of wages determined to be prevailing by the Secretary of Labor in accordance with the Davis-Bacon Act and pursuant to the provisions of 29 CFR Part 1. The prevailing rates and fringe benefits shown in the General Wage Determination Decisions issued by the U.S. Department of Labor shall, in accordance with the provisions of the foregoing statutes, constitute the minimum wages payable on Federal and federally assisted construction projects to laborers and mechanics of the specified classes engaged on contract work of the character and in the localities described therein.

General Wage Determination Decisions, modifications and supersedes decisions thereto are to be used in accordance with the provisions of 29 CFR Parts 1 and 5. Accordingly, the applicable decision, together with any modifications issued, must be made a part of every contract for performance of the described work within the geographic area indicated as required by an applicable DBRA Federal prevailing wage law and 29 CFR Part 5. The wage rates and fringe benefits contained in the General Wage Determination Decision shall be the minimum paid by contractors and subcontractors to laborers and mechanics.

**NOTICE**

The most current **General Wage Determination Decisions** (wage rates) are available on the IDOT web site. They are located on the Letting and Bidding page at http://www.dot.state.il.us/desenv/delett.html.

In addition, ten (10) days prior to the letting, the applicable Federal wage rates will be e-mailed to subscribers. It is recommended that all contractors subscribe to the Federal Wage Rates List or the Contractor's Packet through IDOT's subscription service.

PLEASE NOTE: if you have already subscribed to the Contractor's Packet you will automatically receive the Federal Wage Rates.

The instructions for subscribing are at http://www.dot.state.il.us/desenv/subsc.html.

If you have any questions concerning the wage rates, please contact IDOT's Chief Contract Official at 217-782-7806.

## Additional Provisions for Construction Contracts Exceeding $10,000

## EQUAL EMPLOYMENT OPPORTUNITY - 41 CFR PART 60-1.4(b)

During the performance of this contract, the contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.

3. The contractor will send to each labor union or representative of workers with which s/he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

4. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.

5. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

6. In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedure authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

7. The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provision, including sanctions for noncompliance: *Provided, however,* that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States.

## CERTIFICATION OF NONSEGREGATED FACILITIES (41 CFR PART 60-1.8)

The federally-assisted construction contractor certifies that she or he does not maintain or provide, for his employees, any segregated facilities at any of his establishments and that she or he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally-assisted construction contractor certifies that she or he will not

maintain or provide, for his employees, segregated facilities at any of his establishments and that she or he will not permit his employees to perform their services at any location under his control where segregated facilities are maintained. The federally-assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract.

As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms, and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directives or are, in fact, segregated on the basis of race, color, religion, or national origin because of habit, local custom, or any other reason. The federally-assisted construction contractor agrees that (except where she or he has obtained identical certifications from proposed subcontractors for specific time periods) she or he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause and that she or he will retain such certifications in his files.

## NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION (Title 41 CFR Part 60-4.2)

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

APPENDIX A

The following goal for female utilization in each construction craft and trade shall apply to all Contractors holding Federal and federally assisted construction contracts and subcontracts in excess of $10,000. The goal is applicable to the Contractor's total on-site construction workforce, regardless of whether or not part of that workforce is performing work on a Federal, federally assisted or nonfederally related construction contact or subcontract.

AREA COVERED (STATEWIDE)

Goals for Women apply nationwide.

GOAL

| | Goal (percent) |
|---|---|
| Female Utilization..... | 6.9 |

APPENDIX B

Until further notice, the following goals for minority utilization in each construction craft and trade shall apply to all Contractors holding Federal and federally-assisted construction contracts and subcontracts in excess of $10,000. to be performed in the respective geographical areas. The goals are applicable to the Contractor's total on-site construction workforce, regardless of whether or not part of that workforce is performing work on a Federal, federally-assisted or nonfederally related construction contract or subcontract.

| Economic Area | Goal (percent) |
|---|---|
| 056 Paducah, KY:<br>Non-SMSA Counties -<br>IL - Hardin, Massac, Pope<br>KY - Ballard, Caldwell, Calloway, Carlisle, Crittenden,<br>Fulton, Graves, Hickman, Livingston, Lyon, McCracken, Marshall | 5.2 |
| 080 Evansville, IN:<br>Non-SMSA Counties -<br>IL - Edwards, Gallatin, Hamilton, Lawrence, Saline, Wabash, White<br>IN - Dubois, Knox, Perry, Pike, Spencer<br>KY - Hancock, Hopkins, McLean, Mublenberg, Ohio, Union, Webster | 3.5 |
| 081 Terre Haute, IN:<br>Non-SMSA Counties -<br>IL - Clark, Crawford<br>IN - Parke | 2.5 |

083 Chicago, IL:
SMSA Counties: 19.6
1600 Chicago, IL -
IL - Cook, DuPage, Kane, Lake, McHenry, Will

3740 Kankakee, IL - 9.1
IL - Kankakee

Non-SMSA Counties 18.4
IL - Bureau, DeKalb, Grundy, Iroquois, Kendall, LaSalle, Livingston, Putnam
IN - Jasper, Laporte, Newton, Pulaski, Starke

084 Champaign - Urbana, IL:
SMSA Counties:
1400 Champaign - Urbana - Rantoul, IL - 7.8
IL - Champaign

Non-SMSA Counties - 4.8
IL - Coles, Cumberland, Douglas, Edgar, Ford, Piatt, Vermilion

085 Springfield - Decatur, IL:
SMSA Counties:
2040 Decatur, IL - 7.6
IL - Macon

7880 Springfield, IL - 4.5
IL - Mendard, Sangamon

Non-SMSA Counties 4.0
IL - Cass, Christian, Dewitt, Logan, Morgan, Moultrie, Scott, Shelby

086 Quincy, IL:
Non-SMSA Counties 3.1

IL - Adams, Brown, Pike
MO - Lewis, Marion, Pike, Ralls

087 Peoria, IL:
SMSA Counties:
1040 Bloomington - Normal, IL - 2.5
IL - McLean

6120 Peoria, IL - 4.4
IL - Peoria, Tazewell, Woodford

Non-SMSA Counties - 3.3
IL - Fulton, Knox, McDonough, Marshall, Mason, Schuyler, Stark, Warren

088 Rockford, IL:
SMSA Counties:
6880 Rockford, IL - 6.3
IL - Boone, Winnebago

Non-SMSA Counties - 4.6
IL - Lee, Ogle, Stephenson

098 Dubuque, IA:
Non-SMSA Counties - 0.5
IL - JoDaviess
IA - Atlamakee, Clayton, Delaware, Jackson, Winnesheik
WI - Crawford, Grant, Lafayette

099 Davenport, Rock Island, Moline, IA - IL:
SMSA Counties:
1960 Davenport, Rock Island, Moline, IA - IL - 4.6
IL - Henry, Rock Island
IA - Scott

Non-SMSA Counties - 3.4
IL - Carroll, Hancock, Henderson, Mercer, Whiteside
IA - Clinton, DesMoines, Henry, Lee, Louisa, Muscatine
MO - Clark

107 St. Louis, MO:
SMSA Counties:
7040 St. Louis, MO - IL - 14.7
IL - Clinton, Madison, Monroe, St. Clair
MO - Franklin, Jefferson, St. Charles, St. Louis, St. Louis City

Non-SMSA Counties - 11.4
IL - Alexander, Bond, Calhoun, Clay, Effingham, Fayette, Franklin, Greene, Jackson, Jasper, Jefferson, Jersey, Johnson, Macoupin, Marion, Montgomery, Perry, Pulaski, Randolph, Richland, Union, Washington, Wayne, Williamson
MO - Bollinger, Butler, Cape Girardeau, Carter, Crawford, Dent, Gasconade, Iron, Lincoln, Madison, Maries, Mississippi, Montgomery, Perry, Phelps, Reynolds, Ripley, St. Francois, St. Genevieve, Scott, Stoddard, Warren, Washington, Wayne

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

The Contractor's compliance with Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the provisions and specifications set forth in its federally assisted contracts, and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Illinois Division of Aeronautics will provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction contract and/or subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. This notification will list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is the entire State of Illinois for the goal set forth in APPENDIX A and the county or counties in which the work is located for the goals set forth in APPENDIX B.

**EQUAL EMPLOYMENT OPPORTUNITY SPECIFICATION (Title 41 CFR Part 60-4.3)**

1. As used in these specifications:
   a) "Covered area" means the geographical area described in the solicitation from which this contract resulted;
   b) "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
   c) "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941;
   d) "Minority" includes:
      (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
      (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
      (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
      (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000. the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction Contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

   a) Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working as such sites or in such facilities.

   b) Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

   c) Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractors may have taken.

   d) Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

   e) Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

f) Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreements; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g) Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents, General Foreman, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h) Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i) Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship of other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j) Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.

k) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m) Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n) Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o) Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction Contractors and suppliers, including circulation of solicitations to minority and female Contractor associations and other business associations.

p) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a Contractor association, joint Contractor-union, Contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specified minority group of women is underutilized).

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy his requirement, Contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

**TERMINATION OF CONTRACT (Title 49 CFR Part 18.36)**

1. The Co-Sponsor may, by written notice, terminate this contract in whole or in part at any time, either for the Co-Sponsor's convenience or because of failure to fulfill the contract obligations. Upon receipt of such notice services shall be immediately discontinued (unless the notice directs otherwise) and all materials as may have been accumulated in performing this contract, whether completed or in progress, delivered to the Co-Sponsor.

2. If the termination is for the convenience of the Co-Sponsor, an equitable adjustment in the contract price shall be made, but no amount shall be allowed for anticipated profit on unperformed services.

3. If the termination is due to failure to fulfill the Contractor's obligations, the Co-Sponsor may take over the work and prosecute the same to completion by contract or otherwise. In such case, the Contractor shall be liable to the Co-Sponsor for any additional cost occasioned to the Co-Sponsor thereby.

4. If, after notice of termination for failure to fulfill contract obligations, it is determined that the Contractor had not so failed, the termination shall be deemed to have been effected for the convenience of the Co-Sponsor. In such event, adjustment in the contract price shall be made as provided in paragraph 2 of this clause.

5. The rights and remedies of the Co-Sponsor provided in this clause are in addition to any other rights and remedies provided by law or under this contract.

**Additional Provisions for Construction Contracts Exceeding $25,000**

**CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION (Title 49 CFR Part 29)**

Instructions for Certification

1. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

2. The inability of a person to provide the certification required below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such person from participation in this transaction.

3. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

4. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if at any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

5. The terms "covered transaction" "debarred" "suspended" "ineligible" "lower tier covered transaction" "participant" "person" "primary covered transaction" "principal" "proposal" and "voluntarily excluded" as used in this clause have the meaning set out in the Definitions and Coverage sections of the rules implementing Executive Order 12540. You may contact the department or agency to which this proposal is being submitted for assistance in obtaining a copy of those regulations.

6. The prospective primary participant agrees by submitting this proposal that should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction unless authorized by the department or agency entering into this transaction.

7. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Transaction", provided by the department or agency entering into this covered transaction without modification in all lower covered transactions and in all solicitations for lower covered transactions.

8. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to check the Nonprocurement List (Tel. #).

9. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

10. Except for transactions authorized under paragraph 8 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion**
**Primary Covered Transactions**

1. The prospective primary participant certifies to the best of its knowledge and belief that it and its principals:

   a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by an Federal department or agency;

   b. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain or performing a public (Federal, State or Local) transaction or contract under a public transaction: violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction or destruction of records, making false statements, or receiving stolen property;

   c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

   d. Have not within a three-period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

EACH PRIME CONTRACTOR SHALL INSERT IN EACH SUBCONTRACT THE CERTIFICATION IN APPENDIX B, AND FURTHER, SHALL REQUIRE ITS INCLUSION IN ANY LOWER TIER SUBCONTRACT, PURCHASE ORDER, OR TRANSACTION THAT MAY IN TURN BE MADE.

Appendix B of 49 CFR Part 29

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions

This certification applies to subcontractors, material suppliers, vendors and other lower tier participants.

Instructions for Certification

1. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction, "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

6. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion**
**Lower Tier Covered Transactions**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

## Additional Provisions for Construction Contracts Exceeding $100,000

## CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS (Title 29 CFR Part 5)

(1) Overtime requirements:

No Contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen or guards (including apprentices and trainees described in paragraphs 5 and 6 above) shall require or permit any laborer, mechanic, watchman or guard in any workweek in which he/she is employed on such work, to work

in excess of 40 hours in such workweek unless such laborer, mechanic, watchman or guard receives compensation at a rate not less than one and one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) Violations: Liability for Unpaid Wages; Liquidated Damages:

In the event of any violation of the clause set forth in paragraph (1) above, the Contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) above, in the sum of $10.00 for each calendar day on which such employee was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in paragraph (1) above.

(3) Withholding for Unpaid Wages and Liquidated Damages.

The Federal Aviation Administration or the Co-Sponsor shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any other Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) above.

(4) Subcontracts.

The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

(5) Working Conditions.

No Contractor or subcontractor may require any laborer or mechanic employed in the performance of any contract to work in surroundings or under working conditions that are unsanitary, hazardous, or dangerous to his health or safety as determined under construction safety and health standards (29 CFR 1926) issued by Department of Labor.

**CLEAN AIR AND WATER POLLUTION CONTROL (Title 49 CFR Part 18.36(i)(12))**

In connection with the administration of the Clean Air Act and the Water Pollution Control Act with respect to Federal Grants, specific requirements have been imposed of any contract which is not exempt under the provisions of 40 CFR 15.5.

(1) Any facility listed on the EPA List of Violating Facilities pursuant to Paragraph 15.20 of 40 CFR as of the date of the contract award will not be utilized in the performance of any non-exempt contract or subcontract.

(2) The Contractor shall comply with all the requirements of Section 114 of the Clean Air Act, as amended, 42 USC 1857 et seq. and Section 308 of the Federal Water Pollution Control Act, as amended, 33 USC 1251 et seq. relating to inspection, monitoring, entry, reports and information, as well as all other requirements specified in Section 114 and Section 308 of the Air Act and Water Act, respectively, and all regulations and guidelines issued thereunder after the award of the contract.

(3) Prompt notification shall be required prior to contract award to the awarding official by the Contractor who will receive the award of the receipt of any communication from the Director, Office of Federal Activities, U.S. Environmental Protection Agency, indicating that a facility to be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.

(4) The Contractor shall include or cause to be included the criteria and requirements in paragraphs 1 through 4 in any non-exempt subcontract and will take such action as the Government may direct as a means of enforcing such provisions.

ILLINOIS DEPARTMENT OF TRANSPORTATION
DIVISION OF AERONAUTICS

# REQUIRED CONTRACT PROVISIONS FOR STATE FUNDED AIRPORT CONSTRUCTION PROJECTS

The following provisions are State of Illinois requirements and are in addition to the REQUIRED CONTRACT PROVISIONS FOR FEDERALLY FUNDED AIRPORT CONSTRUCTION CONTRACTS

## DISADVANTAGED BUSINESS POLICY

NOTICE: This proposal contains the special provision entitled "Disadvantaged Business Participation." Inclusion of this Special Provision in this contract satisfies the obligations of the Department of Transportation under federal law as implemented by 49 CFR 23 and under the Illinois "Minority and Female Business Enterprise Act."

POLICY: It is public policy that the businesses defined in 49 CFR Part 23 shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with State or Federal funds. Consequently, the requirements of 49 CFR Part 23 apply to this contract.

OBLIGATION: The Contractor agrees to ensure that the businesses defined in 49 CFR Part 23 have the maximum opportunity to participate in the performance of this contract. In this regard, the Contractor shall take all necessary and reasonable steps, in accordance with 49 CFR Part 23, to ensure that the said businesses have the maximum opportunity to compete for and perform portions of this contract. The Contractor shall not discriminate on the basis of race, color, national origin, or sex in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

The Contractor shall include the above Policy and Obligation statements of this Special Provision in every subcontract, including procurement of materials and leases of equipment.

DBE/WBE CONTRACTOR FINANCE PROGRAM: On contracts where a loan has been obtained through the DBE/WBE Contractor Finance Program, the Contractor shall cooperate with the Department by making all payments due to the DBE/WBE Contractor by means of a two-payee check payable to the Lender (Bank) and the Borrower (DBE/WBE Contractor).

BREACH OF CONTRACT: Failure to carry out the requirements set forth above and in the Special Provision shall constitute a breach of contract and may result in termination of the contract or liquidated damages as provided in the special provision.

## SPECIAL PROVISION FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
**Revised: August 2, 2011**

FEDERAL OBLIGATION: The Department of Transportation, as a recipient of federal financial assistance, is required to take all necessary and reasonable steps to ensure nondiscrimination in the award and administration of contracts. Consequently, the federal regulatory provisions of 49 CFR part 26 apply to this contract concerning the utilization of disadvantaged business enterprises. For the purposes of this Special Provision, a disadvantaged business enterprise (DBE) means a business certified by the Department in accordance with the requirements of 49 CFR part 26 and listed in the Illinois Unified Certification Program (IL UCP) DBE Directory

STATE OBLIGATION. This Special Provision will also be used by the Department to satisfy the requirements of the Business Enterprise for Minorities, Females, and Persons with Disabilities Act, 30 ILCS 575. When this Special Provision is used to satisfy state law requirements on 100 percent state-funded contracts, the federal government has no involvement in such contracts (not a federal-aid contract) and no responsibility to oversee the implementation of this Special Provision by the Department on those contracts. DBE participation on 100 percent state-funded contracts will not be credited toward fulfilling the Department's annual overall DBE goal required by the US Department of Transportation to comply with the federal DBE program requirements.

CONTRACTOR ASSURANCE: The Contractor makes the following assurance and agrees to include the assurance in each subcontract that the Contractor signs with a subcontractor:

> The Contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of contracts funded in whole or in part with federal or state funds. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate.

OVERALL GOAL SET FOR THE DEPARTMENT: As a requirement of compliance with 49 CFR part 26, the Department has set an overall goal for DBE participation in its federally assisted contracts. That goal applies to all federal-aid funds the Department will expend in its federally assisted contracts for the subject reporting fiscal year. The Department is required to make a good faith effort to

achieve the overall goal. The dollar amount paid to all approved DBE companies performing work called for in this contract is eligible to be credited toward fulfillment of the Department's overall goal.

CONTRACT GOAL TO BE ACHIEVED BY THE CONTRACTOR: This contract includes a specific DBE utilization goal established by the Department. The goal has been included because the Department has determined that the work of this contract has subcontracting opportunities that may be suitable for performance by DBE companies. This determination is based on an assessment of the type of work, the location of the work, and the availability of DBE companies to do a part of the work. The assessment indicates that, in the absence of unlawful discrimination, and in an arena of fair and open competition, DBE companies can be expected to perform **11.0%** of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set forth in this Special Provision:

(a) The bidder documents that enough DBE participation has been obtained to meet the goal; or

(b) The bidder documents that a good faith effort has been made to meet the goal, even though the effort did not succeed in obtaining enough DBE participation to meet the goal.

DBE LOCATOR REFERENCES: Bidders shall consult the IL UCP DBE Directory as a reference source for DBE-certified companies. In addition, the Department maintains a letting and item specific DBE locator information system whereby DBE companies can register their interest in providing quotes on particular bid items advertised for letting. Information concerning DBE companies willing to quote work for particular contracts may be obtained by contacting the Department's Bureau of Small Business Enterprises at telephone number (217)785-4611, or by visiting the Department's web site at www.dot.il.gov .

BIDDING PROCEDURES. Compliance with this Special Provision is a material bidding requirement. The failure of the bidder to comply will render the bid not responsive.

(a) The bidder shall submit a Disadvantaged Business Utilization Plan on Department forms SBE 2025 and 2026 with the bid.

(b) The Utilization Plan shall indicate that the bidder either has obtained sufficient DBE participation commitments to meet the contract goal or has not obtained enough DBE participation commitments in spite of a good faith effort to meet the goal. The Utilization Plan shall further provide the name, telephone number and telefax number of a responsible official of the bidder designated for purposes of notification of plan approval or disapproval under the procedures of this Special Provision.

(c) The Utilization Plan shall include a DBE Participation Commitment Statement, Department form SBE 2025, for each DBE proposed for the performance of work to achieve the contract goal. For bidding purposes, submission of the completed SBE 2025 forms, signed by the DBEs and faxed to the bidder will be acceptable as long as the original is available and provided upon request. All elements of information indicated on the said form shall be provided, including but not limited to the following:

(1) The name and address of DBE firms that will participate in the contract;

(2) A description, including pay item numbers, of the work each DBE will perform;

(3) The dollar amount of the participation of each DBE firm participating. The dollar amount of participation for identified work shall specifically state the quantity, unit price and total subcontract price for the work to be completed by the DBE. If partial pay items are to be performed by the DBE, indicate the portion of each item, a unit price where appropriate and the subcontract price amount;

(4) DBE Participation Commitment Statements, form SBE 2025, signed by the bidder and each participating DBE firm documenting the commitment to use the DBE subcontractors whose participation is submitted to meet the contract goal;

(5) If the bidder is a joint venture comprised of DBE companies and non-DBE companies, the plan must also include a clear identification of the portion of the work to be performed by the DBE partner(s); and,

(6) If the contract goal is not met, evidence of good faith efforts.

GOOD FAITH EFFORT PROCEDURE. The contract will not be awarded until the Utilization Plan submitted by the apparent successful bidder is approved. All information submitted by the bidder must be complete, accurate and adequately document that enough DBE participation has been obtained or document the good faith efforts of the bidder, in the event enough DBE participation has not been obtained, before the Department will commit to the performance of the contract by the bidder. The Utilization Plan will be approved by the Department if the Utilization Plan commits sufficient commercially useful DBE work performance to meet the contract goal or the bidder submits sufficient documentation of a good faith effort to meet the contract goal pursuant to 49 CFR part 26, Appendix A.

The Utilization Plan will not be approved by the Department if the Utilization Plan does not commit sufficient DBE participation to meet the contract goal unless the apparent successful bidder documented in the Utilization Plan that it made a good faith effort to meet the goal. This means that the bidder must show that all necessary and reasonable steps were taken to achieve the contract goal. Necessary and reasonable steps are those which, by their scope, intensity and appropriateness to the objective, could reasonably be

expected to obtain sufficient DBE participation, even if they were not successful. The Department will consider the quality, quantity, and intensity of the kinds of efforts that the bidder has made. Mere *pro forma* efforts, in other words, efforts done as a matter of form, are not good faith efforts; rather, the bidder is expected to have taken genuine efforts that would be reasonably expected of a bidder actively and aggressively trying to obtain DBE participation sufficient to meet the contract goal.

(a) The following is a list of types of action that the Department will consider as part of the evaluation of the bidder's good faith efforts to obtain participation. These listed factors are not intended to be a mandatory checklist and are not intended to be exhaustive. Other factors or efforts brought to the attention of the Department may be relevant in appropriate cases, and will be considered by the Department.

(1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBE companies that have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBE companies to respond to the solicitation. The bidder must determine with certainty if the DBE companies are interested by taking appropriate steps to follow up initial solicitations.

(2) Selecting portions of the work to be performed by DBE companies in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime Contractor might otherwise prefer to perform these work items with its own forces.

(3) Providing interested DBE companies with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

(4) a. Negotiating in good faith with interested DBE companies. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBE companies that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBE companies to perform the work.

b. A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBE companies is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable.

Also, the ability or desire of a bidder to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidders are not, however, required to accept higher quotes from DBE companies if the price difference is excessive or unreasonable.

(5) Not rejecting DBE companies as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.

(6) Making efforts to assist interested DBE companies in obtaining bonding, lines of credit, or insurance as required by the recipient or Contractor.

(7) Making efforts to assist interested DBE companies in obtaining necessary equipment, supplies, materials, or related assistance or services.

(8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBE companies.

(b) If the Department determines that the apparent successful bidder has made a good faith effort to secure the work commitment of DBE companies to meet the contract goal, the Department will award the contract provided that it is otherwise eligible for award. If the Department determines that the bidder has failed to meet the requirements of this Special Provision and that a good faith effort has not been made, the Department will notify the responsible company official designated in the Utilization Plan that the bid is not responsive. The notification shall include a statement of reasons why good faith efforts have not been found.

(c) The bidder may request administrative reconsideration of a determination adverse to the bidder within the five working days after receipt of the notification date of the determination by delivering the request to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764 (Telefax: (217)785-1524). Deposit of the request in the United States mail on or before the fifth business day shall not be deemed delivery. The determination shall become final if a request is not made and delivered. A request may provide additional written documentation and/or argument concerning the issues raised in the determination statement of reasons, provided the documentation and arguments address efforts made prior to submitting the bid. The request will be forwarded to

the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person in order to consider all issues of whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten working days after receipt of the request for reconsideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

CALCULATING DBE PARTICIPATION. The Utilization Plan values represent work anticipated to be performed and paid for upon satisfactory completion. The Department is only able to count toward the achievement of the overall goal and the contract goal the value of payments made for the work actually performed by DBE companies. In addition, a DBE must perform a commercially useful function on the contract to be counted. A commercially useful function is generally performed when the DBE is responsible for the work and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. The Department and Contractor are governed by the provisions of 49 CFR part 26.55(c) on questions of commercially useful functions as it affects the work. Specific counting guidelines are provided in 49 CFR part 26.55, the provisions of which govern over the summary contained herein.

(a) DBE as the Contractor: 100 percent goal credit for that portion of the work performed by the DBE's own forces, including the cost of materials and supplies. Work that a DBE subcontracts to a non-DBE does not count toward the DBE goals.

(b) DBE as a joint venture Contractor: 100 percent goal credit for that portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work performed by the DBE's own forces.

(c) DBE as a subcontractor: 100 percent goal credit for the work of the subcontract performed by the DBE's own forces, including the cost of materials and supplies, excluding the purchase of materials and supplies or the lease of equipment by the DBE subcontractor from the prime Contractor or its affiliates. Work that a DBE subcontractor in turn subcontracts to a non-DBE does not count toward the DBE goal.

(d) DBE as a trucker: 100 percent goal credit for trucking participation provided the DBE is responsible for the management and supervision of the entire trucking operation for which it is responsible. At least one truck owned, operated, licensed, and insured by the DBE must be used on the contact. Credit will be given for the following:

(1) The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.

(2) The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement.

(e) DBE as a material supplier:

(1) 60 percent goal credit for the cost of the materials or supplies purchased from a DBE regular dealer.

(2) 100 percent goal credit for the cost of materials or supplies obtained from a DBE manufacturer.

(3) 100 percent credit for the value of reasonable fees and commissions for the procurement of materials and supplies if not a regular dealer or manufacturer.

CONTRACT COMPLIANCE. Compliance with this Special Provision is an essential part of the contract. The Department is prohibited by federal regulations from crediting the participation of a DBE included in the Utilization Plan toward either the contract goal or the Department's overall goal until the amount to be applied toward the goals has been paid to the DBE. The following administrative procedures and remedies govern the compliance by the Contractor with the contractual obligations established by the Utilization Plan. After approval of the Utilization Plan and award of the contract, the Utilization Plan and individual DBE Participation Statements become part of the contract. If the Contractor did not succeed in obtaining enough DBE participation to achieve the advertised contract goal, and the Utilization Plan was approved and contract awarded based upon a determination of good faith, the total dollar value of DBE work calculated in the approved Utilization Plan as a percentage of the awarded contract value shall become the amended contract goal. All work indicated for performance by an approved DBE shall be performed, managed, and supervised by the DBE executing the Participation Statement.

(a) NO AMENDMENT. No amendment to the Utilization Plan may be made without prior written approval from the Department's Bureau of Small Business Enterprises. All requests for amendment to the Utilization Plan shall be submitted to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764. Telephone number (217) 785-4611. Telefax number (217) 785-1524.

(b) TERMINATION OR REPLACEMENT. The Contractor shall not terminate or replace a DBE listed on the approved Utilization Plan, or perform with other forces work designated for a listed DBE except as provided in the Special Provision.

(c) CHANGES TO WORK. Any deviation from the DBE condition-of-award or contract plans, specifications, or special provisions must be approved, in writing, by the Department as provided elsewhere in the Contract. The Contractor shall notify affected

DBEs in writing of any changes in the scope of work which result in a reduction in the dollar amount condition-of-award to the contract. Where the revision includes work committed to a new DBE subcontractor, not previously involved in the project, then a Request for Approval of Subcontractor, Department form BC 260A, must be signed and submitted. If the commitment of work is in the form of additional tasks assigned to an existing subcontract, then a new Request for Approval of Subcontractor shall not be required. However, the Contractor must document efforts to assure that the existing DBE subcontractor is capable of performing the additional work and has agreed in writing to the change.

(d) ALTERNATIVE WORK METHODS. In addition to the above requirements for reductions in the condition of award, additional requirements apply to the two cases of Contractor-initiated work substitution proposals. Where the contract allows alternate work methods which serve to delete or create underruns in condition of award DBE work, and the Contractor selects that alternate method or, where the Contractor proposes a substitute work method or material that serves to diminish or delete work committed to a DBE and replace it with other work, then the Contractor must demonstrate one of the following:

(1) That the replacement work will be performed by the same DBE (as long as the DBE is certified in the respective item of work) in a modification of the condition of award; or

(2) That the DBE is aware that its work will be deleted or will experience underruns and has agreed in writing to the change. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so; or

(3) That the DBE is not capable of performing the replacement work or has declined to perform the work at a reasonably competitive price. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so.

(e) TERMINATION AND REPLACEMENT PROCEDURES. The Contractor shall not terminate or replace a DBE subcontractor listed in the approved Utilization Plan without prior written consent. This includes, but is not limited to, instances in which the Contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm. Written consent will be granted only if the Bureau of Small Business Enterprises agrees, for reasons stated in its concurrence document, that the Contractor has good cause to terminate or replace the DBE firm. Before transmitting to the Bureau of Small Business Enterprises any request to terminate and/or substitute a DBE subcontractor, the Contractor shall give notice in writing to the DBE subcontractor, with a copy to the Bureau, of its intent to request to terminate and/or substitute, and the reason for the request. The Contractor shall give the DBE five days to respond to the Contractor's notice. The DBE so notified shall advise the Bureau and the Contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why the Bureau should not approve the Contractor's action. If required in a particular case as a matter of public necessity, the Bureau may provide a response period shorter than five days.

For purposes of this paragraph, good cause includes the following circumstances:

(1) The listed DBE subcontractor fails or refuses to execute a written contract;

(2) The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime contractor;

(3) The listed DBE subcontractor fails or refuses to meet the prime Contractor's reasonable, nondiscriminatory bond requirements;

(4) The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;

(5) The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant to CFR Parts 180, 215 and 1200 or applicable state law;

(6) You have determined that the listed DBE subcontractor is not a responsible contractor;

(7) The listed DBE subcontractor voluntarily withdraws from the projects and provides to you written notice of its withdrawal;

(8) The listed DBE is ineligible to receive DBE credit for the type of work required;

(9) A DBE owner dies or becomes disabled with the result that the listed DBE contractor is unable to complete its work on the contract;

(10) Other documented good cause that compels the termination of the DBE subcontractor. Provided, that good cause does not exist if the prime Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the prime Contractor can self-perform the work for which the DBE contractor was engaged or so that the prime Contractor can substitute another DBE or non-DBE contractor after contract award.

When a DBE is terminated, or fails to complete its work on the contract for any reason the Contractor shall make a good faith effort to find another DBE to substitute for the original DBE to perform at least the same amount of work under the contract as the terminated DBE to the extent needed to meet the established contract goal.

(f) PAYMENT RECORDS. The Contractor shall maintain a record of payments for work performed to the DBE participants. The records shall be made available to the Department for inspection upon request. After the performance of the final item of work or delivery of material by a DBE and final payment therefore to the DBE by the Contractor, but not later than thirty calendar days after payment has been made by the Department to the Contractor for such work or material, the Contractor shall submit a DBE Payment Agreement on Department form SBE 2115 to the Regional Engineer. If full and final payment has not been made to the DBE, the DBE Payment Agreement shall indicate whether a disagreement as to the payment required exists between the Contractor and the DBE or if the Contractor believes that the work has not been satisfactorily completed. If the Contractor does not have the full amount of work indicated in the Utilization Plan performed by the DBE companies indicated in the Utilization Plan and after good faith efforts are reviewed, the Department may deduct from contract payments to the Contractor the amount of the goal not achieved as liquidated and ascertained damages. The Contractor may request an administrative reconsideration of any amount deducted as damages pursuant to subsection (h) of this part.

(g) ENFORCEMENT. The Department reserves the right to withhold payment to the Contractor to enforce the provisions of this Special Provision. Final payment shall not be made on the contract until such time as the Contractor submits sufficient documentation demonstrating achievement of the goal in accordance with this Special Provision or after liquidated damages have been determined and collected.

(h) RECONSIDERATION. Notwithstanding any other provision of the contract, including but not limited to Article 50-17 of the Standard Specifications, the Contractor may request administrative reconsideration of a decision to deduct the amount of the goal not achieved as liquidated damages. A request to reconsider shall be delivered to the Contract Compliance Section and shall be handled and considered in the same manner as set forth in paragraph (c) of "Good Faith Effort Procedures" of this Special Provision, except a final decision that a good faith effort was not made during contract performance to achieve the goal agreed to in the Utilization Plan shall be the final administrative decision of the Department.

## SPECIAL PROVISION FOR SUBCONTRACTOR MOBILIZATION PAYMENTS
**Revised: April 1, 2011**

To account for the preparatory work and the operations necessary for the movement of subcontractor personnel, equipment, supplies, and incidentals to the project site and for all other work or operations that must be performed or costs incurred when beginning work approved for subcontracting according to Section 80-01 of the Standard Specifications, the Contractor shall make a mobilization payment to each subcontractor.

This mobilization payment shall be made at least 14 days prior to the subcontractor starting work. The amount paid shall be equal to 3 percent of the amount of the subcontract reported on form AER 260A submitted for the approval of the subcontractor's work.

The mobilization payment to the subcontractor is an advance payment of the reported amount of the subcontract and is not a payment in addition to the amount of the subcontract; therefore, the amount of the advance payment will be deducted from future progress payments.

This provision shall be incorporated directly or by reference into each subcontract approved by the Department

## SPECIAL PROVISION FOR PAYMENTS TO SUBCONTRACTORS
**Revised: January 1, 2006**

Federal regulations found at 49 CFR §26.29 mandate the Department to establish a contract clause to require Contractors to pay subcontractors for satisfactory performance of their subcontracts and to set the time for such payments.

State law also addresses the timing of payments to be made to subcontractors and material suppliers. Section 7 of the Prompt Payment Act, 30 ILCS 540/7, requires that when a Contractor receives any payment from the Department, the Contractor shall make corresponding, proportional payments to each subcontractor and material supplier performing work or supplying material within 15 calendar days after receipt of the Department payment. Section 7 of the Act further provides that interest in the amount of two percent per month, in addition to the payment due, shall be paid to any subcontractor or material supplier by the Contractor if the payment required by the Act is withheld or delayed without reasonable cause. The Act also provides that the time for payment required and the calculation of any interest due applies to transactions between subcontractors and lower-tier subcontractors and material suppliers throughout the contracting chain.

This Special Provision establishes the required federal contract clause, and adopts the 15 calendar day requirement of the State Prompt Payment Act for purposes of compliance with the federal regulation regarding payments to subcontractors. This contract is subject to the following payment obligations.

When progress payments are made to the Contractor according to Article 90-07 of the Standard Specifications, the Contractor shall make a corresponding payment to each subcontractor and material supplier in proportion to the work satisfactorily completed by each subcontractor and for the material supplied to perform any work of the contract. The proportionate amount of partial payment due to

each subcontractor and material supplier throughout the contracting chain shall be determined by the quantities measured or otherwise determined as eligible for payment by the Department and included in the progress payment to the Contractor. Subcontractors and material suppliers shall be paid by the Contractor within 15 calendar days after the receipt of payment from the Department. The Contractor shall not hold retainage from the subcontractors. These obligations shall also apply to any payments made by subcontractors and material suppliers to their subcontractors and material suppliers; and to all payments made to lower tier subcontractors and material suppliers throughout the contracting chain. Any payment or portion of a payment subject to this provision may only be withheld from the subcontractor or material supplier to whom it is due for reasonable cause.

This Special Provision does not create any rights in favor of any subcontractor or material supplier against the State or authorize any cause of action against the State on account of any payment, nonpayment, delayed payment, or interest claimed by application of the State Prompt Payment Act. The Department will not approve any delay or postponement of the 15 day requirement except for reasonable cause shown after notice and hearing pursuant to Section 7(b) of the State Prompt Payment Act. State law creates other and additional remedies available to any subcontractor or material supplier, regardless of tier, who has not been paid for work properly performed or material furnished. These remedies are a lien against public funds set forth in Section 23(c) of the Mechanics Lien Act, 770 ILCS 60/23(c), and a recovery on the Contractor's payment bond according to the Public Construction Bond Act, 30 ILCS 550.

**SPECIAL PROVISION FOR ADDITIONAL STATE REQUIREMENTS FOR FEDERAL-AID CONSTRUCTION CONTRACTS**
**Effective: February 1, 1969**
**Revised: January 1, 2010**

**EQUAL EMPLOYMENT OPPORTUNITY**

In the event of the Contractor's noncompliance with any provisions of this Equal Employment Opportunity Clause, the Illinois Fair Employment Practices Act or the Fair Employment Practices Commission's Rules and Regulations for Public Contracts, the Contractor may be declared nonresponsible and therefore ineligible for future contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations, and the contract may be canceled or avoided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation.

During the performance of this contract, the Contractor agrees as follows:

(1) That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin or ancestry; and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.

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

(3) That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, national origin or ancestry.

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

(5) That it will submit reports as required by the Illinois Fair Employment Practices Commission's Rules and Regulations for Public Contracts, furnish all relevant information as may from time to time be requested by the Commission or the contracting agency, and in all respects comply with the Illinois Fair Employment Practices Act and the Commission's Rules and Regulations for Public Contracts.

(6) That it will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency and the Illinois Fair Employment Practices Commission for purposes of investigation to ascertain compliance with the Illinois Fair Employment Practices Act and the Commission's Rules and Regulations for Public Contracts.

(7) That it will include verbatim or by reference the provisions of paragraphs 1 through 7 of this clause in every performance subcontract as defined in Section 2.10(b) of the Commission's Rules and Regulations for Public Contracts so that such provisions will be binding upon every subcontractor; and that it will also so include the provisions or paragraphs 1, 5, 6 and 7 in every supply subcontract as defined in Section 2.10(a) of the Commission's Rules and Regulations for Public Contracts so that such provisions will be binding upon every such subcontractor. In the same manner as with other provisions of this contract, the Contractor will be liable for compliance with applicable provisions of this clause by all its subcontractors; and further it will promptly notify the contracting agency and the Illinois Fair Employment Practices Commission in the event any subcontractor fails or refuses to comply therewith. In addition, no Contractor will utilize any subcontractor declared by the Commission to be nonresponsible and therefore ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations.

## SPECIAL PROVISION FOR NPDES CERTIFICATION

In accordance with the provisions of the Illinois Environmental Protection Act, the Illinois Pollution Control Board Rules and Regulations (35 Ill. Adm. Code, Subtitle C, Chapter I), and the Clean Water Act, and the regulations thereunder, this certification is required for all construction contracts that will result in the disturbance of one or more acres total land area.

The bidder certifies under penalty of law that he/she understands the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit (ILR100000) that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

The Airport Owner or its Agent will:

1) prepare, sign and submit the Notice of Intent (NOI)

2) conduct site inspections and complete and file the inspection reports

3) submit Incidence of Non-Compliance (ION) forms

4) submit Notice of Termination (NOT) form

Prior to the issuance of the Notice-to-Proceed, for each erosion control measure identified in the Storm Water Pollution Prevention Plan, the contractor or subcontractor responsible for the control measure(s) must sign the above certification (forms to be provided by the Department).

State of Illinois
Department of Transportation

SPECIAL PROVISION
FOR
SECTION 90 MEASUREMENT AND PAYMENT

This Special Provision amends the provisions of the Standard Specifications for Construction of Airports, adopted April 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

90-07 PARTIAL PAYMENTS.

DELETE: The entire section.

ADD: Partial payments will be made to the Contractor at least once each month as the work progresses. The payments will be based upon estimates, prepared by the Resident Engineer, of the value of the work performed and materials complete and in place in accordance with the contract, plans, and specifications. Such partial payments may also include the delivered actual cost of those materials stockpiled and stored in accordance with the Section 90-08 PAYMENT FOR MATERIALS ON HAND. From the amount of partial payment so determined, there shall be deducted an amount up to ten percent of the cost of the completed work which shall be retained until all conditions necessary for financial closeout of the project are satisfied. The amount of the estimate approved as due for payment will be vouchered by the Department and presented to the State Comptroller for payment. No amount less than $1,000.00 will be approved for payment other than the final payment.

It is understood and agreed that the Contractor shall not be entitled to demand or receive partial payment based on quantities of work in excess of those provided in the proposal or covered by approved change orders, except when such excess quantities have been determined by the Engineer to be a part of the final quantity for the item of work in question.

No partial payment shall bind the Department to the acceptance of any materials or work in place as to quality or quantity. All partial payments are subject to correction at the time of final payment as provided in Section 90-09 ACCEPTANCE AND FINAL PAYMENT.

The failure to perform any requirement, obligation, or term of the contract by the Contractor shall be reason for withholding any progress payments until the Department determines that compliance has been achieved. Furthermore, progress payments may be reduced by liens filed pursuant to Section 23(c) of the Mechanics Lien Act, 770 ILCS 60/23(c).

In accordance with 49 USC § 47111, the Department will not make payments totaling more than 90 percent of the contract until all conditions necessary for financial closeout of the project are satisfied.

90-10 TRUST AGREEMENT OPTION.

DELETE: The entire section.

# SECTION III

# ST. LOUIS DOWNTOWN AIRPORT
# CAHOKIA, ILLINOIS

# GRADE DITCH PARALLEL TO MAIN RUNWAY

## ILLINOIS PROJECT NO.: CPS-4210
## BLOCK GRANT NO.: 3-17-0039-B29

Prepared By:


Hanson Professional Services Inc.

March 8, 2013

# INDEX

## FOREWORD

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 (IDOT), Division of Aeronautics (Division) for the following improvement project at the **St. Louis Downtown Airport (Airport), Cahokia, Illinois** including the following:

## SCOPE OF WORK

This project (Base Bid) consists of relocation of an existing ditch to a location outside the runway safety area, including grading, construction of concrete paved ditch, relocation of utilities, erosion control and associated work.

The project has an Additive Alternate No. 1 Bid, consisting of partial depth pavement repairs on Taxiway B1 and Taxiway B7, including pavement removal, concrete paving and associated work.

## GOVERNING SPECIFICATIONS AND RULES AND REGULATIONS

The State of Illinois Department of Transportation, Division of Aeronautics, Standard Specifications for Construction of Airports, adopted April 1, 2012, shall govern the project, except as otherwise revised or noted in these Special Provisions. All references to IDOT Specifications refer to Standard Specifications for Road and Bridge Construction, Illinois Department of Transportation, adopted January 1, 2012, as revised. In the event of inconsistencies between the Standard Specifications and the Special Provisions, the Special Provisions shall govern. The Contractor shall maintain a minimum of one printed copy of the relevant sections of the Standard Specifications for Construction of Airports on the project site at all times. The Standard Specifications for Construction of Airports is available on line at the following address link:

http://www.dot.il.gov/aero/airspecs.html

## REFERENCES

The following Federal Aviation Administration Advisory Circulars are referenced on the Plans and/or Special Provision Specifications in regard to safety on airports. These Advisory Circulars are available on the FAA web site at http://www.faa.gov/regulations_policies/advisory_circulars

A. FAA AC No. 70/7460-1K “Obstruction Marking and Lighting.”

B. FAA AC No. 150/5210-5D “Painting, Marking, and Lighting of Vehicles Used on an Airport.”

C. FAA AC No. 150/5300-13A “AIRPORT DESIGN.”

D. FAA AC No. 150/5370-2F (or most current issue) “Operational Safety on Airports During Construction.”

## END OF FOREWORD

# DIVISION I –GENERAL PROVISIONS

## SECTION 70. LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

70-10 BARRICADES, WARNING SIGNS, AND HAZARD MARKINGS. Add the following paragraphs to this section:

"The St. Louis Downtown Airport has three paved runways. This project will require the temporary closure of Runway 12R/30L. The project will also require the temporary closure of taxiways. Refer to the Construction Safety Plan Sheets for information regarding the temporary reduction of the runway safety area during construction.

Runway 12R/30L will be closed any time the Contractor is working within 150 feet of the runway centerline. Runway closures shall be completed in accordance with the details shown in the Construction Plans. Prior to opening the Runway a Representative of the Airport, the Contractor, and the Resident Engineer/Resident Project Representative will inspect Runway 12R/30L to be sure the pavement is clean, all holes and trenches have been backfilled, and all equipment and materials are at least 150 feet from the Runway centerline. Any deficiencies noticed will be corrected before the Contractor will be allowed to re-open the runway.

The Contractor shall coordinate with the Airport and the Resident Engineer/Resident Project Representative to turn off the runway and taxiway lighting circuits as well as the Navaids. When the runway is re-opened these circuits must be re-activated. All existing lighting and Navaids associated with the respective runway that is closed, will be inactive during runway closures.

Work within 58 feet of an active taxi-lane centerline shall require closure of that taxi-lane using barricades.

Work within 66 feet of an active taxiway centerline shall require closure of that taxiway using barricades.

All work included in opening and closing the taxiways, and taxi-lanes will be considered incidental to the Project and no additional compensation will be allowed.

All work included in opening and closing the runways, taxiways, and taxi-lanes will be considered incidental to the Project and no additional compensation will be allowed.

The Airport Director shall be notified a minimum of **72 hours** in advance of any work that would require the closure of the runway, and a minimum of **48 hours** notice before the closure of any taxiway. It will be the responsibility of the Contractor to properly mark the closed runway, and when the runway is re-opened, to remove the marking. The appropriate marking for a closed runway is a cross at both ends of the runway. The legs of the cross will be 60 ft in length and 10 ft in width. The crosses will be constructed of any suitable, locally available materials, such as fabric, plywood, or other similar material. They will be held in place in a manner locally determined to be suitable. The Contractor will be responsible for placing and removing the crosses as the runways are closed and opened. The Contractor will provide the Engineer with a proposed schedule

of when and length of time for all closures. The Project Engineer must review and approve this schedule before any construction begins. The placement, maintenance and removal of the crosses will be considered as an incidental item to the contract and no additional compensation will be allowed.

When the Contractor's vehicles are on Airport property, they shall be properly marked. The markings shall consist of a 3-ft sq. flag consisting of a checkered pattern of international orange and white squares of not less than 1 ft on each side displayed in full view above the vehicle. Contractor vehicles engaged in continuous hauling operations will not be required to display a flag.

The Contractor will be responsible for placing barricades and/or traffic cones at the locations shown on the Construction Plans, or as directed by the Airport Director. It will be the Contractor's responsibility to furnish and maintain the barricades equipped with red flashing or red, steady-burn lights and 20-in. sq. orange flags throughout the duration of this project.

The barricades and their maintenance will be considered as an incidental item to the contract, and no additional compensation will be allowed. Any cost of labor and equipment, which is necessary to insure safety at the Airport during the duration of the project, will be considered incidental to the contract, and no additional reimbursement for these items of work will be received.

All runway closures will be coordinated with the Airport Director. The runway will be closed in accordance with the procedures set forth on the Proposed Safety Plan. Prior to re-opening the runway the Contractor will insure the following:

1. All open holes/trenches have been backfilled.
2. All equipment has been moved to the Equipment Parking Area.
3. All trucks have their beds lowered and all cranes have their booms lowered.
4. There is no material stockpiled within the Runway Object Free Area.
5. All active pavements have been swept of foreign material.
6. All lighting circuits associated with the pavement being re-opened are active and functioning correctly.
7. Representatives of the Contractor, Airport Director and Resident Engineer/Resident Project Representative shall inspect the pavement prior to re-opening. Anything noted will be corrected prior to re-opening."

**Add the following:**

70-27 AIRPORT SECURITY NOTES. Airport security will be maintained at all times. The Contractor will access the proposed job site through a proposed gate. The Contractor will be required to close and secure this gate after he has gone through it. The gate will remain closed during the construction day unless the Contractor is in a continuous hauling operation. During periods of continuous hauling the Contractor will monitor the gate to insure no one will enter the access gate that is not authorized to be on the construction site or on the air side of the airport.

70-28 MAINTAINING OPERATION OF AIRFIELD LIGHTING AND NAVAIDS. Shut down of airfield lighting and/or Navaids shall only be permitted during day light hours and must be coordinated with and approved by the Airport Director. All airfield lighting and navaid circuits shall

be operational at night fall. The Contractor shall not leave the runway lighting, taxiway lighting, or any other airfield lighting circuit inoperable over night. The Contractor shall provide temporary connections and any manual operations of airfield lighting to keep them in operation over night. The Contractor shall secure, identify, and place temporary exposed wiring in conduit, duct, or unit duct to prevent electrocution and fire ignition sources in conformance with the requirements of FAA AC 150/5370-2F “OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION”.

70-29 SITE INSPECTION. The Contractor shall be responsible for an on-site inspection prior to submitting a bid on this project. Upon receipt of a bid, it shall be assumed that the Contractor is fully familiar with the construction site.

**END OF SECTION 70**

## SECTION 80. PROSECUTION AND PROGRESS

80-13 CONTRACTOR'S ACCESS TO AIRFIELD. Add the following to this section:

The Contractor's personnel and equipment shall not traverse outside the designated work areas to other locations on the Airport. The designated haul route will be the only vehicular access to the construction site. It will be the responsibility of the Contractor to maintain the proposed haul route and equipment parking area for the duration of the project.

The Contractor shall access the proposed work site using the haul route as detailed on the Plans. The Contractor will be expected to maintain this access throughout this project. At the end of the project the Contractor will return the haul route and equipment parking area to its original condition, unless otherwise noted on the Plans. An equipment parking area will be located in close proximity to the haul route.

The Contractor will be responsible for obtaining any permits necessary to use the State/County/Township/City roads. All work required in complying with the above requirement will be considered incidental to the Contract, and no additional compensation will be allowed.

Failure to use the prescribed haul routes and equipment parking area or adhere to the safety requirements will result in the suspension of work.

**Add the following:**

80-14 EMPLOYEE PARKING. The Contractor's employees shall park their personal vehicles in the designated parking area shown on the safety plan. The Contractor will transport the workers from the parking area to the work area. Only Contractor vehicles will be allowed outside of the proposed equipment storage and parking areas. No employee vehicle will be allowed onto the proposed construction site.

80-15 EQUIPMENT PARKING AND MATERIAL STORAGE. The Contractor will be allowed to park equipment and store material in the proposed material storage and equipment parking area shown on the safety plan. The Contractor will maintain this area throughout the duration of the project and restore it to its original condition upon completion of the project.

**END OF SECTION 80**

# DIVISION II – PAVING CONSTRUCTION DETAILS

## ITEM AR150510 ENGINEER'S FIELD OFFICE

### DESCRIPTION

150-1.1 Add the following to this section:

"A cellular telephone will be required for exclusive use by the Resident Engineer/Resident Project Representative for the duration of this project. The cellular telephone shall be hand-held and portable, and shall be approved by the Resident Engineer/Resident Project Representative. The Resident Engineer/Resident Project Representative will use this cellular telephone for project related phone calls only. The Contractor will be responsible for all charges associated with this cellular telephone. Upon completion of the project the cellular telephone will be returned to the Contractor."

### CONSTRUCTION METHODS

150-2.1 Revise the first sentence as follows:

"Type A field offices shall have a ceiling height of not less than seven (7') ft and a floor space of not less than three hundred and eighty (380) sq. ft."

### BASIS OF PAYMENT

150-3.1 Revise this section as follows:

"Payment for providing the field office fully equipped as specified shall be made at the contract lump sum price. This price shall include all utility costs and shall reflect the salvage value of the building, equipment, and furniture which become the property of the Contractor after release by the Resident Engineer/Resident Project Representative, except the Engineering firm will make payment for all long distance telephone calls in excess of one hundred dollars ($100.00) per month for the land line.

Payment will be made under:

Item AR150510 Engineer's Field Office - per lump sum"

### END OF ITEM AR150510

## AR150540 HAUL ROUTE

### DESCRIPTION

150540-1.1. This item of work shall consist of the construction and maintenance of the proposed haul route and equipment parking and material storage area that are needed to provide access to the proposed construction area as shown on the Construction Plans. This item of work also includes the restoration of the haul route, equipment parking and material storage area to its pre-construction condition following construction. The entrance to the project site will be from Goose Lake Road. The Contractor will utilize the proposed route as shown on the Scope of Work and Safety and Phasing Plans of the Construction Plan Set.

The proposed parking and material storage area will also be as shown on the Scope of Work and Safety and Phasing Plans of the Construction Plan Set. The Contractor's personnel will park their personal vehicles in this area and be transported to the construction site by a Contractor vehicle.

### CONSTRUCTION METHODS

150540-2.1. In accordance with section 50-04 of the Standard Specifications, it is the Contractor's responsibility to obtain permission and any applicable permits to use the roads (federal, state, county, township) leading to the airport construction site.

The Contractor shall construct the haul route and equipment parking and material storage areas to provide all weather access to the construction site. The haul route and equipment parking and material storage areas will be maintained so as not to cause delays to the proposed construction.

The haul route will be made of suitable aggregate material to provide an all-weather haul route. Upon completion of the project; the haul route limits will be restored to its pre-construction condition.

Restoration: The haul route and parking and material storage area are to remain in place within their pre-construction limits as shown on the plans. Any newly constructed areas are to be removed following construction and will be filled and graded to its original elevations, unless otherwise approved by the Owner. The disturbed areas that are outside of the proposed seeding and mulching limits will be seeded and mulched in accordance with Item 901 - Seeding and Item 908 - Mulching. The restoration of these areas will be considered as part of this item.

Safety: All traffic control, safety, and permitting requirements associated with the construction and use of the haul routes are the responsibility of the Contractor.

### BASIS OF PAYMENT

150540-3.1. Payment will be made at the contract unit price per lump sum for constructing and maintaining the haul route, parking and storage area, and removing/restoring any newly constructed areas as specified above. This price shall be full compensation for furnishing, installing, maintaining and removal of all materials; restoration and turfing; for all labor, equipment, and incidentals necessary to complete this item of work.

Payment will be made under:

Item AR150540 Haul Route - per lump sum

### END OF ITEM AR150540

## ITEM 152 UNCLASSIFIED EXCAVATION

### CONSTRUCTION METHODS

152-2.2 EXCAVATION. The compaction control tests to be used shall be in accordance with Item 611, for aircraft weighing 60,000 pounds or more.

152-2.6 FORMATION OF EMBANKMENT. The compaction control tests to be used shall be in accordance with Item 611, for aircraft weighing 60,000 pounds or more.

152-2.8 HAUL. Add the following to this section:

"The Contractor shall take special precautions when hauling excavated material so as not to create deep ruts in the hauling areas adjacent to the site. All existing graded or turfed areas outside the grading limits which are disturbed or rutted by the Contractor during the hauling operation shall be regraded and returfed at his own expense to the satisfaction of the Resident Engineer/Resident Project Representative.

### BASIS OF PAYMENT

152-4.2. Payment will be made under:

Item AR152410 Unclassified Excavation - per cubic yard

### END OF ITEM 152

## ITEM AR156510 SILT FENCE

### DESCRIPTION

This item of work shall consist of a filter fence as partial implementation of a Stormwater Pollution Prevention Plan (SWPPP).

The measures of the Plan are shown on the Construction Plans, and shall be constructed in accordance with the Illinois Environmental Protection Agency (IEPA) Standards and Specifications for soil erosion and sediment control.

### MATERIALS

SILT FENCE. The proposed silt fence fabric shall consist of woven or non-woven filaments of polypropylene, polyester, or polyethylene. Non-woven fabric may be needle-punched, heat-bonded, resin-bonded, or combination thereof. The filaments in the silt fence fabric must be dimensionally stable (i.e., to each other), resistant to delamination, and must be free from any chemical treatment or coating that might significantly reduce porosity and permeability. The fabric shall be resistant to ultraviolet radiation. The fabric shall comply with the following physical properties:

| Physical Properties (English) | Ground Stabilization | Silt Filter Fence Fabric |
|---|---|---|
| Grab tensile strength (lbs) - ASTM D 4632[1/] | 200 (min.) | 200 (min.) |
| Grab elongation @ break (%) – ASTM D 4632[1/] | 12 (min.) | 12 (min.) |
| Burst strength (psi) - ASTM D 751[2/] | 250 (min.) | 250 (min.) |
| Trapezoidal tear strength (lbs) ASTM D 4533[2/] | 75 | -------- |
| Width (ft) | -------- | 3.5 (min.) |
| Weight (oz/sq. yd.) - ASTM D 3776 | 4.0 (min.) | 4.0 (min.) |
| Apparent Opening Size (AOS) Sieve No. – ASTM D 4751[2/] | -------- | 30 (max.)(non-woven)<br>50 (max.)(woven) |

| Physical Properties (Metric) | Ground Stabilization | Silt Filter Fence Fabric |
|---|---|---|
| Grab tensile strength (N) - ASTM D 4632[1/] | 900 (min.) | 900 (min.) |

| | | |
|---|---|---|
| Grab elongation @ break (%) – ASTM D 4632[1/] | 12 (min.) | 12 (min.) |
| Burst strength (kPa) - ASTM D 751 [2/] | 1720 (min.) | 1720 (min.) |
| Trapezoidal tear strength (N) ASTM D 4533 [2/] | 335 | -------- |
| Width (m) | -------- | 1 (min.) |
| Weight ($g/m^2$) - ASTM D 3776 | 135 (min.) | 135 (min.) |
| Apparent Opening Size (AOS) Sieve No. – ASTM D4751[2/] | -------- | 600 µm (max.) (non-woven)<br>300 µm (max.)(woven) |

1/For woven fabric, test results shall be referenced to orientation with warp or weave, whichever the case may be. Both woven and non-woven fabric shall be tested wet.
2/Test results may be obtained by manufacturer's certification.

## CONSTRUCTION METHODS

SILT FENCE. The proposed erosion control fencing shall be constructed prior to start of grading operations at the locations shown on the Plans. The erosion control fencing shall be constructed to intercept sheet flow of water borne silt and sediment, and prevent it from leaving the area of construction. The barrier shall be constructed according to manufacturer's specifications, where appropriate.

The stakes for the fence barrier shall be a minimum of 48 in. long and made of 2 in. x 2 in. hardwood.

The silt fence will be removed once a stand of grass has been established on the site.

## BASIS OF PAYMENT

Payment will be made at the contract unit bid price for Silt Fence. This price shall be full compensation for constructing all proposed erosion control measures, maintaining all erosion control structures for the duration of the project, and removal of all structures at the completion of the project. This price shall constitute full compensation for erosion control structures, and for furnishing all materials, labor, equipment, and other incidentals necessary to complete this item of work.

Payment will be made under:

Item AR156510 Silt Fence - per lin. ft

**END OF ITEM AR156510**

## ITEM AR156520 INLET PROTECTION

### DESCRIPTION

This item of work shall consist of inlet protection as partial implementation of a Stormwater Pollution Prevention Plan.

The measures of the Plan are shown on the Construction Plans and shall be constructed in accordance with the Illinois Environmental Protection Agency (IEPA) Standards and Specifications for soil erosion and sediment control.

### MATERIALS

SILT FENCE. The proposed silt fence fabric shall meet the requirements of Item AR156510, Silt Fence, as described in these Special Provisions.

### CONSTRUCTION METHODS

INLET PROTECTION. The proposed storm sewer inlets and end sections within the work area shall have silt fence fabric placed as detailed on the construction plans. The inlet protection will be installed at the start of this project, or as soon as possible following installation of proposed inlets/end sections.

The inlet protection will be removed once a stand of grass has been established on the site.

### BASIS OF PAYMENT

Payment will be made at the contract unit bid price for Inlet Protection. This price shall be full compensation for furnishing required material and constructing inlet protection as a proposed erosion control measure, maintaining the inlet protection for the duration of the project, and its removal once a strand of grass has been established on the site.

Payment will be made under:

Item AR156520 Inlet Protection - per each

### END OF ITEM AR156520

## ITEM AR156531 EROSION CONTROL BLANKET

### DESCRIPTION

156531-1.1. This item shall consist of furnishing, transporting, and placing erosion control blanket. The location(s) for the proposed erosion control blanket has not been delineated on the Construction Plans but will be determined at the time of construction by the Resident Engineer/Resident Project Representative.

### MATERIALS

156531-2.1. Materials shall meet the requirements of the following Articles of Division 1000 - Materials, Illinois Department of Transportation, Standard Specifications for Road and Bridge Construction, January 1, 2012.

| Item | Article |
|---|---|
| Knitted Straw Mat | 1081.10(b) |
| Wire Staples | 1081.10(d) |

### CONSTRUCTION REQUIREMENTS

156531-3.1. The blanket shall be placed within 24 hours after seeding operations have been completed on the areas specified. Prior to placing the blanket, the areas to be covered shall be relatively free of all rocks or clods over 1½ in. in diameter, and all 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 will be required to rework the soil until it is smooth and to 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.

Placing and anchoring the blankets in ditches and on slopes shall be as follows:

Erosion Control Blanket. The blankets shall be stapled in-place, using four staples across the end at the start of each roll and placing staples on 6-ft centers along each side. All end seams shall overlap at least 2 in.

### METHOD OF MEASUREMENT

156531-4.1. The area of Erosion Control Blanket to be paid for shall be the number of square yards of blanket measured in-place, satisfactorily installed and maintained throughout the duration of the project and the design lifespan of the blanket product.

## BASIS OF PAYMENT

156531-5.1. Payment will be made at the contract unit price per square yard of Erosion Control Blanket. This price shall be full compensation for furnishing all materials, for all preparation and installation of these materials, including placement, staples, and maintenance, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item AR156531 – Erosion Control Blanket – Per S.Y.

**END OF ITEM AR156531**

## ITEM AS150530 TRAFFIC MAINTENANCE (ADDITIVE ALTERNATE NO. 1 BID)

### DESCRIPTION

150-1.1 This item of work for the Additive Alternate No. 1 shall consist of furnishing, installing, maintaining and removing traffic control devices as indicated on the plans and described herein.

### CONSTRUCTION METHODS

150-2.1 The Contractor shall erect and maintain all traffic control devices - signs, barricades, closure crosses, etc., as indicated on the plans.

Unless specified otherwise, the following standards for traffic control will be applicable:

1. Manual of Uniform Traffic Control Devices for Streets and Highways, including the Illinois supplement, latest edition.

2. FAA AC 150/5370-2, Operational Safety on Airports During Construction, latest edition.

The Contractor shall phase his operations as indicated on the plans.

The number and placement of barricades may be altered as determined by the Resident Engineer at no additional cost to the contract.

### BASIS OF PAYMENT

150-3.1 Payment will be made at the contract unit price per lump sum for traffic maintenance as specified above and on the construction plans. This price shall be full compensation for furnishing, installing, maintaining and removal of all materials, for all labor, equipment, and incidentals necessary to complete this item of work.

Payment will be made under:

Item AR150530 Traffic Maintenance - per lump sum

**END OF ITEM AS150530**

## ITEM AS610510 STRUCTURAL PC CONCRETE (ADDITIVE ALTERNATE NO. 1 BID)

### MATERIALS

610-2.1 GENERAL. The third paragraph of this section shall be revised to read as follows:

An Item 501 PCC mix design is acceptable for use if no IDOT Class PP mix is available.

### CONSTRUCTION METHODS

610-3.2 CONCRETE PROPORTIONS. This section shall be revised to read as follows:

The concrete shall consist of a mixture of coarse aggregate, fine aggregate, Portland cement, and water. All aggregates and bulk cement shall be measured by weight. In proportioning aggregates and mixing water, compensation shall be made for the weight of moisture in the aggregates, and this shall be determined periodically.

The air content by volume shall be between 4% and 7%, by volume, based on measurements made on concrete immediately after discharge from the mixer in accordance with ASTM C 138 or C 231.

Concrete provided under this item shall be IDOT approved Class PP concrete, air entrained with crushed stone coarse aggregate and shall be pre-approved by the Division prior to use. An Item 501 PCC Pavement mix can be used in lieu of a Class PP mix, with the approval of the Division.

The Contractor shall be responsible for obtaining the job mix formula meeting the requirements of this item. The Contractor shall refer to the Illinois Division of Aeronautics latest edition of Policy Memorandum 96-1, “Item 610, Structural Portland Cement Concrete: Job Mix Formula Approval and Production Testing”, located on the internet on the IDOT website.

The Contractor shall provide actual batch weight tickets for every batch of Item 610 concrete used on the project to be collected by the Resident Engineer upon delivery of each batch of concrete. The actual batch weight tickets shall be kept with the project records by the Resident Engineer and shall be available upon request of the Department of transportation.

Concrete provided under this item shall be a workable plastic concrete having a flexural strength of not less than 600 pounds per square inch at the age of 14 days when tested in accordance with ASTM C 78.

The concrete shall have a maximum slump of six inches (6") when tested in accordance with ASTM C 143.

610-3.5 CONSISTENCY. This section shall be revised to read as follows:

The consistency of the concrete shall be checked by the slump test specified in ASTM C 143 and have a range of 2” – 6”.

**END OF ITEM AS610510**

**ITEM AS800372 REMOVE BITUMINOUS & PCC PAVEMENT**
**(ADDITIVE ALTERNATE NO. 1 BID)**

## DESCRIPTION

800-1.1 This item of work for the Additive Alternate No. 1 shall consist of sawcutting and removing bituminous and PCC pavement structure, as described herein.

The Contractor shall remove pavement of the thickness shown in the plans. The underlying aggregate base is to remain in place.

Typical construction details are shown in the plans. Exact locations of pavement removal shall be determined by the Resident Engineer.

## CONSTRUCTION METHODS

800-2.1 The Contractor shall sawcut the existing pavement structure full depth as shown in the plans at locations determined by the Resident Engineer. Sawcutting shall provide a vertical surface.

After completion of sawcutting, the Contractor shall remove the pavement structure using methods which will allow a vertical surface along all sides of the removal area.

Material obtained from removal operations shall be hauled to a disposal site off of airport property by the Contractor. No additional compensation will be made for hauling and disposal of the removed material. Existing aggregate base shall remain in place and shall be compacted in accordance with Item 209.

Any damage to the existing pavement made by the Contractor beyond the limits shown on the plans shall be removed and replaced by the Contractor at his/her own expense, when identified by the Resident Engineer. These areas shall be saw cut as directed by the Resident Engineer.

## METHOD OF MEASUREMENT

800-3.1 The yardage to be paid for shall be the number of square yards of pavement removal as measured in the field, completed and accepted. Sawcutting shall not be measured for payment and shall be included in the cost of the pavement removal item.

## BASIS OF PAYMENT

800-4.1 The accepted quantities of pavement removal will be paid for at the contract unit price per square yard which price and payment shall be full compensation for furnishing all materials, equipment, labor, hauling, disposal and all other incidental items necessary to complete the work to the satisfaction of the Engineer.

**END OF ITEM AS800372**

# DIVISION IV – DRAINAGE

## ITEM AR754 CONCRETE GUTTERS, DITCHES, AND FLUMES

### CONSTRUCTION METHODS

754-3.3 BACKFILLING. The compaction control tests to be used shall be in accordance with Item 611, for aircraft weighing 60,000 pounds or more.

### BASIS OF PAYMENT

Add the following:

"Payment will be made under:

Item AR754610 Paved Ditch - per linear foot"

### END OF ITEM 754

# DIVISION VI – LIGHTING INSTALLATION

## ITEM 108 INSTALLATION OF UNDERGROUND CABLE FOR AIRPORTS

### DESCRIPTION

108-1.1. Add the following to this section:

"This Item of work shall also consist of the installation of cable by directional-boring method. This Item shall include cable in unit duct where noted on the Plans and specified herein."

**Add the following:**

108-1.2 REFERENCES.

A. ASTM Specification B3 – Standard Specification for Soft or Annealed Copper Wire.

B. ASTM Specification B8 – Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.

C. FAA Advisory Circular 150/5345-7E, (or latest edition) "SPECIFICATIONS FOR L-824 UNDERGROUND ELECTRICAL CABLE FOR AIRPORT LIGHTING CIRCUITS.

D. FAA AC No. 150/5345-53 "AIRPORT LIGHTING EQUIPMENT CERTIFICATION PROGRAM" (most current issue) and AC150/5345-53D, AIRPORT LIGHTING EQUIPMENT CERTIFICATION PROGRAM Appendix 3 Addendum.

E. FAA AC No. 150/5370-2F (or most current issue) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".

F. Federal Specification A-A-59544 Cable and Wire, Electrical (Power, Fixed Installation).

G. NFPA 70 – National Electrical Code (most current issue in force).

H. NFPA 70E – Standard for Electrical Safety in the Workplace.

I. OSHA 29 CFR Part 1910 Occupational Safety and Health Standards for electrical safety and lockout/tagout procedures.

J. UL Standard 44 – Thermoset-Insulated Wires and Cables.

K. UL Standard 83 – Thermoplastic-Insulated Wires and Cables.

L. UL Standard 854 – Service Entrance Cables.

108-1.3 SHOP DRAWINGS. The Contractor shall furnish shop drawings for approval before ordering equipment and/or materials. Shop drawings are required for each wire, conductor, and/or cable type to be used on the project. **Shop drawings shall be clear and legible.**

**Copies that are illegible will be rejected.** Contractor shall submit sufficient copies of shop drawings to meet the needs of his personnel, sub-contractor personnel, and equipment suppliers plus 4 copies to be retained by the Project Engineer. Shop drawings shall include the following information:

A. **Certification of compliance with the AIP (Airport Improvement Program) Buy American Preferences for all materials and equipment. Do not submit ARRA (American Recovery and Reinvestment Act) certification as a substitute for certification of compliance with the AIP Buy American Preferences. Shop drawings submitted without certification of compliance with the Airport Improvement Program Buy American Preferences or without certification of manufacture in the United States of America from Domestic materials in accordance with the AIP Buy American Requirements will be rejected. See the FAA website at: http://www.faa.gov/airports/aip/buy_american/ for more information on the Airport Improvement Program Buy American Preferences requirements. FAA approved equipment that is on the FAA Buy American Conformance List or the list of Nationwide Buy American Waivers Issued by the FAA complies with the AIP Buy American Preferences and will not require additional waiver paperwork for AIP projects. See the FAA website at:** http://www.faa.gov/airports/aip/buy_american/media/nationwideBuyAmericanWaiversIssued.pdf **for a list of Nationwide Buy American Waivers Issued by the FAA.**

B. In order to expedite the shop drawing review, inspection and/or testing of materials, the Contractor shall furnish complete statements to the Project Engineer as to the origin, composition, and manufacturer of all material to be used in the work. Such statements shall be furnished promptly after execution of the contract but, in all cases, prior to delivery of such materials.

C. Indicate the pay item number for each respective cable and/or cable in unit duct.

D. Shop drawings shall include wire/conductor/cable cut sheets with type, size, specifications, ETL or UL listing, manufacturer, and catalog or part number.

E. Shop drawings for cable in unit duct items shall include cut sheets with type, size, specifications, ETL or UL listing, manufacturer, and catalog or part number for the respective unit duct.

F. Where cable is required to have colored coded insulation, provide information on the color coding for the respective conductors.

## EQUIPMENT AND MATERIALS

108-2.1 GENERAL. Add the following.

"All cable shall be FAA approved or UL-listed as suitable for installed application. Cable furnished on this project shall comply with the requirements of the Airport Improvement Program Buy American Preferences. All conductors shall be Copper."

108-2.2 CABLE. Revise this section to read as follows:

"L-824 Cable – L-824 cable shall be FAA L-824, Type C and shall conform to the requirements of FAA Advisory Circular 150/5345-7E, (or latest edition) "SPECIFICATIONS FOR L-824 UNDERGROUND ELECTRICAL CABLE FOR AIRPORT LIGHTING CIRCUITS". L-824 cable shall be FAA approved and listed in the current AC150/5345-53D, AIRPORT LIGHTING EQUIPMENT CERTIFICATION PROGRAM Appendix 3 Addendum. Circuits for use with constant current regulator outputs (runway or taxiway lighting circuits) shall use 5000-Volt rated cable. Circuits for use with low voltage applications (600 Volts or below) shall use either 5000-Volt rated cable or 600-Volt rated cable and shall have colored insulation corresponding to the respective voltage system. Cable shall be manufactured in the United States of America to comply with the Airport Improvement Program Buy American Requirement or be on the Federal Aviation Administration list of Nationwide Buy American Waivers.

Item AR108108, 1/C #8 5KV UG Cable shall be one No. 8, 5,000-Volt, FAA L-824, Type C, stranded Copper conductor installed in conduit, duct, manholes, handholes, and/or splice cans.

Item AR108158, 1/C #8 5KV UG Cable in UD shall be one No. 8, 5,000-Volt, FAA L-824, Type C, stranded Copper conductor, in unit duct (3/4-in.).

Item AR108258, 2/C #8 5KV UG Cable in UD shall be two No. 8, 5,000-Volt, FAA L-824, Type C, stranded Copper conductors, in unit duct (1-in.).

XLP-USE Wire. Cable shall comply with UL Standard 44, UL Standard 854, and Federal Specification A-A-59544. Conductor shall be concentric-strand, soft Copper, conforming to ASTM B8 and Underwriters' Laboratories Standard UL44 for Rubber Insulated Wires. Insulation shall be rated for 600-Volt. Insulation shall be cross-linked polyethylene conforming to Underwriter's Laboratories Requirements for Type USE-2 insulation. Cable shall be UL-listed and marked USE-2. Cable shall be manufactured in the United States of America to comply with the Airport Improvement Program Buy American Requirement.

Item AR108082 1/C #2 XLP-USE shall consist of 1/C #2 AWG, XLP-USE, 600-Volt cable installed in conduit, ducts, and manholes. **This cable shall be used with FAA Runway 12L REIL cable adjustments to accommodate the ditch relocation widening.** Conductor insulation for 120/240 VAC circuits shall be color-coded, Phase A-Black, Phase B-Red, and Neutral-White.

Item AR108806, 6 Pair Control Cable will need to be installed for the FAA Runway 12L-30R REIL cable adjustments to accommodate the Runway 12R-30L widening. Cable

shall be compatible with the existing control cable used with the FAA REILS located on Runway 12L-30R. Cable shall comply with ANSI/ICEA S-84-608-2002 and RUS 7 CFR 1755.390 (PE-39). Cable shall be 6-pair, #19 AWG solid-annealed copper, shielded communications cable, gopher-resistant, jelly-filled to resist moisture entry and to inhibit corrosion, suitable for direct burial and for use in duct, Superior Essex CASPIC-F Series, Part Number 04-026-94, or approved equal.

Color-coding: Color-code phase and neutral conductor insulation for No. 6 AWG or smaller. Provide colored marking tape or colored insulation for phase and neutral conductors for No. 4 AWG and larger. **Insulated ground conductors shall have green colored insulation for all conductor sizes (AWG and/or KCMIL) to comply with NEC 250.119. Neutral conductors shall have white colored insulation for No. 6 AWG and smaller to meet the requirements of NEC 200.6.** Standard colors for power wiring and branch circuits for 120/240 VAC, 1-Phase, 3-Wire system shall be Phase A – Black, Phase B – Red, Neutral – White, and Ground – Green."

108-2.3 BARE COPPER WIRE (COUNTERPOISE). Add the following:

"Item AR108706, 1/C #6 Counterpoise will need to be installed with the duct for the power and control cables associated with the FAA REIL cable adjustments and relocations. Counterpoise conductor shall be #6 AWG bare solid copper conductor. Counterpoise shall be bonded to ground rods at approximately 90-ft intervals. The spacing of ground rods must vary by 10% to 20% to prevent resonance. Locate ground rods at approximately 6 ft on either side of the trench. Ground rods shall be 3/4-in. diameter, 10 ft long, UL-listed, copper-clad with 10-mil minimum copper coating. All connections to ground rods and/or counterpoise conductor shall be made with exothermic-weld type connectors, Cadweld by Erico Products, Inc., Solon, Ohio, (Phone: 1-800-248-9353), Thermoweld by Continental Industries, Inc., Tulsa, Oklahoma, (Phone: 918-663-1440), or Ultraweld by Harger, Grayslake, Illinois (Phone 1-800-842-7437), or approved equal. Ground rods and exothermic-weld connections shall be incidental to this Pay Item, and no additional compensation will be allowed."

108-2.4 CABLE CONNECTIONS. Add the following to this section:

"All below grade splices shall be installed in splice cans, handholes, or manholes. Splice cans shall be L-867, Class IA, Size B (12 in. diameter), 24 in. deep, with ½ in. thick, galvanized steel cover and stainless steel bolts. Larger size splice cans shall be provided, as applicable, for specific equipment applications or manufacturer's recommendations, and/or where detailed on the Plans. Splice cans located in areas subject to heavy aircraft or vehicle loading shall be L-868 type. The Engineer shall approve all splice locations before work commences. The furnishing and installing of splice cans for new homerun cables shall be incidental to the respective cable pay item, and no additional compensation will be allowed."

108-2.5 RESERVED. Revise 108-2.5 as follows:

"108-2.5 SPLICER QUALIFICATIONS. Every airfield lighting cable splicer shall be qualified in making cable splices and terminations on cables rated at and/or above 5000 Volts AC. The Contractor shall submit to the Project Engineer proof of the qualifications of each proposed cable splicer for the cable type and voltage level to be worked on.

Cable splicing/terminating personnel shall have a minimum of three (3) years continuous experience in terminating/splicing medium voltage cable."

108-2.12 LINE MARKING TAPE. Delete this section.

108-2.13 UNIT DUCT. Add the following:

"Standard sizes of smooth wall polyethylene duct shall conform to the dimensional requirements specified below:

| Nominal Duct Size | Nominal Inside Diameter | Nominal Standard Wall | Nominal Outside Diameter* |
|---|---|---|---|
| ¾" | 0.910" | 0.070" | 1.050" |
| 1" | 1.145" | 0.085" | 1.315" |
| 1-1/4" | 1.440" | 0.110" | 1.660" |
| 1-1/2" | 1.650" | 0.125" | 1.900" |
| 2" | 2.065" | 0.155" | 2.375" |
| 2-1/2" | 2.449" | 0.213" | 2.875" |
| 3" | 3.048" | 0.226" | 3.500" |
| 4" | 4.000" | 0.250" | 4.500" |

* Dimensions include allowance for duct eccentricity."

## CONSTRUCTION METHODS

108-3.1 GENERAL. Add the following to this section:

"The cable quantities as shown on the Construction plans are based on straight-line measurement. All other cable lengths, such as slack or waste, will not be measured for payment.

If the Contractor wishes to lay cable on a line other than that shown on the Plans, he shall obtain approval of the Resident Engineer/Resident Project Representative before doing so. Any additional cable needed because of such change will be at the Contractor's expense.

Only cable in unit duct may be plowed or directional-bored.

The Contractor shall identify all existing underground utilities located within the area where the proposed cables are being installed, and will take all precautions to protect these utilities from damage. Care shall be taken so as not to damage any existing circuits. Any existing circuits damaged shall be immediately repaired to the satisfaction of the Engineer and/or the respective utility or owner where applicable. Any underground utility damaged will be repaired or replaced at the Contractor's own expense. Any repairs of existing cables will be considered incidental to the contract, and no additional compensation will be allowed.

Contractor shall coordinate work and any power outages with the Airport Director or respective Airport personnel. Any shutdown of existing systems shall be scheduled with and approved by the Airport Director prior to shutdown. Once shut down, the circuits shall be labeled as such to prevent accidental energizing of the respective circuits. All personnel

shall follow U.S. Department of Labor Occupational Safety & Health Administration (OSHA) 29 CFR Part 1910 Occupational Safety and Health Standards for electrical safety and lockout/tagout procedures, including, but not limited to, 29 CFR Section 1910.147 The Control of Hazardous Energy (lockout/tagout).

Contractor shall comply with the requirements of FAA AC No. 150/5370-2F (or most current issue) "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION".

Contractor shall comply with the applicable requirements of NFPA 70E – Standard for Electrical Safety in the Workplace.

All temporary installations shall comply with National Electrical Code Article 590 – "Temporary Installations." The contractor shall secure, identify, and place temporary exposed wiring in conduit, duct, or unit duct to prevent electrocution and fire ignition sources in conformance with the requirements of FAA AC 150/5370-2F, Part 218, Paragraph c.

All cables installed by the Contractor shall be properly labeled and tagged at all points of access (handholes, manholes, terminal panels, control panels, and the respective wireway in the vault).

All changes to the airfield lighting system shall be documented by the Contractor and provided to the Resident Engineer/Resident Project Representative.

The existing cables associated with airfield lighting removals, relocations, and/or cable or duct replacements shall be abandoned in place unless it conflicts with the installation of the airfield light, sign, duct, cable, handhole, manhole, site work, pavement or other work, then it shall be disconnected, removed, and disposed of off the site at no additional cost to the Contract. Contractor may remove abandoned cables at no additional cost to the Contract and shall have the salvage rights to abandoned cables."

108-3.2 INSTALLATION IN DUCT OR CONDUIT. Add the following to this section:

"The unit duct will be run continuous through all ducts and conduits.

Where cable in unit duct enters a handhole or manhole with a continuous duct bank system to the termination point (such as from a handhole to the vault or between handholes and/or manholes) the unit duct will not be required for the respective cable."

108-3.3 TRENCHING. Add the following to this section:

"F. Cable installed in cultivated fields shall be installed a minimum of 42 in. below grade.

G. Any and all trenches will be backfilled to a smooth grade to the satisfaction of the Engineer. All trench settlement shall be corrected for a period of one year. Restoration, grading, and seeding of areas disturbed during the installation of the proposed cable will be incidental to the respective 108 Pay Item."

108-3.5 SPLICING. Add the following:

"In-line connections for existing cables cut during construction shall be repaired with the cast splice kit. The Contractor shall have a minimum of two splice kits on the job site at all times for emergency repairs. Cast splice kits shall be specified in paragraph (a) of Item 108-2.4. **Splice cans shall be provided for existing cables cut and repaired for each splice in cables not to be abandoned. Where a splice can is not readily available at the time of the cable damage, splice markers shall be temporarily installed over each splice in cables not to be abandoned, then these splices shall later be replaced with new splices in an L-867 splice can**.

There shall be no splices between series lighting circuit isolation transformers. In the event that a series lighting circuit cable is cut between isolation transformers, the entire length of cable between these isolation transformers shall be replaced, at the Contractor's own expense.

The Contractor shall use a cable stripper/penciller whenever cable connections are made.

All splices and connections will be considered incidental to the respective cable."

108-3.6 BARE COUNTERPOISE WIRE INSTALLATION FOR LIGHTNING PROTECTION AND GROUNDING. Revise this section to read as follows:

"Item AR108706, 1/C #6 Counterpoise will need to be installed with the power and control cables associated with the FAA REIL cable relocations. The counterpoise shall be embedded in the soil, a minimum of 10 in. above the duct/cable to be protected and located directly above and parallel to the lines or cables being protected. The counterpoise shall be spliced to the existing counterpoise conductor at the respective manholes (where existing REIL power and control cables are to be spliced to the new REIL power and control cables) and bonded to the respective ground rod located at this manhole. Counterpoise shall be bonded to ground rods at approximately 90-ft intervals using exothermic welds. The spacing of ground rods must vary by 10% to 20% to prevent resonance. Install ground rods at approximately 6 ft on either side of the trench. Contractor shall supply the correct exothermic welding kit for the application. The mold and cartridge used shall be selected on the basis of size, number, and type of conductors to be connected, composition and surface shape of object, and position in which the weld will be made. Exothermic welding kits shall be Cadweld (Erico Products, Inc.), Thermoweld (Continental Industries), and Ultraweld (Harger Lightning Protection and Grounding Equipment), or approved equal. The Contractor shall confirm the appropriate kits for each respective application with the respective exothermic-weld manufacturer. Regardless of the source of the kits he selects, the Contractor shall submit catalog cuts or other manufacturer information, demonstrating that the kits fit their intended applications on the above-described basis. The Contractor shall provide and use the proper preparation tools in applying the exothermic-weld process to insure an adequate weld. Ground rods and exothermic-weld connections shall be incidental to this Pay Item, and no additional compensation will be allowed."

108-3.8 TESTING. Add the following.

"K. Prior to beginning cable installation all existing series circuit cables shall be Megger tested and recorded at the vault. All existing series circuit cable loops shall have the resistance tested and recorded for each circuit at the vault."

**Add the following:**

108-3.12 LOCATING OF EXISTING UNDERGROUND UTILITIES AND CABLES. The location, size, and type of material of existing underground and/or aboveground utilities indicated on the Plans are not represented as being accurate, sufficient, or complete. Neither the Owner nor the Engineer assumes any responsibility whatever in respect to the accuracy, completeness, or sufficiency of the information. There is no guarantee, either expressed or implied, that the locations, size, and type of material of existing underground utilities indicated are representative of those to be encountered in the construction. It shall be the Contractor's responsibility to determine the actual location of all such facilities, including service connections to underground utilities. Prior to construction, the Contractor shall notify the utility companies of his operational plans, and shall obtain, from the respective utility companies, detailed information and assistance relative to the location of their facilities and the working schedule of the companies for removal or adjustment, where required. In the event an unexpected utility interference is encountered during construction, the Contractor shall immediately notify the utility company of jurisdiction. The Owner's Representative and/or the Resident Engineer/Resident Project Representative shall also be immediately notified. Any damage to such mains and services shall be restored to service at once and paid for by the Contractor at no additional cost to the Contract.

All utility cables and lines shall be located by the respective utility. **Contact JULIE (Joint Utility Location Information for Excavators) for utility information, phone: 1-800-892-0123.** Contact the FAA (Federal Aviation Administration) for assistance in locating FAA cables and utilities. Location of FAA power, control, and communication cables shall be coordinated with and/or located by the FAA. Also contact Airport Director and Airport Personnel for assistance in locating underground Airport cables and/or utilities. Also coordinate work with all aboveground utilities.

Payment for locating and marking underground utilities and cables will not be paid for separately, but shall be considered incidental to the plowing/trenching/boring of cable and cable in unit duct.

108-3.13 SEPARATION OF HIGH-VOLTAGE AND LOW-VOLTAGE WIRING. Low-voltage wiring shall maintain separation from high-voltage wiring. Low-voltage wiring and high-voltage wiring shall not be installed in the same raceway, handhole, or junction box. Where necessary provide split flexible duct around low voltage cables located in a handhole with high voltage cables, to isolate the cables from possible contact with each other.

108-3.14 IDENTIFICATION OF CABLES. At electrical handholes and manholes, identify and label each cable originating in the vault with respect to the system or device served. Provide identification tags rated suitable for the respective locations with permanent markings.

## METHOD OF MEASUREMENT

108-4.2. Revise this section to read as follows:

The footage of cable installed in duct, conduit, or raceway to be paid for shall be the number of linear feet of cable installed in duct, conduit, or raceway measured in place by direct measurement, completed, ready for operation and accepted as satisfactory with no allowance being made for overrun due to slack, turns, splices, etc. Slack cable required to perform cable splices outside of the respective splice cans, handholes, or manholes, shall be incidental to the respective cable pay item and no additional measurement for payment will be made. Cable will be measured for payment between the respective splice points in the field and/or from the respective termination or splice point in the field up to the vault.

## BASIS OF PAYMENT

108-5.1. Add the following:

"Payment will be made at the contract unit price per lin. ft of cable completed and accepted by the Engineer. This price shall be full compensation for furnishing all materials, and for all preparation, assembly, and installation of these materials; for all splices and connections; for all plowing, trenching, directional-boring, coring of manholes or handholes, installation in ducts, raceways, conduits, splice cans, handholes, or manholes, and for all excavation and backfilling; for all site restoration (topsoiling, grading, seeding, mulching) and pavement restoration; and for all labor, equipment, tools, and incidentals necessary to complete this Item.

Payment will be made under:

Item AR108082; 1/C #2 XLP-USE- per linear foot
Item AR108108; 1/C #8 5KV UG Cable - per linear foot
Item AR108158; 1/C #8 5KV UG Cable in UD - per linear foot
Item AR108258; 2/C #8 5KV UG Cable in UD - per linear foot
Item AR108706; 1/C #6 Counterpoise - per linear foot
Item AR108806; 6 Pair Control Cable - per linear foot"

**END OF ITEM 108**

## ITEM 110 INSTALLATION OF AIRPORT UNDERGROUND ELECTRICAL DUCT

### DESCRIPTION

110-1.1 Add the following:

"This item of work shall consist of the installation of all proposed conduits and ducts as shown on the Construction Plans."

**Add the following:**

110-1.2 REFERENCES

A. ANSI C80.1 – Rigid Steel Conduit, Zinc Coated.

B. ANSI C80.4 – Fittings Rigid Metal Conduit and EMT.

C. ASTM D3350 – Specification of Polyethylene Plastics Pipe and Fittings Materials.

D. ASTM F2160 – Standard Specification for Solid Wall, High-Density Polyethylene Conduit Based on Controlled Outside Diameter.

E. NEMA TC-2 – Electrical Plastic Tubing and Conduit.

F. NEMA TC-3 – Fittings Rigid PVC Conduit and Tubing.

G. NEMA Specification TC-7 – Smooth-Wall Coilable Polyethylene Electrical Plastic Conduit.

H. NFPA 70 – National Electrical Code (NEC), most current issue in force.

I. UL Standard 6 – Rigid Metal Conduit.

J. UL Standard 514B – Conduit, Tubing and Cable Fittings.

K. UL Standard 651 – Schedule 40 and 80 Rigid PVC Conduit.

L. UL Standard 651B – Standard for Continuous Length High-Density Polyethylene (HDPE) Conduit.

110-1.3 SHOP DRAWINGS. The Contractor shall furnish shop drawings for approval before ordering equipment and/or materials. Shop drawings are required for each type of conduit or duct to be used on the project. **Shop drawings shall be clear and legible. Copies that are illegible will be rejected.** Contractor shall submit sufficient copies of shop drawings to meet the needs of his personnel, sub-contractor personnel, and equipment suppliers plus 4 copies to be retained by the Project Engineer. Shop drawings shall include the following information:

A. **Certification of compliance with the AIP (Airport Improvement Program) Buy American Preferences for all materials and equipment. Do not submit ARRA (American Recovery and Reinvestment Act) certification as a substitute for certification of compliance with the AIP Buy American Preferences. Shop drawings**

**submitted without certification of compliance with the Airport Improvement Program Buy American Preferences or without certification of manufacture in the United States of America from Domestic materials in accordance with the AIP Buy American Requirements will be rejected. See the FAA website at: http://www.faa.gov/airports/aip/buy_american/ for more information on the Airport Improvement Program Buy American Preferences requirements.**

B. In order to expedite the shop drawing review, inspection and/or testing of materials and equipment, the Contractor shall furnish complete statements to the Project Engineer as to the origin and manufacturer of all materials and equipment to be used in the work. Such statements shall be furnished promptly after execution of the contract but, in all cases, prior to delivery of such materials and equipment.

C. Indicate the pay item number for each respective conduit or duct.

D. Shop drawings shall include conduit and/or duct cut sheets with type, size, specifications, UL listing, manufacturer, and catalog or part number.

E. Provide manufacturer's literature confirming the respective duct to be bored is suitable for directional boring with the respective Shop Drawing submittal.

F. Provide certification that the respective steel conduits used on this project are manufactured from 100 percent domestic steel.

## EQUIPMENT AND MATERIALS

110-2.1 GENERAL. Add the following:

"All materials for these items shall be in accordance with the FAA Standard Specification 110 Equipment and Materials, as detailed on the Plans, and as specified herein.

A. Conduit for concrete encased duct shall be Schedule 40 Polyvinyl Chloride (PVC).

B. The duct to be directional-bored shall be Schedule 40 PVC Conduit, Schedule 80 PVC Conduit or High-Density Polyethylene (HDPE) duct, (Schedule 40, Schedule 80, SDR 9, SDR 11, or SDR 13.5).

C. Conduit for electric utility service applications shall be as detailed on the Plans and as specified herein.

D. Conduit for telephone utility service applications shall be as detailed on the Plans and as specified herein."

110-2.2 STEEL CONDUIT. Replace this section with the following:

"Rigid Steel Conduit and fittings shall be hot-dipped, galvanized, UL-listed, and produced in accordance with UL Standard 6 – Rigid Metal Conduit and ANSI C80.1 – Rigid Steel Conduit, Zinc Coated. Couplings, connectors, and fittings for rigid steel conduit shall be threaded, galvanized steel or galvanized, malleable iron, specifically designed and

manufactured for the purpose. Fittings shall conform to ANSI C80.4 – Fittings Rigid Metal Conduit and EMT and UL 514B – Conduit, Tubing, and Cable Fittings. Set screw type fittings are not acceptable. Steel used to manufacture conduits shall be 100 percent domestic steel. Contractor shall provide certification that the respective steel conduits used on this project are manufactured from 100 percent domestic steel.

Miscellaneous Fittings. Fittings shall be suitable for use with conduits and ducts supplied. All fittings for use with rigid metal conduit shall be threaded. Set screw-type fittings are not acceptable. All conduit bodies, fittings, and boxes installed in classified hazardous locations (Class I, Division 1 or 2, Group D) shall be suitable for use in Class I, Division 1, and Group D locations. Fittings shall be as manufactured by Appleton, Crouse-Hinds, Hubbell-Killark, O-Z/Gedney, or approved equal."

110-2.3 PLASTIC CONDUIT. Add to this section:

"Conduits shall be suitable for underground applications encased in concrete or direct burial, and suitable for exposed applications aboveground.

A. Conduits for concrete encasement shall be Schedule 40 PVC, UL-listed, rated for 90°C cable-conforming to NEMA Standard TC-2 and UL 651, listed suitable for concrete encasement.

B. Conduits for directional boring shall be Schedule 40 PVC or Schedule 80 PVC conduit, UL-listed, rated for 90°C cable-conforming to NEMA Standard TC-2 and UL 651 and suitable for directional boring installation, Schedule 40 HDPE or Schedule 80 HDPE conduit, UL-listed, conforming to NEMA Standard TC-7 and UL 651B and suitable for directional boring installation, or Wall Type SDR 9, SDR 11, or SDR 13.5 HDPE conduit manufactured in accordance with ASTM D-3350 (Specification of Polyethylene Plastics Pipe and Fittings Materials) and ASTM F2160 (Standard Specification for Solid Wall, High-Density Polyethylene Conduit Based on Controlled Outside Diameter), and suitable for directional boring installation. **Per NEC 300.5 (K), raceways installed using directional boring equipment shall be approved for the purpose. Provide manufacturer's literature confirming the respective duct is suitable for directional boring with the respective Shop Drawing submittal.**

C. Conduits for direct burial in earth shall be PVC Schedule 40 (minimum wall thickness), UL-listed, rated for 90°C cable-conforming to NEMA Standard TC-2 and UL 651, listed suitable for direct burial in earth, or HDPE Schedule 40 (minimum wall thickness), conforming to NEMA Standard TC-7 and UL 651B, or HDPE SDR 13.5 (minimum wall thickness) manufactured in accordance with ASTM D-3350 (Specification of Polyethylene Plastics Pipe and Fittings Materials) and ASTM F2160 (Standard Specification for Solid Wall, High-Density Polyethylene Conduit Based on Controlled Outside Diameter). Conduits shall be suitable for direct burial in earth and/or concrete encasement."

**Add the following:**

110-2.9 NON-METALLIC SPLIT DUCT. Non-metallic spilt duct shall be used to extend existing duct that contains cables and/or for protection of existing cables as detailed on the Plans. Non-

metallic split duct shall be Schedule 40 PVC designed for use with power and control cable applications. Non-metallic split shall be suitable for direct burial in earth and concrete encasement and exhibit superior impact strength. Joints shall be sealed with corrosion-resistant tape and heavy-duty plastic straps as recommended by the split duct manufacturer for the application. Split duct sleeve couplings, duct sweeps, fittings, and accessories shall be by the same manufacturer to assure system integrity. Non-metallic split duct shall be manufactured by Carlon Electrical Products, or approved equal. 4-in. Schedule 40 split ducts shall be Carlon Part Number 49015SD or approved equal. Install split duct as detailed on the Plans and in conformance with manufacturer's recommendations for the respective application. Where split duct is to be concrete-encased, confirm it is suitable for the respective application with the manufacturer.

110-2.10 DUCT SPACERS. Provide duct spacers to provide proper separation of conduits installed in concrete encased duct. Duct spacers shall be designed to provide 3" separation of conduits. Duct spacers shall be Underground Devices Incorporated Wunpeece Series suitable for the respective size and quantity of ducts, approved equal. Contact information for Underground Devices Incorporated is address: 3304 Commercial Avenue, Northbrook, Illinois 60062, Phone: (847) 205-9000, Fax: (847) 205-9004. Confirm catalog numbers with the manufacturer for the respective application.

## CONSTRUCTION METHODS

110-3.1 GENERAL. Add to this section:

> "The proposed conduits and ducts shall be constructed at the locations and in accordance with the details shown on the Construction Plans. Ducts shall be installed 18 in. minimum below grade. Ducts located in area subject to farming shall be 42 in minimum below grade. Where detailed on the Plans or where required to avoid obstructions, ducts shall be buried deeper. Where concrete-encased duct interfaces to directional-bored duct at a pavement crossing, the concrete encasement shall be installed up to the respective pavement edge. Where concrete-encased duct interfaces to an electrical handhole or manhole, the concrete encasement shall be installed up to the respective handhole or manhole. Provide bushings or bells at conduit terminations in electrical handholes or manholes.
>
> Underground ducts installed by directional-boring method shall be installed in a manner that will not damage any existing underground utilities, and shall not disturb or damage the respective pavement or roadway surface. Ducts shall be directional-bored at the locations shown on the Construction Plans. The ducts will be bored at a minimum depth of 24 in. below the bottom of the pavement it is being bored under. Ducts installed under paved areas and roadways shall extend a minimum of 10 ft beyond the respective pavement or roadway surface, unless detailed otherwise on the Plans. A pull wire will be left in the conduit if it is to be left vacant. The ends of the conduit will be sealed with approved plugs.
>
> The Contractor will determine if there is a conflict between the installation of the proposed electrical ducts and any existing utilities. He will make all necessary adjustments in depth of installation to avoid any and all proposed underground improvements."

110-3.7 RESTORATION. Add to this section:

> "Any and all trenches and disturbed areas will be backfilled and restored to a smooth grade and seeded to the satisfaction of the Engineer. All trench settlement shall be corrected for a period of one year. Restoration, grading, and seeding of areas disturbed during the installation of the proposed ducts will be incidental to the respective pay item for which the duct is installed. The fertilizing and seeding will be completed in accordance with Items 901 and 908, but will be incidental to the respective pay item for which the duct is installed."

**Add the following:**

110-3.8 LOCATING OF EXISTING UNDERGROUND UTILITIES AND CABLES. The location, size, and type of material of existing underground and/or aboveground utilities indicated on the Plans are not represented as being accurate, sufficient, or complete. Neither the Owner nor the Engineer assumes any responsibility whatever in respect to the accuracy, completeness, or sufficiency of the information. There is no guarantee, either expressed or implied, that the locations, size, and type of material of existing underground utilities indicated are representative of those to be encountered in the construction. It shall be the Contractor's responsibility to determine the actual location of all such facilities, including service connections to underground utilities. Prior to construction, the Contractor shall notify the utility companies of his operational plans, and shall obtain from the respective utility companies detailed information and assistance relative to the location of their facilities and the working schedule of the companies for removal or adjustment, where required. In the event an unexpected utility interference is encountered during construction, the Contractor shall immediately notify the utility company of jurisdiction. The Owner's Representative and/or the Resident Engineer/Resident Project Representative shall also be immediately notified. Any damage to such mains and services shall be restored to service at once and paid for by the Contractor at no additional cost to the Contract.

All utility cables and lines shall be located by the respective utility. **Contact JULIE (Joint Utility Location Information for Excavators) for utility information, phone: 1-800-892-0123.** Contact the FAA (Federal Aviation Administration) for assistance in locating FAA cables and utilities. Location of FAA power, control, and communication cables shall be coordinated with and/or located by the FAA. Also contact Airport Director/Manager and Airport Personnel for assistance in locating underground Airport cables and/or utilities. Also coordinate work with all aboveground utilities.

Contractor shall locate and mark all existing cables within ten (10) feet of proposed excavating/trenching area. Any cables found interfering with proposed excavation or cable/trenching shall be hand dug and exposed. Any damaged cables shall be immediately repaired to the satisfaction of the Resident Engineer/Resident Project Representative at the Contractor's expense. The Resident Engineer/Resident Project Representative and Owner shall be notified immediately if any cables are damaged.

Payment for locating and marking underground utilities and cables will not be paid for separately, but shall be considered incidental to the respective duct installation.

## METHOD OF MEASUREMENT

110-4.1. Add the following:

"The quantity of conduit to be paid for shall be the number of lin. ft of ducts of the particular type installed and measured in-place, complete, and accepted by the Resident Engineer/Resident Project Representative."

## BASIS OF PAYMENT

110-5.1. Add the following:

"Payment will be made at the contract unit price per each type and size of conduit, completed and accepted. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials; for all sawing and pavement removal; for all duct interface work to handholes/manholes including coring of handholes/manholes; for all excavation and backfilling with aggregate backfill, earth backfill, and concrete; and for all labor, coordination, equipment, tools, and incidentals necessary to complete this Item.

Payment will be made under:

Item AR110012 2" Directional Bore - per linear foot
Item AR110014 4" Directional Bore - per linear foot
Item AR110502 2-Way Concrete Encased Duct - per linear foot
Item AR110504 4-Way Concrete Encased Duct - per linear foot"

## END OF ITEM 110

## ITEM AR110714 ELECTRICAL MANHOLE 4'

### DESCRIPTION

110714-1.1. This item of work shall consist of the construction of a 4' x 4' x 4' airport rated electrical or telephone manhole deep with lids complete, in accordance with this Specification and as detailed on the Construction Plans.

110714-1.2 SHOP DRAWINGS. The Contractor shall furnish shop drawings for approval before ordering equipment and/or materials. Shop drawings are required for each type of conduit or duct to be used on the project. **Shop drawings shall be clear and legible. Copies that are illegible will be rejected.** Contractor shall submit sufficient copies of shop drawings to meet the needs of his personnel, sub-contractor personnel, and equipment suppliers plus 4 copies to be retained by the Project Engineer. Shop drawings shall include the following information:

A. **Certification of compliance with the AIP (Airport Improvement Program) Buy American Preferences for all materials and equipment. Do not submit ARRA (American Recovery and Reinvestment Act) certification as a substitute for certification of compliance with the AIP Buy American Preferences. Shop drawings submitted without certification of compliance with the Airport Improvement Program Buy American Preferences or without certification of manufacture in the United States of America in accordance with the AIP Buy American Requirements will be rejected. See the FAA website at: http://www.faa.gov/airports/aip/buy_american/ for more information on the AIP Buy American Preferences requirements.**

B. In order to expedite the shop drawing review, inspection and/or testing of materials and equipment, the Contractor shall furnish complete statements to the Project Engineer as to the origin and manufacturer of all materials and equipment to be used in the work. Such statements shall be furnished promptly after execution of the contract but, in all cases, prior to delivery of such materials and equipment.

C. Concrete mix design for handholes to be cast in place.

D. Precast concrete handholes and manholes must be on IDOT (Illinois Department of Transportation) List of Certified Precast Concrete Producers. Provide information on respective precast concrete producer for precast handholes and drawings for respective handholes.

E. Provide cut sheets with part number and specification for handhole frame and lid.

### MATERIALS

110714-2.1. 4' x 4' x 4' airport electrical and/or telephone manholes shall be constructed in accordance with the details as shown on the Construction Plans. The manhole shall be provided with extra heavy-duty airport manhole frame and lid capable of withstanding minimum 100,000-pound loads as called for in FAA Advisory Circular AC 150/5320-6D Appendix 3, NEENAH Foundry Company R-3492-A frame and lid, or an approved equal. Lids for the

manholes containing telephone cables shall include lettering labeled "**TELEPHONE**", or as directed by the serving telephone utility company. For telephone manholes confirm lettering requirements with the serving telephone utility company."

## CONSTRUCTION METHODS

110714-3.1. 4' x 4' x 4' airport electrical and/or telephone manholes shall be constructed in accordance with the details as shown on the Construction Plans.

## METHOD OF MEASUREMENT

110714-4.1. The number of 4' x 4' x 4' airport electrical and/or telephone manholes to be paid for shall be the number of structures constructed in place and accepted by the Resident Engineer/Resident Project Representative.

## BASIS OF PAYMENT

110714-5.1. Payment will be made at the contract unit price bid for each 4' x 4' x 4' airport electrical and/or telephone manhole completed and in place. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling, and placing of the materials; for all coring, coordination, and labor associated with conduit, duct, cable in unit duct, and/or cable entries; and for all labor, equipment, tools, and incidentals necessary to complete the structure.

Payment will be made under:

Item AR110714 Electrical Manhole 4' - per each

## END OF ITEM AR110714

## ITEM AR110715 ELECTRICAL MANHOLE SPECIAL

### DESCRIPTION

110715-1.1. This item of work shall consist of the construction of an airport rated electrical manhole 4' x 4' x 6' deep with lids complete, in accordance with this Specification and as detailed on the Construction Plans.

110715-1.2 SHOP DRAWINGS. The Contractor shall furnish shop drawings for approval before ordering equipment and/or materials. Shop drawings are required for each type of electrical manhole to be used on the project. Shop drawings shall be clear and legible. Copies that are illegible will be rejected. Contractor shall submit sufficient copies of shop drawings to meet the needs of his personnel, subcontractor personnel, and equipment suppliers plus 4 copies to be retained by the Project Engineer. Shop drawings shall include the following information:

A. **Certification of compliance with the AIP (Airport Improvement Program) Buy American Preferences for all materials and equipment. Do not submit ARRA (American Recovery and Reinvestment Act) certification as a substitute for certification of compliance with the AIP Buy American Preferences. Shop drawings submitted without certification of compliance with the Airport Improvement Program Buy American Preferences or without certification of manufacture in the United States of America from Domestic materials in accordance with the AIP Buy American Requirements will be rejected. See the FAA website at: http://www.faa.gov/airports/aip/buy_american/ for more information on the Airport Improvement Program Buy American Preferences requirements.**

B. In order to expedite the shop drawing review, inspection and/or testing of materials and equipment, the Contractor shall furnish complete statements to the Project Engineer as to the origin and manufacturer of all materials and equipment to be used in the work. Such statements shall be furnished promptly after execution of the contract but, in all cases, prior to delivery of such materials and equipment.

C. Precast concrete handholes and manholes must be on IDOT (Illinois Department of Transportation) List of Certified Precast Concrete Producers. Provide information on respective precast concrete producer for precast manholes and drawings for respective manholes.

D. Provide cut sheets with part number and specification for manhole frame and lid.

E. Provide certification that the respective pre-cast manholes are manufactured in the United States of America.

### MATERIALS

110715-2.1. Airport electrical manholes shall be constructed in accordance with the details as shown on the Construction Plans. The manhole shall be provided with extra heavy-duty airport manhole frame and lid capable of withstanding minimum 100,000-pound loads as called for in

FAA Advisory Circular AC 150/5320-6D Appendix 3, NEENAH Foundry Company R-3492-A frame and lid, or an approved equal.

A. Lids for the high-voltage manholes shall include lettering labeled **"HIGH-VOLTAGE"**.

B. Lids for the low-voltage manholes shall include lettering labeled **"LOW-VOLTAGE**" or **"0V - 600V ELECTRIC"**.

C. Lids for the manholes containing FAA REIL circuits shall include lettering labeled **"FAA-REILS**".

## CONSTRUCTION METHODS

110715-3.1. Airport electrical manholes shall be constructed in accordance with the details as shown on the Construction Plans. At electrical handholes and manholes, identify and label each cable originating in the vault with respect to the system or device served.

## METHOD OF MEASUREMENT

110715-4.1. The number of electrical manholes to be paid for shall be the number of structures constructed in place and accepted by the Resident Engineer/Resident Project Representative.

## BASIS OF PAYMENT

110715-5.1. Payment will be made at the contract unit price bid for each airport electrical manhole completed and in place. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling, and placing of the materials; for all coring, coordination, and labor associated with conduit, duct, cable in unit duct, and/or cable entries; and for all labor, equipment, tools, and incidentals necessary to complete the structure.

Payment will be made under:

Item AR110715 Electrical Manhole Special - per each

## END OF ITEM AR110715

# APPENDIX A

FAA-GL-918C, Specification for Construction of Terminal Navigational Aid Facilities

Department of Transportation
Federal Aviation Administration
Great Lakes Region, Chicago, Illinois

PLEASE RECYCLE.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
GREAT LAKES REGION
CHICAGO, ILLINOIS

FAA-GL-918C
November 30, 1994

# SPECIFICATION FOR CONSTRUCTION OF TERMINAL NAVIGATIONAL AID FACILITIES

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# DIVISION 1 - GENERAL REQUIREMENTS
## SECTION 1A
## SPECIAL CONDITIONS

1A.1 SCOPE.

a. This specification covers general requirements for construction of an Instrument Landing System (ILS) and Visual Guidance Lighting Systems. The complete ILS consists of several component facilities. The term visual guidance lighting systems covers lighting facilities. Refer to the solicitation package for types of facilities to be constructed. This specification includes requirements common to all facilities and requirements specific to individual facility types. In general, all parts of this specification covering construction required on project drawings and in other contract documents, are applicable to this contract.

b. The contractor shall furnish all plant, labor, materials (except Government-furnished property), equipment, energy, transportation, and other services necessary to construct all elements of the systems required in the specifications, drawings, and other contract documents. Construction shall include all miscellaneous and incidental work necessary for a complete and operational system, whether or not such work is specifically shown or specified.

1A.2 GOVERNMENT-FURNISHED PROPERTY. Government-furnished property (GFP) is also known as Government-furnished material (GFM). Government-furnished property for this contract is shown on the Government-Furnished Property List. The Government-Furnished Property List is the sole contract document which validly identifies Government-furnished property under this contract. The contract drawings give little or no indication of which items are Government-furnished. To determine whether an item of equipment or other material is Government-furnished, see the Government-Furnished Property List. For Government-furnished property, the contractor shall provide for and pay for loading of this property at the storage location (location indicated on the Government-Furnished Property List) and transportation to, and unloading at, the job site.

1A.3 CONTRACTOR-FURNISHED MATERIAL. The contractor shall furnish all material under this contract per Paragraph 1A.1b, except the Government-furnished property identified on the Government-Furnished Property List. The instruction install on the drawings means furnish and install unless the item(s) to which the instruction applies is Government-furnished property included in the Government-Furnished Property List. The contractor shall be aware that certain materials to be furnished by the contractor, may be long-lead-time items. Therefore, the successful bidder should determine the availability of all material immediately after contract award, and initiate procurement action on long-lead-time items at the earliest possible date. To facilitate the use of this specification in procuring material and equipment, see the Material and Equipment Specification Index at the end of this section. Where the specifications mention material or equipment by brand, it is regarded as a known acceptable source, as it meets specifications.

1A.4 SUBMITTALS AND BRAND NAME USAGE.

a. Introduction. Each product required for use in the contract drawings and specifications must meet the actual minimum needs of the Government as demonstrated in the salient (prominent, important) characteristics for that product. If a brand name product is used in the drawings or specifications, it should be regarded as a "known acceptable source" (i.e., a product that meets the actual minimum needs, and demonstrates the appropriate salient characteristics). The product used can be identical or equal to the brand name product or known acceptable source in meeting the salient characteristics, but it need not exceed the actual minimum requirements. Any brand name product or known acceptable source mentioned will, however, not be required for use in order to comply with the specification or drawing unless those documents make it clear that the brand name product is required, and substitution is prohibited. The following submittal procedure shall be followed in order to:

(1) Insure adherence to functional and quality standards in substitute contractor-furnished material.

(2) Inform the FAA of the contractor's plans to use certain material and equipment, e.g., splicing materials and tools, even if they are a known acceptable source.

b. Definition. A submittal is a collection of information required by specifications, or by the Contracting Officer, presenting detailed information on:

(1) Material or equipment items the contractor proposes to use.

(2) Methods or plans of action which the contractor intends to employ in specific situations.

c. Requirements. Submittal requirements are formally defined in a paragraph of the contract Special Specifications. Submittal guidance of varying extent is presented in this specification (FAA-GL-918C), as indicated in the Material and Equipment Specification Index at the end of this section. Each product that a contractor wishes to use that is not a known acceptable source, must be approved before use, by the Contracting Officer or the Contracting Officer's designee. To gain approval, the contractor must submit documents and/or samples that will demonstrate that that product clearly will meet the Government's minimum needs, and demonstrates appropriate salient characteri-stics. All submittals must be in writing. The Contracting Officer shall have the right to require submittals from the contractor where the contractor makes an unsolicited change proposal. The information presented in a submittal shall be sufficient to demonstrate that all specification requirements for the subject material, equipment, methods,

or plans, are met by the contractor's proposal. The informational materials may include documents such as shop drawings, sketches, calculations, data sheets, written plans of action, manufacturers' catalog cuts, brochures, and/or specification sheets. If the specifications or Contracting Officer requires actual samples of material or equipment, the contractor shall provide them. For any documentary submittal, the contractor shall submit four identical sets of documents.

d. Submittal Review. When submitting before the Notice to Proceed date, the contractor shall send the submittal package(s) directly to the Contracting Officer. When submitting after contract work has begun, the contractor shall give submittal packages to the Resident Engineer, who will forward them promptly to the Contracting Officer. The Contracting Officer may personally evaluate the submittal, or request FAA engineers to evaluate it. In either case, the submittal will return directly from the Contracting Officer to the contractor, with the Contracting Officer's approval, approval with comments, or disapproval.

e. Submittal Time Frame. To provide adequate time for document transmission and submittal review, the FAA reserves the right to take two weeks to complete a review, transmission date to transmission date. Terminal navi-gational aid contracts are brief contracts. The review process can therefore span a substantial portion of the contract period. For this reason:

(1) The contractor is urged to initiate submittals as soon as feasible after contract award, and to expedite document transmission.

(2) The Contracting Officer and other reviewers (if any) will expedite reviews and document transmission insofar as feasible.

Maximum use of fast document transmission modes (e.g., fax, couriers, and overnight freight forwarders) is encouraged.

f. Procurement Before Approval. The contractor is advised not to procure any item for which submittal approval is required but not yet granted. If approval is denied, the contractor will be prevented from installing the disapproved item(s). The contractor must transmit a new submittal package for the new items replacing the disapproved items, and must procure only approved items. The contractor shall take responsibility for the delivery and installation of any items installed before submittal approval is granted. The FAA reserves the right to discontinue field work on any item furnished without submittal approval. Procuring and/or installing material which is later disapproved could result in substantial losses of money and time for the contractor.

1A.5 PRE-CONSTRUCTION CONFERENCE. The contractor shall attend a pre-construction conference when required by the contracting officer or airport management. The contractor shall abide by all agreements reached at the conference regarding safety practices, ingress and egress routes to the site, maintenance of airport security (locking gates, etc.), deference to air traffic, and other operational procedures.

1A.6 COORDINATION. All coordination between the contractor and the airport management and local FAA personnel, shall be accomplished through the Resident Engineer.

1A.7 PROJECT DRAWINGS.

a. Conflict Between Site Drawings and Standard Drawings. If any conflict should exist between site drawings (location-specific drawings) and standard drawings (drawings not referring to a particular location), the site drawings shall govern.

b. Drawings Referenced But Not Provided. Unless otherwise specified, drawings which are referenced on contract drawings, but which are not listed in the list of specifications and drawings, do not apply to the contract.

1A.8 TEMPORARY ELECTRICAL POWER. Unless otherwise specified, the contractor shall make all arrangements and pay all costs for temporary electrical power needed for construction of the facility.

1A.9 COMPLIANCE WITH LOCAL AND OTHER CODES. The contractor shall comply with standards (e.g., National Electrical Code) adopted by the contract documents, and with local and other codes. Where the requirements of the specifications and drawings exceed those of the adopted and local codes, the contractor shall comply with the requirements of the specifications and drawings.

1A.10 SANITARY FACILITIES. Sanitary facilities are not available at the work sites. The contractor shall provide temporary toilet facilities as required for his employees. The locations of the toilet facilities shall be where directed by the Resident Engineer.

MATERIAL AND EQUIPMENT SPECIFICATION INDEX

| Material or Equipment Specified | Relevant Paragraph(s) | Does the paragraph include: Product(s) listed? | Submittal guidance? |
|---|---|---|---|
| air conditioner | 16A.17e | N | N |
| anti-seize compound | 13A.2d(1) | Y | N |
| | 13C.2b | Y | N |
| cable | | | |
| 600V power cable, DEB | Section 16B | N | N |
| 600V armored power cable, DEB | Section 16C | N | Y |
| 5,000V power cable, DEB | Section 16D | N | Y |
| clamp | 13A.2d(2) | Y | N |
| control cable | Section 16E | N | Y |
| connector protection | 16A.24 | Y | N |
| end caps | 16A.8 | Y | N |
| splicing connectors | | | |
| power | 13A.6c | Y | Y |
| power and control | 16F.6 | Y | Y |
| splicing kits | | | |
| MALS power | 13A.6b | Y | Y |
| power and control | 16F.6 | Y | Y |
| circuit breakers | 16A.14b&e | Y | N |
| conduit | 16A.1 | N | N |
| | 16A.3 | N | N |
| door hardware for shelters | 13E.4 | Y | N |
| electrical coating | 16A.25 | Y | N |
| electrical enclosures and wireways | 16A.15 | N | N |
| electrical tape | 16A.21 | Y | N |

MATERIAL AND EQUIPMENT SPECIFICATION INDEX (CONTINUED)

| Material or Equipment Specified | Relevant Paragraph(s) | Does the paragraph include: Product(s) listed? | Does the paragraph include: Submittal guidance? |
|---|---|---|---|
| environmental equipment for shelters | 16A.17 | Y | N |
| exothermic welding kits | 16A.4f | Y | Y |
| expansion couplings | 16A.27 | Y | N |
| fiber forms for concrete piers | 3B.7b | Y | N |
| fire and arc proofing | 16A.23 | Y | N |
| framing, commercial metal | 16A.26 | Y | N |
| frangible couplings | 16A.20 | Y | N |
| fuses for switches | 16A.13f | Y | N |
| geotextile | 2B.3a | Y | Y |
| grounding electrode material | 16A.4c | N | N |
| crimped connectors for | 16A.4g | Y | Y |
| grounding conductor | 16A.4d | N | N |
| heater | 16A.17c | Y | N |
| heater timer unit (components) | 16A.17d | Y | N |
| landscape fabric | 2B.3b | Y | Y |
| lamp, MALS 120-watt | 13A.5 | Y | Y |
| lighting equipment for shelters | 16A.17f | Y | N |
| | 16A.17g | Y | N |
| lightning protection equipment | 16A.18 | Y | N |
| paint | 9A | N | N |
| | 13E.7 | Y | N |
| panelboard | 16A.14 | Y | N |
| pre-stretched rubber tubing | 16A.22 | Y | N |

MATERIAL AND EQUIPMENT SPECIFICATION INDEX (CONTINUED)

| Material or Equipment Specified | Relevant Paragraph(s) | Does the paragraph include: Product(s) listed? | Submittal guidance? |
|---|---|---|---|
| safety disconnect switches | 16A.13 | Y | N |
| screw anchor foundations | Section 13D | Y | Y |
| shelter steel siding | 13E.8 | Y | N |
| splicing connectors and kits | see under cable | | |
| surge arrester | 13F.7 | Y | N |
| | 16A.16 | Y | Y |
| switches, safety | 16A.13 | Y | N |
| fuses for | 16A.13 | Y | N |
| tape | see electrical tape | | |
| terminal strips for control cable | 16A.19 | Y | N |
| vent fan | 16A.17a | Y | N |
| thermostat for | 16A.17b | Y | N |

DIVISION 16 - ELECTRICAL
SECTION 16B
600-VOLT POWER CABLE FOR UNDERGROUND INSTALLATION

16B.1 SCOPE. This section covers the material requirements for all contractor-furnished single-conductor 600-volt power cable required for direct earth burial installation. Installation of power cable is covered in Section 16F.

16B.2 GENERAL REQUIREMENTS. Cable construction shall include copper single conductor and XLP (thermosetting crosslinked polyethylene) insulation. Cable shall be UL listed as Type USE or RHW or RHH for use in circuits not exceeding 600 volts at conductor temperatures of 90$^{O}$C for continuous normal operation, 130$^{O}$C for emergency overload conditions, and 250$^{O}$C for short circuit conditions. Cables shall be suitable for direct burial and above-grade installation in wet or dry locations.

16B.3 APPLICABLE SPECIFICATIONS.

a. Underwriters Laboratories Standard 854 for Service Entrance Cables.

b. Underwriters Laboratories Standard 44 for Rubber-Insulated Wires and Cables.

c. ICEA Publication Number S-66-524, NEMA Publication Number WC7 for Crosslinked Polyethylene-Insulated Wire and Cable.

d. Federal Specification J-C-30A.

16B.4 CABLE CONSTRUCTION. Cable characteristics shall include the following materials and construction:

a. Conductors. Conductors shall be solid or Class B stranded annealed uncoated copper, per UL Standards 854 and 44.

b. Separator. A suitable separator over the conductor may be used at the option of the manufacturer.

c. Insulation. Each conductor shall be insulated with XLP (crosslinked polyethylene) complying with the physical and electrical requirements of UL Standard 854 for Type USE and UL Standard 44 for Types RHW and RHH and Paragraph 3-6 of ICEA Publication Number S-66-524. The insulation shall be applied lightly to the conductor and shall be free-stripping.

16B.5 IDENTIFICATION. The cable shall be identified by surface marking indicating manufacturer's conductor size and metal, voltage rating, UL Symbol and type designation, and year of manufacture.

16B.6 TESTS. Cable shall be tested in accordance with requirements of UL Standard 854 for Type USE, UL Standard 44 for Types RHW and RHH, and ICEA Publication Number S-66-524, Paragraph 3.6.

16B.7 DATE OF MANUFACTURE. Year of manufacture of all cable shall be no earlier than one calendar year immediately preceding contract award date.

16B.8 PACKAGING. All cable shall be provided on wooden or steel reels, and ends of all cable shall be sealed to prevent entry of moisture. All reels shall identify type, length, and year of manufacture of cable packaged on such reels. All such identification shall be clearly provided by the manufacturer.

# DIVISION 16 - ELECTRICAL
## SECTION 16E
## CONTROL CABLE

16E.1 SCOPE. This section covers the material requirements for all contractor-furnished exterior standard and gopher-resistant filled control (telephone) cable to be installed as shown on the drawings. Installation of control cables is covered in Section 16F.

16E.2 APPLICABLE SPECIFICATIONS.

a. United States Department of Agriculture, Rural Electrification Administration (REA), Specification PE-39 for "Filled Telephone Cable" (Bulletin 345-67) latest edition, including all addendums and attachments thereto, forms a part of these specifications and is applicable in its entirety.

b. Certain requirements, specified herein, supplement the requirements of Specification PE-39, and shall receive special attention by the cable manufacturer and contractor.

16E.3 GENERAL REQUIREMENTS.

a. Definition. The term "control cable" used throughout these specifications and on the project drawings is a general FAA term for cable used to transmit voice and control functions. The required cable is termed "telephone" or "telephone exchange" cable by the cable manufacturing industry.

b. Quality. All control (telephone) cables shall be the standard products of a single major cable manufacturer and shall be designed and manufactured according to the highest industry standards. All cables shall be free of any imperfection which could affect serviceability and design life.

16E.4 STANDARD CABLE CONSTRUCTION. Cable requirements, complying with these specifications and Specification PE-39, include the following materials and construction.

a. Conductors. #19 AWG solid annealed copper.

b. Conductor Insulation. Solid polypropylene or polyethylene color coded in accordance with telephone industry "standard" coding.

c. Twisted Pairs. Individual conductors twisted into pairs with varying lays to minimize crosstalk.

d. Forming of Cable Core. Cables having 25 pairs or less are assembled into a single cylindrical group. Cables having more than 25 pairs are assembled in units, each individually identified by color coded unit binders.

16E.4e

e. Filling Compound. Water resistant non-hardening compound to fill and seal all interstices between the conductor pairs.

f. Core Covering. Non-hygroscopic dielectric tape.

g. Flooding Compound. Water resistant and bonding compound to fill all voids between the core wrap and shield and between the shield and jacket.

h. Shield. Corrugated electrically continuous and longitudinally applied 0.008 inch coated aluminum or 0.005 inch copper.

i. Jacket. High molecular weight polyethylene or high-molecular weight ethylene copolymer.

16E.5 GOPHER-RESISTANT CABLE CONSTRUCTION.

a. General. If gopher-resistant cable is required by drawings or special specifications, cable construction shall comply with all construction requirements for standard cable in Subsection 16E.4 above (including conformance with REA Specification PE-39) excepting for item h, "Shield", which shall comply with the following:

b. Gopher-Resistant Shield. Corrugated electrically continuous and longitudinally applied overlapping metal shield consisting of one of the following materials:

(1) 0.010 inch copper.

(2) 0.006 inch copper/stainless steel/copper bimetallic alloy.

(3) 0.007 inch Alloy 194 for 6 pr #19 cable.

(4) 0.006 inch Alloy 194 for cables larger than 6 pr #19.

(5) 0.008 inch coated aluminum with 0.006 inch coated steel.

16E.6 CABLE IDENTIFICATION. In accordance with Specification PE-39, all cable shall have jacket printed at periodic intervals with the name of the manufacturer, manufacturer's standard designation, year of manufacture, number of pairs, conductor gauge, sequential length marks, and notation signifying compliance with Specification PE-39 (if not clearly referenced in the manufacturer's submittals). In addition, the gopher-resistant shield shall be clearly identified.

16E.7 DATE OF MANUFACTURE. Year of manufacture of all cable shall be no earlier than one calendar year immediately preceding contract award date.

16E.8 PACKAGING. In accordance with Specification PE-39, all cable shall be stored and shipped on reels affording the required protection. Thermal wrapping shall be provided and ends of all cables shall be capped against exposure to moisture. All reels shall be labeled by the manufacturer and shall bear the manufacturer's name, year of manufacture, REA cable designation, description of cable, actual shipping length, and identification referenced to tests of record as required herein.

16E.9 TESTS.

a. All project cable furnished shall satisfy all test requirements of Specification PE-39. Records of all such tests shall be retained by the manufacturer, according to Paragraph 29 of Specification PE-39, and shall be promptly made available to the Federal Aviation Administration upon request. All tests shall be specifically and clearly referenced to all reels of cable furnished.

b. Basic cable design, for all project cable furnished, shall have proven acceptable to REA through "qualification testing" according to Paragraph 27 of Specification PE-39.

c. Electrical tests, according to paragraph 28.1 of Specification PE-39, shall be performed on 100 percent of all project cable furnished.

d. Quality assurance (capability) tests, according to Paragraph 28.2 of Specification PE-39, shall be performed on such periodic production basis so as to represent quality of all project cable furnished.

16E.10 SUBMITTALS. Prior to procuring any cable specified herein, the contractor shall submit the following documents for the specific cable that the contractor proposes to use, to the Contracting Officer, and receive written approval therefrom (see Paragraph 1A.4 above):

a. Manufacturer's complete cable specifications, including manufacturer's statement of compliance with REA Specification PE-39.

b. Drawing showing cable construction details.

DIVISION 16 - ELECTRICAL
SECTION 16F
CABLE INSTALLATION

16F.1 DESCRIPTION OF WORK. The extent of work is indicated on the drawings and by the provisions of this section. Included in this section are installation, splicing, and testing of power and control cables.

16F.2 GENERAL REQUIREMENTS.

a. Service Interruptions. Existing sources of power and control are indicated on the drawings. For circuits actively in use, the contractor shall coordinate temporary interruptions of service with users and suppliers, the Resident Engineer, and the airport management.

b. Cable Protection.

(1) All cable ends which will be exposed to weather, water, ground, or corrosive environment prior to termination, shall be sealed against these elements while awaiting termination or splicing. This requirement also applies to all cable ends in manholes or handholes. The sealing material shall be properly sized, easily removable heat shrinkable end caps (3M ICEC are acceptable), or electrical tape (see Paragraph 16A.19 above), with an application of brushed-on electrical coating.

(2) Cables shall not be bent at radii less than radii recommended by the manufacturer, or 10 times cable diameter (12 times diameter for armored cable), whichever is greater. Any cables damaged in any way by sharp bending shall be replaced.

(3) Special care should be taken when working with filled cables, especially when the temperature is below $35^{O}$F. This type of cable becomes more difficult to bend and work as the temperature decreases, and there is a possibility of cable damage at temperatures near $0^{O}$F.

c. 600-Volt Wire and Cable Color Coding.

(1) All single conductor 600 volt wire and cable for 120/240 volt power circuits shall be color coded black for line 1, red for line 2, and white for the neutral.

(2) For conductor sizes smaller than #8 AWG, conductor insulation shall be color coded. For sizes #8 AWG and larger, and for armored power cable, colored tape shall be used to identify the conductors if insulation is not color identified.

16F.2c(3)

(3) Conductors shall be color-coded in junction boxes, square duct, terminal boxes, or any other place accessible to view. In no case shall green be used for other than grounding, nor white for other than the system grounded (neutral) conductor.

d. Designation of Armored Cable. On drawings and other contract documents, the letter A immediately following the AWG number of a cable, indicates that the cable is armored (e.g., 3/C #8A, 600V).

16F.3 DIRECT-EARTH BURIAL CABLE INSTALLATION.

a. Installation Method. Unless otherwise specified, outdoor cables running from one structure or item of equipment to another, shall be direct earth buried. Direct-earth burial cables shall be installed either by the trench and backfill method or by the cable plowing method in accordance with all the requirements specified herein.

b. General Requirements.

(1) Underground cables shall be installed in straight lines between terminating locations or points of directional change.

(2) Unless otherwise specified, cables shall be installed a minimum of 24 inches and 30 inches below finished grade on airport property and off airport lands, respectively.

(3) Wherever possible, cable shall be installed in one continuous length without splices from connection to connection. The number of splices shall be kept to a minimum. Cable ends shall be effectively sealed against moisture immediately after cutting any type of cable. See the MALSR splice restrictions of Paragraph 13A.6.

(4) The contractor shall prepare a schedule for installing each reel of underground cable and shall submit it to the Resident Engineer for approval before installing any cable. The plan shall be predicated on use of the longest practical lengths of cable, in order to minimize splicing.

(5) A cable loop of at least three feet shall be left on each end of every cable run, on at least one side of every splice, and at all points where cable is brought above ground. A 3-foot minimum surplus cable length shall be left on both sides of splices in handholes and light bases. The slack loop shall be installed with the same minimum depth requirements as the cable run. Where cable is brought above ground, enough additional slack cable shall be left to make the required connections.

16F.3c

c. Trench and Backfill Installation Method.

(1) Comply with all trenching, backfilling, compaction, and restoration requirements in Division 2.

(2) The contractor shall unreel the cable adjacent to or over the trench and manually place it in the trench. Do not pull the cable into the trench or drag it along the trench.

(3) Where more than one cable is installed in the same trench, maintain separation as hereinafter specified. Multiple cables shall be installed in the same relative positions throughout the cable trench. Cables shall not be stacked, crossed or intertwined in any manner.

d. Cable Plowing Method.

(1) Vibratory cable plowing equipment, adequate for installation of the types of cables to be installed and for the depth required, may be used, provided that soil conditions are suitable, equipment is in good working order, and proper installation procedures are utilized.

(2) While cable is being plowed into place, one person in addition to the operator of the plowing vehicle shall be present to assure that the cables do not kink or bind tightly while entering the plow.

(3) If, during plowing operations, it appears that the soil contains sharp objects, rocks over 2 inches in diameter, or any other hazard to the cable, plowing shall be discontinued, and the Resident Engineer notified. The Resident Engineer shall determine whether plowing will be allowed to continue, or whether another cable placement method shall be used.

(4) The slice left by the plow shall be closed by tamping or other approved method, after cable placement, to minimize the disturbance of the surface by the slice.

e. Cable Separation - Direct Burial.

(1) Where new buried power cables cross over or under control or telephone cables, power cables shall be installed in a length of PVC duct extending two feet each side of the crossing. Minimum separation shall be twelve inches.

(2) Power cables of the same circuit may be laid together in the trench without separation, except as noted below. Series lighting cables may be considered being of the same circuit.

16F.3e(3)

(3) Power cables, of the same or different circuits of less than 600 volts, may be laid together in the same trench without separation.

(4) All power cables, 5,000 volts and below, shall be separated from all control, telephone and coaxial type cables by a minimum of 6 inches.

(5) Power cable, of more than 5,000 volts, shall be separated from all other cables by a minimum of 12 inches.

(6) Control, telephone, and coaxial cables may be laid in the trench without separation from each other.

f. Buried Ground Wire (Counterpoise). Unless specified otherwise, all direct-earth burial power, control and coaxial cables shall include the installation of #6 bare copper ground wire (counterpoise) per Paragraph 16A.4e above.

g. Cable Markers.

(1) Cable runs shall be marked by concrete cable markers according to project drawings. Cable markers for underground cable shall be installed at all changes of direction in cable runs, at 300 feet intervals in straight-line cable run segments, and at all splice locations.

(2) Markers shall not be poured in place. The markers shall be installed flat in the ground immediately above the cable and with approximately one inch projecting above the surface. Impress additional circuit identification symbols on markers if so directed by the Resident Engineer. Existing cable markers removed or displaced shall be replaced after installation of new cable.

16F.4 CABLE INSTALLATION IN UNDERGROUND DUCTS AND CONDUIT.

a. Precautions.

(1) Because almost all cable failures are caused by mechanical damage occurring during installation, the contractor should employ workmen experienced in underground cable installation, and utilize all the proper and unique equipment necessary for successful cable installation. Excessive direct tension, excessive sidewall pressure, sidewall impact, abrasion, sharp bending, and moisture intrusion will either destroy or shorten the useful life of cables installed.

16F.4a(2)

(2) The following conditions and installation procedures, capable of damaging cable, shall be avoided:

(a) Sediment in ducts.

(b) Scoring of duct bends by pulling ropes.

(c) Inadequate support of guiding pulleys and pull tubes, resulting in binding of mechanisms and misalignment.

(d) Inadequate cable and duct lubrication, especially at bends.

(e) Dragging cables over manhole frame edges, duct entrances, and ground or pavement surfaces.

(f) Exposure to pedestrian or vehicular traffic.

(g) Looping in and out of manholes to avoid splicing.

(h) Power pulling at locations other than at ends of cable.

(i) "Jerking" of cables caused by too weak rope that elongates under tension, exerts momentary sharp pull on cable, recovers, and elongates for another like cycle.

(j) Sheaves and pulleys that stop rolling during pull, due to inadequate support or lubrication.

(k) Inadequate sealing and mechanical protection of cable ends.

(l) Reel surface and edge damage from poor hoisting techniques.

(m) Pulling distances too great.

b. Installation Equipment. Major equipment items, required for installing cable in underground ducts, shall include the following:

(1) Power winch.

(2) Cable feed-in tubing guide capable of producing a uniform and rigid 3 and 4-foot and greater radius bend, and having a nominal diameter equal to that of the ducts.

(3) Single pulleys or sheaves providing a minimum cable bending radius (not overall sheave radius) of 10 times the largest cable diameter. Such sheaves shall be

used for minor cable bends within "through cable" manholes and at feed-in manhole rims (if necessary). Sheaves shall have ball or roller bearings.

(4) Adjustable gang pulleys with three or more pulleys capable of producing up to a 4-foot smooth cable bending radius. Each pulley shall have minimum cable bending radius of 10 times the largest cable diameter.

(5) Lubrication equipment to pre-lubricate ducts, cables at guide-in tubing, and cables at intermediate pull-through manholes.

(6) Cable reel support equipment including stands, arbor, and braking mechanism.

(7) Dynamometer for measuring pulling tensions.

(8) Communications equipment.

(9) Pulling ropes or cords having the following characteristics:

(a) A working strength at least equal to the maximum allowable cable tensions as specified herein. "Working strength" is normally 10 to 14 percent of published rope "breaking strength".

(b) Rope or cord shall be a twisted or braided synthetic fiber unaffected by water and having a low level of elongation under load. Material shall have a texture non-injurious to plastic duct when pulled against bends. Wire rope, if proposed, shall have a smooth and rigidly adhering synthetic material covering.

(c) All pulling ropes or cords shall have swivel devices at cable attachment ends.

(10) Cable lubricant specifically manufactured for electrical and control (telephone) cables. Do not use soap lubricants or those containing soap which are harmful to polyethylene- sheathed cables.

(11) Cable pulling devices (secured to ends of cable as specified below).

c. Cable Pulling Devices.

(1) Pulling devices for securing cable to pulling rope shall be factory-installed pulling eyes, field-installed pulling eyes, or basket weave cable grips. All shall be provided with integral or separate swivels.

(2) Factory-installed pulling eyes necessitate that each cable pulling segment be cut to length by the cable manufacturer. Greater tensions and longer pulling lengths can be used with factory pulling eyes for straight duct bank segments.

(3) Field-installed pulling eyes for control cable shall be a 4-crimp series, sized to the cable. Power cable pulling eyes shall be a type secured to conductors and approved by the Resident Engineer.

(4) Basket weave cable pulling grips shall be carefully sized to the specific diameters of the cables to be installed. Use grips with a rotating eye feature for power and control (telephone) cables.

d. Duct Cleanout and Pre-Lubrication.

(1) If any new or existing underground duct or conduit displays any evidence of contamination by soil or other foreign matter, such ducts or conduit shall be cleaned with a stiff bristle brush, swabbed, and flushed clean with water under pressure, before proceeding with cable pulling operations. Even a minor amount of soil or sediment in the bottom area of a duct will greatly increase the coefficient of friction and pulling tension required. With soil contamination, cable lubricant is of little value. Therefore, it is of utmost importance that conduit be cleaned prior to installation of cable.

(2) It is the contractor's responsibility to determine whether ducts designated for occupancy should be cleaned. The contractor shall assume complete responsibility for any difficulties or damage to the cable in placing cable in ducts.

(3) In addition to cable lubrication as specified elsewhere, all ducts to receive cables under this contract, shall be pre-lubricated using the same lubricant as for cables. Lubrication shall be thoroughly applied with applicators designed for this purpose. Lubrication on

cable only, will rub off to a large degree, especially at duct bank offsets at manholes.

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e. Setting Up Cable Reels and Apparatus.

(1) The contractor shall inspect cable reels for flange protrusions which could damage the cable sheath. Also, the contractor shall inspect for any obstructions that could interfere with proper unwinding of the cable.

(2) Careful control shall be exercised in the movement of cable reels. Where it is necessary to roll a reel to a desired location, it shall be rolled in the direction indicated by the arrows painted on the reel flanges. The reel shall not be allowed to tilt. A substantial runway of heavy planks should be employed where uneven ground conditions exist that may cause the reel to tilt. Where it is necessary to move a reel of cable with heavy equipment, a cable reel sling or equivalent should be used.

(3) In conduit sections containing curves, the cable reel shall be set up at the manhole near the curve unless other conditions do not permit.

(4) Cable reels shall be set up on the same side of the manhole as the conduit section in which the cable is to be placed. The reel shall be made level and brought into proper alignment with the conduit section so that the cable may be passed from the top of the reel in a long smooth bend at maximum radius into the duct without twisting and making more than a 90-degree bend. This is of utmost importance in handling filled type cable in temperature ranges of $35^{O}$F and lower. Under no circumstances shall the cable be pulled from the bottom of a reel.

(5) It is essential that the cable reel be in proper alignment and level during the placing operation. Incorrect location of the reel will cause unnecessary binding which will result in uneven cable feed.

(6) Do not permit adjacent turns of cable on the reel to stick together and cause binding as the cable is payed off the reel. Feed the cable by rotating the reel manually.

(7) Other cable support equipment, such as pulleys, sheaves, and gang-pulley equipment shall be set up rigidly within intermediate manholes to smoothly guide cables to exiting ducts.

f. Attaching Pulling Grips. All pulling grips shall be stretched onto the cables such that the entire lengths of the grip woven material will exert tension on the cable, thereby distributing stress. If the end of any cable grip

16F.4f

(furthest from the cable end) does not grip as tightly as the lead end, secure same to cable with a steel banding. Inspect cable grips frequently, and the first pull of control (telephone) cable in particular (in the first intermediate manhole), to ascertain that this requirement is fulfilled. If any uneven gripping is evident, banding will be required for all remaining cable installation of the applicable cable type and size.

g. Feeding and Pulling Cable.

(1) All cable shall be installed using methods that will prevent excessive and harmful stretching, twisting, and flexing of the cable. Such damaging treatment will mechanically weaken the cable and destroy the electrical properties immediately or in a short time.

(2) Cable may be pulled by hand or power winch. Pull rope shall be attached to cables with pulling eye or basket weave pulling grips (all equipped with swivels) for each cable pulled. Do not exceed maximum allowable pulling tension as hereinafter specified. Do not use cable manufacturer's maximum pulling tensions except for cable factory-installed pulling eyes.

(3) All splices shall occur in manholes only. Splices shall not be pulled into ducts or manholes.

(4) Cable feed-in tubing guide, same size as conduit, of suitable length shall be secured in the manhole between the cable reel and the face of the duct to protect the cable and guide it at the maximum possible smooth radius into the duct as it is payed off the reel.

(5) A cable lubricator (funnel) shall be placed around the cable just ahead of the cable feed-in guide to facilitate lubrication of the cable. The quantity of lubricant shall conform to the lubricant manufacturer's recommendations.

(6) Before starting to pull, check the equipment carefully to make sure that it is properly set up in order to minimize the chance of interruption once pulling has started. Tension shall be kept on both the cable reel and the pulling line at the start of the pull. Excessive slack and the twist of the pulling line may

cause the connecting links to turn and catch in the duct. As far as possible, the cable shall be pulled in without stopping. A pulling speed of 80 to 100 feet per minute is recommended to minimize friction forces.

16F.4g(7)

(7) A person experienced with cable handling shall be posted continuously at the cable reel while pulling cable. In addition to braking the reels and observing cable lubrication, he shall carefully inspect cable paying off the reel for cable sheath and other defects. If defects are noticed, the pulling operation shall be stopped immediately and the Resident Engineer promptly notified of the defect. Kinks and/or irregularities in the cable sheath shall be removed or corrected as directed by the Resident Engineer.

(8) Careful attention shall be paid to signals from the installation crew as the cable is being pulled so that pulling may be stopped instantly whenever necessary to avoid damage to the cable.

(9) If for any reason the pulling operation is halted between manholes, the winch operator shall not release the tension on the winch unless directed to do so. In restarting the pulling operation, the inertia of the cable shall be overcome by gradually increasing the tension in steps a few seconds apart until the cable once again is in motion.

(10) The leading end of the cable at intermediate manholes shall be guided into the duct and a feeder tube nozzle placed around the cable to prevent the cable from rubbing on the edge of the duct.

(11) All pulled ends shall be examined for evidence of damage due to the pulling operation. The cable sheath shall not be pulled beyond the cable core. Notify the Resident Engineer for inspection, and for repair or replacement action that must be taken where cracks or openings are found in the cable sheath following the pulling operations.

(12) Cable ends shall be kept sealed at all times using REA-approved cable end caps and electrical tape. After the cable has been placed, the exposed cable in the manholes should be wiped clean of cable lubricant with a cloth before leaving the manhole.

(13) All individual cable segments shall be pulled in one direction only. Both ends of a cut cable segment shall not be introduced into an intermediate manhole and

pulled in two different directions. Also, no cable segments shall be pulled out of any manhole and introduced into the same manhole for a continuation of a cable segment pull. These unacceptable pulling practices, used to avoid splicing, result in abrasion from dragging over ground surfaces and manhole frame, exposure to pedestrian and vehicular traffic,

16F.4g(13)

damage to cable layers from twisting and small bending radii when pulling cable loops through manhole frame. Shields of cables so pulled are almost always damaged.

(14) Sidewall cable pressure from duct bends, feed-in tubes, and pulleys, frequently govern the length of cable that can be pulled. The greater the radii, the less the sidewall pressure. Therefore, the contractor shall use the maximum radius at every manhole where a 90-degree pull is permitted. Adjustable gang pulleys with three or more pulleys shall be used for horizontal bends in manholes. Individual pulleys within the gang pulley device shall have a cable bending radius of minimum 10 times outside diameter of largest cable to be pulled. Width of pulleys shall be adequate to support the cable group to be pulled. Adjust gang pulleys to produce a smooth 90 degree curvature bend where such changes in direction occur.

(15) If cables will be spliced in a manhole where duct banks enter and leave 90 degrees apart, separate cable segments shall be introduced into the manhole and pulled in different directions unless pulling is permitted around a horizontal gang pulley within the manhole.

(16) Where more than one cable will be installed in a single duct, all shall be pulled into the duct concurrently.

h. Cable Spoil. All cable pulling ends shall be trimmed back to remove cable material always damaged by pulling eyes or basket weave pulling grips. To remove such spoil, cut each cable off a distance from the end equal to three times the length of pulling eye or twice the length of the basket weave pulling grip as a minimum. These amounts shall be cut off for all cables including those to be spliced or terminated by others.

i. Use of Dynamometer.

(1) The dynamometer shall be accurately calibrated and secured to properly indicate tension exerted on the cable. The dynamo-meter reading will usually give the resultant force exerted on the anchoring device, which shall be converted to the horizontal component to give correct value of pulling tension.

(2) Dynamometer readings shall be made only in the presence of the Resident Engineer. If any pulling tension is approaching the maximum allowable, and if in the judgment of the Resident Engineer, the allowable will be appreciably exceeded for the proposed run, pulling

16F.4i(2)

operations shall be immediately stopped, and the cable run spliced in the preceding manhole.

j. Maximum Cable Pulling Tensions. Maximum allowable cable pulling tensions, as measured by dynamometer, shall not exceed the following values for single cables. For multiple cables, add the tension values for the number of cables being pulled. Use a pulling rope having a working strength [not breaking strength -- reference subsection 16F.4b(9)] at least equal to the "maximum allowable pulling tension" values below.

| Cable | Maximum Allowable Pulling Tension (lbs) |
|---|---|
| 1-1/C #8 | 125 |
| 1-1/C #6 | 200 |
| 1-1/C #4 | 325 |
| 1/1-C #2 | 500 |
| 1-6 PR #19 | 125 |
| 1-12 PR #19 | 250 |
| 1-25 PR #19 | 500 |

k. Separation of Cables Installed in Conduit or Duct.

(1) Power cables of the same voltage may be installed in the same duct.

(2) Power cables of less than 600 volts may be installed in the same duct.

(3) Power cables of less than 600 volts shall not be installed in the same duct with control, telephone, or coaxial type cables.

(4) Power cables of more than 600 volts shall not be installed in the same duct with control, telephone, coaxial, or power cables of less than 600 volts.

(5) Control, telephone, and coaxial cables may be installed in the same duct.

l. Cable Installation in Manholes or Handholes.

(1) Power and control cables shall be installed in separate manholes or handholes unless otherwise specified. If installed in same manhole, install power and control cables on opposite sides. At splice locations, use

cable racks at different elevations to separate power and control cables.

16F.4l(2)

(2) Cable racking surplus shall be pulled back by hand into intermediate manholes. Pull surplus one manhole at a time beginning near both ends of cable segment. Do not use power winch unless permitted by the Resident Engineer.

(3) Cables shall be carefully routed around manhole interiors, taking all necessary precautions to prevent sharp bending. Cable racks shall be plastic or galvanized steel with properly sized porcelain insulators for the latter. Fasten all cables to plastic racks with nylon ties and to steel racks by means of the insulators.

(4) Where a splice occurs, cable shall make one loop around the manhole, and the splice located near the center of the loop.

(5) Where power and control cables are installed in the same manhole, the entire exposed length of all power and control (telephone) cables shall be fireproofed by applying fire and arc proofing tape per Paragraph 16A.23 above.

16F.5 CABLE TAGGING.

a. All cables shall be tagged in each manhole and in each terminal cabinet with not less than two tags per cable, one near each duct entrance hole. Tags shall be attached to cables immediately after installation of each cable.

b. Tags shall be circular in shape and 2 inches in diameter. Material shall be minimum 0.020-inch thick copper or brass or 0.0625-inch thick lead. 1/4-inch high steel lettering dies or equivalent size engraving equipment shall be used to make the tags. Tags shall be secured firmly to cables with Number 14 AWG copper wire.

c. Tag markings shall consist of an abbreviation of the facility served by the cable and the letter "P" or "C" denoting power or control. The facility shall include the applicable runway. Where like multiple control cables are routed between the same facilities, further identify such cables throughout the run with a single-digit number

following the letter "C". All individual-conductor power circuits shall be bundled under the same tag as opposed to separate tags for each conductor.

16F.6 SPLICING.

a. General Requirements.

(1) Splices shall be performed only by experienced and qualified cable splicers regularly engaged in this type of work.

16F.6a(2)

(2) Cable armor and/or shielding shall be bonded together across splices to provide continuous electrical paths.

(3) Where a cable is cut preparatory to splicing, the work shall proceed without delay. When an unavoidable delay is encountered in completing a splice, the opened cable shall be protected to prevent the entrance of moisture and foreign matter.

(4) Any splicing material (such as resin) older than the do-not-use-after date on the package, shall be replaced with new material at the contractor's expense.

(5) Unless otherwise specified, where multiple runs of single-conductor underground power cables are spliced, each single-conductor cable shall be spliced in a separate envelope.

(6) Approved stress reduction methods shall be used in splicing all shielded high voltage power cables (5KV and higher voltage).

b. Underground Power Cable Splices (600 Volts or Less). All low voltage splices shall be encapsulated in pressure resin in clear plastic envelopes, except as otherwise specified in Paragraph 13A.6 above, on drawings, or in special specifications. All low voltage splices shall be made with compression connectors specified in Paragraph 13A.6 above, except as otherwise specified on drawings and in special specifications.

c. Underground Control (Telephone Cable) Splices.

(1) Kit and Resin. The splices shall consist of a rigid polypropylene mold body with a built-in spacer web to provide cable centering and proper compound coverage. The mold body shall be filled with a flexible polyurethane electrical compound capable of continuous operation at 90°C, with an emergency overload temperature rating of 130°C. Splices must have provisions for inline splicing of shielded or non-shielded plastic or rubber-jacketed control (telephone)

cables. The splices shall be rated for direct burial applications. For control cables with outside diameters between 0.25 inches and 3.25 inches, 3M Scotchcast Signal and Control Cable Inline Splicing kits of the 72N series are approved, as they are among kits which meet specifications.

(2) Connectors. Control cable splice connectors shall be in-line type, in which two conductors are spliced by laying one conductor in each end of the connector, and crimping the connector with a special tool selected to match the connector type and size. Before crimping,

16F.6c(2)

the connector is open on one side of its length. After crimping, the connector is closed all around its length. The connector bodies shall be made with a tin-plated phosphor bronze piece on the inside, to contact the cable conductors, and bonded polyester insulation on the outside, to insulate the connection. The insulation shall be color coded to denote wire size range. The cable splice connectors and tools shall incorporate the insulation displacement termination technique which uses a slotted, tin-plated contact to displace the conductor insulation, thus providing four redundant electrical contact points. Connectors which require prestripping the conductor shall not be used. AMP, Inc. (Harrisburg, PA) Picabond connectors sized for conductor size, and matching AMP tooling, are among products meeting the above specifications, and are approved.

d. Submittals. See Paragraph 1A.4 above. If the contractor --

(1) Intends to splice using materials different from those specified in Paragraphs b and c above, or

(2) Intends to splice a 5KV or higher voltage power cable,

then the contractor shall submit to the Contracting Officer, shop drawings or catalog cuts for all splicing materials, tools, and dies. The contractor shall splice no cables before he has received the Contracting Officer's approval of these items.

16F.7 CONTROL (TELEPHONE) CABLE TERMINATIONS.

a. Cable Routing and Support.

(1) Cable jackets shall be removed within terminating enclosures such that no more than 2 inches of jacket material is visible within the enclosures. Ground shielding and armor as specified below.

(2) Exposed cable conductor bundles shall be lock-stitched laced together with nylon lacing twine spaced at

approximate 5/8- inch intervals. Each bundle shall contain maximum 25 pairs of conductors which shall be neatly routed and secured to backing panels with nylon clamps.

b. Cable Pair Terminations.

(1) Terminated pairs shall have the same sequence on each terminal strip. (For terminal block specifications, see Paragraph 16A.19, above.) The color code termination sequence on the terminal strips shall be in accordance with the following schedule. The white

16F.7b(1)

mates shall start at the top or left-hand side of the terminal block with color continuing down or across the block according to the following schedule:

| MATE COLORS | PRIMARY WIRE COLORS |
|---|---|
| WHITE | BLUE |
| " | ORANGE |
| " | GREEN |
| " | BROWN |
| " | SLATE |
| RED | BLUE |
| " | ORANGE |
| " | GREEN |
| " | BROWN |
| " | SLATE |
| BLACK | BLUE |
| " | ORANGE |
| " | GREEN |
| " | BROWN |
| " | SLATE |
| YELLOW | BLUE |
| " | ORANGE |
| " | GREEN |
| " | BROWN |
| " | SLATE |
| VIOLET | BLUE |
| " | ORANGE |
| " | GREEN |
| " | BROWN |
| " | SLATE |

(2) When cables do not have the preceding color code, like pairs shall be terminated in the same sequence at both ends of the cable.

16F.8 CABLE ARMOR AND SHIELD GROUNDING.

a. Grounding Locations.

(1) Control cable armor and/or shielding shall be grounded at one end of each cable run only.

(2) Power cable armor shall be grounded at both ends of each cable run.

(3) Shielding and armor of control and power cables shall not be grounded at splice locations.

16F.8b

b. Grounding Procedures.

(1) Use #14 AWG stranded copper grounding conductors for grounding shielding and armor. Secure grounding conductors to shielding and armor by using UL-approved grounding connectors specifically designed for this purpose. Neatly tape ends of butted cable to conceal the connections.

(2) Attach crimp-type lugs of proper size to free ends of grounding conductors, and secure lugs to enclosure interior wall with a machine screw and nut.

16F.9 CABLE TESTING.

a. General Requirements.

(1) Both before and after installation, all contractor-furnished and Government-furnished power and control (telephone) cables shall be tested as required herein. Testing after installation shall be accomplished across splices.

(2) All testing shall be accomplished in the presence of the Resident Engineer. Furnish two signed and dated copies of all test results, clearly tabulated for all segments of cable tested, to the Resident Engineer.

(3) The contractor shall use his own test equipment, which shall bear current calibration certification from a certified instrument calibration laboratory.

(4) Any measured values not conforming to specified values shall be cause for rejection of the defective cable installation. After repair or replacement, if so required by the Resident Engineer, cable shall be retested and additional remedial work performed until satisfactory test results are obtained. All repair and

replacement work shall be accomplished at no additional cost to the Government.

b. 600-Volt Power Cable Testing.

(1) Conductor continuity shall test positive.

(2) Armor continuity shall test positive.

(3) Dielectric strength/insulation resistance shall test 50 megohms minimum at 500 volts D.C. between the following:

(a) Conductor and ground for single-conductor cable.

16F.9b(3)(b)

(b) Individual conductors for multi-conductor armored cable.

(c) Individual conductors and grounded armor.

c. Control (Telephone) Cable Testing.

(1) Conductor continuity shall test positive.

(2) Shield continuity shall test positive.

(3) Armor continuity shall test positive.

(4) Dielectric strength/insulation resistance shall test 50 megohms minimum at 500 volts D.C. between paired conductors and between individual conductors and grounded shield.

(5) After installing control cable, the minimum number of acceptable paired conductors shall comply with the following:

(a) For 11 pair or less cable, all pairs shall test acceptable.

(b) For 12 to 25 pair cable, all pairs except one shall test acceptable.

# APPENDIX B

FAA-C-1391c, Specification, Installation, Termination, Splicing, and Transient/Surge Protection of Underground Electrical Distribution System Power Cables

U.S. Department of Transportation
Federal Aviation Administration


FAA-C-1391c
May 2012
SUPERSEDING
FAA-C-1391b
25 January 1991

DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION
SPECIFICATION

# INSTALLATION, TERMINATION, SPLICING, AND TRANSIENT/SURGE PROTECTION OF UNDERGROUND ELECTRICAL DISTRIBUTION SYSTEM POWER CABLES

**This specification is approved for use by all Departments of the Federal Aviation Administration (FAA)**

## FOREWORD

1. This specification provides requirements for the installation of FAA-owned and maintained underground electrical line distribution (ELD) systems in support of FAA facilities. The ELD systems include power cable and associated components on the exterior, commercial power supply side of the circuit at the airfield or remote site up to the FAA facility service entrance.

2. This specification applies only to FAA medium-voltage (MV) and low-voltage (LV) underground power cables, and to a limited extent to overhead lines that may form a part of an FAA-owned circuit. It does not apply to control, telecommunication, or facility service entrance (load side) wiring. For standards pertaining to these non-power cable and electrical systems, consult the office of primary responsibility for applicable standards.

3. Power for airfield lighting cables has a separate set of standards and procedures. Refer to the appropriate FAA Advisory Circular (AC) 150/5340 and associated governing standards.

4. This is an update to an existing specification. It assimilates recent utility industry knowledge concerning ELD systems, providing safer, more reliable FAA underground MV and LV ELD systems.

5. Changes in this version of the document include (see change history, page iv):

   a. Deletion of requirements for non-electrical-line-distribution (non-ELD) systems, including communications and telecommunications cables (both copper and FOTS), control cables, and constant-current-regulated runway approach and edge lighting power cables. Basic separation requirements between ELD and non-ELD cables have been retained. Installation standards and specifications for the non-ELD systems may be found by consulting the appropriate office of primary responsibility.
   b. Emphasis on product changes in FAA ELD systems from the older 2.4 kV to 4.16 kV distribution circuits to the newer industry standard medium voltage systems, e.g., 3-phase/7200 V (phase to neutral). The Power Cable Program favors 15 kV rated cables and equipment to bring FAA ELD systems up to compatibility with the utility industry and to meet future FAA needs.
   c. Increased attention to the protection of sensitive internal constituent parts of MV cable systems during installation, by (1) the imposition of stringent tests meeting IEEE criteria, and (2) using proper cable pulling, splicing, and terminating techniques.
   d. Guidance on acceptance testing of newly installed power cable.
   e. Treatment of the qualifications of MV “qualified persons” during installations.

6. This specification is intended to ensure that minimum FAA requirements are met based on current commercial practices relating to safety, reliability, and restorability of FAA electrical line distribution systems. Contractors are encouraged to provide innovative, best-value solutions wherever possible within the bounds of these requirements.

Comments, suggestions, or questions on this document should be addressed to: Federal Aviation Administration, AJW-22, Power Services Group, Power Cable Program, 950 L'Enfant Plaza SW, Third Floor, Washington, D.C. 20024. https://intranet.faa.gov/faaemployees/org/linebusiness/ato/operations/technical_operations/atc_facilities/power_services/power_cable/

Approved by:

Jay Rupp,
Manager,
Power Services Group, AJW-22

5-7-12
Date

Pamela Curry

Pamela Curry,
Manager,
Power Systems Engineering Team,
AJW-221

5-3-12
Date

Pedro Bracero

Pedro Bracero,
Power Cable Program Manager,
Power Systems Engineering Team,
AJW-221

5-3-12
Date

## Change History

| 1. Originator Name and Address<br>AJW-22, Power Services Group | 2. [] Proposed | 3. Code Identification | 4. Document No. FAA-C-1391c |
|---|---|---|---|
| Washington, DC | [X ] Approved | 5. Code Identification | 6. DCN No. |
| 7. System Designation | 8. Related ECR/NCP No.<br>ATO0W-CABLE-1023 | 9. Contract No. | 10. Contractual Activity N/A |
| 11. Product Integration Plan | | 12. Effectivity | |

This notice informs recipients that the standard identified by the number (and revision letter) shown in block 4 has been changed. The pages changed by this DCN (being those furnished herewith) carry the same date as the DCN. The page numbers and dates listed below in the summary of changed pages, combined with non-listed pages of the original issue of the revision shown in block 4, constitute the current version of this specification.

| 13. DCN No. | 14. Pages changed | S* | A/D* | 15. Date |
|---|---|---|---|---|
| | Summary - general:<br>a. Deletion of requirements for non-electrical-line-distribution (non-ELD) systems, including communications and telecommunications cables (both copper and FOTS), control cables, and constant-current-regulated runway approach and edge lighting power cables. Basic separation requirements between ELD and non-ELD cables have been retained. Installation standards and specifications for the non ELD systems may be found by consulting the appropriate office of primary responsibility.<br>b. Emphasis on product changes in FAA ELD systems from the older 2.4 kV to 4.16 kV distribution circuits to the newer industry standard medium voltage systems, e.g., 3-phase/7200 V (phase to neutral). The Power Cable Program favors 15 kV rated cables and equipment to bring FAA ELD systems up to compatibility with the utility industry and to meet future FAA needs.<br>c. Increased attention to the protection of sensitive internal constituent parts of MV cable systems during installation, by (1) the imposition of stringent tests meeting IEEE criteria, and (2) using proper cable pulling, splicing, and terminating techniques.<br>d. Addition of power cable acceptance testing process for newly installed cables (text main body and Appendix C). Acceptance tests classified as destructive by the IEEE, such as the DC high potential (HIPOT) test, shall no longer be performed on in-service power cables.<br>e. Treatment of the qualifications of MV "qualified persons" during installations. | | | 1/24/2012 |
| | Details – changes:<br>a. Non ELD systems, deletions from FAA-C-1391b version: pp. 1-4, 7-15, 17-19. Sections/paragraphs affected: 2.1.2, 2.1.3, 3.1.2, 3.2.1, 3.2.2, 3.4, 3.4.1.1, 3.4.1.2, 3.4.2.2, Table I, 3.4.3, 3.4.3.1, 3.4.4, 3.4.5, 3.5.1, 3.5.2, 3.6, 4.2, 4.3, 4.5, 4.5.1, 4.5.2, 4.6, 4.6.1, 4.6.2, 4.6.3, App A. | | | 1/24/2012 |
| | Details – changes:<br>b. Product changes, additions in FAA-C-1391c: cable 3.3.6.2; 15 kV surge protection 5.8.2; 15 kV splice kits 5.9. | | | 1/24/2012 |
| | Details – changes:<br>c. Installation of cables, additions in FAA-C-1391c: splice procedures 5.9; cable pulling 5.5.12 and App B; cable end sealing 5.5.11; installer qualifications 3.3.3.2; 50/60 Hz offline partial discharge test 3.3.6.3, 3.3.6.4. | | | 1/24/2012 |
| | Details – changes:<br>d. Acceptance testing procedures, additions in FAA-C-1391c: 3.3.6; Appendix C. | | | 1/24/2012 |
| | Details – changes:<br>e. Qualified persons and contractors, change in FAA-C-1391c: 3.3.3 (all), 3.3.6.4, 5.9. | | | 1/24/2012 |
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## CONTENTS

# 1. SCOPE

This specification defines the minimum requirements for the installation of medium voltage (between 600 V and 34,500 V nominal voltage line to ground) and low voltage (up to 600 V) electrical power cables buried directly in the earth or installed in underground duct or conduit. The work includes surveying, trenching, backfilling, installation of cables, conduits, concrete-encased ducts, hand holes, manholes, duct markers, joints and splicing, terminating, providing surge protection, and testing of cables for acceptability of the finished ELD. In addition, this specification defines the responsibilities of the contractor with respect to safety, quality assurance, and quality control during the installation and testing of power cable systems.

This specification covers installation of power cables only. For FAA power cable product specifications, refer to Section 2.3.1.3 of this document.

**This specification applies to installation of medium and low voltage facility electrical supply power cables only. These cables provide facility power from the power supplier's primary service through the main secondary distribution system up to the branch circuit protective devices. For detailed information on the installation of non-electrical-line distribution cables such as control cables, fiber optics telecommunication (FOTS) cables, communication cables, etc., consult with the office of primary responsibility (OPR) for guidance. The 2400-V shielded constant current power cables serving runway edge lighting fixtures have their own standards and are not the subject of this specification. Consult the appropriate office of primary responsibility and the airport circulars for guidance. For basic separation requirements of FAA utility power cable systems from non-electrical-power cable systems, consult the section of this specification entitled, "Separation of Cables" (5.5.10). When physically integrating non-ELD cables with power cables, do not assume all of the provisions of FAA-C-1391 apply without first coordinating with the appropriate OPR and the FAA onsite project engineer responsible for integration of multiple cable assets.**

**Non-ELD OPRs consist of:**

a. **AJW-45 Ground-Based Navaids Group,**
b. **AJW-46 Lighting Systems Group,**
c. **AJW-52 Communications Systems Engineering Group,**
d. **AJW-53 Telecommunication Services Group,**
e. **AJW-55 Air-Ground Data Communications Group,**
f. **AJW-56 Air-Ground Voice Communications Group,**
g. **Others (as applicable).**

# 2. APPLICABLE DOCUMENTS

## 2.1 General

Due to the continuous updating of Government documents, the FAA Contracting Officer and/or the FAA Project Engineer must specify the document version current at contract award or project design. The current documents form a part of this specification. Some of the FAA documents listed are out of date but are still applicable; reference the notations next to each reference provided. FAA tailoring organizations should consult with the offices of primary responsibility to obtain the most recent applicable documentation.

## 2.2 Order of precedence

In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

## 2.3 Government documents

The following citations are government documents that are used as references in this specification.

### 2.3.1 FAA orders, standards, specifications, and handbooks

The following FAA orders, standards, specifications, and handbooks form a part of this document to the extent specified herein. Unless otherwise stated, requirements contained in these documents are as cited in the project solicitation or contract. (Copies of FAA orders, standards, specifications, handbooks, drawings, and other applicable FAA documents may be obtained from the Contracting Officer issuing the invitation-for-bids or request-for-proposals. Requests should fully identify the material desired; for example: specification, standard, amendment, drawing numbers [drawings possessing standard FAA signature block], and dates. Requests should cite the invitation for bids, request for proposals, the contract involved, or other source of the requested material.)

#### 2.3.1.1. ORDERS

| | |
|---|---|
| JO 3900.XX | Air Traffic Organization Electrical Safety Program [Future] |
| JO 6950.27 | Short Circuit Analysis and Protective Device Coordination Study [contact PSG Systems Engineering for arc flash calculations] |

#### 2.3.1.2 STANDARDS

| | |
|---|---|
| FAA-STD-XXX | Underground Electric Line Distribution (ELD) Systems [Future] |

| | |
|---|---|
| FAA-STD-019 | Lightning Protection, Grounding, Bonding and Shielding Requirements for Facilities |
| FAA-STD-032 | Design Standards for NAS Physical Facilities |

#### 2.3.1.3 SPECIFICATIONS

| | |
|---|---|
| 150/5320 | Surface Drainage Design |
| 150/5370 | FAA Standards for Specifying Construction of Airports |
| FAA-E-113 | Poles, Wood, Treated |
| FAA-E-2793 | Cable, Electrical Power, 500 to 25,000 Volts [out of date, consult with Power Services Group, Power Cable Program] |
| FAA-E-2013 | Cable, Electrical Power, 600 to 15,000 Volts [out of date, consult with Power Services Group, Power Cable Program] |

#### 2.3.1.4 HANDBOOKS

| | |
|---|---|
| FAA-HDBK-XXX | Underground Electric Line Distribution (ELD) Systems [Future] |

### 2.3.2 Other Government documents, drawings, and publications

The following Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

**American Association of State Highway & Transportation Officials Specifications**

| | |
|---|---|
| AASHTO HB-17 | Standard Specifications for Highway Bridges. |
| AASHTO HS-20 | Standard Specifications for Highway Bridges |

**Occupational Safety and Health Administration Codes**

| | |
|---|---|
| Part 1926 | Safety and Health Regulations for Construction. |

**Military Specifications**

| | |
|---|---|
| MIL-I-3825 | Insulating Tape, Self-Fusing |

| | |
|---|---|
| DLA A-A-50563 | Conduit Outlet Boxes, Bodies, and Entrance Caps, Electrical: Cast Metal |
| DLA A-A-59213 | Splice Connectors |
| DLA A-A-59214 | Junction Box: Extension, Junction Box; Cover, Junction Box (Steel, Coated with Corrosion-Resistant Finish) |
| DLA A-A-59544 | Cable and Wire, Electrical (Power, Fixed Installation) |
| DLA A-A-59551 | Wire, Electrical, Copper (Uninsulated) |
| Navy A-A-59827 | Topside Conduit (Flexible) and Conduit fittings, Electrical: Composite Based (Non-metallic) |
| UFC 3-350-03FA | Electrical Power Supply and Distribution |
| UFGS 33 70 02.00 10 | Electrical Distribution System, Underground |
| UFGS 33 71 02.00 20 | Underground Electrical Distribution |

**Federal Specifications**

| | |
|---|---|
| W-C-375/3 | Circuit Breakers, Molded Case; Branch Circuit and Service |
| W-S-865 | Switch, Box (Enclosed), Surface Mounted |
| WW-C-566 | Conduit, Metal, Flexible |
| WW-C-581 | Class 1 Type A with Standard for Electrical Rigid Metal Conduit - Steel, UL 6 |

## 2.4 Non-Government publications

The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

**American National Standards Institute (ANSI) Standards**

| | |
|---|---|
| ANSI 6 | Standard for Rigid Metal Conduit. (Same as UL 6) |
| ANSI 467 | Standard for Grounding and Bonding Equipment. (Same as UL 467) |
| ANSI 514 | Fittings for Cable and Conduit. (Same as UL 514) |

| | |
|---|---|
| ANSI 651 | Schedule 40 and 80 Rigid PVC Conduit. (Same as UL 651) |
| ANSI A14.3 | Safety Code for Fixed Ladders |
| ANSI C2 | National Electrical Safety Code (NESC). (Same as IEEE C2) |
| ANSI C62.11 | IEEE Standard for Metal-Oxide Surge Arresters for AC Power Circuits (>1 kV). (Same as IEEE C62.11) |
| ANSI C62.22 | IEEE Guide for the Application of Metal Oxide Surge Arrester for Alternating Current Power Circuits. (Same as IEEE C62.22) |
| ANSI C62.22.1 | Guide for the Connection of Surge Arresters to Protect Insulated, Shielded Electric Power Cable Systems (Same as IEEE 1299/C62.22.1) |
| ANSI C62.41 | Recommended Practice on Characterization of Surges in Low-Voltage (1000V and Less) AC Power Circuits. (Same as IEEE C62.41) |
| ANSI C80 | Rigid Steel Conduit – Zinc Coated. (Same as NEMA C80) |
| ANSI C119.1 | Sealed Insulated Underground Connector System Rated 600 Volts. (Same as NEMA C119.1) |
| ANSI FB 1 | Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies. (Same as NEMA FB1) |
| ANSI RN 1 | Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Steel Conduit. (Same as NEMA RN 1) |
| ANSI S-97-682-2007 | Standard for Utility Shielded Power Cables Rated 5 through 46 kV (Same as ICEA S-97-682-2007) |
| ANSI TC 6 & 8 | PVC Plastic Utilities Duct for Underground Installation. (Same as NEMA TC 6 & 8) |
| ANSI Z535 | Safety Alerting Standards. (Same as NEMA Z535) |

**American Society of Civil Engineers Standards**

| | |
|---|---|
| CI/ASCE 38-02 | Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data. |

## American Society for Testing & Materials (ASTM) Standards

| | |
|---|---|
| ASTM A48 | Standard Specification for Gray Iron Castings. |
| ASTM B8 | Standard Specification for Concentric-Lay-Stranded Copper Conductors |
| ASTM C478 | Standard specification for Precast Concrete Manhole Section (AASHTO No. M199). |
| ASTM C858 | Standard Specification for Underground Precast Concrete Utility Structures |
| ASTM C990 | Standard Specification for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants. |
| ASTM D422 | Standard Test Method for Particle-Size Analysis of Soils |
| ASTM D698 | Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort |
| ASTM D1056 | Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber. |
| ASTM F512 | Standard Specification for Smooth-wall PVC Conduit and Fittings for Underground Installation |

## Institute of Electrical and Electronics Engineers (IEEE) Standards

| | |
|---|---|
| IEEE C2 | National Electrical Safety Code (NESC) |
| IEEE-48 | Test Procedures and Requirements for Alternating-Current Cable Terminations Used on Shielded Cables Having Laminated Insulation Rated 2.5 kV through 765 kV or Extruded Insulation Rated 2.5 kV through 500 kV |
| IEEE-100 | The Authoritative Dictionary of IEEE Standards Terms |
| IEEE-386 | Standard for Separable Insulated Connector Systems for Power Distribution Systems above 600V |
| IEEE-400.2 | IEEE Guide for Field Testing of Shielded Power Cable Systems Using Very Low Frequency (VLF) |

| | |
|---|---|
| IEEE-400.3 | Guide for Partial Discharge Testing of Shielded Power Cables in a Field Environment |
| IEEE-404 | Standard for Power Cable Joints |
| IEEE-525 | Cable Systems in Substations |
| IEEE-835 | Power Cable Ampacity Tables |
| IEEE C62.11 | IEEE Standard for Metal-Oxide Surge Arresters for AC Power Circuits (>1 kV). |
| IEEE C62.22 | IEEE Guide for the Application of Metal Oxide Surge Arrester for Alternating Current Power Circuits |
| IEEE 1299/C62.22.1 | Guide for the Connection of Surge Arresters to Protect Insulated, Shielded Electric Power Cable Systems |
| IEEE C62.41 (Formerly IEEE 587) | Recommended Practice on Characterization of Surges in Low-Voltage (1000V and Less) AC Power Circuits |

**Insulated Cable Engineers Association (IECA) Standards**

| | |
|---|---|
| ICEA S-97-682-2007 | Standard for Utility Shielded Power Cables Rated 5 through 46 kV |

**International Electrotechnical Commission (IEC) Standards**

| | |
|---|---|
| IEC 60071-2 | Insulation coordination Part 2: application guide. |

**National Electric Manufacturers Association (NEMA) Standards**

| | |
|---|---|
| RN 1 | Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Steel Conduit |
| FB1 | Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies |
| TC 2 | Electrical Polyvinyl Chloride (PVC) Tubing (EPT) and Conduit (EPC-40 AND EPC-80) |
| TC 3 | PVC Fittings for Use with Rigid PVC Conduit and Tubing |
| TC 6 & 8 | PVC Plastic Utilities Duct for Underground Installation |
| TC 9 | Fittings for PVC Plastic Utilities Duct for Underground Installation |

| | |
|---|---|
| TC 14 | Filament-Wound Reinforced Thermosetting Resin Conduit and Fittings |
| NECA/NEMA 605 | Recommended Practice for Installing Underground Nonmetallic Utility Duct |

**Underwriters' Laboratories (UL) Inc. Standards**

| | |
|---|---|
| UL 6 | Standard for Rigid Metal Conduit |
| UL 467 | Standard for Grounding and Bonding Equipment |
| UL 514 | Fittings for Cable and Conduit |
| UL 651 | Schedule 40 and 80 Rigid PVC Conduit |

**National Fire Protection Association (NFPA) Standards**

| | |
|---|---|
| NFPA-70 | National Electric Code (NEC) |
| NFPA-70E | Electrical Safety in the Workplace. |
| NFPA-780 | Standard for the installation of Lightning Protection Systems |
| NEC Hdbk | Art. 110.16, Flash Protection |
| NEC Hdbk | Art. 344.10, Rigid Metal Conduit: Type RMC |
| NEC Hdbk | Art. 280, Surge Arrestors, Over 1 kV |

# 3. GENERAL

## 3.1 Definitions

Unless otherwise specified, electrical and electronics terms used in this specification, and on the drawings, shall be as defined in IEEE 100, *The Authoritative Dictionary of IEEE Standards Terms*.

In the text of this specification, the words "conduit" and "duct" are sometimes used interchangeably and have the same meaning.

In the text of this specification, "medium voltage cable splices" and "medium voltage cable joints" are used interchangeably and have the same meaning.

## 3.2 Submittals

Submittals are limited to those necessary for quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.

A "G" following a submittal item indicates that the submittal requires Government authorization. Note: FAA tailoring organizations may delete a "G" if the submittal item is not complex and can be reviewed through the Contractor's quality control system. Add a G if the submittal is sufficiently important or complex in the context of the project.

Where applicable, the following submittals are required for each kind, voltage, or type used on the project.

a. Design Data Summary Handbook (per FAA-STD-032) [G]
b. Cost estimates submitted and updated as the project progresses [G]
c. Medium voltage cable [G]
d. Medium voltage cable splices and joints [G]
e. Medium voltage cable terminations [G]
f. Conduits [G]
g. Switch pads and sectionalizers [G]
h. Transfer switches (automatic and manual) [G]
i. Transformers [G]
j. Surge arresters [G]
k. Live end caps [G]
l. Precast concrete structures [G]
m. Sealing Material
n. Manhole frames and covers [G]
o. Hand hole frames and covers [G]
p. Cable supports (racks, arms and insulators) [G]
q. Protective devices and coordination study [G]
r. Arc flash hazard study [G]
s. Test Reports [G]
t. Medium voltage cable qualification and production tests [G]
u. Field acceptance checks and tests [G]
v. Arc-proofing test for cable fireproofing tape [G]
w. Cable installation plan and procedure (use cable installation plan only when pulling cable between manholes; do not use for pulling from pole riser to manhole only) [G]
    1. Site layout drawing with cable pulls numerically identified.
    2. A list of equipment used, with calibration certifications.
    3. The manufacturer and quantity of lubricant used on pull.
    4. The cable manufacturer and type of cable.
    5. The dates of cable pulls, time of day, and ambient temperature.
    6. The length of cable pull and calculated cable pulling tensions.
    7. The actual cable pulling tensions encountered during pull.
    8. Certificates.

w. Cable splicer/terminator qualifications [G]
x. Cable installer qualifications [G]
y. Project design drawings [G]

## 3.3 Quality Assurance

All work shall comply with the National Electrical Code (NEC) and IEEE C2/National Electrical Safety Code (NESC) for components and installation. Furnish products that are listed and labeled by a nationally recognized testing laboratory (NRTL) for the application, installation condition, and the environment in which the products are installed.

### 3.3.1 Quality Plan

The contractor shall submit a Quality Plan in compliance with ISO 9001, *Quality Management Systems Requirements*. This plan will allow the FAA to identify the stages at which the FAA requires carrying out an inspection or witnessing a test. The plan shall cover all relevant stages of personnel qualification, design, coordination, supplier selection, manufacturers' acceptance testing, site inspection, site quality control testing, and commissioning. The plan shall identify relevant suppliers by name, components supplied, country of origin, and whether suppliers and supplied components are quality assurance certified.

### 3.3.2 Quality Control

The quality of the equipment installed shall be controlled at the manufacturers' plants and on-site to ensure that it meets the required specifications. The quality of civil engineering work, such as trenching, ducting, and others, shall be inspected by the FAA and authorized after major construction steps. The contractor shall inform the FAA of the manufacturing/shipping schedules and shall offer representatives of the FAA the opportunity to witness acceptance tests. These tests shall be performed on a statistically meaningful number of samples, specified by FAA engineers, or on each reel of cable shipped. After receipt of equipment shipments and prior to installation, the contractor shall subject equipment to a thorough visual inspection. An FAA representative shall be notified in advance and afforded the opportunity to be present and witness this step. Nameplates and markers shall be checked against the required specifications, and deviations brought to the FAA's attention. At the FAA's request, quality control checks, including acceptable electrical measurements (such as cable insulation resistance tests and surge protection leakage current measurements) shall be performed and reported. After the installation of cable systems is completed, acceptance/commissioning tests shall be performed.

All equipment and materials shall be subject to acceptance through manufacturers' certification of compliance with applicable specification requirements when so requested. The requirements of this standard shall be considered as minimum requirements and shall not relieve the contractor of the responsibility to furnish and install higher grades of materials than specified when so required by the contract drawings and specifications. The installation shall conform to the most stringent requirements of the National Electrical Code (NEC/ NFPA-70), the local electrical code

and NFPA-70E, and applicable ANSI and IEEE standards, namely the National Electrical Safety Code (NESC), as well as other relevant guides and standards listed in Section 2.

## 3.3.3 Qualifications of Personnel

### 3.3.3.1 Designers

The design team shall have at least one engineer with significant experience in medium voltage design, review, and construction management. The engineer shall have worked with electrical power systems, and shall have designed electrical distribution systems whose reliability, maintainability, availability, and fault tolerance are of a similarly high level to those found in campus environments such as hospitals, life safety systems, and/or large computer and telecommunication facilities. The design engineer shall have the ultimate responsibility of the construction set (specifications, drawings, and cost estimates) and installation quality control. Drawings and engineering documents published by a non-FAA entity shall be signed by a registered professional engineer with knowledge and qualifications tailored to underground medium-voltage and low-voltage electrical distribution systems.

### 3.3.3.2 Installation Crew

Experienced personnel regularly engaged in underground electrical distribution system work shall perform the work. Personnel exclusively or mainly trained in overhead line work, or low voltage facility wiring work, are not sufficiently qualified to install FAA medium-voltage underground electrical distribution systems. Workers shall be properly licensed where required by law. Only qualified personnel may work on electric circuit parts or equipment being installed.

A qualified person is one who has skills and knowledge related to the construction and operation of the FAA's electrical equipment and installations, and has received safety training to recognize and avoid the hazards involved. Management personnel shall be responsible for authorizing the qualified personnel to perform a task. Besides completion of Occupational and Safety and Health Administration (OSHA)/FAA required electrical safety training for qualified personnel, those authorized shall meet the requirements of a Qualified Person as mandated by OSHA and discussed in NFPA 70E.

Along with training, personnel performing medium voltage work on FAA ELDs shall have: (1) the skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment, including wire and cables, (2) the skills and techniques necessary to determine the nominal voltage of exposed energized electrical conductors or parts, (3) knowledge of the safe approach boundaries, work clearances, and voltages involved, (4) familiarity with construction and operation of equipment and the hazards involved, (5) familiarity with electrical safety related work practices and precautionary techniques, (6) familiarity with proper use of personal protective equipment (PPE), arc flash, insulating and shielding materials, (7) familiarity with the proper use of insulated tools and test equipment, (8) ability to make good decisions in determining the degree and extent of the hazard and the PPE and job planning necessary to perform the task safely, (9) familiarity with safety precautions associated with confined spaces, (10) knowledge of skills and techniques regarding how to select and use a voltage detector and phase meter, (11) familiarity with mechanical aspects of ELD installation work such as trenching, boring, excavation around existing utilities and structures, manhole rigging, and

pulling cable, and (12) CPR certification and basic training for emergency dispatch if an electrocution or confined spaces injury occurs.

Cable termination and splicing shall be performed only by experienced and qualified medium/high voltage electricians experienced in underground distribution systems. Before cable splices/terminations are made, the FAA may request an example splice and/or termination be made to demonstrate the electricians' qualifications. In order to qualify the splicer, this example splice and/or termination shall comply with the requirements of accessory manufacturers, and pass the requirements of IEEE standards 48, 386, and 404 with respect to partial discharge.

#### 3.3.3.3 Inspectors and Testing Personnel

Inspectors of the FAA ELD distribution systems shall have knowledge and experience in quality control activities related to the inspection of cables laid in trenches such as are found at large campus environments such as hospitals, life safety systems, and/or large computer and telecommunication facilities; shall perform quality control activities during installation and preacceptance of medium and low-voltage switchgear and sectionalizers, protective devices, power distribution transformers, surge arrestor equipment, and motor control centers; shall review functional tests of electrical equipment and conduct inspection and preacceptance of cathodic protection, electrical drawings, termination drawing, and cable schedules; and shall interpret the various drawings used in the projects for executing and recording the work.

Test personnel shall be qualified persons meeting the requirements stipulated in Appendix C.

## 3.3.4 Receiving, storing, and protecting

The contractor shall receive, store, protect, and handle products according to National Electrical Contractors Association NECA 1, *Standard Practices for Good Workmanship in Electrical Construction*, and NECA/NEMA 605, *Recommended Practice for Installing Underground Nonmetallic Utility Duct.*

## 3.3.5 Sequencing and scheduling

The contractor shall:

1) Notify the FAA resident engineer to schedule inspection of each duct bank or duct bank segment before concrete is placed.

2) Notify the FAA resident engineer 2 months (3 months if outside the continental United States - CONUS) before anticipated date of acceptance testing of the newly installed replacement ELD system so that arrangements can be coordinated with the testing contractor.

## 3.3.6 Cable testing

### 3.3.6.1 Government-furnished cable

If government-furnished power cable is delivered to the contractor, the contractor shall test the cable on the reel and report electrical or physical cable defects within two weeks of cable receipt. If adequate cable lengths are unavailable for testing on the reel, a visual inspection shall be made and damage reported to the FAA. The required tests shall then be made immediately after unreeling. Defects discovered when installing the cable shall be reported to the FAA in accordance with the contract provisions.

### 3.3.6.2 Contractor-furnished cable

Single and multi-conductor power cables furnished by the contractor shall conform to the following FAA specifications:

a. FAA-E-2013 for single-and multi-conductor power cables used in exterior 600 volt applications.

b. FAA-E-2793 for single and multi-conductor power cables used in exterior 2,000 to 35,000 volt applications.

For applications where no FAA specification is appropriate, the cable shall meet the following minimum requirements:

a. Copper conductors.

b. Thermoplastic, thermosetting, or silicon rubber insulation.

c. Neoprene, polyethylene, or vinyl jacket for normal areas and polytetrafluoroethylene (PTFE) (Teflon®) jacket in areas exposed to fuel, oil, solvent or chemical leakage, excessive groundwater, or extremely acidic soil.

d. For cables with rated voltages to 8 kV, cable insulation shall have a minimum continuous voltage withstanding capability of four times rated voltage (but not less than 150 volts). For rated voltages above 8 kV, insulation shall have a minimum continuous voltage withstanding capability of three times rated voltage. Cable voltage surge capabilities shall be 15 times rated voltage for voltages to 8 kV, nine times rated voltage for voltages above 8 kV through 15 kV, and seven times rated voltage for voltages above 15 kV through 25 kV. Whenever a cable is covered by applicable ICEA/NEMA specifications, the cable shall pass the test requirements for such cable. In addition, the installed cable shall satisfy after-installation acceptance tests as specified below, and in Appendix C.

e. The pull strength of the completed cable(s) shall exceed the expected installation forces by a minimum of 50 percent.

### 3.3.6.3 Acceptance testing of new cable

Following installation, the contractor shall perform cable testing in the presence of the FAA. The contractor shall furnish necessary test instruments except where otherwise indicated in the project plans. Only currently calibrated instruments shall be used for cable testing. A laboratory approved by the measurement instrument manufacturer shall have performed instrument calibration. When conducting FAA-authorized third-party testing, offline partial discharge testing shall constitute the final acceptance test after completion of the installation.

Testing shall be completed on contractor-installed cable before connection is made to existing cables. If warranted, the FAA will test existing cables and provide the results to the contractor through the contracting officer prior to the contractor splicing or connecting cables he has installed to existing cables.

Certain acceptance tests classified as "destructive" by the IEEE shall only be conducted on newly installed cables. Such tests shall only be conducted within the test constraints given in Appendix C. Destructive tests shall not be performed on in-service power cables.

### 3.3.6.4 Acceptance testing of new power cables above 2000 volts

| CAUTION |
| --- |
| Zero-energy verification shall be accomplished before doing any work on de-energized medium-voltage equipment. In preparing for, and conducting, power cable tests, follow electrical safety procedures as outlined in FAA Order 6950.22. |

New FAA underground, shielded, medium-voltage power cables rated 2000 volts and above shall be subjected, after installation but before connection to terminal equipment, to the following acceptance tests:

a. Continuity test for cable conductor, shield, and armor, using an ohmmeter type instrument. See FAA Order 6950.22 for parameters and test equipment.

b. Limited-voltage DC insulation resistance test using a Megger type instrument. This test is formulated to apply and hold a DC voltage on the cable for a specified time, while measuring insulation resistance. See Appendix C for test description and processes.

c. One of the following tests:

a. Very low frequency (VLF, 0.1 Hz) DC high-potential withstand "pass/fail" test. The purpose of this type of test is not to ensure the cable systems' future performance but simply to reassure the construction team that the line is not grounded/shorted before energization. The test shall be performed after cable system installation, including terminations and joints, but before the cable system is placed in normal service. See Appendix C for test description and procedures.

b. If third-party partial discharge acceptance testing is authorized, a diagnostic 50/60 Hz, off-line partial discharge test. This test can localize and determine the severity of any defects in

the new installation. Due to its requirements for specialized test equipment, signal processing software, and diagnostic skills, the test must be conducted by a third-party testing firm. The testing firm shall be a qualified contractor preauthorized by the FAA. See Appendix C for test description and procedures.

**3.3.6.5 Acceptance testing of new power cables 600 volts and below**

| CAUTION |
| --- |
| Zero-energy verification shall be accomplished before doing any work on de-energized medium-voltage equipment. In preparing for, and conducting, power cable tests, follow electrical safety procedures as outlined in FAA Order 6950.22. |

All low-voltage (≤ 600 V) power cables shall measure not less than 50 megohms resistance between conductors, and between conductors and ground (see FAA Order 6950.22, *Maintenance of Electrical Power Cables,* Chapter 3, *Standards and Tolerances,* Paragraph 301, Table (see column heading labeled "NEW CABLE"). Measurements shall be taken at not less than 500 volts DC and not more than 600 volts DC. This test does not constitute proof that the system is free from insulation defects but rather supplies evidence that the insulation was not shorted during the installation process.

**3.3.6.6 Failure of cable under test**

If the contractor-furnished cable fails to meet test requirements after installation, the contractor shall repair or replace, at his expense, the sections of cable proven defective.

If the government-furnished cable fails to meet test requirements after installation due to contractor's faulty installation practices, he shall repair or replace the defective sections of cable at his expense.

The installation contractor shall be responsible for retest costs if components are found to be substandard during acceptance test(s) as a result of contractor faulty installation practices.

# 4. PRODUCTS

## 4.1 Product options and substitutions

Alternative products may be substituted for product types that do not apply to the project. Consult with the airport authority and the local FAA project engineer.

## 4.2 Rigid metal conduit (RMC) and fittings

Wherever conduit and fittings are buried in corrosive soil, use either (a) PVC-coated rigid metal conduit (RMC) or (b) RMC wrapped in half-lap fashion with pressure-sensitive 10-mil PVC-based corrosion protection tape.

Conduit: UL6 – Rigid Metal Electrical Conduit and ANSI C80.1 – *Rigid Steel Conduit, Zinc Coated*.

Fittings and conduit bodies: Zinc-plated, threaded, malleable iron, meeting UL514B and ANSI/NEMA FB1.

## 4.3 Plastic-coated steel conduit and fittings

Where ducts turn up to the surface, use plastic-coated galvanized rigid steel conduit or tape-wrapped rigid galvanized steel conduit for elbow and riser. Use factory-fabricated elbows.

PVC exterior coated, urethane interior coated, galvanized rigid steel conduit shall meet the requirements of NEMA RN 1 – *PVC Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.*

*Fittings and conduit bodies*: Use 40 mil PVC exterior coated, urethane interior coated, zinc-plated, threaded, malleable iron meeting UL514B – *Fittings for Conduit and Outlet Boxes,* and NEMA RN 1 – *PVC Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit*.

## 4.4 Rigid nonmetallic conduit and fittings

Rigid nonmetallic conduit and fittings may be used for any conduit run that does not have a directional turn of 45 degrees or greater.

*Conduit*: Reference UL651 – *Schedule 40 and 80 Rigid PVC Conduit,* and NEMA TC 2 – *Electrical Polyvinyl Chloride (PVC) Conduit,*

*Fittings*: Reference solvent-welded socket fittings meeting UL514C – *Non-Metallic Fittings for Conduit and Outlet Boxes,* and NEMA TC 3 – *PVC Fittings for Use with Rigid PVC Conduit and Tubing*.

## 4.5 Corrosion protection tape

Pressure-sensitive, 10-mil-thick, PVC-based tape for corrosion protection of metal conduit and fittings.

## 4.6 Insulating bushings

NRTL-listed insulating bushings with 105º C rated insulation.

## 4.7 Grounding bushings

NRTL-listed, galvanized malleable iron, 150º C rated insulated throat grounding bushings with lay-in type ground cable lugs.

## 4.8 Ducts and fittings

Underground ducts shall be:

a) PVC coated exterior (urethane coating inside) rigid-metal conduit conforming to NEMA RN 1, or

b) Rigid non-metallic conduit (duct) conforming to UL 651, NEMA TC 6 & 8, and ASTM F-512, or

c) Concrete-encased PVC conduit conforming to UL651, NEMA TC 2, UL514, and NEMA TC 3.

The type of duct used shall depend on the specific application. Ducts shall be of the size, material, and type indicated on the contract documents. Where no size is indicated on the drawings or specifications, the ducts shall not be less than 4 inches inside diameter.

*Fittings:* Follow NEMA TC 9, NEMA TC 14, and ASTM F-512.

## 4.9 Duct spacers

Standard precast spacers ("chairs") shall be used for duct support and alignment. Duct spacers shall provide a 3-inch separation between the conduit and the ground. There shall be a minimum of 3 inches of concrete on bottom, sides, and top of duct.

## 4.10 Duct plugs

Use soft, expansible gasket material compressed with non-metallic plates and bolts to produce a positive seal against water and gas in unused ducts.

## 4.11 Duct sealant and joint filler

Use expandable foam duct sealant kits to prevent water and gas from entering manholes, vaults, or structures.

Use premolded joint filler to fill holes in and around conduit to keep rodents out of the ELD system. Use closed-cell expanded neoprene joint filler conforming to ASTM D1056 – *Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber*.

## 4.12 Underground duct and cable warning tape

Furnish detectable underground warning tape for underground duct banks. Use aluminum-backed, 0.005 inch thick, underground warning tape with a red background color. Lettering shall be black and indicate the type service buried below:

"CAUTION BURIED ELECTRIC LINE BELOW"

Use tape width appropriate for the burial depth:

a. Three-inch wide tape for up to 18 inches depth.
b. Six-inch wide tape for up to 24 inches depth.

All direct buried cable shall be marked with extrusion-laminated underground marking tape. Tape shall be a minimum of six inches (6") wide and shall run continuously in the cable trench six inches (6") below the surface or as indicated on the project plans. Tape shall be bright red, and constructed of solid 100% pigmented plastic, and not an ink-coated plastic.

## 4.13 Pull wires and tape

For spare ducts, specify ¼ inch pull tape having a minimum tensile strength of 400 pounds for non-metallic conduit. The FAA project engineer may specify a larger or more specialized pull tape (impregnated lubricant, distance marking, etc).

For ELD circuits that include raceways within vaults or other locations, raceway measuring/pulling tape may be used. Tape shall have permanently printed measurements in one-foot increments and minimum 1200 lb average breaking strength.

## 4.14 Precast electrical manholes and hand holes, accessories

### 4.14.1 Manholes and Hand Holes

Precast reinforced concrete manholes shall be of the size and shape as detailed on the drawings in conformance with ASTM C-858 – *Standard Specification for Underground Precast Concrete Utility Structures*. Electrical manholes are typically 4' long, 4' wide, and 4' high, or as shown on the drawings. Electrical manhole sections shall conform to ASTM C-478.

Manholes/hand holes, frames, and lids located within the airport runway/taxiway service areas (RSA/TSA) shall be of the aircraft-rated type, designed and certified for the following loadings: at least 100,000 lb. (45,000 kg) wheel loads with 250 psi (1.72 MPa) tire pressure. (Refer to FAA Advisory Circular 150/5320-6, *Surface Drainage Design*). Clearly indicate on the drawings underground structures that will be subject to aircraft loading. For planned future-expansion projects where manholes and hand holes are projected to fall within RSA and TSA boundaries, those structures shall be aircraft rated.

Outside the RSA/TSA, highway-rated manhole and hand hole components, if authorized by the local FAA project engineer, will be permitted. Live loading shall be for H 20 loading per A.A.S.H.T.O. HB-17, *Standard Specifications for Highway Bridges*. Design wheel load shall be a minimum of 32,000 pounds. The live load shall be that loading which produces the maximum bending and shear moments in the structure.

Manholes that consist of two sections shall be joined at the site to provide a watertight joint using a preformed flexible sealant as specified in ASTM C-990. A twelve inch (12 in.) diameter sump, four inches (4 in.) deep, shall be cast in the center of the manhole floor and supplied with a cast iron cover.

Manhole floor shall be cast integral with walls to form the bottom ring. Furnish a keyed joint between the bottom ring and top ring. Manhole roof shall be a one-piece concrete cap.

*Manhole markings*--Identify electrical power manholes and hand holes by "FAA Power" markings cast in the steel cover, or so identified with a die stamped, nominal one sixteenth inch (1/16") minimum thickness copper plate, brazed or fastened to the cover with a minimum of two 10-32 brass machine screws.

### 4.14.2 Manholes accessories

*Frame and lids*--Use heavy duty cast iron manhole frame with solid lid. Lid may be spring loaded. Alternatively, lid may consist of partitioned aircraft-rated lid segments, each segment capable of being lifted separately, facilitating easier and safer access.

*Racks*--Cable racks and cable support arms shall be furnished in the quantities and locations indicated by the drawings for each manhole. Racks shall be made of nonmetallic material (for example, PVC, plastic, or UL-rated glass-reinforced nylon) molded in one piece that can be field cut to length. Furnish 14-inch long and 3-inch long saddle arms.

Splices and cables shall be tied to cable racks using one eighth inch (1/8") nylon line.

## 4.15 Grounding cables

Use 4/0 AWG bare stranded, soft temper copper cable per ASTM B 8, *Standard Specification for Concentric-Lay Stranded Copper Conductors.*

For guard wire, use 1/0 AWG bare copper, stranded.

For bonding conductors, use No. 2 AWG bare copper, stranded.

## 4.16 Ground Rods and down-conductors

Grounding conductors shall be minimum 6 AWG bare copper and shall be bonded by exothermic weld to a three quarter inch (3/4") by ten foot (10') long copper or copper-clad steel ground rod.

## 4.17 Weather heads on risers, drip loops

Risers feeding FAA owned underground distribution systems shall have weather heads installed. Each weather head shall have drip loops.

## 4.18 Electrical equipment enclosures

*Typical*--For typical applications, NEMA Type 3 enclosures may be used. These provide protection against rain, sleet, and snow in outdoor applications.

*Corrosive, wet environments*--Use NEMA 4X enclosures to provide protection in highly corrosive outdoor environments such as installations near saltwater. These enclosures should also be used at sites that are frequently wet or have constant exposure to water, other liquids, or contaminants.

## 4.19 Equipment pads

Follow the drawings for specification and construction details of equipment pads.

*Concrete pads*—Foundations of poured concrete pads shall extend to a depth of 12 inches below the local frost depth to avoid the heave effect on cables. This also applies to poured concrete pads for a junction box or other small equipment.

Prefabricated concrete pads with cutouts for cables can be used where frost heave is prevalent. Arrange for lift equipment to place the pads. Install cables in conduit and leave a slack length of cable in case the pad is displaced upward by the frost ground.

*Polymer pads*--Lightweight polymer pads with cutouts provide sufficient strength-to-weight ratios for most other applications. These units have preinstalled mounting hardware. No extra equipment is required to lift the pads into position.

## 4.20 Bollards

Bollards shall be used to protect electrical equipment and enclosures from field vehicle damage or other mechanical damage. Unless otherwise specified, use 4- to 6-in. diameter steel pipe filled with concrete. The bollard shall be placed 3 ft deep and extend 4 ft above ground level. Orange reflective/weatherproof tape shall be wrapped around the top and middle of the post. Bollards shall be installed a maximum of 4 ft apart from each another.

# 5.0 EXECUTION

## 5.1 Scheduling of work

Airport runways must remain in operation during certain periods. Contractors shall proceed in a manner that produces minimum disruption to the FAA and airport operations. During construction activity, contractors shall coordinate work through the FAA with the airport authority, air traffic control tower, airport security, and other contractors as defined by the contract documents. Work performed within the RSA/TSA of an active runway may require

runway/taxiway closing. Advance notice of proposed work near an active runway shall be required to be given by contractors to the FAA.

## 5.2 Existing FAA buried cable and ducts

### 5.2.1 FAA documentation

The contract documents define the drawing format used by the FAA to record the location of buried cable and ducts. The contractor shall use the FAA format during the course of work to ensure the accurate location of the new installations as described on the FAA drawings. The contract documents shall include copies of FAA drawings for the area of work. Contract drawings and engineering documents published by a non-FAA entity shall be approved by the FAA project engineer.

### 5.2.2 FAA marking of known buried cables and ducts

All known FAA power and control cables leading to and from an operating facility will be marked in the area of work by the FAA for the information of the contractor before starting work. The FAA will mark these cables once for the contractor. It shall be the contractor's responsibility to maintain these markings throughout the course of the project. Airport mowers may be expected to be in use by airport personnel throughout the duration of the work, keeping markers visible. FAA is responsible for marking FAA cables ONLY. The contractor shall be responsible for marking other cables and utilities in the work areas.

### 5.2.3 Other buried cables, ducts, piping and items

*Locating utilities*--The contractor shall be responsible for contacting the utilities prior to starting work and for confirming the location of existing utilities and other items that may be buried in the area of work. Along an area suspected of having utilities of any sort, the contractor *must hand dig* or use other authorized low-impact digging system. The airport authority shall be contacted to locate those items owned or known by the airport to exist.

*Avoiding buried structures*--The contractor shall take precautions to protect existing underground (buried) items including but not limited to; fuel tanks, water lines, cables, ducts and structures. Buried items shall be protected from damage for the duration of work. The contractor shall immediately repair, with equal material by skilled workmen, those items damaged by the contractor or subcontractor.

*Procedure for making repairs during installation*--Prior authorization from the FAA shall be obtained for the materials, workers, time of day or night for making repairs, method of repairs, and for permanent repairs the contractor proposes to make. In the event of inadvertent damage, the contractor shall immediately stop work and notify the FAA and utility when appropriate. Repair work shall be inspected and authorized by the FAA with the concurrence of the affected utility company, airport, or other owner(s) of the damaged item(s).

## 5.3 Safety during construction and testing

All necessary site works included in the overall scope of work, from delivery to site to final authorization, shall be risk assessed with respect to safety. A detailed, site-specific, Safety Risk Assessment shall be required to be submitted by the Contractor to FAA for final authorization no fewer than 3 weeks prior to commencement of on-site work. During construction, installation and testing, the Contractor shall comply with the safety rules of FAA (FAA Order JO 3900.XX, FAA Advisory Circular AC 150/5370-2) and those dictated by OSHA (Part 1926), NEC, ANSI/IEEE, and specifically ANSI C2 (the NESC). The Contractor shall be held responsible for the implementation of FAA-authorized items in the Safety Risk Assessment document.

## 5.4 Excavation and trenching

The following are general excavation and trenching requirements. See specific sections for particular requirements for either (1) direct earth buried cables, or (2) underground duct cables.

### 5.4.1 Depth requirements

IEEE ANSI C2 (part of the National Electric Safety Code) specifies the minimum legal depth requirements for medium-voltage power cable during installation. Tailoring organizations shall evaluate site-specific requirements and follow the following standards in order of precedence: (1) IEEE ANSI C2, then (2) paragraphs b, c, d below, then (3) local standards if applicable.

Conduits shall meet the following minimum standards:

a. Cables, conduits, and ducts shall be buried to the minimum depth to their top as specified by the following paragraphs b, c, d, and e when these specified depths are below the frost line for the location.

b. Direct-earth burial cables under 600V shall be a minimum of twenty four inches (24”) below finished grade when on airport or government controlled property, and thirty six inches (36”) below finished grade when off airport or government property unless local conditions and regulations require deeper burial, in which case the Contractor shall advise FAA about these regulations before proceeding with the construction. Cables over 600V shall be a minimum of thirty (30”) below finished grade, per ANSI C2. If finished grade has not been established before the cable trenches are excavated, it is the contractor’s responsibility to determine what the final finished grade elevation will be and excavate the trench deep enough to meet the depth requirements at the end of the project.

c. Underground concrete-encased duct, rigid steel conduit, or PVC conduit shall be installed so that the top of the concrete envelope or conduit is buried as follows, subject to site-specific requirements:

1. Not less than four feet (4’) below the bottom of paving when installed under runways,

2. Not less than four feet (4') below the bottom of paving when installed under taxiways,

3. Not less than 30 inches (30") below the bottom of paving when installed under other paved areas

4. Not less than 30 inches (30") below finished grade when installed in unpaved areas.

5. For railroads and state-owned highways, at the minimum depth as specified by those entities.

6. Depth should take into account head pressure of water accumulating in the duct(s), so that it may be possible to pump the water out.

7. Should local conditions require unusually deep burial of ducts, Contractor shall discuss the situation with the FAA project engineer and obtain preauthorization.

d. In northern climates where deep trenching is cost prohibitive, use a standard depth of not less than 24 inches (24").

e. Cables shall not be direct buried under paved areas, runways, taxiways, roadways, railroad tracks, or ditches. Where cables cross under roads or other paving exceeding 5 feet in width, such cables shall be installed in either rigid steel conduit, concrete-encased PVC, steel conduit, or high-density polyethylene (HDPE) conduit, as defined by the contract documents. Where cables cross under railroad tracks, such cables shall be installed in accordance with the requirements of the railroad authority. Cables under railroad grades may be installed in reinforced concrete-encased ducts, rigid galvanized steel sleeves, or HDPE conduit, subject to the requirements of the railroad authority. HDPE must be of sufficient crush strength to withstand expected static and dynamic loads over the expected lifetime of the cable without deformation. For directional boring under railroad and roadway grades, standard dimension ratio (SDR) 11 or 9 shall be used depending on conditions and conduit diameter. The SDR of a conduit is defined as the ratio of the average conduit diameter divided by the minimum wall thickness. Damage to conduit coatings shall be prevented by providing ferrous pipe jackets or by predrilling. Ducts shall extend at least 1 foot beyond each edge of paving and at least 5 feet beyond each side of railroad tracks.

f. Where direct burial cable transitions to duct-enclosed cable, direct-burial cables shall be centered in duct entrances, and a waterproof nonhardening mastic compound shall be used to facilitate such centering. Cables may be pulled into duct from a fixed reel where properly sized rollers are provided in the trench. Where cuts are made in paving, the paving and subbase shall be restored to their original condition. Where cable is placed in duct (for example, under paved areas, roads, or railroads), ducts shall be made to slope in order to drain.

## 5.4.2 Survey requirements

### 5.4.2.1 Recording of data

The ELD project record shall consist of (a) information entered in computer-aided design and drafting (CADD) systems, (b) manual plotting onto the FAA drawing set, (c) Global Positioning System (GPS) data, (d) Geographic Information System (GIS) information or databases, and/or (e) other appropriate documentation as set forth in the contract documents.

*Placement of markers*--Drawings shall record placement positions of markers placed in or on top of direct earth buried (DEB) power cable trenches, and at duct bank manholes and hand holes. The markers shall be identified on the drawings by a small circle with a "P" in the center for power cable, "C" for control cable, "R" for coaxial cable, "S" for special purpose points, and "T" for telephone. Locations shall be taken and plotted on the drawings for each ball marker present.

*DEB cable*--DEB cable trenches shall be identified on the drawings with text boxes pointing to the trench indicating what is in the trench. If there are several cables in the trench, each cable shall be called out. Power cables shall be identified by the actual working voltage of the cable and not by the cable insulation rating. Anything unusual, peculiar, or unique about the cable runs shall also be called out in the drawings.

*Duct banks*--Duct banks shall be plotted on the drawings. Those ducts that are installed for future use shall have text boxes pointing to them indicating that they are future-use duct banks. In the case of a duct bank where the duct bank is not a straight line between the manholes or hand holes, enough markers of the type specified herein shall be installed to accurately depict the routing of the duct bank.

*Manholes, hand holes, and splices*--Manholes shall be identified on drawings by a small square with an "MH" in the center. Hand holes shall be identified by a small square with an "HH" in the center. Where manhole and hand hole numbers are on the contract drawings, they shall also be called out on the completed cable drawing. Splices made in manholes and hand holes shall be shown on the cable drawings.

*Abandoned cables*--The contractor shall provide data on the types and locations of abandoned cables in places where they affect the excavation of new trenching, such as at points of intersection with other structures, including runways, taxiways, concrete pads, utility pathways, roads, etc. This information shall be included on the drawings.

### 5.4.2.2 Survey points

The contractor shall record the survey point of each manhole using GPS coordinates. At each major change of direction of the cable circuit, a manhole shall be present and its location surveyed and recorded. Surveying and data gathering for this purpose shall be completed before a trench or structure is backfilled.

If for some reason the cable path deviates from a straight line between manholes and is not capable of being traced using tracing equipment, the deviation should be recorded as a survey point on the drawings for future reference. Where the cable terminates to a building, a

transformer, an antenna, a light bar, an outside demarcation cabinet, switch rack, or other similar device, the survey shall include the four corners of the device or facility where it terminates. A tolerance of plus or minus five inches (± 5") will be acceptable for describing the cable path.

*Special-purpose points*--Special-purpose points may be used to indicate points such as splices or entrances to duct banks in records and on the drawings. Special-purpose points shall be accompanied by a text box to describe the function of the specific point.

## 5.5 Underground duct systems

Power distribution cables at FAA installations shall be installed in underground duct systems. Unless preauthorized per the drawing set and construction specifications, direct earth burial (DEB) of power distribution cables is prohibited. If preauthorized, any DEB construction shall meet the requirements in Section 5.6.

### 5.5.1 Preparation and excavation for underground ducts

For preparation of underground ducts, meet the requirements of ANSI/IEEE C2 and this section, and contact the owner for their requirements. Coordinate underground power cable duct bank system work to avoid interference with other airport projects and with existing utilities. Coordinate work with the Power Cable (ELD) Program Office to verify whether other FAA programs have an interest in using the same duct system or trench.

The contractor shall excavate trenches for underground ducts as follows:

a. To the depth specified in paragraph 5.4.1c.

b. Install underground duct bank systems according to the NEC, the NESC, NECA/NEMA 605 - *Recommended Practice for installing Underground Nonmetallic Utility Duct*, and the requirements in this section.

c. Verify routing and termination locations of duct banks before excavation for rough-in.

d. Verify that field measurements are as shown on the drawings.

e. Position trench so concrete envelope of duct banks shall have the following minimum horizontal and vertical separations from parallel or perpendicular runs of other utility pipes or conduits (Table II). Note: Measurements are guides only; check with local authorities and the owner for their requirements.

f. Recommended practice for proper drainage is to grade trenches for underground duct banks toward manholes. The recommended slope is 2 inches per 100 ft.

g. Make trenches of sufficient width to receive work to be installed and provide specified concrete coverage on sides.

**TABLE II. Spacing of power cable ducts from other utilities.**

| UTILITY TYPE | PARALLEL LINES | PERPENDICULAR CROSSINGS |
|---|---|---|
| Water | 36 inches horizontal separation | 24 inches |
| Gravity Sewer | 36 inches horizontal separation | 24 inches |
| Force Main Sewer | 36 inches horizontal separation | 24 inches |
| Storm Drain | 36 inches horizontal separation | 24 inches |
| Natural Gas | 60 inches horizontal separation | 24 inches |
| Steam or Hot Water | 60 inches horizontal separation | 24 inches |
| Open Communications | 24 inches horizontal separation of tamped soil or 3 inches of concrete | 12 inches vertical separation of tamped soil or 3 inches of concrete |
| Secure Communications | 36 inches horizontal separation of tamped soil or 6 inches of concrete; verify case-by-case with FAA office of primary responsibility. | 24 inches vertical separation of tamped soil or 6 inches of concrete; verify case-by-case with FAA office of primary responsibility. |
| Electrical | 12 inches horizontal separation of tamped soil or 3 inches of concrete | 12 inches vertical separation of tamped soil or 3 inches of concrete |

h. Conduit or castings required under roadways or railroads shall be installed by boring. Jacking of conduit is not allowed. Conduits bored under roads off airport property shall be a minimum of thirty inches (30") below finished grade.

i. Backfill excavations for duct banks and manholes in 6-inch layers; use soil excavated; remove roots, rocks and sharp objects. Furnish coarse sand as required for additional backfill material.

j. Moisture condition backfill soil and compact to 95% of maximum density under paved areas and 90% of maximum density under unpaved areas.

k. Overfill excavations to allow for settlement.

l. Backfill shall be firmly tamped in the separation area.

m. Restoration shall be in accordance with Section 5.5.3.

## 5.5.2. Backfilling

Backfilling material and procedures depend on the design used, whether concrete encased duct or direct buried conduit. Consult FAA Advisory Circular AC 150/5370-10 for construction details.

Trenches shall be completely backfilled and tamped level with the adjacent surface. When necessary to obtain the desired compaction, backfill material shall be moistened or aerated. When sod is to be placed over a trench, backfill shall be stopped at a depth equal to the thickness of the sod to be used. Excess excavated material shall be removed in accordance with the contract documents.

## 5.5.3 Restoration

Restoration shall be in accordance with local airport authority requirements, or as otherwise stated in the contract statement of work. Where soil 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 the original condition.

Restoration shall include the necessary grading, seeding, sodding, sprigging, or hydroseeding as required to restore the disturbed area to match the adjacent area. Where trenching cuts through paved areas, the surface shall be properly backfilled and resurfaced with paving similar to the original paving or concrete as the drawings specify.

Resurfaced areas shall be level with original paving, free from cracks and capable of withstanding full traffic loads without settling or cracking. The contractor shall be held responsible for maintaining all disturbed and restored surfaces until final acceptance by the FAA.

## 5.5.4 Duct installation

Cable duct banks shall be installed outside of the airport runway/taxiway service areas (RSA/TSA), as well as ILS critical areas, to the greatest extent possible.

In non concrete-encased duct systems, place a concrete marker only at each change of direction, provided no manhole or hand hole is in use at the turning point.

## 5.5.5 Manhole and hand hole installation

### 5.5.5.1 Manhole installation

The top of the completed manhole shall be set above finish grade in unpaved areas to prevent water from ponding on the manhole. Place the top of the manhole 2 inches (2”) above grade, plus or minus 1 inch (1”). Grade the backfill material downward and away from the manhole. A one-eighth-inch (1/8”) per foot fall from the manhole top to finish grade, ten feet (10’) from each edge of the manhole is recommended.

The manhole lower half shall be set on a four-inch (4”) bed of crushed stone on undisturbed earth. Add a layer of geotextile fabric between the gravel and earth to enhance soil stability and prevent settling of the manhole. The contract drawings will define any additional requirements where soil bearing capacities are an issue/concern.

Backfill around the manhole in lifts commensurate with the soil and compact each backfill lift to the density of the surrounding earth.

#### 5.5.5.2 Hand hole installation

The top of the hand hole shall be set above finish grade in unpaved areas to prevent water from ponding on the hand hole. A one eighth inch (1/8") per foot fall from the manhole top to finish grade, ten feet (10') from each edge of the hand hole is recommended.

The hand hole shall be set on a four-inch (4") bed of crushed stone on undisturbed earth. Add a layer of geotextile fabric between the gravel and earth to enhance soil stability and prevent settling of the manhole. The contract drawings will define any additional requirements where soil bearing capacities are an issue/concern.

Coat unused rebar couplers with waterproofing material. Extend four (4) half inch (1/2") rebars from each rebar coupler to at least two feet (2') beyond undisturbed earth into duct encasement concrete.

Backfill around the hand hole in lifts commensurate with the soil and compact each backfill lift to the density of the surrounding earth.

#### 5.5.5.3 Manhole and hand hole penetrations

Where a steel conduit penetrates a wall of a manhole or hand hole, a grounding bushing shall be installed. These grounding bushings shall be connected to each other and to the earth ground system with 6 AWG tinned bare copper conductors.

Conduits entering a junction box or other electrical cabinets from underground shall be sealed with duct sealing compound**.** Expanding foam sealants are not allowed for this purpose.

Conduit connections to exterior boxes, electrical cabinets or switches shall be made with weatherproof hub fittings.

## 5.5.6 Mandrel requirements

The contractor shall mandrel each duct or conduit installed and each existing duct or conduit in which cable is installed or replaced. As each conduit run is completed, proceed according to the following:

a. For conduit sizes 3 inches (3") and larger, draw a flexible testing mandrel approximately 12 inches (12") long with a diameter less than the inside diameter of the conduit through the conduit. Next, draw a stiff bristle brush through until conduit is clear of particles of earth, sand, and gravel; then immediately install conduit plugs.

b. For conduit sizes less than 3 inches, draw a stiff bristle brush through until conduit is clear of particles of earth, sand, and gravel; then immediately install conduit plugs (see UFGS 33 71 02.00 20.

c. If the mandrel fails to pass through the duct being tested, either the duct is obstructed, misaligned, or the curve has too small a radius. If obstructed, use a high-pressure water jet to

clear the conduit. Defective duct(s) shall be exposed and the defect corrected. After the duct(s) are repaired, repeat the mandrel test in that section of duct.

### 5.5.7 Spare ducts, preparation

Prepare spare ducts in the following manner. Install ¼ inch pull tape having a minimum tensile strength of 400 pounds for non-metallic conduit. The FAA project engineer may specify a larger or more specialized pull tape (impregnated lubricant, distance marking, etc) unless cost prohibitive. Seal the open ends of spare ducts with removable tapered plugs of a type recommended by the duct manufacturers. Adapt the plug to firmly secure the pull tape.

### 5.5.8 Duct protection

All power cable ducts shall be securely fastened in place during construction and progress of the work, and shall be plugged daily at the end of work to prevent entrance of foreign material. A duct section having a defective joint shall not be installed.

All concrete-encased power cable ducts shall be raised at least 3 inches off the bottom of the trench using spacers (“chairs”). Bottom spacers may be secured to nominal one inch (1”) boards to prevent sinking and overturning. This step shall be followed by a monolithic pour of concrete. Where two or more ducts are encased in concrete the contractor shall space them at not less than one and a half inches (1-1/2”) (measured from outside wall to outside wall) using spacers applicable to the type of duct. As the concrete pour progresses, concrete not less than three inches (3”) thick shall be placed around the sides and top of the duct bank. End bells or couplings shall be installed flush with the concrete encasement where required. Interlock spacers shall be used every five feet (5’) to ensure a uniform spacing between ducts.

Joints in adjacent ducts shall be staggered a minimum of twenty four inches (24”) apart and shall be made completely waterproof prior to covering with concrete.

### 5.5.9 Ducts without concrete encasement

Trenches for single-duct power cable runs shall be no less than six inches (6”) or more than twelve inches (12”) wide, and the trench for two or more ducts installed at the same level shall be proportionally wider. Trench bottoms for ducts without concrete encasement shall be made to conform accurately to grade to provide uniform support for the duct along its entire length. A three inch (3”) layer of bedding material shall be placed around the ducts. The bedding material shall contain no particles that would be retained on a half inch (1/2”) sieve. The bedding material shall be tamped until firm. When two or more ducts are installed in the same trench without concrete encasement, they shall be spaced not less than two inches (2”) apart (outside wall to outside wall) in a horizontal direction, or not less than six inches (6”) apart (outside wall to outside wall) in a vertical direction.

## 5.5.10 Separation of cables

For non-distribution power cable installations in the vicinity of power cables, consult first with the FAA office of primary responsibility for guidance.

Subject to the approval of the FAA project engineer, separation of cables installed in conduit or duct shall be as follows:

a. Power cables of the same circuit shall be installed in the same conduit or duct.
b. Conductors of circuits rated 600 volts, nominal, or less, ac circuits, and dc circuits shall be permitted to occupy the same equipment wiring enclosure, cable, or raceway. Conductors shall have an insulation rating equal to at least the maximum circuit voltage applied to a conductor within the enclosure, cable, or raceway. (NEC 300.3 C 1)
c. Conductors of circuits rated over 600 volts, nominal, shall not occupy the same equipment, wiring enclosure, cable, or raceway with conductors of circuits rated 600 volts, nominal, or less unless preauthorized by the FAA project engineer and permitted in NEC 300.3 (C)(2)(a-e).
d. Except in circumstances authorized by the FAA project engineer, power cables shall not be installed in the same duct systems with communication, control, and signal cables.
e. If joint-use applications apply and are authorized, power cable shall be installed in its own separate conduit. This conduit shall be separated a minimum of three inches (3") outside wall to outside wall, from conduits that contain communications, control, and signal cables. The actual separation for each specific case shall be stipulated by the FAA project engineer.
f. Fiber optic, communications, and control cables shall have completely separate and clearly identified and marked hand holes, pull boxes, and junction boxes.

## 5.5.11 Installation of cables

To minimize splicing, the longest practicable lengths of cable shall be pulled into the ducts at one time. Unless otherwise specified, electrical power manholes and hand holes shall be as far apart as practicable based on the pulling specification of the cable installed. Typically, manholes and hand holes shall be spaced a maximum of 600 ft apart. For long, straight, continuous runs, spacing may be increased, not to exceed 1,200 ft, provided cable manufacturer's specifications for pulling tension has been met, and subject to the project engineer's oversight. To meet grounding requirements of underground multigrounded neutral cable systems over 1000 V, under no condition shall the distance between manholes or hand holes exceed 1,200 ft in accordance with NFPA 70 (NEC) Rule 96C, and ANSI C2 (NESC) standards.

Where a power cable duct or conduit crosses a runway or taxiway, manholes and hand holes shall be placed just outside the RSA/TSA boundaries on opposite sides of the crossing. This will allow for adequate working space to avoid penetrating the safety areas during installation and maintenance activities.

The contractor shall verify that the duct is open, continuous, and clear of debris or blockage (use mandrel) before installing cable. Cable shall be installed in a manner to prevent harmful

stretching of the conductor or damage to the outer protective covering or conductor insulation. Until connections are made, cable ends shall be sealed using adhesive-lined, heat-shrink end caps. Where more than one cable is to be installed in one duct, cable shall be pulled at the same time. In no case shall a splice be pulled into a duct or conduit.

When cable cutting is required, cable ends shall be effectively sealed against moisture immediately after cutting, using end caps as above. Bends of a radius less than eight (8) times the diameter for rubber-covered or plastic-covered cable, or twelve (12) times the diameter for metallic armored cable, shall not be made. Cable that has been kinked shall not be installed.

When unreeling, an observer shall be stationed at the reel to report cable irregularities. Unless specifically stated in the drawings, cables for installation in ducts or for direct burial shall comply with FAA-E-2013D and FAA-E-2793A. Specifically excluded are bare concentric neutral wire cable types. Grounding conductors, where required, shall be a minimum size of 6 AWG bare copper wire. Fire wrap medium voltage cables in all manholes and hand holes.

## 5.5.12 Cable pulling

The contractor shall obtain from the manufacturer an installation manual or set of instructions that address such aspects as cable construction, insulation type, cable diameter, bending radius, cable temperature limits for installation, lubricants, coefficient of friction, conduit cleaning, storage procedures, moisture seals, testing for and purging moisture, maximum allowable pulling tension, and maximum allowable sidewall bearing pressure.

The contractor shall then perform pulling calculations and prepare a pulling plan, which shall be submitted along with the manufacturer’s instructions. Cable shall be installed strictly in accordance with the cable manufacturer's recommendations, ANSI/IEEE C2 standards, and the authorized installation plan.

The pulling plan shall include:

a. Site layout drawing(s) with cable pulls identified in numeric order of expected pulling sequence and direction of cable pull.

b. List of cable installation equipment.

c. Lubricant manufacturer's application instructions.

d. Procedure for resealing cable ends to prevent moisture from entering cable.

e. Cable pulling tension calculations of all cable pulls.

f. Cable percentage conduit fill.

g. Cable sidewall bearing pressure.

h. Cable minimum bend radius and minimum diameter of pulling wheels used.

i. Cable jam ratio.

j. Maximum allowable pulling tension on each different type and size of conductor.

k. Maximum allowable pulling tension on pulling device (see UFGS-33 71 02.00 20).

Prior to pulling cable, pump the water out of the manholes and pull a mandrel/swab 1/4 inch smaller than the duct diameter through duct run to ensure adequate opening of duct run. Thoroughly swab conduits to remove foreign material before pulling cables.

Cables shall not be pulled from an outdoor (exterior) location when the outdoor (exterior) air temperature is below 32 degrees F. Limit conductor temperatures to 194 degrees F.

Determine ampacity in accordance with IEEE 835.

Contractor shall furnish required installation tools to facilitate cable pulling without damage to the cable jacket. Such equipment is to include, but be not limited to, framework, sheaves, winches, cable reels and/or cable reel jacks, duct entrance funnels, pulling tension gauge, and similar devices. The diameter of the sheaves shall be at least 10 times that of the diameter of the largest cable. Equipment shall be of substantial construction to allow steady progress once pulling has begun. Makeshift devices which may move or wear in a manner to pose a hazard to the cable shall not be used. Cable installation may be accomplished using a power winch or by hand. Cable pulling lubricant shall be used to ease pulling tensions. The FAA project engineer will authorize the pulling compound. Lubricant shall be water or silicone based so as not to injure the cable material used. Wax-based lubricants are not allowed. Lubricant shall not harden or become adhesive with age. Petroleum grease shall not be used.

Cable ends shall be sealed and firmly held in the pulling device during the pulling operation.

Actual pulling tensions shall be continuously monitored to ensure the cable pulling operation does not exceed maximum allowable pulling tension.

During pulling operations, several personnel shall be stationed at key points to ensure safety to cable and personnel: at duct entry, duct exit, cable feed, and at the pulling machinery.

Avoid abrasion and other damage to cables during installation. The surface of a cable sheath or jacket shall not be damaged to a depth greater than one tenth ($1/10^{th}$) the original thickness or be flattened out-of- round more than one tenth ($1/10^{th}$) of the outside diameter.

Where cables are left in manhole or switchgear overnight or more than 8 hours prior to termination, the cable ends shall be sealed with paraffin or shrink wrap caps and supported in a manner which will prevent entrance of moisture into the cable. Cable shall be terminated and energized as soon as possible.

Table III lists example maximum pulling tensions for commonly installed cables (see also Appendix B for a pocket guide on calculation method).

The table is for illustration purposes only; it is the designer's and/or installer's responsibility to obtain the manufacturer’s data for the cable chosen for installation. The manufacturer’s data shall be used in conjunction with the pull-configuration(s) proposed, cable type and ampacity, size of conduit, distance, grade, degree of sweeps/bends, proper lubricant, etc, to calculate the maximum tension for each cable pull. The resulting value shall not exceed cable maximum tension and maximum sidewall pressure values.

**TABLE III. Maximum allowable non-armored cable pull tensions using dynamometer or rope.**

| CABLE | TENSION (Pounds) | ROPE DIAMETER (INCHES) Cotton | Manila | Dacron | Nylon |
|---|---|---|---|---|---|
| 2 - 1c #8 Solid | 264 | 3/16 | | | |
| 3 - 1c #8 Solid | 264 | 1/4 | 3/16 | | |
| 4 - 1c #8 Solid | 422 | | 1/4 | | |
| 2 - 1c #6 Stranded | 420 | 1/4 | 3/16 | | |
| 3 - 1c #6 Stranded | 420 | 5/16 | 1/4 | | |
| 4 - 1c #6 Stranded | 672 | 3/8 | | 3/16 | |
| 1 - 2c #8 Stranded | 264 | 1/4 | | | |
| 1 - 3c #8 Stranded | 396 | 1/4 | | | |
| 1 - 4c #8 Stranded | 528 | | 1/4 | | |
| 1 - 2c #6 Stranded | 420 | 1/4 | 3/16 | | |
| 1 - 3c #6 Stranded | 630 | 5/16 | | | |
| 1 - 4c #6 Stranded | 840 | 3/8 | 5/16 | 3/16 | |
| 1 – 1c #4 Stranded, Conc Neut (CN) | 334 | For pull rope sizes, consult manufacturer (etc) | | | |
| 2 – 1c #4 Stranded, CN | 668 | | | | |
| 3 – 1c #4 Stranded, CN | 1,002 | | | | |
| 4 – 1c #4 Stranded, CN | 1,069 | | | | |
| 3 – 1c #2 Stranded | 1,593 | | | | |
| 4 – 1c #2 Stranded | 1,699 | | | | |
| 3 – 1c #2 Stranded, CN | 1,856 | | | | |
| 4 – 1c #2 Stranded, CN | 1,962 | | | | |
| 3 – 1c #1/0 Stranded | 2,534 | | | | |
| 4 – 1c #1/0 Stranded | 2,703 | | | | |
| 3 – 1c #1/0 Stranded, 600 V | 2,955 | | | | |
| 4 – 1c #1/0 Stranded, 600 V | 3,124 | | | | |

Legend: No. of cables/ No. of conductors (c)/ Gauge (AWG)

Note: The above figures are to be used as a guide only. Consult with the manufacturer for exact maximum pull tensions for a given cable type. Ensure conformance with the ANSI/IEEE C2 standards.

## 5.6 MV direct earth buried cables

Direct earth buried (DEB) cables are to be avoided. However, if preauthorized per the FAA-approved drawing set and construction specifications, DEB cable construction shall meet the following requirements. Coordinate underground power cable installation work to avoid interference with other airport projects and with existing utilities.

General--The contractor shall excavate trenches for direct-earth burial cable as follows:

a. To the depth specified in paragraph 5.4.1b.

b. To a width of not less than four inches (4”) for single or six to eight inches (6-8”) for multiple runs of power cable.

c. To a width and depth that will provide horizontal or vertical separation of power cables from other power cables of different voltage ratings, or from power cable and a control or signal cable.

d. Where soil is known to be rocky, select backfill for cable protection. Backfill shall be firmly tamped in the separation area.

e. Restoration shall be in accordance with paragraph 5.5.3.

Unless otherwise specified, power cables in the same location and routed in the same general direction shall be installed in the same trench. Trenches for cables may be excavated manually or with powered trenching equipment. Cable plows shall not be used unless express permission is granted by the FAA project engineer. When rock is encountered, remove to a depth of at least 3 inches (3”) below the cable and fill the space with sand or clean earth free from particles larger than 1/4 inch. Bottoms of trenches shall be smooth and free of stones and sharp objects. Where materials in bottoms of trenches are other than sand, a 3-inch layer of sand shall be laid first and compacted to approximate densities of surrounding firm soil. Trenches shall be in straight lines between cable markers. Bends in trenches shall have a radius of not less than 36 inches (36”) consistent with the cable manufacturer's published minimum cable bending radius for the cable installed. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed.

Trenches shall be opened only for the time required to install, inspect and survey the cables in accordance with FAA Advisory Circular 150/5370. The trench shall be closed in the same working day or marked, barricaded and/or lighted according to current airport specifications and requirements.

*Installation in trench*--Direct earth burial cable shall be unreeled in place along the sides of or in trenches and carefully placed on sand or earth bottoms. Pulling cables into direct-burial trenches from a fixed reel position shall not be permitted, except as required to pull cables through conduits under paving or railroad tracks. Dragging cables over the ground shall not be permitted.

*Separation of cables*--Separation between direct earth burial cables shall be as follows:

a. Power cables may be laid together in the trench. In these instances, there shall be a minimum of 3 inches (3") of separation between cables.

b. Non-power cables (fiber optic, communications, and control cables) shall be installed in a separate trench from power cables (exception: DEB power cable crossing a control cable at the perpendicular and with 12 inches [12"] vertical separation). A concrete marker indicating the presence of power cables shall be installed along the route of the trench.

c. Where cables of different types (power and control or signal) or of different voltages are installed together as stated in (a) and (b) above, the individual cables or groups of the same type cables shall be clearly and unambiguously identified by installing metal or approved plastic tags indicating the type (power, control or signal) and voltages for power cables. These tags should be installed in accordance with Section 5.11.

d. Backfill that serves to separate cables shall be firmly tamped.

***Bends***--Bends in cables shall have an inner radius not less than those specified in NFPA 70 for the type of cable, or manufacturer's recommendation.

***Splicing***--Where splices are required, provide splices designed and rated for direct burial. See splicing Section 5.9 for instructions. All splices shall have their neutrals/shield solidly grounded.

***Slack loop***--A cable slack loop shall be provided at each end termination point of a cable to facilitate any future repairs. Slack loops shall have no bends with an inner radius less than twelve times the outside diameter of the cable. Where cable is brought above ground, additional slack shall be as shown by the drawings or as directed by the FAA.

***Backfilling***--After underground medium-voltage DEB cable has been installed and inspected, the trench shall be backfilled. The first layer of backfill shall be 3 inches (3") deep, loose measurement, and shall be either earth or natural sand containing no material aggregate particles that would be retained on a one quarter inch (1/4") sieve. This layer shall not be compacted. The second layer shall be 9 inches (9") deep, loose measurement, and shall contain no particles that would remain on a one inch (1") sieve.

The remainder of the backfill shall be excavated or imported material (if necessary) and shall not contain stone aggregate larger than 4 inches (4") maximum diameter. The second and subsequent layers shall be thoroughly tamped and compacted to the density of the adjacent undisturbed soil.

*Thermal resistivity:* Trench backfill shall have a soil thermal rho of 90°C-cm/W or less.

*Screening/sieving:* Compacted trench backfills shall meet ASTM D422 and ASTM D698, shall be sufficiently compacted, and shall not have backfill lifts that are too thick. Failure to prepare backfill properly will result in degraded thermal capability of the cable system.

## 5.7 Cable installation in manholes

Cables shall be carefully formed on nonmetallic racks around the interior of manholes or hand holes, avoiding sharp bends or kinks. Ensure that enough cable is coiled in the manhole so that a number of splice repairs can be made without having to fully enter the manhole. Tie splices and cables to cable racks using one eighth inch (1/8") nylon line. Splices shall be a minimum of two feet (2') from the mouth of the duct opening into the manhole or hand hole. Where this is not possible, splices shall be located as advised in the manhole/hand hole specification or drawing. Splices in different cables shall be staggered.

## 5.8 Cable termination, surge protection, and fault protection

### 5.8.1. Cable termination

All power cable terminations rated above 4000 volts or with an outer shield shall be made with an authorized stress-relief device. Cable terminations shall be of a prefabricated design and their installation shall strictly conform to manufacturer's installation recommendations using proper specialized tools. A cable manufacturer's representative shall be present at least in the initial phase to provide guidance to the installation team. Special care shall be exercised to use the proper ratings and physical dimensions.

### 5.8.2 Surge protection

Apply surge protection in accordance with the following standards:

a. For FAA-owned low voltage power systems (600 V or less), surge protection devices (SPD) shall be applied in accordance with FAA-STD-019e.

b. Surge protection for the 600 V to 1000 V medium voltage range shall be implemented in accordance with FAA-STD-019e.

c. Surge protection for the 1000 V to 15 kV medium voltage range shall be implemented in accordance with ANSI/IEEE C62.11 and NEC Article 280.

d. Limit nominal voltage of ELD systems to 34.5 kV. For any other voltages, consult with the office of primary responsibility.

The following guidelines apply to locating and installing surge protection devices (SPD) (see Appendix A for product operating parameters).

a. If an FAA-owned distribution transformer is fed from an overhead line by means of a medium voltage cable, surge arresters of the metal-oxide varistor (MOV) type shall be installed at the pole top and at the transformer between each phase and ground. The pole type arrester shall be of the intermediate class, while the transformer surge arrester shall be of the distribution type. The continuous voltage rating of the arresters shall be determined in a protection and insulation coordination study. As a further protection

against direct lightning, intermediate arresters shall be installed one span before and after the interconnection of transformer. Surge arrester leads connecting to cable conductor and grounded metal shield must be as short as possible to minimize the protective voltage level. This recommended surge protection scheme is illustrated in Figure I.

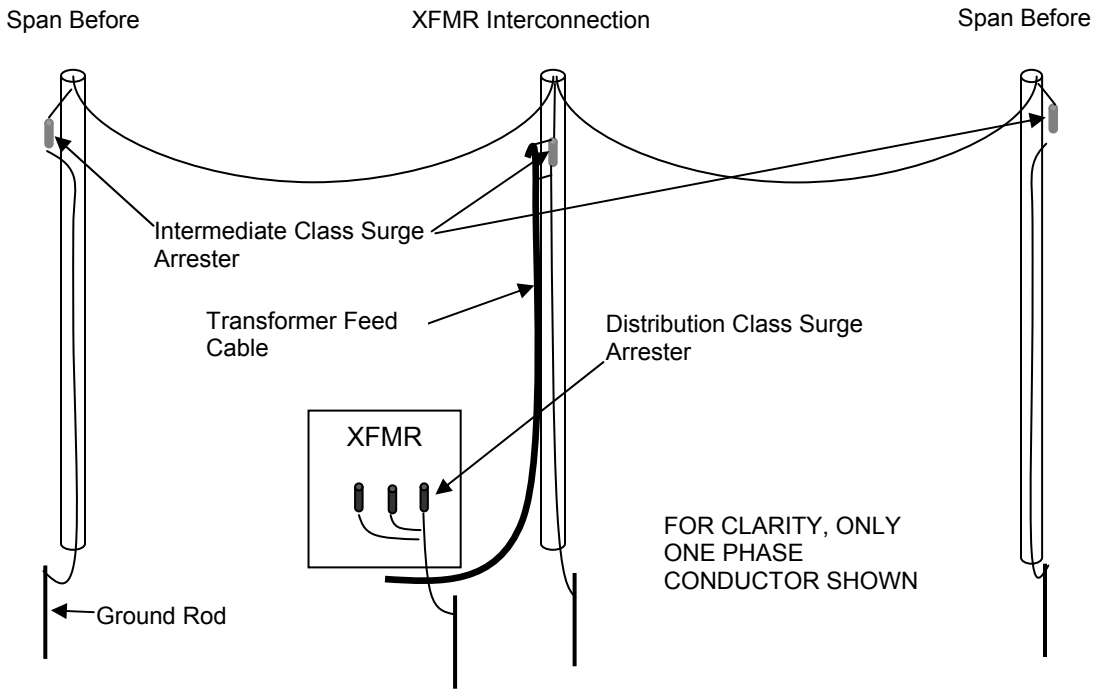



**FIGURE I. Schematic representation of recommended surge protection system.**

b. If an FAA-owned distribution transformer is fed from a station transformer directly by means of a medium voltage underground cable, a distribution arrester shall be installed at both ends of the cable in accordance to the guidelines provided in paragraph (a) above.

c. Within the electrical line distribution system itself, install surge arrestors of the proper class on transformers, switchgear, and sectionalizers. Installation procedure shall be in accordance with the manufacturer's instructions.

## 5.8.3 Fault protection

Use sectionalizers to protect the underground electrical line distribution circuit as a whole from electrical faults. This shall be accomplished by isolating faults to single National Airspace System (NAS) facilities versus multiple facilities ("daisy chained"). Where existing power cable layouts do not permit the isolation of individual facilities, add a sectionalizer.

Similarly, do not connect transformer primaries in a given electrical line distribution (ELD) service together in parallel such that a single power cable or transformer fault upstream will be

allowed to deenergize downstream loads in the ELD circuit, thereby disabling multiple NAS facilities.

## 5.9 Splices

Whenever possible and while still meeting required cable grounding standards, splices are to be avoided. Splices on multiple cables in a trench shall be staggered. Cable ends to be spliced shall be kept free from moisture by using tape or caps. Cable runs shall be given continuity and insulation resistance tests per this specification at the completion of each splice. When conducting FAA-authorized third-party testing, at the completion of the installation of each cable section (from termination to termination), subject the cable section to a 50/60 Hz partial discharge test in accordance with IEEE 400.3 at up to 2.5 times operating voltage level for a duration not to exceed 30 seconds, while the cable section is disconnected from the rest of the system. Any partial discharge within a splice shall comply with the requirements of IEEE 404. Splices are not to be drawn inside of any conduit or duct.

Buried and nonseparable T and Y joints shall never be used. These joints are inherently unreliable and cannot be properly commissioned with partial discharge diagnostics. Finding a fault becomes more difficult and harmful to existing cable assets. In addition, faults due to these types of unreliable joints will take down multiple facilities due to a lack of sectionalizing.

Each cable splicer shall be qualified in making cable splices and in the use of specified cable splicing kits and specialized tools. The contractor shall obtain FAA authorization of the splice and cable splicer prior to making field splices. Cable splicing methods and materials shall be of a type recommended by the splicing materials manufacturer for the cable to be spliced, and a cable manufacturer's representative shall be present at least in the initial phase to provide guidance to the installation team. Splices shall be as follows.

a. Medium voltage power cables (600 volts and above). Use cold-shrink splice kits. The contractor shall make sure that the proper kit and tools are used for each application. The cold shrink product shall meet ANSI/IEEE Std. 404 (for a 15 kV rating).

b. Power cables 600 volts and below. Use heavy-wall self-sealing heat-shrinkable tubing meeting ANSI-C119.1-2006, poured epoxy splice, or any other splicing means approved by ANSI standards.

c. Cable armor and shields. Armor and shield may be folded back prior to splicing, then reinstalled across the splice and bonded by the use of authorized bonding clips, or soldering when copper material is used. If the armor is galvanized material, it shall be bolted. Excess threads should be cut from bolts and wrapped with butyl tape so there are no sharp projections prior to using heat-shrink tubing.

d. Evaluation of products. As a submittal to FAA, the contractor shall provide the product drawings showing details of the splicing methods to be used, and a statement of the experience of the contractor in making splices on underground systems with

the proposed product. In addition, products shall meet the latest editions of standards in Table IV.

**Table IV. Cable splicing specification equivalents.**

| APPLICATION STANDARD | LEVEL OF ACCEPTANCE |
|---|---|
| IEEE-404 Standard for Power Cable Joints | Meet or Exceed |
| IEEE-48 Standard for Cable Terminations | Meet or Exceed |
| ANSI C119.1 Sealed Insulated Underground Connector System Rated 600 Volts | Meet or Exceed |
| IEEE – 386 Standard for Separable Insulated Connectors | Meet or Exceed |

## 5.10 Grounding of ELD systems

Local published standards may take precedence over the national standard. In the case of ambiguity or significant deviation, contact Power Services Group, Power Cable Program Office to provide a technical evaluation. ELD systems grounding shall comply with FAA-STD-019e, NFPA 70, IEEE C2, and in accordance with the specific guidance provided herein.

Typical FAA medium-voltage ELD elements to be grounded include:

a. Power Cables – ground the multigrounded neutral wires and shields,
b. Guard wires,
c. Manholes and hand holes,
d. Equipment and equipment enclosures,
e. Surge arresters,
f. Conduits and fittings,
g. Direct earth buried cables – multigrounded shields.

A typical FAA low-voltage ELD element to be grounded includes:

a. Low-voltage cable segment between a facility transformer and the service entrance.

### 5.10.1 Power cables, multigrounded neutral wires and shields

The FAA ELD systems follow the same practice as multigrounded (solidly grounded, reactance grounded) medium voltage neutral systems in common use by the electric utility companies.

FAA power cables (both in conduit and DEB) shall be effectively grounded by ground connections of sufficiently low impedance levels, and have sufficient current carrying capacity to limit the buildup of voltages to levels below those that may result in undue hazards to persons or connected equipment.

*Multigrounded system*-- Medium voltage cables typically use metallic shields that require grounding (NEC requirement above 5 kV). The shields confine electric fields within the cable to obtain uniform radial distribution of the electric field, protect against induced voltages, and reduce the shock hazard risk to personnel. To effectively ground the shield, install multiple grounds to the cable neutral conductor to limit the voltage rise to 25 volts maximum (measured from neutral to earth ground) per IEEE Std 525. This shall be accomplished by connecting the

neutral of the multigrounded system to electrodes at each transformer location and at a sufficient number of additional points totaling not less than four ground points in each mile of the entire line (every 1300 ft / 400 m [¼ mile], or less) or at every manhole, not including grounds at individual services. This rule applies to underground jacketed shielded cable and to jacketed concentric neutral cable. (Ref NESC Section 9, Rule 096, *Ground Resistance Requirements – Multigrounded System)*. The same practice applies to different kinds of cables; for example, concentric wire, tape shield, etc.

*Bonding across joints*--Apply a shield bonding jumper wire across cable splices.

*DEB cable shield and separate neutral conductor grounding* – Ground direct earth buried cable shields and shields of separate neutral conductor cables at least eight times per mile (not to exceed 660 ft spacing), not including grounds at individual services, in accordance with NESC C2, Rule 354.D.3c).

## 5.10.2 Cable guard wires

Guard wires protect the power cable from lightning surges. The contractor shall install cable guard wires for buried cables and conductors not routed in ferrous conduit to protect underground conductors from the effects of lightning discharges. A 1/0 AWG bare copper stranded guard wire shall be used. The guard wire shall be embedded in the soil, a minimum of 10 inches (25 cm) above the cable and duct to be protected and located directly above and parallel to the cables being protected. When the width of the cable run or duct does not exceed 3 ft (90 cm), one guard wire, centered over the cable run or duct, shall be installed.

When the cable run or duct is more than 3 feet (90 cm) in width, two guard wires shall be installed. The guard wires shall be spaced at least 12 inches (30 cm) apart and be not less than 12 inches (30 cm) nor more than 18 inches (45 cm) inside the outermost wires or the edges of the duct.

The guard wire shall be bonded to the earth electrode system (EES) at each end and to ground rods at approximately 90-foot intervals using exothermic welds. The spacing between ground rods must vary by 10% to 20% to prevent resonance. Install the ground rods from 2 to 6 feet (0.75 to 2 m) on either side of the trench and connect them via jumper wire to the guard wire. Where cables run parallel to the edge of a runway, ground rods shall be located 10 feet from the edge lights on the outside of the lights. (FAA-STD-019e, Section 4.2.1.5)

## 5.10.3 Manholes and hand holes

Power and control cables shall be installed in separate manholes and hand holes.

Until ready for acceptance testing, no installation work shall involve energized systems. Install power cables, ground wires, grounding loops, and manhole racks and furniture in such a way as to give maximum safe clearance space for personnel to enter the manhole when conducting subsequent operation and maintenance tasks. Conductors shall be placed well out of the way of human ingress/egress pathways through the manhole or vault. During acceptance inspection,

manhole installation configurations that are found to be untidy and/or lacking in clearance for later maintenance tasks shall be required to be redone at the contractor's expense.

If space is available, cable slack sufficient for one splice for each cable shall be left in each manhole. Elimination or shortening of slack lengths shall require authorization by the FAA.

All new and existing cable in manholes shall be secured to nonmetallic racks on the manhole walls. Cables shall be secured to racks or mounted on a heavy duty nonmetallic multi-mount cable support arm.

Jumper cables shall be routed in such a manner that through-air clearance between adjacent conductors, and between conductors and any metallic or grounded surface, is maintained.

Physical dimensions of manholes may be altered to fit requirements. The following procedure covers the minimum grounding requirements (Figure II):

a. Install a solid, bare copper bus bar inside the manhole, or alternatively, run a 4/0 bare copper conductor along the inside of the manhole, creating a grounding surface about 12 inches (12") above the finished floor. Arrange bus bar or conductor so as to avoid interference with duct entrances into the manhole, and construct of sufficient length to facilitate repair and future installation operations.
b. Bond all cable shields (or steel interlocked armor if used) and other metallic bodies with a minimum 6 AWG bare copper conductor to the bus bar.
c. Connect and bond the 1/0 AWG guard wires to the outside ground rods on each side of the manhole, ensuring 10 feet (10') distance from the outside of the manhole to the ground rod.
d. Use 3/4-inch (3/4") PVC with 8-inch (8") sweeped elbow(s) inside the manhole, to ensure that any conductors follow a smooth path. The PVC also provides practical distance from other metal equipment, bus bars, cable racks, and wires.
e. All connections, sweeps, or curves in the grounding system shall be smooth and shall be of at least 8 inch (8") radius no matter what the orientation (vertical or horizontal).
f. All splices inside a manhole shall be solidly grounded, with jumpers running across the joints to connect the cable shields.
g. Connect and bond the manhole cover/frame to the bus bar using a braided, copper ground strap with an equivalent ampacity of No. 6 AWG.
h. Bond all wires and metallic equipment inside and outside the manhole as noted above using exothermic weld connections.
i. Apply expandable foam duct sealant at openings to prevent water and gas from entering manholes.
j. Hand holes follow the same basic principles as above, with appropriate modifications.

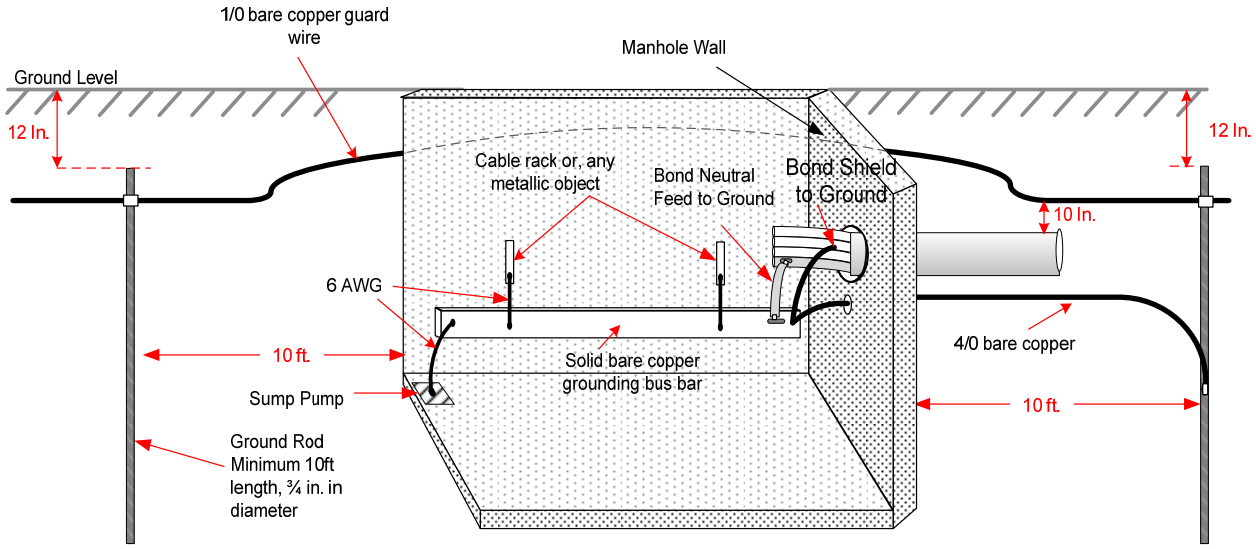



**FIGURE II. Grounding and guard wire installation detail at a manhole.**

Where multiple conduits enter manholes, the following schemes illustrate guard wire grounding methods (all sharp corners to be rounded out) (Figure III).

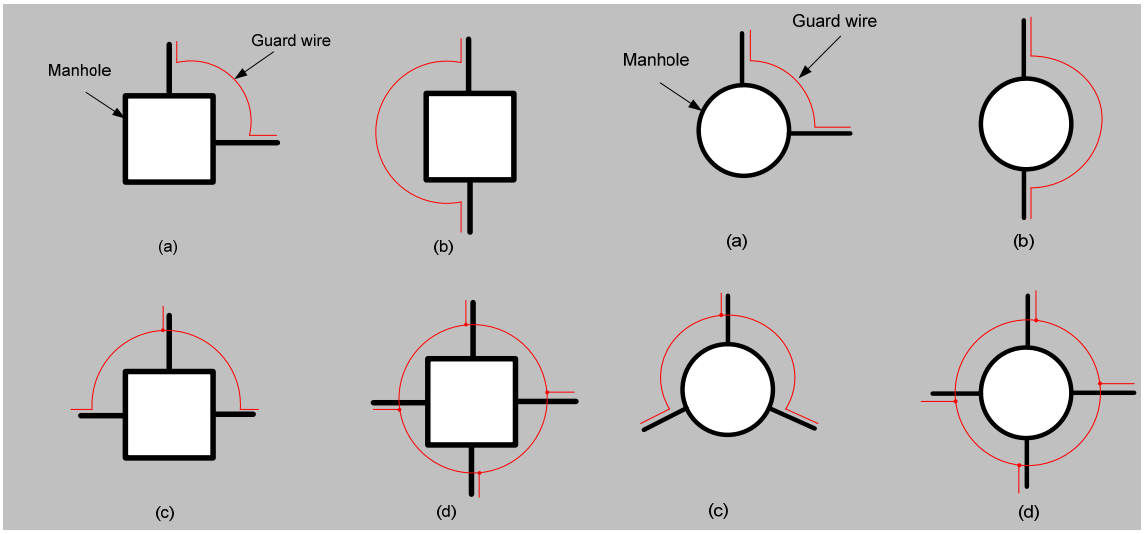



**Figure III. Possible guard wire grounding schemes.**

## 5.10.4 Equipment and equipment enclosures

Ground ELD equipment and equipment enclosures in accordance with NESC ANSI C2 Section 38, Rule 384 (medium voltage equipment), and FAA STD019e (low voltage equipment).

*Pad-mounted transformers*--Install a grounding counterpoise 2’ to 6’ from pad-mounted transformer pads. Counterpoise shall consist of bare 4/0 AWG copper conductors and driven ground rods under and around the pad. Ground the transformer equipment frame and other non-current-carrying metal parts, such as cable shields, cable sheaths and armor, and metallic conduit, to the ground ring. Provide at least two connections from the transformer to the counterpoise. Ground the secondary neutral.

*Other pad-mounted equipment and vaults*--Install a grounding counterpoise 2’ to 6’ from the pads of pad-mounted switchgear, sectionalizers, and other equipment. Counterpoise shall consist of bare 4/0 AWG copper conductors and driven ground rods under and around the pad or vault. Ground the equipment frame and other non-current-carrying metal parts, such as cable shields, cable sheaths and armor, and metallic conduit, to the ground bus in the enclosure with pressure connectors. Provide at least two connections from the equipment to the ground ring.

Connect metallic conduits that terminate without mechanical connection to the housing by grounding bushings and grounding conductor to the equipment ground bus.

Route cables within switchgear and enclosures in a manner which will allow room for bending and terminating of cables. Cables shall be secured in a manner that will not result in cable weight being placed on the termination electrical joint. Cable support shall be made in a manner that does not force cable against grounded metal or that compresses cable diameter. Cable training bend radius shall be at least 12 times cable diameter or shall not be installed.

Route jumper cables in a manner that maintains through-air clearance between adjacent conductors and between conductors and any metallic or grounded surface.

## 5.10.5 Surge arresters

Follow detail drawings in the drawing set for surge arrester grounding. For ungrounded and single-grounded systems, modify the requirement in accordance with IEEE C2 and UFC 3-550-03FA.

Bond surge arresters and neutrals directly to a transformer enclosure and then to the grounding electrode system using a bare copper conductor. Keep lead lengths as short as possible with no kinks or sharp bends.

## 5.10.6 Conduit and fittings

Conduit joints and fittings shall be electrically continuous with a bonding resistance of 5 milliohms or less between joined parts. Ferrous conduit enclosing power conductors to FAA

facilities shall be terminated using conductive fittings to their respective junction boxes, equipment cabinets, enclosures, or other grounded metal structures.

## 5.10.7 Low-voltage cable runs to facility service entrances

ELD cable runs feeding power to FAA facility service entrances are considered premise wiring and shall follow the grounding requirements of NEC/NFPA 70 Section 250, alternating current systems between 50 V and 1000 V.

## 5.10.8 Installation details

### 5.10.8.1 Installation of ground rods

To meet site grounding requirements, install ground rods according to the design drawings to ensure that the desired grounding values are achieved at all points of the ELD system.

*Ground rods* - Drive cone-pointed ground rods to full depth plus another 12 inches below grade. Ensure that the installation provides an earth ground of the appropriate value for the particular equipment being grounded. Neatly and firmly attach grounding conductors to manhole or hand hole walls and keep the amount of exposed bare wire to a minimum.

*Equipment counterpoise* – Install bare 4/0 AWG copper conductors not less than 24 inches (24”) below finished top of soil grade.

### 5.10.8.2 Grounding and bonding connections at or within equipment enclosures

Where grounding connections are buried, external to equipment enclosures, or otherwise normally inaccessible, use exothermic welds. Make exothermic welds strictly in accordance with the weld manufacturer's written recommendations. Welds that are "puffed up" or that show convex surfaces indicating improper cleaning are not acceptable. No mechanical connectors shall be made below grade.

Mechanical connections within equipment enclosures above grade shall employ bolted solderless connectors, in compliance with UL 467.

### 5.10.8.3 Routing grounding and bonding conductors

Bond transformer enclosures and equipment frames to the grounding counterpoise system. Size grounding and bonding conductors in accordance with the drawings. Bends less than 90 degrees are not permitted. Avoid routing ground conductors through concrete. When concrete penetration is necessary, cast nonmetallic conduit flush with the points of concrete entrance and exit so as to provide an opening for the ground conductor. Seal the opening with a sealing compound after installation.

### 5.10.8.4 Grounding cable across expansion joints

For grounding cables that cross expansion joints or similar separations in structures and pavements, use approved devices or methods of installation to provide the necessary slack in the cable across the joint to permit movement. Use stranded or other approved flexible copper cable across such separations.

#### 5.10.8.5 Grounding of armored cable and metallic conduit

Apply the following requirement during initial cable installation. For medium voltage systems, bond cable armor and/or metallic conduit to the earth electrode grounding systems of the connected equipment at both ends with a 2 AWG conductor, including at splices in manholes and hand holes. An armored bonding jumper shall be installed across each splice. For low voltage systems, bond the cable armor to the ground bus of the service disconnecting means at the electrical service entry point. Bonds shall be less than 5 milliohms between joined parts (see FAA-STD-019e, Section 4.2.1.4).

#### 5.10.8.6 Grounding metal splice cases

Ground metal splice cases for medium-voltage direct-burial cable by connection to a driven ground rod located within 2 feet of each splice box using a grounding electrode conductor having a current-carrying capacity of at least 20 percent of the individual phase conductors in the associated splice box, but not less than No. 6 AWG.

#### 5.10.8.7 Grounding Riser poles

Directly connect equipment, neutrals, surge arresters, and items required to be grounded to the single continuous vertical ground rod conductor (No. 2 AWG minimum) on each riser pole. Ensure that ground rod conductors are stapled to wood poles at intervals not exceeding 2 feet.

# 5.11 Cable tagging, equipment markers and labels, and safety signs

## 5.11.1 Cable tags

Individual cables or groups of the same type of cable shall be clearly and unambiguously identified in accessible locations such as manholes, hand holes, junction boxes, and pull boxes by means of a minimum of two tags per cable, one near each duct entrance hole. Unless otherwise specified in the contract documents, cable tags shall be constructed of metal, or of rigid laminated plastic of at least 1/16” total thickness.

Plastic tags shall be exterior classified and consist of two plies: a plastic base and a 0.005” surface of impact acrylic plastic for front engraving. The tag shall be ultraviolet (UV) light stable. Engraving shall be done with 3/8-inch lettering (white background and black letters). Tags shall be attached to the both terminated ends of the cable with two UV-rated nylon or stainless steel cable ties.

Cable terminations and potheads shall be tagged as to function, including facility which they serve, and any pertinent data. Tags shall be marked with an abbreviation of the name of the facility or facilities served by the cable plus the letter “P” (Power). Where more than one identical cable is used to serve the same facility, cables may be bundled under one tag unless job plans state otherwise.

## 5.11.2 Equipment markers and labels

Design and select equipment markers and labels for exterior use.

#### 5.11.2.1 Exterior equipment identification tags, labels, and plaques

Aluminum tags, or any other tags or labels approved by the project engineer, shall be printed with numbers to identify ELD equipment. Attachment options include wires and ties, or screw mounts, nails, or bolts. Contrasting colors shall be considered when ordering tags and labels. Plaques may be made of laminated plastic.

#### 5.11.2.2 Warning and safety signs and labels

To minimize accidents, manufacturers of electrical products use ANSI Z535, *Safety Alerting Standards,* to make their products and manuals safer. Contractors shall ensure that colors, safety signs and labels, safety symbols, barricade tapes, and information on product manuals, instructions, and collateral materials applying to FAA ELD equipment meet ANSI Z535.1 thru .6 standards.

#### 5.11.2.3 Arc flash hazard labeling

In instances where an arc flash analysis has been completed, the results of the study shall be labeled on all corresponding equipment, as well as the drawings. Follow NEC Article 110.16 for guidance on warning labels.

Electrical equipment shall be field marked to warn qualified persons of potential electric arc flash hazards. The marking shall be located so as to be clearly visible to qualified persons before installation of the equipment.

Following the completion of arc flash hazard and shock analyses, the electrical equipment evaluated shall be labeled to include the findings of the analyses. At a minimum, the label shall include the following information: flash hazard boundary; incident energy ($cal/cm^2$) at appropriate working distances; personal protective equipment (PPE) level - including what fire-retardant clothing is required; shock hazard level (kV); limited approach boundary (feet/inches); restricted approach boundary (feet/inches); class of voltage-rated gloves for restricted approach boundary; prohibited approach boundary (feet/inches); class of voltage-rated gloves for prohibited approach boundary; equipment name; additional PPE required (ear, eye, face, and/or head protection); and date of survey.

## 5.12 Cable markers

No particular type or design of marker is specified herein or funded by the program office. The tailoring entity shall identify additional marking requirements, and then check with the local airport authority, municipal jurisdiction, or owner for applicability and funding. Nothing in this section supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 5.12.1 Concrete markers for DEB cable

Concrete markers are required only for direct earth buried (DEB) cables. Install a concrete slab marker at each change of direction of DEB cable, over the ends of ducts or conduits which are installed under paved areas and roadways, and over each splice. Markers shall be two feet (2’) square and six inches (6”) thick, and shall be installed within 24 hours of the final backfill of the

cable trench. The markers shall be installed flat in the ground with the top approximately one inch (1") above the finished grade. Install slabs so that the side nearest the inscription on top includes an arrow indicating the side nearest the cable. Provide color, type, and depth of warning tape.

Concrete shall have a compressive strength of not less than 20 MPa (3000 psi) and have a smooth, troweled finish on the exposed surface. After the concrete marker has set a minimum of 24 hours, the top surface shall be painted bright orange with paint manufactured specifically for uncured exterior concrete. Markers shall not be installed in concrete or asphalt surfaces.

Each cable marker shall have the following information impressed upon its top surface:

a. The word "CABLE".

b. Name of facility served; for example, "ASR," "VORTAC," "ALS," etc.

c. The designation of the type of cables installed shall be shown on the marker. The type shall be marked with the following abbreviations: "P" for Power, "C" for Control, "T" for Telephone, and "R" for Coaxial (Radio Frequency).

d. An arrow to indicate the direction or change of direction of the cable run.

e. Any additional information as defined by the contract drawings.

f. The contractor shall obtain authorization from the FAA for the information to be impressed on the cable marker and for the method of impression. The letters shall be four inches (4") high, three inches (3") wide and one half inch (1/2") deep.

All cable and cable markers shall be coded with applicable color coding standards, as applicable to the locality. If no standard applies, use the American Public Works Association (APWA) color codes shown in Table V.

**TABLE V. APWA color codes.**

| COLOR CODE | TYPE OF UNDERGROUND UTILITY |
|---|---|
| RED | Electric power lines, cables or conduits, and lighting cables |
| YELLOW | Gas, oil, steam, petroleum or other hazardous liquid or gaseous materials |
| ORANGE | Communications, cable TV, alarm or signal lines, cables, or conduits |
| BLUE | Potable water lines |
| GREEN | Sewers, storm sewer facilities and utilities, or their drains lines |
| PURPLE | Reclaimed water, irrigation, or slurry lines |
| WHITE | Proposed excavation |
| PINK | Temporary survey marking |

The location of the ends of ducts shall be marked with concrete markers 2 feet (2') square and 6 inches (6") thick. The duct markers are to be installed in the same manner as cable markers, except the following shall be impressed upon their top surface:

a. The word, "DUCT".

b. Name of facility served; for example, "ASR," "VORTAC," "ALS," etc.

c. An arrow to indicate the direction or the change in direction of the cable route.

d. The number of conduits and the type of conduits: for example, 4-P/2-C.

e. Any additional information as directed by the FAA project engineer.

DEB cables shall be marked every two hundred feet (200') along a cable run, at each change of direction of the cable, and at each cable splice. Markers shall be either concrete or other type, or a combination of both as specified in the contract documents.

The markers used for DEB cables shall be impressed with a "P" for power cable.

### 5.12.2 Special-purpose and near-surface markers

Special-purpose and near-surface markers are used to indicate points of additional information. At a minimum, markers shall indicate the location of splices and the entrances of separate duct banks and/or bores. Other significant points may be required as field-determined. Appropriate-colored surface markers shall also be placed where crossing other utilities (for example, blue for water, orange for telephone, yellow for gas). Markers shall be either drilled into existing surfaces (for example, concrete edge of manhole or pavement) or set in a concrete slab square as above.

## 5.13 Acceptance and inspection procedures

After the installation of cable systems is completed, the FAA and/or its contractor shall perform acceptance/commissioning testing. All safety procedures for energizing the systems following installation shall follow OSHA confined spaces regulations and NFPA 70E. Tests shall be conducted in the operational environment to confirm operational readiness of the ELD and to identify safety hazards involving any component of the ELD system that will support a system in the NAS.

Participants shall include the FAA project manager, project engineer(s), contract technical representatives, environmental, safety, real estate, power company contracts representative, airport authority representative, and airport staff.

Once acceptance tests are completed and the results accepted, the FAA shall take beneficial occupancy of the ELD system. This may occur in stages.

# APPENDIX A—Surge Arrester Performance Data

# 1. SCOPE

This appendix provides surge arrester performance data for FAA medium-voltage (MV) electrical line distribution (ELD) systems. Surge arresters protect the following ELD system elements:

a. Overhead lines and distribution transformers (utility responsibility),
b. MV transformers and cable installations,
c. MV cables,
d. Internal switchgear and sectionalizers in MV networks,
e. Other ELD-related special-purpose applications as required.

# 2. APPLICABLE DOCUMENTS

## 2.1 Non-government publications

**Institute of Electrical and Electronics Engineers (IEEE)**

IEEE C62.11 (2005; And 1 2008)
Standard for Metal-Oxide Surge Arresters for Alternating Current Power Circuits (>1kV)

Guide Information for Electrical Equipment, The White Book 2011, UL Product Categories Correlated to the 2008 and 2011 National Electrical Code®. Surge Arresters 1000 Volts and Higher (VZQK)

**National Electrical Manufacturers Association (NEMA)**

NEMA LA 1 (1992; R 1999) Standard for Surge Arresters

**National Fire Protection Association (NFPA)**

NFPA 70 (2008; TIA 08-1) National Electrical Code

NEC article 280: Introduces surge arresters, general requirements, installation requirements, and connection requirements.

# 3. REQUIREMENTS

## 3.1 Performance Requirements

### 3.1.1. General

The requirement is for high-quality metal-oxide surge arresters for use in FAA-owned distribution networks to ensure the protection of underground power cables, low-level distribution transformers, generators, sectionalizing switches, and other electrical equipment. Surge arresters limit dangerous voltage surges caused by lightning strikes or switching anomalies occurring in the ELD network. Arresters also increase the availability of power by reducing outages. Voltage surges can result in personnel injuries from electrical shock, insulation damage to equipment, and possibly fire. Surge arresters provide safe dissipation of these surges.

The standard root-mean-square (rms) maximum continuous operating voltage (MCOV) and rms duty-cycle voltage ratings for typical nominal voltage values and configurations used in FAA underground electrical distribution systems (except note 1) are shown in the table below. Light-duty surge arresters in common use in FAA ELD systems correspond to these configurations.

| Nominal Voltage (KVrms) | MCOV (KVrms) | Duty-Cycle (KVrms) |
|---|---|---|
| 4,160Y (3φ)<br>2,400 (1φ) | 5.1 KV<br>2.55 kV | 6 KV<br>3 kV |
| 13,200Y(3φ)<br>7,620 (1φ) | 15.3 KV<br>7.65 kV | 18 KV<br>9 kV |
| 4,160Δ (3φ)(see note 1) | 5.1 | 6 kV |
| 13,800 | 15.3 kV | 18 kV |

Note (1): The delta configuration is not a typical FAA ELD configuration. If you encounter this configuration or any configuration not shown above, call the Power Cable Program Office, AJW-22, for guidance.

### 3.1.2 Placement

Surge arresters shall be provided on the line side of:

1. Pole-mounted transformers (utility responsibility in most cases),

2. Overhead to underground terminal poles (utility),

3. All “normally open” switchways of pad-mounted sectionalizing switches connected to and served from overhead lines,

4. Underground primary metering installations connected to and served from overhead lines.

5. On the line side of any location where a voltage/facility transition occurs.

## 3.1.3 IEEE Standard C62.11

The design, fabrication, testing, and performance requirement to which a medium voltage surge arrester shall comply is IEEE C62.11 (reference provided above). The definition provided in IEEE C62.11 for metal-oxide surge arresters for ac power circuits greater than 1 kV is:

> **Arrester, distribution, light duty class:** An arrester normally installed on and used to protect underground distribution systems where the major portion of the lightning stroke current is discharged by an arrester located at the overhead line/cable junction.

This class of surge arrester conforms to the minimum recommended level to provide protection against switching and other transient voltages in the underground ELD infrastructure. Light duty class arresters are constrained by the prescribed test requirements of standard IEEE C62.11 (see table below).

| Class | Rated voltage (kV) | | Lightning impulse classifying current (kA) | Minimum High current Short duration withstand (kA) | Minimum Low current Long duration withstand (A, μs) |
|---|---|---|---|---|---|
| | Duty cycle | MCOV | | | |
| Distribution, light duty | 3–36 | 2.55–29 | 5 | 40 | 75, 2000 |

## 3.1.4 Service conditions

An arrester installed in the FAA ELD system shall be capable of successful operations under the service conditions given in the paragraphs below.

3.1.4.1 Usual service conditions

Physical conditions

a) Ambient air temperature in the general vicinity of the arrester shall be between –40°C and +40°C except that: (1) Ambient air temperature in the general vicinity of deadfront arresters shall be between –40 °C and +65 °C, and (2) Ambient liquid temperature in the general vicinity of liquid-immersed arresters shall be between –40°C and +95°C.
b) Maximum temperature of the arrester, due to external heat sources in the general vicinity of the arrester, shall not exceed 60°C, except that (1) Maximum temperature of the deadfront arrester shall not exceed 85°C, and (2) Maximum temperature of the liquid-immersed arresters shall not exceed 120°C.
c) Altitude shall not exceed 1800 m (6000 ft), except for liquid-immersed arresters.

System conditions

a) Nominal power system frequency of 48 Hz to 62 Hz.

b) System line-to-ground voltage within the ratings of the arrester under all system operating conditions.

3.1.4.2 Unusual service conditions. Exposure to any of the service conditions described in the sections below may require special consideration in the design or application of arresters.

Physical conditions

a) Ambient temperatures in the general vicinity of the arrester exceeding the values given in Section 3.1.4.1 above, Physical Conditions.
b) Maximum arrester temperatures exceeding the values given in Section 3.1.4.1 above, Physical Conditions.
c) Altitude exceeding 1800 m (6000 ft). Arresters for service at higher altitudes shall be suitable for operation at either of the following altitude ranges:
   i) 1801–3600 m (6,001–12,000 ft).
   ii) 3601–5400 m (12,001–18,000 ft).
d) Exposure to any of the following:
   i) Damaging fumes or vapors
   ii) Excessive dirt, salt spray, or other current-conducting deposits.
   iii) Steam.
   iv) Explosive atmospheres, abnormal vibrations, or shocks
e) Limitation on clearances to nearby conducting objects, particularly at altitudes exceeding 1800 m (6000 ft)
f) Unusual transportation or storage.

System conditions

a) Nominal power frequency other than 48 Hz to 62 Hz
b) System operating conditions whereby the ratings of the arrester may be temporarily exceeded. Some examples are as follows:
   i) Loss of neutral ground on normally grounded circuit
   ii) Generator overspeed
   iii) Resonance during faults upon loss of major generation
   iv) System instability
   v) Persistent single line-to-ground fault on ungrounded three-phase systems
c) Any other unusual conditions known to the user.

# APPENDIX B—Cable Pulling Calculations

This appendix provides basic information on how to calculate maximum pull force during cable pull operations. For detailed information and more elaborate tables, consult the cable manufacturer.

1. To calculate cable pulling force for a cable consisting of several segments, and/or where a cable bends around a curve or a number of curves, calculations are done in incremental segments/steps using formulas and tables, with the segments/steps added together to arrive at the cumulative maximum pull tension. Add an additional 15% margin for safety. To illustrate the cumulative method, an example is given: the pull force calculated for a cable segment A is added to a "bend multiplier" AB, a pull force for straight cable segment B, a pull force for cable segment C, a bend multiplier CD, and a cable segment D, etc., plus 15%.

The basic formula for calculating maximum pulling tension in a single cable section is:

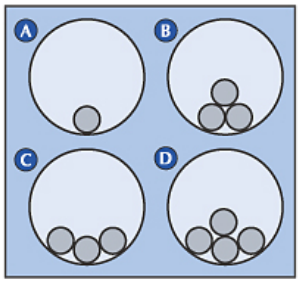
$$T = L \times w \times f \times W,$$

where
T is the total pulling tension (lb),
L is the length (ft) of cable being pulled,
w is the total weight (lb/ft) of the conductors,
f is the coefficient of friction (usually 0.5 for well-lubricated conditions),
W is the weight correction factor.

2. The process for calculating pull force for a segment of a cable run is as follows:

a. Enter the length of the cable segment in the formula above.
b. Enter the weight of the cable segment.
c. Enter the coefficient of friction.
d. Enter the weight correction factor W, derived as follows:
   i. Determine the geometric position of how the cables will lay in the conduit.
   ii. Calculate W using the table below.
e. Check for jamming hazard of the cables in the conduit.
f. Check sidewall bearing pressure (SWBP).
g. Check headroom.

3. The weight correction factor (W) calculation is based on the cable geometry in the duct:




A = Single; B = Triangular; C = Cradled; D = Diamond

To determine cable geometry, use the ratio of the conduit's inside diameter (D) to the cable's outside diameter (d) to find how the single conductors will sit in the conduit:

**Triangular (Fig. B):** This occurs when pulling three individual conductors from three separate reels, and their D/d ratio is less than 2.5. If pulling individual triplexed conductors from a single reel, the cables will also sit in this position.

**Cradle (Fig. C):** This position may occur when pulling three individual conductors from three separate reels, and their D/d ratio is between 2.5 and 3.0. This position is the least favorable because it yields the worst-case scenario of drag during the pull.

**Diamond (Fig. D):** This position occurs when pulling four individual conductors from four separate reels, and their D/d ratio is less than 3.0. If pulling quadruplexed individual conductors from a single reel, the multiconductor cable will also sit in this position.

| **No. of Conductors** | **Position** | **Weight Factor Equation** |
|---|---|---|
| 1 | Single | $W = 1$ |
| 3 | Triangular | $W = 1 / \{1-[d/(D-d)]^2\}^{1/2}$ |
| 3 | Cradled | $W = 1 + \{(4/3) \times [d/(D-d)]^2\}$ |
| 4 | Diamond | $W = 1 + \{2 \times [d/(D-d)]^2\}$ |
| W = Weight correction factor D = Inside diameter of conduit<br>d = Outside diameter of individual conductor | | |

For the most conservative calculation, use the cradle configuration.

4. Jamming ratio. When sizing the conduit system, installers must consider the possibility of cables jamming or wedging. This usually occurs when three or more individual conductors lie side by side in a single plane. As the conductors are pulled through a bend, the curvature of the bend tends to squeeze the conductors together. Use the following formula to determine the likelihood of jamming. Use the inside diameter of the conduit and the outside diameter of the individual conductor. Avoid jam ratios of 2.8 to 3.2 for Type MV extruded dielectric power cables:

$1.05 \times (D \div d)$

Where
D = the inside diameter of the conduit
d = the outside diameter of an individual conductor.
Constant factor 1.05 = correction for oval shape of bends in the sectional view.

- If the value is less than 2.5, the cable will jam,
- If the value is less than 3.0 but greater than 2.8, jamming is very possible,
- If the value is greater than 3.0, jamming will not occur.
- For medium-voltage extruded dielectric power cables, avoid values between 2.8 to 3.2.

5. Sidewall bearing pressure (SWBP). Sidewall bearing pressure (in pounds per foot) is the tension on the cable coming out of a bend (in pounds) divided by the inside radius of the bend (in feet). When pulling at a bend, the recommended maximum sidewall pressures for 15kV class and less is 500 lb/ft (or less, if recommended by the manufacturer).

| **No. of Conductors** | **Position** | **SWBP Equation** |
|---|---|---|
| 1 | Single | $SWBP = T \div R$ |
| 3 | Cradled | $SWBP = [(3W - 2) \times T] \div 3R$ |
| 3 | Triangular | $SWBP = (W \times T) \div 2R$ |
| 4 | Diamond | $SWBP = (W - 1) \times (T \div R)$ |
| W = weight correction factor; T = calculated tension; R = radius of bend (inside radius). | | |

6. Headroom. To ensure a safe and easy pull, provide clearance between the uppermost conductor and the top of the conduit. For straight pulls, a clearance as small as ¼ in. is considered safe. For more complex pulls, between ½ in. and 1 in. is required. Use the equations below to derive the clearance for a given conduit and cable sitting position. Note that allowance is made for variations in cable and conduit diameters, and the oval shape of the raceway sections at bends.

| **Configuration** | **Clearance** |
|---|---|
| Single | $C = D' - d'$ |
| Triangular | $C = \left[\sqrt{D' - 1.366\,d'} + \sqrt{(D' - d')}\right] \times \sqrt{[1 - (d' \div D' - d)^2]}$ |
| Diamond | $C = \left[(D' - d') - 2d'^2\right] \div (D' - d')$ |
| C = Clearance, D′ = 1.05 x nominal conduit inside diameter; d′ = 1.05 x nominal overall diameter of individual conductor. | |

7. Limit pulling tension to 0.008 lb/cmil for copper conductors pulled by pulling eyes or pulling bolts (pulling tension applied directly to the conductor).

8. Limit pulling tension to 1000 lb for jacketed cables pulled by cable grips.

9. Angle of bend. Every time there is a bend in the cable, a bend multiplier factor must be introduced:

| Bend Angle | Multiplier |
|---|---|
| 15 | 1.14 |
| 30 | 1.30 |
| 45 | 1.48 |
| 60 | 1.70 |
| 75 | 1.94 |
| 90 | 2.20 |
| 105 | 2.50 |
| 120 | 2.86 |

10. For steel, wire, rope, or tape used for cable pulling, a dynamometer graduated to indicate the tension on the cable being pulled can be used, or the contractor shall adapt a rope harness properly sized to limit pull tension to the value indicated. Any combination of a group of cables to be pulled into a duct shall not exceed the sum of individual allowable tension of each cable plus 15 percent.

# APPENDIX C—Acceptance testing of newly installed FAA medium voltage underground power cables

This appendix specifies *acceptance testing* of newly installed FAA insulated underground medium voltage power cables rated 2 kV to 15 kV, shielded, non-shielded, and armored. It does not cover *installation testing* or *maintenance testing* as defined in IEEE 400.2. Nor does it cover testing of older, in-service cables. For comprehensive treatment of the maintenance testing of FAA power cables, refer to FAA Order 6950.22, *Maintenance of Electrical Power Cables*.

The testing guidance below applies to both direct burial cables and cables installed in nonmetallic and metal conduit. This appendix covers four types of tests used for validating acceptance of FAA medium voltage cables and accessories: (1) a continuity test, (2) an insulation resistance test; (3) a VLF (0.1 Hz) sinusoidal withstand test; and (4) an offline 50/60 Hz partial discharge test. At a minimum, tests one through three (continuity, insulation resistance, and VLF withstand tests) shall be employed as acceptance tests of new FAA cable installations. Test four (offline PD test) is a state-of-the art test that provides the most thorough and exacting test data of all the choices. It can be substituted for the VLF withstand test if funding is available. The test must be conducted by a qualified third-party testing firm that is preapproved by the FAA, and requires extra lead time in planning the test activity (3 months).

The paragraphs that follow detail each test's theory of operation, parameters and tolerances, test schedules, and safety and test procedures. If any conflicts arise relating to power cable testing parameters, procedures, or safety as presented in this appendix, the guidance of FAA Order 6950.22 shall take precedence.

## SAFETY REQUIREMENTS, GENERAL

The following are general safety requirements for all electrical power cable acceptance tests. Safety requirements particular to each test are provided in the tests' respective sections that follow.

Before testing is performed, ensure that cables and associated terminations are isolated from electrical apparatus such as power transformers, potential transformers, surge arresters, capacitors, etc. Cables are allowed to be connected to switches and fused cutouts as long as the switch isolates the cable and terminations from electrical apparatus mentioned above. Maintain at least a 6-inch clearance between cable ends and any grounded surface. If modular "load break" elbow terminations are used on the cable, ensure that the load break elbows are inserted in the associated isolated parking bushings.

Ensure that all cables and termination are disconnected and isolated from all sources of power. Using proper high-voltage test instruments, verify that the conductors are not energized and there is no back-feed from some unknown source.

Ensure that all cable shields, equipment grounding conductors, armor, and metallic conduits are properly grounded to the earth electrode system at both ends of the cable to be tested. If present, check to ensure that the cable shield, armor, and equipment grounding conductors are electrically continuous from one end of the cable to the other.

Refer to FAA Order 6950.22, Chapters 1 (para. 105), 2 (para. 220, 221, 222), and 5 (para. 504), as well as applicable IEEE standards for more safety guidance.

# 1.0 INSULATION RESISTANCE TEST

## 1.1 Theory of Operation

After cable system installation and before the cable system is placed in normal service, a "limited voltage" DC insulation resistance test shall be performed and documented, including the testing of terminations and joints.

The insulation resistance test is classified by the IEEE as a diagnostic test. The purpose of the test is not to ensure the cable systems' future performance but simply to assure the construction team that the line is not grounded/shorted before energization. Insulation or dielectric resistance is the resistance to the flow of direct current through or over the surface of the insulating material. Cables are tested by measuring the resistance between conductors, and the resistance between each conductor and ground. For a new cable, or one that is believed to be in very good condition, all of these resistances should measure in megohms (for tolerances, see Section 1.2 of this appendix below).

Any insulation resistance values less than 50 megohms shall be investigated. Note that the insulation resistance values may be affected by temperature, cable geometry, cable length, and leakage along cable terminations.

The installation contractor shall be responsible for repair/replacement of any failed components and retest costs.

## 1.2 Parameters and Tolerance limits

For test parameters and tolerance limits, refer to FAA Order 6950.22, *Maintenance of Electrical Power Cables,* Chapter 3, *Standards and Tolerances,* Paragraph 301, Table (see column heading labeled "NEW CABLE").

## 1.3 Test Schedules

Test after installation and just before energizing the new system.

# 1.4 Safety and Test Procedure

## 1.4.1 Safety

Follow safety practices as set forth in Chapter 2 (para. 221e[2][c]) and 5 (para. 502, 503) of FAA Order 6950.22, *Maintenance of Electrical Power Cables.* Refer also to the paragraphs that follow, and IEEE standards, for additional safety and grounding procedures.

Before testing begins, ensure that all associated cable shields, armor, equipment grounding conductors, and metallic conduit are properly grounded at both ends to an approved earth grounding systems or electrode. Verify that the conductors are not energized.

Ensure that cable shields and/or armor are electrically continuous by performing a simple resistance measurement using a reliable and calibrated digital multimeter. Ensure that all insulated conductors in the cable assembly that are not to be tested, as well as adjacent cables, are properly grounded at both ends to prevent capacitive voltage build-up.

When testing, one or more cable ends will need to be remote from the testing site. Therefore, before testing is begun, cables ends under test must be cleared and guarded. Switches and fused cutouts and circuit breakers used for isolating the cable under test shall be identified, locked, and tagged out of service. If possible, remote ends of cable being tested should be enclosed in a locked enclosure, vault, room, or other location accessible to qualified personnel only. All testing shall be performed between earth/ground and each insulated conductor, and between each insulated conductor.

Insulation testing must comply with OSHA regulations, Standard for Electrical Safety in the Work Place (NFPA-70E), and the National Electrical Safety Code (ANSI C2). ***All medium/high voltage testing must be performed by TWO individuals.*** Before, during, and after testing, ensure that all applicable safety rules are followed, including the use of proper personal protection equipment (PPE), lockout/tagout of all associated electrical energy sources, testing cables for possible "backfeed" from unknown electrical sources, and discharge of residual capacitive charges on cables to be tested.

Use only the approved high-voltage power test instruments to check for AC and DC voltages on all cables. ***DO NOT use hand-held test instruments which are only rated (or used in electrical/electronic applications) at 1,000 volts or less.***

## 1.4.2 Test Procedure

Refer to FAA Order 6950.22, Chapter 5, para.503 for detailed test procedures. The test procedures cover new cables having either 100% or 133% cable insulation ratings. In instances where the new cable to be tested is joined to an older cable, consult with the FAA project engineer to adjust the testing parameters as needed.

**CAUTION: After all tests are complete and before the cables and terminations are placed back into normal operation, ENSURE that all temporary safety grounding connections are removed from all insulated conductors that will be energized.**

#### 1.4.2.1 New 2,000 to 5,000 Volt Cables, Terminations, and Joints

The insulation resistance measurements shall be performed and documented after cable system installation, including terminations and joints, but before the cable system is placed in normal service. Test with a 5,000 volt insulation resistance test set (AEMC Instruments Type 5070 or approved equal) applied incrementally up to the voltage rating of the cable for a duration of not to exceed 5 minutes. Do not exceed the rms line-to-ground voltage across the conductor and metallic shield. Record the resistance at each voltage level as well as the ambient temperatures and relative humidity. Perform insulation resistance testing from each insulated conductor to ground and between each insulated conductor (ref FAA Order 6950.22, Chapter 5, para. 505, and Chapter 3, para. 301 table). Because of the power capacity limitations of the test set, cable testing must be restricted to cable lengths of 4,000 feet or less. Any insulation resistance values less than 50 Megohms shall be investigated. Note that the insulation resistance values may be affected by temperature, cable geometry, cable length, and leakage along cable terminations. Terminations shall be thoroughly cleaned and, if required, a guard circuit shall be used at the termination. The installation contractor shall be responsible for repair/replacement of any failed components and retest costs.

#### 1.4.2.2 New 15,000 Volt Cables, Terminations, and Joints

The insulation resistance measurements shall be performed and documented after cable system installation, including terminations and joints, but before the cable system is placed in normal service. Test with a 5,000 volt insulation resistance test set (AEMC type 5070 or approved equal) applied incrementally up to 5,000 volts for a duration not to exceed 5 minutes. Record the resistance at each voltage level as well as the ambient temperatures and relative humidity. Perform insulation resistance testing from each insulated conductor to ground and between each insulated conductor (ref FAA Order 6950.22, Chapter 5, para. 505, and Chapter 3, para. 301 table). Because of the power capacity limitations of the test set, cable testing must be restricted to cable lengths of 4,000 feet or less. Any insulation resistance values less than 50 Megohms shall be investigated. Note that the insulation resistance values may be affected by temperature, cable geometry, cable length, and leakage along cable terminations. Terminations shall be thoroughly cleaned and, if required, a guard circuit shall be used at the termination. The installation contractor shall be responsible for repair/replacement of any failed components and retest costs.

# 2.0 VLF WITHSTAND TEST (DC HIPOT AT 0.1 Hz)

## 2.1 Theory of Operation

The VLF (0.1 Hz sinusoidal) withstand test is essentially a DC Hipot test with a slow voltage oscillation to prevent the buildup of space charge in the cable insulation. The purpose of the test is not to ensure cable system future performance but simply to reassure the construction team that the line is not grounded/shorted before energization. The test is classified by the IEEE as a destructive test because it is designed to bring a cable and/or accessory to failure where severe

defects are present. Thus, the VLF withstand test is a pass/fail test and provides no localization or severity data other than the obvious outward sign of a defect upon failure. Only properly qualified persons who are VLF test-certified by the IBEW (or equivalent) may perform this test on FAA ELD systems.

VLF withstand testing is performed after insulation resistance testing. Even if prior insulation resistance testing has indicated that the cable is in good condition, the VLF test may provide a further indication of cable reliability.

Because VLF testing can cause a severe defect in a cable, joints, and/or terminations to fail, provisions should be made to have personnel on-site to find the defective/faulted cable or termination and make the required repairs. Retest the cable after the repairs. Repeat this procedure until cable and terminations pass the VLF test. The installation contractor shall be responsible for repair or replacement of any failed components and retest costs.

## 2.2 Parameters and Tolerance Limits

For test parameters and tolerance limits, refer to FAA Order 6950.22, *Maintenance of Electrical Power Cables,* Chapter 3, *Standards and Tolerances,* Paragraph 301, Table (see column heading labeled "NEW CABLE"). Also consult IEEE 400.2, *IEEE Guide for Field Testing of Shielded Power Cable Systems Using Very Low Frequency (VLF).*

## 2.3 Test Schedules

Test after installation and just before energizing the new system.

## 2.4 Safety and Test Procedure

### 2.4.1 Safety

Follow general safety practices as set forth in Chapters 1, 2, and 5 of FAA Order 6950.22, *Maintenance of Electrical Power Cables.* Refer also to IEEE 400.2 for safety and grounding procedures, and to the paragraphs below.

VLF testing must comply with OSHA regulations, Standard for Electrical Safety in the Work Place (NFPA-70E), and the National Electrical Safety Code (ANSI C2). ***All medium/high voltage testing must be performed by TWO individuals.*** Before, during, and after testing, ensure that all applicable safety rules are followed, including the use of proper personal protection equipment (PPE), lockout/tagout of all associated electrical energy sources, testing cables for possible "backfeed" from unknown electrical sources, and discharge of residual capacitive charges on cables to be tested.

Before testing is performed, ensure that all cables and associated terminations are disconnected and isolated from all sources of power, including electrical apparatus such as power

transformers, potential transformers, surge arresters, capacitors, etc. Cables are allowed to be connected to switches and fused cutouts so long as the switch isolates the cable and terminations from the electrical apparatus mentioned above. Maintain at least a 6-inch clearance between cable ends and any grounded surface. If modular load-break elbow terminations are used on the cable, ensure the load-break elbows are inserted in the associated isolated parking bushings. Verify that the conductors are not energized and there is no back-feed from some unknown source.

Properly ground all associated cable shields, armor, equipment grounding conductors, and metallic conduit at both ends to an approved earth grounding systems or electrode. Ensure that cable shields and/or armor are electrically continuous from one end of the cable to the other by performing a simple resistance measurement using a reliable and calibrated digital multimeter. Ensure that all insulated conductors in the cable assembly that are not to be tested, as well as adjacent cables, are properly grounded at both ends to prevent capacitive voltage build-up.

When testing, one or more cable ends will need to be remote from the testing site. Therefore, before testing is begun, cables ends under test must be cleared and guarded. Switches and fused cutouts and circuit breakers used for isolating the cable under test shall be identified, locked, and tagged out of service. If possible, remote ends of cable being tested should be enclosed in a locked enclosure, vault, room, or other location accessible to qualified personnel only.

All testing shall be performed between earth/ground and each insulated conductor, and between each insulated conductor. Use only the approved high-voltage power test instruments to check for AC and DC voltages on all cables. ***DO NOT use hand-held test instruments which are only rated (or used in electrical/electronic applications) at 1,000 volts or less!!!***

## 2.4.2 Test Procedure

If the new cable to be tested is joined to an older, in-service cable segment, consult with the FAA project engineer for guidance. The test voltage or other parameters may need to be adjusted for in-service cables because they are more sensitive to the high voltage levels attained during the test. Likewise, consult the FAA project engineer if two cable segments of different voltage ratings are being tested simultaneously, as the lower rated cable could be damaged by high voltage levels used to test the higher rated segment.

VLF testing is not required for cables with rated voltages less than 5,000 volts.

### 2.4.2.1 5,000 Volt Cables

For new 5,000 volt cables and terminations, the VLF sinusoidal withstand acceptance test shall be applied at not to exceed 14,000 volts (peak) for a duration of 15 minutes. This covers cables with both 100% and 133% cable insulation ratings. Record the pass or fail condition at the end of the test along with the ambient temperature and relative humidity. ***Because of the power capacity limitations of the test set, cable testing must be restricted to cable lengths of 3,000 feet or less.***

#### 2.4.2.2 15,000 Volt Cables

For new 15,000 volt cables and terminations, the VLF sinusoidal withstand acceptance test shall be applied at 28,000 volts (peak) using a VLF test set (High Voltage Inc., type VLF-28CM or approved equal) for a duration of 15 minutes. This covers cables with both 100% and 133% cable insulation ratings. Record the pass or fail condition at the end of the test along with the ambient temperature and relative humidity. ***Because of the power capacity limitations of the test set, cable testing must be restricted to cable lengths of 3,000 feet or less.***

**CAUTION: After all tests are complete and before the cables and terminations are placed back into normal operation, ENSURE that all temporary safety grounding connections are removed from all insulated conductors that will be energized.**

# 3.0 OFFLINE 50/60 Hz PARTIAL DISCHARGE TEST

## 3.1 Theory of Operation

The offline 50/60 Hz partial discharge (PD) test can identify the location and severity of a defect within the new cable or its accessories, including a latent defect missed by hipot tests.
The test uses a 50/60 Hz high-voltage power source and sophisticated signal processing/analysis to detect minute partial discharges (PD) in cable insulation, pinpointing manufacturing weaknesses and workmanship errors. It is a reliable method for detecting defects inadvertently missed during factory tests, defects introduced during transportation and installation, and flaws introduced while handling and splicing the cables. These defects frequently do not appear in normal voltage withstand tests but can eventually cause undesirable service failures weeks, months, or years into the future.

The test is classified by the IEEE as a diagnostic test and not a destructive test (i.e., it is not designed to cause cable and accessories to fail). Due to its requirements for specialized test equipment, signal processing software, and diagnostic skills, the test must be conducted by a third-party testing firm. The testing firm must be a qualified contractor preauthorized by the FAA.

## 3.2 Parameters and Tolerance Limits

The test is conducted in accordance with IEEE 400.3 using a maximum test voltage of 2.0 to 2.5 times operating voltage level (Uo) for a duration not to exceed 30 seconds.

For test parameters and tolerance limits, refer to FAA Order 6950.22, Maintenance of Electrical Power Cables, Chapter 3, Standards and Tolerances, Paragraph 301, Table (see column heading labeled “NEW CABLE”).

## 3.3 Test Schedules

Test after installation and just before energizing the new system. Allow adequate lead time for test planning with the third party testing firm: about 3 months before project completion for the initial notice, followed by 8 weeks' advance notice for setting up the information-gathering and detailed planning sessions.

## 3.4 Safety and Test Procedure

### 3.4.1 Safety

The third-party testing firm shall provide safety briefings at the beginning of each test session. See FAA Order 6950.22, Chapter 5, paragraph 504e(1) and applicable IEEE safety standards.

### 3.4.2 Test Procedure

For test procedure details, refer to FAA Order 6950.22, Maintenance of Electrical Power Cables, Chapter 5, Paragraph 504.

**CAUTION: After all tests are complete and before the cables and terminations are placed back into normal operation, ENSURE that all temporary safety grounding connections are removed from all insulated conductors that will be energized.**

# APPENDIX D—Acronyms/glossary

| | |
|---|---|
| AASHTO | American Association of State Highway and Transportation Officials |
| AC | Alternating Current<br>Advisory Circular |
| AJW-22 | FAA Power Services Group |
| ALS | Approach Lighting Systems |
| ANSI | American National Standards Institute |
| APWA | American Public Works Association |
| ASCE | American Society of Civil Engineers |
| ASR | Air Surveillance Radar |
| ASTM | American Society for Testing and Materials |
| AWG | American Wire Gauge. A standard for expressing wire diameter. As the AWG number gets smaller, the wire diameter gets larger. |
| C | Clearance (cable pulling) |
| °C | Degrees Centigrade |
| CADD | Computer-Aided Design and Drafting |
| cmil | Circular Mil(s). Area of a wire that is one-thousandth of an inch (.001 inch, one mil) in diameter. |
| CN | Concentric Neutral |
| CONUS | Continental United States |
| CT | Current Transformer |
| d | Cable Outside Diameter (cable pulling) |
| D | Conduit Inside Diameter (cable pulling) |
| D’ | D x 1.05 (cable pulling) |
| DC | Direct Current |
| DEB | Direct Earth Buried |
| DLA | Defense Logistics Agency |
| DOD | Department of Defense |
| Duct Bank | A set of parallel conduits made of steel, PVC covered, steel, heavy-walled PVC, or thin-walled PVC in reinforced concrete. Duct banks terminate in utility access holes or vaults. If not enclosed in concrete, duct banks must be of thicker material than thin-walled PVC. |
| EES | Earth Electrode System |
| ELD | Electrical Line Distribution |
| Electrical Trees | Tree-like growths consisting of non-solid or carbonized microchannels, which can occur at electric field enhancements such as protrusions, contaminants, voids, or water trees subjected to electrical stress for extended time periods. Partial discharges are responsible for electrical tree growth. |
| EPT | Electrical PVC Tubing |
| EPC | Electrical PVC Conduit |
| f | Coefficient of Friction (cable pulling) |
| FAA | Federal Aviation Administration |
| FOTS | Fiber Optic Telecommunications System(s) |
| ft | Feet |

| | |
|---|---|
| GIS | Geographic Information Systems |
| GPS | Global Positioning System |
| HAZMAT | Hazardous Materials |
| HDBK | FAA Handbook |
| HDPE | High-Density Polyethylene |
| HH | Hand Hole |
| HIPOT | High Potential (Test) |
| Hz | Hertz |
| ICEA | Insulated Cable Engineers Association |
| IEC | International Electrotechnical Commission |
| IECA | Insulated Cable Engineers Association |
| IEEE | Institute of Electrical and Electronics Engineers |
| in. | Inch(es) |
| ISO | International Standards Organization |
| JO | FAA Order |
| kg | Kilogram(s) |
| kV | Kilovolt(s) |
| L | Length of Cable (cable pulling) |
| lb | Pound(s) |
| LV | Low Voltage (Typically 600V and Below for ELD Systems) |
| m | Meter(s) |
| MCOV | Maximum Continuous Operating Voltage |
| MH | Manhole |
| mH | Millihenry(s) |
| MIL-STD | Military Standard |
| MIL-I | Military Specification |
| mil | Unit of Length, Equal to One Thousandth ($10^{-3}$) of an Inch (0.0254 millimeter) |
| mm | Millimeter |
| MOV | Metal Oxide Varistor |
| MV | Medium Voltage (600 V to 37.5 kV) |
| NAS | National Airspace System |
| NEC | National Electrical Code |
| NECA | National Electrical Contractors Association |
| NEMA | National Electrical Manufacturers Association |
| NESC | National Electrical Safety Code |
| NFPA | National Fire Protection Association |
| NRTL | Nationally Recognized Testing Laboratory |
| OPR | Office of Primary Responsibility |
| OSHA | Occupational Safety and Health Administration |
| Pa | Pascal(s) |
| pC | Picocoulomb(s) |
| PD | Partial Discharge |
| PPE | Personal Protective Equipment |
| psi | Pounds per Square Inch |
| PSG | Power Services Group |
| PTFE | Polytetrafluoroethylene (Teflon) |

| | |
|---|---|
| PVC | Polyvinyl Chloride |
| PWRFRQ | Power Frequency (Test) |
| Qualified Person (Electrical) | A person knowledgeable in the construction and operation of electric power generation, transmission, and distribution equipment, along with associated hazards. Also known as “qualified worker.” |
| R | Radius of Bend (cable pulling) |
| rms | Root Mean Square |
| RMC | Rigid Metal Conduit |
| RSA | Runway Safety Area. Areas of a runway established to enhance safety in the event of an aircraft undershoot, overrun, or excursion from the side of the runway. |
| SDR | Standard Dimensional Ratio |
| SPD | Surge Protection Device |
| STD | FAA Standard |
| SWBP | Sidewall Bearing Pressure (cable pulling) |
| T | Total Pulling Tension (cable pulling) |
| TR-XLPE | Tree-retardant XLPE |
| TSA | Taxiway Service Area |
| $U_o$ | Operating Voltage, Line to Ground |
| UFC | Unified Facilities Criteria |
| UFGS | Unified Facilities Guide Specification (DOD). The UFGS was founded by the Secretary of Defense and mandated by the Department of Defense for all Military Services to unify their specifications into one database. |
| UL | Underwriters’ Laboratory |
| UV | Ultraviolet |
| V | Volt(s) |
| VLF | Very Low Frequency |
| VORTAC | VOR/Tactical Air Navigation |
| w | Weight of Conductors (cable pulling) |
| W | Weight correction factor (cable pulling) |
| Xfmr | Transformer |
| XLPE | Cross-Linked Polyethylene |