

**US Army Corps
of Engineers**
Louisville District

Solicitation For

HQ AFMC Renovation Movement Support Task Order M1, Kettering, OH

P2: 475429

Design-Bid-Build

**Specifications - Vol. 2
Certified Final Design**

**28 February 2023
W912QR-30409287**

**MATOC
W912QR20D0026 thru 20D0028**

All requirements of the base MATOC Volume 1 of 2 shall apply to this Task Order unless noted otherwise.

ARIMS: 200A
Disposition: Maintain for 15yrs after construction

REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
LOUISVILLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE, KENTUCKY 40201-0059

Contracting Division

28 February 2023

Richard Group, LLC
Iron Mike Construction, LLC
AMI & LGC JV, LLC

Subject: Solicitation Number W912QR-30409287
AFMC Headquarters Renovation Movement Support Contract (Task Order M1)
for electrical & telecommunications infrastructure at WPAFB, OH

Dear MATOC Contractors:

Reference is made to your Indefinite Delivery Contracts, Numbers W912QR20D0026 thru W912QR20D0028, Multiple Award Task Order Contracts (MATOC) to provide Design/Bid/Build Construction Services within the Great Lakes and Ohio River Division (LRD) Mission Boundaries.

We request you submit a price proposal for the **AFMC Headquarters Renovation Movement Support Contract (Task Order M1) for electrical & telecommunications infrastructure at WPAFB, OH**. This work is detailed in the scope of work, drawings, and specifications, and General Wage Determination OH20230093 posted on SAM.gov. All vendors must be registered in the SAM database. The RFP can be found by logging into the website as a vendor and searching for the solicitation number (**W912QR-30409287**). The estimated cost range is \$500,000 to \$1,000,000.

The basis for award of this task order is lowest evaluated price (base plus all options). Your proposal should include a price breakdown and/or labor category table demonstrating the use of the binding rates included in your MATOC contract. The submitted price breakdown should include sufficient detail to allow the Government to verify that your proposed price incorporates the binding rates from your base contract. Any level of effort shown in the submitted information will not be used for evaluation purposes and will be used only to ensure that the proposal is in compliance with the binding rates from the base contract. Proposals that fail to submit a price breakdown or fail to use the binding rates from your MATOC will not be considered.

Offers providing less than 60 calendar days for Government acceptance after the date offers are due may not be considered and may be rejected.

Proposals are due no later than 10:00 AM ET on 30 March 2023. Submit your proposal by email to Renee Booth at Meranda.R.Booth@usace.army.mil. Proposals not received by the stated date/time will not be considered. Please acknowledge receipt of this RFP by signing below in the space provided and returning to Renee Booth via email.

Payment and Performance Bonds will be required for this project. The Notice to Proceed will be issued after receipt and approval of the bonds.

All questions regarding this Request for Proposal (RFP) must be submitted via ProjNet. The website to access this system is www.projnet.org and the bidder inquiry key for this specific project is: **3C4YXG-5U9EJI**. No Government responses will be entered into the ProjNet system within two (2) days prior to the proposal due date stated in this letter.

System for Award Management (SAM): Your SAM registration is required to be active prior to any award. You must submit a notarized letter appointing the authorized Entity Administrator before your registration will be activated. This requirement now applies to both new and existing entities. Effective 29 April 2018, the notarized letter process is now mandatory on all CURRENT registrants at SAM who have a requirement to update data on their SAM record. The notarized letter is mandatory and is required before the GSA Federal Service Desk (FSD) will activate the entity's registration.

All contractors must be registered in the System for Award Management (www.SAM.gov) prior to award of a contract. All proposed contractors are highly encouraged to review FAR Clause 52.232-33 Payments by Electronic Funds Transfer – System for Award Management, which indicates “All payments by the Government under this contract shall be made by electronic funds transfer (EFT).” Those not currently registered can obtain registration by going to the website <http://www.SAM.gov>. The process can usually be completed from 24 to 48 hours after submission. Contractors will need to obtain a Unique Entity Identifier (formerly DUNS number) for processing their registration. If you do not already have a Unique Entity Identifier, one can be obtained from <http://www.SAM.gov>. Refer to www.SAM.gov for information formerly found in CCR, EPLS, ORCA and FedReg.

If you have contractual questions, please contact Renee Booth at Meranda.R.Booth@usace.army.mil. If an Offeror believes that the requirements in the RFP contain an error, omission, or are otherwise unsound; the offeror shall immediately notify the Contract Specialist in writing with supporting rationale. The Offeror is reminded that the Government reserves the right to award this RFP based on the initial proposals, as received, without discussion.

Sincerely,

JUDD.APRI
 L.CAROL.1
 408885210
 April C. Judd
 Contracting Officer

Digitally signed by
 JUDD.APRI.L.CAROL.1
 L.1408885210
 Date: 2023.02.28
 13:42:56 -05'00'

(Signature)

(Date)

(Printed Name)

(Firm Name)

00 10 00

PRICE BREAKOUT SCHEDULE

OFFEROR'S NAME: _____

CONTRACT LINE ITEM SCHEDULE

Line Item No.	Description	Unit	Amount
<u>BASE PROPOSAL</u>			
0001	All work, materials, and labor required to install electric and communications infrastructure at 1900 Founders Dr, Dayton OH 45420	Job	\$ _____
TOTAL BASE PROPOSAL			\$ _____
<u>OPTIONS</u>			
0002	OPTION 1: All work, material to furnish and install one new subpanel to supplement existing panels	EA	\$ _____
TOTAL OPTIONS			\$ _____
TOTAL PROPOSAL (BASE+OPTION)			\$ _____

NOTES FOR CONTRACT LINE ITEM (CLIN) SCHEDULE

NOTE NO. 1. To better facilitate the receipt and proposal process, all modifications to proposals are to be submitted on copies of the latest Contract Line Item (CLIN) schedules as published in the solicitation or the latest amendment thereto. In lieu of indicating additions/deductions to line items, all Offerors should state their revised prices for each item.

NOTE NO. 2. Offerors must insert a price on all numbered items including options of the CLIN Schedule. Failure to do so may result in the offer being unacceptable.

NOTE NO. 3. The Offeror's Base Bid and all Options will be evaluated on price only. In accordance with FAR 52.217-5, Evaluation of Options, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. Evaluation of options will not obligate the Government to exercise the option(s).

NOTE NO. 4. Option 1 (CLIN 0002) may be exercised up to 10 times under this task order. It may be exercised within forty-five (45) calendar days of Notice to Proceed (NTP). Exercising this option will not extend the period of performance.

-- END OF CLIN SCHEDULE --

OFFEROR'S QUESTIONS AND COMMENTS

Technical inquiries and questions relating to proposal procedures or bonds are to be submitted via Bidder Inquiry in ProjNet at <http://www.ProjNet.org/ProjNet>. As noted below, offerors shall not submit their proposals via ProjNet. Offerors shall submit their proposals in accordance with the provisions stated in the solicitation.

To submit and review bid inquiry items, bidders will need to be a current registered user or self-register into system.

The Solicitation Number is: **W912QR-30409287**

The Bidder Inquiry Key is: **3C4YXG-5U9EJI**

Specific Instructions for ProjNet Bid Inquiry Access:

1. From the ProjNet home page linked above, click on **Quick Add** on the upper right side of the screen.
2. Identify the Agency. This should be marked as **USACE**.
3. Key. Enter the **Bidder Inquiry Key** listed above.
4. Email. Enter the email address you would like to use for communication.
5. Select Continue. A page will then open stating a user account was not found and will ask you to create one using the provided form.
6. Enter your First Name, Last Name, Company, City, State, Phone, Email, Secret Question, Secret Answer, and Time Zone. Make sure to remember your Secret Question and Answer as they will be used from this point on to access the ProjNet system.
7. Select Add User. Once this is completed you are now registered within ProjNet and are currently logged into the system.

Specific Instructions for Future ProjNet Bid Inquiry Access:

1. For future access to ProjNet, you will not be emailed any type of password. You will utilize your Secret Question and Secret Answer to log in.
2. From the ProjNet home page linked above, click on **Quick Add** on the upper right side of the screen.
3. Identify the Agency. This should be marked as **USACE**.
4. Key. Enter the **Bidder Inquiry Key** listed above.
5. Email. Enter the email address you used to register previously in ProjNet.
6. Select Continue. A page will then open asking you to enter the answer to your Secret Question.
7. Enter your Secret Answer and click Login. Once this is completed you are now logged into the system.

From this page you may view all bidder inquiries or add an inquiry.

Bidders will receive an acknowledgement of their question via email, followed by an answer to their question after it has been processed by our technical team.

Offerors are requested to review the specification in its entirety and to review the Bidder Inquiry System for answers to questions prior to submission of a new inquiry.

The call center operates weekdays from 8AM to 5PM U.S. Central Time Zone (Chicago). The telephone number for the Call Center is 800-428-HELP.

Offers will NOT be publicly opened. Information concerning the status of the evaluation and/or award will NOT be available after receipt of proposals.

NOTES:

1. Offerors shall not submit their proposals via ProjNet, but in accordance with the provisions stated in the solicitation. Any questions regarding acceptable means of submitting offers shall be made directly to the Contract Specialist identified in the solicitation.
2. Government responses to technical inquiries and questions relating to proposal procedures or bonds that are submitted to ProjNet in accordance with the procedures above are not binding on the Government unless an amendment is issued on Standard Form 30. In the case of any conflicts, the solicitation governs. Any changes or revisions to the solicitation will be made by formal amendment. Government responses will be limited to: (a) Notice that an amendment will be issued; (b) Reference to an existing requirement contained in the solicitation; or (c) Notice that a response is not necessary.
3. The ability to enter technical inquiries and questions relating to proposal procedures or bonds will be disabled five (5) calendar days prior to the closing date stated in the solicitation. No Government responses will be entered into the ProjNet system within two (2) calendar days prior to the closing date stated in the solicitation.

SECTION 00 70 00**52.211-10 Commencement, Prosecution, and Completion of Work (Apr 1984)**

The Contractor shall be required to

(a) commence work under this contract within 10 calendar days after the date the Contractor receives the Construction Notice to Proceed (NTP). A forty-five (45) calendar day Administrative NTP will be issued after the Bonds are received, followed by a ninety (90) calendar day Construction NTP.

(b) prosecute the work diligently, and

(c) complete the entire work ready for use not later than 135 calendar days from Administrative NTP (45 calendar day period for Administrative NTP and 90 calendar day Construction NTP).

*The time stated for completion shall include final cleanup of the premises.

(End of Clause)

52.211-12 Liquidated Damages -- Construction (Sept 2000)

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount of **\$475.00** for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause.

(End of Clause)

52.211-13 Time Extensions (Sept 2000)

Time extensions for contract changes will depend upon the extent, if any, by which the changes cause delay in the completion of the various elements of construction. The change order granting the time extension may provide that the contract completion date will be extended only for those specific elements related to the changed work and that the remaining contract completion dates for all other portions of the work will not be altered. The change order also may provide an equitable readjustment of liquidated damages under the new completion schedule.

(End of Clause)

52.217-7 -- Option for Increased Quantity -- Separately Priced Line Item.

The Government may require the delivery of the numbered line item, identified in the Schedule as an option item, in the quantity and at the price stated in the Schedule. The Contracting Officer may exercise the option Reference Price Breakout Schedule. Delivery of added items shall continue at the same rate that like items are called for under the contract unless the parties otherwise agree.

(End of Clause)

52.236-1 Performance of Work by the Contractor.

The Contractor shall perform on the site, and with its own organization, work equivalent to at least 20 percent of the total amount of work to be performed under the contract. This percentage may be reduced by a supplemental agreement to this contract if, during performing the work, the Contractor requests a reduction, and the Contracting Officer determines that the reduction would be to the advantage of the Government.

(End of clause)

52.236-4 Physical Data (Apr 1984)

Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of, or conclusion drawn from the data or information by the Contractor.

(a) The indications of physical conditions on the drawings and in the specifications are the result of site investigations by N/A.

(b) Weather conditions: The Contractor shall make his own investigations as to weather conditions at the site. Data may be obtained from various National Weather Service offices located generally at airports of principal cities, the nearest to this project being: Dayton, OH

(c) Transportation facilities: Access ways shall be investigated by the Contractor to satisfy himself as to their existence and allowable use.

(d) Historical data for all areas may be obtained from:

U. S. Department of Commerce
National Climatic Center
Federal Building
Asheville, N. C. 28801

(End of Clause)

52.236-14 Availability and Use of Utility Services.

(a) The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

(b) The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

(End of clause)

52.236-27 Site Visit (Construction) (Feb 1995) – Alternate I (Feb 1995)

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) An organized site visit has been scheduled for –

16 MARCH 2023 at 0900 ET

All attendees are required to meet at 1900 Founders Way, Kettering OH.

Schedule:

0900-0915: Registration for site visit

0915-1100: Site Visit 1900 Founders Way – Movement Support Bldg

No inquiries will be allowed during the site visit. All inquiries must be submitted via the Projnet Bidder Inquiry site. A Bidder Key is provided with the solicitation information.

Please RSVP the following information:

1. Name of Attendee
2. Company
3. Phone Number and Email Address

Please remember to bring a Current State Issued ID in order to attend the site visit.

Send RSVP to edward.g.borden@usace.army.mil. **USACE must receive the RSPV email by 1400 hours ET on 14 March 2023.** No additional attendees will be registered after this date or time. A Confirmation email will be sent out no later than 15 March 2022, to confirm each registration.

(End of provision)

52.246-21 Warranty of Construction (Mar 1994)

(a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier. This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(b) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of --

- (1) The Contractor's failure to conform to contract requirements; or
- (2) Any defect of equipment, material, workmanship, or design furnished.

(c) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or

replacement.

(d) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.

(e) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(f) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall –

(1) Obtain all warranties that would be given in normal commercial practice;

(2) Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and

(3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(g) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(h) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

(i) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

(End of Clause)

52.222-23 Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity for Construction.

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals 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:

Location	Goals for Minority Participation for Each Trade	Goals for Female Participation for Each Trade
Montgomery, OH	11.5%	6.9%

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action

obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. 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, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the-

- (1) Name, address, and telephone number of the subcontractor;
- (2) Employer's identification number of the subcontractor;
- (3) Estimated dollar amount of the subcontract;
- (4) Estimated starting and completion dates of the subcontract; and
- (5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is the state of Ohio, Montgomery County, and city of Dayton.

(End of provision)

252.236-7001 Contract Drawings and Specifications (Aug 2000)

(a) The Government will provide to the Contractor, without charge, one set of contract drawings and specifications, except publications incorporated into the technical provisions by reference, in electronic or paper media as chosen by the Contracting Officer. The Contractor shall—

- (1) Check all drawings furnished immediately upon receipt;
- (2) Compare all drawings and verify the figures before laying out the work;
- (3) Promptly notify the Contracting Officer of any discrepancies;
- (4) Be responsible for any errors that might have been avoided by complying with this paragraph (b); and
- (5) Reproduce and print contract drawings and specifications as needed.

(b) In general—

- (1) Large-scale drawings shall govern small-scale drawings; and
- (2) The Contractor shall follow figures marked on drawings in preference to scale measurements.

(c) Omissions from the drawings or specifications or the misdescription of details of work that are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work. The Contractor shall perform such details as if fully and correctly set forth and described in the drawings and specifications.

(d) The work shall conform to the specifications and the contract drawings identified on the following index of drawings: **G-001**

(End of clause)

"General Decision Number: OH20230093 02/03/2023

Superseded General Decision Number: OH20220093

State: Ohio

Construction Type: Building

County: Montgomery County in Ohio.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

<p>If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:</p>	<p>. Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least \$16.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2023.</p>
<p>If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:</p>	<p>. Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least \$12.15 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2023.</p>

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number Publication Date

0	01/06/2023
1	01/13/2023
2	02/03/2023

ASBE0008-010 03/01/2022

Rates	Fringes
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ASBESTOS WORKER/HEAT & FROST INSULATOR.....	\$ 32.33	20.19
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BROH0022-005 06/01/2021

Rates	Fringes
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BRICKLAYER.....	\$ 28.74	16.49
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BROH0022-011 07/01/2021

Rates	Fringes
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TILE FINISHER.....	\$ 24.98	9.85
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* ELEC0082-004 12/05/2022

Rates	Fringes
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ELECTRICIAN.....	\$ 34.25	21.26
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ELEV0011-002 01/01/2023

Rates	Fringes
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ELEVATOR MECHANIC.....	\$ 52.72	37.335+a+b
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PAID HOLIDAYS:

a. New Year's Day, Memorial Day, Independence Day, Labor Day, Vetern's Day, Thanksgiving Day, the Friday after Thanksgiving, and Christmas Day.

b. Employer contributes 8% of regular hourly rate to vacation pay credit for employee who has worked in business more than 5 years; 6% for less than 5 years' service.

ENGI0018-034 05/01/2018

Rates	Fringes
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POWER EQUIPMENT OPERATOR

Crane.....	\$ 35.89	15.09
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ENGI0066-045 06/01/2017

Rates	Fringes
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POWER EQUIPMENT OPERATOR

Forklift.....	\$ 28.87	19.66
Grader/Blade.....	\$ 32.42	19.66
Mechanic.....	\$ 32.92	19.66

IRON0044-020 06/01/2021

Rates	Fringes
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IRONWORKER, ORNAMENTAL.....	\$ 31.32	21.00
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IRON0290-006 06/01/2022

Rates	Fringes
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IRONWORKER (Reinforcing and Structural).....	\$ 31.59	23.85
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LABO1410-005 05/01/2021

Rates	Fringes
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LABORER

Asbestos Abatement (Removal from Ceilings, Floors, and Walls).....	\$ 29.25	11.80
Mason Tender - Brick.....	\$ 25.10	10.90

PAIN0249-005 06/01/2020

Rates	Fringes
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PAINTER (Brush and Roller).....	\$ 24.17	11.22
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PAIN0387-002 11/01/2021

Rates	Fringes
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GLAZIER.....	\$ 28.18	16.87
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PLUM0050-009 07/04/2022

Rates	Fringes
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PIPEFITTER (Excludes HVAC Pipe Installation).....	\$ 44.60	28.51
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PLUM0162-008 06/01/2022

	Rates	Fringes
PLUMBER (HVAC Pipe Installation Only).....	\$ 36.47	26.80

ROOF0042-001 08/01/2022

	Rates	Fringes
ROOFER.....	\$ 30.90	18.25

SFOH0669-009 04/01/2021

	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers).....	\$ 39.25	25.81

* UAVG-OH-0021 01/01/2019

	Rates	Fringes
OPERATOR: Oiler.....	\$ 27.56	16.37

* UAVG-OH-0025 01/01/2018

	Rates	Fringes
SHEET METAL WORKER, Excludes HVAC Duct and Unit Installation.....	\$ 28.10	23.41

* UAVG-OH-0031 01/01/2018

	Rates	Fringes
BRICKLAYER: TILE SETTER.....	\$ 26.09	12.30

SUOH2012-095 08/29/2014

	Rates	Fringes
CARPENTER.....	\$ 21.59	5.70
CEMENT MASON/CONCRETE FINISHER...	\$ 26.07	12.34
DRYWALL HANGER AND METAL STUD INSTALLER.....	\$ 21.02	4.21
FORM WORKER.....	\$ 22.41	9.01
LABORER: Common or General.....	\$ 20.87	5.92
LABORER: Mason Tender - Cement/Concrete.....	\$ 22.95	8.60

LABORER: Pipelayer.....	\$ 23.98	8.58
OPERATOR:		
Backhoe/Excavator/Trackhoe.....	\$ 33.36	6.13
OPERATOR: Bobcat/Skid		
Steer/Skid Loader.....	\$ 30.26	12.58
OPERATOR: Bulldozer.....	\$ 26.01	4.95
OPERATOR: Loader.....	\$ 29.99	12.80
OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....	\$ 30.28	13.29
OPERATOR: Roller.....	\$ 28.25	12.61
PAINTER: Spray.....	\$ 22.78	12.40
PLUMBER, Excludes HVAC Pipe Installation.....	\$ 26.21	12.51
SHEET METAL WORKER (HVAC Duct and HVAC Unit Installation Only).....	\$ 24.28	10.50
TRUCK DRIVER: Dump (All Types)...	\$ 22.08	11.51

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses

(29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate

that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage

payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION"

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SECTION 00 80 50.00 06

SPECIAL PROVISIONS
01/20

PART 1 GENERAL

This section is a supplement to section 00 80 00.00 06 in the base contract. This document will provide additional information or revise base contract requirements for this task order only.

Attachments to this specification are as follows:

Project Submittal Register

1.1 SUBMITTALS

Government approval/acceptance is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with LRL Section 01 33 00.00 06
SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Labor, Equipment And Material Reports; G
Daily Equipment Report; G

SD-05 Design Data

Equipment-In-Place List
Maintenance And Parts Data
Progress Photographs

SD-11 Closeout Submittals

Preliminary (Working) As-Built Drawings; G
Final As-Built Drawings; G

1.2 COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK

Refer to "LIQUIDATED DAMAGES" in Section 0750 for the amount of Liquidated Damages for the project.

(a) The time stated in Section 00 70 50 for commencement, prosecution, and completion of work shall include installation of Government-furnished furniture as well as as-built drawings, O&M manuals, operational tests/reports/training/instructions, equipment lists.

Refer to FAR 52.211-10 "Commencement, Prosecution, and Completion of Work" in Section 0750 for a notification of significant contract dates.

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1.2.1 Additional Requirements/Clarifications of Work Included Within the Contract

- a. The time stated in FAR 52.211-10 "Commencement, Prosecution, Completion of Work" in Section 0750 for completion shall include as-built drawings; O&M manuals; operational tests, reports, training, instructions; equipment lists.
- b. Not used

1.2.2 Not used

1.3 NOT USED

1.4 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

This provision specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the FAR 52.249-10 "Default (Fixed-Price Construction)". Guidance can also be found in [ER 415-1-15](#), "Construction Time Extensions for Weather". In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

- a. The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.
- b. Indicate the location of the National Weather Service office closest to the site. See: <https://www.weather.gov/srh/nws/offices> The Contractor shall make his own investigations and determinations as to weather conditions at the site. Data may be obtained from various National Weather Service offices located generally at airports of principal cities, the nearest to this project being DAYTON INTERNATIONAL AIRPORT.
- c. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY WORKDAYS
BASED ON (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
11	8	6	5	6	6	4	3	4	4	5	8

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Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor will record on the daily CQ report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled workday. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated listed above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather workdays, and issue a modification in accordance with the FAR 52.249-10 "Default (Fixed-Price Construction)".

1.5 WAGE RATES

The decision of the Secretary of Labor, covering rates of wages, including fringe benefits to be paid laborers and mechanics performing work under this contract, is attached to this solicitation. The payment for all classes of laborers and mechanics actually employed to perform work under the contract will be specified in the following contract provisions: FAR 52.222-4 "Contract Work Hours and Safety Standards -- Overtime Compensation"; FAR 52.222-6 "Construction Wage Rate Requirements"; and, FAR 52.222-10 "Compliance with Copeland Act Requirements".

Wage decision included is **OH20230093 02/03/2023** (Building)

The building decision applies to construction of TASK ORDER M1.

The work to be performed is located in the State of OHIO, MONTGOMERY COUNTY.

1.6 GOVERNMENT FIELD OFFICE FACILITIES AND SERVICES

No Government Field Office will be required. Section 01 50 00 Paragraph 3.6 does not apply to this task order.

1.7 NOT USED

1.8 NOT USED

1.9 AS-BUILT DOCUMENTS FOR DESIGN BID BUILD PROJECTS

1.9.1 General

This section covers the completion of **final as-built drawings**, as a requirement of the contract. The Contractor is responsible for maintaining paper copy working as-built drawings during the construction phase. These paper copy drawings will be used by the Contractor to prepare, maintain, and submit the final as-built drawings.

1.9.1.1 As-Built Drawings

An as-built drawing is a contract construction drawing revised to reflect

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the final as-built conditions of the project because of modifications, changes, corrections to the project design required during construction, submittals, and extensions of design. The terms "drawings," "contract drawings," "drawing files," "working as-built drawings" and "final as-built drawings" refer to contract drawings that are revised to be used for the "RECORD DRAWING AS-BUILTS".

1.9.1.2 Government-Furnished Files

a. The Contractor will be provided electronic files at the beginning of construction for use during the construction phase which are to be maintained during construction for the preparation of as-builts. The Contractor shall be responsible to print two full size paper copies. The Contractor shall enter changes and corrections on two sets of paper full size construction plans on a weekly basis in accordance with Paragraph "Maintenance of Working As-Built Drawings" in this section.

b. The Contractor shall submit completed working paper as-built drawings to the Contracting Officer's Representative based on the paper copy markups maintained by the Contractor during construction.

1.9.2 Withholding

Maintenance of working as-builts is considered part of the value of the facilities being constructed and will not be paid for as a separate line item. All costs in conjunction with periodic as-built maintenance and final preparation shall be considered a subsidiary obligation of the Contractor.

1.9.2.1 Failure to Maintain

If the Contractor fails to maintain the working as-built drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount up to 10% or which, in the Contracting Officer's judgment, represents the estimated cost of bringing the as-built documents up to date. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of working as-built documents. This includes conversion of submittals and other miscellaneous documents.

1.9.2.2 As-Builts Prepared by Contractor

The Contractor is required to prepare and provide final as-built drawings. The Contractor shall include an activity in the cost-loaded schedule for the final As-Built drawing submittal in the amount defined in the following paragraph. See LRL Section 01 32 01.00 06, PROJECT SCHEDULE, para "Basis for Payment and Cost Loading". This amount shall be withheld and not paid until the final As-Built drawing submittal has been accepted by the Government.

Withholding for the final as-built drawing submittal shall be in the amount of: 1% for contract awards less than \$5,000,000; \$50,000 for contracts awarded from \$5,000,000 to \$10,000,000; or \$100,000 for contracts awarded greater than \$10,000,000. Withholding shall be withheld

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until the final as-built drawing submittal has been approved and accepted by the Government.

1.9.3 Maintenance of Working As-Built Drawings

The Contractor shall revise two (2) sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. These as-built marked drawings shall be kept current on a weekly basis and available on the jobsite at all times. Changes in the work from the contract or additional information which is uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. Changes must be reflected on all sheets that the change affects. The working as-built marked drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor before submission of each monthly pay estimate. The working as-built drawings shall show the following information if applicable to the project, but not be limited thereto:

- a. The actual location, kinds, and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Valves, splice boxes and similar appurtenances shall be located by dimensioning along the utility run from a reference point. The average depth below the surface of each run shall also be recorded.
- b. The location and dimensions of any changes within the building structure.
- c. The correct alignments, grade elevations, typical cross section, earthwork, structures, or utilities if any changes were made from contract plans.
- d. Additional as-built information that exceeds the detail shown on the Contract Drawings. These as-built conditions include those that reflect structural details, fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations and layouts, equipment, sizes, mechanical and electrical room layouts and other extensions of design, that were not shown in the original contract documents because the exact details were not known until after the time of approved shop drawings. It is recognized that the shop drawing submittals (revised showing as-built conditions) will serve as the as-built record without actual incorporation into the contract drawings. The final as-built construction drawing shall reference the shop drawing file that includes the as-built information. In turn, the shop drawing shall reference the applicable construction as-built drawing. All such shop drawing submittals must include the paper copy and PDF of the drawings.
- e. The invert elevations and grades of any drainage structures or ditches installed or affected as part of the project construction.

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- f. Changes or modifications which result from the final inspection.
 - g. **Contour map** of the final borrow pit or spoil area with spot elevations as necessary if: borrow material is from sources on Government property; Government property is used as a spoil area; or, if excavated soil materials are placed in approved locations other than a landfill.
 - h. Where contract drawings present options, only the option selected for construction shall be shown on the final as-built drawings.
 - i. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarms, fire sprinklers, fire protection, fire detection and irrigation systems and other related systems in this project, shall be incorporated into the as-built drawings to include detailed information for all aspects of the systems including wiring, piping, and equipment drawings.
 - j. Room numbers shown on the contract drawings are selected for design convenience and may not represent the actual numbers intended for use by the end user. Final as-built drawings shall reflect actual room numbers adopted by the end user.
 - k. Contract modification (change order price) shall include the Contractor's cost to change working and final as-built drawings to reflect modifications and compliance with the following procedures (See "Markings and Indicators"):
 - (1) Directions in the modification for posting descriptive changes shall be followed.
 - (2) A Revision Triangle shall be placed at the location of each deletion.
 - (3) For new details or sections which are added to a drawing, a Revision Triangle shall be placed by the detail or section title.
 - (4) For minor changes, a Revision Triangle shall be placed by the area changed on the drawing (each location).
 - (5) For major changes to a drawing, a Revision Triangle shall be placed by the title of the affected plan, section, or detail at each location.
 - (6) For changes to schedules or drawings, a Revision Triangle shall be placed either by the schedule heading or by the change in the schedule.
- 1.9.4 **Preliminary (Working) As-Built Drawings** Submittal

Two (2) weeks before Contract Completion Date, the Contractor shall submit one (1) set of the original paper working as-built drawings to the Contracting Officer for review and approval. These working as-built marked drawings shall be neat, legible, and accurate. The review by Government personnel will be expedited to the maximum extent possible. If upon

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review, the working as-built drawings are found to contain errors and/or omissions, they will be returned to the Contractor for corrections. The Contractor shall complete the corrections and return the working as-built marked drawings to the Contracting Officer within 14 calendar days. Upon approval, the working as-built drawings will be returned to the Contractor for use in preparation of final as-built drawings.

1.9.5 Preparation of Final As-Built Drawings

The contract drawings shall be modified as may be necessary to correctly show the features of the project as it has been constructed by bringing the contract drawings into agreement with approved working as-built drawings, adding such additional drawings as may be necessary.

These final as-built drawings are part of the permanent records of the project and the Contractor shall be responsible for the protection and safety thereof until returned to the Contracting Officer. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at no expense to the Government.

In the event the Contractor accomplishes additional work which changes the as-built conditions of the facility, after submission and approval of the working as-built drawings, the Contractor shall be responsible for the addition of these changes to the working as-built drawings and to the final as-built documents.

1.9.6 Markings and Indicators

Changes shall be annotated in accordance with [ERDC/ITL TR-12-1](#) "A/E/C Graphics Standard_Release 2.0" at the following locations:

- a. Bottom of the revised detail.
- b. Right hand and bottom border aligned with the revised detail.
- c. The revision block of the title block.

Separate markings shall be made for each modification negotiated into the contract.

1.9.7 Preparation of Other As-Built Documents

All other non-electronic documents which may include, for example, design analysis, catalog cuts, or certification documents that are not available in native electronic format shall be scanned and provided in an organized manner in Adobe PDF format.

1.9.8 Submittal of Final As-Built Documents

Within 14 calendar days of Final Acceptance meeting of the project, Final As-Built documents shall be provided to the Contracting Officer in hard copy, paper format.

1.9.9 Not used

1.9.10 Not used

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1.10 NOT USED

1.11 NOT USED

1.12 NOT USED

1.13 KEY PERSONNEL, SUBCONTRACTORS AND OUTSIDE ASSOCIATES OR CONSULTANTS

In connection with the services covered by this contract, any in-house personnel, subcontractors, and outside associates or consultants will be limited to individuals or firms that were specifically identified and agreed to during negotiations. The Contractor shall obtain the Contracting Officer's written consent before making any substitution for these designated in-house personnel, subcontractors, associates, or consultants.

1.14 NOT USED

1.15 NOT USED

1.16 NOT USED

1.17 NOT USED

1.18 NOT USED

1.19 NOT USED

1.20 NOT USED

1.21 NOT USED

1.22 NO ASBESTOS-CONTAINING MATERIAL (ACM) CERTIFICATION

1.22.1 Construction Phase

Before final payment to the contractor, the contractor's project engineer/manager will sign and submit to the government, on the contracting firm's letterhead, a dated copy of the following statement:

I hereby certify that to the best of my knowledge no asbestos-containing material (ACM) was used as a building material during this project.

I understand that the building owner presumes that all materials marked "May Contain mineral fibers" are considered asbestos unless I either:

(1) Have on file and have submitted to the Government the manufacturer's certification that the material does not contain asbestos, or

(2) Have supplied to the Government documentation to show that the material has been microscopically examined by an AIHA- or NVLAP-certified laboratory and the lab has determine that it that it does not contain asbestos."

1.23 NOT USED

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1.24 NOT USED

1.25 AVAILABILITY OF UTILITIES

1.25.1 Availability and Use of Utility Services

See "Government Furnished Utilities" in Section 00 70 50 for availability of utilities.

1.25.2 Additional Requirements

1.25.2.1 Power

Electric Power for Small Tools not exceeding 20 amperes and 115 volts will be furnished from existing outlets, as specified in the contract, at no cost to the Contractor, subject to proper use, and that total estimated consumption will not exceed 1,000 kilowatt-hours per month. The Contractor's Small Tool Usage Plan shall be submitted for determination of estimated consumption. In the event the estimate exceeds the above allowance, the requirements for other utilities will apply.

1.25.2.2 Water

Drinking Water may be obtained from approved outlets, and at no cost to the Contractor, subject to proper use.

1.25.2.3 Sanitation

Existing Washing Facilities in the building may be used by Contractor employees during normal working hours, provided the Contractor furnishes daily cleaning service.

1.26 NOT USED

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

PART 4 EXEMPTIONS AND CLARIFICATIONS

4.1 NOT USED

4.2 CONTRACTOR MANPOWER DATA REPORTING (CMRA)

The contractor shall report ALL contractor labor hours (including subcontractor labor hours) required for performance of services provided under this contract for the Army - USACE via a secure data collection site. The contractor is required to completely fill in all required data fields using the following web address: <http://www.ecmra.mil/>

Reporting inputs will be for the labor executed during the period of performance during each Government fiscal year (FY), which runs October 1 through September 30. While inputs may be reported any time during the FY, all data shall be reported no later than October 31 of each calendar year, beginning with 2015. Contractors may direct questions to the help desk at

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help desk at: <http://www.ecmra.mil/>

4.3 Veterans Employment Emphasis for U.S. Army Corps of Engineers

In addition to complying with the requirements outlined in Sections 00 70 00 and 00 70 50 and Department of Labor regulations, U.S. Army Corps of Engineers (USACE) contractors and subcontractors at all tiers are encouraged to promote the training and employment of U.S. veterans while performing under a USACE contract. While no set-aside, evaluation preference, or incentive applies to the solicitation or performance under the resultant contract, USACE contractors are encouraged to seek out highly qualified veterans to perform services under this contract. The following resources are available to assist USACE contractors in their outreach efforts:

U.S. Department of Labor Veterans employment and Training Services (VETS):
dol.gov/agencies/vets

Federal veteran employment information: www.fedshirevets.gov/index.aspx
Veterans' Employment and Training Service (VETS): <http://www.dol.gov/vets/>
Veterans Opportunity to Work (VOW) Program: <http://benefits.va.gov/vow/>
U.S. Army Warrior Transition Command Employment Index:
wtc.army.mil/modules/employers/index.html

Hiring Our Heroes initiative: www.uschamberfoundation.org/hiring-our-heroes

-- End of Section --

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SECTION
01 11 50.00 06

Task Order SCOPE OF WORK

05/18

1. PROJECT INFORMATION

1.1. DESIGN-BID-BUILD. The Contractor shall provide all labor, equipment, and materials required for the INSTALLATION OF ELECTRICAL AND COMMUNICATIONS.

1.2. Unless specifically noted otherwise in this Specification Section or in the base MATOC contract Volume 1 of 2 itself, all requirements of the base MATOC contract Volume 1 of 2 shall apply to this Task Order.

1.3. All demolition required to construct the project is included as part of the work of this Contract.

1.4. SITE LOCATION: 1900 Founders Drive, Dayton OH 45420. Though this project is not located on a military installation, all Federal and WPAFB building codes and requirements will apply.

1.5. Remodeling of the building is ongoing, so minor changes may be needed to this task order to accommodate the design.

2. SCOPE OF WORK. In addition to the narrative in this section, drawings are included in APPENDIX A.

2.1. GENERAL

2.1.1. The work described in this SOW is anticipated to take place after the installation of the systems furniture. The Contractor shall "open" or disassemble the furniture to install and make wire/cable connections, then reassemble the furniture back to its completed state.

2.1.2. The Contractor shall perform final connection testing for Electric and Comms at each workstation, private office, conference rooms, and copier/printer. The Contractor will complete the furniture reassembly described in para 2.2.1 above prior to testing.

2.1.3. Not used.

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2.2. TELECOMMUNICATIONS

2.2.1. Install racks and single/multimode backbone fiber to each Telecommunications Room (TR) and category 6 copper and multimode fiber network drops to workstations, offices, printer locations and conference rooms at the Off Base Lease (OBL) site.

2.2.2. Transport nine (9) racks, eighteen (18) vertical wire management channels, and one (1) half-height cabinet (Government Furnished Equipment [GFE]) from 5237 Cooper St, Building 30258, Door 3, Wright Patterson AFB, 88th CS warehouse and deliver, assemble, and install at the OBL site. A signature will be required to transfer the GFE from the warehouse to the contractor.

2.2.3. Implement the following design in conformance with the latest editions of TIA-568, TIA-569, TIA-606, TIA 607, UFC 3-580-01, American National Standards Institute/Telecommunications Industry Association/Electronics Industries Alliance (ANSI/TIA/EIA), National Fire Protection Association (NFPA), National Electric Code (NEC) codes and standards and the AF Installation Facilities Standards (IFS). The contract shall follow any exceptions/guidance in the WPAFB Installation Facility Standard (IFS) and any ETLs and AFIs.

2.2.4. Install a ground bar in each Telecommunications Room (TR), and properly ground the rack and cable tray system in accordance with TIA-607 standards. All ground connections to the Telecommunications Grounding Bar (TGB) will use non-reversible compression type two-hole lugs.

2.2.5. Install wire basket cable tray around the perimeter of each TR as shown in TR drawing (Appendix A, Drawing 3).

2.2.6. Assemble a 7-foot rack and two (2) vertical wire management channels, and install one rack assembly in each TR. The Contractor shall coordinate the exact placement with the USACE COR. See Appendix A, Drawings 4-7.

2.2.7. Install a half-height cabinet in server room of SIPRNet Café/WIMIS area, as shown. The Contractor shall coordinate the exact placement with the USACE COR. See Appendix A, Drawing 10.

2.2.8. Install four fiber optic distribution panels (FODP) in the cabinet in TR 158 (TR1 RM 158) as shown on Appendix A, Drawing 8.

2.2.9. Install a 4-panel FODP in each of the TRs as shown on rack layout drawing. Appendix A, Drawing 9.

2.2.10. Install a 6-panel FODP in the half height cabinet (SC) in server room. See Appendix A, Drawing 10.

2.2.11. Install a wall mounted FODP in front lobby entrance, location FD1 on 2nd floor drawing. Appendix A, Drawing 6.

2.2.12. Within 20 days of starting fiber backbone installation, submit the proposed fiber path to each TR to the Government for review and approval.

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- 2.2.13. Install 12 strands of OS1 single mode and 12 strands of OM4 50-micron multimode backbone cable between the main Communications Entrance Room (CER) - TR 158 (TR1, Room 158) to each of the other TRs, including the half-height cabinet SC in TR 176 (TR1.4 RM 176) in WSMIS server room. Label both ends as "HF-158-TRroom#-SM" and "HF-158-TRroom#-MM."
- 2.2.14. Install 12 strands of OM4 from TR 160 (TR1.3) to FD1.
- 2.2.15. Fiber should be labeled at both ends as "HF-TRfrom - TRto SM" or "HF-TRfrom - TRto MM ex HF-TR158 - TR160 SM" or "HF-TR160 - TR253MM."
- 2.2.16. Terminate all fiber with LC connectors.
- 2.2.17. Install 48 port patch panels in each rack as needed. See Appendix A, Drawing 9.
- 2.2.18. Label each patch panel as A, B, C, etc., from top to bottom as indicated. Appendix A, Drawing 9.
- 2.2.19. Install horizontal wire management under each patch panel. Appendix A, Drawing 9.
- 2.2.20. Install a copper network drop inside each TR next to the door for a wall mounted VOIP phone.
- 2.2.21. Excluding the WSMIS SIPRNet Café, install a single network copper category 6 drop at each workstation location from the closest TR. Appendix A, Drawings 4-7.
- 2.2.22. Excluding the WSMIS SIPRNet Café, install two (2) network copper category 6 drops at each printer location, PO and Boss Box office from the closest TR. Appendix A, Drawings 4-7.
- 2.2.23. Excluding the WSMIS SIPRNet Café, install three (3) copper category 6 network drops in each EO office from the closest TR. Drops locations will be indicated by the customer before work begins with a note on walls. Appendix A, Drawings 4-7.
- 2.2.24. Excluding the WSMIS SIPRNet Café, install four (4) network copper category 6 drops, in each conference room. Drops locations will be indicated by the customer before work begins with a note on walls. Appendix A, Drawings 4-7.
- 2.2.25. Install additional network copper category 6 drops in locations indicated on drawing. Appendix A, Drawings 4-7, 11
- 2.2.26. Label each NIPRNet copper drop location as "TRroom#-Rack#-patch panel port#" (ex. TR160-A1-A1 through TR160-A1-A48, TR160-A1-B1, etc.)
- 2.2.27. Install snake cable tray around walls of Café RM 175 and 176 as shown. Appendix A, Drawing 11.

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2.2.28. Install NIPRnet copper network drops from TR160 (TR1.3) to Rooms 175 and 176 in locations indicated. Drop in Server/printer Room 176 should be for a wall mounted VOIP phone. NIPRNet drops can be above ceiling. Appendix A. Drawing 11.

2.2.29. Install a below-ceiling, through-wall conduit for fiber drops as shown. Appendix A, Drawing 11.

2.2.30. Install fiber drops from half height cabinet SC Room 176 to designated locations in Room 175. Install above furniture using Panduit from cable tray to wall mounted junction box. Terminate all fiber drops in red LC connectors.

2.2.31. Label each fiber drop as "TR176-A1-C1 - C12" and "TR176-A1-D1-D12."

2.2.32. The Contractor shall submit the proposed network drop path(s) to the USACE COR for approval. The use of J-hooks is acceptable.

2.2.33. At end of the project, contractor shall provide electronic AutoCAD files and three (3) paper copies annotating the location of each fiber run showing path to each TR from TR1 Room 158 to the Government.

2.2.34. Supply (23) 3-meter, (26) 2-meter and (23) 1-meter OM4 50-micron LC-LC duplex fiber jumpers.

2.2.35. Supply (26) 2-meter OS1 single mode LC-LC duplex fiber jumpers.

2.2.36. For each workstation and private office, the contractor shall provide a 5-foot-long CAT 6 cable to allow for user to set up their IT equipment.

2.3. ELECTRIC

2.3.1. Install electrical conduit, cabling, junction boxes and related components to provide power to workstations, offices, conference rooms and printer locations at the OBL.

2.3.2. Implement the following design in conformance with the latest editions of the NEC, National Fire Protection (NFPA) 70, National Life Safety Code (NFPA 101), Unified Facilities Criteria (UFC) and Wright-Patterson Installation Facility Standards (IFS).

2.3.3. Contractor shall provide a Certified Electrician to perform electrical work such as connect, disconnect, add, demolish, or modify electrical systems. An Outage Coordination Plan is required at least 17 calendar days before an outage is required.

2.3.4. Contractor shall perform circuit load testing to identify spare capacity on existing circuits.

2.3.5. Where additional electrical capacity is needed due to panels being at/near capacity, the contractor shall provide and install new sub-panels for required electrical circuits. This option shall cover

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the purchase and installation of one sub-panel, and the option may be exercised up to ten (10) times for this project.

2.3.6. Coordinate electrical requirements for new or renovated work with the mechanical and plumbing contractors. Verify voltage, phase, and accessory requirements, such as future wiring requirements.

2.3.7. All conduit shall be a minimum of ¾-inch. Conduit connections must be made with compression couplings. Conductors for branch circuitry are #12 AWG minimum.

2.3.8. Conduit shall be concealed in walls or above ceilings wherever possible.

2.3.9. Coordinate locations of lighting fixtures in offices, and mechanical/electrical/telecommunications rooms with equipment, furniture, and other components.

2.3.10. No more than three (3) phase conductors shall be installed in any one circuit.

2.3.11. No more than eight (8) duplex receptacles shall be installed in any single-phase circuit.

2.3.12. A single circuit must not serve more than four (4) workstations under any circumstance.

2.3.13. For TRs, install a 208V (208~240V), 30 amp dedicated electrical L6-30 locking receptacle in the wall within three (3) feet of the rack and a 120V 20 amp dedicated electrical duplex receptacle in the wall within three (3) feet of the cabinet.

2.3.14. Add one 200-amp, 42 pole breaker electrical panel for each Electrical Room (3 rooms per floor). One ER on the 3rd floor may not have adequate space and that panel will need to be added to the adjacent Comm Room.

2.3.15. Each branch circuit shall contain their own neutral conductor. There shall be no shared neutrals.

2.3.16. Routing of circuitry installed in casework, cabinets, etc. shall be coordinated for proper concealment and function of casework, cabinet, furniture power poles, etc.

2.3.17. Contractor shall validate the actual site conditions as well as any specific programming needs of the customer/user. Any deviation that results in the possible increase in the awarded contract amount must be documented in writing or electronically, submitted to the Contracting Officer, and approved before any work is initiated on that change.

2.3.18. Final electrical drawings and a Bill of Materials will be provided at the end of the project.

2.4. ATTACHMENTS. The information provided in the attachments contain the necessary information for the contractor to construct this project. The

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following attachments are included and shall be used and strictly adhered-to in completing the construction of the project.

APPENDIX A: Design Drawings

2.5. PERMITS. The Contractor shall investigate and submit any permits necessary for the construction of this project. All permit applications shall be completed by the Contractor and provided to the Contracting Officer for submittal to the appropriate agency. Contractor shall pay all permit fees. Copies of all permits shall be provided to the USACE field office representative.

2.6. ENVIRONMENTAL REQUIREMENTS

2.6.1. Environmental Compliance. The contractor shall comply with the National Environmental Protection Act and all other Air Force Environmental regulations.

2.6.2. Dust Control. Contractor shall maintain all work areas free from excess dust to such reasonable degree as to avoid causing a hazard to base personnel or surrounding facilities. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs.

2.6.3. Asbestos. No asbestos containing material shall be used.

2.6.4. Safety Data Sheets. A SDS is required for all building materials except for wood, glass, or steel. The SDS will be submitted to the Contracting Officer within seven (7) calendar days after the NOTICE TO PROCEED.

2.6.5. Hazardous Materials Management. Contractor will provide the Contracting Officer the Safety Data Sheets (SDS) for chemical materials to be used during the project prior to the contract award in accordance with FAR Clause 52.223-3. The Contractor will provide SDSs to the Contracting Officer for review prior to the contractor bringing products on the installation. The contractor must inventory all chemical materials, including but not limited to solvents, paints, degreasers, greases, Ozone Depleting Substances, and oils brought on base. A chemical material inventory must be maintained when used containing the nomenclature, manufacturer, part number, quantity, storage location, and the process in which the material is used. All chemical materials will be managed in accordance with federal, state, local, and Installation regulations.

2.6.6. Paint. All paints must meet Green Seal Certification and be low VOC. See the table below for additional guidance. Paint containing lead will not be used during any painting process. An SDS will be submitted for all paint products used.

For this kind of product:	VOCs (in g/L) shall not exceed:
Flat Topcoat	50
Non-Flat Topcoat	100

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Primer or Undercoat	100
Floor Paint	100
Anti-Corrosive Coating	250
Reflective Wall Coating	50
Reflective Roof Coating	100

2.7. PERSONNEL REQUIREMENTS AND QUALIFICATIONS

2.7.1. PROJECT MANAGER. In addition to the superintendent, CQC staff and safety staff required by this section and Section 01 45 04.10 06 and 01 35 26.00 06, the contractor shall provide a full time Construction Project Manager for the entire life of this contract including both the design and construction phases. The Construction Project Manager shall have a degree in Construction Management or Engineering and shall have 5 years of relative experience in construction management.

2.7.2. SITE SAFETY AND HEALTH OFFICER (SSHO). The SSHO shall be assigned as SSHO but may have duties as the CQC System Manager and the Superintendent. The SSHO and alternate(s) shall have the following training and experience and provide evidence of such.

- 30-Hour OSHA Construction Industry safety class with
- First Aid and CPR Training/AED (must be current)
- Five (5) years of Construction Industry safety experience on similar projects in supervising or managing general construction (managing safety programs or processes or conducting hazard analyses and developing controls).
- Sixteen (16) hours of EM 385-1-1 training in the past 3 years.
- Experience which demonstrates training in personal protective equipment and clothing to include selection, use and maintenance; hazard communication; fall protection; and health hazard recognition.

2.7.2.1. The Contractor shall identify the SSHO and alternate(s) for this project and shall submit qualifications to the Government in resume form for acceptance. A copy of the letter to the SSHO and alternate(s) signed by an authorized official of the firm describing responsibilities and delegating authority to stop work when safety or occupational health of workers is compromised must be provided to the Government.

2.7.2.2. The Accident Prevention Plan shall be prepared IAW EM385-1-1, abbreviated APP version located on page A-10 in Appendix A of the EM 385-1-1.

2.7.3. CQC SYSTEM MANAGER

2.7.3.1. The Contractor shall identify as CQC System Manager to be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be either a graduate engineer, graduate architect, or a

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graduate of construction management; AND shall have a minimum of 5 years construction experience on similar construction projects or a minimum of 10 years in related quality management work.

2.7.3.2. The appropriate CQC personnel shall be present at the construction site as needed during work related to their areas of responsibility. In addition to the requirements of Section 01 45 04.10 06, Volume 1, CQC personnel resumes and site visit frequency shall be identified in the Quality Control Plan (QCP) and accepted by the government.

2.7.3.3. This CQC System Manager shall be employed by the Prime Contractor and be on the site during all construction activity. Alternate(s) for the CQC System Manager shall be identified in the CQC Plan to serve in the event of the CQC System Manager's absence. The requirements for the alternates shall be the same as for the designated CQC System Manager.

2.7.3.4. The CQC System Manager shall be assigned as CQC System Manager, and may have duties as superintendent, SSHO, and can perform other quality control duties if qualified.

3. GENERAL CONSTRUCTION REQUIREMENTS

3.1. GENERAL INFORMATION.

3.1.1. The Contractor shall have shared use of all spaces for execution of the construction work as defined in the requirements of this RFP.

3.1.2. The Contractor shall contact the COR a minimum of 72 hours before starting work on the contract, before restarting work after a lengthy delay, and prior to moving workers and equipment from one site of work to another. Prior to the start of any construction operation, a schedule of work or operations in proper sequence shall be submitted by the contractor for approval by the COR.

3.1.3. The Contractor shall coordinate all Construction scheduling, routing of work, personnel access, material deliveries, and use of premises activities with the COR.

3.1.4. High-ranking officers, foreign dignitaries, or DOD employees may approach you. Only the Contracting Officer can make changes to the contract.

3.1.5. The Contractor shall maintain a project bulletin board IAW 01 50 00, Paragraph 2.1.1.

3.1.6. The Contractor shall provide project and safety signs IAW 01 50 00, Paragraph 2.1.2.

3.2. DOCUMENTATION

3.2.1. Construction Plan

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3.2.1.1. Prior to the start of any onsite construction activities, the Contractor shall submit a detailed construction plan. The plan shall include a detailed schedule of the major construction activities.

3.2.1.2. Once the schedule is approved, the Contractor shall not deviate from the sequence, without prior written approval.

3.3. CONSTRUCTION CONSIDERATIONS

3.3.1. WORK SCHEDULE: The Contractor shall schedule the work between the hours of 7:00 a.m. and 4:30 p.m. Monday through Friday except Federal Holidays. Permission to perform any work outside of these hours must be in writing and submitted five (5) calendar days in advance for approval by the Contracting Officer. The Government may or may not grant such permission at its discretion.

3.3.2. The Contractor employees may use existing toilet and wash facilities if they are functional. If facilities are not functional, the Contractor will be required to provide temporary facilities for its personnel.

3.3.3. Electricity for hand tools will be furnished to the Contractor by the Government from the existing receptacles at no cost to the Contractor, subject to proper use.

3.3.4. Utility Outages.

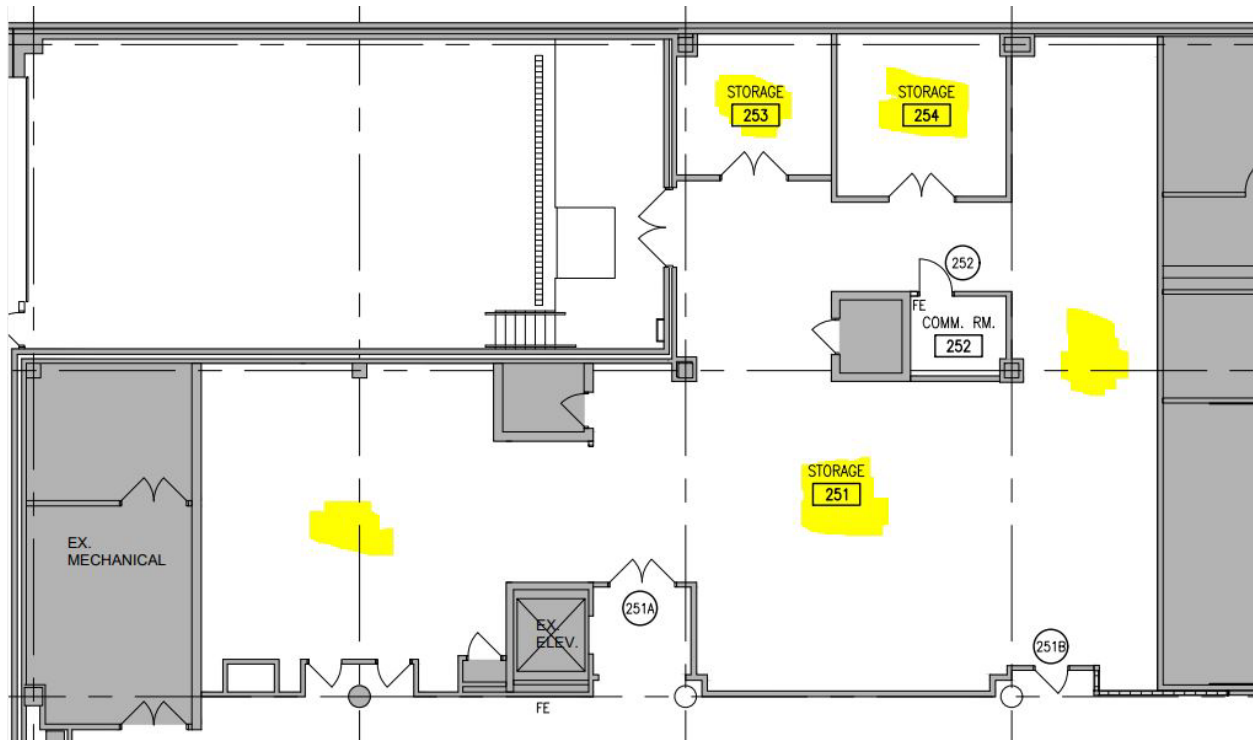
3.3.4.1. The Contractor shall submit requests in writing for utility outages (gas, steam, electricity, and water) no less than seven (7) calendar days prior to proposed outage. Depending on the nature of the outage, it may need to be scheduled for non-work hours.

3.3.5. Contractor Personal Vehicle Parking. The contractor may use a limited number of parking spaces in the existing lots for the contractor's employee parking of personal vehicles.

3.3.6. Contractor shall maintain a neat and orderly workplace with clear paths of emergency egress within the construction area.

3.3.7. Storage of Materials. The Contractor's storage space is on the 2nd floor, southwest corner of the building as highlighted below.

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3.3.7.1. The Contractor shall be responsible for the storage, cleanliness, safekeeping, security, and safety of the storage area and material stored within.

3.3.7.2. The Contractor may request additional space the use of a staging area is desired. The Contracting Officer will provide space if it is feasible to do so; however, such space may not be available.

3.3.8. Security

3.3.8.1. The contractor shall adhere to security requirements. The Contractor shall be responsible for maintaining satisfactory standards of employee competency, conduct, appearance, and integrity. Personnel working on or involved with security alarms, secure areas or security infrastructure shall be US Citizens.

3.3.8.2. Construction operations shall be strictly confined to the designated area of Work.

3.3.8.3. The Contractor shall be responsible for the security of his own equipment.

3.3.9. Protection of Personnel and Government Property

3.3.9.1. Contractor shall comply with all applicable Federal, State, and Local safety codes, regulations, and requirements.

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3.3.9.2. The Contractor shall provide, no later than ten days after receiving Notice of Award, one (1) copies of their written safety program to the Contracting Officer for review. No construction shall commence until the Contractor's Safety Program has been reviewed and accepted by the Contracting Officer.

3.3.9.3. Safety posters, "hard hat area" posters, "authorized personnel only" posters, and any other notifications required by law shall be posted and maintained in sufficient quantity to be conspicuous on the job site.

3.3.9.4. The contractor shall protect all government property in adjacent areas from damages during the construction project, especially furniture and finishes. In the event of damages of any nature caused by this work due to improper protection, precaution, or safety measures, such damages shall be repaired by the Contractor at no cost to the Government. In the event the Contractor does not satisfactorily repair or replace such damage caused by the work of this contract, the Government will make the necessary corrections and the Contractor shall reimburse the Government for inconveniences, labor, and materials, involved.

3.3.10. Waste Disposal

3.3.10.1. The Contractor is required to maintain a clean project site free of accumulating debris. Demolition debris and other construction waste shall be promptly disposed of at the end of each workday in proper waste containers maintained on the project site by the Contractor. Waste Disposal procedures shall comply with the waste disposal plan submitted under the requirements of SECTION 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT, Volume 1.

3.3.10.2. Environmentally hazardous or other construction debris with special disposal requirements shall be stored on the site and disposed of offsite in a proper lawful manner.

3.3.10.3. The Contractor shall coordinate dumpster location with the USACE Project Engineer.

-- End of Section --

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SECTION 26 05 00.00 40

COMMON WORK RESULTS FOR ELECTRICAL
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D709 (2017) Standard Specification for
Laminated Thermosetting Materials

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C2 (2017; Errata 1-2 2017; INT 1 2017)
National Electrical Safety Code

IEEE Stds Dictionary (2009) IEEE Standards Dictionary: Glossary
of Terms & Definitions

INTERNATIONAL CODE COUNCIL (ICC)

ICC/ANSI A117.1 (2009) Accessible and Usable Buildings and
Facilities

INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)

NETA ATS (2017; Errata 2017) Standard for
Acceptance Testing Specifications for
Electrical Power Equipment and Systems

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

ANSI C80.1 (2005) American National Standard for
Electrical Rigid Steel Conduit (ERSC)

ANSI C80.3 (2015) American National Standard for
Electrical Metallic Tubing (EMT)

ANSI/NEMA OS 1 (2013) Sheet-Steel Outlet Boxes, Device
Boxes, Covers, and Box Supports

ANSI/NEMA OS 2 (2013) Nonmetallic Outlet Boxes, Device
Boxes, Covers, and Box Supports

NEMA 250 (2018) Enclosures for Electrical Equipment
(1000 Volts Maximum)

NEMA FB 1 (2014) Standard for Fittings, Cast Metal
Boxes, and Conduit Bodies for Conduit,
Electrical Metallic Tubing, and Cable

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NEMA ICS 1	(2000; R 2015) Standard for Industrial Control and Systems: General Requirements
NEMA ICS 6	(1993; R 2016) Industrial Control and Systems: Enclosures
NEMA RN 1	(2005; R 2013) Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
NEMA TC 2	(2020) Standard for Electrical Polyvinyl Chloride (PVC) Conduit
NEMA TC 3	(2016) Polyvinyl Chloride (PVC) Fittings for Use With Rigid PVC Conduit and Tubing
NEMA WD 1	(1999; R 2015) Standard for General Color Requirements for Wiring Devices
NEMA WD 6	(2016) Wiring Devices Dimensions Specifications

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2020; ERTA 20-1 2020; ERTA 20-2 2020; TIA 20-1; TIA 20-2; TIA 20-3; TIA 20-4) National Electrical Code
NFPA 70E	(2021) Standard for Electrical Safety in the Workplace

UNDERWRITERS LABORATORIES (UL)

UL 1	(2005; Reprint Jan 2020) UL Standard for Safety Flexible Metal Conduit
UL 5	(2016; Reprint Aug 2020) UL Standard for Safety Surface Metal Raceways and Fittings
UL 6	(2007; Reprint Sep 2019) UL Standard for Safety Electrical Rigid Metal Conduit-Steel
UL 83	(2017; Reprint Mar 2020) UL Standard for Safety Thermoplastic-Insulated Wires and Cables
UL 360	(2013; Reprint Oct 2020) UL Standard for Safety Liquid-Tight Flexible Metal Conduit
UL 486A-486B	(2018) UL Standard for Safety Wire Connectors
UL 486C	(2019) UL Standard for Safety Splicing Wire Connectors
UL 498	(2017; Reprint Aug 2020) UL Standard for Safety Attachment Plugs and Receptacles
UL 514A	(2013; Reprint Aug 2017) UL Standard for

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Safety Metallic Outlet Boxes

- UL 514B (2012; Reprint May 2020) Conduit, Tubing and Cable Fittings
- UL 514C (2014; Reprint Feb 2020) UL Standard for Safety Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
- UL 651 (2011; Reprint Mar 2020) UL Standard for Safety Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
- UL 797 (2007; Reprint Mar 2017) UL Standard for Safety Electrical Metallic Tubing -- Steel
- UL 870 (2016; Reprint Mar 2019) UL Standard for Safety Wireways, Auxiliary Gutters, and Associated Fittings
- UL 943 (2016; Reprint Feb 2018) UL Standard for Safety Ground-Fault Circuit-Interrupters
- UL 1242 (2006; Reprint Aug 2020) Standard for Electrical Intermediate Metal Conduit -- Steel

1.2 DEFINITIONS

- a. Unless otherwise specified or indicated, electrical and electronics terms used in these specifications, and on the drawings, are as defined in **IEEE Stds Dictionary**.
- b. The technical sections referred to herein are those specification sections that describe products, installation procedures, and equipment operations and that refer to this section for detailed description of submittal types.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section **01 33 00 SUBMITTAL PROCEDURES**:

SD-03 Product Data

Conduits and Raceways; G

Wire and Cable; G

Circuit Breakers; G

SD-06 Test Reports

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Continuity Test; G

SD-08 Manufacturer's Instructions

Manufacturer's Instructions

1.4 QUALITY CONTROL

1.4.1 Regulatory Requirements

In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Contracting Officer. Ensure equipment, materials, installation, and workmanship are in accordance with the mandatory and advisory provisions of NFPA 70, IEEE C2 unless more stringent requirements are specified or indicated.

1.4.2 Standard Products

Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Provide products which have been in satisfactory commercial or industrial use for 2 years prior to bid opening. Ensure the 2-year period includes applications of equipment and materials under similar circumstances and of similar size. Ensure the product has been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same class of equipment are required, these items must be products of a single manufacturer.

PART 2 PRODUCTS

2.1 EQUIPMENT

Provide the standard cataloged materials and equipment of manufacturers regularly engaged in the manufacture of the products. For material, equipment, and fixture lists submittals, show manufacturer's style or catalog numbers, specification and drawing reference numbers, warranty information, and fabrication site.

Provide factory-applied finish on electrical equipment in accordance with the following:

- a. NEMA 250 corrosion-resistance test and the additional requirements as specified herein.
- b. Interior and exterior steel surfaces of equipment enclosures: thoroughly cleaned followed by a rust-inhibitive phosphatizing or equivalent treatment prior to painting.
- c. Exterior surfaces: free from holes, seams, dents, weld marks, loose scale or other imperfections.
- d. Interior surfaces: receive not less than one coat of corrosion-resisting paint in accordance with the manufacturer's standard practice.

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- e. Exterior surfaces: primed, filled where necessary, and given not less than two coats baked enamel with semigloss finish.
- f. Equipment located indoors: ANSI Light Gray, [and equipment located outdoors: ANSI[Light Gray][Dark Gray]].
- g. Provide manufacturer's coatings for touch-up work and as specified in paragraph FIELD APPLIED PAINTING.

2.1.1.1 Conduits and Raceways

2.1.1.1.1 Rigid Steel Conduit

Provide hot dipped galvanized rigid steel conduit complying with NEMA RN 1, ANSI C80.1, UL 6 and UL 5 as applicable. Except where installed underground, or in corrosive areas, provide polyvinylchloride (PVC), or protect from corrosion by painting with bitumastic coating or wrapping with corrosion inhibiting tape..

Use threaded fittings for rigid steel conduit.

Use solid gaskets. Ensure conduit fittings with blank covers have gaskets, except in clean, dry areas or at the lowest point of a conduit run where drainage is required.

Provide covers with captive screws and are accessible after the work has been completed.

2.1.1.1.2 Electrical Metallic Tubing (EMT)

Ensure EMT is in accordance with UL 797, UL 5, and ANSI C80.3 and is zinc coated steel. Provide zinc-coated couplings and connectors that are raintight, [gland]compression type with insulated throat. Crimp, spring, or setscrew type fittings are not acceptable.

2.1.1.1.3 Flexible Metallic Conduit

Ensure flexible metallic conduit is galvanized steel and complies with UL 1 and UL 360.

Ensure fittings for flexible metallic conduit are specifically designed for such conduit.

Provide liquidtight flexible metallic conduit with a protective jacket of PVC extruded over a flexible interlocked galvanized steel core to protect wiring against moisture, oil, chemicals, and corrosive fumes.

Ensure fittings for liquidtight flexible metallic conduit are specifically designed for such conduit.

2.1.1.1.4 Intermediate Metal Conduit

Ensure intermediate metal conduit is galvanized steel and complies with UL 1242, NEMA RN 1, ANSI C80.1, UL 6 and UL 5 as applicable.

2.1.1.1.5 Rigid Nonmetallic Conduit

Ensure rigid nonmetallic conduit complies with NEMA TC 2, NEMA TC 3, and UL 651 as applicable with a wall thickness not less than Schedule 40.

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2.1.2 Wireways

Ensure wireways and auxiliary gutters are a minimum 4 by 4-inch trade size conforming to UL 870.

UL 870. Material: steel galvanized 16 gauge for heights and depths up to 6 by 6 inches, and 14 gauge for heights and depths up to 12 by 12 inches. Provide in length required for the application with screw cover NEMA 1 enclosure per NEMA ICS 6.

2.1.3 Outlet Boxes, Pull Boxes and Junction Boxes

Ensure outlet boxes for use with conduit systems are in accordance with NEMA FB 1 UL 514A, UL 514B, UL 514C and [ANSI/NEMA OS 1] [ANSI/NEMA OS 2] and are not less than 1-1/2 inches deep. Furnish all pull and junction boxes with screw-fastened covers.

2.2 MATERIALS

2.2.1 Wire And Cable

Provide wires and cables in accordance applicable requirements of NFPA 70 and UL for type of insulation, jacket, and conductor specified or indicated. Do not use wires and cables manufactured more than 12 months prior to date of delivery to site.

Provide minimum conductor size in accordance with the following:

- a. Branch circuits: No. 12 AWG.
- b. Class 1 remote-control and signal circuits: No. 14 AWG.
- c. Class 2 low-energy, remote-control and signal circuits: No. 16 AWG.
- d. Class 3 low-energy, remote-control, alarm and signal circuits: No. 22 AWG.

Ensure connectors used in wire systems comply with UL 486A-486B and UL 486C as applicable.

Ensure conductors installed in plenums are marked plenum rated.

2.2.1.1 Insulation

Unless specified or indicated otherwise or required by NFPA 70, provide power and lighting wires rated for 600-volts, Type THWN/THHN conforming to UL 83, except that grounding wire may be type TW conforming to UL 83; remote-control and signal circuits: Type TW or TF, conforming to UL 83. Where lighting fixtures require 90-degree Centigrade (C) conductors, provide only conductors with 90-degree C insulation or better.

2.2.2 Device Plates

Provide the following:

- a. UL listed, one-piece device plates for outlets to suit the devices installed.

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- b. For metal outlet boxes, plates on unfinished walls: zinc-coated sheet steel or cast metal having round or beveled edges.
- c. For nonmetallic boxes and fittings, other suitable plates may be provided.
- d. Plates on finished walls: nylon or lexan, minimum 0.03 inch wall thickness and same color as receptacle or toggle switch with which they are mounted.
- e. Screws: machine-type with countersunk heads in color to match finish of plate.
- f. Sectional type device plates are not be permitted.

2.2.3 Receptacles

Provide the following:

- a. UL 498, hard use (also designated heavy-duty, grounding-type).
- b. Ratings and configurations: as indicated.
- c. Bodies: match existing devices within space as per NEMA WD 1.
- d. Face and body: thermoplastic supported on a metal mounting strap.
- e. Dimensional requirements: per NEMA WD 6.
- f. Screw-type, side-wired wiring terminals or of the solderless pressure type having suitable conductor-release arrangement.
- g. Grounding pole connected to mounting strap.
- h. The receptacle: containing triple-wipe power contacts and double or triple-wipe ground contacts.

2.2.3.1 Switched Duplex Receptacles

Provide separate terminals for each ungrounded pole. Top receptacle: switched when installed.

2.2.3.2 Ground-Fault Circuit Interrupter Receptacles

UL 943, duplex type for mounting in standard outlet box. Provide device capable of detecting current leak of 6 milliamperes or greater and tripping per requirements of UL 943 for Class A ground-fault circuit interrupter devices. Provide screw-type, side-wired wiring terminals or pre-wired (pigtail) leads.

2.2.3.3 Tamper-Resistant Receptacles

Provide duplex receptacle with mechanical sliding shutters that prevent the insertion of small objects into its contact slots.

2.2.4 Manufacturer's Nameplate

Ensure each item of equipment has a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a

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conspicuous place; the nameplate of the distributing agent is not acceptable.

2.2.5 Firestopping Materials

Provide firestopping around electrical penetrations in accordance with Section 07 84 00, FIRESTOPPING.

PART 3 EXECUTION

3.1 PREPARATION

Submit manufacturer's instructions including special provisions required to install equipment components and system packages. Special provisions include impedances, hazards and safety precautions.

Protect metallic materials against corrosion. Provide equipment enclosures with the standard finish by the manufacturer when used for most indoor installations. Do not use aluminum when in contact with earth or concrete and, where connected to dissimilar metal, protect by using approved fittings and treatment. Except where other equivalent protective treatment is specifically approved in writing, provide hot-dip galvanized ferrous metals for items such as, anchors, bolts, braces, boxes, bodies, clamps, fittings, guards, nuts, pins, rods, shims, thimbles, washers, and miscellaneous items not made of corrosion-resistant steel.

3.2 INSTALLATION

3.2.1 Underground Service

Underground service conductors and associated conduit: continuous from service entrance equipment to outdoor power system connection.

3.2.2 Overhead Service

Overhead service conductors into buildings: terminate at service entrance fittings or weatherhead outside building. Overhead service conductors and support bracket for overhead conductors are included in Section 33 71 01 OVERHEAD TRANSMISSION AND DISTRIBUTION.

3.2.3 Hazardous Locations

Perform work in hazardous locations, as defined by NFPA 70, in strict accordance with NFPA 70 for particular "Class," "Division," and "Group" of hazardous locations involved. Provide conduit and cable seals where required by NFPA 70. Provide conduit with tapered threads.

3.2.4 Service Entrance Identification

Service entrance disconnect devices, switches, and enclosures: labeled and identified as such.

3.2.5 Labels

Wherever work results in service entrance disconnect devices in more than one enclosure, as permitted by NFPA 70, label each enclosure, new and existing, as one of several enclosures containing service entrance disconnect devices. Label, at minimum: indicate number of service disconnect devices housed by enclosure and indicate total number of

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enclosures that contain service disconnect devices. Provide laminated plastic labels conforming to paragraph FIELD FABRICATED NAMEPLATES. Use lettering of at least 0.25 inch in height, and engrave on black-on-white matte finish. Service entrance disconnect devices in more than one enclosure: provided only as permitted by NFPA 70.

3.2.6 Wiring Methods

Provide insulated conductors installed in rigid steel conduit, IMC, rigid nonmetallic conduit, or EMT, except where specifically indicated or specified otherwise or required by NFPA 70 to be installed otherwise. Grounding conductor: separate from electrical system neutral conductor. Provide insulated green equipment grounding conductor for circuit(s) installed in conduit and raceways.[Shared neutral, or multi-wire branch circuits, are not permitted with arc-fault circuit interrupters.] Minimum conduit size: 1/2 inch in diameter for low voltage lighting and power circuits. Vertical distribution in multiple story buildings: made with metal conduit in fire-rated shafts, with metal conduit extending through shafts for minimum distance of 6 inches. Firestop conduit which penetrates fire-rated walls, fire-rated partitions, or fire-rated floors in accordance with Section 07 84 00, FIRESTOPPING.

3.2.6.1 Pull Wire

Install pull wires in empty conduits. Pull wire: plastic having minimum 200-pound force tensile strength. Leave minimum 36 inches of slack at each end of pull wire.

3.2.7 Conduits, Raceways and Fittings

Ensure that conduit runs between outlet and outlet, between fitting and fitting, or between outlet and fitting does not contain more than the equivalent of three 90-degree bends, including those bends located immediately at the outlet or fitting.

Do not install crushed or deformed conduit. Avoid trapped conduit runs where possible. Take care to prevent the lodgment of foreign material in the conduit, boxes, fittings, and equipment during the course of construction. Clear any clogged conduit of obstructions or replace conduit.

Conduit and raceway runs concealed in or behind walls, above ceilings, or exposed on walls and ceilings 5 feet or more above finished floors and not subject to mechanical damage may be electrical metallic tubing (EMT).

Unless indicated otherwise, conceal conduit under floor slabs and within finished walls, ceilings, and floors. Keep conduit minimum 6 inches away from parallel runs of flues and steam or hot water pipes. Install conduit parallel with or at right angles to ceilings, walls, and structural members where located above accessible ceilings and where conduit will be visible after completion of project.

3.2.7.1 Rigid Steel Conduit

Make field-made bends and offsets with approved Hickey bending tool or conduit bending machine. Use long radius conduit for elbows larger than 2-1/2 inches.

Provide a flush coupling for all conduit stubbed-up through concrete floors for connections to free-standing equipment with the exception of

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motor-control centers, cubicles, and other such items of equipment, when the floor slab is of sufficient thickness. Otherwise, provide a floor box set flush with the finished floor. For conduits installed for future use, terminate with a coupling and plug; set flush with the floor.

3.2.7.2 Electrical Metallic Tubing (EMT)

Ground EMT in accordance with **NFPA 70**, using pressure grounding connectors especially designed for EMT.

3.2.7.3 Flexible Metallic Conduit

Use flexible metallic conduit to connect recessed fixtures from outlet boxes in ceilings, transformers, and other approved assemblies.

Use bonding wires in flexible conduit as specified in **NFPA 70**, for all circuits. Flexible conduit is not considered a ground conductor.

Make electrical connections to vibration-isolated equipment with flexible metallic conduit.

Use liquidtight flexible metallic conduit in wet and oily locations and to complete the connection to motor-driven equipment.

Provide flexible steel conduit between **3 and 6 feet** in length for recessed and semirecessed lighting fixtures[; for equipment subject to vibration, noise transmission, or movement; and for motors]. Install flexible conduit to allow 20 percent slack. Minimum flexible steel conduit size: **1/2 inch** diameter. Provide liquidtight flexible[nonmetallic] conduit in wet and damp locations[and in fire pump rooms] for equipment subject to vibration, noise transmission, movement or motors. Provide separate ground conductor across flexible connections.

3.2.7.4 Intermediate Conduit

Make all field-made bends and offsets with approved Hickey bending tool or conduit bending machine. Use intermediate metal conduit only for indoor installations.

3.2.7.5 Rigid Nonmetallic Conduit

Install a green insulated copper grounding conductor in conduit with conductors and solidly connect to ground at each end. Size grounding wires in accordance with **NFPA 70**.

3.2.7.6 Underground Conduit

Plastic-coated rigid steel; plastic-coated steel IMC; PVC, Type EPC-40[; or fiberglass. Convert nonmetallic conduit, other than PVC Schedule 40 or 80, to plastic-coated rigid, or IMC, steel conduit before rising through floor slab.] Plastic coating: extend minimum **6 inches** above floor.

3.2.7.7 Conduit for Circuits Rated Greater Than 600 Volts

Rigid metal conduit or IMC only.

3.2.7.8 Conduit Installed Through Floor Slabs

Where conduits rise through floor slabs, do not allow curved portion of

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bends to be visible above finished slab.

3.2.7.9 Stub Ups

Provide conduits stubbed up through concrete floor for connection to free-standing equipment with adjustable top or coupling threaded inside for plugs, set flush with finished floor. Extend conductors to equipment in rigid steel conduit, except that flexible metal conduit may be used 6 inches above floor. Where no equipment connections are made, install screwdriver-operated threaded flush plugs in conduit end.

3.2.7.10 Conduit Support

Support conduit by pipe straps, wall brackets, threaded rod conduit hangers, or ceiling trapeze. Fasten by wood screws to wood; by toggle bolts on hollow masonry units; by concrete inserts or expansion bolts on concrete or brick; and by machine screws, welded threaded studs, or spring-tension clamps on steel work. Threaded C-clamps may be used on rigid steel conduit only. Do not weld conduits or pipe straps to steel structures. Do not exceed one-fourth proof test load for load applied to fasteners. Provide vibration resistant and shock-resistant fasteners attached to concrete ceiling. Do not cut main reinforcing bars for any holes cut to depth of more than 1 1/2 inches in reinforced concrete beams or to depth of more than 3/4 inch in concrete joints. Fill unused holes. In partitions of light steel construction, use sheet metal screws. In suspended-ceiling construction, run conduit above ceiling. Do not support conduit by ceiling support system. Conduit and box systems: supported independently of both (a) tie wires supporting ceiling grid system, and (b) ceiling grid system into which ceiling panels are placed. Do not share supporting means between electrical raceways and mechanical piping or ducts. Coordinate installation with above-ceiling mechanical systems to assure maximum accessibility to all systems. Spring-steel fasteners may be used for lighting branch circuit conduit supports in suspended ceilings in dry locations. Support exposed risers in wire shafts of multistory buildings by U-clamp hangers at each floor level and at 10 foot maximum intervals. Where conduit crosses building expansion joints, provide suitable watertight expansion fitting that maintains conduit electrical continuity by bonding jumpers or other means. For conduits greater than 2 1/2 inches inside diameter, provide supports to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment weight in the downward direction.

3.2.7.11 Directional Changes in Conduit Runs

Make changes in direction of runs with symmetrical bends or cast-metal fittings. Make field-made bends and offsets with hickey or conduit-bending machine. Do not install crushed or deformed conduits. Avoid trapped conduits. Prevent plaster, dirt, or trash from lodging in conduits, boxes, fittings, and equipment during construction. Free clogged conduits of obstructions.

3.2.7.12 Wireway and Auxiliary Gutter

Bolt together straight sections and fittings to provide a rigid, mechanical connection and electrical continuity. Close dead ends of wireways and auxiliary gutters. Plug all unused conduit openings.

Support wireways for overhead distribution and control circuits at maximum 5-foot intervals.

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3.2.7.13 Surface Raceways and Assemblies

Mount surface raceways plumb and level, with the base and cover secured. Minimum circuit run is three-wire, with one wire designated as ground.

3.2.8 Wiring

Color code feeder and branch circuit conductors as follows:

CONDUCTOR	COLOR AC
Phase A	Black (208VAC); Brown (480VAC)
Phase B	Red (208VAC); Orange (480VAC)
Phase C	Blue (208VAC); Yellow (480VAC)
Neutral	White (208VAC); Natural Gray (480VAC)
Equipment Grounds	Green

Use conductors up to and including [AWG No. 2](#) that are manufactured with colored insulating materials. For conductors larger than [AWG No. 2](#), have ends identified with color plastic tape in outlet, pull, or junction boxes.

Splice in accordance with the [NFPA 70](#). Provide conductor identification within each enclosure where a tap, splice, or termination is made and at the equipment terminal of each conductor. Match terminal and conductor identification as indicated.

Where several feeders pass through a common pullbox, tag the feeders to clearly indicate the electrical characteristics, circuit number, and panel designation.

3.2.9 Wiring Devices

3.2.9.1 Wall Switches and Receptacles

Install wall switches and receptacles so that when device plates are applied, the plates are aligned vertically to within [1/16 inch](#).

Bond ground terminal of each flush-mounted receptacle to the outlet box with an approved green bonding jumper when used with dry wall type construction.

3.2.9.2 Device Plates

Ensure device plates for switches are suitably engraved with a description of the loads when not within sight of the loads controlled.

Mark device plates and receptacle cover plates for receptacles other than 125-volt, single-phase, duplex, convenience outlets. Show the circuit number, voltage, frequency, phasing, and amperage available at the receptacle. Use self-adhesive labels having [1/4 inch](#) embossed letters.

Similarly mark device plates for convenience outlets indicating the supply panel and circuit number.

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3.2.10 Splices and Connectors

Make all splices in **AWG No. 8** and smaller with approved indentor crimp-type connectors and compression tools.

Make all splices in **AWG No. 6** and larger with insulated electrical lugs type . Wrap joints with an insulating tape that has an insulation and temperature rating equivalent to that of the conductor.

3.2.11 Conductor Identification

Provide conductor identification within each enclosure where tap, splice, or termination is made. For conductors No. 6 AWG and smaller diameter, provide color coding by factory-applied, color-impregnated insulation. For conductors No. 4 AWG and larger diameter, provide color coding by plastic-coated, self-sticking markers; colored nylon cable ties and plates; or heat shrink-type sleeves. Identify control circuit terminations in accordance with Section **23 09 00 INSTRUMENTATION AND CONTROL FOR HVAC**. Provide telecommunications system conductor identification as specified in Section **27 10 00 BUILDING TELECOMMUNICATIONS CABLING SYSTEMS**.

3.2.11.1 Marking Strips

Provide marking strips in accordance with the following:

- a. Provide white or other light-colored plastic marking strips, fastened by screws to each terminal block, for wire designations.
- b. Use permanent ink for the wire numbers
- c. Provide reversible marking strips to permit marking both sides, or provide two marking strips with each block.
- d. Size marking strips to accommodate the two sets of wire numbers.
- e. Assign a device designation in accordance with **NEMA ICS 1** to each device to which a connection is made. Mark each device terminal to which a connection is made with a distinct terminal marking corresponding to the wire designation used on the Contractor's schematic and connection diagrams.
- f. The wire (terminal point) designations used on the Contractor's wiring diagrams and printed on terminal block marking strips may be according to the Contractor's standard practice; however, provide additional wire and cable designations for identification of remote (external) circuits for the Government's wire designations.
- g. Prints of the **marking strips** drawings submitted for approval will be so marked and returned to the Contractor for addition of the designations to the terminal strips and tracings, along with any rearrangement of points required.

3.2.12 Safety Switches

Securely fasten switches to the supporting structure or wall, utilizing a minimum of **1/4 inch** bolts. Do not use sheet metal screws and small machine screws for mounting. Do not mount switches in an inaccessible location or where the passageway to the switch may become obstructed. Mounting height

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5 feet above floor level, when possible.

3.2.13 Boxes and Fittings

Provide pullboxes where necessary in the conduit system to facilitate conductor installation. For conduit runs longer than 100 feet or with more than three right-angle bends, install a pullbox at a convenient intermediate location.

Securely mount boxes and enclosures to the building structure using supports that are independent of the conduit entering or leaving the boxes.

Select the mounting height of wall-mounted outlet and switch boxes, as measured between the bottom of the box and the finished floor, in accordance with ICC/ANSI A117.1 and as follows, unless otherwise indicated:

LOCATION	MOUNTING HEIGHT (inches)
Receptacles in offices	18
Receptacles in corridors	18
Receptacles in shops and laboratories	48
Receptacles in rest rooms	48
Switches for light control	48

3.2.14 Covers and Device Plates

Install with edges in continuous contact with finished wall surfaces without use of mats or similar devices. Plaster fillings are not permitted. Install plates with alignment tolerance of 1/16 inch. Use of sectional-type device plates are not permitted. Provide gasket for plates installed in wet locations.

3.2.15 Electrical Penetrations

Seal openings around electrical penetrations through fire resistance-rated walls, partitions, floors, or ceilings in accordance with Section 07 84 00 FIRESTOPPING.

3.2.16 Panelboards

Securely mount panelboards so that the top operating handle does not exceed 72-inches above the finished floor. Do not mount equipment within 36-inches of the front of the panel. Ensure directory card information is complete and legible.

3.2.17 Dry-Type Distribution Transformers

Connect dry-type transformers with flexible metallic conduit.

3.2.18 Surge Protective Devices

Connect the surge protective devices in parallel to the power source, keeping the conductors as short and straight as practically possible. Maximum allowed lead length is 3 feet.

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3.2.19 Field Fabricated Nameplates

Ensure nameplates conform to **ASTM D709**. Provide laminated plastic nameplates for each equipment enclosure, relay, switch, and device, as specified or as indicated on the drawings. Each nameplate inscription identifies the function and, when applicable, the position. Provide nameplates that are melamine plastic, **0.125-inch** thick, white with black center core and a matte finish surface with square corners. Accurately align lettering and engrave into the core. Minimum size of nameplates is **1 by 2.5 inches**. Lettering is a minimum of **0.25-inch** high normal block style.

3.2.20 Identification Plates and Warnings

Provide identification plates for lighting and power panelboards, motor control centers, all line voltage heating and ventilating control panels, fire detector and sprinkler alarms, door bells, pilot lights, disconnect switches, manual starting switches, and magnetic starters. Attach identification plates to process control devices and pilot lights.

Install identification plates for all line voltage enclosed circuit breakers, identifying the equipment served, voltage, phase(s) and power source. For circuits 480 volts and above, install conspicuously located warning signs in accordance with OSHA requirements.

3.3 FIELD FABRICATED NAMEPLATE MOUNTING

Provide number, location, and letter designation of nameplates as indicated. Fasten nameplates to the device with a minimum of two sheet-metal screws or two rivets.

3.4 WARNING SIGN MOUNTING

Provide the number of signs required to be readable from each accessible side. Space the signs in accordance with **NFPA 70E**.

3.5 FIELD APPLIED MOUNTING

Paint electrical equipment as required to match finish of adjacent surfaces or to meet the indicated or specified safety criteria.

3.6 FIELD QUALITY CONTROL

After completion of the installation and splicing, and prior to energizing the conductors, perform wire and cable continuity and insulation tests as herein specified before the conductors are energized.

Provide all necessary test equipment, labor, and personnel to perform the tests, as herein specified.

Isolate completely all wire and cable from all extraneous electrical connections at cable terminations and joints. Use substation and switchboard feeder breakers, disconnects in combination motor starters, circuit breakers in panel boards, and other disconnecting devices to isolate the circuits under test.

Perform **insulation-resistance test** on each field-installed conductor with respect to ground and adjacent conductors. Applied potential is 500 volts dc for 300 volt rated cable and 1000 volts dc for 600 volt rated cable. Take readings after 1 minute and until the reading is constant for 15

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seconds. Minimum insulation-resistance values is not less than 25 Megohms for 300 volt rated cable and 100 Megohms for 600 volt rated cable. For circuits with conductor sizes **AWG No. 8** and smaller insulation resistance testing is not required.

Perform **continuity test** to insure correct cable connection end-to-end (i.e correct phase conductor, grounded conductor, and grounding conductor wiring). Repair and verify any damages to existing or new electrical equipment resulting from mis-wiring. Receive approval for all repairs prior to commencement of the repair.

Conduct **phase-rotation tests** on all three-phase circuits using a phase-rotation indicating instrument. Perform phase rotation of electrical connections to connected equipment in a clockwise direction, facing the source.

Perform **600-volt wiring test** on wiring rated 600 volt and less to verify that no short circuits or accidental grounds exist. Perform insulation resistance tests on wiring No. 6 AWG and larger diameter using instrument which applies voltage of approximately 500 volts to provide direct reading of resistance. Minimum resistance: 250,000 ohms.

Perform the standard, not optional, **transformer tests** in accordance with the Inspection and Test Procedures for transformers, dry type, air-cooled, 600 volt and below; as specified in **NETA ATS**. Measure primary and secondary voltages for proper tap settings. Tests need not be performed by a recognized independent testing firm or independent electrical consulting firm.

Perform **ground-fault receptacle test** for ground-fault receptacles with a "load" (such as a plug in light) to verify that the "line" and "load" leads are not reversed.

Submit test reports in accordance with referenced standards in this section.

Final acceptance requires the successful performance of wire and cable under test. Do not energize any conductor until the final test reports are reviewed and approved.

-- End of Section --

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SECTION 26 05 26.00 40

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

08/19

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

- | | |
|-----------------|---|
| ASTM B3 | (2013) Standard Specification for Soft or Annealed Copper Wire |
| ASTM B8 | (2011; R 2017) Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft |
| ASTM B187/B187M | (2020) Standard Specification for Copper, Bus Bar, Rod and Shapes and General Purpose Rod, Bar and Shapes |

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

- | | |
|---------|--|
| IEEE C2 | (2017; Errata 1-2 2017; INT 1 2017)
National Electrical Safety Code |
|---------|--|

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- | | |
|----------|--|
| NFPA 70 | (2020; ERTA 20-1 2020; ERTA 20-2 2020; TIA 20-1; TIA 20-2; TIA 20-3; TIA 20-4)
National Electrical Code |
| NFPA 780 | (2017) Standard for the Installation of Lightning Protection Systems |

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)

- | | |
|---------|--|
| TIA-607 | (2015c; Addendum 1 2017) Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises |
|---------|--|

UNDERWRITERS LABORATORIES (UL)

- | | |
|--------|--|
| UL 546 | (2008) UL Outline of Investigation for Conductor Termination Compounds |
|--------|--|

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for Contractor Quality Control approval for information only. When used, a

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code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Ground Wires; G

Connectors and Fasteners; G

Conductive Corrosion Inhibiting Compounds; G

Ground Buses; G

SD-06 Test Reports

Bond Resistance Test; G

Ground Resistance Tests; G

Ground Isolation Test; G

Equipment Continuity Test; G

SD-07 Certificates

Ground Resistance Test Equipment; G

Micro-Ohmmeter Test Equipment; G

SD-11 Closeout Submittals

Record Drawings

1.3 QUALITY CONTROL

1.3.1 Regulatory Requirements

In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Contracting Officer. Ensure equipment, materials, installation, and workmanship are in accordance with the mandatory and advisory provisions of NFPA 70, IEEE C2 unless more stringent requirements are specified or indicated.

1.3.2 Standard Products

Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Provide products which have been in satisfactory commercial or industrial use for 2 years prior to bid opening. Ensure the 2-year period includes applications of equipment and materials under similar circumstances and of similar size. Ensure the product has been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same class of equipment are required, these items must be products of a single manufacturer.

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1.3.3 Ground Resistance Test Equipment

Provide combination 3-point and 4-point type ground resistance test equipment specifically designed for grounding electrode resistance and soil resistivity tests. Submit proof of current equipment calibration with test equipment product data.

1.3.4 Micro-Ohmmeter Test Equipment

Perform [circuit and]bond resistance tests using a micro-ohmmeter with the following characteristics:

- a. Resistance range selectable and capable of measuring to 10 micro-Ohms using a minimum of 1 ampere of test current.
- b. Positive and negative test leads of the 2-wire balanced type. Provide both clamp and probe type connections to allow measurements across all bonded surfaces. Provide long length balanced test lead to allow measurements from a bonding location to the nearest test well.

Submit proof of current equipment calibration with test equipment product data.

PART 2 PRODUCTS

Submit material, equipment, and fixture lists for grounding systems, including manufacturer's style or catalog numbers, specification and drawing reference numbers, warranty information, and fabrication site information.

2.1 MATERIALS

2.1.1 Ground Wires

2.1.1.1 Bare

Provide annealed bare copper, Class "B" stranded ground and bond wires in accordance with [ASTM B8](#) for wires #4 AWG and larger and solid in accordance with [ASTM B3](#) for wires #6 AWG and smaller. Provide conductors with 98 percent conductivity and sized wires in accordance with the requirements of [NFPA 70](#) and [NFPA 780](#).

2.1.1.2 Insulated

Ensure insulated conductors conform to the requirements of Section [26 05 00.00 40](#) COMMON WORK RESULTS FOR ELECTRICAL.

Where installed in conduit as part of a complete circuit provide conductors with green insulation for sizes #8 AWG and smaller and with green phase tape at each end and in each junction box for sizes #6 AWG and larger.

2.1.1.3 Straps/Jumpers

Provide copper bonding straps and jumpers with a cross-sectional area of not less than [No. 6 AWG](#). Ensure bonding straps and jumpers for shock-mounted devices with pivot joints are made of tinned-copper wire.

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2.1.1.2 Connectors and Fasteners

2.1.1.2.1 Exothermic Welds

Ensure the molds, materials and powder charges used to make exothermic welds are the standard product of a single manufacturer and listed by the manufacturer for use on the specific type, size, quantity and configuration of conductors to which the weld is applied.

2.1.1.2.2 Irreversible Compression Lugs

Provide irreversible compression lug type connectors manufactured from tin-plated copper and installed using a hydraulic compression tool and die to apply correct, uniformly distributed, circumferential pressure. Ensure tools and dies are as recommended by the irreversible compression lug type connector manufacturer. Use an embossing die code or other standard method to provide visible indication that a connector has been adequately compressed onto the conductor. Apply irreversible compression lug type connectors in strict accordance with the manufacturer's written instructions and published installation instructions. Use 2-hole lug type connectors for connections to NEMA cable pads and bus bars, and single-hole connectors otherwise.

2.1.1.2.3 Mechanical

Provide split bolt and clamp style mechanical type connectors manufactured from copper listed by the manufacturer as suitable for direct burial use. Ensure mechanical type connectors are applied in strict accordance with the manufacturer's published installation instructions.

2.1.1.2.4 Fasteners

Provide bolts, nuts, washers, lock washers, and associated fasteners used for grounding and bonding connections manufactured of copper. Where fasteners contact dissimilar metals, apply conductive oxide-inhibiting compound.

2.1.1.3 Conductive Corrosion Inhibiting Compounds

Provide conductive corrosion inhibiting compounds UL Listed in accordance with [UL 546](#), listed by the manufacturer as suitable for the application, and suitable for all aluminum and copper conductor/connector applications. Ensure conductive corrosion inhibiting compounds inhibit oxidation at the conductor/connector interface and have no deleterious effect on the conductor/connector metal or EPDM, natural rubber, or polyethylene insulating materials.

2.1.1.4 Ground Buses

Provide solid copper ground buses conforming to [ASTM B187/B187M](#) with minimum dimensions of [0.25 inches](#) thick, [4 inches](#) wide, and [12 inches](#) in length or as indicated. Ensure ground buses are equipped with two UL Recognized red 1000V rated insulated standoffs and stainless steel mounting brackets.

Provide Telecommunications Main Ground Buses and Telecommunications Ground Buses in meeting the standards of [TIA-607](#).

Provide grounding buses with predrilled NEMA hole configuration as

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indicated.

PART 3 EXECUTION

3.1 INSTALLATION

Install grounding systems in accordance with NFPA 70, NFPA 780 and IEEE C2, and as indicated.

Bond exposed non-current-carrying metallic parts of electrical equipment and metallic raceway systems to ground.

Bond grounding conductors in metallic and non-metallic raceways to ground. Make ground connections at equipment and to ground rods as indicated. Interconnect all grounding media in or on the structure to provide a common ground potential. This includes lightning protection, electrical service, telecommunications system grounds, as well as underground metallic piping systems.

Bond wiring system neutrals to ground in accordance with the requirements of NFPA 70. Where ground fault protection is employed, ensure that connection of ground and neutral does not interfere with correct operation of fault protection.

3.1.1 Conductors

Install bare or insulated conductors as indicated. Install bare conductors where not specifically identified as bare or insulated except where installed in conduit with associated phase conductors. Install insulated conductors in conduit with insulation of the same material as the associated phase conductors with which it is installed.

Provide straps/jumpers across joints subject to vibration. Install strap/jumper such that vibration will not change its electrical characteristics. Apply strap/jumper to the metallic structure on each side of the joint; do not penetrate any adjacent parts. Install straps/jumpers in areas that are accessible for maintenance. Install strap/jumper such that it does not restrict the movement of the metallic structures to which it is connected. Install strap/jumper such that it does not weaken the metallic structures to which it is attached. Do not connect two or more straps/jumpers in series.

3.1.2 Ground Buses

Install ground busses in accordance with manufacturer's instructions.

3.1.3 Equipment Grounding

Install ground systems for power, telecommunications, and instrumentation. Independently connect each system to the building counterpoise.

3.1.3.1 Equipment and Enclosure Bonding

Bond each metallic enclosure and all electrical equipment to ground. Make at least one copper connection from the system ground point to one or more enclosures in the area such that all enclosures and equipment provide a low-impedance path to ground when properly bonded together.

3.1.3.2 Bonding of Conduit and Raceway Systems

Bond all metal conduit, fittings, junction boxes, outlet boxes, armored and metal sheathed cable, and other raceways. Ensure adequate electrical contact at the joints and terminations. Ensure metallic raceway systems have electrical continuity with equipment. Individually and directly connect equipment to the building ground, independent of the raceway system.

For rigid metal conduit and terminations, ensure threaded connections are wrench-tight with no exposed threads. Ream all ends of the conduit to remove burrs and rough edges. Bond conduits entering boxes and enclosures to the box with [bonding-type locknuts, one outside and one inside.] [locknuts and grounding-type bushings.] Locknuts that gouge into the metal box when tightened are not acceptable.

Conduit systems that are interrupted by PVC dielectric links are bonded separately on either side of the link. Do not jumper the dielectric link.

Install flexible metal conduit with an integral grounding conductor.

3.1.3.3 Cable Tray Bonding

Bond cable tray sections together. Cable tray sections in tandem assembly are considered as having electrical continuity when these sections are bonded with the appropriate bolts. Install bond straps across expansion joints. Bond cable trays to the building ground system.

3.1.4 Bonding Materials And Methods

Accomplish bonding of metal surfaces by [brazing] [welding] [clamping] [structural joining methods].

3.1.4.1 Clamping

In external locations, use clamping only where a disconnect type of connection is required. Connection device may utilize threaded fasteners. Construct device such that positive contact pressure is maintained at all times. Use machine bolts with tooth-type lockwashers.

3.1.4.2 Cleaning of Bonding Surfaces

Thoroughly clean surfaces that comprise the bond before joining. Apply an appropriate abrasive with gentle and uniform pressure to ensure a smooth and uniform surface. Do not remove excessive metal from the surface. Clean clad metals in such a manner that the cladding material is not penetrated by the cleaning process. Then clean bare metal with an appropriate solvent to remove any grease, oil, dirt, corrosion preventives, and other contaminants. Bond to the cleaned area within one hour after cleaning. Seal joint and refinish the exposed surfaces within two hours of exposure to prevent oxidation. When additional time is required, apply a corrosion preventive compound until the area can be refinished.

3.1.4.3 Protection of Finished Bonds

Protect finished bonds by painting to match the original finish after the bond is made.

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3.2 FIELD QUALITY CONTROL

Perform the following tests in the presence of the Contracting Officer. Furnish test equipment and personnel and submit written results of each test. Notify the Contracting Officer at least 14 calendar working days prior to each test.

Submit written results of each test to Contracting Officer for review and approval. Document each location where test is performed, the field conditions at the time of the test, the measured results of the test, and whether the measured results "PASSED" or "FAILED" relative to specified pass/fail performance criteria.

Perform rework to correct FAILED conditions at no additional cost to the Government.

3.2.1 Bond Resistance Test

Resistance of any bond connection cannot exceed 0.5 milliohm. Rework bonds that exceed this resistance at no additional cost to the Government.

3.2.2 Ground Resistance Tests

Test grounding systems for ground resistance. Total resistance from any point on the ground network to the building counterpoise cannot exceed [50] 100 milliohms.

3.2.3 Ground Isolation Test

Test ground systems for isolation from other ground systems.

3.3 CLOSEOUT ACTIVITIES

Submit [record drawings](#) indicating the location of ground rods, mats, grids, building ground bus, supplementary grounding electrodes, steel building columns, and other metal structures connected to the grounding system.

-- End of Section --