NOTICE:

Bids to be opened at 2:00 P.M.
29 JUN 1982 at the office of
Officer in Charge of Construction
Jacksonville, North Carolina Area
Building 1005, Marine Corps Base
Camp Lejeune, North Carolina 28542

CONTRACT NO. N62470-81-B-3651

NAVFAC SPECIFICATION
NO. 05-81-3651

ELECTRICAL MODIFICATIONS FOR NEW ADP EQUIPMENT - BLDG 1101

at the

MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA

DESIGN BY: Design Division, Public Works Department
Marine Corps Base, Camp Lejeune, North Carolina

SPECIFICATION
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SECTION 00101. BIDDING INFORMATION

1. CONTENTS: This Invitation for Bids, IFB NO. N62470-81-B-3651 consists of the following documents:

(a) Bid Instruction Documents

(i) Invitation for Bids (Standard Form 20, Jan 1961 Ed.)
(ii) Bidding Information
(iii) Instructions to Bidders, dated March 1979

(b) Bid Submittal Documents

(i) Bid Form (Standard Form 21, December 1965 Ed.)
(ii) Representations and Certifications, Standard Form 19-B, June 1976 Ed. (REV 1980 AUG), including Appendix "A", dated August 1980
(iii) Bid Guaranty (Standard Form 24, June 1964 Ed.) (See Instructions to Bidders)

(c) Contract Documents

(i) Construction Contract (Standard Form 23, Jan 1961 Ed.)
(ii) Performance Bond (Standard Form 25, June 1967 Ed.)
(iii) Payment Bond (Standard Form 25A, June 1964 Ed.)
(iv) Labor Standards Provisions, dated November 1979
(v) General Provisions dated Mar 1981 (REV 12-81)
(vi) NAVFAC Specification No.
(vii) Drawings identified in Section 01011, Division 1 of the specifications
(viii) Wage Determination Decision No. NC81-1201 for Bldg Constr.

2. BIDS:

2.1 Instruction to Bidders: Instructions to Bidders and Invitation for Bids, Standard Form 20, January 1961 edition, shall be observed in the preparation of bids. Bidders shall affix their names and return addresses in the upper left corner of bid envelope. Envelopes containing bids must be sealed.

2.2 Bid Guaranty: A bid guaranty will be required as stipulated in the Instructions to Bidders.

2.3 Items of Bids: Bids shall be submitted, in duplicate, on Standard Form 21, Bid Form, and shall be accompanied by Standard Form 19B, Representations and Certifications, with Appendix "A" and by Bid Guaranty, all in accordance with the Bid Instruction Documents listed in paragraph 1(a) hereinbefore upon the following item(s):

BASE BID: Price for the entire work, complete in accordance with the drawings and specifications.

2.4 TELEGRAPHIC MODIFICATIONS OF BIDS in accordance with the instructions to Bidders may be made. Two signed copies of the telegram in a sealed envelope marked "Copies of telegraphic modification of bid for ELECTRICAL MODIFICATIONS FOR NEW ADP EQUIPMENT - BLDG 1101 Specification No. 05-81-3651 should be forwarded immediately to the office to which written bids were submitted.

2.5 TELEGRAPHIC MODIFICATIONS OR WITHDRAWAL OF BIDS will be considered as specified herein. TELEPHONIC RECEIPT OF TELEGRAPHIC MODIFICATIONS OR WITHDRAWAL OF BIDS WILL NOT QUALIFY THE TELEGRAM AS TIMELY. The telegram must be received at the place specified for receipt of bids prior to the exact time set for receipt of bids.

2.6 HAND DELIVERED BIDS: All hand delivered bids must be deposited with personnel in the Contract Branch, Room No. 26, Building 1005, Marine Corps Base, Camp Lejeune, North Carolina 28542, prior to the time and date set for bid opening. Any bids submitted by hand after the time set for receipt will not be accepted.

3. PRE-BID SITE VISITATION: To inspect the site of the work prior to bid opening, prior appointment must be made with the Officer in Charge of Construction, Jacksonville, North Carolina Area, telephone 919-451-2581. Bidders are urged and expected to inspect the site where services are to be performed and to satisfy themselves as to all general and local conditions that may affect the cost of performance of the contract to the extent such information is reasonably obtainable. In no event will a failure to inspect the site constitute grounds for withdrawal of a bid after opening or for a claim after award of the contract.

4. CONTROLLED MATERIALS DATA: The Contracting Officer will issue a DO-C2 priority rating for procurement of critical materials. See General Provision 46, "PRIORITIES, ALLOCATIONS AND ALLOTMENTS".

5. INQUIRIES:

5.1 Plans and Specifications: Questions regarding the plans and specifications occurring prior to bid opening shall be presented to the Public Works Design Division, Building 1005, Marine Corps Base, Camp Lejeune, North Carolina, 28542, telephone 919-451-5507. Questions requiring interpretation of drawings and specifications must be submitted at least 10 days before bid opening. Interpretations or modifications to specifications made as a result of questions will be made by amendment only, and unless so done, all bidders should base their bids on the plans and specifications as issued.

5.2 Bidding Procedures: All questions concerning the bidding procedures shall be presented to OICC-ROICC Contract Branch, Room 26, Building 1005, Marine Corps Base, Camp Lejeune, North Carolina, telephone 919-451-2581.

6. AVAILABILITY OF SPECIFICATIONS, STANDARDS AND DESCRIPTIONS (1977 JUN): Specifications, standards and descriptions cited in this solicitation are available as indicated below:

a. Unclassified Federal, Military and Other Specifications and Standards (Excluding Commercial), and Data Item Descriptions: Submit request on DD Form 1425 (Specifications and Standards Requisition) to:

Commanding Officer
U. S. Naval Publications and Forms Center
5801 Tabor Avenue, Philadelphia, Pennsylvania 19120

The Acquisition Management Systems and Data Requirements Control List: DOD Directive 5000.19L, Volume II, may be ordered on the DD Form 1425. The Department of Defense Index of Specifications and Standards (DODISS) may be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. When requesting a specification or standard, the request shall indicate the title, number, date and any applicable amendment thereto by number and date. When requesting a data item description, the request shall cite the solicitation. When DD Form 1425 is not available, the request may be submitted in letter form, giving the same information as listed above, and the solicitation or contract number involved. Such request may also be made to the activity by TELEX No. 834295, Western Union No. 710-670-1685, or telephone 215-697-3321 in case of urgency.

b. Commercial Specifications, Standards and Descriptions: These specifications, standards and descriptions are not available from Government sources. They may be obtained from the publishers.

c. Availability for Examination of Specifications, Standards, Plans, Drawings, and Other Pertinent Documents: The specifications, standards, plans, drawings, and other pertinent documents cited in this solicitation may be examined at the following location:

Public Works Division
Specifications and Estimates Branch
Building 1005, Marine Corps Base
Camp Lejeune, North Carolina

7. RECOVERED MATERIAL: The Contractor certifies by signing this bid/proposal/quotation that recovered materials as defined in DAR 1-2500.4 will be used as required by the applicable specifications.

8. REFERENCE TO AMENDMENTS: Each bidder shall refer in his bid to all amendments to this specification; failure to do so may constitute an informality in the bid.

9. CERTIFICATE OF CURRENT COST OR PRICING DATA: (This paragraph applies to negotiated contracts of $100,000 or more, except where the price is based on adequate competition, and to change orders of $100,000 or more, to any contract.) The Contractor shall submit to the Contracting Officer a certificate in the form set forth below as soon as practicable after agreement is reached on the contract price:

This is to certify that, to the best of my knowledge and belief, cost or pricing data as defined in DAR 3-807.1(a)(1) submitted, either actually or by specific identification in writing (see DAR 3-807.3(a)) to the Contracting Officer or his representative in support of _____* are accurate, complete, and current as of _____**
day month year

This certification includes the cost or pricing data supporting any advance agreement(s) and forward pricing rate agreements between the offeror and the Government which are part of the proposal.

Firm _____
Name _____
Title _____

_____***
Date of Execution

*Describe the proposal, quotation, request for price adjustment or other submission involved, giving appropriate identifying number (e.g. RFP No. _____).

**The effective date shall be the date when price negotiations were concluded and the contract price was agreed to. The responsibility of the Contractor is not limited by the personal knowledge of the Contractor's negotiator if the Contractor had information reasonably available at the time of agreement, showing that the negotiated price is not based on accurate, complete and current data.

***This date should be as close as practicable to the date when the price negotiations were concluded and the contract price was agreed to.

SECTION 01011
GENERAL PARAGRAPHS

1. GENERAL INTENTION: It is the declared and acknowledged intention and meaning to provide and secure Electrical Modifications for New ADP Equipment - Bldg 1101.

2. GENERAL DESCRIPTION: The work includes interior and exterior electrical work, chain link fencing, raised metal flooring and incidental related work.

3. LOCATION: The work shall be located at the Marine Corps Base approximately as shown. The exact location will be indicated by the Contracting Officer. "Officer in Charge of Construction (OICC)" and "Contracting Officer" are used interchangeably in this specification and have the same meaning.

4. COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK: The Contractor will be required to commence work under the contract 15 calendar days after the date of receipt of Notice of Award, to prosecute said work diligently and to complete the entire work ready for use within 120 calendar days. The time stated for completion shall include final cleanup of the premises. The contract completion date will be computed starting 15 calendar days after the date of the Notice of Award. This 15-day period is to allow for mailing of the Notice of Award and the Contractor's submission of required bonds.

5. LIQUIDATED DAMAGES: In case of failure on the part of the Contractor to complete the work within the time fixed in the contract or any extensions thereof, the Contractor shall pay to the Government as liquidated damages pursuant to General Provisions clauses entitled "Termination for Default - Damages for Delay - Time Extensions" and "Damages for Delay - Defense Materials System and Priorities" the sum of $20 for each day of delay.

6. DRAWINGS ACCOMPANYING SPECIFICATION: The following drawings accompany this specification and are a part thereof. The drawings are the property of the Government and shall not be used for any purpose other than that contemplated by the specification.

NAVFAC DWG. NO.	TITLE
4080482	Floor Plan of New Equipment
4080483	Electrical Site Plan and Details
4080484	Electrical Details

7. NORTH CAROLINA SALES AND USE TAX IS REQUIRED. (See also section entitled "Additional General Paragraphs").

8. SCHEDULING THE WORK:

8.1 General Scheduling Requirements: Notwithstanding the requirements of clause entitled "Progress Charts and Requirements for Overtime Work" of the General Provisions, immediately after award the Contractor shall meet with the Contracting Officer and present a schedule of work, prepared in accordance with said clause, for review by the Contracting Officer. The schedule will be reviewed at this meeting and will be retained by the Contracting Officer for final review and approval.

8.2 Work Outside Regular Hours: If the Contractor desires to carry on work outside regular hours or on Saturdays, Sundays, or holidays, he shall submit application to the Officer in Charge of Construction, but shall allow ample time to enable the Government to make satisfactory arrangements for inspecting the work in progress. At night he shall light the different parts of the work in an approved manner. All utility cutovers shall be made after normal working hours or on weekends. Anticipated costs shall be included in the bid. Regular working hours are 7:45 A.M. to 4:15 P.M., Monday through Friday, excluding holidays.

9. SAFETY PROGRAM: The Contractor shall implement a safety program conforming to the requirements of Federal, State and Local laws, rules and regulations. The program shall include, but is not limited to, the following:

a. "Occupational Safety and Health Standards", which can be examined at the office of the Contracting Officer or be ordered from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

b. Department of the Army, Corps of Engineers "General Safety Requirements", which may be examined at the office where bids are being received or may be purchased from the Superintendent of Documents, U. S. Government Printing Office.

c. General Provisions clause entitled "Accident Prevention".

10. TRAILER OR STORAGE BUILDINGS will be permitted on the job site, where space is available, subject to the approval of the Contracting Officer. The trailers or buildings shall be suitably painted and kept in a good state of repair. Failure of the Contractor to maintain his trailers or storage buildings in good condition will be considered sufficient reason to require their removal from the job site.

11. WRITTEN GUARANTEES AND GUARANTOR'S LOCAL REPRESENTATIVE: Prior to completion of the contract, the Contractor shall obtain and furnish to the Contracting Officer's designated representative, written guarantees for all equipment and/or appliances furnished under the contract. The Contractor shall furnish with each guarantee the name, address, and telephone number of the guarantor's representative nearest to the location where the equipment and/or appliances are installed, who, upon request of the using service's representative, will honor the guarantee during the guaranty period and will provide the services prescribed by the terms of the guarantee. At the time of installation, the Contractor shall tag each item of warranted equipment with a durable oil and water resistant tag approved by the Contracting Officer. Leave the date of acceptance and inspector's signature blank until the project is accepted for beneficial occupancy. The tag shall show the following information:

EQUIPMENT WARRANTY TAG

Type of Equipment_____
Accepted Date_____
Warranted Until_____
Under Contract No. N62470-81-B-3651
Inspector's Signature_____
STATION PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE

12. FACTORY INSPECTION of material and equipment for which tests at the place of manufacture are required in referenced specifications will be waived if notarized copies of factory reports are furnished that show compliance with the specification requirements. Factory inspection will be required only where specified herein or in the technical sections of this specification. The Government reserves the right to charge to the Contractor any additional cost of Government inspection and tests when materials and equipment are not ready at the time inspection and tests are requested by the Contractor.

END OF SECTION

SECTION 01012. ADDITIONAL GENERAL PARAGRAPHS

1. UTILITIES:

1.1 Government-Furnished Utilities: The Government will furnish water and electricity from the nearest available outlet free of charge for pursuance of work under this contract. If the nearest available outlet cannot be utilized by the Contractor because of improper voltage, insufficient current, improper pressure, incompatible connectors, etc., it shall be the responsibility of the Contractor to provide temporary utilities as required.

1.2 Energy and Utilities Conservation: The Contractor shall carefully conserve utilities furnished without charge. The Contractor, at his own expense and in a manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines and remove the same prior to final acceptance of the construction. (DAR 7-603.30)

1.3 Operation of Station Utilities: The Contractor shall not operate nor disturb the setting of any control devices in the Base utilities system, including water, sewer, electrical and steam services. The Government will operate the control devices as required for normal conduct of the work. The Contractor shall notify the Contracting Officer, giving reasonable advance notice, when such operation is required.

1.4 Location of Underground Utilities: Where existing piping, utilities, and underground obstructions of any type are indicated in locations to be traversed by new piping, ducts, and other work provided hereunder, and are not indicated or specified to be removed, the elevations of the existing utilities and obstructions shall be determined before the new work is laid closer than the nearest manhole or other structure at which an adjustment in grade could be made. For any additional work required by reason of conflict between the new and existing work, an adjustment in contract price will be made in accordance with General Provisions clause entitled "Differing Site Conditions (1968 FEB)." The Base Telephone Officer, telephone 451-2531, will show the Contractor approximate locations of all buried telephone and fire alarm cables after receiving 10 days notice. The locations of underground utilities shown is only approximate and the information is incomplete.

2. CHANGED CONDITIONS: Wherever changed conditions as defined in General Provisions clause entitled "Differing Site Conditions (1968 FEB)" are encountered, and wherever conditions exposed during the course of the work necessitate a change from quantities indicated or specified as either estimated quantities or as a basis for bids, whether or not provisions for a change in price for such variation is specified, the Contracting Officer must be notified in writing and written directions to do so must be obtained before quantities stated in the contract documents are exceeded.

3. SUBCONTRACTORS AND PERSONNEL: Promptly after the award of the contract, the Contractor shall submit to the Contracting Officer, in triplicate, a list of his subcontractors and the work each is to perform. On this form shall appear the names of the key personnel of the Contractor and subcontractors, together with their home addresses and telephone numbers, for use in event of emergency. From time to time as changes occur and additional information becomes available, the Contractor shall amplify, correct, and change the information contained in previous lists.

4. PRINTS FURNISHED TO CONTRACTOR: Six copies of the project specifications, and six sets of the drawings accompanying the specifications, will be furnished the Contractor. Additional sets of the specifications and drawings can be obtained, if required, by application to the Contracting Officer, provided that the need therefor is justified to the satisfaction of the Contracting Officer.

5. SCHEDULE OF PRICES: The original and seven copies of the Schedule of Prices shall be submitted to the Contracting Officer for approval. Payments will not be made until the Schedule of Prices has been submitted and approved.

6. CONTRACTOR'S INVOICE AND CONTRACT PERFORMANCE STATEMENT: Requests for payment in accordance with the terms of the contract shall consist of:

a. Contractor's Invoice on Form NAVFAC 10-7300/30(4/68), which shall show, in summary form, the basis for arriving at the amount of the invoice

b. Contractor's Monthly Estimate for Voucher (5ND GEN 5265/1)

c. Affidavit to Accompany Invoice (5ND LANTDIV 4-4235/4)(Rev 1/68)

Forms will be furnished by the Contracting Officer. Monthly invoices and supporting forms for work performed through the 15th of the month shall be submitted to the Contracting Officer by the 20th of the month in the following quantities:

a. Contractor's Invoice - Original and five copies

b. Contractor's Monthly Estimate for Voucher - Original and two copies

c. Affidavit - Original

7. OPTIONAL REQUIREMENTS: Where a choice of materials or methods is permitted herein, the Contractor will be given the right to exercise the option unless stated specifically otherwise.

8. QUARANTINE FOR IMPORTED FIRE ANT (CLNC 2/82): All of Onslow, Jones and Carteret Counties and portions of Duplin and Craven Counties have been declared a generally infested area by the United States Department of Agriculture for the imported fire ant. Compliance with the quarantine regulations established by this authority as set forth in USDA Quarantine No. 81 dated 9 October 1970, and USDA Publication 301.81-2A of 23 July 1976, is required for operations hereunder

8.1 The quarantine applies to materials originating from Camp Lejeune and the Marine Corps Air Station (Helicopter), New River, which are to be transported outside the Onslow County or adjacent suppression areas.

8.2 Certification is required for the following articles, and they shall not be moved from the reservation to any point outside the Onslow County and adjacent designated areas unless accompanied by a valid inspection certificate issued by an officer of the Plant Protection and Quarantine Program, USDA:

(1) Bulk soil

(2) Used mechanized soil-moving equipment

(3) Any other products, articles, or means of conveyance if it is determined by an inspector that they present a hazard of spread of the imported fire ant and the person in possession thereof has been so notified.

8.3 Authorization for movement of equipment outside the imported fire ant regulated area shall be obtained from USDA, APHIS, PPQ, Rural Route 6, Box 53, Wilmington, NC 28504; telephone (919) 343-4667. Requests for inspection shall be made at least two days in advance of the date of movement to permit arrangements for the services of authorized inspectors. The equipment shall be prepared and assembled so that it may be readily inspected. All soil on or attached to equipment, supplies and materials shall be removed by washing with water and/or such other means as necessary to accomplish complete removal. Resulting spoil shall be wasted as directed.

9. EMERGENCY MEDICAL CARE: Only emergency medical care is available at Camp Lejeune Government facilities for Contractor employees who suffer on-the-job injury or disease. Emergency care will be rendered at the prevailing rates established in BUMEDINST 6320.4 series. Reimbursement shall be made by the Contractor to the Naval Regional Medical Center Collection Agent upon receipt of a monthly statement.

10. PROPRIETARY NAMES: Names indicated for colors, textures and patterns of materials are for the purpose of color, texture and pattern selection only. Other manufacturer's materials are acceptable provided they closely approximate colors, textures and patterns indicated and provided they conform to all other requirements.

11. NORTH CAROLINA STATE AND LOCAL SALES AND USE TAX (1977 JAN):

(a) As used throughout this clause, the term "materials" means building materials, supplies, fixtures and equipment which become a part of or are annexed to any building or structure erected, altered, or repaired under this contract.

(b) If this is a fixed-price contract as defined in the Defense Acquisition Regulation, the contract price includes the North Carolina state and local sales and use taxes to be paid with respect to materials, notwithstanding any other provision of this contract. If this is a cost-reimbursement type contract as defined in such regulation, any North Carolina state and local sales and use taxes paid by the Contractor with respect to materials shall constitute an allowable cost under this contract.

(c) At the time specified in paragraph (d) below:

(i) The Contractor shall furnish the Contracting Officer certified statements setting forth the cost of the materials purchased from each vendor and the amount of North Carolina state and local sales and use taxes paid thereon. In the event the Contractor makes several purchases from the same vendor, such certified statement shall indicate the invoice numbers, the

inclusive dates of the invoices, the total amount of the invoices and the North Carolina state and local sales and use taxes paid thereon by the Contractor. Any local sales or use taxes included in the Contractor's statements must be shown separately fromthe state sales or use tax. The Contractor shall furnish such additional information as the Commissioner of Revenue of the State of North Carolina may require to substantiate a refund claim for sales or use taxes.

(ii) The Contractor shall obtain and furnish to the Contracting Officer similar certified statements by its subcontractors.

(d) If this contract is completed before the next October 1, the certified statements to be furnished pursuant to paragraph (c) above shall be submitted within 60 days after completion. If this contract is not completed before the next October 1, such certified statements shall be submitted on or before the 30th day of November of each year and shall cover taxes paid during the twelve-month period which ended the preceding September 30.

(e) The certified statements to be furnished prusuant to paragraph (c) above shall be in the following form:

I hereby certify that during the period _____ to _____, (name of Contractor or subcontractor) paid North Carolina state and local sales and use taxes aggregating $_____(state) and $_____ (local) with respect to building materials, supplies, fixtures and equipment which have become a part of or annexed to a building or structure erected, altered or repaired by (name of Contractor) for the United States of America, and that the vendors from whom the property was purchased, the dates and numbers of the invoices covering the purchases, the total amount of the invoices of each vendor, the North Carolina state and local sales and use taxes paid thereon, shown separately, and the cost of property withdrawn from warehouse stock and North Carolina state and local sales or use taxes paid thereon are as set forth in the attachments hereto.

END OF SECTION

SECTION 01401. QUALITY CONTROL

1. APPLICABLE PUBLICATION: The following publication of the issue listed below, but referred to thereafter by basic designation only, forms a part of this specification to the extent indicated by the references thereto:

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

ASTM E329-77 Standard Recommended Practices for Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

2. QUALITY CONTROL of this contract will be administered under the General Provisions Clause entitled "Contractor Inspection System".

3. DEFINITIONS:

3.1 Factory Tests: Tests made on various products and component parts prior to shipment to the job site, including but not limited to such items as transformers, boilers, air conditioning equipment, electrical equipment, and precast concrete.

3.2 Field Tests: Tests or analyses made at, or in the vicinity of, the job site in connection with the actual construction.

3.3 Product: The term "product" includes the plural thereof and means a type or a category of manufactured goods, construction, installations and natural and processed materials or those associated services whose characterization, classification or functional performance determination is specified by standards.

3.4 Person: The term "person" means associations, companies, corporations, educational institutions, firms, government agencies at the Federal, State and Local level, partnerships, and societies, as well as divisions thereof, and individuals.

3.5 Testing Laboratory: The term "testing laboratory" means any "person", as defined above, whose functions include testing, analyzing, or inspecting "products", as defined above, and/or evaluating the designs or specifications of such "products" according to the requirements of applicable standards.

3.6 Certified Test Reports: Reports of tests signed by a qualified professional attesting that the test results reported are accurate and that items tested either meet or fail to meet the stated minimum requirements. These test reports include those performed by Factory Mutual, Underwriters' Laboratories, Inc., and others.

3.7 Certified Inspection Reports: Reports signed by approved inspectors attesting that the items inspected meet the specification requirements other than any exceptions included in the report.

3.8 Manufacturer's Certificate of Conformance or Compliance: A certificate signed by an authorized manufacturer's official attesting that the material or equipment delivered meets the specification requirements.

4. SUBMITTALS shall be prepared in accordance with this specification and the General Provisions and submitted to the Contracting Officer for approval. Each submittal shall be accompanied with a cover letter signed by the Contractor. Each item proposed to be incorporated into the contract shall be clearly marked and identified in the submittals, and shall be cross-referenced to the contract drawings and specifications so as to identify clearly the use for which it is intended. Each sheet of submittal shall be stamped with the Contractor's certification stamp. Data submitted in a bound volume or on one sheet printed on two sides, may be stamped on the front of the first sheet only. The Contractor's certification stamp shall be worded as follows:

"It is hereby certified that the (equipment)(materials) shown and marked in this submittal is that proposed to be incorporated into Contract Number _____, is in compliance with the contract drawings and specifications, can be installed in the allocated spaces, and is submitted for Government approval. Certified by _____ Date _____"

The person signing the certification shall be one designated in writing by the Contractor as having that authority. The signature shall be in original ink. Stamped signatures are not acceptable.

4.1 Submittal Status Logs: The Contractor shall maintain at the job site an up-to-date submittal status log showing the status of all submittals required by the contract. A sample format of an acceptable log is attached at the end of this section. While the use of this sample format is not required, any other format must contain the same information as shown on the sample.

4.2 Samples, shop drawings, manufacturer's data, certifications and data required of the Contractor: Specification MIL-D-1000 shall be used as a guide and its use is encouraged, for all drawings and data submitted by the Contractor. Conformance to the provisions of Specification MIL-D-1000 is not mandatory for maps, sketches, presentation drawings, perspectives, renderings, and all other drawings not requiring Naval Facilities Engineering Command drawing numbers. Before starting the fabrication or installation of any of this work, the Contractor shall submit to the Contracting Officer for, and receive approval of, in accordance with the General Provisions, such drawings as may be required, including all items specified in the applicable paragraphs of the technical sections of this specification. Seven copies of all submittals to be approved by the Contracting Officer shall be forwarded.

4.3 Identification: All catalog cuts, shop drawings, samples and other data submitted for approval shall specifically identify the specification paragraph or contract drawing by number where each item submitted is required to be provided. All submittals shall be clearly marked in

ink to indicate the specific item(s) submitted for approval. Samples shall be clearly labeled with strong tags, firmly affixed, or indelible markings to identify the contract number, contractor, manufacturer, and item name.

4.4 Certified Test Reports: Before delivery of materials and equipment, four certified copies of the reports of all tests listed in the technical sections and referenced publications shall be submitted and approved. The testing shall have been performed in a laboratory meeting the requirements specified herein. The tests shall have been performed within three years of submittal of the reports for approval. Test reports shall be accompanied by certificates from the manufacturer certifying that the material and equipment proposed to be supplied is of the same type, quality, manufacture, and make as that tested.

4.5 Manufacturer's Certificates of Conformance or Compliance: Manufacturer's certification furnished by the Contractor on items of materials and equipment incorporated into the work will be accepted only when this method will assure full compliance with the provisions of the contract, as determined by the Contracting Officer. Preprinted certifications will not be acceptable. All certifications shall be in the original. The original of all manufacturer's certifications shall name the appropriate item of equipment or material, specification, standard, or other document specified as controlling the quality of that item and shall have attached thereto certified copies of test reports upon which the certifications are based. All certificates shall be signed by the manufacturer's official authorized to sign certificates of conformance or compliance.

4.6 Laboratory Reports shall cite the contract requirements, the test or analysis procedures used, the actual test results, and include a statement that the item tested or analyzed conforms or fails to conform to the specification requirements. Each report shall be conspicuously stamped on the cover sheet in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements as the case may be. All test reports shall be signed by the representative of the testing laboratory authorized to sign certified test reports. The Contractor shall arrange for immediate and direct delivery of the signed original of all reports, certifications, and other documentation to the Contracting Officer.

4.7 Tabulation of Tests: In addition to the General Provisions requiremtns for CQC test reports, prior to final payment the Contractor shall obtain from each laboratory a tabulation of all tests it has performed in connection with the construction contract, including conforming or nonconforming, and repeated test results. The tabulation(s) shall be certified as complete, and signed by the authorized representative of the laboratory, and shall be delivered to the Contracting Officer.

5. QUALITY CONTROL REQUIREMENTS: In accordance with the General Provisions Clause entitled "Contractor Inspection System", the Contractor shall inspect and test all work under the contract and maintain records of the inspections and tests. Approvals, except those required for field

installations, field applications, and field tests, shall be obtained before delivery of materials and equipment to the project site. Surveillance of the inspection system will be performed by the Contracting Officer.

5.1 Factory Tests: Unless otherwise specified, the Contractor will arrange for factory tests when they are required under the contract.

5.2 Factory Inspection: Unless otherwise specified, the Contractor will arrange for factory inspection when required under the contract.

5.3 Field Inspections and Tests by the Contractor: The Contractor shall furnish all equipment, instruments, qualified personnel, and facilities necessary to inspect all work and perform all tests required by the contract. All inspections and tests performed and test results received each day shall be included in the Daily Report to Inspector.

5.5 Approval of Testing Laboratories: All laboratory work under this contract shall be performed by a laboratory approved by the Government, whether the laboratory is employed by the Contractor, or is owned and operated by the Contractor. The basis of approval includes the following:

a. Testing laboratories performing work in connection with concrete, steel, and bituminous materials shall comply with ASTM E329, except that the Contracting Officer will perform the function of paragraphs 3.4 and 3.5 therein in the absence of other Government approval.

b. Testing laboratories performing work not in connection with concrete, steel, or bituminous materials shall comply with sections 3 and 4 of ASTM E329, except that the Contracting Officer will perform the functions of paragraphs 3.4 and 3.5 therein in the absence of other Government approval.

5.6 Repeated Tests and Inspections: The Contractor shall repeat tests and inspections after each correction made to nonconforming materials and workmanship until tests and inspections indicate the materials, equipment, and workmanship conform to the contract requirements. The retesting and reinspections shall be performed at no additional cost to the Government.

5.7 Daily Report to Inspector: The Daily Report to the Inspector Form NAVFAC 4330/34 shall be submitted to the Contracting Officer by 10:00 A.M. on the working day following the day the work was performed.

SUBMITTAL STATUS LOG

"SEE INSTRUCTIONS ON REVERSE BEFORE FILLING IN"

PAGE_____ OF_____

CONTRACT NUMBER		SHORT TITLE										LOCATION						CONTRACTOR
SUBMITT'L/ TRANSMITT'L NO.	DESCRIPTION OF ITEMS	SPECIFICATION SECTION REQUIRING SUBMITTAL	SUBMITTAL REQUIRES					CONTRACTOR APPV'D	GOV'T APPROVED	CONTRACTOR ACTION		DATE FORWARDED FROM ROICC	ROICC ACTION		DATE			REMARKS
			SHOP DWGS.	CATALOG DATA	SAMPLE	CERTIFI-CATION	TEST DATA			INSERT ACTION CODE	DATE OF ACTION		INSERT ACTION CODE	DATE OF ACTION	RECEIVED FROM ROICC	MAT'L/EQUIP RECEIVED ON SITE	APPROVED BY CONTRACTOR	
(a)	(b)	(c)	(d)					(e)		(f)		(g)	(h)		(i)	(j)	(k)	

05-81-3651

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INSTRUCTIONS

1. This form may be used by the Contractor for listing all material submittals that require action by either the Contractor or the Government.

2. Columns (a) through (e) should be completed by the Contractor and must include all submissions that are required by the specifications.

3. As submittals are received and processed, the remaining columns are to be completed by the Contractor.

4. In those instances where the Contractor has approved the submittal under his contract responsibility, there may be a dual Action Code under column (f); e.g., "A/E", indicating approved as submitted and forwarded to the OICC for record purposes.

5. In column (f) for those items requiring OICC action (Action Code "D"), the reason for forwarding to the OICC should be entered in the column (l), the Remarks column; e.g., gov't approval required; waiver requested because of variance, substitution, etc.

6. Where no Government action is required, (for Contractor review/approval items), there need be no entry in columns (h) and (i).

7. Column ~~(k)~~ is completed when material or equipment is delivered to the project. Column (k) is completed only after verification that the delivered item is that represented by the approved submittal.

ACTION CODE: To be used when completing columns (f) and (h)

A - Approved as submitted

B - Approved as noted

C - Disapproved

D - Forwarded to OICC for action

E - Forwarded to OICC for record purposes

END OF SECTION

SECTION 01501
ENVIRONMENTAL PROTECTION

1. ENVIRONMENTAL PROTECTION PLAN: The Contractor may be responsible for the preparation and submission of an Environmental Protection Plan. If requested, the Contractor shall meet with the Contracting Officer, or his representative, and discuss the proposed Environmental Protection Plan. The meeting shall develop mutual understanding relative to details of environmental protection, including required reports and measures to be taken should the Contractor fail to provide adequate protection in an adequate and timely manner. Not more than 14 days after the meeting, the Contractor shall submit for approval his proposed Enviornmental Protection Plan.

2. GENERAL REQUIREMENTS: The Contractor shall provide and main-tain environmental protection during the life of the contract, as defined herein. The Contractor's operations shall comply with all Federal, State and local regulations pertaining to water, air, solid waste, and noise pollution.

3. CONTROL AND DISPOSAL OF WASTES: All waste, except rubble, shall be picked up and disposed of daily or placed in containers which are emptied on a weekly schedule. All handling and disposal shall be so conducted as to prevent contamination of the site and any other areas. The Contractor shall transport all such waste and dispose of it in the Base Sanitary Landfill, unless otherwise approved. If transporting any material off Government property, the Contractor shall provide the Contracting Officer a copy of State and/or local permit which reflects the responsible agency's approval of the disposal area and proposed waste disposal methods. Rubble such as masonry, stone, concrete without reinforcing steel, and brick shall be deposited as directed. Upon completion, the work and disposal areas shall be left clean and natural looking. All signs of temporary construction and activities incidental to the construction of the required permanent work in place shall be obliterated.

END OF SECTION

SECTION 02444
CHAIN LINK FENCE WORK

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

FEDERAL SPECIFICATIONS:

RR-F-191H/GEN	Fencing, Wire and Post Metal (and Gates, Chain-Link Fence Fabric, and Accessories)
RR-F-191/1B	Fencing, Wire and Post, Metal (Chain-Link Fence Fabric)
RR-F-191/2B	Fencing, Wire and Post, Metal (Chain-Link Fence Gates)
RR-F-191/3B	Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces)

1.2 SUBMITTALS: All submittals shall be approved prior to commencing work.

1.2.1 Shop Drawings: Submit shop drawings or catalog cuts showing all fencing components and details of fencing, gates, post tops, tension bands and bars, sleeves, ties, and clips. These drawings or cuts shall be accompanied by a layout drawing showing spacing of posts and location of gates, corner, end, and pull posts.

1.2.2 Certificates of Conformance or Compliance: Submit certificates from the manufacturer attesting that all materials meet requirements specified herein.

1.3 DELIVERY, STORAGE AND PROTECTION: Deliver materials to the site in an undamaged condition. Carefully store materials off the ground to provide proper protection against oxidation caused by ground contact.

PART 2 - PRODUCTS

2.1 MATERIALS shall conform to RR-F-191/GEN and detailed specifications as referenced herein and other requirements as specified herein.

2.1.1 Chain-Link Fencing Fabric shall conform to RR-F-191/1; Type I, zinc-coated steel, 9-gage coated wire size. Mesh size shall be two inches. Minimum weight of zinc for zinc-coated steel shall be 1.8 ounces per square foot of uncoated wire. Selvage shall be knuckled at one selvage and twisted and barbed at the other.

2.1.2 Chain-Link Fencing Gates shall conform to RR-F-191/2. Shape and size of the gate frame shall be as indicated. Framing and bracing members shall be steel. Steel member finish shall be zinc-coated. Gate fabric shall be as specified herein for chain-link fencing fabric. Coating on latches, stops, hinges, keepers and accessories shall be zinc-coated steel having weight of zinc-coating not less than 1.8 ounces per square foot. Gate latches shall

be plunger bar type. Gate leaves more than 8 feet wide shall have intermediate members as necessary to provide rigid construction, free from sage or twist. Gate leaves less than 8 feet wide shall have truss rods or intermediate braces. Attach gate fabric to the gate frame by method standard with the manufacturer, except that welding will not be permitted. Arrange latches for padlocking so that padlock will be accessible from both sides of the gate regardless of latching arrangement.

END OF SECTION

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN CONCRETE INSTITUTE (ACI):

ACI 305R-77	Concrete Work in Hot Weather
ACI 306-77	Concrete Work in Cold Weather
ACI 308-71	Curing Concrete

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

C94-78a	Ready-Mixed Concrete

1.2 SUBMITTALS: The testing requirements for materials incorporated in reference documents will be waived provided the Contractor submits notarized certificates from the manufacturer stating that the products furnished for this contract conform to all requirements of this specification and the reference documents.

PART 2 - PRODUCTS

2.1 CONCRETE shall be ready-mixed conforming to ASTM C94 with a minimum strength of 2500 psi at 28 days.

2.2 CURING MATERIALS shall conform to ACI 308.

PART 3 - EXECUTION

3.1 CURING concrete shall conform to ACI 308.

3.2 WORKMANSHIP: The surface immediately under concrete installed on grade shall be wetted as directed immediately before the concrete is placed.

3.3 CONCRETE FINISHES: Exterior concrete shall be given a floated finish.

3.4 CONCRETE SLOPING: Concrete around posts shall be domed to drain water away from posts.

3.5 HOT WEATHER concrete work shall be in accordance with ACI 305.

3.6 COLD WEATHER concrete work shall be in accordance with ACI 306.

END OF SECTION

SECTION 05500
METAL FABRICATIONS

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The following publications of the issues listed below, but referred to elsewhere by basic designation only, form a part of this specification to the extent indicated by the references thereto:

FEDERAL AND MILITARY SPECIFICATIONS:

TT-P-645 Primer, Paint, Zinc-Chromate, Alkyd Type

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

A36-74 Structural Steel

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):

Manual of Steel Construction (7th Edition)

1.2 QUALITY CONTROL: Approvals except those required for field installations, field applications and field tests, shall be obtained before delivery of materials to the project site.

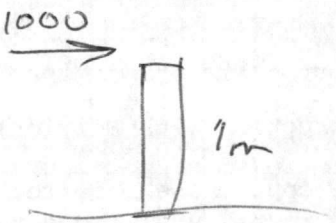
1.3 SUBMITTALS: Shop drawings for the following items shall be submitted and approved before delivery of such items to the site. The drawings shall show materials, connections, finish and all pertinent details.

PART 2 - PRODUCTS

2.1 DELIVERY, STORAGE, AND PROTECTION: Materials shall be delivered to the site in an undamaged condition. Materials shall be carefully stored off the ground to provide proper ventilation, drainage, and protection against dampness. Defective and/or damaged materials shall be replaced by the Contractor at no expense to the Government.

2.2 GENERAL: Fabrications shall be well constructed products conforming to the types, materials and details indicated or specified herein. All metals shall be free of defects which will affect their strength or durability. Bolts, screws and similar suitable fastenings shall be used for anchoring or securing miscellaneous metal work to supporting construction unless indicated otherwise. Materials and parts to complete each item shall be included, even though such work is not definitely shown or specified. Miscellaneous bolts and anchors for completion of the miscellaneous metal work shall be provided.

END OF SECTION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SECTION 10270
ACCESS FLOORING

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

FEDERAL SPECIFICATIONS (FED. SPEC.):

SS-T-312B & Int Am-1	Tile, Floor; Asphalt, Rubber, Vinyl, Vinyl-Asbestos
TT-C-490B	Cleaning Methods and Pretreatment of Ferrous Surfaces for Organic Coatings

FEDERAL TEST METHOD STANDARD (FED. TEST METHOD STD.):

372-1977	Test for Critical Radiant Flux of Carpet Flooring Systems (Flooring Radiant Panel Test)

MILITARY SPECIFICATION (MIL. SPEC.):

DOD-P-21035A	Paint, High Zinc Dust Content, Galvanizing Repair (Metric)

MILITARY STANDARD (MIL. STD.):

MIL-STD-454F	Standard General Requirements for Electronic Equipment

U.S. DEPARTMENT OF COMMERCE, NATIONAL BUREAU OF STANDARDS (NBS):

CS-236-66	Mat-Formed Wood Particleboard (Interior Use)
Handbook H-28	Screw-Threaded Standards for Federal Service

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

A525-81	Steel Sheet, Zinc Coated (Galvanized)
B85-76	Aluminum-Alloy Die Casting
E84-79b	Surface Burning Characteristics of Building Materials

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA):

56A-80	Inhalation Anesthetics (Flammable and Non-Flammable)

1.2 TEST FOR BONDING STRENGTH OF PEDESTAL ADHESIVE:

1.2.1 Individual Pedestals: Where pedestals are to be anchored by the adhesive method, secure pedestals to the floor with the adhesive to be tested and allow to set for the length of time recommended by the adhesive manufacturer. Apply the test load at the top of the extended pedestal. Use a hydraulic jack equipped with a pressure gage for testing. Test not less than four pedestals. Adhesive for anchoring pedestal bases shall have a bonding strength capable of resisting an overturning moment of 1000 inch pounds when force is applied to the top of the pedestal in any direction.

1.2.2 Section of Floor System: In lieu of testing four pedestals individually, a square test section of floor system consisting of nine panels, three panels on a side, isolated on all four sides, may be tested. For testing the section, use a hydraulic jack equipped with a pressure gage, a spreader to distribute the load, two dial gages, and two battens. Mount dial gages on the battens, and attach the battens to the floor section in a manner that will permit the determination of the total movement of the floor section. Place spreader in a manner that will evenly distribute the total load among the 16 pedestals. During the load cycle, the test section shall not deflect more than 0.15 inch. When the test load is removed, the test section shall return to its original position. Should the adhesive fail the bonding strength test, submit new adhesives and test until one passes the test, or use approved mechanical fasteners to anchor the pedestals.

1.3 SUBMITTALS:

1.3.1 Shop Drawings: Submit and obtain approval of shop drawings showing layout of work, ramp framing, sizes and details of components, typical cutout details, gasketing, grounding details, specifications for shop coatings and floor finishes and method of installation. Take measurements from finished areas on the site.

1.3.2 Certified Test Reports: Submit certified test reports of tests listed and described herein.

1.3.2.1 Test Reports: Bonding strength of pedestal adhesive, deflection under loading, flammability, and non-combustibility of edge strips. Conduct grounding and air leakage tests after installation of access floor system.

1.3.2.2 Flame Spread Test Reports: Submit certified copies of test reports from a commercial testing laboratory indicating conformance with the flame spread requirement specified herein to the Contracting Officer. Panels bearing the Underwriters' Laboratories label and listed by Underwriters' Laboratories, Inc. as having a flame spread rating of 25 or less will be accepted in lieu of certified copies of test reports.

1.3.2.3 Load Test Reports: Submit certified copies of test reports from a commercial testing laboratory indicating conformance with the design load requirements specified herein to the Contracting Officer. If floor panels are composed of more than one structural material, the certification shall indicate that the bonding strength of the adhesive(s) used is adequate for the intended purpose. Apply test loads on panels through a one-inch by one-inch testing block and the panels shall be supported by the manufacturer's standard supporting system.

1.4 SAMPLES: Submit and obtain approval of one sample of each component of the floor system, including floor covering. Samples will be returned upon completion of the raised floor installation, or the approved samples may be incorporated into the finished installation provided they are identified and their locations noted.

1.5 COLOR CHIPS: Submit and approve color chips in duplicate from manufacturer's standard range of colors for floor covering material.

1.6 SAFETY EVALUATION: Submit for approval written safety evaluation and corrective action for ramps or steps and railings.

1.7 DELIVER, STORAGE AND PROTECTION: Deliver materials to the site in undamaged condition, in the original containers or packages, complete with all necessary appurtenances and instructions. Materials shall bear the manufacturer's name and brand designations. Where materials are covered by a referenced specification, the containers or packages shall also bear the specification number, type, and class as applicable. Store materials under cover in a well-ventilated enclosure and do not expose to extreme changes in temperature and humidity that could cause damage to the materials. Do not store materials in the building until wet-applied materials are dry. Replace defective or damaged materials. Handle materials in such a manner as to protect them from damage during the entire construction period.

1.8 DESCRIPTION OF SYSTEM: Access flooring consists of a series of square modular, removable, interchangeable panels, resting upon supporting pedestals, utilizing stringerless type construction. Provide access floor as indicated.

PART 2 - PRODUCTS

2.1 ACCESS FLOORING: Include one size modular prefabricated structural floor panel supported by a rigid pedestal-stringer system. Design the system to permit self-alignment of floor panels. Provide adjustable pedestals. Provide readily removable floor panels covered as specified herein.

2.1.1 Safety: To control personnel safety aspects, evaluate the access floor system's design, identify hazards, and prescribe corrective action with regard to ramps.

2.1.2 Fasteners and Fastening: Apply fasteners and fastening for pedestals and stringers, as applicable, in accordance with requirement 12 of MIL-STD-454. Do not use self-tapping screws or spring-action lock-nuts (such as Tinnerman Flat/U Type Speed nuts).

2.3 SUPPORTS: Support system shall allow for 360 degree freedom in laying out cable and cutouts for service to machines. Base access floor system on a 24-inch square module which provides at least 16 inches clearance between the structural floor and the lowest pedestal supported component.

2.4 GROUNDING: Ground access floor system for safety hazard and static suppression. Total system resistivity from the wearing surface of the floor to the building ground shall be within the range of 1.5 x 10 to the fifth power ohms minimum to 2 x 10 to the tenth power ohms maximum. When metal registers and grilles are provided, insulate as required to provide the same grounding resistivity as the wearing surface. The electrical joint resistance between individual stringer and pedestal junctions shall be less than .1 milliohms. The electrical resistance between stringers and floor panels as mounted in normal use shall be not greater than 3 ohms. Make acceptance tests after the access floor system has been installed as specified herein. Make at least one test for each 400 square feet of floor area. Conduct tests in accordance with NFPA 56A, Section 4628, except for the required

limits of resistivity as stated above in this paragraph. Conduct testing in the presence of the Contracting Officer and the representatives of the manufacturer and the installer. Should the access floor system fail the initial tests, make necessary and approved modifications to the grounding system until the tests are passed. Exposed metal is not allowed at the wearing surface of the access floor system, except at metal grilles and registers.

2.5 DESIGN LOADS: Access flooring shall be capable of supporting a uniform live load of minimum 250 pounds per square foot with a deflection not to exceed 0.040 inches. Floor shall also be capable of supporting a minimum 1,000 pound load, concentrated on one square inch at any point on the panel area without deflecting more than 0.080 inch with a safety factor of not less than 3 based on yield strength of the material being used. Floor system shall be laterally stable in all directions whether panels are in place or not. Finished assembly shall be rigid and free of vibration and rocking panels.

2.6 COMPONENTS:

2.6.1 Pedestals: Each capable of carrying a 5,000 pound axial load without permanent deformation. Provide pedestals of steel or aluminum or a combination thereof. Pedestals made of ferrous materials shall have a permanent factory-applied corrosion resistant finish.

2.6.1.1 Pedestal Bases and Shafts: Set each pedestal base with approved mechanical fasteners or adhesive meeting the requirements specified herein for tests for bonding strength of pedestal adhesive. Each pedestal base shall provide a minimum of 16 square inches bearing surface upon the structural floor. Provide base plate not less than 4 inches by 4 inches by 1/8-inch thick, and weld to shaft of pedestal. Approved die-formed bases of equivalent load spreading capacity and bearing area may be provided in lieu of flat base plates. Provide rod shafts not less than 7/8-inch in diameter, pipe shafts not less than one inch in diameter, or square shafts not less than one inch square.

2.6.1.2 Pedestal Adjustments: Provide pedestals with adjusting threads, or other devices which will permit leveling of the access floor system. Adjust pedestal in height within a range of approximately 2 inches. Threaded devices used for adjustment purposes shall conform to either the unified or fine thread series in accordance with NBS Handbook H-28. Provide lock nuts, set screws, or other locking devices to positively lock the final pedestal vertical adjustments in place. Provide a locking device which is effective whether floor panels are or are not in place. Unobstructed vertical space between the subfloor and bottom of lowest member of the raised floor system shall not be less than 16 inches but may include pedestals and stringers as required.

2.6.1.3 Pedestal Caps: Design to fit precisely over pedestal shafts by welding and interlock with panels and stringers in order to preclude tilting, rocking or vibrating of panels when a live load is applied.

2.6.1.4 Leveling: Leveling feature shall allow for overall floor adjustment within plus or minus 0.10 inch and finished access floor surface level within 0.062 inch in every 10 feet in all directions. Provide positive locking device.

2.6.2 Floor Panels: Fabricate so that accurate job cutting and fitting may be done, using standard sizes, for fitting at perimeters and around columns. Metal shall not be exposed on the finished top surface of the panels. Provide vinyl trim or vinyl end bars along the four edges of the panels. Provide cut-outs and cutout closures to accommodate utility systems and equipment intercabling. Reinforce cutouts to meet design load requirements. Cut panels that do meet specific design load requirements shall have extra support pedestals at each corner of cut. Use panels uniform in face dimensions within a tolerance of plus or minus 0.015 inch. Use interchangeable panels which maintain a uniform close fit, one of the following types.

2.6.2.1 Steel Panels: Die-formed construction. Weld a flat steel top sheet to one or more formed steel stiffener sheets. The panels shall have zinc-coating conforming to ASTM A525, G90 or pretreatment conforming to Fed. Spec. TT-C-490, with baked enamel finish standard with access floor manufacturer.

2.6.2.2 Aluminum Panels: Die cast conforming to ASTM B85, Alloy SC84A.

2.6.2.3 Size: Individual floor panels 24 x 24 inches and of such weight that they may be readily removed and handled by one person using a lifting tool furnished by the access floor manufacturer.

2.6.2.4 Floor Finish: Surface panels with 1/8-inch thick vinyl composition tile conforming to Federal Specification SS-T-312, Type IV, Composition 2. Firmly bond floor finish in place with a waterproof adhesive so as not to pull loose by use of the lifting tool or by moving caster loads up to 1,000 pounds. Floor finish colors and patterns from manufacturer's standard selection shall be as selected by Contracting Officer. Bolt heads or similar attachments shall not pierce the traffic surface.

2.6.2.5 To preclude static electricity charge buildup, the floor covering shall have the following additional characteristics:

a. Volume resistivity no greater than 2 x 10 to the tenth power ohms per cubic centimeter or no less than 5 x 10 to the fifth power ohms per cubic centimeter.

b. The electrical resistance shall remain stable over the life expectancy of the floor covering. If an anti-static agent is used in the manufacturing process, it shall not be surfaced applied, but shall be an intergral part of the material.

2.6.2.6 Edge Strips: Provide perimeter of panels with extended vinyl edge strips with top edge flush with panel floor finish. Mechanically lock edge strips and adhesive bond in place. Metal edge strips are not acceptable.

2.6.2.7 Cut-outs and Edge Cuts: Edge with the same material as the panel edges. Bush and close cut-outs with sponge rubber to prevent abrasion of cables and entrance of dust and debris. Use self extinguishing sponge rubber. Paint cut panel edges with primer or sealer recommended by panel manufacturer prior to installing edging materials.

2.7 RAMPS: Bolt to framing. Use extended or cast aluminum step noisings, threshold strips, and floor bevel strips with non-slip traffic surfaces. Close exposed sides of ramps with not lighter than 18-gage aluminum fascia reinforced on the back to prevent warp.

2.7.1 Ramp Surfaces: Surface with same material as specified for floor finish. Ramps shall include supports, brackets, clamps, plates, edging closures, nose pieces, fasteners, and other appurtenances. Slope of ramps shall not exceed one inch rise to 10 inches of run. Provide non-slip inserts on all ramps. Fabricate ramps of the same materials as the floor panels and securely fasten to the raised floor system and subfloor.

2.7.2 Fascia and Lateral Bracing: Provide aluminum or steel fascia plates at open ends of floor, at sides of ramps, at sides of steps, and elsewhere as necessary to enclose the free area under the raised floor. Reinforce a fascia on the back to prevent warping. Provide a factory-applied baked enamel finish. Provide appurtenances including angles, trim, and fasteners, with the plates. Install manufacturer's standard adjustable lateral bracing system behind fascia at maximum 4 feet on center.

PART 3 - EXECUTION

3.1 INSTALLATION: Install all components and accessories in accordance with the requirements as specified herein and manufacturer's recommendations. Clear all debris from the area where the floor system is to be installed. Thoroughly clean floor surfaces and remove all dust before work is started. Free ends of floor, where floor system is to be installed. Thoroughly clean floor surfaces and remove all dust before the work is started. Free ends of floor, where the floor system does not abut wall or other construction, shall have positive anchorage and rigid support, and closed with fascia plates. Where pedestals are to be installed with adhesive, do not apply sealer, hardner, or paint specified for the structural floor supporting the pedestals until the pedestals have been installed and adhesive has cured.

3.1.1 Pedestals: Secure bases of pedestals to the structural floor with approved mechanical fasteners or specified adhesive and provide full and firm contact with the structural floor. Set pedestals plum and in true alignment.

3.1.2 Auxiliary Framing: Provide auxiliary framing around columns and other permanent structures, at sides of ramps, at free ends of floor and beneath floor panels that are substantially cut to accommodate utility systems and provisions for equipment mounting, air, and cable entry. Auxiliary framing shall consist of additional pedestals and stringers designed to specific heights and lengths to meet structural irregularities and design loads. Connect auxiliary framing to main framing.

3.1.3 Floor Panels: Floor panels shall lie flat without warp or twist and shall bear uniformly on supports without rocking and without edges or corners projecting above the floor plane. Interlock panels with pedestals in a manner that will preclude lateral movement. Modular size panels shall be interchangeable without releveling. Fasten perimeter panels, cutout panels, and panels adjoining columns, stairs and ramps to the floor framing.

3.2 REPAIR OF ZINC-COATING: Repair zinc-coating that has been damaged by welding or in installation, and all cut edges of zinc-coated components and accessories, by the application of a galvanizing repair paint conforming to Mil. Spec. DOD-P-21035. Thoroughly clean areas to be repaired and remove slag from welds prior to application of the paint.

3.3 CLEANING AND PROTECTION:

3.3.1 Cleaning: Remove debris accumulated during installation from under the raised floor system. Immediately after completion of the access floor installation, thoroughly clean the floor, using a small amount of an approved cleaner in accordance with the floor covering manufacturer's instructions. Do not permit seepage of cleaner between individual panels.

3.3.2 Protection: Cover cleaned floors with clean building paper before traffic is permitted. Maintain protection until the access floor system is accepted.

3.4 LIFTING DEVICES: Provide floor panel lifting device(s) standard with access floor manufacturer for each individual floor area. The lifting devices shall be a type standard with the raised floor industry for the selected floor covering used.

END OF SECTION

SECTION 16011
ELECTRICAL GENERAL REQUIREMENTS

1. APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where a number in parenthesis is suffixed to the publication number, it denotes the effective amendment to the publication.

FEDERAL SPECIFICATIONS:

TT-E-489F(1)	Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces)
TT-E-496B(2)	Enamel, Heat-Resisting (400 Degrees Fahrenheit), Black
TT-P-28E	Paint, Aluminum, Heat-Resisting (1200 Degrees Fahrenheit)
TT-P-645A	Primer, Paint, Zinc-Chromate, Alkyd Type

MILITARY SPECIFICATIONS:

MIL-P-15328D(1)	Primer (Wash), Pretreatment Blue (Formula No. 117-B for Metals)
MIL-T-152B(2)	Treatment, Moisture and Fungus-Resistant of Communications, Electronic and Associated Electrical Equipment
MIL-V-173C(2)	Varnish, Moisture and Fungus Resistant (for Treatment of Communications, Electronic, and Associated Equipment)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

B117-73(1979)	Salt Spray (Fog) Testing

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA):

NFPA 70-1981	National Electric Code (NEC)

2. APPLICATION: This section applies to all sections of this project except as specified otherwise in the individual sections. All electrical work shall conform to NFPA 70.

3. DELIVERY AND STORAGE: Equipment and materials shall be properly stored, adequately protected, and carefully handled to prevent damage before and during installation. Equipment and materials shall be handled, stored, and protected in accordance with the manufacturer's recommendations and as approved by the Contracting Officer. Electrical conduit shall be stored to provide protection from the weather and accidental damage. Plastic conduit shall be stored on even supports and in locations not subject to direct sun rays or excessive heat. Cables shall be sealed, stored and handled carefully to avoid damage to the outer covering of insulation and damage from moisture and weather. Damaged or defective items, in the opinion of the Contracting Officer, shall be replaced at no cost to the Government.

4. CATALOGED PRODUCTS: Materials and equipment shall be essentially the cataloged products of manufacturers regularly engaged in production of such materials or equipment and shall be manufacturer's latest design that complies with the specification requirements. Materials and equipment shall essentially duplicate items that have been in satisfactory commercial or industrial use at least two years prior to bid opening. Where two units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the system need not be the product of the same manufacturer. Each item of equipment shall have the manufacturer's name and address, and the model and serial number on the nameplate securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable. Nameplate for electrical apparatus shall conform to NEMA standards.

5. FUNGUS CONTROL: Electrical equipment shall be treated to resist fungus and moisture.

5.1 Circuit elements, not covered above and which have a temperature rise of not more than 75 degrees Fahrenheit when operating at full load, shall be coated with a fungus resistant varnish conforming to MIL-V-173. The method of treatment shall be in accordance with MIL-T-152. Circuit elements include, but are not limited to, cable, wire, switchboards, panelboards, terminal and junction blocks, junction boxes, capacitors, and coils.

6. VERIFICATION OF DIMENSIONS: The Contractor shall be responsible for the coordination and proper relation of his work to the building structure and to the work of all trades. The Contractor shall visit the premises and thoroughly familiarize himself with all dimensions in the field, and to advise the Contracting Officer of any discrepancy before performing any work.

7. MANUFACTURER'S RECOMMENDATIONS: Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Contracting Officer prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

8. MECHANICAL REQUIREMENTS: The interconnecting power wiring and conduit, control wiring rated over 120 volts and conduit, the motor-control equipment forming a part of motor-control centers, of switchgear assembled, and the electrical power circuits are included under this division. The electrical components of mechanical equipment such as motors, motor starters, control or push-button stations, float or pressure switches, solenoid valves, electrical disconnecting (isolating) means and other devices functioning to control associated mechanical equipment are specified in the appropriate sections covering such work. Interconnecting wiring for components of packaged equipment shall be provided as an integral part of the equipment as specified elsewhere in the appropriate sections covering such work.

9. COORDINATION: Electrical work shall be coordinated with other trades involved in the construction project. All work shall be carefully laid out in advance coordinating architectural, structural, mechanical, and

sections of this division. It is desirable that all paint be shop applied; however, if the manufacturer's standard shop painting system does not meet these requirements, field painting shall be provided.

10.1 Field Painting: Aluminum surfaces shall not be painted. Dirt, rust, oil and grease shall be removed by wire brushing and solvent degreasing prior to application of paint. Paint shall be applied to clean and dry surfaces only. Where more than one coat of paint is specified, the second coat shall be applied after the preceding coat is thoroughly dry. Damaged painting shall be retouched before applying the succeeding coat. Shop coats shall be lightly sanded before application of field applied coats.

10.1.1 Metal surfaces subject to temperatures less than 120 degrees Fahrenheit shall receive one coat of pretreatment primer conforming to MIL-P-15328 applied to a minimum dry film thickness of 0.3 mil; one coat of primer conforming to TT-P-645 applied to a minimum dry film thickness of 1.0 mil; and two coats of enamel conforming to TT-E-489, applied to a minimum dry film thickness of 1.0 mil per coat.

10.1.2 Metal surfaces subject to temperatures between 120 and 400 degrees Fahrenheit shall receive two coats of heat resisting enamel conforming to TT-E-496, Type II, applied to a total minimum thickness of 2 mils.

10.2 Optional Paint Systems: Manufacturer's standard equipment painting systems may be provided in lieu of the systems specified hereinbefore provided the Contractor submits certification that the painting system applied will withstand 125 hours in a salt-spray fog test, except that equipment located outdoors shall withstand 500 hours in a salt-spray fog test. Salt-spray fog test shall be in accordance with ASTM B117 using a 20 percent sodium chloride solution. Immediately after completion of the test, the paint shall show no signs of blistering, wrinkling or cracking; no loss of adhesion, and the specimen shall show no signs of rust creepage beyond 0.125-inch on either side of the scratch mark. The film thickness of the factory paint system applied on the equipment shall not be less than the film thickness used on the test specimen. If manufacturer's standard painting system is being proposed for use in lieu of specified systems using TT-E-496 or TT-P-28, certifications that the manufacturer's standard system will conform to the heat resistance requirement of TT-E-496 or TT-P-28 as applicable, shall be submitted in addition to other certifications.

END OF SECTION

SECTION 16205
DIESEL GENERATOR FUEL AND EXHAUST SYSTEMS

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

FEDERAL SPECIFICATIONS:

WW-V-54D & Am 3	Valves, Gate, Bronze (125, 150 and 200 Pound; Screwed, Flanged and Solder)
TT-E-489G	Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces)
TT-P-645	Primer, Paint, Zinc-Chromate, Alkyd Type

MILITARY SPECIFICATIONS:

MIL-V-18436C & Am 2	Valves, Check

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI):

B16.3-77	Malleable-Iron Screwed Fittings, 150 and 300 Pounds
B16.9-78	Wrought Steel Butt-Welding Fittings
B16.11-73	Forged Steel Fittings, Socket-Welding and Threaded
B16.18-78	Cast-Bronze Solder-Joint Pressure Fittings
B16.22-73	Wrought Copper and Bronze Solder-Joint Pressure Fittings
B31.1-80	Power Piping

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

A36-77	Structural Steel
A53-78	Welded and Seamless Steel Pipe
A120-80	Black and Hot Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe
B88-80	Seamless Copper Water Tube

STEEL STRUCTURES PAINTING COUNCIL (SSPC):

PS 10.02-64T	Coal Tar Coating System No. 10.02 Cold-Applied Coal Tar Enamel

UNDERWRITERS' LABORATORIES, INC. (UL):

58-76	Steel Underground Tanks for Flammable and Combustible Liquids

MANUFACTURER'S STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS):

SP-58-75	Pipe Hangers and Supports - Materials, Design and Manufacture
SP-69-76	Pipe Hangers and Supports - Selection and Application

1.2 GENERAL REQUIREMENTS: The work includes providing an underground fuel tank, piping for fuel from tank to engine pad, exhaust piping and exhaust piping supports and incidental related work.

PART 2 - PRODUCTS

2.1 FUEL OIL STORAGE TANKS shall be welded steel construction in accordance with NFPA 30 and shall conform to UL 58 for underground tanks, except as indicated otherwise. Underground tanks and hold-down rods shall receive protective coating system in accordance with MIL-F-15147 for a total dry thickness of not less than 0.06-inch. Application of coating shall be in accordance with SSPC-PS-10.02. Tank shall be provided with remote reading fuel gage calibrated in gallons.

2.2 FUEL OIL PIPING: Supply, return, vent and fill piping shall be Schedule 40 black-steel pipe conforming to ASTM A53 or A120; threaded fittings shall conform to ANSI B16.3 or B16.11. Underground steel piping shall receive exterior coal tar coating system in accordance with SSPC-PS-10.02. Vent piping shall be provided with weatherproof vent cap. Supply and return piping may be soft copper tubing conforming to ASTM B88 Type K, with fittings conforming to ANSI B16.18 or B16.22.

2.3 VALVES shall be suitable for fuel oil service.

2.3.1 Gate Valves: WW-V-54, Type III, Class A.

2.3.2 Check Valves: MIL-V-18436, Type I, Class 100.

2.4 ENGINE EXHAUST SYSTEM EXTERNAL TO THE ENGINE:

2.4.1 Stack Support Steel shall conform to ASTM A36.

2.4.2 Exhaust Piping shall be Schedule 40 black-steel pipe conforming to ASTM A53 or A120. Piping two inches and smaller shall have threaded fittings. Piping 2.5 inches and larger shall have welding fittings. Threaded fittings shall conform to ANSI B16.3, Class 300. Welding fittings shall conform to ANSI B16.19 on the same material and weight as the piping in which they are installed. Welding shall be in accordance with ANSI B31.1.

2.4.3 Pipe Hangers and Supports shall be provided and shall conform to MSS SP-58 and SP-69. The finish of pipe hangers and supports shall be zinc or cadmium-plated.

PART 3 - EXECUTION

3.1 STACK PIPING shall be in accordance with ANSI B31.1.

3.2 CONCRETE for tank pad and anchoring stack support shall be 3,000 psi and conform to Section 03300, "Cast-in-Place Concrete".

3.3 EXPOSED structural steel and miscellaneous fasteners shall be painted one prime coat of TT-P-645 and one coat of TT-E-489 following erection.

END OF SECTION

SECTION 16301
UNDERGROUND ELECTRICAL WORK

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI):

C2-81	National Electrical Safety Code (NESC)
C37.42-69(R74)	Distribution Enclosed, Open and Open-link Cutouts
C37.43-69(R74)	Distribution Fuse Cutout Links for Use in Distribution Enclosed, Open, and Open-link Cutouts

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

B1-70(R76)	Hard Drawn Copper Wire
B8-77	Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
D698-78	Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5-lb. (2.49-KG) Rammer and 12-in. (305-MM) Drop

ASSOCIATION OF EDISON ILLUMINATING COMPANIES (AEIC):

CS5-79	Specifications for Polyethylene and Cross-Linked Polyethylene Insulated Shielded Power Cables Rated 5 through 69 kV (6th Edition)
CS6-79	Specifications for Ethylene Propylene Rubber Insulated Shielded Power Cables Rated 5 through 69 kV (3rd Edition)

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC. (IEEE):

48-1975	Standard Test Procedures and Requirements for High Voltage Alternating Current Cable Terminators

NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA):

LA1-76(R80)	Surge Arresters
WC7-71(R76) (REV 8-78)	Standard for Cross-Linked Thermosetting Polyethylene Insulated Wire and Cable for Transmission and Distribution of Electrical Energy (IPCEA S-66-524)
WC8-76(R80)	Ethylene-Propylene-Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy (IPCEA S-68-516)
TC6-1978	PVC and ABS Plastic Utilitirs Duct for Underground Installation
TC9-1978	Fittings for ABS and PVC Plastic Utilities Duct for Underground Installation

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA):

70-81	National Electrical Code (NEC)

UNDERWRITER'S LABORATORIES INC. (UL):

UL-6-76	Rigid Metallic Conduit
UL-510-76	Insulating Tape
UL-514-79	Outlet Boxes and Fittings

1.2 GENERAL REQUIREMENTS: Section 16011, "Electrical General Requirements" applies to this section with additions and modifications specified herein.

1.2.1 Underground Service: Underground service into buildings shall terminate at a point five feet outside the building and projections thereof, except that service conductors shall be continuous to the interior terminating point indicated. Connections of the underground service to the service switch, panelboard or load center is included in Section 16402, "Interior Wiring Systems." Ends of the underground conduit shall be protected by threaded metal caps until connections are made.

1.3 SUBMITTALS REQUIRED:

1.3.1 Manufacturer's Data:

a. Conduit
b. Cutout Switches
c. Insulating Tape
d. High Voltage Cables
e. High Voltage Terminating Kits
f. Lightning Arrestors
g. Terminator
h. Sealing Material for Precast Manhole and Handhole Joints

1.3.2 Manufacturer's Instructions:

a. Manufacturer's directions for use of ground megger with proposed method indicated.
b. Terminator manufacturer's installation instructions.

1.3.3 Certificates:

1.3.3.1 Material and Equipment: Provide manufacturer's statement certifying that the product supplied meets or exceeds contract requirements.

a. High voltage cable.
b. High voltage terminator

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT: Provide materials and equipment listed by UL or approved by Factory Mutual (FM) System, when such equipment is listed or approved.

2.1.1 Conduit: Conduit shall be rigid hot-dipped galvanized steel plastic conforming to the following:

2.1.1.1 Rigid galvanized steel conduit shall conform to the requirements of UL6.

2.1.1.2 Plastic duct for concrete encased burial shall be PVC and shall conform to NEMA TC6, Type EB. Fittings shall conform to NEMA TC9.

2.1.1.3 Outlet boxes for use with steel conduit, rigid or flexible shall be cast-metal cadmium or zinc-coated if of ferrous metal with gasketed closures and shall conform to UL514.

2.1.2 Tape: Plastic insulating tape shall conform to the requirements of UL510.

2.1.3 Wire and Cable:

2.1.3.1 Wire and cable conductor sizes are designated by American Wire Gauge (AWG). Conductor and conduit sizes indicated are for copper conductors, unless otherwise noted. Insulated conductors shall bear the date of manufacture imprinted on the wire insulation with other identification. Wire and cable manufactured more than 12 months before delivery to the job site shall not be used.

2.1.3.2 Conductors rated 600 volts and less, including service entrances, shall conform to UL 854, Type USE. Conductors No. 6 AWG and smaller shall be copper. Conductor size and number of conductors in each cable shall be as indicated. Cable shall be color coded. Conductor identification shall be provided within each enclosure where a tap, splice or termination is made. Conductors No. 6 and smaller shall have factory applied color impregnated insulation. Conductors larger than No. 6 shall be identified with colored nylon cable ties and plastic or heat shrink type sleeves. Control circuit terminations shall be properly identified. Aluminum or copper-clad aluminum conductors may be substituted for copper conductors No. 4 AWG and larger.

208 VOLT SYSTEM	480 VOLT SYSTEM
Neutral - White	Neutral - White
Phase A - Black	Phase A - Brown
Phase B - Red	Phase B - Orange
Phase C - Blue	Phase C - Yellow
Grounding Conductor - Green	Grounding Conductor - Green

2.1.3.3 Cable for 12.47 kV underground distribution system shall be cross linked thermosetting polyethylene insulated cable conforming to NEMA WC7, as applicable and AEIC CS5 or Ozone resistant ethylene propylene rubber insulated cable conforming to NEMA WC8, as applicable and AEIC CS6. Cable shall be single conductor, employing concentric, Class B stranded copper conductor. Cable shall have conductor and insulation shielding. Insulation shielding shall be metal wire type consisting of a concentric serving of wires according to NEMA WC7. Cable shall be rated 15 kV and shall have a polyvinyl chloride jacket.

2.1.4 High Voltage Cable Terminations: Except as otherwise indicated, terminators for solid insulation nonmetallic jacketed cables shall be porcelain insulator type. Terminators shall be applied to single conductor cables or to each conductor of multiple conductor cables, which are exposed to the weather. The terminator and all components shall be the product of one manufacturer and finished in a package or kit form compatible with the insulation and conductor material. The kit shall include complete assembly and installation instructions. Contractor shall supply one complete copy of all manufacturer's instructions and information. The terminator shall comply with all requirements of IEEE 48, Class 1 except that the requirements of design tightness test need not be met. However, the terminator shall not exude any filler compound under either test or service. The terminator shall consist of a porcelain insulator, cable connector-hoodnut assembly and aerial lug as required, metal body and supporting bracket, sealed cable entrance, and internal stress relief device for shielded cable, and insulating filler compound or material.

2.1.5 Pull Wire: Pull wire shall be No. 14 AWG hot-dip galvanized steel, or plastic having a minimum tensile strength of 200 pounds. Minimum 12 inches of slack shall be left at each end of pull wire.

2.1.6 Connectors and Terminals: Connectors and terminals shall be designed and approved for use with the associated conductor material, and shall provide a uniform compression over the entire contact surface. Solderless terminal lugs shall be used on all stranded conductors. For connecting aluminum to copper, connectors shall be the circumferentially compressed, metallurgically bonded type.

2.1.7 Grounding: Grounding and bonding equipment shall conform to UL 467. Ground rods shall be copperweld type copper clad steel with diameter adequate to permit driving to full length of the rod, but not less than 3/4 inch in diameter and 10 feet long unless otherwise indicated.

2.1.8 Ground Wire: Provide soft-drawn copper wire ground conductors to smaller than No. 6 AWG. Ground wire protectors shall be PVC or half round wood molding.

2.1.9 Surge Arresters: Provide valve type surge arresters conforming to NEMA LA1 arranged for crossarm mounting. Rating shall be 9 kV.

2.1.10 Fused Cutouts: Provide heavy duty drop-out fused cutouts rated 100 amperes at 14.4 kV ungrounded, conforming to ANSI C37.42. Provide type k fuses conforming to ANSI C37.43 with ampere ratings as indicated. Open link type fuses and fuse cutouts are not acceptable.

2.1.11 Conduit Risers: Provide rigid galvanized steel conduit conforming to UL 6.

PART 3 - EXECUTION

3.1 INSTALLATION: Underground installation shall conform to ANSI C2 and NFPA 70 except as otherwise specified or indicated.

3.1.1 Contractor Damage: The Contractor shall promptly repair any indicated utility lines or systems damaged by his operations. Damages to lines or systems not indicated, which are caused by his operations shall be treated as "Changes" under the terms of the General Provisions of the contract. If the Contractor is advised in writing of the location of a nonindicated line or system, such notice shall provide that portion of the line or system with "indicated" status in determining liability for damages. In any event, the Contractor shall immediately notify the Contracting Officer of any such damage.

3.1.2 Underground Duct with Concrete Encasement: Underground duct lines shall be constructed of individual conduits encased in concrete. Except where rigid galvanized steel conduit is indicated or specified, the conduit shall be of PVC Type EB. The kind of conduit used shall not be mixed in any one duct bank. Ducts shall not be smaller than 4 inches in diameter unless otherwise indicated. The concrete encasement surrounding the bank shall be rectangular in cross-section and shall provide at least 3 inches of concrete cover for ducts. Conduit shall be separated by a minimum concrete thickness of 2 inches, except that light and power conduits shall be separated from control, signal, and telephone conduits by a minimum concrete thickness of 3 inches.

3.1.2.1 The top of the concrete envelope shall not be less than 24 inches below grade and under railroad tracks not less than 36 inches below grade.

3.1.2.2 Duct lines shall have a continuous slope downward toward underground structures and away from buildings with a pitch of not less than 3 inches in 100 feet. Except at conduit risers, changes in direction of runs exceeding a total of 10 degrees, either vertical or horizontal, shall be accomplished by long sweep bends having a minimum radius of curvature of 25 feet, sweep bends may be made up of one or more curved or straight sections or combinations thereof. Manufactured bends shall have a minimum raduis of 18 inches for use with conduits of less than 3 inches in diameter and a minimum radius of 36 inches for ducts of 3 inches in diameter and larger. Trenches shall be excavated along straight lines from structure to structure before ducts are laid or structure constructed so the elevation can be adjusted, if necessary, to avoid unseen obstruction. Conduit supports and anchors shall be spaced 8 feet on center or as required or directed by the Contracting Officer prior to concrete placement.

3.1.2.3 Conduits shall terminate in end-bells where duct lines enter underground structures. Separators shall be of precast concrete, high impact polystyrene, steel, or any combination of these. The joints of the conduits shall be staggered by rows and layers so as to provide a duct line having the maximum strength. During construction, partially completed duct lines shall be protected from the entrance of debris such as mud, sand and dirt by means of suitable conduit plugs. As each section of a duct line is completed from structure to structure, a testing mandrel not less than 12 inches long with a diameter 1/4 inch less than the size of the conduit, shall be drawn through each conduit, after which a brush having the diameter of the duct, and having stiff bristles shall be drawn through until the conduit is clear of all particles of earth, sand, and gravel; conduit plugs shall then be immediately installed. Provide a plastic pull rope, having 3 feet of spare at each end, in telephone ducts.

3.1.2.4 New conduit indicated as being unused or empty shall be provided with plugs on each end. Plugs shall contain a weephole or screen to allow water drainage.

3.1.2.5 Connections to Concrete Pads: For duct line connections to concrete pads, break an opening in the pad out to the dimensions required and preserve the steel in the pad. Cut the steel and bend it out to tie into the reinforcing of the duct line envelope. Chip out the opening in the pad to form a key for the duct line envelope.

3.1.2.6 Connections to Existing Ducts: Where connections to existing duct lines are indicated, excavate the lines to the maximum depth necessary. The lines shall be cut off and loose concrete removed from the conduits before new concrete encased ducts are installed. A reinforced concrete collar, poured monolithically with the new duct line shall be provided to take the shear at the joint of the duct lines.

3.1.2.7 Partially Completed Duct Lines: During construction wherever a construction joint is necessary in a duct line, prevent debris such as mud, sand, and dirt from entering ducts by providing suitable conduit plugs. Fit concrete envelope of a partially completed duct line with reinforcing steel extending a minimum of two feet back into the envelope and a minimum of two

feet beyond the end of the envelope. Provide one No. 4 bar in each corner, three inches from the edge of the envelope. Secure corner bars with two No. 3 bars, spaced approximately one foot apart, all around. Restrain reinforcing assembly from moving during concrete pouring.

3.1.3 Concrete: Concrete for electrical requirements shall have a compressive strength of 3000 psi at 28 days with one inch maximum aggregate conforming to the requirements of Section 03300, "Cast-In-Place Concrete".

3.1.4 Earthwork: Excavation for underground structures shall be to depths indicated. If hard material is encountered, the provisions of the contract respecting an adjustment for changed conditions shall apply, subject to the requirements of notification thereunder being given. Hard material shall be defined as solid rock, firmly cemented unstratified masses or conglomerate deposits possessing the characteristics of solid rock not ordinarily removed without systematic drilling and blasting, and any boulder, masonry, or concrete (except pavement), exceeding 1/2 cubic yard in volume.

3.1.4.1 Excavated materials not required or suitable for backfill shall be wasted on the project site as directed. Provide sheeting and shoring as necessary for protection of work and safety of personnel. Remove water from excavation by pumping or other approved method.

3.1.4.2 Backfilling around structures shall consist of earth, loam, sandclay, or sand and gravel, free from large clods of earth or stones over one inch in size. Backfill materials shall be placed symmetrically on all sides in loose layers not more than 9 inches deep. Each layer shall be moistened, if necessary, and compacted with mechanical or hand tampers to 90 percent compaction.

3.1.4.3 Backfilling Trenches: Backfill shall be placed in layers not more than 6 inches thick and each layer shall be compacted. Backfilling shall progress as rapidly as the construction, testing, and acceptance of the work permits. Backfill shall be free from roots, wood scrap material, and other vegetable matter and refuse. Compaction of backfill shall be to 90 percent of ASTM D698 density. The first layer shall be earth or sand, free from particles that would be retained on a 1/4-inch sieve and extending not less than 3 inches above the top of the cables. The succeeding layers shall be excavated material having stones no larger than would pass through a 4-inch ring. The backfill may be moistened. The backfill shall be level with the adjacent surface except that in sodded areas a space equal to the thickness of the sod shall be left.

3.1.5 Reconditioning of Surfaces:

3.1.5.1 Unpaved surfaces disturbed during the installation of duct or direct burial cable shall be restored to their original elevation and condition. Sod or topsoil shall be preserved carefully and replaced after the backfilling is completed. Sod that is damaged shall be replaced by sod of quality equal to that removed. Where the surface is disturbed in a newly seeded area, the restored surface shall be reseeded with the same quantity and formula of seed as that used in the original seeding.

3.1.5.2 Paving Repairs: Where trenches, pits or other excavations are made in existing roadways and other areas of pavement where surface treatment of any kind exists, such surface treatment or pavement shall be restored to the same thickness and in the same kind as previously existed, except as otherwise specified, and to match and tie into the adjacent and surrounding existing surfaces in a neat and acceptable manner.

3.2 FIELD TESTS: As an exception to requirements that may be stated elsewhere in the contract, the Contracting Officer shall be given 5 working days notice prior to each test. The Contractor shall provide all labor, equipment and incidentals required for testing, except that the Government will provide electric power required for the tests. All defective material and workmanship disclosed as the result of the tests given herein shall be corrected by the Contractor at no cost to the Government. The Contractor shall show by demonstration in service that all circuits and devices are in good operating condition. Tests shall be such that each item of control equipment will function not less than five times.

3.2.1 Distribution Conductors 600 Volt Class: After wiring is completed and connected ready for operation, but prior to placing systems in service and before any branch circuit breakers are closed, insulation resistance tests shall be made in all circuits. The insulation resistance between conductors and between each conductor and ground shall be measured. Measurements shall be made with an instrument capable of making measurements of an applied potential of 500 volts. Readings shall be taken after the voltage has been appled for a minimum of one minute. The minimum insulation resistance for circuits of No. 10 AWG or larger conductors, a resistance based on the allowable ampacity of the conductor as fixed by NFPA 70 shall be as follows:

25 through 50 amperes	250,000 ohms
51 through 100 amperes	100,000 ohms
101 through 200 amperes	50,000 ohms
201 through 400 amperes	25,000 ohms
401 through 800 amperes	12,000 ohms
Over 800 amperes	5,000 ohms

3.2.2 High Voltage Cables: After installation and before placing in service, cables shall be given a field acceptance test performed by a representative of the Contractor. Prior to testing, the cables shall be disconnected from all equipment. The test procedure shall be in accordance with AEIC and IPCEA/NEMA. Field acceptance test voltage shall be 12.4 KV AC for 5 minutes. Subsequent acceptance tests, required because of failure of cable to pass the initial test, will be performed at the Contractor's expense.

3.2.3 Ground Rods: Test ground rods for ground resistance value before any wire is connected. Ground resistance measurements shall be made in normally dry weather, not less than 48 hours after rainfall. Ground resistance shall also be measured for each piece of equipment to the ground electrode. A portable ground testing megger shall be used to test each ground or group of grounds. The instrument shall be equipped with a meter reading directly in ohms or fractions thereof to indicate the ground value of the ground electrode under test. Provide one copy of the megger manufacturer's directions for use of the ground megger indicating the method to be used.

END OF SECTION

SECTION 16402
INTERIOR WIRING SYSTEMS

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

FEDERAL SPECIFICATIONS (FED. SPEC.):

W-C-375B	Circuit Breaker, Molded Case, Branch-Circuit and Service

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI):

C2-81	National Electrical Safety Code (NESC)
C80.1-1977	Specification for Rigid Steel Conduit, Zinc-coated

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

B1-70(R76)	Hard-Drawn Copper Wire
B8-77	Concentric-Lay-Stranded Copper Conductor, Hard, Medium-Hard, or Soft

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA):

70-1981	National Electrical Code (NEC)

UNDERWRITERS' LABORATORIES, INC. (UL):

50-1980	Cabinets and Boxes
67-1979(R80)	Panelboards
467-72(R79)	Grounding and Bonding Equipment
486A-80	Wire Connectors and Soldering Lugs for Use with Copper Conductors
486B-78(R81)	Wire Connectors for Use with Aluminum Conductors
510-76(R80)	Outlet Boxes and Fittings
1008-77	Automatic Transfer Switches

1.2 GENERAL REQUIREMENTS: Section 16011, "Electrical General Requirements," applies to this section with additions and modifications specified herein. In each of the standards referred to herein, consider the advisory provisions to be mandatory, as though the word "shall" had been substituted for "should" wherever it appears. Interpret reference in these standards to the "authority having jurisdiction," or words of similar meaning, to mean the Contracting Officer.

1.2.1 Underground Service: Underground service into buildings shall terminate at a point 5 feet outside the building and projections thereof, except that service conductors shall be continuous to the interior terminating point indicated. The underground portion of the conduit shall be encased in a concrete envelope having a wall thickness of not less than three inches and shall be buried not less than 24 inches. Where a conduit enters through a

concrete floor, the curved portion shall not be visible above the finished floor and the entire conduit below the floor slab shall be encased in a concrete envelope having a wall thickness of not less than three inches. Ends of the underground conduit shall be protected by threaded metal caps until connections are made. Underground service from 5 feet outside the building to the connection to the existing power system shall be provided under Section 16301, "Underground Electrical Work."

1.3 SUBMITTALS

1.3.1 Manufacturer's Data:

a. Circuit Breakers
b. Switches
c. Conduit Supports
d. Automatic Transfer Switch

1.3.2 Shop Drawings:

a. Panelboards
b. Busway

1.3.3 Certificates of Conformance or Compliance:

a. Conduit (except plastic and IMC)
b. Ground Rods
c. Outlet and Junction Boxes
d. Insulating Tapes
e. Conduit Fittings
f. Conductors

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT: All materials, equipment, and devices shall, as a minimum, meet the requirements of UL where UL Standards are established for those items and the requirements of NFPA-70. All items shall be new unless specified or indicated otherwise.

2.1.1 Coordination: Coordinate new equipment fuses, circuit breakers, relays, and other equipment with existing station equipment. The Contracting Officer will provide the necessary information on existing equipment when requested.

2.1.2 Conduit and Fittings:

2.1.2.1 Rigid Steel Conduit (Zinc-coated): ANSI C80.1.

2.1.2.2 Fittings for Metal Conduit: UL 514. All ferrous fittings shall be cadmium- or zinc-coated per UL 514.

2.1.2.3 Fittings for rigid metal conduit shall be threaded type. Split couplings are not acceptable.

2.1.3 Outlet Boxes and Covers: UL 514, cadmium- or zinc-coated if of ferrous metal.

2.1.4 Cabinets, Junction Boxes, and Pull Boxes (With Volume Greater than 100 Cubic Inches): UL 50, hot-dip zinc-coated if of sheet steel.

2.1.5 Wires and Cables: Wires and cables shall meet the applicable requirements of NFPA 70 and UL for the type of insulation, jacket, and conductor specified or indicated. Unless indicated or specified otherwise, conductor sizes are based on copper. Conductors No. 10 AWG and smaller shall be solid copper. Conductors No. 8 AWG and larger shall be stranded copper.

2.1.6 Automatic Transfer Switch: Shall conform to UL 1008, except as specified otherwise, and shall be rated 800 amperes (for all class of loads) 3 pole for 480 volt, 3 phase, 4 wire normal source and 480 volt, 3 phase, 4 wire emergency source. The transfer switch shall be of the mechanically held type so that once it has transferred to either the normal or emergency position, it does not depend on the application of power to hold it in position. The switch shall be a true double throw switch so that when transferring, the normal and emergency poles cannot both be in a sustained closed position at the same time. All moveable and stationary main contacts, arcing contacts and relay contacts, all coils, spring and control elements shall be so constructed that maintenance and repairs can be easily accomplished.

2.1.6.1 Manual Operator: Shall be provided to allow for transfer in either direction in the event of an electrical failure in the control circuit. A test switch to simulate normal failure shall be provided.

2.1.6.2 Relays: Shall meet NEMA and IEEE standards for industrial type power relays. Relays and controls shall be arranged so that when any phase of the normal source drops to 70 percent or less of rated voltage for an adjustable period of 0 to 3 seconds, the engine-generator shall automatically start. A voltage frequency sensitive relay shall be provided so that the switch will not transfer to the emergency source until the voltage and frequency of this source are within 90 to 95 percent of rated value. The switch shall retransfer to the normal source when all phases have been restored to 90 percent or more of rated voltage for an adjustable period of 0 to 2 minutes. In the event of failure of emergency power during this 0 to 2 minutes period, the switch shall retransfer to normal as soon as all phases of the normal source are restored to 90 percent or more of rated values. The complete transfer time in either direction measured from energization of the operating mechanism to completion of transfer shall not exceed 1/6 second.

2.1.6.3 Main Contacts: Shall be silver surfaced or silver alloy and provided with arc chutes on all poles. Each main contact shall be protected by separate arcing contacts or other provisions to minimize errosion of the main current carrying contacts.

2.1.6.4 Transfer Switch: Shall have a minimum inrush current rating of 20 times rated current and a minimum interrupting capacity of 6 times rated current.

2.1.6.5 Control Circuitry: Shall be provided with necessary contacts to initiate starting controls of the emergency generator.

2.1.6.6 Automatic Transfer Switch: Shall be provided in an unventilated NEMA-3R enclosure. Enclosure shall provide adequate space for all wires and connections.

2.1.6.7 Certified Test Data from a recognized testing laboratory shall be submitted to establish conformance with the requirements specified herein. The test data shall show that tests as listed below have been conducted on a switch of the same amperage rating, with voltages equal to or greater than the voltage specified. Single pole or single phase data will not be acceptable. During testing, normal and emergency sources shall be separated 120 electrical degrees. The required tests, which shall be as specified in UL 1008, are as follows: overload, temperature rise, endurance, withstand current rating (WCR), dielectric breakdown.

2.1.7 Panelboards: UL 67 and UL 50, as applicable. Panelboards for use as service disconnecting means shall additionally conform to UL 869. Panelboards shall be circuit breaker equipped unless indicated otherwise. Design complete panelboard assembly so that any individual breaker can be removed without disturbing adjacent units or without loosening or removing supplemental insulation supplied as a means of obtaining clearances as required by UL. Where "space only" is indicated, make provisions for the future installation of a breaker sized as indicated.

2.1.7.1 Panelboard Buses: Provide copper bus bars supported on bases independent of the circuit breakers. Design main buses and back pans so that breakers may be changed without machining, drilling, or tapping. Provide an insulated neutral bus in each panel for connection of circuit neutral conductors. Provide a separate ground bus marked with a green stripe along its front and bonded to the steel cabinet for connecting grounding conductors.

2.1.7.2 Circuit Breakers: Fed. Spec. W-C-375 (ambient-compensated) thermal magnetic type with interrupting capacity of 10,000 amperes symmetrical minimum. Design breakers to accept copper, copper-clad, and aluminum conductors. Plug-in circuit breakers are not acceptable.

2.1.7.3 Multipole Breakers: Provide common-trip type with a single operating handle. Design breakers so that an overload in one pole automatically causes all poles to open. Maintain phase sequence throughout each panel so that any three adjacent breaker poles are connected to Phases A, B, and C respectively.

2.1.8 Splices and Termination Components: UL 486A and UL 486B, as applicable for wire connectors, and UL 510 for insulating tapes. Connectors for wires No. 10 and smaller shall be insulated pressure-type or wirenut-type. Provide solderless terminal lugs on stranded conductors.

2.1.9 Grounding and Bonding Equipment: UL 467.

2.1.10 Grounding and Bonding Conductors: ASTM B1, solid bare copper wire for sizes No. 8 AWG and smaller; ASTM B8, Class B, stranded bare copper wire for sizes No. 6 AWG and larger. Grounding and bonding conductors shall be insulated type where indicated or specified.

2.1.11 Color coding is required for all service, feeder, branch, control, and signalling circuit conductors. Color shall be white for neutrals and green for grounding conductors. The color of the ungrounded conductors in different voltage systems shall be as follows:

a. 120/208 volt, 3-phase: red, black, and blue
b. 277/480 volt, 3-phase: yellow, brown, and orange
c. 120/240 volt, single phase: red and black

All ungrounded conductors of the same color shall be connected to the same ungrounded feeder conductor.

PART 3 - EXECUTION

3.1 INSTALLATION:

3.1.1 General Requirements: Electrical installations shall conform to the requirements of ANSI C2 and NFPA 70 and to the requirements specified herein. Measure mounting heights specified or indicated to the center of the device or outlet.

3.1.2 Wiring Methods: Wiring method shall be insulated conductors installed in conduit, except where specifically indicated or specified otherwise, or required by NFPA 70 to be installed otherwise. Conduit shall be rigid metal conduit.

3.1.2.1 Underground Conduit: Rigid steel or PVC, type EB and encased in a minimum of 3 inches of concrete.

3.1.2.2 Conduit Installation: Support conduit by pipe straps, wall brackets, 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; 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. The load applied to fasteners shall not exceed one-fourth of the proof test load. Fasteners attached to concrete ceiling shall be vibration and shock resistant. Holes cut to a depth of more than 1-1/2 inches in reinforced concrete beams or to a depth of more than 3/4-inch in concrete joints shall not cut the main reinforcing bars. Fill holes that are not used. In partitions of light steel construction, use sheetmetal screws.

3.1.3 Boxes, Outlets, and Supports: Provide boxes in the wiring or raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Boxes for metallic raceways shall be of the cast-metal hub type when located in normally wet locations, when surface mounted on outside of exterior surfaces, in hazardous areas, and when installed exposed up to 7 feet above interior floors and walkways. Boxes in other locations shall be sheet steel.

3.2 FIELD TESTS: As an exception to requirements that may be stated elsewhere in the contract, the Contracting Officer shall be given 5 working days notice prior to each test.

3.2.1 Devices Subject to Manual Operation: Each device subject to manual operation shall be operated at least five times, demonstrating satisfactory operation each time.

3.2.2 Test on 600-Volt Wiring: Test all 600-volt wiring to verify that no short circuits or accidental grounds exist. Tests shall be made using an instrument which applies a voltage of approximately 500 volts to provide a direct reading of resistance.

3.2.3 Grounding System Test: Test the grounding system to assure continuity and that the resistance to ground is not excessive. Test each ground rod for resistance to ground. Make resistance measurements in normally dry weather, not less than 48 hours after rainfall, and with the ground rod under test isolated from other grounds. Submit written results of each test to the Contracting Officer and indicate the location of the rod as well as the resistance and soil conditions at the time the measurements were made.

END OF SECTION

SECTION 16462
PAD MOUNTED TRANSFORMERS

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

MILITARY SPECIFICATION (MIL. SPEC.):

MIL-P-28641	Primer Coating, Vinyl Chloride-Acetate Copolymer, High-Build (For Steel and Masonry)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI):

C2-81	National Electric Safety Code
C57.12.26-75	Pad-Mounted Compartmental-Type, Self-Cooled, Three-Phase Distribution Transformers, Separable Insulated High-Voltage Connectors; High-Voltage 24,940 GRDY/14400 Volts and Below; 2500 kVA and Smaller
Z35.1-72	Specifications for Accident Prevention Signs

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

D 117-80	Test Method for Electrical Insulating Oils of Petroleum Origin
D 3487-79	Mineral Insulating Oil Used in Electrical Apparatus, Standard Specification for

INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS INC. (IEEE):

386-1977	Separable Insulated Connectors for Power Distribution Systems Above 600 V

1.2 SUBMITTALS:

1.2.1 Catalog Information and Shop Drawings: Indicate ratings, capacity, and detailed arrangement of components.

Pad Mounted Transformer
Separable Insulated High Voltage Connectors

1.2.2 Certificates: (4 copies)

Certified Test Report of Transformer Manufacturer

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT:

2.1.1 Distribution Padmount Compartmental-Type Transformer: The unit shall contain the transformer, primary disconnect, current limiting fusing and separate compartments in a weather resistant, tamper-resistant enclosure, arranged for padlocking. Transformer shall conform to ANSI C57.12.26. . High

voltage and low voltage compartments shall be isolated from each other in a manner to require a separate unlatching or unbolting action to give access to the high voltage compartment. Undercoat the underside of the transformer enclosure including the steel base with a 4 mil thickness of coating conforming to Mil. Spec. MIL-P-28641.

2.1.1.1 Transformer: Dead front, three phase, two winding, 60 Hz, 65 degree C rise, oil insulated, self-cooled type rated 500 kVA capacity, high voltage 12.47 delta primary, with two 2-1/2 full capacity taps above and below rated primary voltage. Basic Insulation Level shall be 95 kV. Low voltage shall be 480/277 volts wye. Impedance shall not be less than 4.1 percent. Transformer tank shall be sealed except for bolted handhole access. Provide lifting lugs. Provide external tap changing for deenergized operation only. Locate the changer control handle within the high voltage compartment and provide position indicator and method of securing the control handle against unintentional operation. Tank Construction: Liquid immersed transformer shall have a sealed tank with a welded-on cover.

2.1.2 Mineral Oil: ASTM D 3487, Type II tested in accordance with ASTM D 117.

2.2 TRANSFORMER PAD: Provide concrete slab foundation 6 inches thick, reinforced by 6-inch by 6-inch number 10 mesh placed uniformly located 3 inches below the top of the slab. Slab shall be placed on a well compacted gravel subbase so that the top is 4 inches above grade. All edges shall have a 1/2-inch chamfer. Pad dimensions shall allow at least 8 inches of free space on all sides of the equipment. Cable entrance space and location shall be as required by the equipment to be mounted.

2.2.1 Concrete For Electrical Requirements: 3000 psi concrete with one-inch maximum aggregate conforming to the requirements of Division 3 of the project specifications.

2.3 HIGH VOLTAGE SEPARABLE CONNECTORS: Terminators shall be provided for single cables as indicated conforming to the requirements of IEEE 386. The manufacturer shall provide all components and at least two copies of complete directions for assembling, and putting the unit into service, one of which shall be submitted for record. Aluminum and copper or copper bearing parts shall not be used in contact with each other in construction or installation. Terminators shall be designed for use with the specific cable and type of installation required.

2.4 GROUND RODS: Ground rods shall be copper clad steel with diameter adequate to permit driving full length to a depth of at least 12 inches below finished grade. Rods shall be not less than 3/4 inch in diameter and not less than 10 feet in length.

2.5 SIGNS; "DANGER HIGH VOLTAGE" signs shall conform to ANSI Z35.1. Letters to be minimum of 3 inches high. Signs to be clearly visible from all accessible sides.

PART 3 - EXECUTION

3.1 INSTALLATION: Pad mounted transformer installation shall conform to the manufacturer's shop drawings and mounting instructions and shall include securing it to the concrete slab by at least four anchor bolts. Completed installation shall conform to the requirements of ANSI C2.

3.2 GROUNDING: Pad mounted transformer without protective fencing shall have all ground pads connected to a solid earth ground using cone pointed driven ground rods as noted under paragraph entitled, Ground Rods. Install as indicated to provide an earth ground having a test resistance of no more than 5 ohms.

3.2.1 Connections: Grounding connections which are buried or otherwise normally inaccessible, and excepting specifically those connections for which access for periodic testing is required, shall be made by thermit weld or by using a compatible mechanical connector and brazing completely over. Thermit welds shall be made strictly in accordance with the weld manufacturer's written recommendations. Welds which have "puffed up" or which show convex surfaces, indicating improper cleaning, are not acceptable. No mechanical connector is required at thermit weldments.

3.3 SIGNS: Install "DANGER HIGH VOLTAGE" signs with tamper-proof screws on each side of pad mounted transformers.

3.4 FIELD TESTS: After the installation has been completed, and the Contracting Officer has been given 5 days notice of the proposed test, the Contractor shall conduct an operating test demonstrating that all equipment and devices operate in accordance with the requirements of the plans and specifications.

3.5 GROUND RODS: Test ground rods for ground resistance value before any wire is connected. A portable ground testing megger shall be used to test each ground rod or group of rods. The instrument shall be equipped with a meter reading directly in ohms or fractions thereof to indicate the ground value of the electrode under test. Provide one copy of the megger manufacturer's directions for use of the ground megger indicating the method to be used.

3.6 TEST REPORTS:

a. Grounding electrodes and systems (identify each ground and give test value).

b. Manufacturer to provide certified test reports in accordance with ANSI C57.12.26. Routine tests are minimum design or other tests as required by the Contracting Officer.

END OF SECTION

SUPERSEDEAS DECISION

STATE: NORTH CAROLINA
COUNTIES: BRUNSWICK, CARTERET, COLUMBUS, CRAVEN, DUPLIN, JONES, LENOIR, NEW HANOVER, ONSLOW, PAMLICO, AND PENDER
DECISION NUMBER: NC81-1201 DATE: DATE OF PUBLICATION
Supersedes Decisions Number NC81-1181, dated January 23, 1981, 46 FR 7745; NC81-1182, dated January 23, 1981, 46 FR 7744; Number NC81-1147, dated December 30, 1980, 45 FR 86200.
DESCRIPTION OF WORK: BUILDING CONSTRUCTION PROJECTS (does not include single family homes and apartments up to and including four stories).

	Basic Hr. Rate	FRINGE BENEFITS PAYMENTS			
		H&W	Pensions	Vacation	Edu and/or Appr. Tr.
Asbestos Workers	$7.26				
Bricklayers	7.10				
Carpenters	6.02				
Cement Masons	5.68				
Drywell Mechanics	7.00				
Electricians	6.22				
Electronic Technicians	4.50				
Glaziers	5.38				
Ironworkers	6.66				
Laborers:					
Laborers - General	3.78				
Pipe Layers	4.94				
Millworkers	9.45				
Painters	5.00				
Plasters	6.00				
Plumbers & Pipefitters	6.52				
Roofers	5.91				
Sheet Metal Workers	6.38				
Soft Floor Layers	7.00				
Sprinkler Fitters	7.95				
Tile Setters	6.00				
Truck Drivers	3.90				
Welders - Rate for Craft					
Power Equipment Operators:					
Asphalt Raker	4.27				
Backhoe	5.32				
Bulldozer	5.25				
Crance	6.80				
Distributor	4.70				
Fork Lift	6.50				
Front End Loader	4.50				
Motor Grader	5.36				
Paver - Screed	4.25				
Roller	5.00				
Scraper - Pan	4.60				
Tractor	5.00				

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