



AMENDMENT NO. 0002 TO ADVERTISED IFB W912DR-04-B-0010  
EFFECTIVE: APR 27, 2004

SOLICITATION:

1) Section 00010, Unit Price Schedule: Delete the Unit Price Schedule in its entirety as originally issued and substitute therefor the attached revised Unit Price Schedule, dated Apr 26, 2004.

SPECIFICATIONS:

2) Project Table Of Contents: Delete the Project Table of Contents in its entirety as originally issued and substitute the attached revised Project Table of Contents, dated Apr 19, 2004.

3) SECTION 01270: Delete SECTION 1270 MEASUREMENT AND PAYMENT in its entirety as originally issued and substitute therefor the attached revised SECTION 1270 MEASUREMENT AND PAYMENT, dated Apr 19, 2004.

4) Section 01330, Submittal Register: Delete the Submittal Register in its entirety as originally issued and substitute the attached revised Submittal Register, dated Apr 19, 2004.

5) Section 01420: Delete SECTION 1420, SOURCES FOR REFERENCE PUBLICATIONS in its entirety as originally issued and substitute the attached revised like-numbered section, dated Apr 19, 2004.

6) SECTION 01510: Delete SECTION 1510 TEMPORARY CONSTRUCTION ITEMS, exclusive of signage sample attachments, as originally issued and substitute therefor the attached revised SECTION 1510 TEMPORARY CONSTRUCTION ITEMS, dated Apr 19, 2004.

7) Section 11281: Immediately after this section, add the attached new Sections 16050N, BASIC ELECTRICAL MATERIALS AND METHODS, 16081N, TESTING, and 16403A, PANELBOARDS.

DRAWINGS:

8) Sheet C-5: Delete this sheet in its entirety as originally issued and substitute the attached revised like-numbered sheet, dated Apr 26, 2004.

9) Sheet G-1, Index of Drawings: Add to the index in appropriate columns "Plate No. 24, Electrical Symbols, Abbreviations, and General Notes, File Name 434E-001.dwg,

AMENDMENT NO. 0002 TO ADVERTISED IFB W912DR-04-B-0010  
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Sheet No. E-1;” and “Plate No. 25, Electrical Panel and Receptacles, File Name 434E-002.dwg, Sheet No. E-2.”

10) Sheet S-1, Structural Details: Add the following sentences to General Note 10: “CONTRACTOR SHALL SURVEY AN INVERT PROFILE OF EACH PIPE, AND MEASURE CROSS SECTIONS AS NECESSARY, TO DETERMINE IF THERE ARE ANY DEVIATIONS TO THE AS-BUILT DIMENSIONS SHOWN IN THE CONTRACT DRAWINGS. THIS LAYOUT SHALL BE SUBMITTED AND APPROVED BY THE CONTRACTING OFFICER PRIOR TO ORDERING ALUMINUM PIPES. BE ADVISED AS A RESULT OF THIS SURVEY THE GOVERNMENT MAY CHANGE THE LOCATION OF PIPES TO BE PLUGGED AND GROUTED. THIS CHANGE WILL BE AT NO ADDITIONAL COST TO THE GOVERNMENT IF IT DOES NOT MOVE THE PLUGGED AND GROUTED PIPES TO SEPARATE PHASES.”

11) Sheets M-1 and M-2: Delete these sheets in their entirety as originally issued and substitute the attached revised like-numbered sheets, dated Apr 26, 2004.

12) Sheet ES-7: Immediately after this sheet add the attached Sheet E-1, Electrical Symbols, Abbreviations, and General Notes; and Sheet E-2, Electrical Panel and Receptacles, both dated Apr 23, 2004.

ATTACHMENTS:

- 1) Revised Unit Price Schedule, dated Apr 26, 2004.
- 2) Revised Project Table of Contents, dated Apr 19, 2004.
- 3) Revised Submittal Register, dated Apr 19, 2004.
- 4) Revised Section 01270, MEASUREMENT AND PAYMENT, dated Apr 19, 2004.
- 5) Revised Section 01420, SOURCES FOR REFERENCE PUBLICATIONS, dated Apr 19, 2004.
- 6) Revised Section 1510, TEMPORARY CONSTRUCTION ITEMS, dated Apr 19, 2004.
- 7) New Section 16050N, BASIC ELECTRICAL MATERIALS AND METHODS.
- 8) New Section 16081N, TESTING.
- 9) New Section 16403A, PANELBOARDS.
- 10) Revised Sheet C-5, dated Apr 26, 2004.
- 11) Revised Sheet M-1, dated Apr 26, 2004.
- 12) Revised Sheet M-2, dated Apr 26, 2004.
- 13) New Sheet E-1, Electrical Symbols, Abbreviations, and General Notes, dated Apr 23, 2004.
- 14) New Sheet E-2, Electrical Panel and Receptacles, dated Apr 23, 2004.

PART I - THE PRICE SCHEDULE  
SECTION 00010 - SUPPLIES OR SERVICES AND PRICES

ATTACHMENT TO ACCOMPANY AMENDMENT NO. 0002 TO IFB W912DR-04-B-0010  
REVISED APR 26, 2004

UNIT PRICE SCHEDULE

Item No.	Description	Estimated Quantity	Unit	Price	Amount
<u>BASE BID</u>					
0001	All costs in connection with Abrahams Creek Diversion Structure Rehabilitation, complete as shown on drawings and specified, but exclusive of work covered in Base Bid Items 0002, 0003 and Optional Bid Item 0004 below. (See Section 01270)	---	JOB	LS	\$_____
0002	Replacement of Paved Levee Ramp (See Section 01270)	765	SY	\$_____	\$_____
0003	Excavation of Existing Downstream Channel (See Section 01270)	163	CY	\$_____	\$_____
TOTAL ESTIMATED BASE BID AMOUNT					\$_____
<u>OPTIONAL ITEM</u>					
0004	Gate Replacement (See Section 01270)	---	JOB	LS	\$_____
TOTAL ESTIMATED BASE AND OPTION BID AMOUNT					\$_____

PART I - THE PRICE SCHEDULE  
SECTION 00010 - SUPPLIES OR SERVICES AND PRICES

NOTES TO BIDDERS

Bidders must bid on all items including the Optional Item. Failure to bid on all items may be cause for rejection of the bid.

The Optional Item may be exercised at any time within 365 calendar days after contract award. The Contracting Officer may exercise the Optional Item by written notice to the Contractor, postmarked within the period specified above. The Government may or may not exercise the Optional Item.

No additional time for contract completion will be allowed when the Optional Item is exercised.

EVALUATION OF OPTIONS. Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interest, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirements. Evaluation of options will not obligate the Government to exercise the option(s). (FAR 52.217-5 JUL 1990)

PROJECT TABLE OF CONTENTS, Apr 19, 2004

DIVISION 01 - GENERAL REQUIREMENTS

01000 ADMINISTRATIVE REQUIREMENTS  
01050 JOB CONDITIONS  
01060 SAFETY  
01200 WARRANTY REQUIREMENT  
01270 MEASUREMENT AND PAYMENT  
01312A QUALITY CONTROL SYSTEM (QCS)  
01320A PROJECT SCHEDULE  
01330 SUBMITTAL PROCEDURES  
01356 STORM WATER POLLUTION PREVENTION MEASURES  
01420 SOURCES FOR REFERENCE PUBLICATIONS  
01451 CONTRACTOR QUALITY CONTROL  
01510 TEMPORARY CONSTRUCTION ITEMS  
01561 ENVIRONMENTAL PROTECTION  
01720 AS-BUILT DRAWINGS - CADD

DIVISION 02 - SITE CONSTRUCTION

02220 DEMOLITION  
02231 CLEARING AND GRUBBING  
02300 EARTHWORK  
02548 BITUMINOUS PAVING  
02630 STORM DRAINAGE  
02921A SEEDING

DIVISION 03 - CONCRETE

03307A CONCRETE FOR MINOR STRUCTURES

DIVISION 04 - Not Used

DIVISION 05 - Not Used

DIVISION 06 - Not Used

DIVISION 07 - Not Used

DIVISION 08 - Not Used

DIVISION 09 - FINISHES

09965A PAINTING: HYDRAULIC STRUCTURES

DIVISION 10 - Not Used

DIVISION 11 - EQUIPMENT

11281 SLUICE GATE MODIFICATION

DIVISION 12 - Not Used

DIVISION 13 - Not Used

DIVISION 14 - Not Used

DIVISION 15 - Not Used

DIVISION 16 - ELECTRICAL

16050N BASIC ELECTRICAL MATERIALS AND METHODS

16081N TESTING

16403A PANELBOARDS

-- End of Project Table of Contents --

# SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION  
 Rehabilitation of Abrahams Creek Diversion Structure, Apr 19, 2004

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION REVIEWER	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01000	SD-01 Preconstruction Submittals														
			Photographs	1.11													
			SD-03 Product Data														
			Cost or Pricing Data	1.5													
			Equipment Data	1.6													
			SD-05 Design Data														
			Progress Schedule	1.2	G AR												
			SD-10 Operation and Maintenance Data														
			O and M Data	1.7													
		01050	SD-01 Preconstruction Submittals														
			Shut Down Utility Services	1.4.3	G AR												
			Checklist	1.4.6	G AR												
			SD-05 Design Data														
			Survey Data	1.1	G AR												
			Quantity Surveys	1.12													
			Traffic Control Plan	1.17.2	G AR												
		01060	SD-01 Preconstruction Submittals														
			Safety Supervisor	1.3	G AR												
			Accident Prevention Plan	1.3	G AR												
			Activity Phase Hazard Analysis Plan	1.3	G AR												
			OSHA Log	1.4.2.1													
			SD-07 Certificates														
			Language Certification	1.3													
		01200	SD-04 Samples														

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		01200	Sample Tags	1.7.1.2													
		01356	SD-07 Certificates														
			Mill Certificate or Affidavit	2.1.3													
		01451	SD-01 Preconstruction Submittals														
			CQC Plan	3.2	G AR												
			Control Phase	3.6.1	G AR												
			SD-05 Design Data														
			Notification of Changes	3.2.4													
			Punchlist	3.8.1													
			Minutes	3.3													
			SD-06 Test Reports														
			Tests	3.7.1													
			Test Reports	3.7.1													
			Documentation	3.9													
			Tests Performed	3.7.1													
		01510	SD-02 Shop Drawings														
			Haul and Access Routes	1.6	G AR												
			Site Plan	1.10	G AR												
			Emergency Bulkhead Plan	1.11	G AR												
			Bulkhead Plan for Gate Replacement	1.12	G AR												
			Survey	1.13	G AR												
		01561	SD-01 Preconstruction Submittals														
			Facility Plan	1.9.4	G AR												
			Temporary Plan	1.9.5	G AR												
		01720	SD-11 Closeout Submittals														

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01720	Preliminary Submittal	1.4	G AR												
			Final Requirements	1.6	G AR												
		02220	SD-07 Certificates														
			Demolition plan	1.9	G AE												
		02231	SD-03 Product Data														
			Nonsaleable Materials	3.6.1	G AR												
		02300	SD-01 Preconstruction Submittals														
			Dewatering Work Plan	1.6	G AR												
		02630	SD-03 Product Data														
			Placing Pipe	3.1													
			SD-04 Samples														
			Pipe for Culverts and Storm Drains	2.1													
		02921A	SD-03 Product Data														
			Equipment	3.1.3													
			Surface Erosion Control Material	2.6													
			Chemical Treatment Material	1.4.3													
			Delivery	1.4.1													
			Finished Grade and Topsoil	3.2.1													
			Topsoil	2.2													
			Quantity Check	3.5													
			Seed Establishment Period	3.8													
			Maintenance Record	3.8.3.4													
			SD-04 Samples														
			Delivered Topsoil	1.4.1.1													
			Soil Amendments	2.3													

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TITLE AND LOCATION Rehabilitation of Abrahams Creek Diversion Structure						CONTRACTOR											
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		02921A	Mulch	2.4													
			SD-06 Test Reports														
			Equipment Calibration	3.1.3													
			Soil Test	3.1.4													
			SD-07 Certificates														
			Seed	2.1	G AR												
			Topsoil	2.2	G AR												
			pH Adjuster	2.3.1	G AR												
			Fertilizer	2.3.2	G AR												
			Organic Material	2.3.4	G AR												
			Soil Conditioner	2.3.5	G AR												
			Mulch	2.4	G AR												
		03307A	SD-03 Product Data														
			Air-Entraining Admixture	2.1.3.1	G AE												
			Accelerating Admixture	2.1.3.2	G AE												
			Water-Reducing or Retarding Admixture	2.1.3.3	G AE												
			Curing Materials	2.1.8	G AE												
			Reinforcing Steel	2.1.5	G AE												
			Batching and Mixing Equipment	3.1.4.3	G AE												
			Conveying and Placing Concrete	3.2	G AE												
			Formwork	2.1.6	G AE												
			SD-06 Test Reports														
			Aggregates	2.1.2	G AE												
			Concrete Mixture Proportions	1.4.3	G AE												
			SD-07 Certificates														

**SUBMITTAL REGISTER**

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
Rehabilitation of Abrahams Creek Diversion Structure																	
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		03307A	Cementitious Materials	2.1.1	G AE												
			Aggregates	2.1.2	G AE												
		09965A	SD-03 Product Data														
			Safety and Health Provisions	1.6	G AE												
			Confined Spaces	1.6.6.1	G AE												
			Respirators	1.6.7.2	G AE												
			Certified Laboratory	1.4.2	G AE												
			Ventilation	1.6.6.1	G AE												
			Medical Status	1.7	G AE												
			Lead-Based Paint Removal	1.7	G AE												
			Environmental Protection	1.9	G AE												
			Waste Classification, Handling, and Disposal	1.9.1	G AE												
			Containment	1.9.2	G AE												
			Visible Emissions Monitoring	1.9.3	G AE												
			PM-10 Monitoring	1.9.4.1	G AE												
			Water Quality	1.9.5	G AE												
			Soil Quality	1.9.6	G AE												
			SD-04 Samples														
			Special Paint Formulas	2.1	G AE												
			Paint Formulations	2.2	G AE												
			Solvent and Thinners	2.3.3	G AE												
			SD-06 Test Reports														
			PM-10 Monitoring	1.9.4.1	G AE												
			TSP Monitoring	1.9.4.2	G AE												
			Certified Laboratory	1.4.2	G AE												

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TITLE AND LOCATION Rehabilitation of Abrahams Creek Diversion Structure						CONTRACTOR											
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		09965A	Soil Quality Inspection	1.9.6	G AE												
			SD-07 Certificates														
			Qualifications	1.4	G AE												
			Qualified Painting Contractor	1.4.3	G AE												
			Qualified Hazardous Paint Removal Contractor	1.4.4	G AE												
			Coating Thickness Gage Qualification	1.4.6	G AE												
		11281	SD-02 Shop Drawings														
			Lay-out drawings and materials.		G AE												
			layout drawings and materials														
		16081N	SD-06 Test Reports														
			Acceptance tests and inspections	1.4.2	G												
			Acceptance tests and inspections	3.1	G												
			SD-07 Certificates														
			Qualifications	1.4.1	G												
			Acceptance test and inspections procedure	1.4.3	G												
		16403A	SD-02 Shop Drawings														
			Drawings		G AE.												
			Shop Drawings		G AE.												
			Panelboards	2.2	G AE.												
			SD-03 Product Data														
			Equipment	1.4	G AE.												
			Factory Tests	2.4													



SECTION 01270, Apr 19, 2004

MEASUREMENT AND PAYMENT  
02/94

## PART 1 GENERAL

## 1.1 SCOPE

This section covers the methods and procedures which will be used to measure the Contractor's work and to effect payment.

## 1.2 GENERAL

The general outline of the principal features of each item as listed does not in any way limit the responsibility of the Contractor for making a thorough investigation of the drawings and specifications to determine the scope of work under the entire contract. Payment to the Contractor of the amounts based on the quantities of work as measured in accordance with the specified methods of measurement and the prices stipulated in the accepted proposal will constitute complete compensation for all work shown on the drawings, provided in the specifications or other Contract Documents and all costs of accepting the general risks, liabilities and obligations expressed or implied. Payment under all items shall include, but not necessarily be limited to, compensation for furnishing all supervision, labor, equipment, materials and services (including overhead and profit), as well as performing all work required to accomplish and complete the work specified under each item and other work required.

## 1.3 LUMP SUM PAYMENT ITEMS

Payment items for the work of this contract for which contract lump sum payments will be made are listed in the BIDDING SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

## 1.3.1 Abrahams Creek Diversion Structure Rehabilitation (Item No. 0001)

No separate measurement shall be made for the rehabilitation of the Abrahams Creek Diversion Structure. Payment for the diversion structure rehabilitation shall be made at the contract lump sum price for the diversion structure rehabilitation, complete. The lump sum price shall include all costs in connection with Abrahams Creek Diversion Structure Rehabilitation, complete as shown on the drawings and specified, but exclusive of work covered in Items 0002, 0003, and 0004 below. The lump sum price for Abrahams Creek Diversion Structure Rehabilitation shall include care and diversion of water during construction, modifications to sluice gates as shown in the schedule on Sheet M-1 of the drawings, replacement of stems and operators, installation of 56 inch pipes, grouting between pipes, plugging two of the pipes, blasting clean and painting the

sluice gates, frames and sheet piles, new structural connection between pipe sleeves and sheet pile, removal and replacement of derrick stone and placing and compacting Type 2A aggregate against sheetpile, removal of debris, installation of concrete apron including the excavation and placement of Type 2A aggregate, armoring the slope and between pipes (including the clearing of existing slope vegetation and excavation of existing riprap), clearing of vegetation, clearing and grubbing, erosion and sediment control, construction and restoration of access roads including stripping of topsoil, and full compensation for all plant, labor, materials, equipment, and all incidental items necessary to complete the work as shown on the drawings. Costs for full compliance with confined space entry shall also be included. Also included in the lump sum price shall be the removal of all debris, sediment and materials within the existing culverts and the area within the limits of work upstream of the culverts, and any required cleaning and preparation of the existing pipes. Construction shall be in accordance with applicable portions of the Specifications and the drawings. Payment shall be made at the lump sum price for Item No. 0001, "Abraham's Creek Diversion Structure Rehabilitation" of the Unit Price Schedule.

#### 1.3.2 Gate Replacement (Optional Item No. 0004)

Payment for the optional gate replacement shall be made at the contract lump sum price for the optional gate replacement, complete. In the event that upon field investigation, it is determined by the Contracting Officer that one of the Gates 3 through 10, or 12 through 14 is in need of replacement, the contractor may opt to replace the gate with either existing Gate 1 or Gate 2, whichever gate is not being used to replace Gate 11. The lump sum price for the optional gate replacement shall include the removal of the gate that is being replaced, the installation of Gate 1 or Gate 2, and any other incidental items necessary to complete the work. The work shall be in accordance with applicable portions of the specifications and the drawings. Payment shall be made at the lump sum price for Item No. 0004, "Gate Replacement" of the Unit Price Schedule.

#### 1.4 UNIT PRICE PAYMENT ITEMS

Payment items for the work of this contract on which the contract unit price payments will be made are listed in the BIDDING SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items.

##### 1.4.1 Replacement of Paved Levee Ramp (Item No. 0002)

###### 1.4.1.1 Payment

Payment will be made for costs associated with excavation and disposal of excavated material from the existing levee ramp, and furnishing, transporting, and placing the proposed pavement section shown on the plans.

###### 1.4.1.2 Measurement

The paved levee ramp will be measured for payment by the square yard, measured at the surface wearing course.

1.4.1.3 Unit of Measure

Unit of measure: square yard.

1.4.2 Excavation of Existing Downstream Channel (Item No. 0003)

1.4.2.1 Payment

Payment will be made for costs associated with excavation for the downstream channel and disposal of excess excavated material.

1.4.2.2 Measurement

The total quantity of excavated material for which payment will be made will be the theoretical quantity between the surveyed existing contours and the top of the existing derrick stone, within the limits shown on the plans. The measurements will include authorized excavation of rock, authorized excavation of unsatisfactory subgrade soil, and the volume of loose, scattered rocks and boulders collected within the limits of the work; allowance will be made on the same basis for selected backfill ordered as replacement. The measurement will not include the volume of subgrade material or other material that is scarified or plowed and reused in-place, and will not include the volume excavated without authorization or the volume of any material used for purposes other than directed. The measurement will not include the volume of any excavation performed prior to the taking of elevations and measurements of the undisturbed grade.

1.4.2.3 Unit of Measure

Unit of measure: cubic yard.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

## SECTION 01420, Apr 19, 2004

SOURCES FOR REFERENCE PUBLICATIONS  
09/03

## PART 1 GENERAL

## 1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization, (e.g. ASTM B 564 Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

## 1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

ACI INTERNATIONAL (ACI)  
P.O. Box 9094  
Farmington Hills, MI 48333-9094  
Ph: 248-848-3700  
Fax: 248-848-3701  
Internet: <http://www.aci-int.org>

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS  
(AASHTO)  
444 North Capital Street, NW, Suite 249  
Washington, DC 20001  
Ph: 202-624-5800  
Fax: 202-624-5806  
Internet: <http://www.aashto.org>  
E-Mail: [info@aaashto.org](mailto:info@aaashto.org)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)  
1819 L Street, NW, 6th Floor  
Washington, DC 20036  
Ph: 202-293-8020  
Fax: 202-293-9287  
E-mail: [info@ansi.org](mailto:info@ansi.org)  
Internet: <http://www.ansi.org/>

Note --- Documents beginning with the letter "S" can be ordered from:

Acoustical Society of America (ASA)  
2 Huntington Quadrangle, Suite 1N01

Melville, NY 11747-4502  
Ph: 516-576-2360  
Fax: 516-576-2377  
Internet: <http://asa.aip.org>  
E-mail: [asa@aip.org](mailto:asa@aip.org)

AMERICAN PETROLEUM INSTITUTE (API)  
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Washington, DC 20005-4070  
Ph: 202-682-8000  
Fax: 202-682-8223  
Internet: <http://www.api.org>

ASME INTERNATIONAL (ASME)  
Three Park Avenue  
New York, NY 10016-5990  
Ph: 212-591-7722  
Fax: 212-591-7674  
E-mail: [infocentral@asme.org](mailto:infocentral@asme.org)  
Internet: <http://www.asme.org>

ASTM INTERNATIONAL (ASTM)  
100 Barr Harbor Drive, P.O. Box C700  
West Conshohocken, PA 19428-2959  
Ph: 610-832-9500  
Fax: 610-832-9555  
E-mail: [service@astm.org](mailto:service@astm.org)  
Internet: <http://www.astm.org>

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)  
445 Hoes Lane  
Piscataway, NJ 08855-1331  
Ph: 732-981-0060  
Fax: 732-981-1712  
Internet: <http://www.ieee.org>  
E-mail: [customer.services@ieee.org](mailto:customer.services@ieee.org)

INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)  
  
P.O. Box 687  
106 Stone Street  
Morrison, CO 80465  
PH: 303-697-8441  
FAX: 303-697-8431  
E-mail: [neta@netaworld.org](mailto:neta@netaworld.org)  
Internet: <http://www.netaworld.org>

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)  
1300 North 17th Street, Suite 1847  
Rosslyn, VA 22209  
Ph: 703-841-3200  
Fax: 703-841-3300  
Internet: <http://www.nema.org/>  
E-mail: [webmaster@nema.org](mailto:webmaster@nema.org)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)  
1 Batterymarch Park  
P.O. Box 9101  
Quincy, MA 02269-9101

Ph: 617-770-3000  
Fax: 617-770-0700  
Internet: <http://www.nfpa.org>  
E-mail: [webmaster@nfpa.org](mailto:webmaster@nfpa.org)

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)  
Mail Stop C-13  
4676 Columbia Parkway  
Cincinnati, OH 45226-1998  
Ph: 800-356-4674  
Fax: 513-533-8573  
E-mail: [pubstaff@cdc.gov](mailto:pubstaff@cdc.gov)  
Internet: <http://www.cdc.gov/niosh/homepage.html>

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (PA DEP)  
16th Floor, Rachel Carson State Office Building  
P.O. Box 2063  
Harrisburg, PA 17105-2063  
Ph: 717-783-2300  
Fax: 717-783-8926  
Internet: <http://www.dep.state.pa.us>  
E-mail: [ra-epaskdep@state.pa.us](mailto:ra-epaskdep@state.pa.us)

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION (PENNDOT)  
Keystone Building  
400 North Street  
Harrisburg, PA 17120  
Ph: 717-787-2838  
Fax: 717-787-1738  
Internet: <http://www.dot.state.pa.us>

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)  
40 24th Street, 6th Floor  
Pittsburgh, PA 15222-4656  
Ph: 412-281-2331  
Fax: 412-281-9992  
Internet: <http://www.sspc.org>

UNDERWRITERS LABORATORIES (UL)  
333 Pfingsten Road  
Northbrook, IL 60062-2096  
Ph: 847-272-8800  
Fax: 847-272-8129  
Internet: <http://www.ul.com/>  
E-mail: [northbrook@us.ul.com](mailto:northbrook@us.ul.com)

U.S. ARMY CORPS OF ENGINEERS (USACE)  
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Vicksburg, MS 39180-6199  
Ph: 601-634-2664  
Fax: 601-634-2388  
E-mail: [mtc-info@erdc.usace.army.mil](mailto:mtc-info@erdc.usace.army.mil)  
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Internet: <http://www.usace.army.mil/publications>  
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U.S. DEPARTMENT OF AGRICULTURE (USDA)  
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AGRICULTURAL MARKETING SERVICE (AMS)  
Seed Regulatory and Testing Branch  
801 Summit Crossing Place, Suite C  
Gastonia, NC 28054-2193  
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Fax: 704-852-4189  
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Order Other Publications from:  
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Ph: 202-720-2791  
Fax: 202-720-2166  
Internet: <http://www.usda.gov>

U.S. GENERAL SERVICES ADMINISTRATION (GSA)  
General Services Administration  
1800 F Street, NW  
Washington, DC 20405  
PH: 202-501-1021

Order from:  
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Arlington, VA 22202  
PH: 703-605-5400  
Internet: <http://apps.fss.gsa.gov/pub/fedspecs/indexcfm>

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)  
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College Park, MD 20740-6001  
Ph: 866-272-6272  
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Fax: 202-512-2250  
E-mail: [gpoinfo@gpo.gov](mailto:gpoinfo@gpo.gov)  
Internet: <http://www.gpo.gov>

-- End of Section --

SECTION 01510, Apr 19, 2004

TEMPORARY CONSTRUCTION ITEMS  
01/01

PART 1 GENERAL

1.1 REFERENCES

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

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION (PENNDOT)

Publication 408 (2003) PENNDOT Construction Specifications

1.2 GENERAL

The work covered by this section consists of furnishing all labor, materials, equipment, and services and performing all work required for or incidental to the items herein specified. No separate payment will be made for the construction and services required by this section, and all costs in connection therewith shall be included in the overall cost of the work unless specifically stated otherwise.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Haul and Access Routes; G AR.

Drawings and narrative showing routes to the site.

Site Plan; G AR.

Site plan showing the Contractor's fenced areas as specified in this section.

Emergency Bulkhead Plan; G AR.

Emergency Bulkhead plan outlining the Contractor's procedure for emergency flood protection as specified in this section.

Bulkhead Plan for Gate Replacement; G AR.

Bulkhead plan outlining the Contractor's procedure for diverting water as specified in this section.

Survey; G AR.

Invert profile survey of pipes, as specified in this section.

#### 1.4 PROJECT SIGN: (JUN 1994)

A project sign shall be provided and erected at a location designated by the Contracting Officer. The sign shall be erected as soon as possible and within 15 days after the date of receipt of notice to proceed.

Upon completion of the project, the sign shall be removed and disposed of by the Contractor. (CENAB)

#### 1.5 SAFETY SIGN (JUN 1994)

A safety sign shall be provided and erected at a location designated by the Contracting Officer. The sign shall be erected as soon as possible and within 15 days after the date of receipt of notice to proceed. (CENAB)

#### 1.6 ACCESS ROADS (1967)

The Contractor shall, at his expense, construct such haul and access routes as shown on the plans. Access roads shall be constructed to the minimum width and length shown on the drawings. Topsoil shall be stripped prior to placement of the rock. Rock shall be AASHTO No. 1 as specified in PENNDOT Publication 408, Section 703.2. The thickness of the road shall be no less than 8 inches. For installation in clay or poorly drained soils, a geotextile fabric underlayment of a type recommended for such applications by the manufacturer shall be used. Access roads shall be constructed in a workmanlike manner with suitable grades and widths. Sharp curves, blind corners, and dangerous cross traffic shall be avoided. The Contractor shall provide all necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control although optional shall be adequate to insure safe operation at all times. Location, grade, width, and alignment of construction and access roads shall be subject to approval of the Contracting Officer. Lighting shall be adequate to assure full and clear visibility for full width of access and work areas during any night work operations. Upon completion of the work, access roads shall remain in place above the normal water flow limits.

#### 1.7 PLANT COMMUNICATION (JAN 63)

Whenever the Contractor has the individual elements of his plant so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices. The facilities shall be made available for use by Government personnel. (CENAB)

#### 1.8 SAND BAG DIVERSION

The Contractor shall erect and maintain temporary sandbag diversions as shown on the plans. The diversions should be installed from upstream to downstream. The stream bed should be hand prepared prior to the base layer of sandbags in order to ensure a water tight fit. Sandbags should consist of materials which are resistant to ultra-violet radiation, tearing and puncture and should be woven tightly enough to prevent leakage of the fill material. Sheeting on the diversion should be positioned such that the upstream portion covers the downstream portion with at least and 18 inch overlap. Sheeting should consist of polyethylene or other materials which are impervious and resistant to puncture and tearing.

### 1.9 TEMPORARY STREAM CROSSING ACCESS ROADS

The Contractor shall erect and maintain temporary stone access roads as shown on the plans. The roads shall consist of AASHTO #1 aggregate and each road shall allow passage of base flow of Abrahams Creek by way of eight 42 inch corrugated metal pipes, as shown on the plans.

### 1.10 SITE PLAN

Contractor staging areas shall be as shown on drawings or as directed by the Contracting Officer. The Contractor shall prepare a site plan showing fencing, the number of and location of trailers to be used, avenues of ingress/egress to the fenced area and details of the fence installation. Any areas which may have to be graveled to prevent the tracking of mud shall also be identified.

### 1.11 EMERGENCY BULKHEAD PLAN

In order to prevent upstream flooding, the contractor shall prepare an emergency bulkhead plan. This plan shall outline the contractor's procedure for bulkheading the downstream end of pipes in the event that a flood event occurs at some point during construction where it is determined that the gates must be closed, and one or more of the gates is not operable.

### 1.12 BULKHEAD PLAN FOR GATE REPLACEMENT

The contractor shall prepare a bulkhead plan for gate replacement. This plan shall outline the contractor's procedure for bulkheading the upstream end of Pipes No. 1 and/or 2 in order to divert water and thereby facilitate the removal of Gates No. 1 and/or 2 during Phase 1 of construction.

### 1.13 SURVEY

The contractor shall survey an invert profile of each pipe, and measure cross section as necessary, to determine if there are any deviations to the as-built dimensions shown in the contract drawings. This layout shall be submitted and approved by the contracting officer prior to ordering aluminum pipes. Be advised as a result of this survey the government may change the location of pipes to be plugged and grouted. This change will be at no additional cost to the government if it does not move the plugged and grouted pipes to separate phases.

### 1.14 EMPLOYEE PARKING

Contractor employees shall park privately owned vehicles in areas designated by the Contracting Officer. Areas will be within reasonable walking distance of the construction site. Contractor employee parking shall not interfere with local residences or businesses.

### 1.15 CONTRACTOR'S TEMPORARY FACILITIES

#### 1.15.1 Administrative Field Offices

The Contractor shall provide and maintain administrative field office facilities at a location designated by the Contracting Officer. Government or private office and warehouse facilities will not be available to the Contractor's personnel.

### 1.15.2 Storage and Staging Areas

Storage and staging areas shall be as shown on drawings or as directed by the Contracting Officer. Trailers, equipment, or materials shall not be open to public view with the exception of those items which are in support of ongoing work on any given day. Unless otherwise approved by the Contracting Officer, mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment, shall be parked within the staging area at the end of each work day.

### 1.15.3 Appearance of Trailers

Trailers utilized by the Contractor for administrative or material storage purposes shall present a clean and neat exterior appearance and shall be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed.

### 1.15.4 Maintenance of Storage Area

Fencing shall be kept in a state of good repair and proper alignment. Should the Contractor elect to traverse, with construction equipment or other vehicles, grassed or unpaved areas which are not established roadways, such areas shall be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways; gravel gradation shall be at the Contractor's discretion. Grass located within the boundaries of the construction site shall be mowed for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers shall be edged or trimmed neatly.

### 1.15.5 Security Provisions

Adequate approved outside security lighting shall be provided at the Contractor's temporary facilities. The Contractor shall be responsible for the security of its own equipment; in addition, the Contractor shall notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

### 1.15.6 Restoration of Storage Areas

Upon completion of the project and after removal of trailers, materials, and equipment from within the fenced area, the fence shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition. Gravel used to traverse grassed areas shall be removed and the area restored to its original condition, including top soil and seeding as necessary.

PART 2 PRODUCT  
NOT APPLICABLE

PART 3 EXECUTION  
NOT APPLICABLE

ATTACHMENTS:

Attachment 1 Project Sign

Attachment 2 Safety Sign

-- End of Section --

## SECTION 16050N

## BASIC ELECTRICAL MATERIALS AND METHODS

02/03

## PART 1 GENERAL

## 1.1 REFERENCES

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

## ASTM INTERNATIONAL (ASTM)

ASTM D 709 (2001) Laminated Thermosetting Materials

## INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE Std 100 (2000) Dictionary of Electrical and Electronics Terms (IEEE)

IEEE Std 81 (1983) Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System (Part 1) Normal Measurements (IEEE)

IEEE C2 (2002) National Electrical Safety Code (IEEE)

## NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 6 (1993; R 2001) Industrial Control and Systems: Enclosures

NEMA WD 6 (2002) Dimensional Requirements for Wiring Devices

NEMA WD 1 (1999) General Requirements for Wiring Devices

## NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2002) National Electrical Code

## UNDERWRITERS LABORATORIES (UL)

UL 467 (1993; Rev thru Feb. 2001) Grounding and Bonding Equipment

UL 943 (1993; Rev thru Apr. 2002) Ground-Fault Circuit-Interrupters

## U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.147 The Control of Hazardous Energy (Lockout/Target)

## 1.2 RELATED REQUIREMENTS

This section applies to all sections of Division 16, "Electrical," of this project specification unless specified otherwise in the individual sections.

## 1.3 DEFINITIONS

- a. Unless otherwise specified or indicated, electrical and electronics terms used in these specifications, and on the drawings, shall be as defined in IEEE Std 100.
- b. The technical sections referred to herein are those specification sections that describe products, installation procedures, and equipment operations and that refer to this section for detailed description of submittal types.
- c. The technical paragraphs referred to herein are those paragraphs in PART 2 - PRODUCTS and PART 3 - EXECUTION of the technical sections that describe products, systems, installation procedures, equipment, and test methods.

## 1.4 ELECTRICAL CHARACTERISTICS

Electrical characteristics for this project shall be 240 volts secondary, single phase, three wire. Final connections to the power distribution system at the existing pole shall be made by the Contractor as directed by the Contracting Officer.

## 1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

Submittals required in the sections which refer to this section must also conform to the following additional requirements. Submittals shall include the manufacturer's name, trade name, place of manufacture, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and technical paragraph reference. Submittals shall also include applicable federal, military, industry, and technical society publication references, and years of satisfactory service, and other information necessary to establish contract compliance of each item to be provided. Photographs of existing installations are unacceptable and will be returned without approval.

### 1.5.1 Manufacturer's Catalog Data

Submittals for each manufactured item shall be current manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts. Handwritten and typed modifications and other notations not part of the manufacturer's preprinted data will result in the rejection of the submittal. Should manufacturer's data require supplemental information for clarification, the supplemental information shall be submitted as specified for certificates of compliance.

### 1.5.2 Drawings

Submit drawings a minimum of 14 by 20 inches in size using a minimum scale of 1/8 inch per foot. Include wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, panel, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation. Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices.

### 1.5.3 Instructions

Where installation procedures or part of the installation procedures are required to be in accordance with manufacturer's instructions, submit printed copies of those instructions prior to installation. Installation of the item shall not proceed until manufacturer's instructions are received. Failure to submit manufacturer's instructions shall be cause for rejection of the equipment or material.

### 1.5.4 Certificates

Submit manufacturer's certifications as required for products, materials, finishes, and equipment as specified in the technical sections. Certificates from material suppliers are not acceptable. Preprinted certifications and copies of previously submitted documents will not be acceptable. The manufacturer's certifications shall name the appropriate products, equipment, or materials and the publication specified as controlling the quality of that item. Certification shall not contain statements to imply that the item does not meet requirements specified, such as "as good as"; "achieve the same end use and results as materials formulated in accordance with the referenced publications"; or "equal or exceed the service and performance of the specified material." Certifications shall simply state that the item conforms to the requirements specified. Certificates shall be printed on the manufacturer's letterhead and shall be signed by the manufacturer's official authorized to sign certificates of compliance.

#### 1.5.4.1 Reference Standard Compliance

Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance.

#### 1.5.4.2 Independent Testing Organization Certificate

In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Contracting Officer. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

### 1.5.5 Operation and Maintenance Manuals

#### 1.5.5.1 Operating Instructions

Submit text of posted operating instructions for each system and principal item of equipment as specified in the technical sections.

### 1.6 QUALITY ASSURANCE

#### 1.6.1 Material and Equipment Qualifications

Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in the technical section.

#### 1.6.2 Regulatory Requirements

Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70.

#### 1.6.3 Alternative Qualifications

Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.

#### 1.6.4 Service Support

The equipment items shall be supported by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

#### 1.6.5 Manufacturer's Nameplate

Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

#### 1.6.6 Modification of References

In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Contracting Officer.

#### 1.6.7 Material and Equipment Manufacturing Date

Products manufactured more than 3 years prior to date of delivery to site shall not be used, unless specified otherwise.

#### 1.7 POSTED OPERATING INSTRUCTIONS

Provide for each system and principal item of equipment as specified in the technical sections for use by operation and maintenance personnel. The operating instructions shall include the following:

- a. Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
- b. Start up, proper adjustment, operating, lubrication, and shutdown procedures.
- c. Safety precautions.
- d. The procedure in the event of equipment failure.
- e. Other items of instruction as recommended by the manufacturer of each system or item of equipment.

Print or engrave operating instructions and frame under glass or in approved laminated plastic. Post instructions where directed. For operating instructions exposed to the weather, provide weather-resistant materials or weatherproof enclosures. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

#### 1.8 NAMEPLATES

ASTM D 709. Provide laminated plastic nameplates for each panelboard, equipment enclosure, relay, switch, and device; as specified in the technical sections or as indicated on the drawings. Each nameplate inscription shall identify the function and, when applicable, the position.

Nameplates shall be melamine plastic, 0.125 inch thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be one by 2.5 inches. Lettering shall be a minimum of 0.25 inch high normal block style.

#### 1.9 CABLE TAGS IN MANHOLES, HANDHOLES, AND VAULTS

##### 1.9.1 Polyethylene Cable Tags

Provide tags of polyethylene that have an average tensile strength of 3250 pounds per square inch; and that are 0.08 inch thick (minimum), non-corrosive non-conductive; resistive to acids, alkalis, organic solvents, and salt water; and distortion resistant to 170 degrees F. Provide 0.05 inch (minimum) thick black polyethylene tag holder. Provide a one-piece nylon, self-locking tie at each end of the cable tag. Ties shall have a minimum loop tensile strength of 175 pounds. The cable tags shall have black block letters, numbers, and symbols one inch high on a yellow background. Letters, numbers, and symbols shall not fall off or change positions regardless of the cable tags' orientation.

### 1.9.2 Lead Cable Tags

Provide tags of virgin sheet lead, one-piece wraparound strap type, slotted on one end for attaching the strap. Minimum size of tags shall be one inch wide by 3/64 inch thick and a length sufficient for die stamping the identification on one line and banding around the cable or wire, but not less than 10 inches long. Tags shall be die stamped with numbers, letters, and symbols not less than 0.25 inch high and approximately 0.015 inch deep in normal block style.

### 1.10 ELECTRICAL REQUIREMENTS

Electrical installations shall conform to IEEE C2, NFPA 70, and requirements specified herein.

### 1.11 INSTRUCTION TO GOVERNMENT PERSONNEL

Where specified in the technical sections, furnish the services of competent instructors to give full instruction to designated Government personnel in the adjustment, operation, and maintenance of the specified systems and equipment, including pertinent safety requirements as required. Instructors shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Government for regular operation. The number of man-days (8 hours per day) of instruction furnished shall be as specified in the individual section.

### 1.12 LOCKOUT REQUIREMENTS

Provide disconnecting means capable of being locked out for machines and other equipment to prevent unexpected startup or release of stored energy in accordance with 29 CFR 1910.147. Mechanical isolation of machines and other equipment shall be in accordance with requirements of Division 15, "Mechanical."

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

### 3.1 GROUNDING

Grounding shall be in conformance with NFPA 70, the contract drawings, and the following specifications.

#### 3.1.1 Ground Rods

The resistance to ground shall be measured using the fall-of-potential method described in IEEE Std 81. The maximum resistance of a driven ground shall not exceed 25 ohms under normally dry conditions. If this resistance cannot be obtained with a single rod, additional rods not less than 6 feet on centers shall be added. In high-ground-resistance, UL listed chemically charged ground rods may be used. If the resultant resistance exceeds 25 ohms measured not less than 48 hours after rainfall, the Contracting Officer shall be notified immediately. Connections below grade shall be fusion welded. Connections above grade shall be fusion welded or shall use UL 467 approved connectors.

### 3.2 RECEPTACLES

#### 3.2.1 Heavy Duty Grade

NEMA WD 1. Devices shall conform to all requirements for heavy duty receptacles.

#### 3.2.2 Ground Fault Interrupters

UL 943, Class A or B.

#### 3.2.3 NEMA Standard Receptacle Configurations

NEMA WD 6.

- a. Single and Duplex, 20-Ampere, 125 Volt

20-ampere, non-locking: NEMA type 5-20R.

### 3.3 PAINTING OF EQUIPMENT

#### 3.3.1 Factory Applied

Electrical equipment shall have factory-applied painting systems which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test.

#### 3.3.2 Field Applied

Paint electrical equipment as required to match finish of adjacent surfaces or to meet the indicated or specified safety criteria. Painting shall be as specified in the section specifying the associated electrical equipment.

### 3.4 NAMEPLATE MOUNTING

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

### 3.5 WARNING SIGN MOUNTING

Provide the number of signs required to be readable from each accessible side, but space the signs a maximum of 30 feet apart.

### 3.6 CABLE TAG INSTALLATION

Install cable tags in each manhole, handhole, and vault as specified, including each splice. Install cable tags over the fireproofing, if any, and locate the tags so that they are clearly visible without disturbing any cabling or wiring in the manholes, handholes, and vaults.

-- End of Section --

## SECTION 16081N

## TESTING

02/03

## PART 1 GENERAL

## 1.1 REFERENCES

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

## INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)

NETA ATS (2003) Acceptance Testing Specifications

## 1.2 RELATED REQUIREMENTS

Section 16050N, BASIC ELECTRICAL MATERIALS AND METHODS applies to this section with additions and modifications specified herein.

## 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

## SD-06 Test Reports

Acceptance tests and inspections; G

## SD-07 Certificates

Qualifications of organization, and lead engineering technician; G

Acceptance test and inspections procedure; G

## 1.4 QUALITY ASSURANCE

## 1.4.1 Qualifications

Contractor shall engage the services of a qualified testing organization to provide inspection, testing, calibration, and adjustment of the electrical distribution system and generation equipment listed in paragraph entitled "Acceptance Tests and Inspections" herein. Organization shall be independent of the supplier, manufacturer, and installer of the equipment.

The organization shall be a first tier subcontractor. No work required by this section of the specification shall be performed by a second tier subcontractor.

- a. Submit name and qualifications of organization. Organization shall have been regularly engaged in the testing of electrical materials, devices, installations, and systems for a minimum of 5 years. The organization shall have a calibration program, and

test instruments used shall be calibrated in accordance with NETA ATS.

- b. Submit name and qualifications of the lead engineering technician performing the required testing services. Include a list of three comparable jobs performed by the technician with specific names and telephone numbers for reference. Testing, inspection, calibration, and adjustments shall be performed by an engineering technician, certified by NETA or the National Institute for Certification in Engineering Technologies (NICET) with a minimum of 5 years' experience inspecting, testing, and calibrating electrical distribution and generation equipment, systems, and devices.

#### 1.4.2 Acceptance Tests and Inspections Reports

Submit certified copies of inspection reports and test reports. Reports shall include certification of compliance with specified requirements, identify deficiencies, and recommend corrective action when appropriate. Type and neatly bind test reports to form a part of the final record. Submit test reports documenting the results of each test not more than 10 days after test is completed.

#### 1.4.3 Acceptance Test and Inspections Procedure

Submit test procedure reports for each item of equipment to be field tested at least 45 days prior to planned testing date. Do not perform testing until after test procedure has been approved.

### PART 2 PRODUCTS

Not used.

### PART 3 EXECUTION

#### 3.1 ACCEPTANCE TESTS AND INSPECTIONS

Testing organization shall perform acceptance tests and inspections. Test methods, procedures, and test values shall be performed and evaluated in accordance with NETA ATS, the manufacturer's recommendations, and paragraph entitled "Field Quality Control" of each applicable specification section. Tests identified as optional in NETA ATS are not required unless otherwise specified. Equipment shall be placed in service only after completion of required tests and evaluation of the test results have been completed. Contractor shall supply to the testing organization complete sets of shop drawings, settings of adjustable devices, and other information necessary for an accurate test and inspection of the system prior to the performance of any final testing. Contracting Officer shall be notified at least 14 days in advance of when tests will be conducted by the testing organization. Perform acceptance tests and inspections on applicable equipment and systems specified in the following section:

- a. Section 16403A, "PANELBOARDS".

#### 3.2 SYSTEM ACCEPTANCE

Final acceptance of the system is contingent upon satisfactory completion of acceptance tests and inspections.

3.3 PLACING EQUIPMENT IN SERVICE

A representative of the approved testing organization shall be present when equipment tested by the organization is initially energized and placed in service.

-- End of Section --

## SECTION 16403A

## PANELBOARDS

11/03

## PART 1 GENERAL

## 1.1 REFERENCES

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

## ASTM INTERNATIONAL (ASTM)

ASTM B 187/B 187M (2002) Copper, Bus Bar, Rod and General Purpose Rod, Bar and Shapes

## ASME INTERNATIONAL (ASME)

ASME B1.1 (1989; R 2001) Unified Inch Screw Threads (UN and UNR Thread Form)

ASME B1.20.1 (1983; R 2001) Pipe Threads, General Purpose, Inch

## NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA AB 1 (2002) Molded-Case Circuit Breakers, Molded Case Switches, and Circuit-Breaker Enclosures

NEMA PB 1 (2000) Panelboards

## NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2002) National Electrical Code

## UNDERWRITERS LABORATORIES (UL)

UL 44 (1999; Rev thru May 2002) Thermoset-Insulated Wires and Cables

UL 50 (1995; Rev thru Nov 1999) Enclosures for Electrical Equipment

UL 67 (1993; Rev thru Feb 2003) Panelboards

UL 489 (2002; Rev thru May 2003) Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit Breaker Enclosures

UL 1063 (1998; Rev thru Nov 2001) Machine-Tool Wires and Cables

## 1.2 SYSTEM DESCRIPTION

These specifications include the design, fabrication, assembly, wiring, testing, and delivery of an electrical panelboard, accessories and spare parts as shown on the drawings.

### 1.2.1 Rules

The equipment shall conform to the requirements of NFPA 70 unless more stringent requirements are indicated herein or shown. NEMA rated and UL listed equipment has been specified when available. Equipment must meet NEMA and UL construction and rating requirements as specified. No equivalent will be acceptable. The contractor shall immediately notify the Contracting Officer of any requirements of the specifications or contractor proposed materials or assemblies that do not comply with UL or NEMA. International Electrotechnical Commission (IEC) rated equipment will not be considered an acceptable alternative to specified NEMA ratings.

### 1.2.2 Coordination

The general arrangement of the panelboard is shown on the contract drawings. Any modifications of the equipment arrangement or device requirements as shown on the drawings shall be subject to the approval of the Contracting Officer. If any conflicts occur necessitating departures from the drawings, details of and reasons for departures shall be submitted and approved prior to implementing any change. All equipment shall be completely assembled at the factory.

### 1.2.3 Standard Products

Material and equipment shall be standard products of a manufacturer regularly engaged in their manufacture and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. All materials shall conform to the requirements of these specifications. Materials shall be of high quality, free from defects and imperfections, of recent manufacture, and of the classification and grades designated. All materials, supplies, and articles not manufactured by the Contractor shall be the products of other recognized reputable manufacturers. If the Contractor desires for any reason to deviate from the standards designated in these specifications, he shall, after award, submit a statement of the exact nature of the deviation, and shall submit, for the approval of the Contracting Officer, complete specifications for the materials which he proposes to use.

### 1.2.4 Nameplates

Nameplates shall be made of laminated sheet plastic or of anodized aluminum approximately 1/8 inch thick, engraved to provide white letters on a black background. The nameplates shall be fastened to the panel in proper positions with anodized round-head screws. Lettering shall be minimum 1/2 inch high. Nameplate designations shall be in accordance with lists on the drawings, and as a minimum shall be provided for the following equipment:

- a. Panelboards
- b. Individually-mounted circuit breakers in Panelboard

## 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

## SD-02 Shop Drawings

Drawings; G AE.  
Shop Drawings; G AE.

The Contractor shall, within 30 calendar days after date of award, submit for the approval of the Contracting Officer six (6) copies of outline drawings of all equipment to be furnished under this contract, together with weights and overall dimensions. Drawings shall show the general arrangement and overall dimensions of the panelboard. These drawings shall show space requirements, details of any floor supports to be embedded in concrete and provisions for conduits for external cables.

Panelboards; G AE.

The Contractor shall, within 30 calendar days after date of award, submit for the approval of the Contracting Officer six (6) copies of electrical equipment drawings. A single-line diagram, equipment list and nameplate schedule shall be provided for the panelboard.

## SD-03 Product Data

Equipment; G AE.

The Contractor shall, within 30 calendar days after date of award, submit for approval six (6) copies of such descriptive cuts and information as are required to demonstrate fully that all parts of the equipment will conform to the requirements and intent of the specifications. Data shall include descriptive data showing typical construction of the types of equipment proposed, including the manufacturer's name, type of molded case circuit breakers or motor circuit protectors, performance capacities and other information pertaining to the equipment. Six (6) sets of characteristic curves of the individual breaker trip element shall be submitted.

Factory Tests

The Contractor shall submit, within a minimum of 14 days prior to the proposed date of tests, six (6) copies of manufacturer's routine factory test procedures and production line tests for the panelboard.

## SD-06 Test Reports

Factory Tests

The Contractor shall submit six (6) complete reproducible copies of the factory inspection results and six (6) complete reproducible copies of the factory test results in booklet form, including all plotted data curves, all test conditions, a listing of test equipment complete with calibration certifications, and all measurements taken. Report shall be signed and dated by the Contractor's and Contracting Officer's Representatives.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

The equipment shall be shipped as completely assembled and wired as feasible so as to require a minimum of installation work. Each shipping section shall be properly match marked to facilitate reassembly, and shall be provided with removable lifting channels with eye bolts for attachment of crane slings to facilitate lifting and handling. Any relay or other device which cannot withstand the hazards of shipment when mounted in place on the equipment shall be carefully packed and shipped separately. These devices shall be marked with the number of the panel which they are to be mounted on and fully identified. All finished painted surfaces and metal work shall be wrapped suitably or otherwise protected from damage during shipment. All parts shall be prepared for shipment so that slings for handling may be attached readily while the parts are in a railway car or transport truck.

### PART 2 PRODUCTS

#### 2.1 MOLDED CASE CIRCUIT BREAKERS

##### 2.1.1 120/240-Volt AC Circuits

Circuit breakers for 120-volt ac circuits shall be rated not less than 120/240 or 240 volts ac, and shall have a UL listed minimum interrupting capacity of 10,000 symmetrical amperes.

#### 2.2 PANELBOARDS

Panelboards shall consist of assemblies of circuit breakers with buses and terminal lugs for the control and protection of branch circuits to motors, heating devices and other equipment operating at 480 volts ac or less. Panelboards shall be UL 67 labeled. "Loadcenter" type panels are not acceptable. Panelboards shall be designed for installation in surface-mounted or flush-mounted cabinets accessible from the front only, as shown on the drawings.

##### 2.2.1 Enclosure

Enclosures shall meet the requirements of UL 50. All cabinets shall be fabricated from sheet steel of not less than No 10 gage. Cabinets shall be hot-dipped galvanized after fabrication. Cabinets shall be painted in accordance with paragraph PAINTING. Outdoor cabinets shall be of NEMA 3R raintight and conduit hubs welded to the cabinet. Front edges of cabinets shall be form-flanged or fitted with structural shapes welded or riveted to the sheet steel, for supporting the panelboard front. All cabinets shall be so fabricated that no part of any surface on the finished cabinet shall deviate from a true plane by more than 1/8 inch. Holes shall be provided in the back of indoor surface-mounted cabinets, with outside spacers and inside stiffeners, for mounting the cabinets with a 1/2 inch clear space between the back of the cabinet and the wall surface. Flush doors shall be mounted on hinges that expose only the hinge roll to view when the door is

closed. Each door shall be fitted with a combined catch and lock, except that doors over 24 inches long shall be provided with a three-point latch having a knob with a T-handle, and a cylinder lock. Two keys shall be provided with each lock, and all locks shall be keyed alike. Finished-head cap screws shall be provided for mounting the panelboard fronts on the cabinets. Enclosure shall have nameplates in accordance with paragraph NAMEPLATES. Directory holders, containing a neatly typed or printed directory under a transparent cover, shall be provided on the inside of panelboard doors.

#### 2.2.2 Buses

All panelboards shall be of the dead-front type with buses and circuit breakers mounted on a plate or base for installation as a unit in a cabinet. All buses shall be of copper. Copper bars and shapes for bus conductors shall conform to the applicable requirements of ASTM B 187/B 187M.

The sizes of buses and the details of panelboard construction shall meet or exceed the requirements of NEMA PB 1. Suitable provisions shall be made for mounting the bus within panelboards and adjusting their positions in the cabinets. Terminal lugs required to accommodate the conductor sizes shown on the drawing, shall be provided for all branch circuits larger than No. 10 AWG. A grounding lug suitable for 1/0 AWG wire shall be provided for the panelboard.

#### 2.2.3 Components

Each branch circuit, and the main buses where so specified or shown on the drawings, shall be equipped with molded-case circuit breakers having overcurrent trip ratings as shown on the drawings. The circuit breakers shall be of a type designed for bolted connection to buses in a panelboard assembly, and shall meet the requirements of paragraph MOLDED CASE CIRCUIT BREAKERS. Circuit breakers of the same frame size and rating shall be interchangeable.

#### 2.3 PAINTING

Interior and exterior steel surfaces of equipment enclosures shall be thoroughly cleaned and then receive a rust-inhibitive phosphatizing or equivalent treatment prior to painting. Exterior surfaces shall be free from holes, seams, dents, weld marks, loose scale or other imperfections. Interior surfaces shall receive not less than one coat of corrosion-resisting paint in accordance with the manufacturer's standard practice. Exterior surfaces shall be primed, filled where necessary, and given not less than two coats baked enamel with semigloss finish. Equipment located indoors shall be ANSI Light Gray. All touch-up work shall be done with manufacturer's coatings as supplied under paragraph SPARE PARTS.

#### 2.4 FACTORY TESTS

Each item of equipment supplied under this contract shall be given the manufacturer's routine factory tests and tests as specified below, to insure successful operation of all parts of the assemblies. All tests required herein shall be witnessed by the Contracting Officer unless waived in writing, and no equipment shall be shipped until it has been approved for shipment by the Contracting Officer. The Contractor shall notify the Contracting Officer a minimum of 14 days prior to the proposed date of the tests so that arrangements can be made for the Contracting Officer to be present at the tests. The factory test equipment and the test methods used

shall conform to the applicable NEMA Standards, and shall be subject to the approval of the Contracting Officer. Reports of all witnessed tests shall be signed by witnessing representatives of the Contractor and Contracting Officer. The cost of performing all tests shall be borne by the Contractor and shall be included in the prices bid in the schedule for equipment.

#### 2.4.1 Panelboards Tests

Each panelboard shall be assembled with cabinet and front to the extent necessary to check the fit and provisions for installing all parts in the field. Each panelboard shall be given a dielectric test in accordance with NEMA PB 1. All circuit breakers shall be operated to check mechanical adjustments. All doors and locks shall be checked for door clearances and fits and the performance of lock and latches.

#### PART 3 EXECUTION (Not Applicable)

-- End of Section --