

**PRIMARY ELECTRICAL SERVICE REVISIONS  
BAY ARENAC ISD  
ADMINISTRATION BUILDING  
AND CAREER CENTER**

FEBRUARY 5, 2007

Prepared by:

MacMillan Associates, Inc.  
714 E. Midland St.  
Bay City, MI 48706  
Phone: 989-894-4300  
Fax: 989-894-9930

**PRIMARY ELECTRICAL SERVICE REVISIONS BAY ARENAC ISD**  
**ADMINISTRATION BUILDING AND CAREER CENTER**

**INDEX**

**BID DOCUMENTS**

00030 Invitation for Bids  
00100 Instructions to Bidders  
00300 Proposal Form  
00500 Agreement Between Owner & Contractor  
00610 Performance Bond, Labor and Material Bond  
00650 Insurance Requirements  
00700 General Conditions of the Contract  
00750 Supplementary Conditions

**DIVISION 1**

01010 Summary of the Work  
01019 Contract Considerations  
01041 Project Coordination  
01300 Submittals  
01400 Quality Control  
01600 Material and Equipment  
01700 Contract Closeout

**DIVISION 16**

16010 Basic Electrical Requirements  
16060 Minor Electrical Demolition for Remodeling  
16100 Electrical Checkout and Tests  
16111 Conduit  
16121 Medium Voltage Cable  
16170 Grounding and Bonding  
16190 Supporting Devices  
16195 Electrical Identification  
16330 Pad Mounted Primary Switch  
16421 Utility Service Entrance

**DRAWINGS**

E1 Administration Building Partial Site Plan - Electrical  
E2 Career Center Partial Site Plan - Electrical  
E3 Power Riser Diagram, Symbols and Schedules  
Reference Site Plan - April 1972 Roadway and Utilities

SECTION 00030

INVITATION FOR BIDS

Primary Electrical Service Revisions  
Bay Arenac ISD  
Administration Building and Career Center  
Bay City, MI

Sealed proposals will be received by Mr. Dave Bourdon at Bay Arenac Administration Office, 4228 Two Mile, Bay City, Michigan 48706 until 1:00 p.m. local time, February 21, 2007 for the above titled work. Bids will be publicly opened.

Bidding documents may be obtained at the office of the Engineer.

There is a \$15.00 mailing fee (which should be issued as a separate check) for those contractors who wish to obtain sets by mail.

The bid documents, including plans and specifications, are on file at the following locations:

Engineer's Office

MacMillan Associates, Inc.  
714 East Midland Street  
Bay City, Michigan 48706  
Phone: (989) 894-4300

Tri-City Builder's Exchange  
334 South Water Street  
Saginaw, Michigan 48607  
Phone (989) 754-4872

Each proposal shall be accompanied by a certified check or bid bond, by a recognized surety company, in the amount of 5% of the bid, drawn payable to Bay Arenac ISD as security for the proper execution of the contract.

Successful bidder will be required to furnish Performance, Labor and Material Bonds covering the entire work as specified in the General Conditions.

Bay Arenac ISD reserves the right to reject any or all bids, to waive irregularities and/or informalities and to make an award in any manner deemed in the best interest of the Owner. Proposals shall be made on the forms provided as part of the Bidding Documents. After the time of opening, no bid may be withdrawn for a period of 30 days.

A mandatory pre-bid walk through shall take place at 10:00 am, February 14, 2007. Meet at the Administration Office Building 4228 Two Mile Rd, Bay City, Michigan, 48706. Other requests for site visits shall be made to Mr. Dave Bourdon (989) 667-3270.

END OF SECTION

MAI 2006-0194

## SECTION 00100

### INSTRUCTIONS TO BIDDERS

#### PART 1 - GENERAL

##### 1.1 TIME FOR RECEIVING BIDS.

- A. Sealed proposals will be received by Bay Arenac ISD for primary electrical service revisions at Administration Building and Career Center 4228 Two Mile Rd, Bay City, Michigan.
- B. Sealed proposals will be received by Mr. Dave Bourdon at Bay Arenac Administration Office, 4228 Two Mile, Bay City, Michigan 48706 until 1:00 p.m. local time, February 21, 2007 for the above titled work. Bids will be publicly opened.
- C. Bids received prior to the time of opening will be securely kept, unopened. Bay Arenac ISD will decide when the specified time has arrived, no bid received thereafter will be considered. Bids will be read publicly at the bid due time.

A mandatory pre-bid walk through shall take place at 10:00 am, February 14, 2007. Meet at the Administration Office Building 4228 Two Mile Rd, Bay City, Michigan, 48706. Other requests for site visits shall be made to Mr. Dave Bourdon (989) 667-3270.

- D. The Owner reserves the right to waive any irregularities in bidding, to reject any or all bids, or to accept any bid which in its opinion will serve the best interest of the project.

##### 1.2 PROPOSALS

- A. Sealed proposals covering the work shall be submitted on Contract Proposal Forms furnished by the Engineer as a part of these Contract Documents. The Contract Proposal Forms shall be completely executed and strictly adhered to in every respect, and any deviation therefrom may be cause for rejection of said proposal.
- B. It is mandatory that all portions of each Proposal Form be completely executed with blank spaces properly filled in, including Alternates, starting and completion dates, acknowledgement of Addenda received, percentage markup on additional work, unit prices, etc. Whenever subcontractor schedules are provided, same shall be completely executed as part of the Proposal, including prices where requested.
- C. Lump sum proposals will be received.
- D. Proposals shall state price in both writing and figures, shall be signed by the bidder, by a partner, or by a duly authorized officer of a corporation, and shall give the bidder's business address. In case of a discrepancy between the amount stated in words and that in figures, the amount stated in words shall govern.
- E. No oral, telephone, or facsimile proposals or modifications thereto will be considered.

- F. It is the bidder's responsibility to deliver his proposal at the proper time to the proper place. The fact that a proposal was dispatched will not be considered. The bidder must have the proposal actually delivered.
- G. All proposals shall be either filled out in ink or typewritten; typewriting is preferred.
- H. Proposals shall be enclosed in a sealed envelope upon which must be endorsed the words "Electrical Service Revisions Bid".
- I. No alterations or erasures or interlineations will be allowed on proposals submitted. After bids have been opened, permission will not be in any case be given for the withdrawal, modification or rectification of any bid.
- J. Proposal Forms shall be submitted in duplicate, two to be submitted.

### 1.3 WITHDRAWAL OF BID

- A. Bids may be withdrawn on written or facsimile request dispatched by the bidder in time for delivery in the normal course of business prior to the time fixed for opening; provided that written confirmation of any telegraphic withdrawal over the signature of the bidder is placed in the mail and postmarked prior to the time set for bid opening. Negligence on the part of the bidder in preparing his bid confers no right of withdrawal or modification of his bid after such bid has been opened.

### 1.4 AWARD OF CONTRACT

- A. A lump sum contract will be executed for the entire work.
- B. The contract will be awarded to the responsible bidder submitting the lowest proposal complying with the Instructions to Bidders, provided his bid is reasonable and it is to the interest of Bay Arenac ISD.
- C. To be considered for award, a bid must comply in all material respects with the Instructions to Bidders, both as to the method and timeliness of submission and as to the substance of any resulting contract.
- D. Bay Arenac ISD also reserves the right to reject the bid of any bidder who has previously failed to perform properly, or to complete on time, contracts of a similar nature; who is not in a position to perform the contract, or who has habitually and without just cause neglected the payment of bills or otherwise disregarded his obligations to subcontractors, materialmen or employees.
- E. The ability of a bidder to obtain a performance bond shall not be regarded as the sole test of such bidder's competency or responsibility.

### 1.5 BID DOCUMENTS

- A. Bidding documents may be obtained at the office of the Engineer.
- B. There is a \$15.00 mailing fee (which should be issued as a separate check) for those contractors who wish to obtain sets by mail.

## 1.6 BID GUARANTY AND TIME LIMIT

- A. The bid must be accompanied by a bid guaranty which shall not be less than five percent (5%) of the amount of the bid, and at the option of the bidder may be a certified check, bank draft, U.S. Government bonds at par value, or a bid bond secured by a surety company. Certified check or bank draft must be made payable to the order of the Bay Arenac ISD. The bid guaranty shall ensure the execution of the contract and the furnishing of performance and payment bond or bonds by the successful bidder all as required by the specifications. The bid guaranty of unsuccessful bidders will be returned as soon as practicable after the opening of bids.
- B. No bid may be withdrawn for a period of thirty (30) days after the scheduled closing time for the receipt of bids, and then only if notice of award has not been given to the bidder by the Owner prior to the expiration of said thirty (30) day period. Bids offering less than thirty days for acceptance by the Owner from the date set for opening will be considered non-responsive and will be rejected.
- C. Each bidders agrees to forfeit the certified check, bank draft, or bid bond in the above amount in case of his refusal to enter into contract with the Owner within ten (10) days after notice of award and/or failure to produce the required bonds.

## 1.7 FINANCIAL BACKING

- A. Low bidders, if requested, must submit a financial statement, experience record, and an equipment schedule. Financial statement must reflect true financial condition of bidder within three months prior to opening.
- B. A bidder, in order to be eligible for the contract, must be able to show his financial ability to carry on the work until such time as he receives the first payment on the contract, and to finance the work between payments until the contract is completed and accepted.

## 1.8 BONDS

- A. The successful contractor will be required to furnish a satisfactory Performance Bond and a Labor and Material bond covering the entire work as specified in Section 00610 - Bonds.

## 1.9 INSURANCE

- A. The successful contractor will be required to satisfy the insurance requirements as specified in Section 00500 - Agreement Between Owner and Contractor and Section 00650 - Insurance Requirements.

## 1.10 STARTING AND COMPLETION DATES

- A. Prompt completion of the construction work is important to the Owner. Therefore, by submission of a proposal, each bidder agrees that he will commence construction work within ten (10) days after the Owner has given written notice to proceed with the work.
- B. Each bidder also agrees to complete the entire work within the number of calendar days he has quoted in his proposal.

## 1.11 CLARIFICATION OF DOCUMENTS

- A. Should there be any doubt as to the exact meaning of these bidding documents or contract documents, this matter shall be immediately brought to the Engineer's attention for resolution.
- B. Each bidder shall thoroughly examine the bidding and contract documents, and shall complete said examination in sufficient time to bring all questions to the Engineer's attention not later than seven (7) days prior to the date proposals are due.
- C. Where conflicts between sections of the specifications or between the drawings and the specifications occur, the Contractor shall assume the most restrictive applies. It shall be the Engineer's sole responsibility to determine which document or portion of document shall govern. The Contractor shall abide by that decision with no right to any additional fee.
- D. Addenda will be prepared by the Engineer as necessary to clarify the documents and issued to all parties of record having bidding documents.
- E. It is the Contractor's responsibility to ensure that all work required for a complete project either noted, implied or otherwise determined necessary is included in his bid. Additional fees will not be allowed for items the Contractor assumed were included is by his subcontractor.
- F. Refer all technical questions to: Mr. Ed Barry  
MacMillan Associates, Inc.  
714 East Midland Street  
Bay City, Michigan 48706  
Phone: (989) 894-4300  
Fax: (989) 894-9930

Refer bidding questions in writing to: Mr. Dave Bourdon  
4155 Monitor  
Bay City, MI 48706  
Phone: (989) 667-3270  
Fax: (989) 667-3292

## 1.12 ADDENDA

- A. Any addenda to the plans and specifications issued during the time of bidding shall be covered by the proposal and shall become a part of the contract. All addenda used in determining contractor's bid shall be acknowledged on the proposal form.

## 1.13 CHANGES IN THE WORK

- A. Bidders shall state in the space where provided on the proposal form, the charges, expressed as a percentage of the cost for changes in the work, including additions or deductions to the contract work, when done by his own organization and when done by subcontractors under his contract. Costs shall include all charges for supervision, overhead and profit. Charges for taxes, Social Security payments and insurance for

work done by the Contractor's own organization shall be computed separately and shall not be subject to percentage fee.

1.16 CONTRACTS WITH SUBCONTRACTORS

- A. All contracts made by the Contractor with subcontractors shall be covered by the terms and conditions of the general contract. The contractor shall see to it that his subcontractors are fully informed in regard to these terms and conditions.

1.17 SALES TAX

- A. The 6% Michigan State Sales Tax is applicable to this project and shall be included in the bid.

1.18 EQUAL EMPLOYMENT OPPORTUNITY

- A. Corporations, companies, agencies, partnerships, or individuals retained or hired to provide equipment, materials, labor and services shall be "Equal Employment Opportunity" employers.

1.19 BID BREAKDOWN

- A. Work at both the Administration Building and the Career Center shall be done by the same contractor under this bid package. After contract award, the Contractor shall provide a breakdown of costs for accounting purposes between the Career Center and the Administration Building.

END OF SECTION

MAI 2006-0194

SECTION 00300

PROPOSAL FORM

Date \_\_\_\_\_

Name of Bidder \_\_\_\_\_

Bidder's Address \_\_\_\_\_

\_\_\_\_\_

To: Bay Arenac ISD  
4228 Two Mile Road  
Bay City, MI 48706

PROPOSAL FOR: Primary Electrical Service Revisions  
Bay Arenac ISD  
Administration Building and Career Center  
Bay City, MI

1. The undersigned, hereinafter called the Contractor, hereby declares that he has read the "Instruction to Bidders", has examined the "Construction Contract Forms" and bidding documents and the locations where the work is to be performed and is fully informed of the nature of the work, the conditions relating to its performance and under which work will be performed, and accepts the method for which payment will be received.

The Contractor, hereby proposes to furnish all necessary equipment and tools, furnish all labor and materials, provide supervision including all overhead and profit to complete the work described within the time schedule; all in accordance with the project documents and other contract documents, including:

Addendum No. \_\_\_\_\_, Dated \_\_\_\_\_  
 Addendum No. \_\_\_\_\_, Dated \_\_\_\_\_

Issued thereto for the sum of \_\_\_\_\_

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_) Base Bid.

Said sum to be subject to all of the terms of the contract and to include all money allowances called for in the specifications applicable thereto.

2. PROPOSAL BREAKDOWN

The undersigned will submit for approval within 72 hours, if requested by Owner, a schedule of values including a list of proposed subcontractors and the amounts of their subcontracts. The undersigned agrees in every way to be responsible for the work, material, equipment and supplies furnished by each subcontractor.

3. STARTING AND COMPLETION DATES: The undersigned agrees, if awarded the contract, that he will commence the work within ten (10) calendar days after the Owner shall have given the Bidder written notice to commence the work, and shall complete the entire work within \_\_\_\_\_ calendar days.

4. UNIT PRICES

The Contractor proposes unit prices in accordance with the following. Said unit prices include all charges for incidental expenses, general conditions, supervision, taxes, insurance, overhead and profit.

Said unit prices shall be applicable to the pricing of deletions from or additions to the work shown on the contract drawings or called for in the contract specifications, and shall not be adjusted in respect to work (authorized in writing by Owner) which, although different from work shown on said drawings or specifications is reasonably similar thereto. Said unit prices shall be practically related to the determination of such additional unit prices as may be required from time to time.

A. For hand excavation \_\_\_\_\_ per cu. yd.

B. For directional boring machine \_\_\_\_\_ per linear foot

5. FEES FOR ADDITIONAL WORK

For additional work performed upon instructions of the Owner by subcontractors of the undersigned, a fee of \_\_\_\_\_ percent of the subcontractor's price will be charged by the undersigned for overhead, profit, etc.

For additional work performed upon instructions of the Owner by work forces of the undersigned, the charges shall be the actual cost of all labor and materials (less all discounts) plus a fee of \_\_\_\_\_ percent, (\_\_\_\_\_% ) which includes all charges of the undersigned for overhead, profit, etc.

6. ALTERNATES

The undersigned submits the following alternate proposals which are to be added to or deducted from the Base Bid in the event the Owner elects to make the changes described therein. (Voluntary alternates may be submitted on a separate sheet for the Owner's consideration.)

	ADD	DEDUCT
Alternate No. 1	_____	_____
Alternate No. 2	_____	_____

Alternate No. 3 \_\_\_\_\_

Alternate No. 4 \_\_\_\_\_

Alternate No. 5 \_\_\_\_\_

7. By submission of this proposal, the Bidder certifies that he will provide non-segregated facilities on this project and will require this same certification from his subcontractors.

8. The undersigned has carefully examined the bidding and contract documents including the Instructions to Bidders, Agreement Between Owner and Contractor, General Conditions, Supplementary Conditions, Contract Requirements, General Requirements, Specifications, Drawings, and any and all Addenda issued, and agrees to be bound by all requirements thereof in the submission of his proposal, and in the performance of the contract if awarded to him on this proposal.

9. The undersigned agrees that his proposal shall not be withdrawn until thirty (30) days after the time set for receipt of proposals.

10. ADDRESS, LEGAL STATUS and SIGNATURE OF BIDDER

The undersigned bidder does hereby designate the address given below as the legal address to which all notices, directions, or other communications may be served or mailed.

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

The undersigned bidder does hereby declare that the bidder has the legal status checked below:

\_\_\_\_\_ Individual

\_\_\_\_\_ Co-partnership

\_\_\_\_\_ Corporation incorporated under the laws of the State of \_\_\_\_\_

The names and addresses of all persons indicated as partners in this Proposal are as follows:

Names

Addresses

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

This proposal is submitted in the name of: \_\_\_\_\_  
(Name of Contractor)

By: \_\_\_\_\_

Title: \_\_\_\_\_

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_.

Instructions: Submit two (2) copies of bid.

END OF SECTION

MAI 2006-0194

SECTION 00500

AGREEMENT BETWEEN OWNER AND CONTRACTOR

PART 1 GENERAL

1.1 AGREEMENT FORM

- A. The Agreement between Owner and Contractor will be AIA Document A101. A copy of that agreement may be obtained from AIA Michigan, Detroit, Michigan.

1.2 RELATED SECTIONS

- A. Section 00100 - Instructions to Bidders
- B. Section 00300 - Proposal Form
- C. Section 00610 - Performance Bond, Labor and Material Bond
- D. Section 00650 - Insurance Requirements
- E. Section 00700 - General Conditions of the Contract
- F. Section 00750 - Supplementary Conditions

END OF SECTION

MAI 2006-0194

## SECTION 00610

### PERFORMANCE BOND, LABOR AND MATERIAL BOND

#### PART 1 GENERAL

##### 1.1 RELATED REQUIREMENTS

- A. Section 00500 - Agreement Between Owner and Contractor (Including General Conditions of the Contract).

##### 1.2 BONDS REQUIRED

- A. The successful Contractor, shall within fifteen (15) days after acceptance of his proposal, furnish a Performance Bond, in an amount equal to one hundred percent (100%) of the Contract Sum as security for the faithful performance of this Contract and also a Labor and Material Payment Bond in an amount not less than one hundred percent (100%) of the Contract Sum as security for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract.
- B. Cost of said bonds shall be included as a part of the Base Bid.
- C. The Contractor shall obtain such bonds in a manner consistent with Michigan Law.
- D. Bonds signed by Attorney-In-Fact must be accompanied by a certified and effectively dated copy of their Power of Attorney.

END OF SECTION

MAI 2006-0194

## SECTION 00650

### INSURANCE REQUIREMENTS

#### PART 1 GENERAL

##### 1.1 RELATED REQUIREMENTS

- A. Section 00500 - Agreement Between Owner and Contractor including General Conditions.

##### 1.2 MINIMUM INSURANCE REQUIREMENTS.

- A. Worker's Compensation, Occupational Disease and Employer's Liability Insurance:

1. State; Michigan – Statutory limits.
2. Applicable Federal (if any) – Statutory limits.
3. Employer's Liability –

Bodily Injury by Accident	-	\$1,000,000.00 each accident
Bodily Injury by Disease	-	\$1,000,000.00 each employee
Bodily Injury by Accident	-	\$1,000,000.00 each policy limit

- B. Commercial General Liability Insurance including as minimum coverage:

- Premises - Operation Liability
- Independent Contractor's Protective Liability
- Products and Completed Operations Liability
- Broad Form Property Damage Endorsement
- Blanket Contractual
- Personal Injury

1. Special Requirements:

- a. Property Damage Liability Insurance will provide "X, C, and U" (Explosion, Collapse, and Underground Hazard) coverage as applicable.
- b. Products and completed operations to be maintained for one (1) year after final payment.
- c. The Owner, Engineer, agents and employees shall be named as "additional insured" on the commercial general liability policy of the general contractor and/or subcontractor on any tier.

2. Limits of Liability:

\$1,000,000.00	Each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.
\$2,000,000.00	General Aggregate
\$1,000,000.00	Products/Completed Operations Aggregate
\$1,000,000.00	Personal and Advertising Injury

C. Automobile Liability Insurance:

1. The State of Michigan has a no-fault automobile insurance requirement. Contractors shall be certain coverage is provided which conforms to any specific stipulation in the law.

2. Special Requirements:

a. All owned, hired and non-owned vehicles including the loading or unloading thereof.

3. Limits of Liability

\$1,000,000.00	Each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.
----------------	---

D. Owner's and Engineer's Protective Liability Insurance:

The Contractor will furnish and maintain during the entire period of construction an Owner's Protective Liability Policy written in the name of the owner, and engineer with the following limits of liability.

1. Limits of Liability

\$1,000,000.00	Each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.
\$1,000,000.00	General Aggregate

E. Umbrella/Excess Liability Insurance:

1. Limits of Liability

\$5,000,000.00	Each occurrence
\$5,000,000.00	Aggregate

1.3 LENGTH OF COVERAGE

A. All insurance shall remain in force until acceptance of the work by the Owner and Engineer unless specified otherwise.

#### 1.4 CERTIFICATES REQUIRED

- A. Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the work. Certificates shall contain a provision that coverages afforded under the policies will not be modified or canceled until at least 30 days prior written notice has been given to the Owner. The Owner and the Engineer (MacMillan Associates, Inc.) shall be listed as additional insured under the Contractors General Liability Policy. Submit one copy of each certificate to the Owner and one copy to the Engineer. Furnish to the Owner and Engineer copies of any endorsements that are subsequently issued amending coverage or limits.
  
- B. All insurance shall be carried with companies which are financially responsible. If any such insurance is due to expire during the term of the Contract, the Contractor shall not permit the coverage to lapse and shall furnish evidence of continuing coverage to the Owner and Engineer.

END OF SECTION

MAI 2006-0194

## SECTION 00700

### GENERAL CONDITIONS OF THE CONTRACT

#### PART 1 GENERAL

##### 1.1 GENERAL CONDITIONS

- A. The 1997 edition of the AIA General Conditions of the Contract for Construction (AIA document A-201) as amended by the supplementary conditions, is hereby made a part of the Contract and shall be as fully binding on all Contractors and subcontractors as if bound herein.
- B. A copy of this document is included as reference.

##### 1.2 RELATED REQUIREMENTS

- A. Section 00100 - Instructions to Bidders
- B. Section 00300 - Proposal Form
- C. Section 00500 - Agreement Between Owner and Contractor
- D. Section 00610 - Performance Bond, Labor and Material Bond
- E. Section 00650 - Insurance Requirements
- F. Section 00750 - Supplementary Conditions

##### 1.3 CONTRACTOR'S RESPONSIBILITY

- A. Prior to the beginning of construction, the Contractor shall acquaint each contractor, subcontractor, superintendent of construction, foreman, workman, supplier, or others who are or will be responsible for the execution of any section or trade under this contract with all provisions of the Conditions of the Contract (General Conditions, Supplementary and other Conditions) the drawings, the specifications, all addenda issued prior to bid, and all modifications issued after execution of the Contract.

END OF SECTION

MAI 2006-0194

## SECTION 00750

### SUPPLEMENTARY CONDITIONS

#### INTRODUCTION

- A. The following supplements modify, change, delete from or add to the "General Conditions of the Contract for Construction", [AIA Document A-201, Fourteenth Edition, 1987]. Where any Article of the General Conditions is modified or any paragraph, subparagraph or clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, paragraph, subparagraph, or clause shall remain in effect.
- B. The following supplements are set forth under the title of the respective Articles to which they relate.

#### ARTICLE 3 - CONTRACTOR

##### 3.4 Labor and Materials

- 3.4.3 After the Contract has been executed, the Owner and the Engineer will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements of the Specifications (Division 1).
- 3.4.4 By making requests for substitutions based on Clause 3.4.3 above, the Contractor:
  1. represents that he has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
  2. represents that he will provide the same warranty for the substitution that he would for that specified;
  3. certifies that the cost data presented is complete and includes all related costs under this Contract but excludes costs under separate contracts, and excludes the Engineer's redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and
  4. will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects.

#### ARTICLE 4 - ADMINISTRATION OF THE CONTRACT

##### 4.5 Arbitration

- 4.5.1.1 In addition and prior to arbitration, the parties shall endeavor to settle disputes by mediation under the Construction Industry Mediation Rules of the American Arbitration Association currently in effect. Mediation shall commence, unless otherwise agreed, within the same time limits stipulated in Subparagraph 4.5.1 and 4.5.4 and Clause 4.5.4.1 for the filing of a notice of a claim in arbitration. Such time limits shall then be extended for arbitration by ten days and the duration of the mediation process.

## ARTICLE 8 - TIME

### 8.2 Progress and Completion

8.2.4 The penalty for non-completion by the above-stated completion date shall be suspension of all further payments on the Contract until completion of work and acceptance of same by the Owner. Said penalty shall be invoked unless an extension of time has been granted due to strikes or other causes beyond the Contractor's control, as stated in Article 8.3. The Engineer shall be the judge in matters concerning the application of the stated penalty for failure to complete contract work on time.

## ARTICLE 9 - PAYMENTS

### 9.3 Application for Payment

9.3.1.3 Until final payment, the Owner will pay 90 percent of the amount due the Contractor on account of progress payments. If the manner of completion of the Work and its progress are and remain satisfactory to the Engineer and in the absence of other good and sufficient reasons, for each Work category shown to be 50 percent or more complete in the Application for Payment, the Engineer will, without reduction of previous retainage (on presentation by the Contractor of Consent of Surety for each application), certify any remaining progress payments for each Work category to be paid in full.

9.3.1.4 The full Contract retainage may be reinstated if the manner of completion of the Work and its progress do not remain satisfactory to the Engineer (or if the Surety withholds his consent), or for other good and sufficient reasons.

## ARTICLE 11 - INSURANCE

### 11.1 Contractor's Liability Insurance

11.1.1.8 Liability Insurance shall include all major divisions of coverage and be on a comprehensive basis including:

1. Premises Operations (including X,C and U coverage as applicable).
2. Independent Contractor's Protective.
3. Products and Completed Operations.
4. Personal Injury Liability with Employment Exclusion deleted.
5. Contractual, including specified provision for Contractor's obligation under Paragraph 3.18.
6. Owned, non-owned and hired motor vehicles.
7. Broad Form Property Damage including Completed Operations.

11.1.1.9 If the General Liability coverages are provided by a Commercial General Liability Policy on a claims-made basis, the policy date or Retroactive Date shall predate the Contract; the termination date of the policy or applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment, certified in accordance with Subparagraph 9.10.2.

11.3 Property Insurance

Add the following sentence to Clause 11.3.1.1:

The form of policy for this coverage shall be Completed Value.

11.3.1.5 The insurance required by Paragraph 11.3 is not intended to cover machinery, tools or equipment owned or rented by the Contractor which are utilized in the performance of the Work but not incorporated into the permanent improvements. The Contractor shall, at the Contractor's own expense, provide insurance coverage for owned or rented machinery, tools or equipment which shall be subject to the provisions of Subparagraph 11.3.7.

END OF SECTION

MAI 2006-0194

## SECTION 01010

### SUMMARY OF WORK

#### PART 1 GENERAL

##### 1.1 GENERAL

- A. The work covered by this specification and accompanying drawings includes furnishing all labor, material, equipment, tools and services, plus all supervision and other related work required to complete, test and leave ready for operation all systems as indicated on the drawings and/or in the specification, together with all items required to complete and finish the job. All materials shall be new unless otherwise indicated.

##### 1.2 SCOPE OF WORK

- A. The scope of work includes but is not necessarily limited to the following:
- Provide (2) new separate primary electrical services, one at the Career Center and one at the Administration Building. Directional boring, conduit, cable, cable terminations, primary switch/fuse cabinets, concrete foundation/pad, site restoration, and coordination with utility service connection points. The existing primary cables shall be abandoned in place and various hardware removed as defined on the drawings.
  - Removal and proper disposal of all electrical equipment taken out of service.
  - Furnishing all labor and miscellaneous materials in addition to the major pieces for a complete operating, school owned, primary electrical service.
  - Coordination with utility company for all shut-downs and tie-ins, which will include work outside of the normal business hours at both buildings. Include all costs required.
  - Utility company costs for this project will be paid for directly by the ISD.

END OF SECTION

MAI 2006-0194

SECTION 01019

CONTRACT CONSIDERATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Application for payment.
- B. Change procedures.

1.2 APPLICATIONS FOR PAYMENT

- A. Submit two copies of each application on AIA Form G702 - Application and Certificate for Payment, AIA G703 - Continuation Sheet, and a detailed schedule of values.

1.3 CHANGE PROCEDURES

- A. The Engineer may issue a Bulletin which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications. Contractor will prepare and submit an estimate within 3 days.
- B. Contractor shall not proceed with any changes until written authorization is received from the Owner. Additional work performed by the Contractor without written authorization will not be reimbursed.

END OF SECTION

MAI 2006-0194

## SECTION 01041

### PROJECT COORDINATION

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Project coordination by the Contractor.
- B. Construction mobilization.
- C. Schedules.
- D. Submittals.
- E. Coordination drawings.
- F. Closeout procedures.

##### 1.2 RELATED SECTIONS

- A. General Conditions: Duties of the Contractor, Sections 00700 General Conditions of the Contract and 00750 Supplementary Conditions.
- B. Section 01010 - Summary of Work.
- C. Section 01700 - Contract Closeout: Contract Closeout Procedures.

##### 1.3 PROJECT COORDINATOR

- A. Project Coordinator: Contractor.

##### 1.4 CONSTRUCTION MOBILIZATION

- A. Cooperate with the Owner in allocation of mobilization areas of site; for field offices and sheds, for site access, traffic, and parking facilities.
- B. Coordinate field engineering and layout.

##### 1.5 SCHEDULES

- A. Submit preliminary progress schedule in accordance with Section 01300.
- B. After review, revise and resubmit schedule to comply with revised Project schedule.
- C. During progress of work revise and resubmit as directed.

## 1.6 SUBMITTALS

- A. Submit shop drawings, product data and samples in accordance with Section 01300 for review and compliance with Contract Documents, for field dimensions and clearances, for relation to available space, and for relation to work of separate contracts. Revise and resubmit as required.
- B. Submit applications for payment on AIA Form G702 for review, and for transmittal to Owner.
- C. Submit requests for interpretation of Contract Documents, and obtain instructions from the Owner.
- D. Process requests for substitutions through the General Contractor in accordance with Section 01600.
- E. Deliver closeout submittals for review and preliminary inspection reports, for transmittal to Engineer.

## 1.7 COORDINATION DRAWINGS

- A. Provide information required for preparation of coordination drawings.
- B. Review drawings prior to submission to Engineer.

## 1.8 CLOSEOUT PROCEDURES

- A. Notify the Engineer when Work is considered ready for Substantial Completion.

END OF SECTION

MAI 2006-0194

## SECTION 01300

### SUBMITTALS

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Shop Drawings.
- D. Product Data.
- E. Manufacturers' certificates.

##### 1.2 RELATED SECTIONS

- A. Section 01019 - Contract Considerations: Photographs associated with application for payment.
- B. Section 01400 - Quality Control: Manufacturers' field services and reports.
- C. Section 01700 - Contract Closeout: Contract warranties, manufacturers' certificates, and closeout submittals.

##### 1.3 SUBMITTAL PROCEDURES

- A. Transmit each submittal with Contractors Standard Transmittal Form.
- B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate.
- D. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the Project, and deliver to Engineer. Coordinate submission of related items.
- F. For each submittal for review, allow 10 working days excluding delivery time to and from the contractor.

- G. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- H. Provide space for Contractor and Engineer review stamps.
- I. Revise and resubmit, identify all changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with provisions.
- K. Submittals not requested will not be recognized or processed.

#### 1.4 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial schedule in duplicate within 10 days after date award of contract established in Notice to Proceed.
- B. Revise and resubmit as required.
- C. Submit revised schedules with each Application for Payment, identifying changes since previous version.
- D. Submit a horizontal bar chart with separate line for each major section of Work or operation, identifying first work day of each week.
- E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- F. Indicate estimated percentage of completion for each item of Work at each submission.
- G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and required by Allowances.

#### 1.5 SHOP DRAWINGS

- A. As listed in Division 16 Section 16010.

#### 1.6 PRODUCT DATA

- A. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.

#### 1.7 MANUFACTURER CERTIFICATES

- A. When specified in individual specification sections, submit certification by manufacturer to Engineer, in quantities specified for Product Data.
- B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Engineer.

END OF SECTION

MAI 2006-0194

## SECTION 01400

### QUALITY CONTROL

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Quality assurance - control of installation.
- B. Tolerances
- C. References.
- D. Inspecting and testing laboratory services.
- E. Manufacturers' field services and reports.

##### 1.2 RELATED SECTIONS

- A. Section 01300 - Submittals: Submission of manufacturers' instructions and certificates.
- B. Section 01600 - Material and Equipment: Requirements for material and product quality.

##### 1.3 QUALITY ASSURANCE - CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

##### 1.4 TOLERANCES

- A. Monitor tolerance control of installed Products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

- C. Adjust Products to appropriate dimensions; position before securing Products in place.

#### 1.5 REFERENCES

- A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of Contract Documents, except where a specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Engineer shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

#### 1.6 INSPECTING AND TESTING LABORATORY SERVICES

- A. Owner will appoint, employ, and pay for specified services of an independent firm to perform inspecting and testing.
- B. Testing or inspecting does not relieve Contractor to perform Work to contract requirements.

#### 1.7 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Engineer 10 days in advance of required observations. Observer subject to approval of Engineer and Owner.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Submit report within 5 days of observation to Engineer for information.

END OF SECTION

MAI 2006-0194

SECTION 01600  
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Product options.
- E. Substitutions.

1.2 PRODUCTS

- A. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- B. Provide interchangeable components of the same manufacture, for components being replaced.

1.3 TRANSPORTATION AND HANDLING

- A. Transport and handle Products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.
- C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.4 STORAGE AND PROTECTION

- A. Store and protect Products in accordance with manufacturers' instructions, with seals and labels intact and legible.
- B. Store sensitive Products in weather tight, climate controlled enclosures.
- C. For exterior storage of fabricated Products, place on sloped supports, above ground.
- D. Provide off-site storage and protection when site does not permit on-site storage or protection.
- E. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of Product.

- F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- G. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- H. Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

#### 1.5 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

#### 1.6 SUBSTITUTIONS

- A. Engineer will consider requests for Substitutions only within 15 days after date of award of contract.
- B. Substitutions will not be considered unless a cost savings is available to the Owner or a higher quality product is to be furnished at the same cost.
- C. Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.
- D. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
- E. A request constitutes a representation that the Contractor:
  - 1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
  - 2. Will provide the same warranty for the Substitution as for the specified Product.
  - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
  - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
  - 5. Will reimburse Owner and Engineer for review or redesign services associated with re-approval by authorities.
- F. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

G. Substitution Submittal Procedure:

1. Submit 2 copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
2. Submit shop drawings, product data, and certified test results attesting to the proposed Product equivalence. Burden of proof is on proposer.
3. The Engineer will notify Contractor in writing of decision to accept or reject request.

END OF SECTION

MAI 2006-0194

SECTION 01700  
CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures.
- B. Final cleaning.
- C. Adjusting.
- D. Project record documents.
- E. Warranties.

1.2 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect/Engineer's review.
- B. Provide submittals to Owner that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.3 SITE WORK

- A. Regrade, resod, etc. to match existing condition.
- B. Clean site; sweep paved areas.
- C. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.4 ADJUSTING

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.5 PROJECT RECORD DOCUMENTS

- A. Maintain on site, one set of the following record documents; record actual revisions to the Work:
  - 1. Drawings.
  - 2. Specifications.
  - 3. Addenda.
  - 4. Change Orders and other modifications to the contract.
  - 5. Reviewed Shop drawings, product data and samples.
  - 6. Manufacturer's instruction for assembly, installation and adjusting.

- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
  - 1. Manufacturer's name and product model and number.
  - 2. Product substitutions or alternates utilized.
  - 3. Changes made by Addenda and modifications.
- F. Record documents and Shop Drawings: Legibly mark each item to record actual construction including:
  - 1. Field changes of dimension and detail.
  - 2. Details not on original contract drawings.
- G. Remove engineer title block from all documents.
- H. Submit documents to Engineer with claim for final Application for Payment.

#### 1.6 WARRANTIES

- A. Provide duplicate notarized copies.
- B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
- C. Submit prior to final Application for Payment.
- D. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

END OF SECTION

MAI 2006-0194

## SECTION 16010

### BASIC ELECTRICAL REQUIREMENTS

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Basic electrical Requirements specifically applicable to Division 16 Sections, in addition to Division 1 - General Requirements.
- B. Information in this section is intended to clarify or make additions to the requirements set forth in the General Conditions, Supplementary Conditions and Division 1 of these specifications. Any conflict between this Division 16 and those in the General Conditions or within the Division 16 drawings, Supplementary Conditions and Division 1 shall be brought to the attention of the Engineer in writing as a request for addendum prior to the bid opening.
- C. Furnish all equipment, materials, articles, items, operations or methods listed, mentioned or scheduled on drawings, these specifications, manufacturer's installation instructions and include all labor materials, equipment and incidentals necessary for complete installation and operation.
- D. All information contained in this section applies to all sections within Division 16 as it was part of each section.
- E. Final walk-thru. Contractor shall submit in writing to the Engineer's office advising that all of the work has been completed in accordance with the plans and specifications. The intent is to acknowledge the Division 16 Contractor is ready. Open items that are part of the normal required construction work should be completed prior to the final walk-thru to avoid developing a construction completion list. The engineer reserves the right to reschedule the final walk-thru as determined accordingly.
- F. Pre bid questions. All pre-bid questions, clarifications, etc. must be submitted in writing to the Engineer's Office. Phone calls will not be accepted

##### 1.2 LAYOUT OF THE WORK

- A. Examine the site and all the drawings before proceeding with the layout and installation of this work.
- B. The Electrical Trades shall provide required cutting, and patching chases, etc.
- C. During the bidder's estimating phases if any design or discrepancy issues are discovered between the electrical drawings, specifications and other project plans the Contractor shall notify Engineer. The intent is to resolve any issues during the bidding phase. For any pertinent issues, addendums will be issued accordingly.

### 1.3 INTERFERENCES

- A. The Electrical Contractor shall examine the plans and shall notify the Engineer to resolve such interference or discrepancy. Contractor shall obtain and review all project documents. The Contractor, when directed, shall make such changes or off-sets as required so that the work shall be properly located and coordinated with the other trades. Failure to comply with the foregoing will not relieve contractor's responsibilities of making such changes. Such changes shall be completed at no additional cost to the Owner.
- B. All changes in location of distribution equipment from those shown on plans, shall be made without charge when directed by the Engineer before installation. At this time, an agreement shall be made if such a change is an additional cost to the owner.
- C. Any changes made, necessary through failure to make proper arrangement to avoid interference, shall not be considered as extra.
- D. In the event the described work on the drawings does not match requirements described in the specification the more stringent requirements shall be provided.

### 1.4 MATERIALS AND WORKMANSHIP

- A. All materials and equipment furnished for installation on this project shall be new and in strict accordance with this specification. All packaged materials shall be delivered in the original containers which show the manufacturer's name and the identifying designations as to size, quality, etc. Materials delivered to the job in unmarked or mutilated packages will be ordered to be removed from the site at once. Materials or equipment judged as "damaged" by the Architect or Engineer shall be removed from the job. All electrical equipment shall bear the Underwriter's Label.
- B. All work shall be performed in a professional manner under the supervision of the contractor's project manager. The project manager shall be considered the point of contact for the Engineer and Owner's daily communication.
- C. Should any dispute arise as to the quality of the workmanship, Owner, Engineer and Contractor shall mutually agree work is non-acceptable and shall be reworked at no additional cost to the Owner.
- D. Division 16 specifications and/or written schedules shall govern if it is found that the manufacturer's catalog numbering shown on the drawing is not accurate, or changed, or been discontinued by the manufacturer without notification. Contractor shall notify the Engineer with any conflicts during the bidding phase to get clarifications. After entering into a Contract, it shall be considered all specifications and/or drawings provide the information to meet the intended quality and performance without any identified conflicts.

### 1.5 GUARANTEES

- A. All equipment and work performed under Division 16 shall be guaranteed for one (1) year from time of substantial completion of project, unless directed otherwise in Division 1.

## 1.6 VOLUNTARY ALTERNATES

- A. The Engineer will only accept voluntary alternate as a bid deduct. Alternate must maintain the same level of quality to meet the design intent. Voluntary alternates must be submitted with the bid for review by the Owner. Failure to comply will be no reason to accept any voluntary alternates after entering into a contract.

## 1.7 OWNERS ACCEPTANCE OF EQUIPMENT

- A. Upon the Owner's written acceptance, the Contractor's guarantee period shall begin and the Owner shall accept the responsibility for operation and maintenance and the Contractor's liability shall be limited to the conditions covered in the guarantee as described in these specifications.

## 1.8 REFERENCES

- A. Conform to requirements of NFPA 70, 2002 National Electric Code, State of Michigan Electric Code, local code, and Bay Arenac ISD Electrical practices.

## 1.9 SUBMITTALS

- A. Provide a minimum of 8 copies of shop drawings.
- B. Proposed Products List: Include Products specified in the following Sections:
  - 1. Medium voltage cable and terminations
  - 2. HDPE direct burial conduit
  - 3. Pad mounted primary switch
  - 4. Fuses
- C. Submit shop drawings and product data grouped to include complete submittals of related systems, products, and accessories in single submittals.
- D. Mark dimensions and values in units to match those specified.
- E. Shop drawings shall be reviewed and checked for compliance to the project specification by the Contractor prior to submittal. Contractor shall not rely on the electrical supplier to prepare and submit shop drawings. Shop drawings shall be prepared by the manufacturer's representative. The submittals shall include a business letterhead cover. Submittals received from the electrical supplier are not acceptable and be returned with no additional costs or project delays to Owner.
- F. Bill of Materials are not considered a Shop Drawing. Include Bill of Material as part of O&M manuals.

## 1.10 REGULATORY REQUIREMENTS

- A. Conform to applicable Building Code.
- B. Conform to requirements of NFPA 70, 2002 National Electric Code, State of Michigan Electric Code, local code, and Bay Arenac ISD Electrical practices.

- C. Equipment: U.L. tested and approved for its purpose.
- D. The Electrical Contractor shall obtain and pay for all permits and inspection fees. Copies of the Certificate of Inspection are to be provided to the Owner after final inspection and approval from authorities having jurisdiction.

#### 1.11 PROJECT/SITE CONDITIONS

- A. Install Work in locations shown on drawings, unless prevented by project conditions.
- B. All bidders shall personally inspect the site and acquaint themselves with all existing conditions involved in execution of this contract, and make all necessary measurements. No "extra" will be considered for additional work required because of bidder's failure to do so.

#### 1.12 TEMPORARY SERVICES

- A. The Contractor shall provide temporary wiring to complete the primary cable installation. Contractor shall provide portable generators as deemed necessary to complete the work. Contractor's power tools, cords, etc shall be in strict accordance with National Electrical Code 2002, Article 527.
- B. Arrange outage time periods with the Owner prior to starting the primary service cable change over.

#### 1.13 RECORD DRAWINGS

- A. The Electrical Contractor shall furnish a clean set of reproducible drawings of the complete electrical installation with all Addendum, Change Orders and Field Directed Changes included at the completion of the project.

#### 1.14 OPERATION AND MAINTENANCE MANUALS

- A. Verbal instruction and written operational instructions are to be given on all equipment and systems under this contract. A time is to be scheduled with the Architect/Engineer and Owner for these instructions and a time submitted in writing for instructions at the facility.
- B. Two (2) bound sets of Operating and Maintenance Manuals are to be submitted to the Engineer for approval. Manuals are to include complete parts list and maintenance procedures as well as operating instructions on all equipment supplied under Division 16.

MAI 2006-0194

END OF SECTION

## SECTION 16060

### MINOR ELECTRICAL DEMOLITION FOR REMODELING

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Electrical demolition per plans and specifications.

##### 1.2 RELATED SECTIONS

- A. All drawings and specification sections apply to work in this section. Furnish all items, articles, materials, equipment, operations or methods that are mentioned, listed or scheduled on drawings or are in this specification including all labor, equipment, materials and miscellaneous incidentals necessary and/or required for the completion of this project. The work covered under this section of the specifications is in no way complete within itself but is supplementary to the entire specification and drawings.

#### PART 2 PRODUCTS

##### 2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work: As specified in individual Sections.

#### PART 3 EXECUTION

##### 3.1 EXAMINATION

- A. Contractor shall examine the project documents and visit the site as the Contractor deems necessary prior to submitting a bid.

##### 3.2 PREPARATION

- A. Confirm the drawings prior to commencing demolition.

##### 3.3 DEMOLITION OF EXISTING ELECTRICAL SYSTEMS

- A. Remove the existing primary cables at the Boiler House transformer and the Administration Building transformer. Abandon existing cables in place.
- B. Hand dig around the existing transformers to permit cable removal and new cable installation.
- C. Remove primary metering cabinet and primary switch located southeast of the Administration Building. Consumers Energy Company to remove and deactivate their primary feed into the meter cabinet and remove all metering hardware owned by the utility company.

- D. Remove primary switch and (3) single phase transformers at a sewage lift station on the south side of the roadway between the Administration Building and Career Center Building. The outage and revisions shall be coordinated with Consumers Energy Company and the Bay County Sewer Department prior to removal to assure that a new service is available prior to removal of this dedicated service at the lift station.
- E. Remove all miscellaneous materials, such as concrete pads, ground rods, wire, etc. and level off the soil in the work areas.
- F. Regrade ready for , reseed by the ISD staff to match existing conditions upon completion of the new primary cable and switchgear installations.

MAI 2006-0194

END OF SECTION

## SECTION 16100

### ELECTRICAL CHECK-OUT AND TESTS

#### PART 1 PRODUCTS

##### 1.1 GENERAL

- A. The specification intends that the workmanship, methods, inspections and materials used in erection and installation of the subject equipment shall conform with accepted engineering and construction practices, IEEE Standards, the National Electrical Code and the following:
  - 1. This Specification.
  - 2. Manufacturer's Instructions.
- B. Phase matching by a phase meter from installation all the way to incoming source shall be finally checked immediately prior to energization of equipment covered by this specification.
- C. Grounding connections shall be verified and measured.
- D. Electrical connections shall be tested to verify correct torque value.

##### 1.2 RESPONSIBILITY

- A. The contractor shall be responsible for all equipment check-out procedures, tests and test records.
- B. The contractor shall provide all material, equipment, craft labor and technical supervision to perform and complete the equipment check-out and acceptance tests as required and specified herein.
- C. The contractor shall provide all necessary test equipment and shall be responsible for setting up all test equipment, wire checks of factory wiring and any other preliminary work in preparation for the electrical acceptance tests.
- D. All tests shall be scheduled by the contractor and cleared by the Owner. No testing shall be done without this clearance.
- E. The contractor shall be responsible for a visual inspection of the equipment which shall be made immediately prior to the test and/or energization of that equipment.

##### 1.3 TEST AND REPORTS

- A. After completion for all tests and adjustments listed above, the contractor shall submit the following information to the Owner:
  - 1. "As-built" conduit layout diagrams including wire color code and/or tag number.
  - 2. Complete "as-built" wiring drawings.

- B. Final tests and inspection shall be held in the presence of the authorized representatives of the Owner to their satisfaction. The contractor shall supply all personnel and equipment required for all tests without additional cost.

#### 1.4 ADDITIONAL SUBMITTAL REQUIREMENTS

- A. For each piece of equipment tested, records of all check-out procedures, tests and calibrations with complete data of all readings taken, shall be made and incorporated into a report. One copy shall be delivered to the Owner at the end of each test period.
- B. The report shall be contained in a three-ring binder which is properly identified as to site location, building and type of equipment tested. Divider tabs shall separate the test results for each type of equipment.
- C. All test reports shall be submitted by the contractor, signed and dated by the authorized witnesses and approved by the Owner.

END OF SECTION

MAI 2006-0194

## SECTION 16111

### CONDUIT

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Metal conduit.
- B. Flexible metal conduit.
- C. Liquidtight flexible metal conduit.
- D. Electrical metallic tubing.
- E. HDPE
- F. Nonmetallic raceway.
- G. Fittings and conduit bodies.

##### 1.2 RELATED SECTIONS

- A. All drawings and specification sections apply to work in this section. Furnish all items, articles, materials, equipment, operations or methods that are mentioned, listed or scheduled on drawings or are in this specification including all labor, equipment, materials and miscellaneous incidentals necessary and/or required for the completion of this project. The work covered under this section of the specifications is in no way complete within itself but is supplementary to the entire specification and drawings.

##### 1.3 REFERENCES

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.
- C. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- D. ANSI/NFPA 70 - 2002 National Electrical Code, Saginaw Township codes, Consumers Energy Facility Department Electrical Specification User Manual and 2003 Michigan Building.
- E. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).
- F. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

##### 1.4 DESIGN REQUIREMENTS

- A. Conduit Size: ANSI/NFPA 70.

## 1.5 PROJECT RECORD DOCUMENTS

- A. Record all underground conduits shall be shown on record set.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle Products to site.
- B. Accept conduit on site. Inspect for damage.
- C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- D. Protect PVC conduit from sunlight.

## 1.7 PROJECT CONDITIONS

- A. Verify routing and termination locations of conduit prior to rough-in.
- B. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

## 1.8 REGULATORY REQUIREMENTS

- A. ANSI/NFPA 70 - 2002 National Electrical Code, Saginaw Township codes, Consumers Energy Facility Department Electrical Specification User Manual and 2003 Michigan Building Code.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and indicated.

## PART 2 PRODUCTS

### 2.1 CONDUIT REQUIREMENTS

- A. Minimum Size:  $\frac{3}{4}$  inch unless otherwise specified.
- B. Dry Interior Locations:
  - 1. Use EMT type conduit, set screw steel coupling and connectors.
- C. Damp Interior Locations:
  - 1. Use EMT type conduit steel compressions fittings and connectors.
- D. Exterior Locations:
  - 1. Use schedule 40 rigid non-metallic (RNMC) conduit and rain tight couplings and connectors.
  - 2. Use rigid galvanized steel (RGS) for conduit risers above grade.

- E. Underground Locations:
  - 1. Use Sch 40 RNMC for pad-mount primary switch and transformer primary and secondary service entrance. Refer to drawing for details.
  - 2. Use HDPE for directional bore.

## 2.2 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Steel Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit.
- C. No cast fitting permitted.

## 2.3 FLEXIBLE METAL CONDUIT

- A. Description: Interlocked steel construction.
- B. Fittings: ANSI/NEMA FB 1.
- C. Use for final connection interior equipment location.

## 2.4 ELECTRICAL METALLIC TUBING (EMT)

- A. Description: ANSI C80.3; galvanized tubing.

## 2.5 RIGID NON-METALLIC CONDUIT

- A. Schedule 40 PVC
- B. Compatible fittings.

## 2.6 HDPE

- A. Underground suitable for use with directional boring methods and practices.

## 2.7 CONDUIT / FITTINGS MANUFACTURERS

- A. Rigid Steel
  - 1. Allied Tube & Conduit.
  - 2. Triangle Plug.
  - 3. Republic Steel Corporation.
- B. Conduit Fittings - Steel
  - 1. Appleton.
  - 2. Crouse Hinds.
  - 3. Meyers Electric.
  - 4. Pyle National.
- C. Sealing Bushing and Hubs
  - 1. Myers.
  - 2. OZ Gedney.

- D. Conduit Sealing Bushing
  - 1. Appleton.
  - 2. Crouse - Hinds.
  - 3. Killark.
  
- E. Liquid - Tight Flexible Steel Conduit
  - 1. Anamet Inc. "Sealtite".
    - a. Type VA 1 ¼" and smaller.
    - b. Type EF 1 ½" and larger.
  
- F. Locknuts & Bushings
  - 1. Steel City.
  - 2. T & B.
  - 3. Tomic
  
- G. Flexible Steel Conduit
  - 1. Appleton - ST Series.
  - 2. OZ Gedney - 4Q Series.
  - 3. T & B - 5200 Series.
  - 4. Midwest Type LT.
  
- H. Electrical Metallic Tubing
  - 1. Allied Tube & Conduit.
  - 2. Triangle PWC Incorporation.
  
- I. Electrical Metallic Tubing Fittings
  - 1. Appleton.
  - 2. OZ Gedney.
  - 3. Crouse - Hinds.
  
- J. Manufacturers listed are based on the Owner's acceptable manufacturers.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Install nonmetallic conduit in accordance with manufacturer's instructions.
- B. Arrange supports to prevent misalignment during wiring installation.
- C. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- D. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.
- E. Fasten conduit supports to building structure and surfaces under provisions of Section 16190.
- F. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports

- G. Do not attach conduit to ceiling support wires.
- H. Arrange conduit to maintain headroom and present neat appearance.
- I. Route conduit parallel and perpendicular to walls or building centerlines.
- J. Maintain adequate clearance between conduit and piping.
- K. Maintain 12 inch clearance between conduit and surfaces with temperatures exceeding 104 degrees F.
- L. Bring conduit to shoulder of fittings; fasten securely.
- M. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
- N. Provide suitable pull strings in each empty conduit.
- O. Use suitable caps to protect installed conduit against entrance of dirt and moisture.
- P. Ground and bond conduit under provisions of Section 16170.
- Q. Identify conduit under provisions of Section 16195.

### 3.2 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements. Use fire stop caulking.

END OF SECTION

MAI 2006-0194

## SECTION 16121

### MEDIUM VOLTAGE CABLE

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Medium voltage cable.
- B. Cable terminations.

##### 1.2 REFERENCES

- A. ANSI/IEEE C2 - National Electrical Safety Code.
- B. Conform to requirements of NFPA 70, 2002 National Electric Code, 2003 Michigan Building Code, State of Michigan Electric Code, 2000 Michigan Barrier Free Manual and local code requirements.
- C. IEEE 48 - Test Procedures and Requirements for High- Voltage Alternating-Current Cable Terminations.
- D. NEMA WC 3 - Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
- E. NEMA WC 5 - Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
- F. NEMA WC 7 - Cross-Linked-Thermosetting-Polyethylene- Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
- G. NEMA WC 8 - Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.

##### 1.3 SUBMITTALS

- A. Provide submittal as listed in Section 16010.
- B. Product Data: Provide for cable, terminations, and accessories.
- C. Test Reports: Indicate results of cable test in tabular form and in plots of current versus voltage for incremental voltage steps, and current versus time at 30 second intervals at maximum voltage.
- D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements.
- E. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

#### 1.4 PROJECT RECORD DOCUMENTS

- A. Accurately record actual sizes and locations of cables.

#### 1.5 OPERATION AND MAINTENANCE DATA

- A. Maintenance Data: Include instructions for testing and cleaning cable and accessories.

#### 1.6 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70, 2002 National Electric Code, 2003 Michigan Building Code, State of Michigan Electric Code, 2000 Michigan Barrier Free Manual and local code requirements.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle Products to site.
- B. Accept cable and accessories on site in manufacturer's packaging. Inspect for damage.
- C. Store and protect in accordance with manufacturer's instructions.
- D. Protect from weather. Provide adequate ventilation to prevent condensation.

#### 1.8 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Verify routing and termination locations of cable bank prior to rough-in.
- C. Cable routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

### PART 2 PRODUCTS

#### 2.1 MEDIUM VOLTAGE CABLE, UNDERGROUND INSTALLATION

- A. Description: NEMA WC 7; cross-linked polyethylene or NEMA WC 8; ethylene propylene rubber insulated cable.
- B. Voltage: Coordinate primary voltage with utility company to meet utility standards.
- C. Conductor: #1/0 Aluminum, stranded, with concentric neutral to meet Consumers Energy Co. standards.
- D. Construction: Single conductor insulated with bare neutral.
- E. Insulation Jacket: 25KV, 260 mill.

## 2.2 MODULAR CABLE TERMINATION

- A. Manufacturers:
  - 1. Cooper.
  - 2. Raychem.
  - 3. 3M Cold Quick Term Series.
- B. Description: IEEE 48; Class 1, molded rubber cable termination in kit form with stress cone, ground clamp, non-tracking rubber skirts, load break connector, rubber cap, and aerial lug.
- C. The intent is to use the same products as the local utility to allow for future repairs or revisions that may be required.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that conduit is ready to receive cable.

### 3.2 PREPARATION

- A. Use swab to clean conduits before pulling cables.

### 3.3 INSTALLATION

- A. Install cable and accessories in accordance with manufacturer's instructions.
- B. Avoid abrasion and other damage to cables during installation.
- C. Use suitable lubricants and pulling equipment.
- D. Do not exceed cable pulling tensions and bending radius.
- E. Ground cable shield at each termination and splice.

### 3.4 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed to assure proper operation.
- B. Inspect exposed cable sections for physical damage.
- C. Inspect cable for proper connections as shown on Drawings.
- D. Inspect shield grounding, cable supports, and terminations for proper installation.
- E. Perform DC high potential test at 1 ½ times normal operating voltage.
- F. Connect untested conductors in circuit to ground during test.
- G. Apply test voltage in at least eight equal increments to maximum test voltage.
- H. Record leakage current at each increment, allowing for charging current decay.

I. Hold maximum test voltage for ten minutes.

3.5 PROTECTION

A. Protect installed cables from entrance of moisture.

END OF SECTION

MAI 2006-0194

## SECTION 16170

### GROUNDING AND BONDING

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Equipment grounding conductors.
- B. Bonding.
- C. Service entrance grounding.

##### 1.2 RELATED SECTIONS

- A. All drawings and specification sections apply to work in this section. Furnish all items, articles, materials, equipment, operations or methods that are mentioned, listed or scheduled on drawings or are in this specification including all labor, equipment, materials and miscellaneous incidentals necessary and/or required for the completion of this project. The work covered under this section of the specifications is in no way complete within itself but is supplementary to the entire specification and drawings.

##### 1.3 REFERENCES

- A. ANSI/NFPA 70 - 2002 National Electrical Code, Consumers Energy Facility Department Electrical Specification User Manual and 2003 Michigan Building Code.

##### 1.4 REGULATORY REQUIREMENTS

- A. ANSI/NFPA 70 - 2002 National Electrical Code, Consumers Energy Facility Department Electrical Specification User Manual and 2003 Michigan Building Code.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and indicated.

#### PART 2 PRODUCTS

##### 2.1 WIRE

- A. Material: Stranded copper.
- B.  $\frac{3}{4}$ " x 10 feet copper clad steel ground rod.
- C. Manufacturers:
  - 1. Blackburn - Ground Rod.
  - 2. Burndy - Grounding Connectors.
  - 3. Erico - Exothermic.
  - 4. T & B - Grounding Connector.
  - 5. Manufacturers listed are the Owner's preferred manufacturers.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Install Products in accordance with manufacturer's instructions.
- B. Provide bonding to meet Regulatory Requirements.
- C. Provide ground mat cable to connect to the new ground rod system as per plans and specifications.
- D. Use minimum of 3/0 cable into the secondary compartment of pad-mounted transformer. Final ground connection by the Contractor.
- E. All compression connectors, lugs, etc. used in grounding circuit shall be manufacturer of silicon bronze alloy.

### 3.2 FIELD QUALITY CONTROL

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

END OF SECTION

MAI 2006-0194

SECTION 16190  
SUPPORTING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Conduit and equipment supports.
- B. Anchors and fasteners.

1.2 REFERENCES

- A. ANSI/NFPA 70 - 2002 National Electrical Code, Consumers Energy Facility Department Electrical Specification User Manual and 2003 Michigan Building Code.

1.3 REGULATORY REQUIREMENTS

- A. ANSI/NFPA 70 - 2002 National Electrical Code, Consumers Energy Facility Department Electrical Specification User Manual and 2003 Michigan Building Code.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and indicated.

PART 2 PRODUCTS

2.1 PRODUCT REQUIREMENTS

- A. Materials and Finishes: Provide adequate corrosion resistance.
- B. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.
- C. Anchors and Fasteners:
  - 1. Concrete Structural Elements: Use expansion anchors.
  - 2. Steel Structural Elements: Use beam clamps.
  - 3. Concrete Surfaces: Use self-drilling anchors and expansion anchors.
  - 4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts and hollow wall fasteners.
  - 5. Solid Masonry Walls: Use expansion anchors.
  - 6. Sheet Metal: Use sheet metal screws.
  - 7. Wood Elements: Use wood screws.
- D. Manufacturers:
  - 1. Appleton.
  - 2. Delta Star.
  - 3. General Devices.
  - 4. Grinnel Company.
  - 5. C.C Korns.
  - 6. Phillips Drill.
  - 7. Channel Section Supports.

- a. B-Line.
  - b. Midland Ross.
  - c. Steel City.
8. Manufacturers provided are based on the Owner's preferred manufacturers.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Attachments of mechanical or electrical equipment to structural members are the responsibility of the installing trade. Structural members shall not be field cut, welded or otherwise modified without approval of the Engineer. Attachment to steel joist shall be made at panel points whenever possible. Steel joist shall be reinforced for non-panel point concentrated loads in accordance with the structural details; this work shall be performed by certified welders and is the responsibility of the trade installing the subject load. Structural members shall not be overloaded as a result of attachments. Attachment/equipment loading for all trades resulting in total load greater than an equivalent uniform 5 psf for any member shall be submitted to the Architect/Engineer for review. Contractor may contact the structural engineer as needed to assist with panel point locations. Electrical Contractor is still responsible to design, fabricate and install electrical supports.
- B. Install products in accordance with manufacturer's instructions.
- C. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.
- D. Do not use spring steel clips and clamps.
- E. Do not use powder-actuated anchors.
- F. Do not drill or cut structural members without permission from Architect/Engineer.
- G. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
- H. In wet and damp locations use primed, painted and/or galvanized steel channel supports.
- I. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.
- J. Use ½" minimum size threaded rod for trapeze or ring type hanger.
- K. Use 1 ½"x 1 ½" minimum size channel, electregalvanized.

END OF SECTION

## SECTION 16195

### ELECTRICAL IDENTIFICATION

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Nameplates and labels.
- B. Wire and cable markers.

##### 1.2 RELATED SECTIONS

- A. All drawings and specification sections apply to work in this section. Furnish all items, articles, materials, equipment, operations or methods that are mentioned, listed or scheduled on drawings or are in this specification including all labor, equipment, materials and miscellaneous incidentals necessary and/or required for the completion of this project. The work covered under this section of the specifications is in no way complete within itself but is supplementary to the entire specification and drawings.

##### 1.3 REFERENCES

- A. ANSI/NFPA 70 - 2002 National Electrical Code, Consumers Energy Facility Department Electrical Specification User Manual and 2003 Michigan Building Code.

##### 1.4 REGULATORY REQUIREMENTS

- A. ANSI/NFPA 70 - 2002 National Electrical Code, Consumers Energy Facility Department Electrical Specification User Manual and 2003 Michigan Building Code.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

#### PART 2 PRODUCTS

##### 2.1 NAMEPLATES AND LABELS

- A. Nameplates:
  - 1. Engraved three-layer laminated plastic, white letters on black background for normal power to match facility standard. Refer to labeling methods and standards for sizes.
- B. Letter Size:
  - 1. Match facility standards.

##### 2.2 WIRE MARKERS

- A. Manufacturers:
  - 1. Brady or equal.

- B. Description: Tape or tubing type wire markers.
- C. Locations: Each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.

### 2.3 ARC FLASH LABELS

- A. Contractor shall provide proper warning labels required on all electrical distribution equipment for ARC flash in accordance with NEC 2002 Section 110-16 Requirements.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Degrease and clean surfaces to receive nameplates and labels.
- B. Provide tap and screw type installation of nameplates and labels.

### 3.2 APPLICATION

- A. Install nameplate and label parallel to equipment lines.

END OF SECTION

MAI 2006-0194

## SECTION 16330

### PAD MOUNTED PRIMARY SWITCH

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Pad mounted low profile primary switch gear, supplied by Owner.

##### 1.2 RELATED SECTIONS

- A. All drawings and specification sections apply to work in this section. Furnish all items, articles, materials, equipment, operations or methods that are mentioned, listed or scheduled on drawings or are in this specification including all labor, equipment, materials and miscellaneous incidentals necessary and/or required for the completion of this project. The work covered under this section of the specifications is in no way complete within itself but is supplementary to the entire specification and drawings.

##### 1.3 REFERENCES

- A. ANSI C57.12.28 - Switchgear and Transformers--Pad-Mounted Equipment--Enclosure Integrity.
- B. IEEE 386 - Separable Insulated Connector Systems for Power Distribution Systems Above 600 V.
- C. NEMA 260 - Safety Labels for Padmounted Switchgear and Transformers Sited in Public Areas.
- D. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment.
- E. ASTM - Paint finish durability for outdoor utility equipment.
- F. Conform to requirements of NFPA 70, 2002 National Electric Code, 2003 Michigan Building Code, State of Michigan Electric Code, and local code requirements.

##### 1.4 SUBMITTALS FOR REVIEW

- A. Provide submittals as listed in Section 16010.
- B. Shop Drawings: Indicate electrical characteristics and connection requirements, outline dimensions, connection and support points, weight, specified ratings and materials.
- C. Product Data: Provide electrical characteristics and connection requirements, standard model design tests, and options.

##### 1.5 PROJECT CLOSEOUT SUBMITTALS

- A. Submittals for project closeout, Division 1.
- B. Include copy of manufacturer's certified drawings in project record documents.

- C. Maintenance Data: Include maintenance instructions for cleaning methods; cleaning materials recommended; procedures for sampling and maintaining fluid.

## 1.6 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70, 2002 National Electric Code, 2003 Michigan Building Code, State of Michigan Electric Code, and local code requirements.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and indicated.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Division 1 - Material and Equipment: Transport, handle, store, and protect products.
- B. Accept primary switch on site. Inspect for damage. Contractor shall assume all responsibility for primary switch once accepted on site.

## 1.8 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

## 1.9 MAINTENANCE MATERIALS

- A. Division 1 - Contract Closeout.
- B. Furnish one set each of any special tools required to operate and maintain primary switch.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. As supplied by Owner.

### 2.2 SWITCH CONFIGURATION

- A. Refer to the drawings.

### 2.3 SERVICE CONDITIONS

- A. Meet requirements for usual service conditions described in ANSI C57.12.00.
- B. Meet all requirements of local utility company.

### 2.4 RATINGS

- A. Primary Voltage: Refer to drawings and coordinate with utility company.
- B. Bus Rating - 600 amps continuous.

- C. Switch Ratings:
  - 1. Continuous amps 600
  - 2. Momentary amps 20,000
  - 3. Fault closing amps 20,000
  
- D. Fuse Rating:
  - 1. Interrupting 300 MVA (nominal)
  - 2. Maximum continuous amps 100
  - 3. Supplied by Owner. Final coordination with utility.
  
- E. Basic Insulation Level: 95 kV.

## 2.5 ACCESSORIES

- A. Folding concealed socket with handle to operate switch.

## 2.6 FABRICATION

- A. Conform to the requirements of ANSI C57.12.28.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Division 1 - Coordination and Meetings: Verification of existing conditions prior to beginning work.
  
- B. Verify that support pads provided under Division 1 are ready to receive Products.
  
- C. Coordinate fuse sizing in conjunction with utility company standards for proper fuse coordination.

### 3.2 INSTALLATION

- A. Install plumb and level.
  
- B. Install safety labels to NEMA 260.

### 3.3 ADJUSTING

- A. Division 1 - Contract Closeout: Adjusting installed work.

END OF SECTION

MAI 2006-0194

## SECTION 16421

### UTILITY SERVICE ENTRANCE

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Primary service by the Contractor.

##### 1.2 RELATED SECTIONS

- A. All drawings and specification sections apply to work in this section. Furnish all items, articles, materials, equipment, operations or methods that are mentioned, listed or scheduled on drawings or are in this specification including all labor, equipment, materials and miscellaneous incidentals necessary and/or required for the completion of this project. The work covered under this section of the specifications is in no way complete within itself but is supplementary to the entire specification and drawings.

##### 1.3 REFERENCES

- A. ANSI/NFPA 70 - 2002 National Electrical Code, Consumers Energy Facility Department Electrical Specification User Manual and 2003 Michigan Building Code.

##### 1.4 SYSTEM DESCRIPTION

- A. System Characteristics: Extension of utility 8320 volt distribution circuit through new ISD owned primary fusible pad mounted switch.

##### 1.5 PRE-INSTALLATION CONFERENCE

- A. Make arrangements with the Owner prior to facility outage..

##### 1.6 FIELD VERIFICATION

- A. Verify utility service entrance locations and requirements.
- B. Contractor shall field verify all equipment locations and distances prior to starting work. Documents provided are based on Owner's record drawings and previous projects. Contractor shall provide all conduit and cable lengths required to meet field conditions.

##### 1.7 REGULATORY REQUIREMENTS

- A. ANSI/NFPA 70 - 2002 National Electrical Code, Saginaw Township codes, Consumers Energy Facility Department Electrical Specification User Manual and 2003 Michigan Building Code.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and indicated.

## PART 2 PRODUCTS

### 2.1 SERVICE ENTRANCE GROUNDING

- A. Furnish and install grounding conductors as specified, shown or noted on the drawings and specifications.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Contractor shall complete (2) new primary service entrances from utility connection points to the new primary switches and existing transformers, including conduit, wire, terminations, cutting, boring and patching, etc.
- B. Contractor shall furnish primary switches and all labor and materials to reconnect existing primary transformers owned by BAISD, refer to drawings.
- C. Contractor shall back fill, compact and prepare top soil ready for seeding by BAISD.
- D. Contractor shall complete all the new service work prior to pre-planned facility outages in order to minimize outage durations. Contractor shall schedule the outage during the Owner's non-business hours and include all premium time in bid. Contractor shall provide all labor and material to maintain essential systems. Contractor shall also include all temporary power sources necessary to complete work, etc.
- E. The Administration Building is equipped with a stand by diesel fueled generator capable of providing a source of lighting and power for the entire building. Contractor shall furnish all temporary wire, light fixtures and related components to extend and utilize power sources for their use to complete work.

END OF SECTION

MAI 2006-0194