

Project Manual for:  
City of Negaunee  
Fire Station Roof Replacement  
200 South Pioneer Avenue

Issued:  
For Bids  
January 28, 2019

Project Number:  
1831

Prepared By:



420 Rail Street  
Negaunee, MI 49866  
906-475-6616  
WWW.NDW.US

## **Section 00 01 10 Table of Contents**

### **Division 00 – Procurement and Contracting Requirements**

- 000101 Title Page
- 000110 Table of Contents
- 001116 Invitation to Bid
- 002100 Instructions to Bidders
- 004100 Bid Form
- 007300 Supplementary Conditions

### **Division 01 – General Requirements**

- 011100 Summary of the Work
- 012000 Price and Payment Procedures
- 013300 Submittal Procedures
- 015000 Temporary Facilities and Controls
- 017000 Execution and Closeout Requirements

### **Division 02 – Existing Conditions**

- 024119 Selective Structure Demolition

### **Division 03 – Concrete**

Not Used

### **Division 04 – Masonry**

Not Used

### **Division 05 – Metals**

Not Used

### **Division 06 – Wood, Plastics, and Composites**

- 060140 Architectural Woodwork Restoration

### **Division 07 – Thermal & Moisture Protection**

- 076100 Sheet Metal Roofing
- 079200 Joint Sealers

### **Division 08 – Openings**

Not Used

### **Division 09 – Finishes**

- 099000 Paints and Coatings

**Division 10 – Specialties**

Not Used

**Division 11 – Equipment**

Not Used

**Division 12 – Furnishings**

Not Used

**Division 13 – Special Construction**

Not Used

**Division 14 – Conveying Equipment**

Not Used

**Division 21 – Fire Suppression**

Not Used

**Division 22 – Plumbing**

Not Used

**Division 23 – Heating, Ventilating, and Air Conditioning**

Not Used

**Division 26 – Electrical**

260500 Common Work Results for Electrical

265600 Exterior Lighting

**Division 27 – Communications**

Not Used

**Division 28 – Electronic Safety and Security**

Not Used

**Division 31 – Earthwork**

Not Used

**Division 32 – Exterior Improvements**

Not Used

**Division 33 – Utilities**

Not Used

**End of Section**

**Section 00 11 16  
Invitation to Bid**

Notice is given hereby that

**City of Negaunee**

will accept bids from qualified contractors for construction of:

**Fire Station Roof Replacement**

according to Drawings and Specifications prepared by:

Northern Design Works  
420 Rail Street  
Negaunee, MI 49866

Including, but not limited to: Removal and replacement of standing seam roofing, restoration of existing flagpole, installation of new flagpole lighting

Sealed bids will be received at the office of the Negaunee City Clerk, 319 W. Case Street until 2:00 PM local time, February 21, 2019. At that time, bids will be publicly opened. Bids received after the date and time specified may be returned to the bidder, unopened.

Bids will be taken on a lump sum basis as defined on the bid form. Bids shall be accompanied by bid security equal to 5% of the bid amount.

100% surety bonds for performance and payment of labor and materials are required.

Bid documents may be examined at the following locations:

Northern Design Works  
420 Rail Street  
Negaunee, MI 49866

Negaunee City Hall

Marquette Builders Exchange

Iron Mountain Builders Exchange

Builders Exchange of Wisconsin - Fox Valley

Delta County Builders Exchange

Builders Exchange of Northwest Michigan

Bid documents are available from the office of the architect, upon payment of \$30. Partial sets will not be issued. Electronic versions of the documents are available via e-mail or upon payment of a \$20 fee for a CD-ROM copy to cover the cost of handling and delivery.

Contractors are requested to notify the architect of their interest in the project, so they can be placed on the plan holders list.

The owner reserves the right to reject any or all bids and to waive irregularity in the bidding or the bidding process and accept the bid that is most advantageous to the owner.

Dated: January 28, 2019

by: City of Negaunee

**End of Section**

## **Section 00 21 00 Instructions to Bidders**

### **PART 1 - General**

#### 1.1 Summary

- A. Section includes:
  - 1. Bidder representations.
  - 2. Bid submission.
  - 3. Contract time.
  - 4. Bidding documents.
  - 5. Inquiries and addenda.
  - 6. Product substitutions.
  - 7. Site examination.
  - 8. Bidder qualifications.
  - 9. Subcontractors and suppliers.
  - 10. Submission procedure.
  - 11. Permits and Fees.
  - 12. Rejection of bids.
  - 13. Security deposit.
  - 14. Performance assurance.
  - 15. Acceptance of bid.
  - 16. Correction or withdrawal of bids.
  - 17. Form of agreement between owner and contractor.
- B. Related documents:
  - 1. Section 00 11 16 – Invitation to Bid.
  - 2. Section 00 41 00 – Bid Form.
  - 3. Section 00 73 00 – Supplementary Conditions.

#### 1.2 Bidder Representations

- A. By submitting a Bid, the Bidder represents that:
  - 1. The bidder has examined and understands the bidding documents.
  - 2. The Bid is made in compliance with the bidding documents.
  - 3. The bidder has examined the site in accordance with 'Site Examination' below.
  - 4. The bid is based on the materials, equipment, and systems required by the bidding documents without exception.
  - 5. The Bid is based solely on the information contained in the bidding documents, including addenda, and the bidder has not relied on any verbal statement from the Owner or Architect in the preparation of the Bid.

#### 1.3 Bid Submission

- A. Refer to Section 00 11 16 – Invitation to Bid for bid date, time, and location.
- B. Bids received after the date and time stated above may be returned to the bidder unopened.
- C. Amendments to submitted bids will be permitted when received in writing prior to bid closing and when endorsed by the same party or parties who signed and sealed the bid.

#### 1.4 Contract Time

- A. The Work is to be substantially complete by September 1, 2019.
- 1.5 Bidding Documents
- A. Refer to Section 00 11 16 – Invitation to Bid for information on document availability.
  - B. Bidding Documents are made available only for the purpose of obtaining bids on this Project. Their use does not grant a license for other purposes.
  - C. Bidders shall use complete sets of bidding documents in the preparation of their Bid. Neither the Owner nor the Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of bidding documents.
- 1.6 Inquiries and Addenda
- A. Direct questions in writing to the office of the Architect.
  - B. Verbal answers are not binding on any party and bidders shall not rely on them.
  - C. Submit questions not less than four (4) days before bid date. Replies will be made by Addenda when required.
  - D. Addenda will be issued at least two (2) days before bid date, unless addenda include a revision in bid date. Addenda will be issued to all plan holders who have notified the Architect of their interest in bidding the project and to all plan rooms known to the Architect to have sets on file.
  - E. Costs for all addenda shall be included in the Bid.
  - F. Each bidder shall verify their receipt of all addenda before submitting a Bid and shall note receipt of addenda where indicated on bid form.
- 1.7 Product Substitutions
- A. The materials, products, and equipment described in the bid documents establish a standard or required function, dimension, appearance, and quality to be met by any proposed substitution.
  - B. Where bidding documents stipulate particular products, and substitutions are allowed, Bidders may submit requests for substitutions in writing no later than seven (7) days prior to bid date. With each substitution request provide enough information for Architect to determine acceptability of proposed products. Requests without sufficient information will be rejected without review.
  - C. Approved substitutions will be identified by addenda.
  - D. Claims by the bidder after the bid date for an addition to the Contract Time or Contract Sum because of changes in the Work necessitated by substitutions will not be considered.
- 1.8 Site Examination
- A. All contractors will be responsible for reviewing the existing site conditions prior to bidding. Each bidder shall fully inform himself prior to bidding as to existing conditions and limitations under which the work is to be performed and shall include in his bid a sum to cover the cost of items necessary to perform the work as set forth in the contract documents. No allowance will be made to a bidder because of lack of such examination. The submission of a bid will be considered as conclusive evidence that the bidder has made such examination.
  - B. The exterior of the building is open for examination at all times.
- 1.9 Bidder Qualifications
- A. To demonstrate qualifications to perform the Work of this Project, Bidders may be requested to submit written evidence of financial position, previous experience, current commitments, licensure, and current and past legal disputes related to project

performance. All such information will be treated as confidential by the Architect and Owner and used for purposes of evaluating contractor qualifications only.

- 1.10 Subcontractors and Suppliers
  - A. Bidder shall state proposed sub-contractors where requested on the bid form. Failure to do so may be cause for rejection of a bid.
  - B. The Owner reserves the right to reject proposed sub-contractors or suppliers for reasonable cause.
  - C. Refer to AIA document A201-2017, article 5 of General Conditions.
- 1.11 Submission Procedure
  - A. Bidders are solely responsible for delivery of Bids in manner and time described.
  - B. Submit two copies of executed offer on Bid Form provided, signed by an authorized individual, with bid security as noted in Section 00 11 16 – Invitation to Bid, in a sealed envelope. Label the envelope with the bidder’s name, project name, and ‘sealed bid’.
  - C. Bids will not be accepted in facsimile, phone, electronically transmitted, or verbal format.
  - D. A bid summary will be available to bidders after bids are received and reviewed.
- 1.12 Permits and Fees
  - A. The Bid shall include all applicable fees and permit costs required by authorities having jurisdiction over the project unless noted otherwise in these specifications.
- 1.13 Rejection of Bids
  - A. Bids that do not meet the requirements stated above, are un-signed, or illegible may be rejected by the Owner.
- 1.14 Security Deposit
  - A. Refer to Section 00 11 16 – Invitation to Bid, for amount of bid security required.
  - B. Security may be in one of the following forms:
    - 1. Certified check in the name of the Owner.
    - 2. Bid bond on AIA document A310 – Bid Bond or surety standard form. Bond shall be endorsed in the name of the Owner as obligee, signed and sealed by principal (Contractor) and surety.
  - C. Security deposit of accepted bidder will be returned after execution of contract and submittal of any required bonds.
  - D. After a bid has been accepted, security deposit will be returned to other bidders.
- 1.15 Performance Assurance
  - A. The accepted bidder shall provide a performance and payment bond as described in 00 73 00 – Supplementary Conditions. The cost of such bond shall be included in the contract sum.
- 1.16 Acceptance of Bid
  - A. The Owner reserves the right to accept or reject any offer, with or without cause and to waive any informalities or irregularities in the bidding process.
  - B. If the lowest bid exceeds the project budget, the Owner reserves the right to negotiate scope changes, and contract sum adjustments, with the lowest bidder.
  - C. After acceptance of the bidder by the Owner, the Architect will issue, on behalf of the Owner, a letter of award. The bidder shall then cooperate with the Owner, with technical and practical advice from the Architect, to prepare and execute a contract within the time stated on the bid form.

- 1.17 Correction or Withdrawal of Bid
- A. Bidders may withdraw their bids by written request at any time before bid closing. The written request shall not reveal the amount of the bid.
  - B. After the bid closing, corrections may be made to bids where the error resulted from mathematical or clerical errors and the correct information is readily apparent from the information on the bid form.
  - C. Bidders may be allowed to withdraw their bid after bid closing, without penalty, for serious mistakes of fact given that:
    - 1. The mistake is objectively provable.
    - 2. The mistake is large enough to present a material detriment to the bidder.
  - D. Bidders will not be allowed to withdraw their bid after bid closing for mistakes of judgment. Bidders which do not execute a contract in such a situation will forfeit their bid security as damages to the Owner as stated on the bid form.
- 1.18 Form of agreement between Owner and Contractor
- A. The form of agreement shall be AIA document A101 – Standard Form of Agreement between Owner and Contractor where the basis of payment is a Stipulated Sum, 2017 edition.
  - B. AIA document A201 – General Conditions of the Contract for Construction, 2017 edition, is included by reference herein.
    - 1. Refer to Section 00 73 00 – Supplementary Conditions for modifications to the General Conditions.
  - C. Copies of these documents may be obtained from the office of the Architect.

### **End of Section**



**Section 00 41 00  
Bid Form**

**PART 1 - General**

1.1 Project Information

- A. To: City of Negaunee, hereinafter called 'Owner'.
- B. Project: Fire Station Roof Replacement
- C. Date: February 21, 2019

1.2 Contractor Information

- A. Submitted by:

---

(Hereinafter called 'Bidder')

---

(Address)

---

(Address)

---

(Phone and Fax numbers)

1.3 Bid

- A. Base Bid

Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by Northern Design Works for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:

(Dollars)

---

(\$ \_\_\_\_\_) in lawful money of the United State of America

- B. Contract Time

If this bid is accepted, we will achieve Substantial Completion by September 1, 2019

- C. Bid Acceptance

This offer shall be open to acceptance and irrevocable for thirty (30) days from the Bid Date.

If the Owner accepts the Bid within the time stated above, we will:

1. Execute the Agreement within seven (7) days of receipt of Notice of Award.
2. Furnish the required bonds, as described in Section 00 73 00 – Supplementary Conditions, within seven (7) days of receipt of Notice of Award.
3. Commence work within seven (7) days of Notice to Proceed.

If this bid is accepted within the time stated, and we fail to commence the Work, the security deposit shall be forfeited as damages to the Owner by reason of our failure,

limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.

In the event our bid is not accepted within the time stated above, the required security deposit will be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

D. Addenda  
The following addenda have been received. The modifications to the Bid Documents have been noted and all costs are included in the Bid Sum.

1. Addenda numbers \_\_\_\_\_

E. Sub-Contractors  
The following work will be performed by Sub-Contractors and coordinated by the Contractor. Failure to list sub-contractors at bid time may be a cause for rejection of the bid. (indicate portion of work and sub-contractor name, attach additional sheet if needed):

---

---

---

---

---

---

---

---

F. Voluntary Alternates  
The Contract Sum proposed by the undersigned on the Bid Form is for the work as shown on the Drawings, described in the Specifications and otherwise defined in the Contract Documents. However, the undersigned proposes the following Voluntary Alternates for the Owner's consideration. Should the Owner accept any or all of the proposed substitutions, the bidders proposed Contract sum would be reduced by the amount shown (indicate specified product or material, proposed substitute, and reduction in Sum):

---

---

---

---

---

G. Bid Form Signatures

---

(Authorized Signature(s))

---

(Printed name(s) and title(s))

---

(Type of organization – Corporation, partnership, etc.)

Affix corporate seal, additional signatures required to give authority to bind corporation, or additional signatures for a joint venture or partnership as appropriate.

**End of Section**

## **Section 00 73 00 Supplementary Conditions**

### **PART 1 - General**

- 1.1 Summary
  - A. This document includes Supplementary Conditions to the General Conditions of the Contract for Construction.
- 1.2 Related Documents
  - A. Section 00 21 00 – Instructions to Bidders: Reference to Agreement and General Conditions.
- 1.3 Supplementary Conditions:
  - A. These Supplementary Conditions modify the General Conditions of the Contract for Construction, AIA Document A201-2017, and other provisions of the Contract Documents as indicated below. All provisions that are not so modified remain in full force and effect.
  - B. The terms used in these Supplementary Conditions that are defined in the General Conditions of the Contract for Construction, AIA Document A201-2017, have the meanings assigned to them in the General Conditions.

#### Article 1.1 Basic Definitions

Add the following:

##### 1.1.9 Miscellaneous Definitions

- A. The term 'product' includes materials, systems, and equipment.
- B. The term "provide" includes furnishing and installing a product, complete in place, tested and approved.
- C. The term "building code," and the term "code," refer to regulations of governmental agencies having jurisdiction.
- D. The terms "approved," "required," and "as directed" refer to and indicate the work or materials that may be approved, required, or directed by the Architect acting as the agent of the Owner.
- E. The term "similar" means in its general sense and not necessarily identical.
- F. The terms "shown," "indicated," "detailed," "noted," "scheduled," and terms of similar import, refer to requirements contained in the Contract Documents.

#### Article 3.10 Contractor's Construction Schedules

Add the following to 3.10.3:

In planning his construction schedule within the agreed contract time, it shall be assumed that the Contractor has anticipated the amount of adverse weather conditions normal to the site of the Work for the season or seasons of the year involved. The Architect will consider those weather delays attributable to other than normal weather conditions only.

Add the following to 3.10.3:

When the contract time has been extended, as provided under this Paragraph, such extension of time shall not be considered as justifying extra compensation to the Contractor for administrative or similar costs.

#### Article 3.14 Cutting and Patching

Add the following:

3.14.3 Each Subcontractor shall do all fitting of his own work as required to make its several components fit together or to receive the work of other Contractors. Holes cut in exterior walls or roofs for installation of mechanical or electrical equipment shall be waterproofed by the Contractor responsible for such installation.

#### Article 7 Changes in the Work

Add the following:

7.1.4 The Agreement identifies the overhead and profit fees applicable to Changes in the Work, whether additions to or deductions from the Work on which the Contract Sum is based and identifies the fees for subcontract work for changes (both additions and deductions) in the Work. The Contractor shall apply fees as noted, to the Subcontractor's gross (net plus fee) costs on additional work.

#### Article 9 Payments and Completion

Add the following to 9.3.1:

The form of application for payment shall be AIA Documents G702, "Application and Certificate for Payment," supported by continuation sheet or sheets G703 as approved by the Owner.

Add the following:

9.6.8 Retainage: Progress payments shall include that portion of the Contract Sum properly allocable to completed Work and stored materials, less Retainage of ten percent (10%). Retainage will be limited as follows: After fifty percent (50%) of the work has been completed, if the Architect finds that satisfactory progress is being made, the Architect shall recommend that the retainage be reduced to five percent (5%) on remaining progress payments.

#### Article 11 Insurance and Bonds

Add the following to 11.1.2:

Insurance coverage shall not be less than the following:

- A. Worker's Compensation: Statutory
- B. Contractor's Public Liability:
  - 1. Personal injury: \$500,000/\$1,000,000
  - 2. Property damage: \$500,000/\$1,000,000

- C. Contractor's Contingent Liability:
  - 1. Personal injury: \$500,000/\$1,000,000
  - 2. Property damage: \$500,000/\$1,000,000
  
- D. Automobile Public Liability:
  - 1. Personal injury: \$500,000/\$1,000,000
  - 2. Property damage: \$500,000 each occurrence

Substitute the following for 11.4.1:

11.4.1 The Contractors shall furnish a Performance Bond in an amount equal to One Hundred Percent (100%) of the Contract and, also a Labor and Material Payment Bond in the amount of not less than One Hundred Percent (100%) of the Contract Sum or in a penal sum not less than that prescribed by State, Federal, Territorial, or Local Law, as security for payment of persons performing the Labor on the Project under this Contract and furnishing material in connection with this Contract. The Performance and Material Payment Bond may be in one or separate instruments and shall be delivered to the Owner not later than the date of execution of the Contract. Bonds shall be submitted on AIA document A312 or surety's standard form.

**End of Section**

## **Section 01 11 00 Summary of the Work**

### **PART 1 - General**

#### 1.1 The Work

- A. The project includes all material, labor, tools, equipment, field engineering, and transportation necessary to complete all work as identified in the Drawings and further defined in these Specifications. This includes all items not specifically mentioned, but incidental to the work to provide a complete and operational product.
- B. The Work includes:
  - 1. Removal and replacement of standing seam roofing, restoration of existing flagpole, installation of new flagpole lighting
- C. The Owner may contract for other work concurrent with this contract.

#### 1.2 Owner Occupancy

- A. The Owner will occupy the premises during the entire period of construction for the conduct of normal operations.
- B. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations.

**End of Section**

## **Section 01 20 00**

### **Price and Payment Procedures**

#### **PART 1 - General**

- 1.1 Section Includes
  - A. Schedule of Values
  - B. Applications for Payment
  - C. Requests for Information
  - D. Contract Modification Procedures
  - E. Defect Assessment
- 1.2 Schedule of Values
  - A. Submit printed schedule on AIA form G703 – Continuation Sheet for G702. Contractor’s standard form will be considered if similar to above.
  - B. Submit two copies of schedule of values to Architect within 15 days after date of Owner-Contractor Agreement.
  - C. Format: Identify each line item with title. Include mobilization and bonds and insurance as line items.
  - D. Include in each line item allowances specified in this section.
  - E. Revise schedule to include approved Change Orders with each Application for Payment.
- 1.3 Applications for Payment
  - A. Submit three copies of each application on AIA form G702 – Application and Certificate for Payment and G703 – Continuation Sheet for G702.
  - B. Content and Format: Utilize schedule of values for listing items in application for payment.
  - C. Payment Period: Submit at intervals as specified in the Agreement.
- 1.4 Requests for Information
  - A. Requests for Information (RFI) shall be used to:
    - 1. Request information and/or clarification related to the plans, specifications, or contract requirements.
    - 2. Request approval for minor deviations from contract requirements that do not involve any time or cost adjustment.
    - 3. Obtain directions on how to proceed when there are conflicting contract requirements.
  - B. RFI shall be submitted by the Contractor to the Architect on the Contractor’s standard RFI form. RFI’s shall be numbered sequentially and shall include:
    - 1. RFI number.
    - 2. Date.
    - 3. Identification of the construction deficiency or Contract document clarification requested.
    - 4. Reference to Specification and paragraph numbers, drawing numbers and drawing reference.
    - 5. Impact this clarification will have on schedule (number of days) and project costs (if any).



- C. If a change in the Contract Time and/or Contract Sum are required, a Change Order will be issued by the Architect for signatures of parties as provided for in the Conditions of the Contract.
- 1.5 Contract Modification Procedures
- A. The Architect will advise of minor changes in the Work, not involving adjustment to Contract Sum or Contract Time by issuing supplemental instructions.
  - B. The Architect may issue a Bulletin, including a detailed description of proposed change. The Contractor shall promptly prepare and submit a fixed price quotation for the proposed change, including any adjustment in the Contract Time. Provide full documentation to support price quotation.
  - C. Contractor may propose changes by submitting a request for change to the Architect, describing proposed change and its full effect on the Work. Include a statement describing reason for the change, and effect on Contract Sum and Contract Time with full documentation.
  - D. Stipulated Sum Change Order: Based on a Bulletin and the Contractor's price quotation, or Contractor's request for change.
    - 1. Change Orders will be prepared on the Architect's standard form.
    - 2. Architect will issue Change Orders for signatures of parties as provided for in the Conditions of the Contract.
  - E. Construction Change Directive: Architect may issue directive, on AIA form G713 – Construction Change Directive, signed by Owner, instructing Contractor to proceed with change in the Work. The change will subsequently be included in a Change Order. The document will describe changes in the Work, and designate a method for determining any change in Contract Sum or Contract Time. Promptly execute change.
  - F. Correlation of Contractor Submittals:
    - 1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum.
    - 2. Promptly revise project schedules to reflect change in Contract Time and resubmit.
    - 3. Promptly enter change in project record documents.
- 1.6 Defect Assessment
- A. Replace the Work, or portion of the Work, not conforming to specified requirements.
  - B. If, in the opinion of the Architect, it is not practical to remove and replace the non-conforming work, the Architect will direct appropriate remedy or adjust payment.
  - C. At the Owner's discretion, defective work may remain and an appropriate adjustment be made in payment.
  - D. Authority of Architect to assess defects and identify payment adjustments is final.
  - E. Non-Payment for Rejected Products: Payment will not be made for rejected products for any of the following:
    - 1. Products wasted or disposed of in a manner that is not acceptable.
    - 2. Products determined as un-acceptable before or after placement.
    - 3. Products placed beyond lines and levels of required Work.
    - 4. Products remaining on hand after completion of Work.
    - 5. Loading, hauling, and disposing of rejected products.

**PART 2 - Products – Not Used**

**PART 3 - Execution – Not Used**

**End of Section**

## **Section 01 33 00 Submittal Procedures**

### **PART 1 - General**

#### 1.1 Summary

- A. Section includes samples, test reports, certificates, shop drawings and manufacturers' literature and data.
- B. Submit for approval, all of the items specifically mentioned under the separate sections of the specification, with information sufficient to evidence full compliance with contract requirements. Materials, fabricated articles and the like to be installed in permanent work shall equal those of approved submittals. After an item has been approved, no change in brand or make will be permitted unless:
  - 1. Satisfactory written evidence is presented to, and approved by the Architect, that manufacturer cannot make scheduled delivery of approved item or;
  - 2. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;
  - 3. Other conditions become apparent which indicates approval of such substitute item to be in best interest of the Owner.
- C. The Architect may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections.
- D. Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.
- E. Forward submittals in sufficient time to permit proper consideration and approval action. Time submission to assure adequate lead time for procurement of contract required items. Delays attributable to untimely and rejected submittals will not serve as a basis for extending contract time for completion.

#### 1.2 Submittals

- A. Provide transmittal form with each submittal including:
  - 1. Contractor name
  - 2. Date of submittal
  - 3. Project title
  - 4. Section number of the specification section by which submittal is required.
  - 5. Description of submittal
  - 6. Submittal number
  - 7. When submittal is a re-submission, add alphabetic suffix on submittal number. For example, submittal 1 would become 1A to indicate re-submission.
- B. Provide submittals other than physical samples in electronic format submitted via e-mail to the Architect. Electronic submittals should include transmittal form as part of the submittal. Electronic files must be of sufficient quality that all information is legible. Electronic format shall be in PDF, unless otherwise specified or coordinated with the Architect.
- C. When submittals cannot be submitted in electronic format provide four copies.
- D. Samples should be submitted in the quantity specified in each specification requesting the samples.
- E. Submit two copies of Operations and Maintenance Data at completion of work for review and approval.

- 1.3 Quality Assurance
  - A. The contractor shall review all submittals before submission for compliance with the contract documents.
  - B. Submittals which have not been reviewed and certified as compliant with the project requirements by the Contractor will be rejected.
- 1.4 Scheduling
  - A. Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time.
  - B. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential re-submittal.
  - C. Allow 10 business days for review of submittals in the construction schedule.

**PART 2 - Products - Not Used**

**PART 3 - Execution - Not Used**

**End of Section**

## Section 01 50 00 Temporary Facilities and Controls

### PART 1 - General

- 1.1 Section Includes
  - A. Temporary Utilities
    - 1. Temporary electricity.
    - 2. Temporary lighting for construction purposes.
    - 3. Temporary water service.
    - 4. Temporary sanitary facilities.
  - B. Construction Facilities
    - 1. Fire Extinguishers.
    - 2. Vehicular access and parking.
    - 3. Progress cleaning and waste removal.
    - 4. Project identification.
    - 5. Traffic regulation.
  - C. Temporary Controls
    - 1. Barriers.
    - 2. Dust control.
    - 3. Pest control.
    - 4. Pollution control.
    - 5. Smoking.
    - 6. Removal of temporary utilities, facilities, and controls.
- 1.2 Temporary Electricity
  - A. Owner will pay cost of energy used. Exercise measures to conserve energy. Utilize Owner's existing power service.
  - B. Provide flexible power cords as required for portable tools and equipment.
  - C. Permanent convenience receptacles may be used during construction.
- 1.3 Temporary Lighting for Construction Purposes
  - A. Provide and maintain adequate lighting for construction operations.
  - B. Maintain lighting and provide routine repairs.
  - C. Permanent building lighting may be used during construction.
- 1.4 Temporary Water Service
  - A. Owner will pay for cost of temporary water. Exercise measures to conserve water. Utilize Owner's existing water system, extend and supplement with temporary devices as needed to maintain specified conditions for construction operations.
- 1.5 Temporary Sanitary Facilities
  - A. Provide and maintain required facilities in a sanitary condition. Use of existing facilities is not permitted. Provide facilities at time of project mobilization.
- 1.6 Fire Extinguishers
  - A. Provide at least one 4A:10B-C rated portable fire extinguisher at each floor which is under construction.
  - B. Locate fire extinguishers at stairs if applicable.
  - C. Provide an additional fire extinguisher at each area where flammable or combustible liquids are stored, used, and dispensed.

- 1.7 Vehicular Access and Parking
  - A. Provide unimpeded access for emergency vehicles.
  - B. Provide and maintain access to fire hydrants and control valves free of obstructions.
  - C. Do not allow heavy vehicles or construction equipment in parking areas.
- 1.8 Progress Cleaning and Waste Removal
  - A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition.
  - B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other enclosed or remote spaces prior to enclosing spaces.
  - C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
  - D. Collect and remove waste materials, debris, and rubbish from site weekly and dispose of off-site.
  - E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.
- 1.9 Project Identification
  - A. No signs are permitted without Owner permission, except those required by law.
- 1.10 Traffic Regulation
  - A. Signs, Signals, and Devices
    - 1. Post and wall mounted traffic control and information signs: As approved by authority having jurisdiction.
    - 2. Traffic cones and drums, flares, and lights: As approved by authority having jurisdiction.
  - B. Flag Persons
    - 1. Provide trained persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.
    - 2. Provide equipment required by authority having jurisdiction to flag persons.
  - C. Flares and Lights
    - 1. Use flares and lights during hours of low visibility to delineate traffic lanes and guide traffic.
  - D. Removal
    - 1. Remove traffic regulation devices when no longer required.
    - 2. Repair any damage caused by installation.
- 1.11 Barriers
  - A. Provide barriers to prevent un-authorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
  - B. Provide barricades required by authorities having jurisdiction for public rights-of-way and for public access to existing buildings.
  - C. Protect non-owned vehicles, stored materials, site, and structures from damage.
- 1.12 Dust Control
  - A. Execute Work by methods to minimize raising dust from construction operations.
  - B. Provide positive means to prevent dispersion of air-borne dust.
- 1.13 Pest and Rodent Control
  - A. Provide methods, means, and facilities to prevent pests and rodents from damaging the Work or entering facility.
- 1.14 Pollution Control

- A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.
  - B. Comply with pollution and environmental control requirements of authorities having jurisdiction.
- 1.15 Smoking
- A. Smoking is not permitted in this facility.
- 1.16 Removal of Temporary Utilities, Facilities, and Controls
- A. Remove temporary utilities, equipment, facilities, and materials prior to final inspection.
  - B. Clean and repair damage caused by temporary installations or use of temporary work.
  - C. Restore existing and new facilities used during construction to original or specified condition.

**PART 2 - Products – Not Used**

**PART 3 - Execution – Not Used**

**End of Section**

## Section 01 70 00 Execution and Closeout Requirements

### PART 1 - General

- 1.1 Summary
  - A. Section includes:
    - 1. Closeout procedures.
    - 2. Final cleaning.
    - 3. Protecting installed construction.
    - 4. Project record documents.
    - 5. Operation and maintenance data.
    - 6. Spare parts and maintenance products.
    - 7. Product warranties.
- 1.2 Closeout Procedures
  - A. Submit notification that Work is complete in accordance with Contract Documents and ready for Architect's review.
  - B. Provide submittals to Architect required by authorities having jurisdiction.
  - C. Upon completion of all punch list items, submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.
  - D. Include with final Application for Payment the Contractor's lien waiver, conditional on receipt of final payment.
  - E. Owner will occupy building as specified in Section 01 11 00 – Summary of the Work.
- 1.3 Final Cleaning
  - A. Execute final cleaning prior to final project assessment.
  - B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces.
  - C. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.
  - D. Clean or replace filters of operating equipment.
  - E. Clean debris from roofs, gutters, downspouts, and drainage systems.
  - F. Clean site; sweep paved areas, rake clean landscaped surfaces.
  - G. Remove waste and surplus materials, rubbish, and construction facilities from site.
- 1.4 Protecting Installed Construction
  - A. Protect installed Work and provide special protection where specified in individual specification sections.
  - B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
  - C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
  - D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
  - E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- 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, not less than weekly.
  - 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 Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
    1. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
    2. Field changes of dimension and detail.
    3. Details not on original Contract drawings.
  - G. Submit documents to Architect with final Application for Payment.
- 1.6 Operation and Maintenance Data
- A. Submit data bound in 8-1/2 x 11 inch (A4) text pages, binders with durable covers.
  - B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.
  - C. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
  - D. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
  - E. Contents: Prepare Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
    1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.
    2. Part 2: Operation and maintenance instructions arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      - a. Significant design criteria.
      - b. List of equipment.
      - c. Parts list for each component.
      - d. Operating instructions.
      - e. Maintenance instructions for equipment and systems.
      - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
    3. Part 3: Project documents and certificates, including the following:

- a. Shop drawings and product data.
- b. Air and water balance reports.
- c. Certificates.
- d. Warranties.

1.7 Spare Parts and Maintenance Products

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.
- B. Deliver to Project site and place in location as directed by Owner.

1.8 Product Warranties

- A. Obtain warranties executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
- B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form and contain full information.
- D. Co-execute submittals when required.
- E. Include Table of Contents and assemble in binder with durable cover.
- F. Submit with final Application for Payment.

**PART 2 - Products**

2.1 Not Used

**PART 3 - Execution**

3.1 Not Used

**End of Section**

## **Section 02 41 19**

### **Selective Structure Demolition**

#### **PART 1 - General**

- 1.1 Summary
  - A. Section includes removal of designated building equipment and fixtures; removal of designated construction; dismantling, cutting, and alterations for completion of the Work; disposal of materials to be removed; storage of materials to be re-installed; capping and identification of utilities; salvaged items; and protection of work to remain.
- 1.2 Closeout Submittals
  - A. Project Record Documents: Accurately record actual locations of capped utilities and sub-surface obstructions.
- 1.3 Scheduling
  - A. Schedule work to coincide with new construction.
- 1.4 Project Conditions
  - A. Conduct demolition to minimize interference with adjacent and occupied building areas and prevent dust migration into occupied spaces.
  - B. Maintain building security and protected ingress and egress at all times. Note maintenance of required exits, which may be adjacent to or contained within the construction activity.
  - C. Cease operations immediately when structure appears to be in danger and notify Owner and Architect. Do not resume operations until directed.

#### **PART 2 - Products – Not Used**

#### **PART 3 - Execution**

- 3.1 Preparation
  - A. Erect and maintain temporary safeguards, including warning signs, barricades, and similar measures for protection of the public, Owner, Contractor's employees, and existing improvements to remain.
  - B. Erect and maintain weatherproof enclosures for exterior openings.
  - C. Erect and maintain temporary partitions to prevent spread of dust, odors, and noise to permit continued occupancy.
  - D. Protect existing materials and existing improvements not indicated to be altered.
  - E. Prevent movement of structure; provide temporary bracing and shoring required to ensure safety of existing structure.
  - F. Notify affected utility companies before beginning work and comply with their requirements.
  - G. Mark location and termination of utilities.
  - H. Provide appropriate temporary signage including signage for exit or building egress.
- 3.2 Demolition
  - A. Disconnect, remove, cap, and identify designated utilities within demolition areas.
  - B. Demolish in orderly and careful manner. Protect existing foundation, supporting structural members, and adjacent surfaces.

- C. Remove demolished materials from site unless specifically noted otherwise. Do not burn or bury materials on site.
- D. All demolished equipment and materials become property of the Contractor unless claimed by the Owner. The Contractor shall contact the Owner and establish components that will be salvaged and turned over to the Owner prior to commencement of demolition. Demolished equipment and materials not claimed by the Owner shall be disposed of by the Contractor. All costs for removal, handling, transportation, and disposal shall be included in the bid.
- E. Relics, antiques, and similar objects remain the property of the Owner. Notify the Architect prior to removal and obtain acceptance of method of removal.
- F. Remove materials as work progresses. Upon completion of the Work, leave areas in clean condition.
- G. Upon completion of Work, remove all temporary construction.

### **End of Section**

## Section 06 01 40 Architectural Woodwork Restoration

### PART 1 - General

- 1.1 Summary
  - A. Section includes repair and restoration of existing exterior woodwork.
- 1.2 References
  - A. US Department of the Interior – National Park Service: Preservation Briefs: 10 – Exterior Paint Problems on Historic Woodwork.
- 1.3 Submittals
  - A. Product Data: Submit data on repair products.
  - B. Manufacturers’ Installation Instructions: Submit special procedures and substrate conditions requiring special attention.
- 1.4 Delivery, Storage, and Handling
  - A. Deliver products to site in sealed and labeled containers.
  - B. Do not use epoxies or adhesives that have exceeded manufacturer’s shelf life.
  - C. Follow all safety precautions as defined by product manufacturer.
  - D. Provide a minimum 20 lb capacity carbon dioxide type fire extinguisher at the immediate work area.
- 1.5 Quality Assurance
  - A. Perform all work in accordance with US Department of the Interior standards for historic preservation.
- 1.6 Environmental Requirements
  - A. Do not apply materials when surface or ambient temperatures are outside temperature ranges recommended by manufacturer.
  - B. Wood to be consolidated must be dry, with a moisture content below 18%. Protect area from moisture until epoxy has completely cured.
  - C. Wood being prepared for painting shall have moisture content below 12% by weight. Protect area from moisture until re-painting is complete and cured.
  - D. Protect adjacent surfaces and materials during completion of this work. Do not use fasteners to secure protection to historic material.
  - E. Lead Containing Materials
    - 1. The existing paint on this project is known to contain lead.
    - 2. Conduct the work in accordance with all necessary precautions to avoid exposure to lead containing materials by workers and others.
    - 3. Conduct the work and disposal of lead based materials in accordance with all applicable regulations.
    - 4. Before commencing work, provide every worker with instruction and training in the hazards of lead paint exposures, in personal hygiene and work practices, and in the use, cleaning, and disposal of respirators and protective clothing.
- 1.7 Clean Up
  - A. Remove from the building any oil soaked rags and/or brushes at the end of each work day or sooner if use of oil is finished. This is to avoid any danger of linseed oil soaked rags spontaneously combusting.

- B. Clean up work area at the end of each workday. Remove from building and discard unused materials, containers, tools, towels, and paint dust in accordance with any local, State, and Federal regulations.

## **PART 2 - Products**

### 2.1 Components

- A. Epoxy Wood Consolidant:
  - 1. LiquidWood by Abatron, Inc. 800-445-1754.
  - 2. ConServ Flexible Epoxy Consolidant 100 by Housecraft Associates, 973-579-1112.
  - 3. Approved equal.
- B. Epoxy Wood Replacement:
  - 1. WoodEpoxy by Abatron, Inc. 800-445-1754.
  - 2. ConServ Flexible Epoxy Patch 200 by Housecraft Associates, 973-579-1112.
  - 3. Approved equal.
- C. Fume Silica: Fumed silica or equal may be used to thicken the patch to enhance tooling and application.
- D. Adhesive: Two part marine epoxy formulated for use on porous materials.
- E. Surface Preparation Materials
  - 1. Boiled linseed oil.
  - 2. Turpentine.

## **PART 3 - Execution**

### 3.1 Preparation

- A. Remove all dirt, paint, loose wood, and soft wood decay in area to be repaired down to sound wood.
- B. Protect wood to be repaired from exposure to moisture during course of repairs.
- C. Protect adjacent vegetation and building fabric from damage, spills, or drips.

3.2 Sequence of work: Consolidation and patching with epoxy shall be executed after paint removal but before the surface preparation work.

### 3.3 Paint Removal

- A. All interior and exterior surfaces shall be scraped and sanded to sound substrate, which may or may not be bare wood. Where epoxy repairs are required, strip to bare wood.
- B. Paint Removal
  - 1. Heat guns and careful scraping and sanding are permissible means of removing paint from wood components. Use diligent precautions regarding fire at all times as combustible materials are present. Use heat guns in such a way that wood is not scorched.
  - 2. Where use of stripping chemicals is desired, submit information on materials to be used to the Architect for approval.
  - 3. Open flame devices for paint removal are not permitted because of fire hazards.
  - 4. Scraping and sanding shall be done carefully so as not to gouge or otherwise alter profiles of moldings. Orbital sanders are not permitted because of the tendency to tear across the grain.
  - 5. Customize blades for scrapers to match the shape of the original profiles.

6. Carefully sand to achieve a smooth surface without altering profiles. Feather edges. Remove all dust with HEPA vacuum and wipe clean. The desired end result need not be bare wood.
7. Wipe all surfaces down with a weak solution of trisodiumphospate (TSP); follow all safety procedures. Keep amount applied to absolute minimum to avoid wetting wood.

#### 3.4 Epoxy Consolidation

- A. Perforate wood to be consolidated with 1/8" diameter holes at 1/2" o.c. prior to applying consolidant.
- B. Apply consolidant by pouring or brushing.
- C. Apply liberally to prepared decay areas but not beyond.
- D. Repeat application 4 to 6 times or until surfaces do not accept more consolidant.
- E. Allow approximately one hour between applications.
- F. Keep epoxy consolidant out of direct sunlight and at temperatures above 60 degrees F until fully cured.

#### 3.5 Epoxy Patching

- A. Apply epoxy patch with a putty knife, trowel, or similar tool.
- B. Apply patch to prepared cavities or checks.
- C. Observe manufacturers directions for maximum thickness of application per layer. Allow epoxy to set before applying additional layers.
- D. Where outside corners have been damaged, mix the patch materials to a low viscosity and form to the desired shape.
- E. Plane, tool, and sand wood smooth to remove excess epoxy and restore profile.
- F. Surfaces should not be completely covered in epoxy. After final tooling and sanding as much sound wood as possible should show.

#### 3.6 Dutchmen

- A. Material spliced in as repair shall be same wood species, with grain oriented to match original.
- B. Joints shall be tight so that after finishing they are not readily visible.
- C. Joints shall be weather tight, bevel exterior joints so they will drain to the exterior if moisture penetrates.
- D. Material spliced in shall be attached to the parent piece, not adjacent element.
- E. Surface fasteners are not permitted. Clamp until adhesive has set and protect from pressure marks.

#### 3.7 Surface Preparation

- A. All areas of bare wood that are weathered gray and which have not been consolidated and patched with epoxy, shall be treated with one coat of boiled linseed oil and turpentine, mixed 1:1, applied by brush.
- B. Once the surface is dry, well-kneaded oil based glazing putty may be used to fill any small holes or imperfections and tooled smooth. Surfaces must be dry, free of dust, and all friable material must be removed prior to beginning.
- C. Primer shall not be applied before the linseed oil/turpentine mixture has oxidized and a skin has formed on the putty.

#### 3.8 Cleaning

- A. Upon completion remove stains, dust, and smudges caused by work. Restore any damaged caused by work as directed by Architect.

**End of Section**



## **Section 07 61 00 Sheet Metal Roofing**

### **PART 1 - General**

- 1.1 Summary
  - A. Section includes installation of pre-finished sheet metal roofing, flashing, and accessories indicated on drawings and specified here.
  - B. Related Sections:
    - 1. Section 07 92 00 – Sealants
- 1.2 References
  - A. ASTM A653 / A653M Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - B. ASTM A792 / A792M Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
  - C. ASTM D226 Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
  - D. SMACNA (Sheet Metal and Air Conditioning Contractors National Association) - Architectural Sheet Metal Manual.
- 1.3 Submittals
  - A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
  - B. Product Data: Submit data on metal types, finishes, and characteristics.
  - C. Submit samples of roof panel finishes for color selection.
- 1.4 Quality Assurance
  - A. Perform Work in accordance with SMACNA Architectural Sheet Metal Manual and manufacturer's standard details, except as otherwise noted.
- 1.5 Qualifications
  - A. Installer: Company specializing in sheet metal roof installations with minimum three years experience.
- 1.6 Delivery, Storage, and Handling
  - A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
  - B. Prevent contact with materials causing discoloration or staining.
- 1.7 Warranty
  - A. Paint finish shall have a twenty year guarantee against cracking, peeling and fade (not to exceed 5 N.B.S. units).
  - B. Sheet metal material shall have a twenty year guarantee against failure due to corrosion, rupture or perforation.
  - C. Applicator shall furnish guarantee covering water tightness of the roofing system for the period of two (2) years from the date of substantial completion.

### **PART 2 - Products**

- 2.1 Sheet Metal Material

- A. Prefinished metal shall be hot-dipped galvanized – ASTM A653 Grade C G90 Coating 24 gauge core steel or prefinished Galvalume – ASTM A792 AZ-55.
  - B. Finish shall be full strength Kynar 500 Fluoropolymer coating applied by the manufacturer.
    - 1. Top side dry film thickness shall be 0.70 to 0.90 mil over 0.25 to 0.35 mil prime coat, to provide a total dry film thickness of 0.95 to 1.25 mil. Bottom side shall be coated with primer with a dry film thickness of 0.25 mil.
    - 2. Color shall be colonial red color selected from manufacturer’s full color line. Submit samples for color selection.
- 2.2 Accessories
- A. Fasteners: Galvanized steel where concealed, same finish as roofing metal where exposed.
  - B. Underlayment: Synthetic roofing underlayment meeting physical requirements of ASTM D226 Type II, No. 30. Material shall be acceptable to metal roofing manufacturer.
  - C. Sealant: As specified in section 07 92 00.
- 2.3 Fabrication
- A. All exposed adjacent flashing shall be of the same material and finish as the roof panels.
  - B. Form sections’ shape as indicated on Drawings, accurate in size, square, and free from distortion or defects.
  - C. Fabricate cleats of same material as sheet, to interlock with sheet.
  - D. Fabricate starter strips of same material as sheet, continuous, to interlock with sheet.
  - E. Form pieces in longest practical lengths.
  - F. Hem exposed edges on underside 1/2 inch; miter and seam corners.
  - G. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- 2.4 Standing Seam Roof Panel
- A. Panels shall have 1 1/2” high vertical legs, spaced 16” on center.
  - B. Standing seam shall be of mechanically seamed interlocking design.
  - C. Attach panels to roof with concealed clips, spaced and fastened per manufacturer’s recommendations, maximum 24” o.c.

### **PART 3 - Execution**

- 3.1 Examination
- A. Inspect roof deck to verify deck is clean and smooth, free of depressions, waves, or projections, and properly sloped to eaves.
  - B. Verify deck is dry and free of snow and ice. Verify joints in wood deck are solidly supported and fastened.
  - C. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, reglets are in place, and nailing strips located.
  - D. Verify roofing termination and base flashings are in place, sealed, and secure.
- 3.2 Preparation
- A. Fill knot holes and surface cracks with latex filler at areas of bonded eave protection.
  - B. Broom clean deck surfaces.
  - C. Install starter and edge strips, and cleats before starting installation.
- 3.3 Installation

- A. Underlayment Installation.
    - 1. Apply underlayment over entire roof area horizontally with 6" minimum overlap and 18" endlaps.
    - 2. Minimize nail quantity. Ensure that nail heads are flush with the substrate.
  - B. Standing Seam Roofing Installation.
    - 1. Comply with manufacturer's standard instructions and conform to standards set forth in the Architectural Sheet Metal Manual published by SMACNA, in order to achieve a water tight installation.
    - 2. Install panels in such a manner that horizontal lines are true and level and vertical lines are plumb.
    - 3. Install starter and edge trim before installing roof panels.
    - 4. Remove protective strippable film prior to installation of roof panels.
    - 5. Attach panels with manufacturer's standard clips and fasteners, spaced in accordance with manufacturer's directions.
    - 6. Install sealants per manufacturer's directions.
    - 7. Clean any grease, finger marks, or stains from the panels per manufacturer's recommendations.
    - 8. Remove all scrap and debris from the site.
- 3.4 Protection of Installed Construction
- A. Do not allow traffic on completed roof. If required, provide cushioned walk boards.

### **End of Section**

## Section 07 92 00 Joint Sealants

### PART 1 - General

- 1.1 Summary
  - A. Section includes sealants, joint backing, and accessories.
  - B. Related Sections:
    - 1. Section 07 61 00 – Sheet Metal Roofing: Sealants required in conjunction with roofing.
- 1.2 References
  - A. ASTM C834 – Latex Sealing Compounds.
  - B. ASTM C919 – Practice for Use of Sealants in Acoustical Applications.
  - C. ASTM C920 – Elastomeric Joint Sealants.
  - D. ASTM C1193 – Guide for Use of Joint Sealants.
  - E. ASTM D1056 – Flexible Cellular Materials – Sponge or Expanded Rubber.
  - F. ASTM D1565 – Flexible Cellular Materials – Vinyl Chloride Polymers and Co-Polymers (Open Cell Foam).
  - G. ASTM D1667 – Flexible Cellular Materials – Vinyl Chloride Polymers and Co-Polymers (Closed Cell Foam).
  - H. ASTM D2628 – Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.
- 1.3 Submittals
  - A. Product Data: Submit data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.
  - B. Manufacturer’s Installation Instructions: Submit special procedures, surface preparation, and perimeter conditions requiring special attention.
  - C. Warranty: Include coverage for installed sealants and accessories failing to achieve airtight seal, watertight seal, exhibiting loss of adhesion or cohesion, and sealants which do not cure.
- 1.4 Environmental Requirements
  - A. Maintain temperature and humidity recommended by sealant manufacturer during and after installation.
- 1.5 Coordination
  - A. Coordinate sealant installation with work of sections referencing this section.

### PART 2 - Products

- 2.1 Joint Sealers:
  - A. High Performance General Purpose Exterior (Non-traffic) Sealant: Polyurethane, ASTM C920, Grade NS, Class 25, Uses NT, M, A, and O, Type S or M (single or multi-component):
    - 1. Color: Colors as selected from manufacturer’s standard colors to match adjoining surfaces.
    - 2. Applications: Use for:
      - a. Control, expansion, and soft joints in masonry.
      - b. Joints between concrete and other materials.

- c. Joints between metal frames and other materials.
    - d. Other exterior non-traffic joints for which no other sealant is specified.
  - B. Exterior Metal Lap Joint: Butyl or polyisobutylene, non-drying, non-skinning, non-curing.
    - 1. Applications: Use for concealed sealant bead in sheet metal work.
- 2.2 Accessories
  - A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
  - B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer, compatible with joint forming materials.
  - C. Joint Backing: Round foam rod compatible with sealant, oversized 30 to 50 percent larger than joint width.
  - D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

### **PART 3 - Execution**

- 3.1 Examination
  - A. Verify substrate surfaces and joint openings are ready to receive work.
  - B. Verify joint backing and release tapes are compatible with sealant.
- 3.2 Preparation
  - A. Remove loose materials and foreign matter impairing adhesion of sealant.
  - B. Clean and prime joints.
  - C. Perform preparation in accordance with ASTM C1193.
  - D. Protect elements surrounding work of this section from damage or disfiguration.
- 3.3 Installation
  - A. Perform installation in accordance with ASTM C1193.
  - B. Perform acoustical sealant application work in accordance with ASTM C919.
  - C. Measure joint dimensions and size joint backers to achieve the following, unless otherwise specified by the manufacturer's installation directions:
    - 1. Width / depth ration of 2:1.
    - 2. Neck dimension no greater than ½ of joint width.
    - 3. Surface bond area on each side not less than 75 percent of joint width.
  - D. Install bond breaker at bottom of joint where backing is not used to prevent three-sided adhesion.
  - E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
  - F. Apply sealant within recommended application temperature range. Consult sealant manufacturer when sealant cannot be applied within this range.
  - G. Tool joints concave.
- 3.4 Cleaning
  - A. Clean adjacent soiled surfaces.
- 3.5 Protection of Installed Construction
  - A. Protect sealants until cured.
  - B. Any sealants that become contaminated before they have cured shall be removed and replaced.

**End of Section**

## **Section 09 90 00 Paints and Coatings**

### **PART 1 - General**

- 1.1 Summary
  - A. Section includes surface preparation and field application of paints.
  - B. Related Sections:
    - 1. Section 06 01 40 – Architectural Woodwork Restoration: Preparation of existing woodwork for repainting.
- 1.2 References
  - A. ASTM D16 – Terminology Relating to Paint, Varnish, Lacquer, and Related Products.
  - B. ASTM D4442 – Test Methods for Direct Moisture Content Measurement of Wood and Wood-base Materials.
  - C. NACE (National Association of Corrosion Engineers) – Industrial Maintenance Painting.
  - D. PDCA (Painting and Decorating Contractors of America) – Architectural Specifications Manual.
  - E. SSPC (Steel Structures Painting Council) – Steel Structures Painting Manual.
- 1.3 Definitions
  - A. Conform to ASTM D16 for interpretation of terms used in this section.
- 1.4 Submittals
  - A. Product Data: Submit data on finishing products.
  - B. Manufacturers’ Installation Instructions: Submit special surface preparation procedures and substrate conditions requiring special attention.
- 1.5 Delivery, Storage, and Handling
  - A. Deliver products to site in sealed and labeled containers.
  - B. Paint Materials: Store at minimum ambient temperature of 45° F and maximum of 90° F, in ventilated area, or as required by manufacturer’s instructions.
- 1.6 Environmental Requirements
  - A. Do not apply materials when surface or ambient temperatures are outside temperature ranges recommended by paint manufacturer.
  - B. Do not apply exterior coatings during rain or snow, when relative humidity is outside range recommended by manufacturer, or when moisture content of surfaces exceeds that recommended by manufacturer.
  - C. Minimum application temperature for latex paints shall be 50° F for exteriors unless stated otherwise, in writing, by the manufacturer.
  - D. Provide lighting level of 80 fc measured mid-height at substrate surface.

### **PART 2 - Products**

- 2.1 Paints and Coatings
  - A. Manufacturers: Scheduled products establish standard for quality of materials. Provide materials by one of the following manufacturers:
    - 1. Sherwin Williams
    - 2. Benjamin Moore
    - 3. Pittsburgh Paints

4. Pratt and Lambert
5. Thoro
6. Chemprobe Technologies Inc.
7. Substitutions: Division 1 – Product Requirements.

## 2.2 Components

- A. Coatings: Ready mixed, except field-catalyzed coatings. Prepare coatings:
  1. To soft paste consistency, capable of being readily and uniformly dispersed to homogenous coating.
  2. For good flow and brushing properties.
  3. Capable of drying or curing free of streaks and sags.
- B. Accessory materials: Linseed oil, shellac, turpentine, paint thinners, and other materials not specifically indicated but required to achieve finishes specified; commercial quality.
- C. Patching materials: Latex filler.
- D. Fastener head cover materials: Latex filler.

## PART 3 - Execution

### 3.1 Examination

- A. Verify surfaces and substrates are ready to receive work as instructed by product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report conditions capable of affecting proper application.
- C. Test shop applied primer for compatibility with subsequent cover materials.
- D. Measure moisture content of material using electronic moisture meter. Do not apply finishes unless moisture content of surface is below the following:
  1. Interior and exterior wood: 15 percent, measured in accordance with ASTM D4442.

### 3.2 Preparation

- A. Surface Appurtenances: Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing. Mask items which cannot be removed.
- B. Surfaces: Correct defects and clean surfaces capable of affecting the work of this section. Remove or repair existing coatings exhibiting surface defects.
- C. Marks: Seal with shellac those that may bleed through finish.
- D. Impervious surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- E. Galvanized surfaces: Remove surface contamination and oils and wash with solvent per SSPC-SP1. Apply coat of etching primer.
- F. Uncoated steel and iron surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Clean with hand tools per SSPC-SP2 or power tools per SSPC-SP3, removing loose rust, mill scale, and other loose contaminants. Ensure weld joints, bolts, and nuts are similarly cleaned.
- G. Shop primed steel surfaces: Sand and scrape to remove loose primer and rust. Feather edge to make touch-ups inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
- H. Exterior wood items schedule to receive paint finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior caulking compound after primer coat has dried.

- 3.3 Protection
  - A. Protect elements surrounding the work of this section from damage.
  - B. Furnish drop clothes, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- 3.4 Existing Work
  - A. Extend existing paint and coating installations using materials and methods compatible with existing installations and as specified.
- 3.5 Application
  - A. Apply finishes in accordance with manufacturer's directions.
  - B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
  - C. Apply each coat to uniform appearance.
  - D. Sand wood and metal surfaces lightly between coats to achieve required finish.
  - E. Vacuum surfaces clean of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- 3.6 Cleaning
  - A. Collect waste material that may constitute a fire hazard, place in a sealed metal container, and remove from site daily.
  - B. As work proceeds, promptly remove paint where spilled, splashed, or splattered.
- 3.7 Schedule – Exterior Surfaces
  - A. Wood – Painted
    - 1. One coat of Sherwin-Williams Exterior oil-based wood primer or equal.
    - 2. Two coats of Sherwin-Williams Duration Exterior Acrylic Latex, satin finish or equal.
    - 3. See finish schedule for sheen.
- 3.8 Schedule – Colors
  - A. Flag pole: Color 1 - SW6328 Fireweed – gloss sheen.
  - B. Flag pole top: Color 2 - Krylon gold metallic enamel or equal.

### **End of Section**



## Section 26 05 00 Common Work Results for Electrical

### PART 1 - General

#### 1.1 Summary

- A. This section applies to all sections of Division 26.
- B. Furnish and install electrical systems, materials, equipment, and accessories in accordance with the specifications and drawings. Capacities and ratings of motors, transformers, conductors and cable, switchboards, switchgear, panelboards, motor control centers, generators, automatic transfer switches, and other items and arrangements for the specified items are shown on the drawings.
- C. Electrical service entrance equipment and arrangements for temporary and Conductor ampacities specified or shown on the drawings are based on copper conductors, with the conduit and raceways sized per NEC. Aluminum conductors are prohibited.

#### 1.2 Minimum Requirements

- A. The latest International Building Code (IBC), Underwriters Laboratories, Inc. (UL), Institute of Electrical and Electronics Engineers (IEEE), and National Fire Protection Association (NFPA) codes and standards are the minimum requirements for materials and installation.
- B. The drawings and specifications shall govern in those instances where requirements are greater than those stated in the above codes and standards.

#### 1.3 Test Standards

- A. All materials and equipment shall be listed, labeled, or certified by a Nationally Recognized Testing Laboratory (NRTL) to meet Underwriters Laboratories, Inc. (UL), standards where test standards have been established. Materials and equipment which are not covered by UL standards will be accepted, providing that materials and equipment are listed, labeled, certified or otherwise determined to meet the safety requirements of a NRTL. Materials and equipment which no NRTL accepts, certifies, lists, labels, or determines to be safe, will be considered if inspected or tested in accordance with national industrial standards, such as ANSI, NEMA, and NETA. Evidence of compliance shall include certified test reports and definitive shop drawings.
- B. Definitions:
  - 1. Listed: Materials and equipment included in a list published by an organization that is acceptable to the Authority Having Jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production or listed materials and equipment or periodic evaluation of services, and whose listing states that the materials and equipment either meets appropriate designated standards or has been tested and found suitable for a specified purpose.
  - 2. Labeled: Materials and equipment to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the Authority Having Jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled materials and

equipment, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3. Certified: Materials and equipment which:
  - a. Have been tested and found by a NRTL to meet nationally recognized standards or to be safe for use in a specified manner.
  - b. Are periodically inspected by a NRTL.
  - c. Bear a label, tag, or other record of certification.
  - d. Nationally Recognized Testing Laboratory: Testing laboratory which is recognized and approved by the Secretary of Labor in accordance with OSHA regulations.

#### 1.4 Manufactured Products

- A. Materials and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items, and for which replacement parts shall be available. Materials and equipment furnished shall be new.
- B. When more than one unit of the same class or type of materials and equipment is required, such units shall be the product of a single manufacturer.
- C. Equipment Assemblies and Components:
  1. Components of an assembled unit need not be products of the same manufacturer.
  2. Manufacturers of equipment assemblies, which include components made by others, shall assume complete responsibility for the final assembled unit.
  3. Components shall be compatible with each other and with the total assembly for the intended service.
  4. Constituent parts which are similar shall be the product of a single manufacturer.
- D. Factory wiring and terminals shall be identified on the equipment being furnished and on all wiring diagrams.

#### 1.5 Variations from Contract Requirements

- A. Where the Owner or the Contractor requests variations from the contract requirements, the connecting work and related components shall include, but not be limited to additions or changes to branch circuits, circuit protective devices, conduits, wire, feeders, controls, panels and installation methods.

#### 1.6 Materials and Equipment Protection

- A. Materials and equipment shall be protected during shipment and storage against physical damage, vermin, dirt, corrosive substances, fumes, moisture, cold and rain.
  1. Store materials and equipment indoors in clean dry space with uniform temperature to prevent condensation.
  2. During installation, equipment shall be protected against entry of foreign matter, and be vacuum-cleaned both inside and outside before testing and operating. Compressed air shall not be used to clean equipment. Remove loose packing and flammable materials from inside equipment.
  3. Damaged equipment shall be repaired or replaced, as determined by the Architect.
  4. Painted surfaces shall be protected with factory installed removable heavy kraft paper, sheet vinyl or equal.
  5. Damaged paint on equipment shall be refinished with the same quality of paint and workmanship as used by the manufacturer so repaired areas are not obvious.

## 1.7 Work Performance

- A. All electrical work shall comply with requirements of the latest NFPA 70 (NEC), NFPA 70B, NFPA 70E, NFPA 99, NFPA 110, OSHA Part 1910 subpart J – General Environmental Controls, OSHA Part 1910 subpart K – Medical and First Aid, and OSHA Part 1910 subpart S – Electrical, in addition to other references required by contract.
- B. Job site safety and worker safety is the responsibility of the Contractor.
- C. Electrical work shall be accomplished with all affected circuits or equipment de-energized. However, energized electrical work may be performed only for the non-destructive and non-invasive diagnostic testing(s), or when scheduled outage poses an imminent hazard to occupants, safety, or physical security. In such case, all aspects of energized electrical work, such as the availability of appropriate/correct personal protective equipment (PPE) and the use of PPE, shall comply with the latest NFPA 70E, as well as the following requirements:
  - 1. Only Qualified Person(s) shall perform energized electrical work. Supervisor of Qualified Person(s) shall witness the work of its entirety to ensure compliance with safety requirements and approved work plan.
  - 2. At least two weeks before initiating any energized electrical work, the Contractor and the Qualified Person(s) who is designated to perform the work shall visually inspect, verify and confirm that the work area and electrical equipment can safely accommodate the work involved.
- D. For work that affects existing electrical systems, arrange, phase and perform work to assure minimal interference with normal functioning of the facility.
- E. New work shall be installed and connected to existing work neatly, safely and professionally. Disturbed or damaged work shall be replaced or repaired to its prior conditions.
- F. Coordinate location of equipment and conduit with other trades to minimize interference.

## 1.8 Equipment Installation and Requirements

- A. Equipment location shall be as close as practical to locations shown on the drawings.
- B. Working clearances shall not be less than specified in the NEC.
- C. Inaccessible Equipment:
  - 1. Where the Architect determines that the Contractor has installed equipment not readily accessible for operation and maintenance, the equipment shall be removed and reinstalled as directed at no additional cost to the Owner.
  - 2. "Readily accessible" is defined as being capable of being reached quickly for operation, maintenance, or inspections without the use of ladders, or without climbing or crawling under or over obstacles such as, but not limited to, motors, pumps, belt guards, transformers, piping, ductwork, conduit and raceways.
- D. Electrical service entrance equipment and arrangements for temporary and permanent connections to the electric utility company's system shall conform to the electric utility company's requirements. Coordinate fuses, circuit breakers and relays with the electric utility company's system and obtain electric utility company approval for sizes and settings of these devices.

## 1.9 Equipment Identification

- A. In addition to the requirements of the NEC, install an identification sign which clearly indicates information required for use and maintenance of items such as

switchboards and switchgear, panelboards, cabinets, motor controllers, fused and non-fused safety switches, generators, automatic transfer switches, separately enclosed circuit breakers, individual breakers and controllers in switchboards, switchgear and motor control assemblies, control devices and other significant equipment.

- B. Identification signs for Normal Power System equipment shall be laminated black phenolic resin with a white core with engraved lettering. Identification signs for Essential Electrical System (EES) equipment, as defined in the NEC, shall be laminated red phenolic resin with a white core with engraved lettering. Lettering shall be a minimum of 12 mm (1/2 inch) high. Identification signs shall indicate equipment designation, rated bus amperage, voltage, number of phases, number of wires, and type of EES power branch as applicable. Secure nameplates with screws.
- C. Install adhesive arc flash warning labels on all equipment as required by the latest NFPA 70E. Label shall show specific and correct information for specific equipment based on its arc flash calculations. Label shall show the followings:
  - 1. Nominal system voltage.
  - 2. Equipment/bus name, date prepared, and manufacturer name and address.
  - 3. Arc flash boundary.
  - 4. Available arc flash incident energy and the corresponding working distance.
  - 5. Minimum arc rating of clothing.
  - 6. Site-specific level of PPE.

#### 1.10 Singular Number

- A. Where any device or part of equipment is referred to in these specifications in the singular number (e.g., "the switch"), this reference shall be deemed to apply to as many such devices as are required to complete the installation as shown on the drawings.

#### 1.11 Acceptance Checks and Tests

- A. The Contractor shall furnish the instruments, materials, and labor for tests.
- B. Where systems are comprised of components specified in more than one section of Division 26, the Contractor shall coordinate the installation, testing, and adjustment of all components between various manufacturer's representatives and technicians so that a complete, functional, and operational system is delivered to the Owner.
- C. When test results indicate any defects, the Contractor shall repair or replace the defective materials or equipment and repeat the tests for the equipment. Repair, replacement, and re-testing shall be accomplished at no additional cost to the Owner.

#### 1.12 Instruction

- A. Instruction to designated Owner personnel shall be provided for the equipment or system as required in each associated technical specification section.
- B. Furnish the services of competent and factory-trained instructors to give full instruction in the adjustment, operation, and maintenance of the specified equipment and system, including pertinent safety requirements. Instructors shall be thoroughly familiar with all aspects of the installation and shall be factory-trained in operating theory as well as practical operation and maintenance procedures.

## **PART 2 - Products (Not Used)**

**End of Section**

## **Section 26 56 00 Exterior Lighting**

### **PART 1 - General**

#### 1.1 Summary

- A. Section includes the furnishing, installation and connection of exterior fixtures and supports.
- B. Related Sections:
  - 1. Section 26 05 00 – Common Work Results for Electrical.

#### 1.2 References

- A. ANSI H35.1 - American National Standard Alloy and Temper Designation Systems for Aluminum
- B. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- C. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- D. ASTM B108 - Aluminum-Alloy Permanent Mold Castings
- E. IESNA LM-72 - Directional Positioning of Photometric Data
- F. IESNA LM-79 - Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products
- G. IESNA LM-80 - Approved Method for Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules
- H. IESNA TM-15 - Luminaire Classification System for Outdoor Luminaires
- I. NEMA C81.61 - Electrical Lamp Bases – Specifications for Bases (Caps) for Electric Lamps
- J. NEMA C136.3 - For Roadway and Area Lighting Equipment – Luminaire Attachments
- K. NEMA C136.17 - Roadway and Area Lighting Equipment – Enclosed Side-Mounted Luminaires for Horizontal-Burning High-Intensity-Discharge Lamps – Mechanical Interchangeability of Refractors
- L. NEMA ICS 2 - Controllers, Contactors and Overload Relays Rated 600 Volts
- M. NEMA ICS 6 - Enclosures
- N. NFPA 70 - National Electrical Code (NEC)
- O. UL 496 - Lampholders
- P. UL 773 - Plug-In, Locking Type Photocontrols for Use with Area Lighting
- Q. UL 773A - Nonindustrial Photoelectric Switches for Lighting Control
- R. UL 1598 - Luminaires
- S. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products

#### 1.3 Submittals

- A. Submit in accordance with section 01 33 00 – Submittal Procedures.
- B. Shop Drawings: Submit the following information for each type of lighting fixture, arranged in order of lighting fixture designation.
  - 1. Material and construction details, include information on housing and optics system.
  - 2. Physical dimensions and description.
  - 3. Wiring schematic and connection diagram.
  - 4. Installation details.
  - 5. Energy efficiency data.

6. Photometric data based on laboratory tests complying with IES Lighting Measurements testing and calculation guides.
  7. For LED lighting fixtures, submit US DOE LED Lighting Facts label, and IES L70 rated life.
- C. Manuals:
1. Submit, simultaneously with the shop drawings, complete maintenance and operating manuals, including technical data sheets, wiring diagrams, and information for ordering replacement parts.

## **PART 2 - Products**

### 2.1 General Requirements

- A. Luminaires, materials and equipment shall be in accordance with NEC, UL, ANSI, and as shown on the drawings and specified.

### 2.2 Luminaires

- A. Luminaires shall be weatherproof, heavy duty, outdoor types designed for efficient light utilization, adequate dissipation of lamp and ballast heat, and safe cleaning.
- B. Materials shall be rustproof. Latches and fittings shall be non-ferrous metal.
- C. Provide manufacturer's standard finish, as scheduled on the drawings.

### 2.3 Lamps

- A. LED sources shall meet the following requirements:
  1. Operating temperature rating shall be between -40 degrees C (-40 degrees F) and 50 degrees C (120 degrees F).
  2. Correlated Color Temperature (CCT): 5000K.
  3. Color Rendering Index (CRI):  $\geq 85$ .
  4. The manufacturer shall have performed reliability tests on the LEDs luminaires complying with Illuminating Engineering Society (IES) LM79 for photometric performance and LM80 for lumen maintenance and L70 life.

### 2.4 LED drivers

- A. LED drivers shall meet the following requirements:
  1. Drivers shall have a minimum efficiency of 85%.
  2. Starting Temperature: -40 degrees C (-40 degrees F).
  3. Input Voltage: 120 to 480 ( $\pm 10\%$ ) volt.
  4. Power Supplies: Class I or II output.
  5. Surge Protection: The system must survive 250 repetitive strikes of "C Low" (C Low: 6kV/1.2 x 50  $\mu$ s, 10kA/8 x 20  $\mu$ s) waveforms at 1-minute intervals with less than 10% degradation in clamping voltage. "C Low" waveforms are as defined in IEEE/ASNI C62.41.2, Scenario 1 Location Category C.
  6. Power Factor (PF):  $\geq 0.90$ .
  7. Total Harmonic Distortion (THD):  $\leq 20\%$ .
  8. Comply with FCC Title 47 CFR Part 18 Non-consumer RFI/EMI Standards.
  9. Drivers shall be reduction of hazardous substances (ROHS)-compliant.

## **PART 3 - Execution**

### 3.1 Installation

- A. Install lighting in accordance with the NEC, as shown on the drawings, and in accordance with manufacturer's recommendations.
- B. Adjust luminaires that require field adjustment or aiming.

- 3.2 Grounding
  - A. Ground noncurrent-carrying parts of equipment, including metal poles, luminaires, mounting arms, brackets, and metallic enclosures. Where copper grounding conductor is connected to a metal other than copper, provide specially-treated or lined connectors suitable and listed for this purpose.
- 3.3 Acceptance Checks and Tests
  - A. Verify operation after installing luminaires and energizing circuits.

**End of Section**