

# PROJECT MANUAL

**PROJECT NAME:**

DVA IVH Loftus and Malloy Water Infiltration

**PROJECT ADDRESS:**

1301 Summit Street  
Marshalltown, IA 50158

**PROJECT DATE:** April 10, 2026

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**OWNER:**

Iowa Department of Administrative Services  
109 Southeast 13<sup>th</sup> Street  
Des Moines, Iowa 50319



**OWNER PROJECT NUMBER:** 9487.00

**OWNER REQUEST FOR BID NUMBER:** RFB 948700-01

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**CONSTRUCTION MANAGER:**

DCI Group  
220 SE 6<sup>th</sup> Street, Suite 200  
Des Moines, IA 50309



**CONSTRUCTION MANAGER PROJECT NUMBER:** 9487.00

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**ARCHITECT:**

Genesis Architectural Design  
4708 Stonebridge Road  
West Des Moines, IA 50265

**ARCHITECT PROJECT NUMBER:** 0719-01

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SECTION 00 0107 – CERTIFICATION PAGE

I hereby certify that the portion of this technical submission described below was prepared by me or under my supervision and responsible charge. I am a duly registered architect under the laws of the state of Iowa.



**GENESIS Architectural Design**

Edward L. Matt, AIA

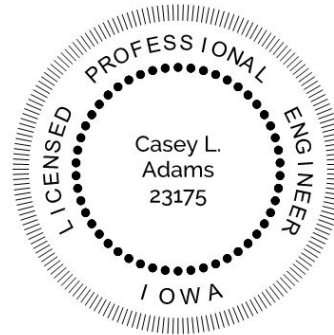
Handwritten signature of Edward L. Matt in black ink.

Signature

Pages or sheets covered in part or whole by this seal:  
Specifications Div.1 thru 9.

Date Issued: April 10, 2026

I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge.



Discipline: Mechanical & Electrical Engineering  
Company Name: Durantem MEP Consulting, Inc  
Address: 3737 Woodland Ave. Ste 420, WDM, IA 50266  
Telephone: (515) 452-8341  
Name: Casey Adams, PE  
License#: 23175

Stamp:

Responsibility: Divisions 22, 23, 26, and 27



**CIVIL / SITE**

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed professional engineer under the laws of the State of Iowa.

Printed or typed name

IOWA LIC No.  
**28412**

4/10/2026

Signature

Date

Expiration Date: DEC 31ST, 2026

Pages or sheets covered by this seal: DIV 31 and 32

Date Issued:

4/10/2026

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**SECTION 00 0115**

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**DRAWINGS**

<b>1.01</b>	<b>SHEET</b>	<b>TITLE</b>
A.	A0.0	Cover, Sheet Index, Contacts, Symbols, & Abbreviations
B.	A0.1	Locations and Staging Maps
C.	A1.0	Dack Roof Plan
D.	A1.1	Malloy Roof Plan North Section
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F.	A2.0	Enlarged Plans & Details
G.	A3.0	Details
H.	A3.1	Details
I.	ME0.0	Mechanical Notes & Schedules
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K.	ME1.1	Basement Mechanical & Electrical Floor Plan
L.	C0.1	Cover Sheet
M.	C1.1	Demo Plan/Site Survey
N.	C2.1	Layout/Landscaping Plan
O.	C3.1	Grading/Utility Plan

**END OF SECTION**

**SECTION 00 0116**

**BID SUBMITTAL CHECKLIST**

**PART 1 - GENERAL**

**1.01 BID SUBMITTAL CHECKLIST**

- A. The Bidder is responsible to see that the bid is submitted online at [IMPACS Electronic Procurement System](#) on or before the due date and time specified. Late bids shall not be accepted.
- B. Bids shall be typewritten or in ink. All information requested shall accompany the bid. All blocks shall be completed. Errors shall be lined out and initialed.
- C. The right is reserved to reject any or all bids. The State may waive minor deficiencies or informalities in the best interest of the State of Iowa.
- D. A properly prepared and submitted bid document is the bidder's responsibility.
- E. Bids cannot be changed after the bid opening.
- F. In all cases, no verbal communications by any party will override written communications from the issuing office.
- G. The Bid Form shall be completed in full and signed and submitted by an officer of the bidder with authority to bind in a contract.
- H. If Bid Bond is called for, it shall accompany the Bid submission.
- I. If Non-discrimination Clause information is called for, it shall accompany the Bid submission.
- J. If Targeted Small Business Pre-bid Contact information is called for, it shall accompany the Bid submission.
- K. If Certificate of Site Visit form is called for, it shall accompany the Bid submission.

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION – NOT USED**

**END OF SECTION**

**SECTION 00 1113  
NOTICE TO BIDDERS  
RFB #948700-01**

The Iowa Department of Administrative Services will be receiving bids for the Loftus and Malloy Water Infiltration - Flooding at the Iowa Veterans Home, 1301 Summit Street, Marshalltown, IA, 50158.

The Iowa Department of Administrative Services anticipates construction to begin on June 08, 2026, and end on November 12, 2026.

Bids must be received no later than **2:00 PM, Thursday, May 14, 2026**. Late bids will not be considered. Bids shall be submitted on [IMPACS Electronic Procurement System](#). The Bid shall be accompanied by a Bid Security as set forth in the Instructions to Bidders in the amount of 5% of the total bid amount. Each bid shall be accompanied by a bid bond, cashier's check or a certified check drawn upon a solvent bank chartered under the laws of the United States of America.

**Bid Opening**

The time and place of bid opening will be held virtually at 3:00PM on Google Meet on Thursday, May 14, 2026. The meeting information is listed below:

Meeting code

[meet.google.com/bys-qujh-aoV](https://meet.google.com/bys-qujh-aoV)

Phone Numbers

(US)+1 781-591-7005

PIN: 301 714 667#

The Iowa Department of Administrative Services reserves the right to reject any and all bids, and to waive irregularities and to accept a bid that is deemed in the best interest of the State of Iowa.

Bidders must comply with all affirmative action/equal employment opportunity provisions of the State of Iowa and the Federal Government.

This project is exempt from Iowa Sales Tax. Davis Bacon Wages **will** apply for this project.

Questions must be submitted by 2:00 PM, May 06, 2026, to the Issuing Officer.

Bidding documents may stipulate a specific product. Substitute product will be considered if a written request is received by 2:00 PM, May 06, 2026, prior to bid opening. Substitution requests will be considered for all products per Section 01 2500 Substitution Procedures, even if the specification does not include a statement such as "or equal," "equal to," "equivalent to," or "basis of design," unless otherwise noted.

**Mandatory** pre-bid meetings will be held on Thursday, April 30, 2026, at 9:00 AM at the Iowa Veterans Home, 1301 Summit Street, Marshalltown, IA, 50158 and on Tuesday, May 05, 2026, at 2:00 PM at 1301 Summit Street, Marshalltown, IA, 50158. Attendance at one of the two mandatory pre-bid meetings is **required** to qualify for bidding.

Bidding Documents, including drawing sheets bearing the project name 9487.00 – DVA IVH Loftus and Malloy Water Infiltration - Flooding, Dated 04/10/2026 and the Project Manual prepared by Genesis Architectural Design dated 04/10/2026, may be obtained from Beeline and Blue by visiting [www.beelineandblue.com](http://www.beelineandblue.com) or by calling (515) 244-1611 on Wednesday, April 22, 2026.

For further information regarding this project contact:

Katelyn Howells – Issuing Officer

Phone: (515) 721-7856

E-Mail: [construction.procurement@iowa.gov](mailto:construction.procurement@iowa.gov)

**END OF SECTION**

**SECTION 00 2113**  
**INSTRUCTIONS TO BIDDERS**  
**RFB #948700-01**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Project Description
- B. Owner
- C. State Agency Representatives and Contacts
- D. Proposal Form and Submissions
- E. Taxes
- F. Alternate Bids
- G. Drawings
- H. Bid Security
- I. Due Date and Time for Receipt of Bids
- J. Commencement and Completion Date
- K. Site Visit
- L. Pre-bid Meeting
- M. Questions
- N. Addenda and Interpretations of the Contract Documents
- O. Substitutions
- P. Obligation of Bidder
- Q. Public Records and Requests for Confidential Treatment
- R. Withdrawal of Bid
- S. Bid Closing
- T. Basis of Bids
- U. Informalities/Rejection of Bids
- V. Consideration of Bids
- W. Preference
- X. Qualifications
- Y. Insurance
- Z. Form of Agreement between Owner and Contractor
- AA. Execution of Contract
- BB. Laws and Regulations
- CC. Contract Documents and Order of Precedence
- DD. Conditions of the Work
- EE. Subcontracts
- FF. Project Manual/Drawings

**1.02 PROJECT DESCRIPTION**

- A. Project Description: Loftus and Malloy water infiltration mitigation on the foundations of both buildings.

**1.03 OWNER**

- A. State of Iowa, Department of Administrative Services, 109 SE 13th St, Des Moines, IA 50319

**1.04 STATE AGENCY REPRESENTATIVES AND CONTACTS**

- A. PURCHASING AGENT: Purchasing Agent – Issuing Officer, State of Iowa, Department of Administrative Services, Hoover State Office Building, 3<sup>rd</sup> floor, 1305 East Walnut Street, Des Moines, IA 50319-0105, Phone: 515-823-9327; email: [construction.procurement@iowa.gov](mailto:construction.procurement@iowa.gov)
- B. OWNER REPRESENTATIVE: Brad Tonyan, State of Iowa, Department of Administrative Services, 109 SE 13<sup>th</sup> Street, Des Moines, IA 50319, Phone: 515-360-7718; email: [brad.tonyan@iowa.gov](mailto:brad.tonyan@iowa.gov)
- C. ON-SITE COORDINATOR: David Haines, Facilities Director, 1301 Summit Street, Marshalltown, IA 50158, Phone: 641-750-6022; email: [david.haines@ivh.state.ia.us](mailto:david.haines@ivh.state.ia.us)
- D. CONSTRUCTION MANAGER CONTACT: Scott Gustafson, DCI Group, 220 SE 6<sup>th</sup> Street – Suite 200, Des Moines, IA 50309, Phone: 515-490-6364; email: [scottg@dcigroup-us.com](mailto:scottg@dcigroup-us.com)
- E. DESIGN PROFESSIONAL CONTACT: Ed Matt, Genesis Architectural Design, 939 Office Park Road, West Des Moines, IA 50265, Phone: 515-440-1681; email: [ematt@gendsn.com](mailto:ematt@gendsn.com)

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION**

**3.01 PROPOSAL FORM AND SUBMISSION**

- A. A properly prepared and submitted bid is the bidder’s responsibility. Bids are to be made in accordance with these Instructions to Bidders and items included on the Bid submission. Failure to comply may be cause for rejection.
- B. The Bid is to consist of the required Bid information, together with the other information specified below to be submitted with the Bid, in which copies are included with these Bidding Documents.
  - 1. The total bid package submitted is required to include the following:
    - a. An online submission including:
      - 1) Required Bid Form (To be uploaded online)
      - 2) Required Non-discrimination Clause Information
      - 3) Required Targeted Small Business Pre-bid Contact Information
      - 4) Bid Security (documentation provided by Bidder) (To be uploaded online) (Required)
      - 5) Certification of Site Visit (To be uploaded online if Pre-Bid is Mandatory)
- C. Include the amount for performing all work described in the drawings and specifications for Base Bid and for each Alternate Bid requested.
- D. Acknowledge receipt of all Addenda issued, where so indicated on the Bid Form
- E. All required information to be submitted, by an officer of the company having authority to bind the company in a contract.
- F. Commencement of the work of the contract shall begin with the Contractor’s receipt of a fully executed contract (signed by both parties).
- G. The Owner reserves the right to award a contract for Base Bid only, or for Base Bid in combination with any, or all, identified Alternate Bids. The Owner reserves the right to award a contract for individual Bid Packages, or any combination of Bid Packages. Each Bidder must comply with all of the General Requirements of the project and any requirements of the Project manual that apply to their scope of work.
- H. The company’s Federal I.D. Number and the Iowa Contractors Registration Number shall be included in the Bid Form.
- I. Unless indicated otherwise, the Bid shall be for a single responsibility contract for all work as indicated on the Drawings and specified in the Project Manual and shall be a lump sum amount. If no change in the Base Bid amount is required with respect to consideration of a particular Alternate Bid, enter “No Change” in the blank for that Alternate Bid.
- J. Where so requested, provide Unit Prices for the designated types of work and in the units specified, in which the Unit Prices would be used as adjustments to the quantities described in the instructions as the basis for the Base Bid and any Alternate Bid work. A Unit Price would be applicable in the event the Owner should request additional work of that type beyond the extent

and quantity that has been established as the scope of the work by graphic delineation and notations on the Drawings, or by otherwise stipulating in the Bidding Documents a numerical quantity of the work, for the Bidder's use in determining the lump sum bid amount for the Base Bid and any requested Alternate Bid containing such work. The Unit Prices shall also be used to adjust the Contract Amount for actual quantities of work involved when the work subject to Unit Price adjustment differs by being less in quantity than that contemplated by the original scope of work for the respective Base Bid or Alternate Bid.

- K. Completed State of Iowa Nondiscrimination Clause information and Subcontractor Targeted Small Business Enterprise Pre-Bid Contact Information, included in these Bidding Documents, are to accompany the Bid submission. Bidders shall comply with all affirmative action/equal opportunity provisions of State and Federal laws. The Owner seeks to provide opportunities for Targeted Small Businesses in accordance with the provisions of Chapter 73 of the Code of Iowa.
- L. All Bid information is to be submitted online. Any required Bid Security shall be provided, in the form and amount specified elsewhere in these Instructions to Bidders, at the time of submission of the Bid. When a site visit is mandatory as specified elsewhere in these Instructions to Bidders, and a Certificate of Site Visit is required to be submitted with the Bid as evidence of such visit having occurred for purposes of observing the conditions of the site and the work proposed therein, the Certificate shall be uploaded with the bid submission.

### **3.02 TAXES**

- A. In accordance with Section 423 of the Code of Iowa and 701-19 of the Iowa Administrative Rules, Iowa Construction Sales Tax Exemption Certificates for this project will be issued. Do not include Iowa sales tax or use tax, or any local option sales tax, on construction materials in determining your bid prices. The successful Contractor will be required to notify the Department of Administrative Services project manager of all Subcontractors within forty-eight (48) hours after the published date and time by which bids must be submitted. Information on the Contractor and each Subcontractor shall include the firms' name, address, contact person, federal tax identification number, and the Iowa contractor registration number. For the Contractor and each Subcontractor, designate the type of trade or category of work that is to be provided on the project. The Construction Manager for the Department of Administrative Services must be informed when any Subcontractor is added to the project. Following receipt of the information, the Construction Manager for the Department of Administrative Services will arrange to have an authorization letter and certificate (please see sample, included in the Project Manual) issued on behalf of the Contractor and each Subcontractor and will forward the documents to the Contractor for distribution and use by each in purchasing construction materials for this project. Certificates issued for this project shall be used for tax-exempt purchasing construction materials for this project only.

### **3.03 ALTERNATE BIDS**

- A. Bidders are to bid all Alternates requested on the Bid Form. Alternates quoted will be reviewed and accepted or rejected at the option of the Department of Administrative Services. Accepted Alternates will be identified in the Owner-Contractor agreement. Indicate the price for Alternates described, as shown on the Drawings and specified in the Project Manual, and identify in the correct location on the Bid Form.

### **3.04 DRAWINGS AND PROJECT MANUAL**

- A. Drawings and Project Manual are specified in the Notice to Bidders or any extension thereof made by Addendum.

### **3.05 BID SECURITY**

- A. Each Bid shall be accompanied by Bid Security.
- B. The Bid Security shall be in the form of a Bid Bond, Certified check, or Cashier's check in an amount not less than five percent (5%) of the maximum value of the Bid, including any additive

Alternates. NOTE: Checks other than Certified checks and Cashier's checks will not be accepted. Bonds shall be issued by a bonding company licensed to transact business in the State of Iowa. The Attorney in Fact who signs the Bond shall file with the Bond a certified and effectively dated copy of their Power of Attorney. The Bid Security shall be made payable to the Iowa Department of Administrative Services, and shall accompany the Bid. If a Bid Bond is not used, copies of Certified checks or Cashier's checks must be uploaded and hand delivered, in a sealed envelope, or mailed upon request. The Bid Security shall serve as a guarantee that a Bidder who is offered a contract will enter into an Agreement with the State of Iowa and will file an approved surety company's Performance Bond, Payment Bond and the Insurance Certificates as evidence of the required Insurance prior to execution of the contract. Upon failure to comply, the Bid Security shall be forfeited as liquidated damages. The governmental entity shall retain the bid security furnished by the successful bidder until the approved contract form has been fully executed, a bond has been filed by the bidder guaranteeing the performance of the contract, and the contract and bond have been approved by the governmental entity. The provisions of chapter 573, where applicable, apply to contracts awarded under this chapter. The governmental entity shall promptly return the checks or bidder's bonds of unsuccessful bidders to the bidders once the Notice of Intent to Award is issued.

### **3.06 DUE DATE AND TIME FOR RECEIPT OF BIDS**

- A. Properly completed Bids shall be submitted online through [IMPACS Electronic Procurement System](#), no later than the time and date specified in the Notice to Bidder or any extension thereof made by Addendum. Written, emailed, oral or telephonic Bids are invalid, and will not receive consideration. The Bidder shall assume full responsibility for the timely online submission of the Bid. Late bids will not be accepted.

### **3.07 COMMENCEMENT AND COMPLETION DATES**

- A. Commencement of the Work of the Contract shall be the day of receipt by the selected Contractor of the fully-executed contract. Final completion of the Work of the contract shall be acknowledged as a part of the Contractor's proposal.

### **3.08 SITE VISIT**

- A. A site visit by the prospective bidder is highly recommended at the time of the Pre-Bid Meeting of this project.

### **3.09 PRE-BID MEETING**

- A. Pre-Bid Meeting will be specified in the Notice to Bidders or any extension thereof made by Addendum.

### **3.010 QUESTIONS**

- A. Questions on this project may be raised and discussed at the time of the Pre-Bid Meeting or by submitting in writing to the issuing officer as specified in the Notice to Bidders or any extension thereof made by Addendum.

### **3.011 ADDENDA AND INTERPRETATIONS OF THE CONTRACT DOCUMENTS**

- A. Any person contemplating submitting a proposal for the proposed Contract, who is in doubt as to the true meaning of any part of the Bidding Documents, shall submit a written request for an interpretation thereof. The person submitting a request will be responsible for its prompt delivery. Every request for such interpretation should reference the Bid Number specified in the Bidding Documents, and shall be made in writing (email preferred). Questions shall be submitted to the previously identified Purchasing Agent for the Department of Administrative Services. To be given consideration, requests shall be received as specified in the Notice to Bidders or any

extension thereof made by Addendum. Replies, which revise or correct the Bidding Documents, or provide necessary clarifications, will be issued in the form of a written Addendum to the Bidding Documents. Interpretations, corrections or changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections, or changes. The Bidder is to include any resultant cost changes in the Bid Sum. Addenda will be posted electronically at the respective bid site where the bid is initially posted. Acknowledgment by the Bidder of each issued Addendum shall be noted in the location so indicated on the Bid. All Addenda issued shall become part of the Contract Documents.

### **3.012 SUBSTITUTIONS**

- A. Where the Bidding Documents stipulate a specific product be provided by naming one or more manufacturer and model, a substitute product will be considered when a written request is received as specified in the Notice to Bidders or any extension thereof made by Addendum prior to bid opening. Substitution requests will be considered for all products per Section 01 2500 Substitution Procedures, even if the specification does not include a statement such as “or equal,” “equal to,” “equivalent to,” or “basis of design,” unless otherwise noted. Substitution requests shall be emailed to the Issuing Officer at the email address provided in Instructions to Bidders Section 1.04.

### **3.013 OBLIGATION OF BIDDER**

- A. It shall be the responsibility of each Bidder contemplating the submission of a Bid for the proposed Contract to fully acquaint himself/herself with conditions at the work site, project requirements, and to become acquainted thoroughly with the work, and all conditions that may be related to it. No considerations or revision in the contract price or scope of the project will be considered by the Owner for any item that could have been revealed by a thorough on-site inspection and examination.
- B. By submission of a Bid, it shall be understood that the Bidder assures that he/she has reviewed and is thoroughly familiar with the project requirements, contract conditions and supplementary conditions, the drawings, specifications, addenda, and that the bidder is aware of the conditions existing at the site that may relate to the work of this project. Failure of any Bidder to examine any form, document, or other instrument shall in no way relieve the Bidder from any obligation in respect to his/her Bid.

### **3.014 PUBLIC RECORDS AND REQUESTS FOR CONFIDENTIAL TREATMENT**

- A. The Agency’s release of public records is governed by Iowa Code chapter 22. Contractors are encouraged to familiarize themselves with Chapter 22 before submitting a Proposal. The Agency will copy and produce public records upon request as required to comply with Chapter 22 and will treat all information submitted by a Contractor as non-confidential records unless Contractor requests specific parts of the Proposal be treated as confidential at the time of the submission as set forth herein AND the information is confidential under Iowa or other applicable law.
- B. A Contractor requesting confidential treatment of specific information must: (1) fully complete Form 22 (Available at <https://das.iowa.gov/sites/default/files/procurement/pdf/Form%2022-ConfidentialityRequest-RFB.pdf>), (2) identify the request in the transmittal letter with the Contractor’s Proposal, (3) conspicuously mark the outside of its Proposal as containing confidential information, (4) mark each page upon which confidential information appears, and (5) submit a “Public Copy” from which the confidential information has been excised.
- C. Form 22 will not be considered fully complete unless, for each confidentiality request, the Contractor: (1) enumerates the specific grounds in Iowa Code chapter 22 or other applicable law that supports treatment of the material as confidential, (2) justifies why the material should be maintained in confidence, (3) explains why disclosure of the material would not be in the best interest of the public, and (4) sets forth the name, address, telephone, and e-mail for the person authorized by Contractor to respond to inquiries by the Agency concerning the confidential status of such material.

- D. The Public Copy from which confidential information has been excised is in addition to the number of copies requested in Section 3 of this RFP. The confidential material must be excised in such a way as to allow the public to determine the general nature of the material removed and to retain as much of the Proposal as possible.
- E. **Failure to request information be treated as confidential as specified herein shall relieve Agency and State personnel from any responsibility for maintaining the information in confidence. Contractors may not request confidential treatment with respect to pricing information and transmittal letters. A contractor's request for confidentiality that does not comply with this section or a contractor's request for confidentiality on information or material that cannot be held in confidence as set forth herein are grounds for rejecting contractor's Proposal as non-responsive. Requests to maintain an entire Proposal as confidential will be rejected as non-responsive.**
- F. If Agency receives a request for information that Contractor has marked as confidential and if a judicial or administrative proceeding is initiated to compel the release of such material, Contractor shall, at its sole expense, appear in such action and defend its request for confidentiality. If Contractor fails to do so, Agency may release the information or material with or without providing advance notice to Contractor and with or without affording Contractor the opportunity to obtain an order restraining its release from a court possessing competent jurisdiction. Additionally, if Contractor fails to comply with the request process set forth herein, if Contractor's request for confidentiality is unreasonable, or if Contractor rescinds its request for confidential treatment, Agency may release such information or material with or without providing advance notice to Contractor and with or without affording Contractor the opportunity to obtain an order restraining its release from a court possessing competent jurisdiction.

### **3.015 WITHDRAWAL OF BID**

- A. A Bid may be modified or withdrawn only before the time and date for receipt of Bids. Said request for modification or withdrawal of a bid must be completed online through [IMPACS Electronic Procurement System](#). A Bid shall remain valid for consideration by the Owner for the following period(s) of time after the date specified for receipt of Bids, or until such time following that period that the apparent low bidder requests in writing that the Bid be withdrawn, after which the Bid may be withdrawn without forfeiture of any required Bid Security. The Bid shall be valid for not less than thirty (30) calendar days after the date Bids are specified to be due. With the approval of the Department of Administrative Services, a bid may be withdrawn after opening, but only if the bidder provides prompt written notification that adequately documents the commission of an honest error that may cause undue financial loss.

### **3.016 BID OPENING**

- A. All bids received on or before the due date and time specified in the Notice to Bidder or any extension thereof made by Addendum will be opened and the name of the Bidder and the amount of their Bid will be announced.

### **3.017 BASIS OF BIDS**

- A. The Bidder shall include all additional documents or appendices that are requested to be submitted concurrent with the Bid submission; failure to comply may be cause for rejection.
- B. In accordance with Iowa law, Section 8A.311: A bidder, to be considered for an award of a state construction contract, shall disclose to the state agency awarding the contract the names of all subcontractors and suppliers who will work on the project being bid, within forty-eight (48) hours after the published date and time by which bids must be submitted. A bidder shall not replace a subcontractor or supplier disclosed without the approval of the state agency awarding the contract.
  - 1. A bidder, prior to an award or who is awarded a state construction contract, shall disclose all of the following, as applicable:
    - a. If a subcontractor or supplier disclosed (under the preceding) by a bidder is replaced, the reason for replacement and the name of the new subcontractor or supplier;

- b. If the cost of work to be done by a subcontractor or supplier is changed or if the replacement of a subcontractor or supplier results in a change in the cost, the amount of the change in cost.
- c. Any reduction in subcontractor or supplier price as a result of the change, if the change is approved by the Owner, shall be deducted from the Trade Contract via a deductive Change Order. Any such changes, if approved by the Owner, which result in an increase in the Trade Contract Price shall be borne by the Trade Contractor.
- C. The Bidder is specifically advised that any person, firm or other party to whom it is proposed to award a subcontract under this contract must:
  - 1. Be registered in the State of Iowa and have an Iowa Contractor's Registration number, and
  - 2. Be acceptable to the Owner.

### **3.018 INFORMALITIES/ REJECTION OF BIDS**

- A. The Iowa Department of Administrative Services reserves the right to waive any irregularities or informalities and to enter into a Contract with a Bidder, or to reject any or all bids as it deems to be in the best interest of the State, without penalty.

### **3.019 CONSIDERATION OF BIDS**

- A. It is the intent of the Department of Administrative Services to award a Contract to the lowest responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and is determined to be compliant with all Bidding Requirements, and does not exceed the funds available for construction.
- B. Bidder is to bid on each Alternate Bid requested. Failure to do so may result in disqualification of the bid. The Department of Administrative Services reserves the right to accept any, or no, Alternate Bid. Alternate Bids may be considered in any order or combination, and the low successful Bidder will be determined on the basis of the sum of the Base Bid and the Alternate(s) accepted at the time of the Contract award.
- C. In evaluating Bids, any proposal offered by a Bidder for an alternate design, or for materials other than those shown or specified for the Base Bid or for Alternate Bid construction under the proposed Construction Documents or called for by any issued Addenda to those Construction Documents, will not be considered in determining the low successful Bidder. However, the Department of Administrative Services reserves the right to consider any such Bidder-proposed (Contractor's Alternate) alternate designs or materials with the low successful Bidder, after the low successful Bidder is determined in the manner described above (A and B).
- D. Notice of Intent to Award the Bid(s) will be sent to all Respondents submitting a timely Bid and may be posted at the website shown on the RFB cover sheet. Negotiation and execution of the Contract(s) shall be completed no later than fifteen (15) days from the date of the Notice of Intent to Award or such other time as designated by Agency. If the successful Bidder fails to negotiate and deliver an executed Contract, including all required documents such as payment and performance bonds and insurance certificate, by that date, the Agency, in its sole discretion, may cancel the award and award the Contract to the remaining Bidder the Agency believes will provide the best value to the State.

### **3.020 PREFERENCE**

- A. By virtue of statutory authority, a preference shall be given to Iowa domestic labor, products produced and provisions grown within the state of Iowa, in accordance with the provisions of Chapter 73, Code of Iowa and any amendments thereto.
- B. Enforcement of reciprocal resident bidder preference and resident labor force preference codified at Iowa Code Section 73A.21.
  - 1. NOTICE: Failure on the part of the bidder to carefully read the following paragraphs and to provide the information requested below may make the bidder's bid materially nonresponsive and therefore ineligible for contract award. Violations of Iowa Code Section 73A.21 may, among other things, result in civil penalties assessed by the Commissioner of the Division of

Labor of Iowa Workforce Development. The bidder should seek out the advice of an attorney if he or she has questions about Iowa Code Section 73A.21. As a part of the competitive procurement of contracts for Public Improvements that must be awarded to the low bidder (if the bid is responsive and the bidder is deemed responsible), Public Bodies shall allow a preference to Resident Bidders if a Nonresident Bidder places a bid for the contract for the Public Improvement and that Nonresident Bidder's state or foreign country gives resident bidders of that state or foreign country a preference (including a labor force preference or any type of preferential treatment). The preference allowed, or reciprocally applied, shall be equal to the preference given or required by the state or foreign country in which the Nonresident Bidder is a resident bidder.

"Public Body" means the State of Iowa (and its agencies) and any of its political subdivisions, including school districts, public utilities, and the state board of regents.

"Public Improvement" means a building or other construction work to be paid for in whole or in part by the use of funds of the State of Iowa, its agencies, and any of its political subdivisions and includes road construction, reconstruction, and maintenance projects.

"Resident Bidder" means a person or entity authorized to transact business in of the State of Iowa and having a place of business for transacting business within the State of Iowa at which it is conducting and has conducted business for at least three years prior to the date of the first advertisement for the public improvement. Note, however, that if a nonresident bidder's state or foreign country has a more stringent definition of a resident bidder, the more stringent definition is applicable as to bidders from that state or foreign country.

"Nonresident Bidder" means a person or entity who does not meet the definition of a resident bidder.

- C. Nonresident bidders shall be required to certify on the Bid submission, where so indicated, the state or foreign country in which the firm is a resident, and if that state or foreign country uses a percentage for in-state bidders and the amount of the preference.
- D. If it is determined that this may cause denial of federal funds which would otherwise be available, or would otherwise be inconsistent with requirements of federal law, this section shall be suspended, but only to the extent necessary to prevent denial of the funds or to eliminate the inconsistency with federal requirements.

### **3.021 QUALIFICATIONS**

- A. In accordance with Iowa Code 26.9(2) and 26.16, no potential bidder shall be required to provide confidential or proprietary information or meet any class requirements as a precondition to submitting a responsive bid. However, as noted in Iowa Code 26.9(2), the lowest responsive bidder may be required to provide additional information to verify responsibility prior to and as a condition of obtaining final award of the contract. Any qualification requirements contained in any bid document indicates only preferred qualifications, not a precondition to bid, and the lowest responsive bidder's qualifications will be evaluated individually based on all information provided.
- B. The Owner may make such investigations as he or she deems necessary to determine the ability of the awarded Bidder to perform the required work, and the awarded Bidder shall furnish to the Owner all such information and data for this purpose. The Owner reserves the right to rescind any awarded Bid if the evidence submitted by, or in investigation of, such Bidder fails to satisfy the Owner that the Bidder is properly qualified to carry-out the obligations of the Contract and to complete the Work contemplated therein.
- C. Bidders shall be registered as a Construction Contractor with the Labor Commissioner, Iowa Workforce Development Department, as required by Chapter 91C of the Code of Iowa. Bidder's Iowa Contractor Registration Number shall be included in the location provided in the Bid Form.
- D. Non-resident corporations submitting bids must be in compliance with Section 490.1501 of the Code of Iowa and legally authorized thereby to carry-on such business in the State of Iowa as is required by the Contract Documents.
- E. An out-of-state Bidder, if awarded a contract, will be required to submit evidence of authorization to do business in the State of Iowa.

### **3.022 INSURANCE**

- A. Insurance Requirements
  - 1. The Contractor shall maintain in effect, with insurance companies of recognized responsibility, at its expense, insurance covering its work of the type and in amounts required by this Contract. The Contractor's insurance shall, among other things, insure against any loss or damage resulting from the Contractor's performance of this Contract. All such insurance policies shall remain in full force and effect for the entire life of this Contract and shall not be canceled or changed except after thirty (30) days written notice to the Owner.
  - 2. **Amounts of Insurance Required – Refer to ConsensusDocs 802 (see template in Project Manual)**
- B. Certificates of Coverage
  - 1. Certificates of the insurance described above shall be submitted to the Owner before starting any construction activities and shall be subject to approval by the Owner. The Contractor shall provide certificates for the insurance required. The insurer shall state in the certificate that no cancellation of the insurance will be made without at least thirty (30) days prior written notice to the Contractor. Upon receipt of any notice of cancellation or alteration, Contractor shall within ten (10) days procure other policies of insurance, similar in all respects to the policy or policies, about to be canceled or altered, and, if the Contractor fails to provide, procure, and deliver acceptable policies of insurance, or satisfactory evidence thereof, in accordance with the terms hereof then, at the Owner's option, Owner may obtain such insurance at the cost and expense of Contractor, without the need of any notice to Contractor.
- C. No Limitation of Liability
  - 1. Acceptance of the insurance certificates by the Owner shall not act to relieve the Contractor of any obligation under this Contract. All insurance policies and certificates shall be issued only by companies authorized to transact business in the State of Iowa. It shall be the responsibility of the Contractor to keep the respective insurance policies and coverage's current and in force during the life of this agreement.
  - 2. A Sample Certificate of Insurance is attached for reference following this Section.

### **3.023 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR**

- A. The Agreement for the Work will be written on ConsensusDocs 802 Form of Agreement between Owner and Contractor (sample of the document with modifications incorporated is bound in this Project Manual).

### **3.024 EXECUTION OF CONTRACT**

- A. Contract documents shall mean and include the following:
  - 1. Contract: ConsensusDocs 802
  - 2. Performance and Payment Bonds
  - 3. Project Manual
  - 4. Drawings
  - 5. Numbered Addenda issued after initial publication of Bid Documents
  - 6. Numbered Modifications (Change Orders) issued after Contract is signed

### **3.025 LAWS AND REGULATIONS**

- A. The Bidder's attention is directed to the fact that all applicable laws and regulations of Federal and State agencies having jurisdiction over the construction of this project shall apply to any contract resulting from this proposal, and it shall be deemed that those rules and regulations are made a part of such contract the same as if set forth in their entirety therein. By submitting a Bid, the Bidder confirms that he/she is familiar with and understands the Contractor's responsibility under all Federal and State of Iowa laws and regulations with respect to the Work described by the proposed Contract Documents.

### **3.026 CONTRACT DOCUMENTS AND ORDER OF PRECEDENCE**

- A. Where an irreconcilable conflict exists among Applicable Legal Requirements, this Contract, the specifications in the Materials and the Drawings, the earliest item mentioned in this sentence involving a conflict shall control over any later mentioned item or items subject to such conflict unless doing so would result in reducing the Bidder's duty of care or obligations under this Contract, in which case the terms resulting in the highest requirements for Bidder performance shall control.

**3.027 CONDITIONS OF THE WORK**

- A. Each bidder must fully inform him/herself of the conditions under which the work is to be performed at the site of the work, the obstacles which may be encountered, and all other relevant matters concerning the work to be performed. Failure to do so will not relieve a successful bidder of the obligation to furnish all material and labor necessary to carry out the provisions of the contract. When a site visit is required by provisions located elsewhere in these Instructions to Bidders, as a site tour in conjunction with a mandatory Pre-Bid Meeting, it shall be the Bidder's responsibility to fulfill this obligation as a condition of bidding the Work described in the Bidding Documents.
- B. No allowance will be made for any additional compensation by reason of any matter or condition with which the bidder might have fully informed him/herself, but failed to do so prior to bidding. Insofar as possible, the Contractor and all subcontractors shall employ such methods or means in carrying out the work so as not to cause any interruption of, or interference with, the work of any other subcontractor or trade.

**3.028 SUBCONTRACTS**

- A. The Prime Contractor shall be responsible for notifying all subcontractors and suppliers and informing them that they are bound in each case by all applicable provisions of the bidding information and those of the proposed Form of Agreements as defined in the Contract Documents.

**END OF SECTION**

## SECTION 00 2113.01

### IMPACS Public Construction Bidders User Guide

Public construction bids must be submitted on-line at [IMPACS Electronic Procurement System](#).

Bidders must be registered in IMPACS to submit a Bid.

To create an account, enter your email address and click on “Next” and click “Create Account”. Bidder must enter all fields noted with \* including legal company name, contact first and last name, phone number, confirm email address, password, re-enter password, select account recovery question including answer, confirm answer, select box accepting websites use terms and conditions and select security check box “I’m not a robot”.

On the [IMPACS Electronic Procurement System](#) Customer Portal Home page, Bidder selects “View Event” in the Sourcing Events section.

**Sourcing Events** ?

Show Opening or Closing Soon ▾ [Go to Public Opportunities](#)

Event Number	Status	Event Title	Dates	Action
RFB923700-02	Open	Hoover East Side Pavers	Open: 4/27/2022 12:00:00 PM CDT Close: 5/5/2022 12:00:00 PM CDT	<a href="#">View Event ▾</a>

Bidders can view event details including description, prerequisites, buyer attachments, questions and answers.

To submit a Bid, Bidder must select “**Yes, I intend to Bid**”. Bidder must complete the following sections.

**Prerequisites** - Bidder must complete all prerequisites.

- Bidder must upload a file of the Bid Security/Bond for 5% of total Bid Amount and certify that if they are awarded the construction contract they will enter into the contract at the Bid Amount submitted.
- Bidder must upload the completed and signed Bid Form.  
**NOTE: Bids are to be entered on the Bid Form only; not in the IMPACS. As a result, IMPACS will display a bid amount of \$0.**

**Questions** - Bidder must complete all questions.

**Review & Submit** - Bidder must select the certification box certifying that the statements and information in response are true and correct to the best of their knowledge and belief.

SECTION 00 2113.02

**SAMPLE**

**CERTIFICATE OF LIABILITY INSURANCE**



DATE (MM/DD/YYYY)  
xx/xx/xxxx

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

<b>PRODUCER</b> Agent's Name Agent's Address	<b>CONTACT NAME: Agent's Information</b>	
	PHONE (A/C, No. Ext): E-MAIL ADDRESS:	FAX (A/C, No.):
<b>INSURED</b> Trade Contractor's Name Trade Contractor's Mailing Address	INSURER(S) AFFORDING COVERAGE	
	INSURER A: Company A (AM Best Rated A/VI or Better)	
	INSURER B:	
	INSURER C:	
	INSURER D:	
	INSURER E:	
		NAIC # Admitted Carriers

**COVERAGES** CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	Minimum
* A	COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR  GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PROJECT <input type="checkbox"/> LOC OTHER:	X	X	#TBD- CGL	3/1/17	3/1/18	EACH OCCURRENCE	\$ 1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	\$
							MED EXP (Any one person)	\$
							PERSONAL & ADV INJURY	\$ 1,000,000
							GENERAL AGGREGATE	\$ 2,000,000
							PRODUCTS - COM/PROP AGG	\$ 1,000,000
								\$
B	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> HIRED AUTOS	X	X	#TBD-AL	3/1/17	3/1/18	COMBINED SINGLE LIMIT (Ea accident)	\$ 1,000,000
	<input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> NON-OWNED AUTOS						BODILY INJURY (Per person)	e
							BODILY INJURY (Per accident)	amount varies based on paragraph 10.2.2 of the ConsensusDocs 802 contract
							PROPERTY DAMAGE (Per accident)	
C	UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED RETENTION \$	X	X	#TBD-UMB	3/1/17	3/1/18	EACH OCCURRENCE	\$ 10,000,000
							AGGREGATE	\$
D	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below		N/A	#TBD-WC	3/1/17	3/1/18	PER STATUTE	X
							OTH-ER	
							E.L. EACH ACCIDENT	\$ 500,000
							E.L. DISEASE - EA EMPLOYEE	\$ 500,000
							E.L. DISEASE - POLICY LIMIT	\$ 500,000
* E	Owners Contractors Protective Liability			#TBD-OCF	3/1/17	3/1/18	*Limits equal to CGL (or) as required by owner (Note- Would be either CGL or OCF, not both)	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)  
 Additional Insured on a Primary & Non-Contributory basis (CGL;AL;UMB/Excess) in favor of : (Owner) Iowa Department of Administrative Services (DAS), Officers, Directors, Members, Consultants, Agents, and Employees.  
 Waiver of Subrogation (CGL;AL;WC/EL;UMB/Excess) in favor of: (Owner) Iowa Department of Administrative Services (DAS), Officers, Directors, Members, Consultants, Agents, and Employees.  
 Project XXXX.XX (Number varies by project)

<b>CERTIFICATE HOLDER</b> Iowa Department of Administrative Services (DAS) 109 SE 13th Street Des Moines, IA 50319	<b>CANCELLATION</b> SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.  AUTHORIZED REPRESENTATIVE Signature
---	---

**CERTIFICATE OF SITE VISIT**

This is certification that

---

(Name of Person)

As authorized representative of:

---

(Name of Firm)

---

(Firm's Address)

Visited the job site for verification of the conditions for the:

---

(Name of Project)

On

---

(Date of Visit)

---

(Signature of Owner's Representative or designated site authority)

**Attention: This Certification of Site Visit must be completed and submitted with your bid package. If multiple locations are involved, provide a separate form for each location.**

**SECTION 00 3113**

**PRELIMINARY SCHEDULE**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Preliminary Construction Schedule
- B. Schedule Durations

**1.02 PRELIMINARY SCHEDULE**

- A. A preliminary schedule has been identified by the Owner for the implementation of the Project. Refer to the schedule following this Section for references to anticipated milestones and construction duration.
- B. Each step of the Preliminary Schedule is subject to receipt of acceptable bids, Owner's decision process and date of commencement.
- C. A proposed construction schedule shall be submitted by all Trade Contractors to the Construction Manager no later than 48 hours prior to the pre-construction meeting. A revised Construction Schedule will be submitted by the Construction Manager once all preliminary schedules are reviewed and approved by the Owner.
- D. The final construction schedule will be established post award of bids with the cooperation of all contractors.

**1.03 SCHEDULE DURATIONS**

- A. Anticipated Notice of Intent to Award – 05/15/2026
- B. Anticipated Date of Commencement – 05/22/2026
- C. Substantial Completion by – 09/17/2026

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION – NOT USED**

**END OF SECTION**

Activity ID	Activity Name	Original Duration	Start	Finish	April 2026			May 2026				June 2026				July 2026				August 2026				September 2026				October 2026				November 2026				December 2026				January 2027
					12	19	26	03	10	17	24	31	07	14	21	28	05	12	19	26	02	09	16	23	30	06	13	20	27	04	11	18	25	01	08	15	22	29	06	13

**9487.00 - DVA IVH Loftus and Malloy Water Infiltration-Flooding**

Milestones				
M1170	Issue Design RFP	0	06-Aug-25 A	
M1110	Start of Design	0	27-Aug-25 A	
M1140	Designer Under Contract	0	25-Sep-25 A	
M1050	Schematic Design Complete	0	22-Jan-26 A	
M1060	Design Development Estimate	0	17-Feb-26 A	
M1000	50% CDs Complete	0	17-Feb-26 A	
M1070	CD Estimate	0	30-Mar-26 A	
M1010	95% CDs Complete	0	01-Apr-26 A	
M1020	100% Bid Documents	0	12-Apr-26 A	
M1030	Design Development Complete	0	14-Apr-26 A	
M1190	Special Inspections Under Contract	0	14-Apr-26	
M1100	Electrical Inspection (Final)	0	14-Apr-26	
M1160	Hazardous Materials Consultant Under Contract	0	28-May-26	
M1220	Contractors under Contract	0	01-Jun-26	
M1120	NPDES Permit	0	01-Jun-26	
M1180	Notification of Abatement Activities	0	01-Jun-26	
M1230	Construction Start	0	18-Jun-26	
M1270	Submit NPDES Permit Discontinuation or Renewal	0	11-Sep-26	
M1080	Site Stabilized	0	11-Sep-26	
M1200	Submit SWPPP Discontinuation	0	14-Sep-26	
M1250	Owner Closeout Conference	0	30-Nov-26	
M1240	Final Completion	0	03-Dec-26	
M1260	Owner Occupancy	0	03-Dec-26	

Preconstruction				
A1	Submit CMPC Proposal	2	25-Aug-25 A	27-Aug-25 A

Consultant Selection				
Environmental Consultant				
Design Consultant				
Hazardous Materials Consultant				
A122	Develop Hazardous Materials Consultant RFP	5	14-Apr-26	20-Apr-26
A124	Issue RFP to Procurement	1	21-Apr-26	21-Apr-26
A125	Post RFP to TSB	2	22-Apr-26	23-Apr-26
A126	RFP Procurement	13	24-Apr-26	12-May-26
A127	Pre-Proposal Meeting	0	30-Apr-26	
A128	RFP Questions Due	0	04-May-26	
A129	RFP Final Addendum	0	06-May-26	
A130	Proposals Due	0		12-May-26
A131	Proposal Evaluation	5	13-May-26	19-May-26
A132	NOI	0	20-May-26	
A133	Contract Execution	5	20-May-26	27-May-26

Site Selection				
Design				



<span style="color: blue;">█</span> Actual Work	◆ Milestone
<span style="color: green;">█</span> Remaining Work	◆ CRIT MILESTONE
<span style="color: red;">█</span> Critical Remaining Work	









**SECTION 00 3126**

**EXISTING HAZARDOUS MATERIAL INFORMATION**

**PART 1 - GENERAL**

**1.01 EXISTING HAZARDOUS MATERIAL INFORMATION**

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information but are not a warranty of existing conditions.
- B. An existing asbestos testing report for Project, DVA IVH Loftus and Malloy Water Infiltration, will be provided to the awarded contractor.
- C. Related Requirements:
  - 1. Document "Instructions to Bidders" for the Bidder's responsibilities for examination of Project site and existing conditions.
  - 2. Section 02 4119 "Selective Structure Demolition" for notification requirements if materials suspected of containing hazardous materials are encountered.
  - 3. Section 3.12 "Hazardous Materials" in the ConsensusDocs 802 contract for notification requirements if materials suspected of containing hazardous materials are encountered.

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION – NOT USED**

**END OF SECTION**

**SECTION 00 3132**

**GEOTECHNICAL DATA**

**PART 1 - GENERAL**

**1.01 GEOTECHNICAL DATA**

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information but are not a warranty of existing conditions.
  
- B. A geotechnical investigation report for Project, titled DVA IVH Loftus and Malloy Water Infiltration, will be provided to the awarded contractor prior to the start of construction.

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION – NOT USED**

**END OF SECTION**

**SECTION 00 3143**

**PERMIT APPLICATION**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Permit Application Information
- B. Licenses, Permits, and Related Inspections

**1.02 PERMIT APPLICATION INFORMATION**

- A. State Building Code Plan Review: The plan review and inspections for this project have been applied for by the Architect. Please contact your inspector prior to construction and occupancy.
- B. Electrical Permit and Inspections: Trade Contractor is responsible for permits and inspections.
- C. Other Applicable inspections: Trade Contractor is responsible for any other applicable project specific permits and inspections.

**1.03 LICENSES, PERMITS, AND RELATED INSPECTIONS**

- A. The Bidder shall comply with all codes, laws, ordinances, rules and regulations of any public authority having jurisdiction that bears on the performance of its work. All construction, materials and methods shall comply with the State Building Codes, except where plans and specifications establish a higher standard.

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION – NOT USED**

**END OF SECTION**

**SECTION 00 4116**

**BID FORM**

**The Bid Form must be submitted online through the State's [IMPACS Electronic Procurement System](#).**

RFB #948700-01

BID FORM for CONSTRUCTION CONTRACT

for

Iowa Veterans Home

1300 Summit Street

Marshalltown, Iowa 50158

Project 9487.00

Iowa Department of Administrative Services  
Hoover State Office Building, Level 3  
1305 East Walnut Street  
Des Moines, Iowa 50319-0105

The following information is to be completed and submitted with your bid.

1. Bid Form - Completed and Signed (to be uploaded with bid submission)
2. Non-Discrimination Clause Information
3. Contractor Targeted Small Business Enterprise Pre-Bid Contract Information
4. Bid Security – 5% of total Bid amount (to be uploaded with bid submission)

**Authorized Representative:**

The undersigned Bidder, in response to your Request for Bid for construction of the above project, having examined the Drawings, Specifications, and other Bidding Documents dated 03/31/2026, and Addenda issued and acknowledged below as received and being familiar with all the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, equipment and supplies to perform all work to construct the project in strict accordance with the proposed Contract Documents, within the time and at the prices stated below. Prices are to cover all expenses incurred in performing the work required under the proposed Contract Documents, of which this bid is a part.

Bidder acknowledges receipt of the following Addenda which are a part of the Bidding Documents and for which any effect on cost of the Work is included in the bid amounts indicated:

Number \_\_\_\_\_

Number \_\_\_\_\_

Note that the State of Iowa is exempt from State and Local sales and use taxes (including local option and school option) for this project. Taxes on construction materials shall NOT be included in the bid amounts.

Amounts shall be indicated in both words and figures. In case of discrepancy, the amount indicated in words shall govern.

BID PACKAGES:

BP 01

Description: Sitework, Utilities, and Concrete

Bidder proposes and agrees to perform all work as described in the Construction Documents for the sum of:

\_\_\_\_\_ Dollars  
(\$\_\_\_\_\_).

BP 02

Description: Electrical and Low Voltage

Bidder proposes and agrees to perform all work as described in the Construction Documents for the sum of:

\_\_\_\_\_ Dollars  
(\$\_\_\_\_\_).

BP 03

Description: Waterproofing

Bidder proposes and agrees to perform all work as described in the Construction Documents for the sum of:

\_\_\_\_\_ Dollars  
(\$\_\_\_\_\_).

BP 04

Description: General Construction

Bidder proposes and agrees to perform all work as described in the Construction Documents for the sum of:

\_\_\_\_\_ Dollars  
(\$\_\_\_\_\_).

UNIT PRICES:

UNIT 01

Description: Wood Framing Repairs

\_\_\_\_\_ Dollars  
\_\_\_\_\_ Dollars  
(\$\_\_\_\_\_).

UNIT 02

Description: Concrete Foundation Crack Repairs

\_\_\_\_\_ Dollars  
\_\_\_\_\_ Dollars  
(\$\_\_\_\_\_).

ALTERNATE 01

Description: (DEDUCT) Basement Interior Finish Repairs

\_\_\_\_\_ Dollars  
\_\_\_\_\_ Dollars  
(\$\_\_\_\_\_).

Bidder hereby certifies that:

1. This bid is genuine and is not made in the interest of or on behalf of any undisclosed person, firm or corporation.
2. Bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid; Bidder has not solicited or induced any person, firm or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain any advantage over any other bidder or over the Owner.
3. Bidder hereby certifies that the Bidder is registered with the Iowa Labor Commissioner as a Contractor as required by Chapter 91C, Code of Iowa.
4. Bidder agrees to comply with all Federal and State Affirmative Action/Equal Employment Opportunity requirements concerning fair employment and will not discriminate between or among them by reason of race, color, religion, sex, national origin or physical handicap.
5. All construction under this Contract shall conform to the requirements of the *Iowa State Building Code*.
6. Bidder agrees that this bid shall remain valid and shall not be withdrawn for a period of thirty (30) calendar days after the date for receipt of bids.
7. Bidder agrees that if written notice of acceptance of this bid is mailed, emailed, or delivered to the undersigned within thirty (30) days after the date in which bids are due, or at any time thereafter before it is withdrawn, the undersigned will sign and return the Contract Agreement, prepared in accord with the Bidding Documents and this bid as accepted; and will also provide proof of insurance coverage and required surety bonds.
8. Bidder understands that the Owner reserves the right to reject any and all bids, and to waive irregularities or informalities and enter into a contract for the work, as the Owner deems to be in the best interest of the State.

9. Bidder understands that the Owner reserves the right to accept any, or no, Alternate Bid, if requested, and that the Alternate Bids may be considered in any order or combination, and the low Bidder shall be determined on the basis of the sum of the base bid and any Alternate(s) accepted.

**Subcontractors:**

The Trade Contractor must identify all Subcontractors and Suppliers within 48 hours of the published date and time for which bids must be submitted, in accordance with Iowa Code Section 8A311, as amended by House File 646 in 2011. Subcontractors and suppliers may not be changed without the approval of the Owner. Requests for changing a Subcontractor or supplier must identify the reason for the proposed change, the name of the new Subcontractor or supplier, and the change in the subcontractor or supplier price as a result of the change. Any reduction in subcontractor or supplier price as a result of the change, if the change is approved by the Owner, shall be deducted from the Trade Contract Price via a deductive Change Order. Any such changes, if approved by the Owner, which result in an increase in the Trade Contract Price shall be borne by the Trade Contractor.

**Enforcement of Reciprocal Resident Bidder Preference, per Iowa Code 73A.21.**

All bidders shall either check the box next to "Resident Bidder" or check the box next to "Nonresident Bidder" and by doing so and signing thereafter certifies and attests to the same. All information requested must be provided. Seek out the advice of an attorney if you have questions.

"Resident Bidder" means a person or entity authorized to transact business in of the State of Iowa and having a place of business for transacting business within the State of Iowa at which it is conducting and has conducted business for at least three years prior to the date of the first advertisement for the public improvement. Note, however, that if a nonresident bidder's state or foreign country has a more stringent definition of a resident bidder, the more stringent definition is applicable as to bidders from that state or foreign country.

Resident Bidder

Name of Resident Bidder: \_\_\_\_\_

By: \_\_\_\_\_  
Authorized Agent and Signatory of Resident Bidder

**OR:**

Nonresident Bidder

Name of Nonresident Bidder: \_\_\_\_\_

Name of State or Foreign Country of Nonresident Bidder: \_\_\_\_\_

Particularly identify and describe any preference, labor preference, or any other type of preferential treatment, in effect in the nonresident bidder's state or foreign country at the time of this bid:

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NOTICE: Nonresident Bidders domiciled in a state or country with a resident labor force preference shall make and keep, for a period of not less than three years, accurate records of all workers employed on the public improvement. The records shall include each worker's name, address, telephone number when available, social security number, trade classification, and the starting ending time of employment.

By: \_\_\_\_\_  
Authorized Agent and Signatory of Nonresident Bidder

---

**REQUIRED: Bid Form shall be signed by an officer of the company with authority to bind in a contract.** Notice of acceptance of this bid, or request for additional information by the Department of Administrative Services, may be addressed to the undersigned at the address set forth below:

Legal Name of Firm: \_\_\_\_\_

Date: \_\_\_\_\_

Signature of Bidder: \_\_\_\_\_

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

Typed Name of Signatory: \_\_\_\_\_

Email: \_\_\_\_\_

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

Telephone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_

Federal Tax Identification Number: \_\_\_\_\_

Iowa Contractor Registration Number: \_\_\_\_\_

Bidder Safety Manager Name: \_\_\_\_\_

For an out-of-state Bidder, Bidder certifies that the Resident Preference given by the State or Foreign Country of Bidder's residence, \_\_\_\_\_, is \_\_\_\_\_ %.

**END OF SECTION**

## SECTION 00 4116.01

### NON-DISCRIMINATION CLAUSE

This Section is for informational purposes only. All information will be submitted online through the State's [IMPACS Electronic Procurement System](#).

#### PART 1 - GENERAL

All contractors, subcontractors, vendors and suppliers of goods and services doing business with the State of Iowa and value of said business equals or exceeds \$10,000 annually, agree as stated below.

#### 1.01 NONDISCRIMINATION CLAUSE

- A. The contractor, subcontractor, vendor and supplier of goods and services will not discriminate against an employee or applicant for employment because of race, creed, color, sex, national origin, ancestry, religion, economic status, age, disability, political opinion, or affiliations of an applicant or employee based upon the nature of the job occupation. The contractor, subcontractor, vendor and supplier will develop an Affirmative Action Program to insure that applicants are employed and that employees are treated during employment without regard to their race, creed, color, sex, national origin, ancestry, religion, economic status, age, disability, political opinions or affiliations. Such action shall include, but not be limited to the following:
  - 1. Employment.
  - 2. Upgrading.
  - 3. Demotion or transfer.
  - 4. Recruitment and advertising.
  - 5. Layoff or termination.
  - 6. Rates of pay or other forms of compensation.
  - 7. Selection for training, including apprenticeship.
- B. The contractor, subcontractor, vendor and supplier of goods and services will, in all solicitations or advertisements for employees, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex, national origin, ancestry, religion, economic status, age, disability, political opinion or affiliations.
- C. The contractor, subcontractor, vendor and supplier or their collective bargaining representative will send to each labor union or representative or workers with which they have a collective bargaining agreement or other contract or understanding, a notice advising the said labor union or workers' representative of the contractor's commitments under this section.
- D. The contractor, subcontractor, vendor and supplier of goods and services will comply with all published rules, regulations, directives and orders of the State of Iowa Affirmative Action Program Contract Compliance Provisions.
- E. The contractor, subcontractor, vendor and supplier of goods and services will furnish and file compliance reports within such time and upon such forms as provided by the Equal Employment Opportunity Officer, said forms may elicit information as to the policies, procedures, patterns, and practices of each subcontractor as state as the contractor themselves and said contractor, subcontractor, vendor and supplier will permit access to their employment books, records and accounts to the State's Equal Employment Opportunity Officer, for the purpose of investigation to ascertain compliance with this Contract and with rules regulations of the State's Affirmative Action Program.
- F. In the event of the contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of such rules, regulations and orders; this Contract may be canceled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further contracts in accordance with procedures authorized by the State of Iowa.

- G. The contractor, subcontractor, vendor and supplier of goods and services will include, or incorporate by reference, the provisions of the nondiscrimination clause in every contract, subcontract or purchase order unless exempted by the rules, regulations or orders of the State's Affirmative Action Program, and will provide in every subcontract or purchase order that said provisions will be binding upon each contractor, subcontractor or seller.
- H. The parties agree to comply with "Compliance with the Law; Nondiscrimination in Employment" of the current Terms and Conditions at the award of this contract. Current Terms and Conditions may be found on the following web site and are, by this reference, made a part of this Agreement. <https://das.iowa.gov/procurement/terms-and-conditions>
- I. We certify and recognize that we are morally and legally committed to nondiscrimination in employment. Any person who applies for employment with our company will not be discriminated against because of race, creed, color, sex, national origin, ancestry, religion, economic status, age or disabilities, unless disabilities are based upon the nature of the job occupation.

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION – NOT USED**

**END OF SECTION**

**SECTION 00 4116.02**

**TARGETED SMALL BUSINESS INFORMATION**

**This Section is for informational purposes only. All information will be submitted online through the State's [IMPACS Electronic Procurement System](#).**

**PART 1 - GENERAL**

**1.01 TARGETED SMALL BUSINESS INFORMATION**

- A. Subcontractor Targeted Small Business Enterprise Pre-Bid Contact Information, including subcontractor and dollar amount to be subcontracted, is to accompany the Bid submission. Bidders shall comply with all affirmative action/equal opportunity provisions of State and Federal laws. The Owner seeks to provide opportunities for Targeted Small Businesses in accordance with the provisions of Chapter 73 of the Code of Iowa.
  
- B. [Search the Targeted Small Business Directory](#) for certified State of Iowa Targeted Small Businesses.

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION – NOT USED**

**END OF SECTION**

IOWA DEPARTMENT OF ADMINISTRATIVE SERVICES  
 SUBCONTRACTOR  
 TARGETED SMALL BUSINESS ENTERPRISE  
 PRE-BID CONTRACT INFORMATION

<b>CONTRACTOR</b>	<b>BID NO.</b>
<b>CONTRACTOR</b>	<b>PAGE #</b>

(to be completed by bidder)

*You are requested to provide the information on this form showing your targeted Small Business enterprises contracts made prior to your bid submission. This information is subject to verification and confirmation. NOTE: The Department of General Services will not regard your acceptance or use of a low quote or bid from a non-targeted Small Business Enterprise on any subcontract item as evidence itself of any lack of good faith effort to solicit targeted Small Business Enterprise subcontractors on this project. However, every effort shall be made to solicit quotes or bids on as many subcontractable items as necessary to evidence affirmative action in contracting.*

**TABLE OF INFORMATION SHOWING BIDDER'S PRE-BID TARGETED SMALL BUSINESS ENTERPRISE CONTACTS**

SUBCONTRACTOR	TSB	DATES CONTACTED	QUOTES RECEIVED		QUOTATION USED IN BID	
			YES/NO	DATES	YES/NO	DOLLAR AMOUNT PROPOSED TO BE SUBCONTRACTED

Total dollar amount proposed to be subcontracted to TSB on this project \$ \_\_\_\_\_  
 List items to be subcontracted. (if more space is needed, use reverse side.)

**SECTION 00 4313**

**BID SECURITY FORMS**

**PART 1 - GENERAL**

**1.01 BID SECURITY FORMS**

- A. A Bid Bond form will be required on this project. An amended ConsensusDocs 262 is attached for reference following this page. ConsensusDocs bid bond form is not required (other standard forms are acceptable to the State of Iowa).

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION – NOT USED**

**END OF SECTION**



**CONSENSUSDOCS 262  
 BID BOND  
 (AMENDED BY STATE OF IOWA)**

This document was developed through a collaborative effort of organizations representing a wide cross-section of the design and construction industry. The organizations endorsing this document believe it represents a fair allocation of risk and responsibilities for all project participants.

Endorsing organizations recognize that this document must be reviewed and adapted to meet specific needs and applicable laws. This document has important legal and insurance consequences. You are encouraged to consult legal, insurance and surety advisors before completing or modifying this document. The software includes a notes section indicating where information is to be inserted to complete this document. Further information and endorsing organizations' perspectives are available at [www.consensusdocs.org/guidebook](http://www.consensusdocs.org/guidebook).

For Use with ConsensusDOCS 200, Standard Form of Agreement and General Conditions Between Owner and Constructor (Where the Contract Price is a Lump Sum) and ConsensusDOCS 500, Standard Agreement and General Conditions Between Owner and Construction Manager.

The Trade Contractor, \_\_\_\_\_ (the "Trade Contractor") has submitted a Bid to the Owner, \_\_\_\_\_ (the "Owner") for the \_\_\_\_\_ (the "Project") in accordance with the Bidding Documents, including Drawings and Specifications prepared by \_\_\_\_\_ (the "Design Professional").

---

**IMPORTANT:** A vertical line in the margin indicates a change has been made to the original text. Prior to signing, recipients may wish to request from the party producing the document a "redlined" version indicating changes to the original text. Consultation with legal and insurance counsel and careful review of the entire document are strongly encouraged.  
 ConsensusDOCS 262 • BID BOND Copyright © 2007, Revised 2009 and 2011, ConsensusDOCS LLC. AN INDIVIDUAL PURCHASE OF THIS DOCUMENT PERMITS THE USER TO PRINT ONE CONTRACT FOR ONE PROJECT ONLY. YOU MAY ONLY MAKE COPIES OF A COMPLETED DOCUMENT FOR DISTRIBUTION TO PARTIES IN DIRECT CONNECTION WITH THE SPECIFIC CONSTRUCTION PROJECT. ANY OTHER USES, INCLUDING COPYING THE DOCUMENT, ARE STRICTLY PROHIBITED.

By virtue of this Bid Bond (the "Bond"), the Constructor as Principal and \_\_\_\_\_ as Surety ("Surety"), are bound to the Owner as Oblige in the maximum amount \_\_\_\_\_, Dollars (\$\_\_\_\_\_) (the "Bond Sum"). The Constructor and Surety hereby bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein.

1. If the Oblige shall accept the bid of the Constructor, the Constructor shall enter into an Agreement with the Oblige in accordance with the terms of such Bid.
2. Constructor shall procure such bond or bonds as are specified in the Contract Documents for the faithful performance of the Work and for the prompt payment of labor and materials furnished in the performance of the Work.
3. If the Constructor fails to enter such Agreement and give such bonds, the Constructor shall pay to the Oblige the difference between the amount of Constructor's bid and the amount of such agreement the Oblige in good faith executes with another Party to perform the Work covered by Constructor's Bid, not to exceed the Bond Sum stated above.
4. If the Constructor shall fulfill its obligation under Articles 1 through 3, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

This Bond is entered into as of \_\_\_\_\_ (date)

SURETY: \_\_\_\_\_ (seal)

BY: .....

Print Name: \_\_\_\_\_

Print Title: \_\_\_\_\_ (Attach Power of Attorney)

Witness: .....

(Additional signatures, if any, appear on attached page)

Constructor: \_\_\_\_\_ (seal)

BY: .....

Print Name: \_\_\_\_\_

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

Witness: .....

(Additional signatures, if any, appear on attached page)

**IMPORTANT:** A vertical line in the margin indicates a change has been made to the original text. Prior to signing, recipients may wish to request from the party producing the document a "redlined" version indicating changes to the original text. Consultation with legal and insurance counsel and careful review of the entire document are strongly encouraged.  
ConsensusDOCS 262 • BID BOND Copyright © 2007, Revised 2009 and 2011, ConsensusDOCS LLC, AN INDIVIDUAL PURCHASE OF THIS DOCUMENT PERMITS THE USER TO PRINT ONE CONTRACT FOR ONE PROJECT ONLY, YOU MAY ONLY MAKE COPIES OF A COMPLETED DOCUMENT FOR DISTRIBUTION TO PARTIES IN DIRECT CONNECTION WITH THE SPECIFIC CONSTRUCTION PROJECT, ANY OTHER USES, INCLUDING COPYING THE DOCUMENT, ARE STRICTLY PROHIBITED.

**SECTION 00 5200**

**AGREEMENT FORM**

**PART 1 - GENERAL**

**1.01 AGREEMENT FORM**

- A. The Form of Agreement to be used on this project is a modified ConsensusDocs 802. A sample is attached following this page.

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION – NOT USED**

**END OF SECTION**

# ConsensusDocs 802

## STANDARD FORM OF AGREEMENT BETWEEN OWNER AND TRADE CONTRACTOR

(Where the Construction Manager Is the Owner's Agent)



### TABLE OF ARTICLES

1. AGREEMENT
2. GENERAL PROVISIONS
3. TRADE CONTRACTOR'S OBLIGATIONS
4. OWNER'S RESPONSIBILITIES
5. SUBCONTRACTS
6. TRADE CONTRACT TIME
7. TRADE CONTRACT PRICE
8. CHANGES
9. PAYMENT
10. INDEMNITY, INSURANCE, WAIVERS AND BONDS
11. SUSPENSION, NOTICE TO CURE AND TERMINATION OF AGREEMENT
12. DISPUTE MITIGATION AND RESOLUTION
13. MISCELLANEOUS PROVISIONS
14. TRADE CONTRACT DOCUMENTS

This Agreement has important legal and insurance consequences. Consultations with an attorney and with insurance and surety consultants are encouraged with respect to its completion or modification. Notes indicate where information is to be inserted to complete this Agreement.



## ARTICLE 1 AGREEMENT

This Trade Contractor Agreement is made effective as of the XX day of Month, Year , by and between the

OWNER

State of Iowa - DAS, Department of Administrative Services ("DAS"). DAS's principal office is located: 109 SE 13th Street, Des Moines, IA 50319-0120.

and the

TRADE CONTRACTOR

*Contractor Name*

*Address*

*City, State, Zip*

for work in connection with the following

PROJECT

*XXXX.XX - Project Name*

The CONSTRUCTION MANAGER is

*Construction Manager Name*

*Address*

*City, State, Zip*

The DESIGN PROFESSIONAL for the Project is

*Designer Name*

*Address*

*City, State, Zip*

Notice to the Parties shall be given at the above addresses.

## ARTICLE 2 GENERAL PROVISIONS

2.1 RELATIONSHIP OF PARTIES The Owner and the Trade Contractor agree to proceed with this Agreement on the basis of mutual trust, good faith and fair dealing and shall cooperate with each other and with the Construction Manager and Design Professional in furthering the Owner's interests. The Trade Contractor shall use its diligent efforts to perform the work in an expeditious manner consistent with the Trade Contract Documents. The Owner and the Trade Contractor will endeavor to promote harmony and cooperation among all Project participants.

2.1.1 The Owner and the Trade Contractor shall perform their obligations with integrity, ensuring at a minimum that

2.1.1.1 conflicts of interest shall be avoided or disclosed promptly to the other Party; and

2.1.1.2 the Trade Contractor and the Owner warrant that they have not and shall not pay nor receive any contingent fees or gratuities to or from the other Party, including its agents, officers and employees, Subcontractors or others for whom they may be liable, to secure preferential



treatment.

2.2 PROJECT ORGANIZATION This Agreement is for the performance of work described herein in connection with the construction of the Project. The Owner also may enter into separate agreements with other trade contractors for other portions of the Project. The Owner has entered or will enter into a Construction Management Agreement with the Construction Manager, and a design agreement with the Design Professional.

2.3 INDEPENDENT CONTRACTOR The Trade Contractor represents that it is an independent contractor and that its performance of the Trade Contract Work it shall act as an independent contractor. Neither Trade Contractor nor any of its agents or employees shall act on behalf of the Owner except as provided in this Agreement or unless authorized in writing by the Owner.

2.4 CONSTRUCTION MANAGER IS OWNER'S AGENT The Construction Manager will represent the Owner as its agent in the administration and management of this Agreement. Any instructions, reviews, approvals, orders or directions given to the Trade Contractor by the Construction Manager will be given on behalf of and as agent for the Owner. The Trade Contractor shall be obligated to respond or perform as if the same were given directly by the Owner. The Trade Contractor shall communicate and provide all requests and concerns regarding the Trade Contract Work to the Construction Manager. The Trade Contractor shall provide copies to the Construction Manager of all notices to the Owner required by and regarding this Agreement.

2.5 CONSTRUCTION MANAGER NOT IN PRIVITY WITH TRADE CONTRACTOR This Agreement shall not give the Trade Contractor any claim or right of action against the Construction Manager. The Trade Contractor and its subcontractors shall not be beneficiaries of any obligations of the Construction Manager. This Agreement shall not create a contractual relationship between any parties except the Owner and the Trade Contractor.

2.5A NO THIRD-PARTY BENEFICIARY There are no third-party beneficiaries of this Agreement.

2.6 DESIGN PROFESSIONAL The Owner, through its Design Professional, shall provide all architectural and engineering design services necessary for the completion of the Work, except the following:

#### No exceptions

The Trade Contractor shall not be required to provide professional services which constitute the practice of architecture or engineering except as otherwise provided in section 3.15.

2.6.1 The Owner shall obtain from the Design Professional either a license for Trade Contractor and Subcontractors to use the design documents prepared by the Design Professional or ownership of the copyrights for such design documents, and shall defend, indemnify and hold harmless the Trade Contractor against any suits or claims of infringement of any copyrights or licenses arising out of the use of the design documents. To the extent portions of this paragraph are in conflict with SF 396 (codified at Iowa Code Section 537A.5) said portions are void and unenforceable.

2.7 EXTENT OF AGREEMENT This Agreement is solely for the benefit of the Parties, represents the entire integrated agreement between the Parties, and supersedes all prior negotiations, representations and agreements, either written or oral. This Agreement and each and every provision is for the exclusive benefit of the Owner and the Trade Contractor and not for the benefit of any third party except to the extent expressly provided in this Agreement. In the event of conflict between this Agreement and any of the Exhibits or any other documents incorporated into this Agreement, the terms and provisions of this Agreement shall control.

#### 2.8 DEFINITIONS



2.8.1 Agreement means this ConsensusDocs 802 Standard Form of Agreement Between Owner and Trade Contractor (Where the Construction Manager is the Owner's Agent), as modified by the Parties, and Exhibits and Attachments made part of this Agreement upon its execution.

2.8.2 Design Professional means the Architect, Design Professional or Engineer identified in ARTICLE 1 and its consultants, retained by Owner to perform design services for the Project, and licensed in the State in which the Project is located. The use of the term Design Professional in this Agreement is for convenience and is not intended to imply or infer that the individual or entity named in ARTICLE 1 will provide design professional services in a discipline in which it is not licensed.

2.8.3 Construction Manager means the Construction Manager identified in ARTICLE 1 and its authorized representative.

2.8.4 The Construction Schedule is the document initially prepared by and updated by the Construction Manager and approved by the Owner that indicates proposed activity sequences, durations, or milestone dates for such activities as receipt and approval of pertinent information, issuance of the Construction Documents, the preparation and processing of shop drawings and samples, delivery of materials or equipment requiring long-lead-time procurement, Owner's occupancy requirements and estimated dates of Substantial Completion and Final Completion of the Project.

2.8.5 The term Day shall mean calendar day unless otherwise specifically defined.

2.8.6 Final Completion occurs on the date when the Trade Contractor's obligations under this Agreement are complete and accepted by the Owner and final payment becomes due and payable, as established in ARTICLE 6. This date shall be confirmed by a Certificate of Final Completion signed by the Owner and the Trade Contractor.

2.8.7 A Hazardous Material is any substance or material identified now or in the future as toxic or hazardous under any federal, state or local law or regulation, or any other substance or material which may be considered hazardous or otherwise subject to statutory or regulatory requirements governing handling, disposal or clean-up.

2.8.8 A Material Supplier is a person or entity retained by the Trade Contractor to provide material or equipment for the Trade Contract Work. This definition is not intended to, and shall not be interpreted to, expand or modify the definition(s) of materials or material suppliers contained in Iowa Code Chapter 573.

2.8.9 Others means other contractors, material suppliers, and persons at the Worksite who are not employed by the Trade Contractor or Subcontractors.

2.8.10 The term Overhead shall mean a) payroll costs and other compensation of Trade Contractor employees in the Trade Contractor's principal and branch offices; b) general and administrative expenses of the Trade Contractor's principal and branch offices including deductibles paid on any insurance policy and c) the Trade Contractor's capital expenses, including interest on capital used for the Work.

2.8.11 Owner is the person or entity identified in ARTICLE 1 as Owner, and includes the Owner's representative.

2.8.12 The Project, as identified in ARTICLE 1, is the building, facility or other improvements for which the Trade Contractor is to perform the Trade Contract Work.

2.8.13 A Subcontractor is a person or entity retained by the Trade Contractor as an independent contractor to provide the labor, materials, equipment or services necessary to complete a specific



portion of the Work. This definition is not intended to, and shall not be interpreted to, expand or modify the definition(s) of materials or material suppliers contained in Iowa Code Chapter 573.

2.8.14 Per Iowa Code Section 26.13, "substantially completed" means the first date on which any of the following occurs: (1) Completion of the Project (or Trade Contract Work, in the case of the multiple Trade Contractors) or when the Project (or Trade Contract Work in the case of multiple Trade Contractors) has been substantially completed in general accordance with the terms and provisions of the contract. (2) The work on the Project (or Trade Contract Work in the case of multiple Trade Contractors) or on the designated portion is substantially completed in general accordance with the terms of the contract so that the State Iowa can occupy or utilize the Project or designated portion of the Project for its intended purpose. (3) The Project (or Trade Contract Work in the case of multiple Trade Contractors) is certified as having been substantially completed by either of the following: (a) the architect or engineer authorized to make such certification (which is defined in this Agreement as the Design Professional). (b) The authorized contract representative (which is defined in this Agreement as the Owner's Representative). (4) The State of Iowa is occupying or utilizing the Project (or Trade Contract Work in the case of multiple Trade Contractors) for its intended purpose. This subparagraph shall not apply to highway, bridge, or culvert projects.

2.8.15 Terrorism means a violent act, or an act that is dangerous to human life, property or infrastructure, that is committed by an individual or individuals and that appears to be part of an effort to coerce a civilian population or to influence the policy or affect the conduct of any government by coercion. Terrorism includes, but is not limited to, any act certified by the United States government as an act of terrorism pursuant to the Terrorism Risk Insurance Act, as amended.

2.8.16 A Trade Contract Change Order is a written order signed by the Owner and the Trade Contractor after execution of this Agreement, indicating changes in the scope of the Trade Contract Work, the Trade Contract Price or Trade Contract Time, including substitutions proposed by the Trade Contractor and accepted by the Owner. Trade Contract Change Orders shall be executed using the ConsensusDOCS 813 Trade Contract Change Order (CM as Owner's Agent) form document with exhibits attached as necessary.

2.8.17 The Trade Contract Documents consist of this Agreement (as modified), the drawings, specifications, addenda issued prior to execution of this Agreement, approved submittals, information furnished by the Owner under subsection 4.1.3, the bid documents, other documents listed in this Agreement and any modifications issued after execution.

2.8.18 The Trade Contract Price is the amount indicated in section 7.1 of this Agreement.

2.8.19 The Trade Contract Time is the period between the Date of Commencement and Final Completion.

2.8.20 Trade Contract Work means the construction and services provided by the Trade Contractor.

2.8.20.1 Changed Work means work that is different from the original scope of Trade Contract Work; or work that changes the Trade Contract Price or Trade Contract Time.

2.8.20.2 Defective Work is any portion of the Trade Contract Work that is not in conformance with the Trade Contract Documents.

2.8.21 The Trade Contractor is the person or entity identified in ARTICLE 1 and includes the Trade Contractor's Representative.

2.8.22 The term Work means the construction and services necessary or incidental to fulfill the Trade



Contractors' obligations for the Project. The Work may refer to the whole Project or only a part of the Project.

2.8.23 Worksite means the geographical area at the location of the Project as identified in ARTICLE 1 where the Trade Contract Work is to be performed.

### ARTICLE 3 TRADE CONTRACTOR'S OBLIGATIONS

#### 3.1 GENERAL RESPONSIBILITIES

3.1.1 RESPONSIBILITIES The Trade Contractor shall provide all of the labor, materials, equipment and services necessary to complete the Trade Contract Work, all of which shall be provided in full accord with or as reasonably inferable from the Trade Contract Documents as being necessary to produce the indicated results.

3.1.2 The Trade Contractor shall be responsible for the supervision and coordination of the Trade Contract Work, including the construction means, methods, techniques, sequences and procedures utilized, unless the Trade Contract Documents give other specific instructions. In such case, the Trade Contractor shall not be liable to the Owner for damages resulting from compliance with such instructions unless the Trade Contractor recognized and failed to timely report to the Owner any error, inconsistency, omission or unsafe practice that it discovered in the specified construction means, methods, techniques, safety, sequences or procedures.

3.1.3 The Trade Contractor shall perform Trade Contract Work only within locations allowed by the Trade Contract Documents, applicable permits and applicable local law.

#### 3.2 COOPERATION WITH WORK OF OWNER AND OTHERS

3.2.1 The Owner may perform work at the Worksite directly or by Others. Any agreements with Others to perform construction or operations related to the Project shall include provisions pertaining to insurance, indemnification, waiver of subrogation, coordination, interference, clean up and safety which are substantively the same as the corresponding provisions of this Agreement.

3.2.2 In the event that the Owner elects to perform work at the Worksite directly or by Others, the Trade Contractor and the Owner shall, with the assistance of the Construction Manager, coordinate the activities of all forces at the Worksite and agree upon fair and reasonable schedules and operational procedures for Worksite activities. The Owner shall require each separate contractor to cooperate with the Trade Contractor and assist with the coordination of activities and the review of construction schedules and operations. The Trade Contract Price and Trade Contract Time shall be equitably adjusted, as mutually agreed by the Parties, for subsequent changes made necessary by the coordination of construction activities, and the Trade Contractor's construction schedule and the Construction Schedule shall be revised accordingly. The Trade Contractor, Owner and Others shall adhere to the revised Construction Schedule until it may subsequently be revised.

3.2.3 With regard to the work of the Owner and Others, the Trade Contractor shall (a) proceed with the Trade Contract Work in a manner which does not hinder, delay or interfere with the work of the Owner or Others or cause the work of the Owner or Others to become defective, (b) afford the Owner or Others reasonable access for introduction and storage of their materials and equipment and performance of their activities, and (c) coordinate the Trade Contractor's construction and operations with theirs as required by this section.

3.2.4 Before proceeding with any portion of the Trade Contract Work affected by the construction or operations of the Owner or Others, the Trade Contractor shall give the Owner and Construction



Manager prompt written notification of any defects the Trade Contractor discovers in their work which will prevent the proper execution of the Trade Contract Work. The Trade Contractor's obligations in this section do not create a responsibility for the work of the Owner or Others, but are for the purpose of facilitating the Trade Contract Work. If the Trade Contractor does not notify the Owner and Construction Manager of patent defects interfering with the performance of the Trade Contract Work, the Trade Contractor acknowledges that the work of the Owner or Others is not defective and is acceptable for the proper execution of the Trade Contract Work. Following receipt of written notice from the Trade Contractor of defects, the Owner, through the Construction Manager, shall promptly inform the Trade Contractor what action, if any, the Trade Contractor shall take with regard to the defects.

### 3.3 RESPONSIBILITY FOR PERFORMANCE

3.3.1 In order to facilitate its responsibilities for completion of the Work in accordance with and as reasonably inferable from the Trade Contract Documents, prior to commencing the Work the Trade Contractor shall examine and compare the drawings and specifications with information furnished by the Owner pursuant to subsection 4.1.3, relevant field measurements made by the Trade Contractor and any visible conditions at the Worksite affecting the Trade Contract Work.

3.3.2 If in the course of the performance of the obligations in subsection 3.3.1 the Trade Contractor discovers any errors, omissions or inconsistencies in the Contract Documents, the Trade Contractor shall promptly report them to the Owner and Construction Manager. It is recognized, however, that the Trade Contractor is not acting in the capacity of a licensed design professional, and that the Trade Contractor's examination is to facilitate construction and does not create an affirmative responsibility to detect errors, omissions or inconsistencies or to ascertain compliance with applicable laws, building codes or regulations. Following receipt of written notice from the Trade Contractor of defects, the Owner shall promptly inform the Trade Contractor what action, if any, the Trade Contractor shall take with regard to the defects.

3.3.3 The Trade Contractor shall have no liability for errors, omissions or inconsistencies discovered under subsections 3.3.1 and 3.3.2 unless the Trade Contractor fails to report a recognized problem to the Owner and Construction Manager.

3.3.4 The Trade Contractor may be entitled to additional costs or time if there are changes in the scope of the Trade Contract Work that increase the cost of the Work or increase the number of days required to perform the Work, respectively, because of clarifications or instructions arising out of the Trade Contractor's reports described in the three preceding Subsections.

### 3.4 CONSTRUCTION PERSONNEL AND SUPERVISION

3.4.1 The Trade Contractor shall provide competent supervision for the performance of the Trade Contract Work. Before commencing the Trade Contract Work, Trade Contractor shall notify Owner and Construction Manager in writing of the name and qualifications of its proposed superintendent(s) and project manager so Owner and Construction Manager may review the individual's qualifications. If, for reasonable cause, the Owner or Construction Manager refuses to approve the individual, or withdraws its approval after once giving it, Trade Contractor shall name a different superintendent or project manager for Owner's and Construction Manager's review. Any disapproved superintendent shall not perform in that capacity thereafter at the Worksite.

3.4.2 The Trade Contractor shall be responsible to the Owner for acts or omissions of parties or entities performing portions of the Trade Contract Work for or on behalf of the Trade Contractor or any of its Subcontractors.

3.4.3 The Trade Contractor shall permit only qualified persons to perform the Trade Contract Work. The



Trade Contractor shall enforce safety procedures, strict discipline and good order among persons performing the Trade Contract Work. If the Owner or Construction Manager determines that a particular person does not follow safety procedures, or is unfit or unskilled for the assigned work, the Trade Contractor shall immediately reassign the person on receipt of the Owner's or Construction Manager's written notice to do so.

3.4.4 TRADE CONTRACTOR'S REPRESENTATIVE The Trade Contractor's authorized representative is . The Trade Contractor's representative shall possess full authority to receive instructions from the Owner and to act on those instructions. The Trade Contractor shall notify the Owner and the Construction Manager in writing of a change in the designation of the Trade Contractor's representative. The Trade Contractor's representative is also authorized to bind the Trade Contractor in all matters relating to this Agreement including, without limitation, all matters requiring the Trade Contractor's approval, authorization, or written notice. The Trade Contractor's representative is also authorized to resolve disputes in accordance with Section 12.2 of this Agreement.

### 3.5 MATERIALS FURNISHED BY THE OWNER OR OTHERS

3.5.1 In the event the Trade Contract Work includes installation of materials or equipment furnished by the Owner or Others, it shall be the responsibility of the Trade Contractor to examine the items so provided and thereupon handle, store and install the items, unless otherwise provided in the Trade Contract Documents, with such skill and care as to provide a satisfactory and proper installation. Loss or damage due to acts or omissions of the Trade Contractor shall be the responsibility of the Trade Contractor and may be deducted from any amounts due or to become due the Trade Contractor. Any defects discovered in such materials or equipment shall be reported at once to the Owner and Construction Manager. Following receipt of written notice from the Trade Contractor of defects, the Owner shall promptly inform the Trade Contractor what action, if any, the Trade Contractor shall take with regard to the defects.

### 3.6 TESTS AND INSPECTIONS

3.6.1 The Trade Contractor shall schedule all required tests, approvals and inspections of the Trade Contract Work or portions thereof at appropriate times so as not to delay the progress of the Trade Contract Work or other work related to the Project. The Trade Contractor shall give proper notice to the Construction Manager and to all required parties of such tests, approvals and inspections. If feasible, the Owner and Others may timely observe the tests at the normal place of testing. Except as provided in subsection 3.6.3, the Owner shall bear all expenses associated with tests, inspections and approvals required by the Trade Contract Documents, which, unless otherwise agreed to, shall be conducted by an independent testing laboratory or entity retained by the Owner. Unless otherwise required by the Trade Contract Documents, required certificates of testing, approval or inspection shall be secured by the Trade Contractor and promptly delivered to the Owner and Construction Manager.

3.6.2 If the Owner, Construction Manager or appropriate authorities determine that tests, inspections or approvals in addition to those required by the Trade Contract Documents will be necessary, the Trade Contractor shall arrange for the procedures and give timely notice to the Owner, Construction Manager and Others who may observe the procedures. Costs of the additional tests, inspections or approvals are at the Owner's expense except as provided in subsection 3.6.3.

3.6.3 If the procedures described in subsections 3.6.1 and 3.6.2 indicate that portions of the Trade Contract Work fail to comply with the Trade Contract Documents, the Trade Contractor shall be responsible for costs of correction and retesting.

### 3.7 WARRANTY



3.7.1 The Trade Contract Work shall be executed in accordance with the Trade Contract Documents in a workmanlike manner. The Trade Contractor warrants that all materials and equipment shall be furnished in sufficient quantities to facilitate the proper and expeditious execution of the Trade Contract Work and shall be new unless otherwise specified, of good quality, in conformance with the Trade Contract Documents, and free from defective workmanship and materials. At the Owner's or Construction Manager's request, the Trade Contractor shall furnish satisfactory evidence of the quality and type of materials and equipment furnished. The Trade Contractor further warrants that the Trade Contract Work shall be free from material defects not intrinsic in the design or materials required in the Trade Contract Documents. The Trade Contractor's warranty does not include remedies for defects or damages caused by normal wear and tear during normal usage, use for a purpose for which the Project was not intended, improper or insufficient maintenance, modifications performed by the Owner or Others, or abuse. The Trade Contractor's warranty pursuant to this section shall commence on the Date of Substantial Completion.

3.7.2 The Trade Contractor shall obtain from its Subcontractors and material suppliers any special or extended warranties required by the Trade Contract Documents. All such warranties shall be listed in an attached Exhibit to this Agreement.

### 3.8 CORRECTION OF TRADE CONTRACT WORK WITHIN ONE YEAR

3.8.1 If, prior to Substantial Completion and within one year after the date of Substantial Completion of the Trade Contract Work, any Defective Work is found, the Owner shall promptly notify the Trade Contractor in writing. Unless the Owner provides written acceptance of the condition, the Trade Contractor shall promptly correct the Defective Work at its own cost and time and bear the expense of additional services required for correction of any Defective Work for which it is responsible. If within the one-year correction period the Owner discovers and does not promptly notify the Trade Contractor or give the Trade Contractor an opportunity to test or correct Defective Work as reasonably requested by the Trade Contractor, the Owner waives the Trade Contractor's obligation to correct that Defective Work as well as the Owner's right to claim a breach of the warranty with respect to that Defective Work.

3.8.2 With respect to any portion of Trade Contract Work first performed after Substantial Completion, the one-year correction period shall be extended by the period of time between Substantial Completion and the actual performance of the later Trade Contract Work. Correction periods shall not be extended by corrective work performed by the Trade Contractor.

3.8.3 If the Trade Contractor fails to correct Defective Work within a reasonable time after receipt of written notice from the Owner prior to final payment, the Owner may correct it in accordance with the Owner's right to carry out the Trade Contract Work in section 11.2. In such case, an appropriate Trade Contract Change Order shall be issued deducting the cost of correcting such deficiencies from payments then or thereafter due the Trade Contractor. If payments then or thereafter due Trade Contractor are not sufficient to cover such amounts, the Trade Contractor shall pay the difference to the Owner.

3.8.4 If after the one-year correction period but before the applicable limitation period the Owner discovers any Defective Work, the Owner shall, unless the Defective Work requires emergency correction, promptly notify the Trade Contractor. If the Trade Contractor elects to correct the Defective Work, it shall provide written notice of such intent within fourteen (14) Days of its receipt of notice from the Owner. The Trade Contractor shall complete the correction of Defective Work within a time frame mutually agreed upon by the Trade Contractor and the Owner. If the Trade Contractor does not elect to correct the Defective Work, the Owner may have the Defective Work corrected by itself or Others and charge the Trade Contractor for the reasonable cost of the correction and other directly related



expenses. Owner shall provide Trade Contractor with an accounting of correction costs it incurs.

3.8.5 If the Trade Contractor's correction or removal of Defective Work causes damage to or destroys other completed or partially completed Work or existing buildings, the Trade Contractor shall be responsible for the cost of correcting the destroyed or damaged property.

3.8.6 The one-year period for correction of Defective Work does not constitute a limitation period with respect to the enforcement of the Trade Contractor's other obligations under the Trade Contract Documents.

3.8.7 Prior to final payment, at the Owner's option and with the Trade Contractor's agreement, the Owner may elect to accept Defective Work rather than require its removal and correction. In such case the Contract Price shall be equitably adjusted for any diminution in the value of the Project caused by such Defective Work. Before the Owner accepts any such change it must be documented in writing with a Change Order signed by both the Trade Contractor and Owner.

### 3.9 CORRECTION OF COVERED TRADE CONTRACT WORK

3.9.1 On request of the Owner or Construction Manager, Trade Contract Work that has been covered without a requirement that it be inspected prior to being covered may be uncovered for the Owner's or Construction Manager's inspection. The Owner shall pay for the costs of uncovering and replacement if the Work proves to be in conformance with the Trade Contract Documents, or if the defective condition was caused by the Owner or Others. If the uncovered Trade Contract Work proves to be defective, the Trade Contractor shall pay the costs of uncovering and replacement.

3.9.2 If contrary to specific requirements in the Trade Contract Documents or contrary to a specific request from the Owner or Construction Manager, a portion of the Trade Contract Work is covered, the Owner or Construction Manager, by written request, may require the Trade Contractor to uncover the Trade Contract Work for the Owner's or Construction Manager's observation. In this circumstance the Trade Contract Work shall be uncovered and recovered at the Trade Contractor's expense and with no adjustment to the Trade Contract Time. Costs incurred by the Owner as a direct result of the above shall be deducted from the Trade Contract Price.

### 3.10 SAFETY OF PERSONS AND PROPERTY

3.10.1 SAFETY PRECAUTIONS AND PROGRAMS The Trade Contractor shall have overall responsibility for safety precautions and programs in the performance of the Trade Contract Work. While this section establishes the responsibility for safety between the Owner and Trade Contractor, it does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with the provisions of applicable laws and regulations.

3.10.2 The Trade Contractor shall seek to avoid injury, loss or damage to persons or property by taking reasonable steps to protect:

3.10.2.1 its employees and other persons at the Worksite;

3.10.2.2 materials and equipment stored at on-site or off-site locations for use in the Trade Contract Work; and

3.10.2.3 property located at the site and adjacent to Trade Contract Work areas, whether or not the property is part of the Trade Contract Work.

3.10.3 TRADE CONTRACTOR'S SAFETY REPRESENTATIVE The Trade Contractor's Worksite Safety Representative is who shall act as the Trade Contractor's authorized safety representative with a duty



to prevent accidents in accordance with subsection 3.10.2 If no individual is identified in this section, the authorized safety representative shall be the Trade Contractor's Representative. The Trade Contractor shall report immediately in writing to the Owner and Construction Manager all recordable accidents and injuries occurring at the Worksite. When the Trade Contractor is required to file an accident report with a public authority, the Trade Contractor shall furnish a copy of the report to the Owner and Construction Manager.

3.10.4 The Trade Contractor shall provide the Owner and Construction Manager with copies of all notices required of the Trade Contractor by law or regulation. The Trade Contractor's safety program shall comply with the requirements of governmental and quasi-governmental authorities having jurisdiction.

3.10.5 Damage or loss not insured under property insurance which may arise from the Trade Contract Work, to the extent caused by the negligent acts or omissions of the Trade Contractor, or anyone for whose acts the Trade Contractor may be liable, shall be promptly remedied by the Trade Contractor.

3.10.6 If the Owner or Construction Manager deems any part of the Trade Contract Work or Worksite unsafe, the Owner or Construction Manager, without assuming responsibility for the Trade Contractor's safety program, may require the Trade Contractor to stop performance of the Trade Contract Work or take corrective measures satisfactory to the Owner, or both. If the Trade Contractor does not adopt corrective measures, the Owner may perform them and deduct their cost from the Trade Contract Price. The Trade Contractor agrees to make no claim for damages, for an increase in the Trade Contract Price or for a change in the Trade Contract Time based on the Trade Contractor's compliance with the Owner's or Construction Manager's reasonable request.

### 3.11 EMERGENCIES

3.11.1 In an emergency, the Trade Contractor shall act in a reasonable manner to prevent personal injury or property damage. Any change in the Trade Contract Price or Trade Contract Time resulting from the actions of the Trade Contractor in an emergency situation shall be determined as provided in ARTICLE 8.

### 3.12 HAZARDOUS MATERIALS

3.12.1 The Trade Contractor shall not be obligated to commence or continue Trade Contract Work until any Hazardous Material discovered at the Worksite has been removed, rendered or determined to be harmless by the Owner as certified by an independent testing laboratory and approved by the appropriate government agency.

3.12.2 If after the commencement of the Trade Contract Work a Hazardous Material is discovered at the Worksite, the Trade Contractor shall be entitled to immediately stop Trade Contract Work in the affected area. The Trade Contractor shall report the condition to the Owner, the Construction Manager, and, if required, the government agency with jurisdiction.

3.12.3 The Trade Contractor shall not be required to perform any Trade Contract Work relating to or in the area of Hazardous Material without written mutual agreement.

3.12.4 The Owner shall be responsible for retaining an independent testing laboratory to determine the nature of the Hazardous Material encountered and whether the material requires corrective measures or remedial action. Such measures shall be the sole responsibility of the Owner, and shall be performed in a manner minimizing any adverse effects upon the Trade Contract Work. The Trade Contractor shall resume Trade Contract Work in the area affected by any Hazardous Material only upon written agreement between the Parties after the Hazardous Material has been removed or rendered harmless



and only after approval, if necessary, of the governmental agency with jurisdiction.

3.12.5 If the Trade Contractor incurs additional costs or is delayed due to the presence or remediation of Hazardous Material, the Trade Contractor shall be entitled to an equitable adjustment in the Trade Contract Price or the Trade Contract Time.

3.12.6 To the extent not caused by the negligent acts or omissions of the Trade Contractor, its Subcontractors and Sub-subcontractors, and the agents, officers, directors and employees of each of them, the Owner shall defend, indemnify and hold harmless the Trade Contractor, its Subcontractors and Sub-subcontractors, and the agents, officers, directors and employees of each of them, from and against any and all direct claims, damages, losses, costs and expenses, including but not limited to attorney's fees, costs and expenses incurred in connection with any dispute resolution process, to the extent permitted pursuant to section 6.6, arising out of or relating to the performance of the Trade Contract Work in any area affected by Hazardous Material. To the extent portions of this paragraph are in conflict with SF 396 (codified at Iowa Code Section 537A.5) said portions are void and unenforceable.

### 3.12.7 MATERIALS BROUGHT TO THE WORKSITE

3.12.7.1 Material Safety Data (MSD) sheets as required by law and pertaining to materials or substances used or consumed in the performance of the Trade Contract Work, whether obtained by the Trade Contractor, Subcontractors, the Owner or Others, shall be maintained at the Worksite by the Trade Contractor and made available to the Owner, Construction Manager, Subcontractors and Others.

3.12.7.2 The Trade Contractor shall be responsible for the proper delivery, handling, application, storage, removal and disposal of all materials and substances brought to the Worksite by the Trade Contractor in accordance with the Trade Contract Documents and used or consumed in the performance of the Trade Contract Work.

3.12.7.3 The Trade Contractor shall indemnify and hold harmless the Owner, Construction Manager, their agents, officers, directors and employees, from and against any and all claims, damages, losses, costs and expenses, including but not limited to attorney's fees, costs and expenses incurred in connection with any dispute resolution procedure, arising out of or relating to the delivery, handling, application, storage, removal and disposal of all materials and substances brought to the Worksite by the Trade Contractor in accordance or not in accordance with the Trade Contract Documents. To the extent portions of this paragraph are in conflict with SF 396 (codified at Iowa Code Section 537A.5) said portions are void and unenforceable.

3.12.8 The terms of this section shall survive the completion of the Trade Work or any termination of this Agreement.

### 3.13 SUBMITTALS

3.13.1 The Trade Contractor shall submit to the Construction Manager, and the Design Professional, for review and approval all shop drawings, samples, product data and similar submittals required by the Trade Contract Documents. Submittals may be submitted in electronic form if required in accordance with ConsensusDocs 200.2 and subsection 4.4.1. The Trade Contractor shall be responsible to the Owner for the accuracy and conformity of its submittals to the Trade Contract Documents. The Trade Contractor shall prepare and deliver its submittals in a manner consistent with the Construction Schedule and in such time and sequence so as not to delay the performance of the Trade Contract Work or the work of the Owner and Others. When the Trade Contractor delivers its submittals the Trade Contractor shall identify in writing for each submittal all changes, deviations or substitutions from the requirements of the Trade Contract Documents. The review and approval of any Trade Contractor



submittal shall not be deemed to authorize changes, deviations or substitutions from the requirements of the Trade Contract Documents unless express written approval is obtained from the Owner specifically authorizing such deviation, substitution or change. To the extent a change, deviation or substitution causes an impact to the Contract Price or Contract Time, such approval shall be promptly memorialized in a Change Order. Further, the Construction Manager and Design Professional shall not make any change, deviation or substitution through the submittal process without specifically identifying and authorizing such deviation to the Trade Contractor. In the event that the Trade Contract Documents do not contain submittal requirements pertaining to the Trade Contract Work, the Trade Contractor agrees upon request to submit in a timely fashion to the Construction Manager and the Design Professional for review and approval any shop drawings, samples, product data, manufacturers' literature or similar submittals as may reasonably be required by the Owner, Construction Manager, or Design Professional.

3.13.2 The Owner shall be responsible for review and approval of submittals with reasonable promptness to avoid causing delay.

3.13.3 The Trade Contractor shall perform all Trade Contract Work strictly in accordance with approved submittals. Approval of shop drawings is not authorization to Trade Contractor to perform Changed Work, unless the procedures of ARTICLE 8 are followed. Approval does not relieve the Trade Contractor from responsibility for Defective Work resulting from errors or omissions of any kind on the approved Shop Drawings.

3.13.4 Record copies of the following, incorporating field changes and selections made during construction, shall be maintained by the Trade Contractor at the Project site and available to the Owner upon request: drawings, specifications, addenda, Trade Contract Change Order and other modifications, and required submittals including product data, samples and shop drawings.

3.13.5 No substitutions shall be made in the Trade Contract Work unless permitted in the Trade Contract Documents and then only after the Trade Contractor obtains approvals required under the Trade Contract Documents for substitutions. All such substitutions shall be promptly memorialized in a Change Order no later than seven (7) Days following approval by the Owner and, if applicable, provide for an adjustment in the Contract Price or Contract Time.

3.13.6 The Trade Contractor shall prepare and submit to the Construction Manager for submission to the Owner

(Check one only)

- final marked up as-built drawings
- updated electronic data, in accordance with ConsensusDocs 200.2 and section 4.4.1
- such documentation as defined by the Parties by attachment to this Agreement,

in general documenting how the various elements of the Trade Contract Work were actually constructed or installed.

### 3.14 PROFESSIONAL SERVICES

3.14.1 The Trade Contractor may be required to procure professional services in order to carry out its responsibilities for construction means, methods, techniques, sequences and procedures for such services specifically called for by the Contract Documents. The Trade Contractor shall obtain these professional services and any design certifications required from State of Iowa licensed design professionals. All drawings, specifications, calculations, certifications and submittals prepared by such



design professionals shall bear the signature and seal of such design professionals and the Owner and the Design Professional shall be entitled to rely upon the adequacy, accuracy and completeness of such design services. If professional services are specifically required by the Contract Documents, the Owner shall indicate all required performance and design criteria. The Trade Contractor shall not be responsible for the adequacy of such performance and design criteria. The Trade Contractor shall not be required to provide such services in violation of existing laws, rules and regulations in the jurisdiction where the Project is located.

### 3.15 WORKSITE CONDITIONS

3.15.1 WORKSITE VISIT The Trade Contractor acknowledges that it has visited, or has had the opportunity to visit, the Worksite to visually inspect the general and local conditions which could affect the Trade Contract Work.

3.15.2 CONCEALED OR UNKNOWN SITE CONDITIONS If the conditions at the Worksite are (a) subsurface or other concealed physical conditions which are materially different from those indicated in the Trade Contract Documents, or (b) unusual and unknown physical conditions which are materially different from conditions ordinarily encountered and generally recognized as inherent in Trade Contract Work provided for in the Trade Contract Documents, the Trade Contractor shall stop Trade Contract Work and give immediate written notice of the condition to the Owner, Construction Manager and the Design Professional. The Trade Contractor shall not be required to perform any work relating to the unknown condition without the written mutual agreement of the Parties. Any change in the Contract Price or the Contract Time as a result of the unknown condition shall be determined as provided in this article. The Trade Contractor shall provide the Owner and the Construction Manager with written notice of any claim as a result of unknown conditions within the time period set forth in section 8.4.

### 3.16 PERMITS AND TAXES

3.16.1 Trade Contractor shall give public authorities all notices required by law and, except for permits and fees which are the responsibility of the Owner pursuant to section 4.2, shall obtain and pay for all necessary permits, licenses and renewals pertaining to the Trade Contract Work. Trade Contractor shall provide to Owner copies of all notices, permits, licenses and renewals required under this Agreement.

3.16.2 Trade Contractor shall pay all applicable taxes legally enacted when bids are received or negotiations concluded for the Trade Contract Work provided by the Trade Contractor.

3.16.3 The Contract Price or Contract Time shall be equitably adjusted by Trade Contract Change Order for additional costs resulting from any changes in laws, ordinances, rules and regulations enacted after the date of this Agreement, including increased taxes.

3.16.3 (Deleted)

### 3.17 CUTTING, FITTING AND PATCHING

3.17.1 The Trade Contractor shall perform cutting, fitting and patching necessary to coordinate the various parts of the Trade Contract Work and to prepare its Trade Contract Work for the work of the Owner or Others.

3.17.2 Cutting, patching or altering the work of the Owner or Others shall be done with the prior written approval of the Owner. Such approval shall not be unreasonably withheld.

### 3.18 CLEANING UP

3.18.1 The Trade Contractor shall regularly remove debris and waste materials at the Worksite resulting



from the Trade Contract Work. Prior to discontinuing Trade Contract Work in an area, the Trade Contractor shall clean the area and remove all rubbish and its construction equipment, tools, machinery, waste and surplus materials. The Trade Contractor shall minimize and confine dust and debris resulting from construction activities. At the completion of the Trade Contract Work, the Trade Contractor shall remove from the Worksite all construction equipment, tools, surplus materials, waste materials and debris.

3.18.2 If the Trade Contractor fails to commence compliance with cleanup duties within two (2) business Days after written notification from the Owner or the Construction Manager of noncompliance, the Owner may implement appropriate cleanup measures without further notice and the cost shall be deducted from any amounts due or to become due the Trade Contractor in the next payment period.

3.19 ACCESS TO TRADE CONTRACT WORK The Trade Contractor shall facilitate the access of the Owner, Construction Manager, Design Professional and Others to Trade Contract Work in progress.

3.20 COST MONITORING The Trade Contractor shall provide the Construction Manager with cost monitoring information appropriate for the manner of Trade Contractor's compensation, to enable the Construction Manager to develop and track construction and project budgets, including amounts for work in progress, uncompleted work and proposed changes.

3.21 ROYALTIES, PATENTS AND COPYRIGHTS The Trade Contractor shall pay all royalties and license fees which may be due on the inclusion of any patented or copyrighted materials, methods or systems selected by the Trade Contractor and incorporated in the Trade Contract Work. The Trade Contractor shall defend, indemnify and hold the Owner harmless from all suits or claims for infringement of any patent rights or copyrights arising out of such selection. The Owner agrees to indemnify and hold the Trade Contractor harmless from any suits or claims of infringement of any patent rights or copyrights arising out of any patented or copyrighted materials, methods or systems specified by the Owner, Construction Manager and Design Professional. To the extent portions of this paragraph are in conflict with SF 396 (codified at Iowa Code Section 537A.5) said portions are void and unenforceable.

3.22 CONFIDENTIALITY The Owner shall treat as confidential information all of the Trade Contractor's estimating systems and historical and parameter cost data that may be disclosed to the Owner in connection with the performance of this Agreement if they are specified and marked as confidential and shall mark them. If a document is not marked as "Confidential" it will not be treated as such. Nothing contained herein, however, shall be interpreted in a manner that modifies or is in conflict with the purpose and application of the open records laws contained in the Code of Iowa.

## ARTICLE 4 OWNER'S RESPONSIBILITIES

### 4.1 INFORMATION SERVICES

4.1.1 FULL INFORMATION Any information or services to be provided by the Owner shall be provided in a timely manner so as not to delay the Trade Contract Work.

4.1.2 FINANCIAL INFORMATION Upon the written request of the Trade Contractor, the Owner shall provide the Trade Contractor with evidence of Project financing. If requested in writing, evidence of such financing shall be a condition precedent to the Trade Contractor's commencing or continuing the Trade Contract Work. The Trade Contractor shall be notified by the Owner prior to any material change in Project financing.

4.1.3 WORKSITE INFORMATION Except to the extent that the Trade Contractor knows of any inaccuracy, the Trade Contractor is entitled to rely on Worksite information furnished by the Owner pursuant to this subsection. To the extent the Owner has obtained, or is required elsewhere in the



Trade Contract Documents to obtain, the following Worksite information, the Owner shall provide at the Owner's expense and with reasonable promptness:

4.1.3.1 information describing the physical characteristics of the site, including surveys, site evaluations, legal descriptions, data or drawings depicting existing conditions, subsurface conditions and environmental studies, reports and investigations;

4.1.3.2 tests, inspections and other reports dealing with environmental matters, Hazardous Material and other existing conditions, including structural, mechanical and chemical tests, required by the Trade Contract Documents or by law; and

4.1.3.3 any other information or services requested in writing by the Trade Contractor which are relevant to the Trade Contractor's performance of the Trade Contract Work and under the Owner's control. The information required by subsection 4.1.3 shall be provided in reasonable detail. Legal descriptions shall include easements, title restrictions, boundaries, and zoning restrictions. Worksite descriptions shall include existing buildings and other construction and all other pertinent site conditions. Adjacent property descriptions shall include structures, streets, sidewalks, alleys, and other features relevant to the Trade Contract Work. Utility details shall include available services, lines at the Worksite and adjacent and connection points. The information shall include public and private information, subsurface information, grades, contours, and elevations, drainage data, exact locations and dimensions, and benchmarks that can be used by the Trade Contractor in laying out the Trade Contract Work. The Trade Contractor shall in writing request from the Owner any information identified in Paragraph 4.1.3 that the Trade Contractor believes the Owner has obtained but has not provided to the Trade Contractor.

4.1.3.4 OWNER'S REPRESENTATIVE The Owner's representative is test. The Owner's representative shall have authority to bind the Owner in all matters relating to this Agreement including, without limitation, all matters requiring the Owner's approval, authorization or written notice. If the Owner changes its representative as listed above, the Owner shall notify the Trade Contractor in advance in writing. The Owner's Representative is also authorized to resolve disputes in accordance with Section 12.2 of this Agreement. The Construction Manager, while unauthorized to modify the Agreement or settle a dispute without the Owner's approval, however, does have the requisite authority to act as the Owner's agent throughout the construction of the Project in accordance with the contract between the Owner and the Construction Manager (ConsensusDOCS 801 as modified by the State of Iowa).

4.2 BUILDING PERMIT, FEES AND APPROVALS Except for those permits and fees related to the Trade Contract Work which are the responsibility of the Trade Contractor pursuant to subsection 3.16.1, the Owner shall secure and pay for all other permits, approvals, easements, assessments and fees required for the development, construction, use or occupancy of permanent structures or for permanent changes in existing facilities, including the building permit.

4.3 Deleted

4.4 TRADE CONTRACT DOCUMENTS Unless otherwise specified, Owner shall provide One (1) copies of the Trade Contract Documents to the Trade Contractor without cost. Additional copies will be provided to the Trade Contractor at cost. This paragraph is not intended to be in conflict with Iowa Code Section 26.3 requirement that a sufficient number of copies of the contract documents be made available to bidders without charge (but a deposit not to exceed \$250 per set may be required). If the Trade Contractor was required to make a deposit for a set of Trade Contract Documents for purposes of bidding then the Trade Contractor may elect to have the deposit returned instead of being provided with an additional copy.



4.4.1 DIGITIZED DOCUMENTS If the Owner requires that the Owner, Design Professional, Construction Manager and Trade Contractor exchange documents and data in electronic or digital form, prior to any such exchange, the Owner, Design Professional, Construction Manager and Trade Contractor shall agree on a written protocol governing all exchanges in ConsensusDocs 200.2 or a separate Agreement, which, at a minimum, shall specify: (a) the definition of documents and data to be accepted in electronic or digital form or to be transmitted electronically or digitally; (b) management and coordination responsibilities; (c) necessary equipment, software and services; (d) acceptable formats, transmission methods and verification procedures; (e) methods for maintaining version control; (f) privacy and security requirements; and (g) storage and retrieval requirements. Except as otherwise agreed to by the Parties in writing, the Parties shall each bear their own costs as identified in the protocol. In the absence of a written protocol, use of documents and data in electronic or digital form shall be at the sole risk of the recipient.

4.5 OWNER'S CUTTING AND PATCHING Cutting, patching or altering the Trade Contract Work by the Owner or Others shall be done with the prior written approval of the Trade Contractor, which approval shall not be unreasonably withheld.

4.6 OWNER'S RIGHT TO CLEAN UP In case of a dispute between the Trade Contractor and Others with regard to respective responsibilities for cleaning up at the Worksite, the Owner may implement appropriate cleanup measures after two (2) business Days' notice and allocate the cost among those responsible during the following pay period.

4.7 COST OF CORRECTING DAMAGED OR DESTROYED WORK With regard to damage or loss attributable to the acts or omissions of the Owner or Others and not to the Trade Contractor, the Owner may either (a) promptly remedy the damage or loss or (b) accept the damage or loss. If the Trade Contractor incurs additional costs or is delayed due to such loss or damage, the Trade Contractor shall be entitled to an equitable adjustment in the Trade Contract Price or Trade Contract Time.

## ARTICLE 5 SUBCONTRACTS

5.1 SUBCONTRACTORS The Trade Contract Work not performed by the Trade Contractor with its own forces shall be performed by Subcontractors.

### 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE TRADE CONTRACT WORK

5.2.0 The Trade Contractor must identify all Subcontractors and suppliers within 48 hours of the published date and time for which bids must be submitted, in accordance with Iowa Code Section 8A.311, as amended by House File 646 in 2011. Subcontractors and suppliers may not be changed without the approval of the Owner. Requests for changing a Subcontractor or supplier must identify the reason for the proposed change, the name of the new Subcontractor or supplier, and the change in the subcontractor or supplier price as a result of the change. Any reduction in subcontractor or supplier price as a result of the change, if the change is approved by the Owner, shall be deducted from the Trade Contract Price via a deductive Change Order. Any such changes, if approved by the Owner, which result in an increase in the Trade Contract Price shall be borne by the Trade Contractor.

5.2.1 If the Owner has a reasonable objection to any proposed subcontractor or material supplier, the Owner shall notify the Trade Contractor in writing.

5.2.2 If the Owner has reasonably and promptly objected as provided in subsection 5.2.1, the Trade Contractor shall not contract with the proposed subcontractor or material supplier, and the Trade Contractor shall propose another Subcontractor acceptable to the Owner. To the extent the substitution results in an increase or decrease in the Trade Contract Price or Trade Contract Time, an appropriate



Trade Contract Change Order shall be issued as provided in ARTICLE 8.

5.3 BINDING OF SUBCONTRACTORS The Trade Contractor agrees to bind every Subcontractor (and require every Subcontractor to so bind its subcontractors) to all the provisions of this Agreement and the Trade Contract Documents as they apply to the Subcontractor's portion of the Trade Contract Work.

5.4 Deleted

#### 5.5 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

5.5.1 If this Agreement is terminated, each subcontract agreement shall be assigned by the Trade Contractor to the Owner, subject to the prior rights of any surety, provided that:

5.5.1.1 this Agreement is terminated by the Owner pursuant to sections 11.3 or 11.4; and

5.5.1.2 the Owner accepts such assignment after termination by notifying the Subcontractor and Trade Contractor in writing, and assumes all rights and obligations of the Contractor pursuant to each subcontract agreement.

5.5.2 If the Owner accepts such an assignment, and the Work has been suspended for more than thirty (30) consecutive Days, following termination, if appropriate, the Subcontractor's compensation shall be equitably adjusted as a result of the suspension.

### ARTICLE 6 TRADE CONTRACT TIME

#### 6.1 PERFORMANCE OF THE TRADE CONTRACT WORK

6.1.1 DATE OF COMMENCEMENT The Date of Commencement is the date of Owner's written notice to proceed unless otherwise set forth below:

6.1.2 TIME Substantial Completion of the Trade Contract Work shall be achieved in xxx (xx) Days from the Date of Commencement. Unless otherwise specified in the Certificate of Substantial Completion, the Trade Contractor shall achieve Final Completion within 30 Days after the date of Substantial Completion, subject to adjustments as provided for in the Trade Contract Documents.

6.1.3 Time limits stated above are of the essence of this Agreement.

6.1.4 Unless instructed by the Owner in writing, the Trade Contractor shall not knowingly commence the Trade Contract Work before the effective date of insurance to be provided by the Trade Contractor and Owner as required by the Trade Contract Documents.

6.2 CONSTRUCTION SCHEDULE Prior to the commencement of the construction of the Trade Contract Work, the Trade Contractor shall submit a copy of its critical path method (CPM) construction schedule showing the completion of the Trade Contract Work within the allowable number of days identified above. The Trade Contractor shall regularly update its CPM construction schedule for the Trade Contract Work and promptly furnish the Construction Manager on an ongoing basis scheduling information requested by the Construction Manager for the Trade Contract Work. In consultation with the Trade Contractor, the Construction Manager shall incorporate the Trade Contract Work and work of other trade contractors into an overall Construction Schedule for the entire Project. The Trade Contractor shall be bound by the Construction. Nothing in this Trade Contractor Agreement shall relieve the Trade Contractor of any liability for any unexcused failure to comply with its original schedule, the Construction Schedule, or any completion dates. The Construction Manager shall have the right to coordinate the Trade Contractors, including the right, if necessary, to change the time, order and priority in which the various portions of the Trade Contract Work and the other work associated with the Project shall be performed.



### 6.3 DELAYS AND EXTENSIONS OF TIME

6.3.1 If the Trade Contractor is delayed at any time in the commencement or progress of the Work by any cause beyond the control of the Trade Contractor, the Trade Contractor shall be entitled to an equitable extension of the Trade Contract Time if the Trade Contractor is able to show that the critical path of the Trade Contract Work was delayed by causes beyond the control of the Trade Contractor. Examples of causes beyond the control of the Trade Contractor include, but are not limited to, the following: acts or omissions of the Owner, the Design Professional, Construction Manager or Others; changes in the Work or the sequencing of the Work ordered by the Owner, or arising from decisions of the Owner that impact the time of performance of the Work; transportation delays not reasonably foreseeable; labor disputes not involving the Trade Contractor; general labor disputes impacting the Project but not specifically related to the Worksite; fire; terrorism, epidemics, adverse governmental actions, unavoidable accidents or circumstances; adverse weather conditions not reasonably anticipated; encountering Hazardous Materials; concealed or unknown conditions; delay authorized by the Owner pending dispute resolution; and suspension by the Owner under section 11.1. The Trade Contractor shall submit any requests for equitable extensions of Contract Time in accordance with the provisions of ARTICLE 8.

6.3.2 In addition, if the Trade Contractor is able to show that it incurred additional costs because the critical path of the Trade Contract Work was delayed by acts or omissions of the Owner, the Design Professional, Construction Manager or Others, changes in the Work or the sequencing of the Work ordered by the Owner, or arising from decisions of the Owner that impact the time of performance of the Work, encountering Hazardous Materials, or concealed or unknown conditions, delay authorized by the Owner pending dispute resolution or suspension by the Owner under section 11.1, then the Trade Contractor shall be entitled to an equitable adjustment in the Trade Contract Price subject to section 6.6.

6.3.3 NOTICE OF DELAYS In the event delays to the Trade Contract Work are encountered for any reason, the Trade Contractor shall provide prompt written notice to the Owner and the Construction Manager of the cause of such delays after Trade Contractor first recognizes the delay. The Owner and Trade Contractor agree to undertake reasonable steps to mitigate the effect of such delays.

6.4 NOTICE OF DELAY CLAIMS If the Trade Contractor believes it is due an equitable extension of Trade Contract Time or an equitable adjustment in Trade Contract Price as a result of a delay described in subsection 6.3.1, the Trade Contractor shall give the Owner and the Construction Manager written notice of the claim in accordance with section 8.4. If the Trade Contractor causes delay in the completion of the Trade Contract Work, the Owner shall be entitled to recover its additional costs subject to subsection 6.6. The Owner shall process any such claim against the Trade Contractor in accordance with ARTICLE 8.

### 6.5 LIQUIDATED DAMAGES

6.5.1 SUBSTANTIAL COMPLETION The Owner and the Trade Contractor agree that this Agreement  shall /  shall not (indicate one) provide for the imposition of liquidated damages based on the Date of Substantial Completion.

6.5.1.1 The Trade Contractor understands that if the Date of Substantial Completion established by this Agreement, as may be amended by subsequent Trade Change Order, is not attained, the Owner will suffer damages which are difficult to determine and accurately specify. The Trade Contractor agrees that if the Date of Substantial Completion is not attained the Trade Contractor shall pay the Owner Zero Dollars and No Cents (\$0.00) as liquidated damages and not as a penalty for each day that Substantial Completion extends beyond the Date of Substantial Completion. The liquidated damages provided herein shall be in lieu of all liability for any and all



extra costs, losses, expenses, claims, penalties and any other damages of whatsoever nature incurred by the Owner which are occasioned by any delay in achieving the Date of Substantial Completion.

6.5.2 FINAL COMPLETION The Owner and the Trade Contractor agree that this Agreement  shall /  shall not (indicate one) provide for the imposition of liquidated damages based on the Date of Final Completion.

6.5.2.1 The Trade Contractor understands that if the Date of Final Completion established by this Agreement, as may be amended by subsequent Trade Change Order is not attained, the Owner will suffer damages which are difficult to determine and accurately specify. The Trade Contractor agrees that if the Date of Final Completion is not attained the Trade Contractor shall pay the Owner Zero Dollars and No Cents (\$0.00) as liquidated damages and not as a penalty for each day that Final Completion extends beyond the Date of Final Completion. The liquidated damages provided herein shall be in lieu of all liability for any and all extra costs, losses, expenses, claims, penalties and any other damages of whatsoever nature incurred by the Owner which are occasioned by any delay in achieving the Date of Final Completion.

6.5.3 OTHER LIQUIDATED DAMAGES The Owner and the Trade Contractor may agree upon the imposition of liquidated damages based on other project milestones or performance requirements. Such agreement shall be included as an exhibit to this Agreement.

6.6 LIMITED MUTUAL WAIVER OF CONSEQUENTIAL DAMAGES Except for damages mutually agreed upon by the Parties as liquidated damages in Section 6.5 and excluding losses covered by insurance required by the Trade Contract Documents, the Owner and the Trade Contractor agree to waive all claims against each other for any consequential damages that may arise out of or relate to this Agreement, except for those specific items of damages excluded from this waiver as mutually agreed upon by the Parties and identified below. The Owner agrees to waive damages including but not limited to the Owner's loss of use of the Project, any rental expenses incurred, loss of income, profit or financing related to the Project, as well as the loss of business, loss of financing, principal office overhead and expenses, loss of profits not related to this Project, loss of reputation, or insolvency. The Trade Contractor agrees to waive damages including but not limited to loss of business, loss of financing, principal office overhead and expenses, loss of profits not related to this Project, loss of bonding capacity, loss of reputation, or insolvency. The provisions of this section shall also apply to the termination of this Agreement and shall survive such termination.

6.6.1 The following items of damages are excluded from this mutual waiver: The provisions of this section shall also apply to the termination of this Agreement and shall survive such termination. The Owner and the Trade Contractor shall require similar waivers in contracts with Subcontractors and Others retained for the Project.

## ARTICLE 7 TRADE CONTRACT PRICE

7.1 LUMP SUM As full compensation for performance by the Trade Contractor of the Work in conformance with the Contract Documents, the Owner shall pay the Trade Contractor the lump sum price of: XX dollars and XX cents (\$XX.XX). The lump sum price is hereinafter referred to as the Trade Contract Price, which shall be subject to increase or decrease as provided in article 8.

Lump Sum Price includes Base Bid of \$X.XX and Alternate #XX for {alternate description} for \$X.XX for a total Lump Sum Price of \$X.XX.

### 7.2 ALLOWANCES

7.2.1 All allowances stated in the Trade Contract Documents shall be included in the Trade Contract Price. The Owner shall select allowance items in a timely manner so as not to delay the Trade Contract



Work.

7.2.2 Allowances shall include the costs of materials, supplies and equipment delivered to the Worksite, less applicable trade discounts and including requisite taxes, unloading and handling at the Worksite, and labor and installation, unless specifically stated otherwise. The Trade Contractor's Overhead and profit for the allowances shall be included in the Trade Contract Price, but not in the allowances. The Trade Contract Price shall be adjusted by Trade Contract Change Order to reflect the actual costs when they are greater than or less than the allowances.

## ARTICLE 8 CHANGES

Changes in the Trade Contract Work that are within the general scope of this Agreement shall be accomplished, without invalidating this Agreement, by Trade Contract Change Order, and Trade Contract Interim Directed Change.

### 8.1 TRADE CHANGE ORDER

8.1.1 The Owner may order or the Trade Contractor may request changes in the Trade Contract Work or the timing or sequencing of the Trade Contract Work that impacts the Trade Contract Price or the Trade Contract Time. All such changes in the Trade Contract Work that affect Trade Contract Time or Trade Contract Price shall in the form of a Trade Contract Change Order. Any such requests for a change in the Trade Contract Price or the Trade Contract Time shall be processed in accordance with this article 8. Trade Contract Change Orders shall be executed on the ConsensusDOCS 813 - Trade Contract Change Order (CM as Owner's Agent) with attachments as necessary.

8.1.2 The Owner, with the assistance of the Construction Manager, and the Trade Contractor shall negotiate in good faith an appropriate adjustment to the Trade Contract Price or the Trade Contract Time and shall conclude these negotiations as expeditiously as possible. Acceptance of the Trade Contract Change Order and any adjustment in the Trade Contract Price or Trade Contract Time shall not be unreasonably withheld.

### 8.2 TRADE CONTRACT INTERIM DIRECTED CHANGE

8.2.1 The Construction Manager may issue a written Trade Contract Interim Directed Change signed by the Owner directing a change in the Trade Contract Work prior to reaching agreement with the Trade Contractor on the adjustment, if any, in the Trade Contract Price or the Trade Contract Time.

8.2.2 The Owner, with the assistance of the Construction Manager, and the Trade Contractor shall negotiate expeditiously and in good faith for appropriate adjustments, as applicable, to the Trade Contract Price or the Trade Contract Time arising out of a Trade Contract Interim Directed Change. As the Trade Contract Changed Work is performed, the Trade Contractor shall submit its costs for such work with its application for payment beginning with the next application for payment within thirty (30) Days of the issuance of the Trade Contract Interim Directed Change. If there is a dispute as to the cost to the Owner, the Trade Contractor shall continue to perform the Trade Contract Changed Work set forth in the Trade Contract Interim Directed Change and the Owner shall pay the requirements Trade Contractor the Cost of the Work, defined in 8.3.1.3 below upon receipt of an application for payment and the Owner's (and the Architect's and construction manger's) determination that the work has been completed. The Parties reserve their rights as to the disputed amount, subject to the requirements ARTICLE 12.

8.2.3 When the Owner and the Trade Contractor agree upon the adjustment in the Trade Contract Price or the Trade Contract Time, for a change in the Trade Contract Work directed by a Trade Contract Interim Directed Change, such agreement shall be the subject of a Trade Contract Change Order. The



Trade Contract Change Order shall include all outstanding Trade Contract Interim Directed Changes on which the Owner and Trade Contractor have reached agreement on Contract Price or Contract Time issued since the last Trade Contract Change Order.

### 8.3 DETERMINATION OF COST

8.3.1 An increase or decrease in the Trade Contract Price or the Trade Contract Time resulting from a change in the Trade Contract Work shall be determined by one or more of the following methods:

8.3.1.1 unit prices set forth in this Agreement or as subsequently agreed;

8.3.1.2 a mutually accepted, itemized lump sum;

8.3.1.3 COST OF THE WORK Cost of the Work as defined by this subsection plus 10.0 % for Overhead and 5.0 % for profit. "Cost of the Work" shall include the following costs reasonably incurred to perform a change in the Work

8.3.1.3.1 wages paid for labor in the direct employ of the Constructor in the performance of the Work;

8.3.1.3.2 salaries of the Trade Contractor's employees when stationed at the field office to the extent necessary to complete the applicable Work, employees engaged on the road expediting the production or transportation of material and equipment, and supervisory employees from the principal or branch office performing the functions listed below;

8.3.1.3.3 cost of applicable employee benefits and taxes, including but not limited to, workers' compensation, unemployment compensation, social security, health, welfare, retirement and other fringe benefits as required by law, labor agreements, or paid under the Trade Contractor's standard personnel policy, insofar as such costs are paid to employees of the Trade Contractor who are included in the Cost of the Work in subsections .1 and .2 immediately above;

8.3.1.3.4 reasonable transportation, travel, and hotel expenses of the Trade Contractor's personnel incurred in connection with the Work;

8.3.1.3.5 cost of all materials, supplies, and equipment incorporated in the Work, including costs of inspection and testing if not provided by the Owner, transportation, storage, and handling;

8.3.1.3.6 payments made by the Trade Contractor to Subcontractors for Work performed under this Agreement;

8.3.1.3.7 cost, including transportation and maintenance of all materials, supplies, equipment, temporary facilities, and hand tools not owned by the workers that are used or consumed in the performance of the Work, less salvage value or residual value; and cost less salvage value of such items used, but not consumed that remain the property of the Trade Contractor;

8.3.1.3.8 rental charges of all necessary machinery and equipment, exclusive of hand tools owned by workers, used at the Worksite, whether rented from the Trade Contractor or Others, including installation, repair and replacement, dismantling, removal, maintenance, transportation, and delivery costs. Rental from unrelated third parties shall be reimbursed at actual cost. Rentals from the Trade Contractor or its affiliates, subsidiaries, or related parties shall be reimbursed at the prevailing rates in the locality of the Worksite up to eighty-five percent (85%) of the value of the piece of equipment;

8.3.1.3.9 cost of the premiums for all insurance and surety bonds which the Trade Contractor is



required to procure or deems necessary, and approved by the Owner including any additional premium incurred as a result of any increase in the cost of the Work;

8.3.1.3.10 sales, use, gross receipts or other taxes, tariffs, or duties related to the Work for which the Trade Contractor is liable;

8.3.1.3.11 permits, fees, licenses, tests, and royalties;

8.3.1.3.12 reproduction costs, photographs, facsimile transmissions, long-distance telephone calls, data processing costs and services, postage, express delivery charges, data transmission, telephone service, and computer-related costs at the Worksite to the extent such items are used and consumed in the performance of the Work or are not capable of use after completion of the Work;

8.3.1.3.13 all water, power, and fuel costs necessary for the Work;

8.3.1.3.14 cost of removal of all nonhazardous substances, debris, and waste materials;

8.3.1.3.15 all costs directly incurred to perform a change in the Work which are reasonably inferable from the Contract Documents for the Changed Work;

8.3.1.3.16 DISCOUNTS All discounts for prompt payment shall accrue to the Owner to the extent such payments are made directly by the Owner. To the extent payments are made with funds of the Constructor, all cash discounts shall accrue to the Constructor. All trade discounts, rebates and refunds, and all returns from sale of surplus materials and equipment, shall be credited to the Cost of the Work;

8.3.1.3.17 COST REPORTING The Trade Contractor shall maintain in conformance with generally accepted accounting principles a complete and current set of records that are prepared or used by the Trade Contractor to calculate the Cost of Work. The Owner and Construction Manager shall be afforded access to the Trade Contractor's records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda and similar data relating to requested payment for Cost of the Work. The Trade Contractor shall preserve all such records for a period of three years after the final payment or longer where required by law;

8.3.1.3.18 COST AND SCHEDULE ESTIMATES The Trade Contractor shall use reasonable skill and judgment in the preparation of a cost estimate or schedule for a change to the Work, but does not warrant or guarantee their accuracy

8.3.1.4 If an increase or decrease cannot be agreed to as set forth in Clauses .1 through .3 above, and the Owner or the Construction Manager issues a Trade Contract Interim Directed Change, the cost of the change in the Trade Contract Work shall be determined by the reasonable actual expense and savings of the performance of the Work resulting from the change. If there is a net increase in the Trade Contract Price, the Trade Contractor's Fee shall be adjusted accordingly. In case of a net decrease in the Trade Contract Price, the Trade Contractor's Fee shall not be adjusted unless ten percent (10%) or more of the Project is deleted. The Trade Contractor shall maintain a documented, itemized accounting evidencing the expenses and savings.

8.3.2 If unit prices are set forth in the Trade Contract Documents or are subsequently agreed to by the Parties, but the character or quantity of such unit items as originally contemplated is so different in a proposed Trade Change Order that the original unit prices will cause substantial inequity to the Owner or the Trade Contractor, such unit prices shall be equitably adjusted.

8.4 CLAIMS FOR ADDITIONAL COST OR TIME Except as provided in subsection 6.3.2 and section 6.4 for



any claim for an increase in the Trade Contract Price or the Trade Contract Time, the Trade Contractor shall give the Owner and the Construction Manager written notice of the claim within fourteen (14) Days after the occurrence giving rise to the claim or within fourteen (14) Days after the Trade Contractor first recognizes (or should have recognized) the condition giving rise to the claim, whichever is later. Except in an emergency, notice shall be given before proceeding with the Trade Contract Work. Thereafter, the Trade Contractor shall submit written documentation of its claim, including appropriate supporting documentation, within twenty-one (21) Days after giving notice, unless the Parties mutually agree upon a period of time. The Owner or Construction Manager shall respond in writing denying or approving the Trade Contractor's claim no later than fourteen (14) Days after receipt of the Trade Contractor's claim. Any change in the Trade Contract Price or the Trade Contract Time resulting from such claim shall be authorized by Trade Contract Change Order.

## ARTICLE 9 PAYMENT

9.1 GENERAL PROVISIONS Within fourteen (14) calendar Days from the date of execution of this Agreement, the Trade Contractor shall prepare and submit to the Construction Manager for approval a Schedule of Values apportioned to the various divisions or phases of the Trade Contract Work. Each line item contained in the Schedule of Values shall be assigned a monetary price such that the total of all such items shall equal the Trade Contract Price. The Schedule of Values shall be prepared in such detail and be supported by such documents and proof as may be required by the Construction Manager.

### 9.2 PROGRESS PAYMENTS

9.2.1 APPLICATIONS The Trade Contractor shall submit to the Construction Manager monthly notarized applications for payment. Trade Contractor's applications for payment shall be itemized and supported by the Trade Contractor's Schedule of Values and any other substantiating data as required by this Trade Contractor Agreement or requested by the Construction Manager or Design Professional. Payment applications may include payment requests on account of properly authorized Trade Contract Change Orders and Interim Directed Changes. The progress payment application shall include Trade Contract Work performed through the preceding calendar month. The Construction Manager will review the application and recommend to the Design professional and the Owner amounts payable by the Owner to the Trade Contractor. The Owner, in accordance with the determination of the Design Professional, shall pay the amount otherwise due on any payment application, less any amounts as set forth below, no later than thirty (30) calendar Days after the payment application, or portion thereof, is approved the Design Professional. The Owner may deduct, from any progress payment, such amounts as may be retained pursuant to subsection 9.2.4 below.

9.2.2 STORED MATERIALS AND EQUIPMENT Unless otherwise provided in the contract documents, applications for payment may include materials and equipment not yet incorporated into the Work but delivered to and suitably stored onsite or offsite including applicable insurance, storage and costs incurred transporting the materials to an offsite storage facility. Approval of payment applications for stored materials and equipment stored offsite shall be conditioned on submission by the Trade Contractor of bills of sale and proof of required insurance, or such other procedures satisfactory to the Owner to establish the proper valuation of the stored materials and equipment, the Owner's title to such materials and equipment, and to otherwise protect the Owner's interests therein, including transportation to the site.

### 9.2.3 CLAIM WAIVERS

9.2.3.1 PARTIAL CLAIMWAIVERS AND AFFIDAVITS As a prerequisite for payment, the Trade Contractor shall provide, in a form satisfactory to the Owner and the Construction Manager, partial claim waivers in the amount of the application for payment and affidavits from the Trade Contractor, and its Subcontractors, Material Suppliers for the completed Trade Contract Work.



Such waivers shall be effective upon payment. In no event shall the Trade Contractor be required to sign an unconditional waiver of claim, either partial or final, prior to receiving payment or in an amount in excess of what it has been paid.

9.2.4 **RETAINAGE** From each progress payment made to the Trade Contractor has the Owner shall retain FIVE (5) percent of the amount otherwise due after deduction of any amounts as provided in section 9.3 and in no event shall such percentage exceed any applicable statutory requirements of this Agreement. Retainage shall be withheld and administered in accordance with Iowa Code Chapter 572:

9.3 **ADJUSTMENT OF TRADE CONTRACTOR'S PAYMENT APPLICATION** The Owner or the Construction Manager, upon notification of the Design Professional, may reject or adjust a Trade Contractor payment application or nullify a previously approved Trade Contractor payment application, in whole or in part, as may reasonably be necessary to protect the Owner from loss or damage based upon the following, to the extent that the Trade Contractor is responsible therefor under this Trade Contractor Agreement:

9.3.1 the Trade Contractor's repeated failure to perform the Trade Contract Work as required by the Trade Contractor Agreement;

9.3.2 loss or damage arising out of or relating to the Trade Contractor Agreement and caused by the Trade Contractor to the Owner, or to the Construction Manager or others to whom the Owner may be liable;

9.3.3 the Trade Contractor's failure to properly pay for labor, materials, equipment or supplies furnished in connection with the Trade Contract Work;

9.3.4 nonconforming or defective Trade Contract Work which has not been corrected in a timely fashion;

9.3.5 reasonable evidence of delay in performance of the Trade Contract Work such that the work will not be completed within the Trade Contract Time, and that the unpaid balance of the Trade Contract Price is not sufficient to offset any liquidated damages or actual damages that may be sustained by the Owner as a result of the anticipated delay caused by the Trade Contractor;

9.3.6 reasonable evidence demonstrating that the unpaid balance of the Trade Contract Price is insufficient to cover the cost to complete the Trade Contract Work; and

9.3.7 third-party claims involving the Trade Contractor or reasonable evidence demonstrating that third-party claims are likely to be filed unless and until the Trade Contractor furnishes the Owner with adequate security in the form of a surety bond, letter of credit or other collateral or commitment which are sufficient to discharge such claims if established. No later than thirty (30) Days after receipt of an application for payment, the Owner or Construction Manager shall give written notice to the Trade Contractor, disapproving or nullifying it or a portion thereof, specifying the reasons for the disapproval or nullification. When the above reasons for disapproving or nullifying an application for payment are removed, payment will be made for amounts previously withheld.

9.4 **PAYMENT NOT ACCEPTANCE** Payment to the Trade Contractor does not constitute or imply acceptance of any portion of the Trade Contract Work.

9.5 **PAYMENT DELAY** If for any reason not the fault of the Trade Contractor, the Trade Contractor does not receive a progress payment from the Owner sixty (60) calendar Days after the time such payment is due, as defined in Subparagraph 9.2.1, then the Trade Contractor, upon giving within seven (7) calendar Days after written notice to the Owner, and without prejudice to and in addition to any other legal remedies, may stop its Trade Contract Work until payment of the full amount owing to the Trade Contractor has been received. The



Trade Contract Price and Trade Contract Time shall be equitably adjusted by a Trade Contract Change Order to reflect reasonable cost and delay resulting from shutdown, delay and start-up.

## 9.6 SUBSTANTIAL COMPLETION

9.6.1 The Trade Contractor shall notify the Owner, the Construction Manager and the Design Professional when it considers Substantial Completion of the Trade Contract Work or a designated portion to have been achieved. The Construction Manager and the Design Professional shall promptly conduct an inspection to determine whether the Trade Contract Work or designated portion can be occupied or utilized for its intended use by the Owner without excessive interference in completing any remaining unfinished Trade Contract Work by the Trade Contractor. If the Construction Manager and the Design Professional determine that the Trade Contract Work or designated portion has not reached Substantial Completion, the Design Professional, and the Construction Manager, shall promptly compile a list of items to be completed or corrected so the Owner may occupy or utilize the Trade Contract Work or designated portion for its intended use. The Trade Contractor shall promptly complete all items on the list.

9.6.2 When Substantial Completion of the Trade Contract Work or a designated portion is achieved, the Construction Manager and the Design Professional shall prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, and the respective responsibilities of the Owner and Trade Contractor for interim items such as security, maintenance, utilities, insurance and damage to the Trade Contract Work. The Owner shall assume all responsibilities for items such as security, maintenance, utilities, and insurance, and damage to the Work. The certificate shall also list the items to be completed or corrected, and establish the time for their completion or correction. The Certificate of Substantial Completion shall be submitted to the Trade Contractor for written acceptance of responsibilities assigned in the Certificate.

9.6.3 Unless otherwise provided in the Certificate of Substantial Completion, warranties required by the Trade Contract Documents shall commence on the date of Substantial Completion of the Trade Contract Work or a designated portion.

9.6.4 Uncompleted items shall be completed by the Trade Contractor by the Final Completion date set forth in the Agreement and/or Construction Schedule. The Trade Contractor may request early release of retainage in accordance with Iowa Code Section 26.13. Payment for completed work and retainage shall be made in accordance with Iowa Code Chapters 26 and 573.

9.7 PARTIAL OCCUPANCY OR USE The Owner may occupy or use completed or partially completed portions of the Trade Contract Work when (a) the portion of the Trade Contract Work is designated in a Certificate of Substantial Completion, (b) appropriate insurer(s) consent to the occupancy or use, and (c) appropriate public authorities authorize the occupancy or use. Such partial occupancy or use shall constitute Substantial Completion of that portion of the Trade Contract Work.

## 9.8 FINAL PAYMENT

9.8.1 APPLICATION Upon acceptance of the Trade Contract Work by the Construction Manager, and approval by the Design Professional, and upon the Trade Contractor furnishing evidence of fulfillment of the Trade Contractor's obligations in accordance with the Trade Contract Documents, the Trade Contractor shall submit its application for final payment. The Construction Manager will review the Trade Contractor's final payment application and recommend to the Design Professional and the Owner an amount payable by the Owner to the Trade Contractor. The Design Professional shall then recommend an amount to be paid by the Owner. Final payment shall be made in accordance with Iowa Code Chapters 26 and 573.



9.8.2 REQUIREMENTS Along with its application for final payment, the Trade Contractor shall furnish to the Construction Manager:

9.8.2.1 an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Trade Contract Work for which the Owner or its property or the Construction Manager or the Owner's surety might in any way be liable, have been paid or otherwise satisfied;

9.8.2.2 consent of the Trade Contractor's surety to final payment;

9.8.2.3 satisfaction of closeout procedures as may be required by the Trade Contractor Agreement;

9.8.2.4 certification (or other writing indicating) that insurance required by the Trade Contractor Agreement is and will remain effect beyond final payment pursuant to this Trade Contractor Agreement and

9.8.2.5 other data if required by the Owner or Construction Manager, such as receipts, releases, and waivers of liens effective upon payment to the extent and in such form as may be designated by the Owner or Construction Manager. Acceptance of final payment by the Trade Contractor shall constitute a waiver of all claims by the Trade Contractor except those previously made in writing and identified by the Trade Contractor as unsettled at the time of final application for payment.

9.8.3 TIME OF PAYMENT Final payment of the balance of the Trade Contract Price, less any amount retained pursuant to subsection 9.2.4 of this Agreement, and as required by Iowa Code Chapters 26 and 573, which among other things requires that twice the amount of an Iowa Code Chapter 573 subcontractor claim be withheld from final payment, shall be made to the Trade contractor within sixty (60) Days after the Trade Contractor has submitted a complete and accurate application for final payment.

9.8.4 LATE PAYMENT INTEREST Progress payments or final payment due and unpaid under this Trade Contractor Agreement shall bear interest from the date payment is due at the statutory rate prevailing at the place of the Project.

9.9 PAYMENT USE AND VERIFICATION The Trade Contractor is required to pay for all labor, materials and equipment used in the performance of the Trade Contract Work through the most current period applicable to progress payments received. Reasonable evidence, satisfactory to the Construction Manager, may be required to show that all obligations relating to the Trade Contract Work are current before releasing any payment due on the Trade Contract Work. If required by the Construction Manager, before final payment is made for the Trade Contract Work, the Trade Contractor shall submit evidence satisfactory to the Construction Manager that all payrolls, bills for materials and equipment, and all known indebtedness connected with the Trade Contract Work, have been paid or otherwise satisfied as set forth in subsection 9.8.2.

## ARTICLE 10 INDEMNITY, INSURANCE, WAIVERS AND BONDS

### 10.1 INDEMNITY

10.1A To the extent portions of this Article are in conflict with SF 396 (codified at Iowa Code Section 573A.5) said portions are void and unenforceable.

10.1.1 TRADE CONTRACTOR'S INDEMNITY To the fullest extent permitted by law, the Trade Contractor shall indemnify and hold harmless the Owner, the Owner's officers, directors, members,



consultants, agents and employees, from all claims for bodily injury and property damage, other than to the Work itself and other property insured under subsection 10.3.1, including reasonable attorneys' fees, costs and expenses, that may arise from the performance of the Work, but only to the extent caused by the negligent acts or omissions of the Trade Contractor, Subcontractors or anyone employed directly or indirectly by any of them or by anyone for whose acts any of them may be liable. The Trade Contractor shall be entitled to reimbursement of any defense costs paid above the Trade Contractor's percentage of liability for the underlying claim to the extent provided for under subsection 10.1.2.

10.1.2 OWNER'S INDEMNITY To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Trade Contractor, its officers, directors, members, consultants, agents, and employees, from all claims for bodily injury and property damage, other than property insured under subsection 10.3.1, including reasonable attorneys' fees, costs and expenses, that may arise from the performance of work by Owner, Design Professional or Others, but only to the extent caused by the negligent acts or omissions of the Owner, Design Professional or Others. The Owner shall be entitled to reimbursement of any defense costs paid above Owner's percentage of liability for the underlying claim to the extent provided for under subsection 10.1.1.

10.1.3 CONSTRUCTION MANAGER AND DESIGN PROFESSIONAL INDEMNITY The Owner shall cause the Construction Manager and the Design Professional to agree to indemnify and hold harmless the Owner from all claims for bodily injury and property damage, other than to the Work itself and other property insured under section 10.3, that may arise from the Construction Manager's or the Design Professional's services, but only to the extent that such claims result from the negligent acts or omissions of the Construction Manager or the Design Professional, respectively, or anyone for whose acts or omissions the Construction Manager or Design Professional, respectively, is liable. Such provisions shall be in a form no less protective of the Parties than the Construction Manager's Indemnity provided in ConsensusDocs 801 (2011) or the Design Professional's indemnity provided in ConsensusDocs 803 (2011) respectively, and shall be reasonably satisfactory to the Owner and the Trade Contractor.

10.1.4 ADJACENT PROPERTY INDEMNIFICATION To the extent of the limits of Trade Contractor's Commercial General Liability Insurance specified in subsection 10.2.1 or Zero Dollars and No Cents (\$0.00) whichever is more, the Trade Contractor shall indemnify and hold harmless the Owner against any and all liability, claims, demands, damages, losses and expenses, including attorney's fees, in connection with or arising out of any damage or alleged damage to any of Owner's existing adjacent property that may arise from the performance of the Trade Contract Work, but only to the extent of the negligent acts or omissions of the Trade Contractor, Subcontractor or anyone employed directly or indirectly by any of them or by anyone for whose acts any of them may be liable.

10.1.5 NO LIMITATION ON LIABILITY In any and all claims against the Indemnitees by any employee of the Trade Contractor, anyone directly or indirectly employed by the Trade Contractor or anyone for whose acts the Trade Contractor may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Trade Contractor under Workers' Compensation acts, disability benefit acts or other employment benefit acts.

## 10.2 TRADE CONTRACTOR'S INSURANCE

10.2.1 Prior to the start of the Work, the Trade Contractor shall procure and maintain in force Workers Compensation/Employers' Liability Insurance, Business Automobile Liability Insurance, and Commercial General Liability Insurance (CGL). The CGL policy shall include coverage for liability arising from premises, operations, independent contractors, products-completed operations, personal injury and



advertising injury, contractual liability, and broad form property damage. The Trade Contractor's liability policies, as required in this Subparagraph 10.2.1, shall be written on an occurrence basis with at least the following limits of liability:

10.2.1.1 Workers' Compensation- amount required by the laws of Iowa

10.2.1.2 Employers' Liability Insurance - \$500,000 or an amount required by Iowa law, whichever is greater.

10.2.1.3 Business Automobile Liability Insurance

a. \$1,000,000 Each Accident

10.2.1.4 Commercial General Liability Insurance

a. \$1,000,000 Each Occurrence b. \$2,000,000 General Aggregate c. \$1,000,000 Products/Completed Operations Aggregate d. \$1,000,000 Personal and Advertising Injury Limit

10.2.2 The Trade Contractor Must also carry and maintain Excess or Umbrella Liability coverage for the policies in subsection 10.2.1 in the amounts as listed below:

Trade Contractor Contract Amount: <\$1,000,000 - \$2 Million Umbrella or more \$1,000,000 - \$5,000,000 - \$5 Million Umbrella or more >\$5,000,000 - \$10 Million Umbrella or more

10.2.3 The Trade Contractor shall maintain in effect all insurance coverage required under subsection 10.2.1 with insurance companies lawfully authorized to do business in Iowa. Such insurance companies shall have a minimum A.M. Best Rating of A-VI (Consult instructions and insurance advisor). If the Trade Contractor fails to obtain or maintain any insurance coverage required under this Agreement, the Owner may purchase such coverage and charge the expense to the Trade Contractor, or terminate this Agreement.

10.2.4 To the extent commercially available, the policies of insurance required under Subparagraph 10.2.1 shall contain a provision that the insurance company or its designee must give the Owner written notice transmitted in paper or electronic format: (a) 30 days before coverage is nonrenewed by the insurance company and (b) with 10 business days after cancelation of coverage by the insurance company. The Trade Contractor shall maintain completed operations liability insurance for one year after acceptance of the Contract Documents, whichever is longer. Prior to commencement of services, the Trade Contractor shall furnish the Owner with certificates evidencing the required coverages. In addition, if any insurance policy required under subsection 10.2.1 is not to be immediately replaced without a lapse in coverage when it expires, exhausts its limits, or is to be, cancelled, the Trade Contractor shall give Owner prompt written notice upon actual or constructive knowledge of such condition.

#### 10.2.5 ADDITIONAL LIABILITY COVERAGE

10.2.5.1 The Owner  shall /  shall not (indicate one) require the Trade Contractor to purchase and maintain liability coverage, primary to the Owner's coverage under subsection 10.3.1.

10.2.5.2 If required by subsection 10.2.5.1, the additional liability coverage required of the Trade Contractor shall be:

1. Additional Insured Owner shall be named as an additional insured on Trade Contractor's Commercial General Liability Insurance specified for operations and completed operations,



but only with respect to liability for bodily injury, property damage or personal and advertising injury to the extent caused by the negligent acts or omissions of Trade Contractor, or those acting on Trade Contractor's behalf, in the performance of Trade Contractor's Work for.

2. OCP Trade Contractor shall provide an Owners' and Contractors' Protective Liability Insurance ("OCP") policy with limits equal to the limits on Commercial General Liability Insurance specified or limits as otherwise required by Owner.

Any documented additional cost in the form of a surcharge associated with procuring the additional liability coverage in accordance with this subsection shall be paid by the Owner directly or the costs may be reimbursed by the Owner to the Trade Contractor by increasing the Trade Contract Price to correspond to the actual cost required to purchase and maintain the additional liability coverage. Prior to commencement of the Work, the Trade Contractor shall obtain and furnish to the Owner a certificate evidencing that the additional liability coverages have been procured.

10.2.6 PROFESSIONAL LIABILITY INSURANCE To the extent the Trade Contractor is required to procure design services under this Agreement, in accordance with section 3.14, the Trade Contractor shall require the designers to obtain professional liability insurance for claims arising from the negligent performance of professional services under this Agreement, with a company reasonably satisfactory to the Owner, including coverage for all professional liability caused by any of the Designer's(s') consultants, written for not less than \$1,000,000 per claim and in the aggregate with the deductible not to exceed \$2,000,000. The deductible shall be paid by the Designer.

### 10.3 OWNER'S INSURANCE

10.3.1 Deleted.

10.3.2 Deleted.

### 10.4 PROPERTY INSURANCE

10.4.1 Before the start of Trade Contract Work, the Owner shall obtain and maintain Builder's Risk Policy insurance with minimum coverage limits equal to the full cost of replacement of the Project at the time of loss. This insurance shall also name the Trade Contractor, Subcontractors, Material Suppliers, Construction Manager and Design Professional as insureds. This insurance shall be written as a Builder's Risk Policy or equivalent form to cover all risks of physical loss except those specifically excluded by the policy, and shall insure at least against the perils of fire, lightning, explosion, windstorm, hail, smoke, aircraft and vehicles, riot and civil commotion, theft, vandalism, malicious mischief, debris removal, flood (subject to sublimits), earthquake (subject to sublimits), earth movement, water damage, wind damage, testing if applicable, collapse however caused, and shall include coverage for, material, or equipment stored offsite, onsite or in transit. This policy shall provide for a waiver of subrogation in favor of the Trade Contractor, Subcontractors, Material Suppliers, Construction Manager and Design Professional. This insurance shall remain in effect until the Substantial Completion of the Work, final payment has been made or until no person or entity other than the Owner has an insurable interest in the property to be covered by this insurance, whichever is sooner. Partial occupancy or use of the Work shall not commence until the Owner has secured the consent of the insurance company or companies providing the coverage required in this Subparagraph 10.4.1.

10.4.2 If the Owner does not intend to purchase the property insurance required by this Agreement, including all of the coverages and deductibles described herein, the Owner shall give written notice to the Trade Contractor, the Design Professional and the Construction Manager before the Trade Contract



Work is commenced. The Trade Contractor may then provide insurance to protect its interests and the interests of the Subcontractors, including the coverage of deductibles. The cost of this insurance shall be charged to the Owner in a Change Order. The Owner shall be responsible for all of Trade Contractor's costs reasonably attributed to the Owner's failure or neglect in purchasing or maintaining the coverage described above.

10.4.2.1 The Owner will not obtain insurance to cover the risk of physical loss resulting from Terrorism. The Construction Manager is not required to purchase this type of insurance but may purchase this type of insurance if it chooses. If purchased, the cost of this insurance shall be borne by the Construction manager.

10.4.3 POLICIES The Owner shall provide the Trade Contractor with a copy of all policies including all endorsements upon request.

## 10.5 PROPERTY INSURANCE LOSS ADJUSTMENT

10.5.1 LOSS ADJUSTMENT Any insured loss shall be adjusted with the Owner and the Trade Contractor and made payable to the Owner as trustee for the insureds, as their interests may appear.

10.5.2 DISTRIBUTION OF PROCEEDS Following the occurrence of an insured loss, monies received will be deposited in a separate account and the trustee shall make distribution in accordance with the agreement of the Parties in interest.

## 10.6 WAIVERS

10.6.1 PROPERTY DAMAGE The Owner and Trade Contractor waive all claims and other rights they may have against each other for loss of or damage to (a) the Project, (b) all materials, machinery, equipment and other items used in accomplishing the Trade Contract Work or services or to be incorporated into the Project, while the same are in transit, at the Project Site, during erection and otherwise, and (c) all property owned by or in the custody of Owner and its affiliates, however such loss or damage shall occur, to the extent such damage is covered by property insurance. The proceeds of such insurance shall be held by the Owner as trustee.

10.6.2 WAIVER OF SUBROGATION The Owner shall have its insurers waive all rights of subrogation they may have against the Construction Manager, Design Professional, Trade Contractors, and their Subcontractors and Material Suppliers on all policies carried by the Owner on the Project and adjacent properties, including, after final payment, those policies to be provided on the completed Project not intended to insure the Project during construction.

10.6.3 ENDORSEMENT If the policies of insurance referred to in this section require an endorsement to provide for continued coverage where there is a waiver of subrogation, the Owner will cause them to be so endorsed.

10.7 RISK OF LOSS Except to the extent a loss is covered by property insurance, carried by the owner, risk of loss or damage to the Work shall be upon the Trade Contractor until the Date of Final Completion, unless otherwise agreed to by the Parties.

## 10.8 BONDS Performance and Payment Bonds

are

are not

required of the Trade Contractor that meet the requirements of Iowa Code Chapter 573. A deposit in lieu of a



bond may be acceptable if it meets the requirements of Iowa Code Section 573.4. Such bonds shall be issued by a surety admitted in the State in which the Project is located and must be acceptable to the Owner. The Owner's acceptance shall not be withheld without reasonable cause. The penal sum of the Payment Bond and of the Performance Bond shall each be one hundred percent (100%) of the original Contract Price. Any increase in the Contract Price that exceeds ten percent (10%) in the aggregate shall require a rider to the Bonds increasing penal sums accordingly. Up to such ten percent (10%) amount, the penal sum of the Bond shall remain equal to one hundred percent (100%) of the Contract Price. The Trade Contractor shall endeavor to keep its surety advised of changes potentially impacting the Contract Time and Contract Price, though the Trade Contractor shall require that its surety waives any requirement to be notified of any alteration or extension of time. The Trade Contractor's Payment Bond for the Project, if any, shall be made available by the Owner for review and copying by the Subcontractor. Iowa Code Chapter 573 shall control and take precedence over any conflicting term or condition in this Agreement

## ARTICLE 11 SUSPENSION, NOTICE TO CURE AND TERMINATION OF AGREEMENT

### 11.1 SUSPENSION BY OWNER FOR CONVENIENCE

11.1.1 OWNER SUSPENSION Should the Owner order the Trade Contractor in writing to suspend, delay, or interrupt the performance of the Trade Contract Work for such period of time as may be determined to be appropriate for the convenience of the Owner and not due to any act or omission of the Trade Contractor or any person or entity for whose acts or omissions the Trade Contractor may be liable, then the Trade Contractor shall immediately suspend, delay or interrupt that portion of the Trade Contract Work as ordered by the Owner. The Trade Contract Price and the Trade Contract Time shall be equitably adjusted by Trade Contract Change Order for the cost and delay resulting from any such suspension.

11.1.2 Any action taken by the Owner that is permitted by any other provision of the Trade Contract Documents and that results in a suspension of part or all of the Trade Contract Work does not constitute a suspension of Trade Contract Work under this section.

11.2 NOTICE TO CURE A DEFAULT If the Trade Contractor persistently refuses or fails to supply enough properly skilled workers, proper materials, or equipment to maintain the approved Construction Schedule in accordance with ARTICLE 6, or fails to make prompt payment to its workers, Subcontractors or Material Suppliers; disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction; or is otherwise guilty of a material breach of a provision of this Agreement, the Trade Contractor may be deemed in default. If the Trade Contractor fails within seven (7) business Days after receipt of written notification to commence and continue satisfactory correction of such default with diligence and promptness, then the Owner shall give the Trade Contractor a second notice to correct the default within a three (3) Day period. If the Trade Contractor fails to promptly commence and continue satisfactory correction of the default following receipt of such second notice, the Owner without prejudice to any other rights or remedies may:

11.2.1 supply workers and materials, equipment and other facilities as the Owner or Construction Manager deems necessary for the satisfactory correction of the default, and charge the cost to the Trade Contractor, who shall be liable for the payment of same including reasonable Overhead, profit and attorneys' fees;

11.2.2 contract with Others to perform such part of the Trade Contract Work as the Owner or Construction Manager determines shall provide the most expeditious correction of the default, and charge the cost to the Trade Contractor;

11.2.3 withhold payment due the Trade Contractor in accordance with section 9.3; and

11.2.4 in the event of an emergency affecting the safety of persons or property, immediately commence



and continue satisfactory correction of such default as provided in subsections 11.2.1 and 11.2.2 without first giving written notice to the Trade Contractor, but shall give prompt written notice of such action to the Trade Contractor following commencement of the action.

### 11.3 OWNER'S RIGHT TO TERMINATE FOR DEFAULT

11.3.1 TERMINATION BY OWNER FOR DEFAULT If, within seven (7) Days of receipt of a notice to cure pursuant to section 11.2, the Trade Contractor fails to commence and satisfactorily continue correction of the default set forth in the notice to cure, the Owner may notify the Trade Contractor that it intends to terminate this Agreement for default absent appropriate corrective action within fourteen additional Days. After the expiration of the additional fourteen (14) Day period, the Owner may terminate this Agreement by written notice absent appropriate corrective action. Termination for default is in addition to any other remedies available to Owner under section 11.2. If the Owner's cost arising out of the Trade Contractor's failure to cure, including the cost of completing the Trade Contract Work and reasonable attorneys' fees, exceeds the unpaid Trade Contract Price, the Trade Contractor shall be liable to the Owner for such excess costs. If the Owner's costs are less than the unpaid Trade Contract Price, the Owner shall pay the difference to the Trade Contractor. In the event the Owner exercises its rights under this section, upon the request of the Trade Contractor the Owner shall furnish to the Trade Contractor a detailed accounting of the cost incurred by the Owner.

11.3.2 USE OF TRADE CONTRACTOR'S MATERIALS, SUPPLIES AND EQUIPMENT If the Owner or Others perform work under this section, the Owner shall have the right to take and use any materials, supplies and equipment belonging to the Trade Contractor and located at the Worksite for the purpose of completing any remaining Trade Contract Work. Immediately upon completion of the Work, any remaining materials, supplies or equipment not consumed or incorporated in the Trade Contract Work shall be returned to the Trade Contractor in substantially the same condition as when they were taken, reasonable wear and tear excepted.

11.3.3 If the Trade Contractor files a petition under the Bankruptcy Code, this Agreement may be terminated for cause at the may be terminated for cause at the Owner.

11.3.3 If the Trade Contractor files a petition under the Bankruptcy Code, this Agreement may be terminated for cause at the may be terminated for cause at the Owner.

11.3.4 The Owner shall make reasonable efforts to mitigate damages arising from Trade Contractor default, and shall promptly invoice the Trade Contractor for all amounts due pursuant to sections 11.2 and 11.3.

### 11.4 TERMINATION BY OWNER FOR CONVENIENCE

11.4.1 Upon written notice to the Trade Contractor, the Owner may, without cause, terminate this Agreement. The Trade Contractor shall immediately stop the Work, follow the Owner's or Construction Manager's instructions regarding shutdown and termination procedures, and strive to minimize any further costs.

11.4.2 If the Owner terminates this Agreement pursuant to this section, the Trade Contractor shall be paid:

11.4.2.1 for the Work performed to date including Overhead and profit; and

11.4.2.2 for all demobilization costs and costs incurred as a result of the termination but not including Overhead or profit on work not performed;

11.4.2A Upon written notice to the Trade Contractor the Owner has the right to terminate this



Agreement without penalty as a result of the following: 1) the legislature or governor fail to appropriate funds sufficient to allow the Owner to operate as required and fulfill its obligations under this Agreement, 2) funds are de-appropriated or not allocated, 3) the Owner's authorization to operate is withdrawn or there is a material alteration in the programs administered by the owner, or 4) the Owner's duties are substantially modified. If such a termination results then the Trade Contractor shall be paid in the manner set forth in subparagraph 11.4.2. If, however, an appropriation to cover the cost of this Agreement becomes available within sixty (60) days subsequent to termination under this paragraph then the Owner agrees to re-enter into a modified version of this Agreement that accounts for the termination and reinstatement.

11.4.3 If the Owner terminates this Agreement pursuant to sections 11.3 or 11.4, the Trade Contractor shall:

11.4.3 If the Owner terminates this Agreement pursuant to sections 11.3 or 11.4, the Trade Contractor shall:

11.4.3.1 execute and deliver to the Owner all papers and take all action required to assign, transfer and vest in the Owner the rights of the Trade Contractor to all materials, supplies and equipment for which payment has or will be made in accordance with the Trade Contract Documents and all subcontracts, orders and commitments which have been made in accordance with the Trade Contract Documents;

11.4.3.2 exert reasonable effort to reduce to a minimum the Owner's liability for subcontracts, orders and commitments that have not been fulfilled at the time of the termination;

11.4.3.3 cancel any subcontracts, orders and commitments as the Owner or Construction Manager directs; and

11.4.3.4 sell at prices approved by the Owner or Construction Manager any materials, supplies and equipment as the Owner or Construction Manager directs, with all proceeds paid or credited to the Owner.

## 11.5 TRADE CONTRACTOR'S RIGHT TO TERMINATE

11.5.1 Upon seven (7) Days' written notice to the Owner and Construction Manager, the Trade Contractor may terminate this Agreement if the Trade Contract Work has been stopped for a thirty (30) Day period through no fault of the Trade Contractor for any of the following reasons:

11.5.1.1 under court order or order of other governmental authorities having jurisdiction;

11.5.1.2 as a result of the declaration of a national emergency or other governmental act during which, through no act or fault of the Trade Contractor, materials are not available; or

11.5.1.3 suspension by the Owner for convenience pursuant to section 11.1

11.5.2 In addition, upon seven (7) Days' written notice to the Owner and Construction Manager, the Trade Contractor may terminate the Agreement if the Owner:

11.5.2.1 fails to furnish reasonable evidence pursuant to section 4.1.2 that sufficient funds are available and committed for Project financing, or

11.5.2.2 assigns this Agreement over the Trade Contractor's reasonable objection, or

11.5.2.3 fails to pay the Trade Contractor in accordance with this Agreement and the Trade Contractor has complied with the notice provisions of section 9.5, or



11.5.2.4 otherwise materially breaches this Agreement.

11.5.3 Upon termination by the Trade Contractor in accordance with this section, the Trade Contractor shall be entitled to recover from the Owner payment for all Trade Contract Work executed and for any proven loss, cost or expense in connection with the Trade Contract Work, including all demobilization costs plus reasonable Overhead and profit on work not performed.

11.6 OBLIGATIONS ARISING BEFORE TERMINATION Even after termination pursuant to ARTICLE 11, the provisions of this Agreement still apply to any Trade Contract Work performed, payments made, events occurring, costs charged or incurred or obligations arising before the termination date.

## ARTICLE 12 DISPUTE MITIGATION AND RESOLUTION

12.1 WORK CONTINUANCE AND PAYMENT Unless otherwise agreed in writing, the Trade Contractor shall continue the Trade Contract Work and maintain the Construction Schedule during any dispute mitigation or resolution proceedings. If the Trade Contractor continues to perform, the Owner shall continue to make payments in accordance with this Agreement.

12.2 DIRECT DISCUSSIONS If the Parties cannot reach resolution on a matter relating to or arising out of the Agreement, the Parties shall endeavor to reach resolution through good faith direct discussions between the Parties' representatives, who shall possess the necessary authority to resolve such matter and who shall record the date of first discussions. The authorized representative for the Trade Contractor is identified in Paragraph 3.4 of the Agreement. The authorized representative for the Owner is identified in Paragraph 4.2 of the Agreement. The parties' authorized representative are, among other things, authorized to resolve matters of disagreement and disputes between the Parties. If the dispute remains unresolved after fifteen (15) Days from the date of first discussion, the Parties shall submit such matter to the dispute mitigation and dispute resolution procedures selected herein.

12.3 MITIGATION The Parties agree that dispute mitigation procedures provided in this Project. Disputes remaining unresolved after direct discussions shall be directed to the selected mitigation procedure immediately below. The dispute mitigation procedure shall result in nonbinding finding on the matter. This may be introduced as evidence at a subsequent binding adjudication of the matter, as designee on Paragraph 12.5. The Parties agree that the dispute mitigation procedure shall be

(Designate only one.)

Project Neutral

Dispute Review Board

12.3.1 MITIGATION PROCEDURES The Project Neutral/Dispute Review Board shall be mutually selected and appointed by the Parties and shall execute a retainer agreement with the Parties establishing the scope of the Project Neutral/Dispute Review Board's responsibilities. The costs and expenses of the Project Neutral/Dispute Review Board shall be shared equally by the Parties. The Project Neutral/Dispute Review Board shall be available to either Party, upon request, throughout the course of the Project, and shall make regular visits to the Project so as to maintain an up-to-date understanding of the Project progress and issues and to enable the Project Neutral/Dispute Review Board to address matters in dispute between the Parties promptly and knowledgeably. The Project Neutral/Dispute Review Board shall issue nonbinding findings within five (5) business Days of referral of the matter to the Project Neutral, unless good cause is shown.

12.3.2 If the matter remains unresolved following the issuance of the nonbinding finding by the mitigation procedure or if the Project Neutral/Dispute Review Board fails to issue nonbinding findings



within five (5) Days of the referral, the Parties shall submit the matter to the binding dispute resolution procedure designated in section 12.5.

12.4 MEDIATION If direct discussions pursuant to section 12.2 do not result in resolution of the matter and no dispute mitigation procedure is selected under section 12.3, the Parties shall endeavor to resolve the matter by mediation through the current Construction Industry Mediation Rules of the American Arbitration Association, or the Parties may mutually agree to select another set of mediation rules. The administration of the mediation shall be as mutually agreed by the Parties. The mediation shall be convened within thirty (30) business Days of the matter first being discussed and shall conclude within forty-five (45) business Days of the matter first being discussed. Either Party may terminate the mediation at any time after the first session, but the decision to terminate shall be delivered in person by the terminating Party to the non-terminating Party and to the mediator. The costs of the mediation shall be shared equally by the Parties.

12.5 BINDING DISPUTE RESOLUTION If the matter is unresolved after submission of the matter to a mitigation procedure or to mediation, the Parties shall submit the matter to the binding dispute resolution procedure designated herein.

(Designate only one.)

Arbitration using the current Construction Industry Arbitration Rules of the American Arbitration Association

Litigation in either the state or federal court having jurisdiction of the matter in the location of the Project.

12.5.1 The costs of any binding dispute resolution procedures shall be borne by the non-prevailing Party, as determined by the adjudicator of the dispute. However, the costs of binding dispute resolution does not include attorney fees. The Parties are each responsible for paying for their own attorney fees.

12.5.2 VENUE The venue of any binding dispute resolution procedure shall be Des Moines, Iowa.

12.6 MULTIPARTY PROCEEDING All parties necessary to resolve a claim shall be parties to the same dispute resolution proceeding. Appropriate provisions shall be included in all other contracts relating to the Work to provide for the joinder or consolidation of such dispute resolution procedures.

12.7 LIEN RIGHTS The Trade Contractor acknowledges that it has no mechanic's lien rights on this Project because it is a public improvement project.

### ARTICLE 13 MISCELLANEOUS PROVISIONS

13.1 ASSIGNMENT Neither the Owner nor the Trade Contractor shall assign their interest in this Agreement without the written consent of the other except as to the assignment of proceeds. The terms and conditions of this Agreement shall be binding upon both Parties, their partners, successors, assigns and legal representatives. Neither Party to this Agreement shall assign the Agreement as a whole without written consent of the other. If either Party attempts to make such an assignment, that Party shall nevertheless remain legally responsible for all obligations under this Agreement, unless otherwise agreed by the other Party.

13.2 GOVERNING LAW This Agreement and all disputes arising there from shall be governed by the Iowa law.

13.3 SEVERABILITY The partial or complete invalidity of any one or more provisions of this Agreement shall not affect the validity or continuing force and effect of any other provision.



13.4 NO WAIVER OF PERFORMANCE The failure of either Party to insist, in any one or more instances, on the performance of any of the terms, covenants or conditions of this Agreement, or to exercise any of its rights, shall not be construed as a waiver or relinquishment of such term, covenant, condition or right with respect to further performance or any other term, covenant, condition or right.

13.5 TITLES AND GROUPINGS The titles given to the articles of this Agreement are for ease of reference only and shall not be relied upon or cited for any other purpose. The grouping of the articles in this Agreement and of the Owner's specifications under the various headings is solely for the purpose of convenient organization and in no event shall the grouping of provisions, the use of sections or the use of headings be construed to limit or alter the meaning of any provisions.

13.6 ASSISTANCE OF COUNSEL AND INTERPRETATION The Parties agree that they had the opportunity to obtain the assistance of counsel in reviewing the Agreement terms prior to execution. This Agreement shall be construed neither against nor in favor of either Party, but shall be construed in a neutral manner.

13.7 RIGHTS AND REMEDIES The Parties' rights, liabilities, responsibilities and remedies with respect to this Agreement, whether in contract, tort, negligence or otherwise, shall be exclusively those expressly set forth in this Agreement.

13.8 ADDITIONAL PROVISIONS (Insert here other provisions, if any, that pertain to this Agreement See Below.)

13.9 COMPLIANCE WITH LAW AND REGULATIONS The Trade Contractor shall comply with all applicable federal, state, and local laws, rules, ordinances, regulations and orders when performing services and/or performing work under this Agreement, including without limitation, all laws applicable to the prevention of discrimination in employment and the use of targeted small businesses as subcontractors or suppliers. The Trade Contractor declares that it has complied with all federal, state and local laws regarding business permits and licenses that may be required to provide the services and work required by this Agreement. The Trade Contractor further acknowledges that if this Project is a recipient of Federal financial assistance that it may be subject to requirements of Federal Acts and Executive Orders as mandated by Federal agencies having authority and jurisdiction to enforce and ensure compliance with such laws and regulations including, but not necessarily limited to, the Davis Bacon Act and other Federal Acts and Executive Orders.

13.10 EMPLOYMENT PRACTICES: It is the intent of the Iowa Department of Administrative Services to assure equal employment opportunity in all contract work as required by law. Vendors, are required to take affirmative action to ensure that applicants employed or seeking employment with them are treated equally as required by law. Vendors shall not illegally discriminate against any employee. During the course of the Project, the Vendor may be required to show compliance with the EEO and Affirmative Action requirements. Noncompliance with the provisions set forth at the time of contract award may result in termination or suspension of the Agreement in whole or in part. All vendors and service providers working under the terms of this Agreement are prohibited from engaging in discriminatory employment practices forbidden by Iowa law. Vendors shall complete and submit the Nondiscrimination Clause form for the Owner's approval.

13.11 RECIPROCAL BIDDER PREFERENCE In accordance with Iowa Code Section 73A.21, as amended in 2011 by HF 648, if the Trade Contractor is not a resident bidder of Iowa, as defined by law, then the Trade Contractor must specifically identify in writing with its bid any and all preferences or preferential treatment (including preferences related to labor) enforced by the state or foreign country in which the Trade Contractor is a resident. If the low bid Trade Contractor is not a resident bidder of Iowa and the Trade Contractor's foreign State of residence enforces such a preference then the Owner shall reciprocally enforce the preference in favor of a resident bidder of Iowa. Failure on the part of the Trade Contractor to completely and accurately abide by this legal requirement may, among other things, result in civil penalties and void this Agreement. The Trade Contractor should contact its attorney regarding this legal requirement if the Trade



Contractor has questions regarding its meaning or application.

13.12 LABOR RELATIONS The Trade Contractor shall comply with all Iowa and Federal labor laws. In accordance with Executive Order Number 69, issued by the Governor of Iowa on or about January 14, 2011, no project labor agreement (also known as a PLA), or similar, will be used on this Project. Iowa is a right to work state. No consultant, contractor, or employee shall be obligated to contract with or join any labor organization as a condition of performing work on this Project.

#### ARTICLE 14 TRADE CONTRACT DOCUMENTS

14.1 The Trade Contract Documents in existence at the time of execution of this Agreement are as follows:

RFBXXXXXXXXX Bid Package X

#### 14.2 INTERPRETATION OF TRADE CONTRACT DOCUMENTS

14.2.1 The drawings and specifications are complementary. If Trade Contract Work is shown only on one but not on the other, the Trade Contractor shall perform the Trade Contract Work as though fully described on both consistent with the Trade Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

14.2.2 In case of conflicts between the drawings and specifications, the specifications shall govern. In any case of omissions or errors in figures, drawings or specifications, the Trade Contractor shall immediately submit the matter to the Owner for clarification. The Owner's clarifications are final and binding on all Parties, subject to an equitable adjustment in Trade Contract Time or Price pursuant to ARTICLE 6 and ARTICLE 7 or dispute resolution in accordance with ARTICLE 12.

14.2.3 Where figures are given, they shall be preferred to scaled dimensions.

14.2.4 Any terms that have well-known technical or trade meanings, unless otherwise specifically defined in this Agreement, shall be interpreted in accordance with their well-known meanings. This Agreement entered into as of the date entered in ARTICLE 1.

14.2.5 PRECEDENCE In case of any inconsistency, conflict or ambiguity among the Trade Contract Documents, the documents shall govern in the following order: (a) Trade Contract Change Orders and written amendments to this Agreement; (b) this Agreement; (c) subject to subsection 14.2.2 the drawings, specifications and addenda issued prior to the execution of this Agreement; (d) approved submittals; (e) information furnished by the Owner pursuant to subsection 4.1.3; (f) other documents listed in this Agreement. Among all the Trade Contract Documents, the term or provision that is most specific or includes the latest date shall control. Information identified in one Trade Contract Document and not identified in another shall not be considered to be a conflict or inconsistency.

This Agreement entered into as of the date entered in ARTICLE 1.

OWNER State of Iowa, Department of Administrative Services



Trade Contractor: *Contractor Name*

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

(Authorized Representative)

Name:

Title:

Date:

Owner: State of Iowa - DAS

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

(Authorized Representative)

Name:

Title:

Date:

END OF DOCUMENT.

DRAFT



**SECTION 00 6000**

**PERFORMANCE AND PAYMENT BOND**

**PART 1 - GENERAL**

**1.01 PERFORMANCE AND PAYMENT BOND**

- A. Performance and payment bonds to be used on this project, ConsensusDocs 260 and 261 are attached for reference following this page. ConsensusDocs performance and payment bonds are not required (other standard forms are acceptable to the State of Iowa).

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION – NOT USED**

**END OF SECTION**



## CONSENSUSDOCS 260 PERFORMANCE BOND

This document was developed through a collaborative effort of organizations representing a wide cross-section of the design and construction industry. The organizations endorsing this document believe it represents a fair allocation of risk and responsibilities for all project participants.

Endorsing organizations recognize that this document must be reviewed and adapted to meet specific needs and applicable laws. This document has important legal and insurance consequences. You are encouraged to consult legal, insurance and surety advisors before completing or modifying this document. The software includes a notes section indicating where information is to be inserted to complete this document. Further information and endorsing organizations' perspectives are available at [www.consensusdocs.org/guidebook](http://www.consensusdocs.org/guidebook).

For Use with ConsensusDOCS 200, Standard Form of Agreement and General Conditions Between Owner and Constructor (Where the Contract Price is a Lump Sum) and ConsensusDOCS 500, Standard Agreement and General Conditions Between Owner and Construction Manager.

The Owner, \_\_\_\_\_, (the "Owner") and the Constructor, \_\_\_\_\_, (the "Constructor") have entered into a Contract (the "Contract") dated \_\_\_\_\_ for \_\_\_\_\_ (the "Project"). The Contract is incorporated by reference into this Performance Bond (the "Bond").

By virtue of this Bond, the Constructor as Principal and \_\_\_\_\_ as Surety ("Surety"), are bound to the Owner as Oblige in the maximum amount of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) (the "Bond Sum"). The Constructor and Surety hereby bind themselves, their heirs, executors,

---

**IMPORTANT:** A vertical line in the margin indicates a change has been made to the original text. Prior to signing, recipients may wish to request from the party producing the document a "redlined" version indicating changes to the original text. Consultation with legal and insurance counsel and careful review of the entire document are strongly encouraged.

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administrators, successors and assigns, jointly and severally, as provided herein.

1. GENERAL CONDITIONS It is the condition of this Bond that if the Constructor performs its Contract obligations (the "Work"), the Surety's obligations under this Bond are null and void, Otherwise the Surety's obligations shall remain in full force and effect. The Surety waives any requirement to be notified of alterations or extensions of time made by the Owner in the Contract. The Owner may not invoke the provisions of this Bond unless the Owner has performed its obligations pursuant to the Contract. Upon making demand on this Bond, the Owner shall make the Contract Balance (the total amount payable by the Owner to the Constructor pursuant to the Contract less amounts properly paid by the Owner to the Constructor) available to the Surety for completion of the Work.

2. SURETY OBLIGATIONS If the Constructor is in default pursuant to the Contract and the Owner has declared the Constructor in default, the Surety promptly may remedy the default or shall

- a. Complete the Work, with the consent of the Owner, through the Constructor or otherwise,
- b. Arrange for the completion of the Work by a Constructor acceptable to the Owner and secured by performance and payment bonds equivalent to those for the Contract issued by a qualified surety. The Surety shall make available as the Work progresses sufficient funds to pay the cost of completion of the Work less the Contract Balance up to the Bond Sum, or
- c. Waive its right to complete the Work and reimburse the Owner the amount of its reasonable costs, not to exceed the Bond Sum, to complete the Work less the Contract Balance.

3. DISPUTE RESOLUTION All disputes pursuant to this Bond shall be instituted in any court of competent jurisdiction in the location in which the Project is located and shall be commenced within two years after default of the Constructor or Substantial Completion of the Work, whichever occurs first. If this provision is prohibited by law, the minimum period of limitation available to sureties in the jurisdiction shall be applicable.

This Bond is entered into as of \_\_\_\_\_.

SURETY \_\_\_\_\_ (seal)

By: .....

Print Name: \_\_\_\_\_

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

(Attach Power of Attorney)

Witness: .....

CONSTRUCTOR \_\_\_\_\_ (seal)

By: .....

Print Name: \_\_\_\_\_

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

Witness: .....

(Additional signatures, if any, appear on attached page)

**IMPORTANT:** A vertical line in the margin indicates a change has been made to the original text. Prior to signing, recipients may wish to request from the party producing the document a "redlined" version indicating changes to the original text. Consultation with legal and insurance counsel and careful review of the entire document are strongly encouraged.

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**CONSENSUSDOCS 261  
PAYMENT BOND**

This document was developed through a collaborative effort of organizations representing a wide cross-section of the design and construction industry. The organizations endorsing this document believe it represents a fair allocation of risk and responsibilities for all project participants.

Endorsing organizations recognize that this document must be reviewed and adapted to meet specific needs and applicable laws. This document has important legal and insurance consequences. You are encouraged to consult legal, insurance and surety advisors before completing or modifying this document. The software includes a notes section indicating where information is to be inserted to complete this document. Further information and endorsing organizations' perspectives are available at [www.consensusdocs.org/guidebook](http://www.consensusdocs.org/guidebook).

For Use with ConsensusDOCS 200, Standard Form of Agreement and General Conditions Between Owner and Constructor (Where the Contract Price is a Lump Sum) and ConsensusDOCS 500, Standard Agreement and General Conditions Between Owner and Construction Manager.

The Owner, \_\_\_\_\_, (the "Owner")  
and the Constructor, \_\_\_\_\_,  
(the "Constructor") have entered into a Contract (the "Contract") dated \_\_\_\_\_ for  
\_\_\_\_\_ (the "Project"). The Contract is  
incorporated by reference into this Payment Bond (the "Bond").

By virtue of this Bond, the Constructor as Principal and \_\_\_\_\_ as  
Surety ("Surety"), are bound to the Owner as Obligee in the maximum amount of  
\_\_\_\_\_ Dollars (\$ \_\_\_\_\_) (the  
"Bond Sum"). The Constructor and Surety hereby bind themselves, their heirs, executors,

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**IMPORTANT:** A vertical line in the margin indicates a change has been made to the original text. Prior to signing, recipients may wish to request from the party producing the document a "redlined" version indicating changes to the original text. Consultation with legal and insurance counsel and careful review of the entire document are strongly encouraged.  
ConsensusDOCS 261 • PAYMENT BOND Copyright © 2007, Revised 2009 and 2011, ConsensusDOCS LLC, AN INDIVIDUAL PURCHASE OF THIS DOCUMENT PERMITS THE USER TO PRINT ONE CONTRACT FOR ONE PROJECT ONLY. YOU MAY ONLY MAKE COPIES OF A COMPLETED DOCUMENT FOR DISTRIBUTION TO PARTIES IN DIRECT CONNECTION WITH THE SPECIFIC CONSTRUCTION PROJECT. ANY OTHER USES, INCLUDING COPYING THE DOCUMENT, ARE STRICTLY PROHIBITED.

administrators, successors and assigns, jointly and severally, as provided herein.

1. GENERAL CONDITIONS It is the condition of this Bond that if the Constructor promptly makes payment of all sums for all labor, materials, and equipment furnished for use in the performance of the work required by the Contract, the Surety's obligations pursuant to this Bond are null and void. Otherwise the Surety's obligations shall remain in full force and effect. The Surety waives any requirement to be notified of alterations or extensions of time made by the Owner in the Contract.

2. SURETY OBLIGATION Every Claimant who has not been paid in full before the expiration of a period of ninety (90) Days after such Claimant provided or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, may have a right of action on this Bond. The Surety's obligation to the Claimant(s) shall not exceed the Bond Sum.

3. LIMITATION OF ACTION No suit or action shall be commenced on this Bond by any Claimant  
a. Unless Claimant, other than one having a direct Contract with the Constructor, shall have given written notice to the Constructor, the Owner and the Surety within ninety (90) Days after the Claimant provided or performed the last of the work or labor, or furnished the last of the materials for which the claim is made, stating with substantial accuracy the amount claimed and the name of the Party to whom the materials were furnished, or for whom the work or labor was provided or performed. Such notice shall be served by any means which provides written third party verification of delivery to the Constructor at any place it maintains an office or conducts business, or served in any manner in which legal process may be served in the state in which the Project is located.  
b. After the expiration of one (1) year from the date on which the Claimant last performed labor or furnished materials or equipment on the Project. If this provision is prohibited by law, the minimum period of limitation available to sureties in the jurisdiction shall be applicable.  
c. Other than in any court of competent jurisdiction in the location in which the Project is located.

4. CLAIMANT A Claimant is defined as an individual or entity having a direct contract with the Constructor or having a contract with a subcontractor having a direct contract with the Constructor to furnish labor, materials or equipment for use in the performance of the Contract.

This Bond is entered into as of \_\_\_\_\_.

SURETY \_\_\_\_\_ (seal)

By: .....

Print Name: \_\_\_\_\_

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

(Attach Power of Attorney)

Witness: .....

CONSTRUCTOR \_\_\_\_\_ (seal)

By: .....

Print Name: \_\_\_\_\_

**IMPORTANT:** A vertical line in the margin indicates a change has been made to the original text. Prior to signing, recipients may wish to request from the party producing the document a "redlined" version indicating changes to the original text. Consultation with legal and insurance counsel and careful review of the entire document are strongly encouraged.

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

Witness: .....

(Additional signatures, if any, appear on attached page)

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## Section 00 07000

### DAVIS BACON PREVAILING WAGE AND RELATED ACTS

Trade Contractors and Subcontractors will be required to comply with prevailing labor rate requirements for this project (**Davis-Bacon and Related Acts (40 USC §276a; 29 CFR Parts 1, 3, 5, 6 and 7)**) Trade Contractor is responsible to understand all requirements related to Davis-Bacon and Related Acts. Information provided in this section is for general guidance only.

The Davis-Bacon and Related Acts (DBRA) are administered by the Wage and Hour Division. These Acts apply to contractors and subcontractors performing on federally funded or assisted contracts in excess of \$2,000 for the construction, alteration, or repair (including painting and decorating) of public buildings or public works.

### Basic Provisions/Requirements

The Davis-Bacon Act requires that all contractors and subcontractors performing on federal contracts (and contractors or subcontractors performing on federally assisted contracts under the related Acts) in excess of \$2,000 pay their laborers and mechanics not less than the prevailing wage rates and fringe benefits listed in the contract's Davis-Bacon wage determination for corresponding classes of laborers and mechanics employed on similar projects in the area. Davis-Bacon labor standards clauses must be included in covered contracts.

Apprentices may be employed at less than predetermined rates if they are in an apprenticeship program registered with the Department of Labor or with a state apprenticeship agency recognized by the Department. Trainees may be employed at less than predetermined rates if they are in a training program certified by the Department.

Contractors and subcontractors on prime contracts in excess of \$100,000 are required, pursuant to the Contract Work Hours and Safety Standards Act, to pay employees one and one-half times their basic rates of pay for all hours over 40 worked on covered contract work in a workweek. Covered contractors and subcontractors are also required to pay employees weekly and to submit weekly certified payroll records to the contracting agency.

### Employee Rights

The Davis-Bacon and Related Acts provide laborers and mechanics on covered federally financed or assisted construction contracts the right to receive at least the locally prevailing wage rate and fringe benefits, as determined by the Department of Labor, for the type of work performed. The Wage and Hour Division and respective federal contracting agencies accept complaints of alleged Davis-Bacon violations.

All Trade Contractors are responsible for ensuring they use the most current rates as applicable in their respective bid(s).

# Recordkeeping, Reporting, Notices and Posters

## Notices and Posters

Every employer performing work covered by the labor standards of the DBRA must post the WH-1321 "Employee Rights Under the Davis-Bacon Act" poster at the site of the work in a prominent and accessible place where it may be easily seen by employees. There is no particular size requirement. The wage determination must be similarly posted.

## Recordkeeping

Under the DBRA, covered contractors must maintain payroll and basic records for all laborers and mechanics during the course of the work and for a period of three years thereafter. Records to be maintained include:

- Name, address, and Social Security number of each employee
- Each employee's work classifications
- Hourly rates of pay, including rates of contributions or costs anticipated for fringe benefits or their cash equivalents
- Daily and weekly numbers of hours worked
- Deductions made
- Actual wages paid
- If applicable, detailed information regarding various fringe benefit plans and programs, including records that show that the plan or program has been communicated in writing to the laborers and mechanics affected
- If applicable, detailed information regarding approved apprenticeship or trainee programs

Some of the records required to be kept under the law are also required under the Fair Labor Standards Act. See Wage and Hour Division Fact sheet #21: Recordkeeping Requirements under the Fair Labor Standards Act (FLSA).

## Reporting

Each covered contractor and subcontractor must, on a weekly basis, provide the federal agency a copy of all payrolls providing the information listed above under "Recordkeeping" for the preceding weekly payroll period. Each payroll submitted must be accompanied by a "Statement of Compliance." The contractor, subcontractor or the authorized officer or employee of the contractor or subcontractor who supervises the payment of wages must sign the weekly statement. Statements of Compliance are to be made on the form WH-347 "Payroll (For Contractors Optional Use)" or on any form with identical wording. This must be completed within seven days after the regular pay date for the pay period.

Contractors may also be asked to submit, via survey, wage data that may be used by the Wage and Hour Division to determine the locally prevailing wage rates that will apply to workers on Davis-Bacon and DBRA-covered projects. The submission of wage data is

encouraged, but voluntary. Contractors and others may use the WD-10 Form, Report of Construction Contractor's Wage Rates.

## **Penalties/Sanctions**

Contractors or subcontractors found to have disregarded their obligations to employees, or to have committed aggravated or willful violations while performing work on Davis-Bacon covered projects, may be subject to contract termination and debarment from future contracts for up to three years. In addition, contract payments may be withheld in sufficient amounts to satisfy liabilities for unpaid wages and liquidated damages that result from overtime violations of the Contract Work Hours and Safety Standards Act (CWHSSA).

Contractors and subcontractors may challenge determinations of violations and debarment before an Administrative Law Judge. Contractors and subcontractors may appeal decisions by Administrative Law Judge's with the Department's Administrative Review Board. Final Board determinations on violations may be appealed to and are enforceable through the federal courts.

Falsification of certified payroll records or the required kickback of wages may subject a contractor or subcontractor to civil or criminal prosecution, the penalty for which may be fines and/or imprisonment.

## **Relation to State, Local, and Other Federal Regulations:**

The Work of this Contract and those providing services or materials to this Project shall comply with the following Federal Regulations:

1. Title VI of the Civil Rights Act of 1964 (P.L. 88-352)
2. Iowa Civil Rights Act of 1965 (Iowa Executive Orders 15 & 34)
3. The Housing and Community Development Act of 1974, Section 109, Title 1 as amended (42 U.S.C 5309)
4. The Age Discrimination Act of 1975 as amended (42 U.S.C. 1601 et seq)
5. The Rehabilitation Act of 1973, Section 504, as amended (P.L. 93-112, 29 U.S.C. 794)
6. The Americans with Disabilities Act (P.L 101-336, 42 U.S.C. 12101-12213)
7. The Housing and Urban Development Act of 1968, Section 3, as amended (12 U.S.C. 1701u)
8. Federal Executive Order 11063, as amended by Executive Order 12259
9. Federal Executive Order 11246, as amended

10. Intergovernmental Personnel Act of 1970 (42 U.S.C. 4728-4763)
11. Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4801 et seq)
12. Title IX of the Education Amendments of 1972, as amended (20 U.S.C 16811683. And 1685-1686)
13. The Drug Abuse Office and Treatment Act of 1972 (P.L 92-255) as amended
14. The Comprehensive Alcohol Abuse and Alcoholism Prevention Treatment and Rehabilitator act of 1970 (P.L. 91-616) as amended.
15. 523-527 of the Public Health Service Act of 1972 (42 U.S.C 290 dd-3 and 290 sc3) as amended.
16. Title VIII of the Civil Rights Act of 1968 (42 U.S.C. 3601 et seq.) as amended.
17. Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646)
18. The Davis Bacon Act (40 U.S.C 276m to 276m-7)
19. The Copeland Act (40 U.S.C. 276c and 8 U.S.C. 874)
20. The Contract Work Hours and Safety Standards Act (40 U.S.C. 327333)
21. Any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made.
22. The requirements of any other nondiscrimination statutes that may apply to the application.

## **Compliance Assistance Available**

The Department of Labor provides employers, workers, and others with clear and easy-to-access information and assistance on how to comply with the Davis-Bacon and Related Acts, such as the [DBRA Forms page](#). Other compliance assistance related to the Act — including the [Davis-Bacon and Related Acts \(DBRA\) Web Page](#) and regulatory and interpretive materials — is available on the [Compliance Assistance "By Law" Web page](#). Also, the [Wage Determinations OnLine \(WDOL\) Web site](#) provides a single location for federal contracting officers to obtain Davis-Bacon wage determinations for use in covered contracts. The WDOL Web site library provides a variety of links that relate to compliance with the prevailing wage laws that apply to federal and federally assisted contracts.



POWER EQUIPMENT OPERATOR

Class 2

Forklift (Used for steel erection or machinery moving).....\$ 37.62 18.35

Class 3

Forklift (Other than above).....\$ 35.29 18.35

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ENGI0234-019 05/01/2025

Rates Fringes

POWER EQUIPMENT OPERATOR

(Crane).....\$ 40.75 18.35

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IRON0111-002 07/01/2024

Rates Fringes

IRONWORKER (Reinforcing).....\$ 37.50 30.99

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IRON0577-001 06/01/2025

Rates Fringes

IRONWORKER (Ornamental).....\$ 36.30 25.80

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LAB00177-002 05/01/2025

Rates Fringes

LABORER (Mason Tender - Brick)...\$ 29.36 17.99

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PAIN0246-001 05/01/2025

Rates Fringes

PAINTER (Brush and Roller).....\$ 32.41 16.3

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PAIN0676-001 05/01/2024

Rates Fringes

DRYWALL FINISHER/TAPER.....\$ 31.82 19.05

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SFIA0669-002 04/01/2025

Rates Fringes

SPRINKLER FITTER (Fire Sprinklers).....	\$ 45.99	26.42
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 SHEE0045-003 06/01/2024

	Rates	Fringes
SHEET METAL WORKER (Includes HVAC Duct Installation).....	\$ 39.38	24.95

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 \* UAVG-IA-0001 01/01/2025

	Rates	Fringes
MILLWRIGHT.....	\$ 35.93	28.05

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 \* UAVG-IA-0002 01/01/2025

	Rates	Fringes
PIPEFITTER, Includes HVAC Pipe and Unit Installation.....	\$ 41.64	23.22

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 SUIA2016-022 07/19/2016

	Rates	Fringes
BRICKLAYER.....	\$ 25.93	9.70
CARPENTER, Includes Acoustical Ceiling Installation, and Drywall Hanging (Excludes Form Work).....	\$ 23.30	12.28
CEMENT MASON/CONCRETE FINISHER....	\$ 21.12	11.07
ELECTRICIAN, Includes HVAC/Temperature Controls Installation.....	\$ 26.11	6.56
INSULATOR: Mechanical (Duct, Pipe and Mechanical System Insulation).....	\$ 19.04	7.32
IRONWORKER, STRUCTURAL.....	\$ 25.29	15.89
LABORER: Common or General.....	\$ 17.25	6.93
LABORER: Landscape.....	\$ 14.81	0.00

LABORER: Pipelayer.....	\$ 18.00	2.70
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 27.31	15.35
OPERATOR: Bobcat/Skid Steer/Skid Loader.....	\$ 27.55	22.85
OPERATOR: Bulldozer.....	\$ 22.31	8.36
OPERATOR: Loader.....	\$ 25.80	17.19
PLUMBER.....	\$ 31.85	15.12
ROOFER.....	\$ 14.00	3.91

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

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

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the contractor must pay all covered workers at least \$13.30 per

hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

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

#### Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

#### Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE:

UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

#### Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

#### State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

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## WAGE DETERMINATION APPEALS PROCESS

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

- a) a survey underlying a wage determination
- b) an existing published wage determination
- c) an initial WHD letter setting forth a position on a wage determination matter
- d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to [davisbaconinfo@dol.gov](mailto:davisbaconinfo@dol.gov) or by mail to:

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

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to [BCWD-Office@dol.gov](mailto:BCWD-Office@dol.gov) or by mail to:

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

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to [dba.reconsideration@dol.gov](mailto:dba.reconsideration@dol.gov) or by mail to:

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

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that

the requestor considers relevant to the issue.

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

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

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END OF GENERAL DECISION

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## SECTION 01 1200

### CONTRACT SUMMARY

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Project Information
- B. Project Summary
- C. Bid Scope Summary
- D. Work Hour Restrictions
- E. Access to Site
- F. Coordination with Occupants
- G. Rules for Construction Workers
- H. Bid Package Instructions

##### 1.02 PROJECT INFORMATION

- A. Facility Name/Location: Iowa Veterans Home, 1301 Summit St, Marshalltown, IA 50158
- B. DAS Project #: 9487.00
- C. Owner: State of Iowa, Department of Administrative Services, Hoover State Office Building, Level 3, 1305 East Walnut Street, Des Moines, IA 50319
- D. Owner's Representative: Brad Tonyan, Iowa Department of Administrative Services, 109 SE 13th Street, Des Moines, IA 50319
- E. Construction Manager: Scott Gustafson, DCI Group, 220 SE 6<sup>th</sup> Street, Suite 200, Des Moines, IA 50309

##### 1.03 PROJECT SUMMARY

- A. The project includes sub-grade excavation and waterproofing of the lower levels of the west and north side of the Loftus Building and the lower level of the northwest area of the Malloy Building.
- B. Target date to provide substantial completion is 11/12/2026.

##### 1.04 BID SCOPE SUMMARY

- A. Scope Applicable to All Bid Packages:
  - 1. The Contractor's Work includes all labor, supervision, materials, equipment, services, supplies, tools, facilities, transportation, hoisting, storage, receiving, licenses, inspections, certifications, overhead, profit, or other items required or reasonably inferable to properly and timely perform and complete all work and services to be performed by the Contractor pursuant to this Agreement. Unless specifically stated otherwise, incidental work required to accomplish the work of this Bid Package shall be included in the bid. This would include, but not be limited to, temporary facilities, protection of the work, security of equipment, materials, and work in progress, etc. Contractor's Work shall be performed in accordance with the Drawings, Specification Divisions 00 and 01, and Specification sections applicable to each Contractor's scope.
  - 2. Contractor is responsible for all labor and equipment to unload, account for all material delivered, stock, and delivery for this scope of work. Storage and delivery of materials and equipment at the Site shall be permitted only to the extent approved in advance by the Construction Manager, and if anything, so stored, obstructs the progress of any portion of the work, it shall be promptly removed or relocated by the Contractor without reimbursement.
  - 3. On site supervision by Prime Contractor at all times work by that contractor or their subcontractors/suppliers is taking place.

4. Provide all temporary facilities required for this scope of work including trailer, trailer power, telephone, secured storage, temporary power for work, temporary and task lighting for work, etc. as determined necessary by Contractor. Coordinate location of trailers, material storage and utility lines with Construction Manager. Limited space is available, and permission to bring any such facility or excess materials on to the site shall be approved by the Construction Manager.
5. Contractor shall provide all equipment and tools for Contractor's own cleanup. Clean up shall be done at end of every shift or more frequently if required for the Contractor to perform their work, for other Contractors to perform their work, as required by the Owner's operations, and at the discretion of the Construction Manager.
6. All turf, landscaping, and subgrade disturbances caused by equipment traffic or other activities related to the Contractor's scope shall be repaired or restored to proper conditions by the Contractor.
7. Protect adjacent existing building elements from damage from Scope of work. Repair existing building elements damaged during Contractor's Scope of work.

#### **1.05 WORK HOUR RESTRICTIONS**

- A. Work hours are from 07:00 AM to 05:00 PM, Monday through Friday unless arrangements are made in advance.

#### **1.06 CONTRACTOR USE OF SITE AND PREMISES**

- A. Construction Operations: Limited to areas noted on Drawings.
- B. Provide access to and from site as required by law and Owner:
  1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
  2. Do not obstruct roadways, sidewalks, or other public ways without permission of Owner and permit if required.
- C. Facility will be occupied at all times during duration of work. Contractor personnel shall conduct themselves in an agreeable manner at all times. Failure to do so may result in removal from the work site.
- D. All contractor staging and parking shall take place in the Northwest contractor staging area. All contractors shall be aware this area will be shared with a roofing replacement project which will be taking place simultaneously and not part of this project.

#### **1.07 OWNER OCCUPANCY**

- A. Owner intends to occupy the Project upon Substantial Completion.
- B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- C. Schedule the Work to accommodate Owner occupancy.
- D. The Owner has scheduled activities in the Courtyard during the duration of this project. All Contractors will be required to coordinate around those activities. A list of the scheduled events will be provided to the awarded Contractors for coordinating with the Construction Manager.

#### **1.08 RULES FOR CONSTRUCTION WORKERS**

- A. The staff of the State of Iowa has a responsibility to protect the public by providing a secure environment. All work site rules must be followed to the letter, at all times.
- B. All construction workers must have a background check completed prior to entering the campus to perform work.
- C. Hot Work Permit Processes and Fire Watch, when necessary, will be adhered to for this project.
- D. All State properties are tobacco free. No smoking will be permitted or tolerated on campus unless in designated areas.
- E. You are permitted access only to the work site and no other area of the institution.

- F. No drugs, alcohol, or firearms are allowed on the work site.
- G. Do not leave money, drugs, alcohol, or firearms in your personal vehicle.
- H. Company and personal vehicles are to be parked and locked in designated or authorized areas of the work.
- I. Secure all tools at the end of the day.
- J. Maintain control of all tools, supplies, and debris at all times during the project.
- K. Never leave keys in any vehicle. If a security officer finds keys in a vehicle, they are under orders to turn them into a security supervisor.
- L. Do not give anything to residents or take anything from residents; if they offer, inform your supervisor.
- M. Secure all tools at the end of each day. Never leave tools unattended. All tools shall be checked in at the beginning of the day and checked out at the end of the day. If security officers find loose tools, they are under orders to turn them in to their supervisor.
- N. All delivery vehicles must go directly to the job site. Extra time should be anticipated for all deliveries. Provide 24-hour notice to the facility for deliveries.
- O. During an emergency, follow the instructions of the security staff.
- P. Contractor shall wear clothing of a different color, pattern, fashion, etc. as to distinguish themselves from inmates.
- Q. All contractors shall a representative from their company check-in at the Loftus building switchboard to collect contractor badges for all workers of their company or subcontractors. These will need to be checked back in at the end of each work shift.
- R. Contractors shall develop a weekly sequencing schedule for review with the construction manager and Iowa Veterans Home. The Weekly Work Plan (WWP) will be reviewed daily with contractors to ensure work is taking place as intended for the day.
- S. Daily, the work area should be cleared of all debris and relocated to the dumpster in the staging area for residents' safety.
- T. When traversing existing pavement, all contractors shall take precautions to not damage or blemish pavement. This shall include, but not be limited to, bridging pavement when damage is a concern. Bridging material shall be removed when not in use if it may impact resident or employee pathways. Any damage to pavement during construction shall be replaced at project completion at no additional cost to the project.
- U. Contractors shall provide protection to bridge existing tunnel locations. IVH will provide the locations this will be required to occur.

## 1.09 BID PACKAGE INSTRUCTIONS

- A. **Bid Package #01** – Sitework, Utilities, and Concrete: Trade Contractor shall include all the following, but not limited to, as part of the contract:
  - 1. Includes specification:
    - a. Division 00 Procurement and Contracting Requirements
    - b. Division 01 General Requirements
    - c. 02 4119 Selective Structure Demolition
    - d. Division 03 Concrete
    - e. Division 05 Metals
    - f. Division 07 Thermal and Moisture Protection
    - g. Division 22 Plumbing
    - h. Division 31 Earthwork
    - i. Division 32 Exterior Improvements
    - j. Division 33 Site Utilities
  - 2. General:
    - a. Prior to the start of construction, this contractor shall coordinate a joint locate meeting with DCI Group, utility providers, and the Iowa Veterans Home.
    - b. This contractor shall be responsible for the installation, maintenance, and removal of temporary orange snow fencing to separate the construction area from the public. Intermediate posts for fencing shall be spaced no greater than 6' and top

rail support shall be installed and maintained to avoid sagging in the fence. Fencing location shall be coordinated with the construction manager and Iowa Veterans Home prior to installation.

- c. All layout and staking required for the work of this bid package shall be the responsibility of this bid package.

3. Sitework:

- a. This contractor shall be responsible for establishing, maintaining, and removing erosion control measures for the duration of the project. Erosion control measures shall be in place at the construction and staging areas and shall meet or exceed industry standards for erosion control. Contractor shall submit and erosion control plan to the construction manager and designer for review prior to proceeding.
- b. All excavations for storm utilities and waterproofing shall be the responsibility of this contractor. Coordinate with Bid Package #03 on excavation requirements for waterproofing. Contractor shall hand dig to locate all utilities.
- c. This contractor shall be responsible for backfilling at the completion of utilities and waterproofing work. Backfilling of excavations completed by Bid Package #02 will be the responsibility of that bid package.
- d. It shall be the responsibility of this contractor to strip all topsoil, stockpile, and respread prior to landscaping and turf repairs. Topsoil shall be free of rocks and debris to meet the requirements of the project documents. Respread of topsoil shall include all areas disturbed by construction. Contractor shall import additional topsoil if necessary. Contractor shall be aware the area stockpiling of soil will need to be located in the northeast staging area.
- e. This contract shall be responsible for all grading activities. This shall include, but not be limited to, rough grading, final grading, and topsoil spreading.
- f. Tree, stump, and roots removal shall be the responsibility of this contractor.
- g. All concrete, landscaping, and site features called to be demolished or that needs removed to accommodate the scope of this bid package shall be the responsibility of this contractor. This contractor shall salvage all landscape rock and shall coordinate with Bid Package #04 on turnover of rock for reinstallation by that bid package. Salvaged rock shall be free of soil and debris.
- h. All dewatering of excavations by this contractor shall be the responsibility of this contractor, including dewatering if necessary, prior to waterproofing work.
- i. All new and existing exposed non-metallic utilities should have detectable warning tape installed along length of utility by this contractor.
- j. Steel beam and plate shoring and underpinning at the existing awning footing shall be the responsibility of this contractor.
- k. Were utilities are encountered, contractor shall provide protection from damage including support beneath utilities if excavations will be completed beneath.
- l. This contractor shall be responsible for coordinating and scheduling an Owner provided testing agency on all construction materials testing requirements.

4. Concrete:

- a. This contractor shall be responsible for a new concrete. This shall include, but not be limited to, sidewalks, curbs, concrete trench drain and trench drain grate, new drainage flume and swale, compaction, sub-base, insulation, reinforcing, jointing, sealants, finishing and curing.
- b. Water repellent and saltguard installation shall be the responsibility of this contractor.

5. Storm Utilities:

- a. This contractor shall be responsible for all storm utilities, including but not limited to, demolition of existing, new inlets, drains, cleanouts, flumes, bedding, and pipes. This shall include new 2" roof drain with cast iron dome grate and piping at area well. This shall include all work required for the sump pumps.

- b. Sump pit excavation, basins, sump pumps, controls/alarming, routing and connections of sump pump piping is the responsibility of this contractor. Concrete removal, patching, and concrete sealing to accommodate sump pit installations are also included in this scope. Electrical outlets for sump pump operation will be provided by Bid Package #02. Coordinate with Bid Package #02 on requirements.
- c. Drain tile installations shall be the responsibility of this contractor. This shall include but not be limited to, tile, cleanouts, silt fabric, drainage course, drainage fabric, and connections into storm structures. Core drilling and sealing penetrations required for drain tile lines into the building shall be the responsibility of this contractor.
- d. Disconnection and reconnection of the sprinkler discharge pipe to accommodate new work will also be the responsibility of this bid package.
- e. All concrete removals, replacements, and excavation for utilities and piping installations shall be completed by this contractor. Fire caulking at floor penetration where identified shall also be the responsibility of this contractor.
- f. Where utility pipes have been removed from the building foundation, this contractor shall patch holes with concrete repair mortar, spray foam insulation, or 10" galvanized plate as called for in the documents and make ready for waterproofing installation.
- g. This contractor shall install water stops, through wall hydraulic cement, and link seal sleeves at pipe penetrations where called for in the documents.

**B. Bid Package #02 – Electrical and Low Voltage:** Trade Contractor shall include all the following, but not limited to, as part of the contract:

- 1. Includes specification:
  - a. Division 00 Procurement and Contracting Requirements
  - b. Division 01 General Requirements
  - c. Division 26 Electrical
  - d. Division 31 Earthwork
- 2. All electrical and low voltage demolition and new work shall be the responsibility of this contractor. This shall include excavation and backfill as needed for this scope of work.
- 3. Outlets for sump pump operation shall be provided by this bid package. Coordinate with Bid Package #01 on requirements.
- 4. This contractor shall be responsible for all new light fixtures.
- 5. New cable tray and installation of circuits in new tray shall be the responsibility of this contractor.
- 6. This contractor shall demo the existing ceiling exhaust fan, wiring, controls, and gooseneck hood.
- 7. Contractor shall turnover demolished equipment to the Owner or properly dispose of equipment if Owner does not want to retain in.
- 8. This contractor shall be responsible for all permitting and coordination with utility providers if required for work within the transformer.
- 9. It shall be the responsibility of this contractor to coordinate a pre cutover meeting with DCI Group, Iowa Veterans Home, and the designer prior to removing power to the building.
- 10. Where work by this contractor penetrates exterior walls, this contractor shall be responsible for installing link seal sleeve system and sealing penetration.
- 11. Where electrical lines have been demolished and penetrations abandoned through the building, this contractor shall be responsible for patching.

**C. Bid Package #03 – Waterproofing:** Trade Contractor shall include all the following, but not limited to, as part of the contract:

- 1. Includes specification:
  - a. Division 00 Procurement and Contracting Requirements
  - b. Division 01 General Requirements
  - c. Division 03 Concrete

- d. Division 07 Thermal and Moisture Protection
- e. Division 32 Exterior Improvements
- 2. This contractor shall be responsible for all waterproofing of the building and existing tunnel. This scope shall include but not be limited to excavation, water stops, sealants, cants, waterproofing membrane, terminations, drainage board, and protection board. Piping water stops to be by Bid Package #01. Cleaning surfaces to provide proper adhesion and per manufacturer's requirements will be the responsibility of this contractor.
- 3. Waterproofing at new and existing penetrations shall be the responsibility of this contractor.
- 4. This contractor shall inspect all precast grouting setting joints that are exposed from excavation and replace any bad grout areas.
- 5. This contractor shall replace precast wall joint sealants and sealant dams where identified in the project documents.
- 6. Removal of the existing EPDM sheet membrane lining in the area way pit, preparing substrate, and applying fluid membrane will be the responsibility of this contractor.
- 7. Contractor shall allow for construction manager and designer inspection of all substrate conditions prior to waterproofing installation as well as final waterproofing installation prior to backfill.
- 8. Deck coatings at the existing concrete patio will be the responsibility of this contractor. This shall include cleaning, routing and sealing cracks, and protection. This contractor shall be responsible for where existing construction must be temporarily removed to complete this scope.
- 9. Preparing surfaces and installation hydraulic cement in joints where called for will be the responsibility of this contractor.
- 10. This contractor shall patch cracks in exposed portion of area way foundation wall and install Cementous coating on top of exposed concrete and down face of wall.
- 11. It shall be the responsibility of this contractor to remove sealants and install new expansion joints at area way wall and concrete patio.
- 12. All epoxy injection grouting shall be completed by this contractor.

**D. Bid Package #04 – General Construction:** Trade Contractor shall include all the following, but not limited to, as part of the contract:

- 1. Includes specification:
  - a. Division 00 Procurement and Contracting Requirements
  - b. Division 01 General Requirements
  - c. Division 02 Existing Conditions
  - d. Division 05 Metals
  - e. Division 06 Wood, Plastics, and Composites
  - f. Division 07 Thermal and Moisture Protection
  - g. Division 09 Finishes
  - h. Division 32 Exterior Improvements
- 2. General Construction:
  - a. Removal, modification, and reinstallation of handrails shall be the responsibility of this contractor. This shall include preparing and painting handrails.
  - b. This contractor shall be responsible for modifications to the area well roofs. This shall include new roof panel assemblies, sheathing, sills, sealants between top of wall and new 2x8s, framing as required, vapor barrier, flashing, fascia, roof hatch and curb, and pit ladder.
  - c. Demolition of the existing vent and infill at the area well-sheet metal cover shall be the responsibility of this contractor.
  - d. Removal and replacement of ceilings tiles shall be the responsibility of this contractor.
  - e. This contractor shall be responsible for all painting and preparation of substrate.
  - f. Removal and replacement of vinyl base shall be the responsibility of this contractor.
- 3. Landscaping:

- a. This contractor shall be responsible for all landscaping including, but not limited to, seeding/sod, landscape edging, rock, and plantings.
  - b. All areas disturbed by construction activities should be prepped and seeded or sodded by this contractor. Contractor shall anticipate minor final grading.
  - c. All reinstallation of landscape rock shall be the responsibility of this bid package. This shall include new ground cloth where rock is reinstalled. Coordinate with Bid Package #01 on turnover of landscape rock salvaged by that bid package.
  - d. Provide landscaping rock infill at sunshade awning post where opening in concrete is left for access to anchor bolts.
- E. **Unit Price #01** – Wood Framing Repairs: Trade Contractor shall include all the following, but not limited to, as part of the contract:
- 1. Description: Provide the unit cost to repair existing water-damaged or dry rotted wood rafters under the metal roof areas with standard wood framing lumber. Splice onto existing rafters by sistering on new sections of 2x8. Overlap onto existing solid wood minimum of 3 feet. Provide screw fasteners at 8” staggered across the width of the boards for attachment to existing. Pricing based on standard 2x8.
  - 2. Unit of Measurement: 4 Lineal Feet.
  - 3. Unit prices include all necessary material, plus cost for delivery, installation, insurance, overhead, and profit.
  - 4. Owner reserves the right to reject Contractor’s measurements of work in place that involves use of established unit prices and to have this work measured, at the Owner’s expense, by an independent surveyor acceptable to the Contractor.
- F. **Unit Price #02** – Concrete Foundation Crack Repairs: Trade Contractor shall include all the following, but not limited to, as part of the contract:
- 1. Description: State the lineal foot cost to perform additional crack repairs on the exposed concrete foundation walls. Repair cracks on the exterior concrete surfaces by epoxy injection using ports and dams as needed on horizontal and vertical surfaces. Prepare the concrete and install epoxy injection per specification Section 03 0137 – Rehabilitation of Cast-In-Place Concrete.
  - 2. Unit of Measurement: 1 Lineal Foot.
  - 3. Unit prices include all necessary material, plus cost for delivery, installation, insurance, overhead, and profit.
  - 4. Owner reserves the right to reject Contractor’s measurements of work in place that involves use of established unit prices and to have this work measured, at the Owner’s expense, by an independent surveyor acceptable to the Contractor.
- G. **Alternate #01** – (DEDUCT) Basement Interior Repairs: Trade Contractor shall include all the following, but not limited to, as part of the contract:
- 1. Description: State the lump sum price to deduct from the base bid all work called out for basement finish repairs on both the Loftus and Malloy buildings as called for on Drawing Sheet A1.2 and the finish repairs called for on Sheet A1.3.
- H. **Work Performed by Owner:** The State of Iowa and Iowa Veterans Home will perform the following work items:
- 1. Relocate all moveable furniture, fixtures and equipment (FF&E), including window treatments; and personal materials from each sequenced work area prior to demolition and construction activities and after new construction is completed.
  - 2. Water maintenance of new seed or sod.
- I. **Owner Provided:** The State of Iowa will provide the following items for the project:
- 1. The Construction Manager shall be responsible for dumpster service for all bid packages for the duration of the project. Dumpsters shall be located in the staging area identified on the project documents.

2. The Construction Manager shall provide temporary toilet facilities for the duration of the project. The toilet facilities shall be located in the staging area identified on the project documents.

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION – NOT USED**

**END OF SECTION**

## SECTION 01 1201

### GENERAL WORK REQUIREMENTS

#### 1.01 BIDDING

- A. Trade Contractor shall include all applicable fees, permits, freight, hoisting, scaffolding, clean up, supervision, overhead, etc. to perform his work.
- B. The owner will provide the general building permit only. All other permits required for completion of contractor's scope of work or by any governing body are the responsibility of said contractor.
- C. Bidders to review ALL Bid Packages to fully understand the requirements of each package. Where two bid packages conflict, confirm with Construction Manager as to which package is to perform the work noted before bidding. After bidding, any conflict noted will be evaluated by the Construction Manager. The Construction Manager will then determine which package should perform the work and which package will credit the associated work's cost.
- D. Where conditions conflict in the project manual or project drawings, contact the Construction Manager for clarification. When in doubt figure the more extensive requirement.
- E. Each contractor is responsible for the identification of alternates and how they relate to each bid package. If a bid package is affected in ANY way by ANY of the alternates, an add/deduct should be noted on the bid form. If there is no change in cost write zero dollars.
- F. The Contractor should visit the site of the Work to acquaint the firm with all local conditions affecting the Contract, including the structure of the ground, the obstacles which may be encountered, and all other conditions relative to the Work to be performed; and shall not be allowed any extra compensation by reason of any difficulties or obstacles which the Bidder could have discovered or reasonably anticipated prior to Bidding. Contractor shall review Instructions to Bidders for coordination of site visits.
- G. On all project Drawings, figures take precedence over measurement by scale, and any scaling is done at the Contractor's own risk. The Design Professional shall decide on questions that may arise regarding the meaning and intent of the Project Drawings and Project Specifications. Should any details or figures have been omitted which are necessary to a clear understanding of the Work or should any error appear in either, or should discrepancies be found between the Project Drawings and Project Specifications, it shall be the duty of the Contractor to notify the Construction Manager of such omissions, errors, or discrepancies, and in no case proceed in uncertainty. Mistakes resulting from the Contractor's neglect to notify the Construction Manager in such matters shall be corrected at the expense of the Contractor. Bidders are responsible for all electronic documents and their use is at their risk.
- H. Construction Manager (DCI Group) has been engaged for this Project to serve as an advisor to the Owner and to provide assistance in administering the Contract for Construction between Owner and the Contractor. The Construction Manager will not be providing any self-performed work for this Project.
- I. All Contractors are responsible for on-the-job supervision of their work, or any subcontracted work. An onsite Superintendent or lead foreman is required during any time that work is being performed to coordinate their work and work with other trades. No superintendent or lead foreman may be replaced without approval of the Owner and DCI Group. Any work necessary to be performed after the regular working hours shall be supervised and shall be done at no additional cost to the Owner.
- J. All food and drinks shall be confined to CM designated areas and a maintained covered trash container shall be provided by the contractor. Failure to comply with this rule may cause a need for extra cleaning efforts by others which will result in a back charge to the Contractor.
- K. Tools, materials, and equipment storage and security is the responsibility of each Contractor.
- L. All work shall comply with the applicable codes and standards adopted by the Authority having Jurisdiction.
- M. All Authorities having Jurisdiction inspections shall be requested by the responsible contractor and coordinated through the Construction Manager. Attendance by contractors is mandatory as applicable to the work being inspected.
- N. All contractors must have the appropriate licenses to perform work in the jurisdictions.

- O. Before ordering any materials or performing any Work, the Contractors shall verify all measurements at the Project Site for the particular Work and be responsible for the correctness of same. No extra charge or compensation will be allowed to the Contractor on account of differences between actual dimensions and the measurements shown on the Project Drawings. Any noticeable discrepancy in this request shall be reported to the Construction Manager immediately for his consideration and decision. All the component parts of the Work shall be carefully checked and laid out in order that the structure as a whole shall conform to the intent of the Project Drawings and Project Manual.
- P. The Contractor shall have personnel attending regular project meetings. These meetings will be held at intervals established by the Construction Manager. Contractor must have representative attending when they are on the job or needed for coordination prior to having work start on the project. The representative attending must be able to adequately represent the Contractor and speak on the Contractors behalf providing valuable information to the meeting; specifically, things such as schedule, cost, production, manpower, etc.
- Q. Contractor will be required to attend all pre-installation conferences before commencement of related work.
- R. Trade Contractor shall complete a daily log for each workday on site and submit to Construction Manager. Content of daily log will be directed by Construction Manager.
- S. This Contractor is responsible to protect all openings made to the existing buildings envelope, as required for this bid package work, for the entire time work is being conducted until the new work scope is completed. This protection shall include but is not limited to protection against; rain, snow, wind infiltration, security and temperature fluctuations. Trade Contractor will maintain all weather protection provisions until permanent work is completed. All costs relating to damage incurred to existing facilities as a result of improper weather protection provisions will be borne by the Trade Contractor.

## **1.02 SAFETY**

- A. The contractor shall comply with all local and federal, safety and health requirements.
  - 1. Contractor will provide a safety plan customized for the project to DCI Group.
  - 2. It is the contractor's responsibility to notify other contractor's on the jobsite of any hazardous materials to which their employees may be exposed.
  - 3. All Contractors shall inform their employees to immediately advise their supervisor of any unsafe conditions that are encountered. The supervisor shall promptly remediate such danger and/or contact the Construction Manager.
  - 4. Contractors performing hot work are to have a fire extinguisher in their work areas at all times as applicable.
  - 5. All Contractors are responsible for their own fall protection.
  - 6. Contractors are required to provide emergency phone numbers upon the request of the Construction Manager. Emergency phone numbers are numbers where the Contractor can be reached during off hours.
  - 7. All floor edge, roof and similar openings, barricades, handrails, or cabling for fall protection will be installed by the Contractor that creates the hazard as part of that Contractor's scope of work. At no time shall an opening be left unprotected from fall hazard. All Contractors shall protect and maintain such devices per OSHA standards. When a device conflicts with the work of this bid package or when the work of this bid package replaces the need for such devices, this Contractor is responsible for removal. If the work of this Contractor requires additional holes/penetrations, this Contractor shall provide necessary protection until final materials are installed.
  - 8. No fire exit can be blocked at any time.

## **1.03 SITE MANAGEMENT**

- A. All contractors are responsible for all their own utility locates. This shall include both public and private locates. All Contractors shall coordinate locates with One Call Services.

- B. When active services are encountered in the Work, protect, brace and support existing active sewers, gas, electric or other services, where required for proper execution of the Work. If existing active services are encountered that require relocation, make request in writing for determination. Do not proceed with Work until written directions are received. Do not prevent or disturb operation of active services that are to remain.
- C. All contractors are required to protect their work. Provide proper protection for all existing work performed by others when performing your work next to, or around, other materials. Repair or replacement of any damaged material will be the responsibility of the contractor who damaged it.
- D. All contractors/vendors are responsible for their own cutting and patching unless otherwise specified.
- E. All contractors shall provide protection to the building at any penetrations created by that bid package. This shall include protection from rain, wind, temperatures, humidity, animals, or unauthorized access. Protection shall be in place and maintained until final penetration sealants or repairs are made.
- F. All contractors are responsible for maintaining dust control during their work.
- G. Contractors shall be responsible for maintaining traffic control coordination with the Owner, DCI Group, and the Authority Having Jurisdiction.
- H. Public and private roadways will be maintained and cleaned as required by the contractor leaving debris, mud, excess gravel, etc. on roadways at their expense as defined in bid packages.
- I. No steel track mounted equipment will be allowed on finished paved surfaces. Any damage to the finished paved surfaces will be repaired at the cost to the contractor causing such damage.
- J. Bridging of finished pavement will be responsibility of the contractor. This includes bridging curbs, pavement, sidewalks, etc. Any damage to the aforementioned including pavement markings will be repaired or replaced at the cost of the contractor causing such damage.
- K. Contractors that have work that requires equipment off the existing road ways are required to locate and protect from damage all under and above ground existing features such as utilities, tunnels, landscaping, etc... The Contractor will be responsible to repair back to original condition any damages that occur, including but not limited to ruts and sod damage.
- L. Any areas disturbed or damaged by one's operation are to be repaired to Owner/Construction Manager's satisfaction.
- M. Contractor shall clean their installed materials prior to the next successor activity.
- N. Any signs located on the jobsite must be approved by the Construction Manager. Signage will not be allowed in most cases unless it is required for safety or provides instruction.
- O. Receiving, unloading and handling of material provided by the bid package shall be included. Spotting location shall be coordinated with the Construction Manager. All deliveries shall be coordinated with other Contractors and Construction Manager in advance of the delivery. Provide freight to the jobsite for any material provided. If storage is not available onsite, each bid package shall include other means of secure storage. If contractor is not onsite to unload delivery, the delivery will be rejected and will have to be re-scheduled at the contractor's expense. Materials must be stored off the ground, out of the mud and on a solid surface. As required or needed, material should be stored on dunnage or pallets in order to keep it off the ground or surface below. Special storage is the responsibility of respective contractor.
- P. Contractor shall not store materials within construction designated locations without approval from Construction Manager. No materials storage will be allowed that may inhibit construction progress.
- Q. The Contractors shall layout and correctly establish all lines, levels, grades, positions, walls, partitions, equipment and location of all Work on the Project and be responsible for their accuracy and proper correlation with control lines, monuments and data furnished. Such monuments and data shall be carefully preserved and, if displaced, reset at the expense of the persons displacing them.
- R. All Contractors are responsible for the coordination of their work with the complete set of specifications, construction drawings, addenda, request for information (RFI's), Architect's Instruction to Contractor (ITC), shop drawings, coordination drawings, and other contract modifications.
- S. Contractor shall carefully inspect any work performed by others that is to receive, align, abut or similarly relate to the Contractor's work and shall immediately notify the Construction Manager in

writing of any apparent defects or inconsistencies. The Contractor is responsible for coordinating and verifying the dimension, measurements, and elevations at the project site relevant to the Contractor's work. If Contractor commences his work without such written notice, such commencement shall constitute acceptance of all such work performed by others and of all such field conditions, and all costs incurred in connection with the Contractor's work as a result thereof shall be borne by Contractor.

- T. Incorporate construction tolerances for the work of others into the design of the systems in this scope of work. Include field measurements of work by others and any necessary adjustments to systems prior to fabrication to accommodate such allowable tolerances, or accept all costs to correct materials, which do not fit job conditions.
- U. Any interior work that is scheduled to be completed while Owner is in normal operation must be sensitive to the Owners continued use of the building. No workers are allowed to be in areas of the building that are not directly related to scope of work. Hallways and general access paths to construction areas must also be kept clean at all times. The Owner has the right at any time to shut down any construction activities that they deem to be too much of a distraction to the occupants of the building.
- V. All contractors are responsible for familiarizing themselves with the coordination and sequencing requirements related to Owner furnished equipment.
- W. If not already required by the contract documents and reasonably requested by the Construction Manager, the Contractor shall prepare coordinated drawings in areas of congestion specifically noting and advising the Construction Manager of potential conflicts between the Contractor's work and other work at the project. Even with such cooperative and coordinated efforts should a conflict occur the Construction Manager will determine how such conflicts should be resolved and its decision in that regard will be final. The Contractor agrees to abide by such decisions and make any changes required to eliminate such conflict without additional costs or expense to the Owner.

#### **1.04 SCHEDULE MANAGEMENT**

- A. Prior to the commencement of the construction for the Prime Contract Work, the Prime Contractor shall participate in a minimum of two (2) joint planning meetings with the Construction Manager and other Prime Contractors for the purpose of planning the overall Construction Schedule. A Preliminary Construction Schedule as developed by the Construction Manager will be used as the basis of the overall Construction Schedule. In consultation with the Prime Contractor, the Construction Manager shall incorporate the Prime Contract Work and work of other prime contractors into the overall Construction Schedule for the entire project. Critical Milestones and working hours as defined by the Construction Manager (as included in the bidding documents) will not be altered. The Prime Contractor shall on a weekly basis (at a minimum) provide the Construction Manager scheduling information with regards to progress and work to be performed in the next 4 (four) weeks. The Prime Contractor shall be bound by the Construction schedule. Nothing in the Prime Contract Agreement shall relieve the Prime Contractor of any liability for any unexcused failure to comply with the agreed upon overall Construction Schedule or any completion dates. The Construction Manager shall have the right to coordinate the Prime Contractors, including the right, if necessary, to change the time, order and priority in which the various portions of the Prime Contract Work and other work associated with the Project shall be performed.
- B. All Contractors shall cooperate with the Construction Manager and with other Contractors. The completion of the Work will depend upon a collective effort by all parties involved.

#### **1.05 GENERAL HOUSEKEEPING**

- A. Daily cleanup (broom clean) of dust and debris from construction operation is part of each contractor's scope of work. If any contractor fails to keep the site clean and organized on a continuous basis, the Construction Manager will notify the contractor in writing only once. The contractor will then have 24 hours to correct the situation. If the contractor fails to correct the situation, the Construction Manager will hire another party for cleaning and charge the said

contractor. Trade Contractor shall submit prior to beginning work a plan to the Construction Manager defining manpower and methods for achieving daily cleanup. If Construction Manager deems necessary, each Trade Contractor shall provide 1 employee for each 5 employees on the project to clean all work areas and/or staging areas to a broom clean condition. If the Trade Contractor has less than 5 employees on site, the contractor will provide 1 employee to the necessary cleanup requirement. Cleanup duration will take as long as it takes to achieve the broom clean results.

**END OF SECTION 01 1201**

## SECTION 01 1202

### SPECIAL WORK REQUIREMENTS

- A. Bidders are to hold their bids for a period of thirty (30) days after the bid.
- B. Contractors and their employees shall show upmost respect for the occupying residents and staff. Profanity and unnecessary loud language will not be tolerated.
- C. Each Contractor working in Owner occupied space will provide necessary means of protection to floors, walls, ceilings, equipment as required to accomplish work without harming or damaging existing conditions. All damage performed during this work will be charged to the responsible contractor.
- D. The use of motorized scissor lifts on any interior work will not be allowed except under special circumstances and must have prior approval from the Construction Manager.
- E. All deliveries must be accepted by the Contractor.
- F. Owner will provide snow removal to all existing pavements on campus that are not under construction. See specific Contractor's responsibility under specific Bid Packages.
- G. Contractor includes complete cleanup and haul off to dumpster (Provided by Construction Manager) for all typical construction debris resulting from this scope of work. Bid Package #1 Contractor will be responsible for providing dumpsters as required for the entire project duration and understands that ALL Bid Packages will be using dumpster. Each Prime Contractor to provide brooms, shovels and other equipment for cleanup for their respective scope of work. Excess materials shall be removed from the site at the Contractor's expense. All primes shall remove debris on a daily basis.
- H. Contractor will be responsible to provide portable generators or an alternative power source for all tools and equipment that require a power source higher than 120 Volt.
- I. Contractors working on roofs are required to take appropriate precautionary measures to protect existing roofing from damage. Contractors are required to take all precautionary measures necessary to ensure that their items do not fall or blow off the roofs.
- J. Prior to performing work in areas with smoke and fire detection systems the Contractor shall coordinate with the CM precautionary measures to eliminate false alarms. If the fire alarm system is activated and there is not an emergency the Contractor responsible for the false activation shall be responsible to pay for all resulting owner incurred expenses such as Emergency Response fees.
- K. The Construction Manager will provide temporary toilet facilities for ALL Contractors and for the entire duration of the project. Temporary toilets shall meet all OSHA regulations.
- L. Contractors shall document existing conditions prior to start of work. All damage to existing pavements, landscaped areas, and all other existing property will be repaired by the responsible Contractor. Interior as well.
- M. The Prime Contractor's shall provide the Construction Manager detailed information as outlined below for the purpose of developing the Construction Schedule:
  - a. **SUBMITTALS:**
    - i. Submittal Schedule: Prime Contractor shall submit a submittal schedule listing all required submittals, submittal "To CM" dates, procurement durations, and expected dates for materials to be on the jobsite. The submittal schedule shall be submitted to the CM within five (5) business days of receipt of Owner/Prime Contractor Agreement.
    - ii. Format: Submittal Schedule shall be prepared in an Excel spreadsheet.
    - iii. Materials & Long Lead Procurement: Prime Contractor shall identify any/all submittal items that require "field verifies" and also identify the dates when these field verifies can be taken.
- N. See preliminary construction schedule in Section 00 3113. This schedule will aid the bidder(s) in understanding the preliminary scheduling and planning for the project. As the construction schedule is finalized the **Prime Contractor and their Subcontractors** shall participate in a meeting with the Construction Manager and other Prime Contractors for the purpose of

presenting the overall Construction Schedule. These "Subcontractors" shall be any/all subcontractors who will be performing Work on the project.

- O. Per the preliminary construction schedule the bidder(s) acknowledges that there are multiple mobilizations, phases, sub-phases, material deliveries, and milestone completion dates required in order to complete the work.
- P. The Owner owns the weather duration contingency as shown in the preliminary construction schedule on the following pages. The Construction Manager manages and will adjust the weather duration contingency. As weather days are not utilized the substantial completion dates shall be adjusted accordingly.
- Q. Expected work hours will be 7:00 AM to 5:00 PM Monday thru Friday (5 day work week). Contractors requiring working time other than these hours are to coordinate and receive approval in advance from the Construction Manager. The Contractor shall provide at his expense increased work crews and/or overtime necessary to meet the scheduled milestones. Contractor shall immediately notify the Construction Manager of any delays in the work.**
- R. After contract award bid the Contractor is required to attend a meeting with the Construction Manager to review bid package scopes.
- S. Parking and material staging on site will be limited. All contractors shall coordinate one's parking and material staging with the DCI Group Project Manager, DCI Superintendent or DCI Designated Personnel.
- T. The jobsite is on Public Property. Smoking, vaping or smokeless tobacco **WILL NOT** be allowed. Smoking, vaping and smokeless tobacco may be used only inside the contractor's vehicle. Also, no shelled sunflower seeds are allowed inside the enclosed facility.
- U. No radios or headsets are allowed in the construction areas.
- V. All warranties start at Project Substantial Completion, Contractor will be required to provide from this date and not the startup date of the equipment. Contractor will not be compensated for any cost related to purchasing extended warranties to meet this requirement. See Special Work Requirements for project schedule information.
- W. Contractors shall maintain accurate as-built construction records and provide complete clean and legible copies to Construction Manager on completion of work. All Contractors will be required to provide electronic copies as well as hard copies of all O&M's and as-built drawings. See Project Manual for additional Closeout requirements.

## Iowa Veterans Home

### Marshalltown, Iowa

## Outside Contractor Projects

The Iowa Veterans Home has provided a brief description of regulatory and safety guidelines that outside contractors must observe while they are on IVH grounds performing contract work. The contractor shall abide by OSHA and other regulatory agencies.

### Contact Person

The following IVH representative is your contact person: David Haines

Ext. 641-753-4411, Cell: 641-750-6022

Their supervisor is Nathan Wilson

Ext. 641-844-6358

Other IVH representatives you should call are: David McLeland

Ext. 641-753-4531, Cell: 641-750-2533

The IVH Switchboard can also contact the above listed Maintenance staff by 2-way radio. Dial 0 on in-house IVH phone or 641-752-1501.

### Emergency Phone Numbers

Emergency numbers for in-house phones are:

4333 Ext. **4333** for any emergency (This emergency number calls the Switchboard and is answered immediately).

9-911 9-911 9 is to reach an outside line 911 – Marshalltown Communication Center.

0 0 IVH Switchboard for information.

### Equipment-- Safe Operation

1. All of the Contractor's equipment will be in good repair. If equipment does not meet regulatory standards imposed on IVH, we have the right to take it out of service.
2. Contractor's employees will be knowledgeable and trained how to safely operate the equipment.

3. If unsafe operation of equipment is observed, IVH has the right to immediately shutdown operation of that equipment until the foreman can assure safe operation and the employee demonstrates such.
4. Contractor's employees will wear PPE for protection when operating equipment that could cause injury, such as safety glasses, goggles, gloves, etc.
5. Equipment will be secured if the area is left unattended, to prevent injury to IVH residents or employees.
6. If the Contractor uses any IVH equipment and it becomes unsafe during use, he will notify an IVH representative.
7. All equipment and vehicles will require the keys removed from the ignition when not occupied.

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### **Dress Code**

The IVH has established a dress code policy. Contractors should adhere to the following guidelines that are part of the IVH dress code:

No open-toed shoes.

No shorts.

No shirts or hats with language or pictures, which are perceived as being offensive.

### **Confined Space (Policy 29)**

If the project involves entering a confined space, you must contact your IVH representative to complete appropriate forms and assure that safe methods are used.

### **Excavation/Trenching**

If the project involves excavation/trenching, you must contact your IVH representative to complete appropriate forms and assure that safe methods are used.

### **Lockout/Tagout**

IVH has procedures in place for lockout/tagout. If any equipment requires a shutdown of more than one power source, lockout/tagout procedures must be followed. The IVH representative has a listing of all lockout/tagout procedures.

**Fire** The Iowa Veterans Home has a fire plan that all residents, staff, visitors, and contractors are expected to follow. Contact IVH representative for a copy of the plan.

### **PPE (Personal Protective Equipment)**

Contractor's employees should wear PPE when working in areas or with materials that are hazardous. PPE includes safety glasses, goggles, gloves, hard-toed shoes, OSHA approved respirator, etc.

When working in food preparation areas, employees must wear a hairnet or ball cap. Beards must also be covered.

## **SDS**

Prior to starting a project, the contractor will provide the IVH representative an SDS for all chemicals that will be brought onto IVH grounds. All chemicals must have appropriate labels. Your IVH representative has information of all chemicals used at IVH. Contact them for information on possible hazardous substance exposures.

## **Tornado and Severe Weather**

The Iowa Veterans Home has a tornado and severe storm plan that all residents, staff, visitors, volunteers and contractors are expected to follow. The IVH representative will provide a severe weather plan upon request.

**Iowa Veterans Home**

**Marshalltown, Iowa**

**Outside Contractor Projects**

(Small Projects)

I acknowledge that I received a copy of IVH's regulatory and safety guidelines for Outside Contractor Projects from the IVH representative below. I agree to observe and follow these guidelines (if awarded a contract) for performing work at IVH.

Contractor: \_\_\_\_\_ Date: \_\_\_\_\_

IVH Representative: \_\_\_\_\_ Date: \_\_\_\_\_

cc: Safety Officer

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## SECTION 01 2500

### SUBSTITUTION PROCEDURES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Substitution Procedures
- B. Request for Substitution form

#### PART 2 - PRODUCTS – NOT USED

#### PART 3 - EXECUTION

##### 3.01 SUBSTITUTION PROCEDURES

- A. Where the Bidding Documents stipulate a specific product be provided by naming one or more manufacturer and model, a substitute product will be considered when written request is received by the date and time identified in Section 00 1113 NOTICE TO BIDDERS. Substitution requests will be considered for all products, even if the specification does not include a statement such as “or equal,” “equal to,” “equivalent to,” or “basis of design,” unless noted otherwise.
- B. References in the Bidding Documents to brand or trade names are intended to illustrate the general characteristics of the item and not to limit competition unless noted otherwise.
- C. The written request shall be on the “Request for Substitution” form included in the Project Manual. If no such form is included, the request shall be provided on the letterhead of the company making the request.
- D. Substitution requests received after the specified date will be viewed in the context of a Change Order to the Contract, and consideration will only be given in the event a product becomes unavailable or not practical due to no fault of the Contractor, or the substitution is substantially to the Owner’s advantage (equal product for less cost or higher quality product at no change in Contract Sum).
- E. Document each substitution request with complete data substantiating compliance of the proposed substitution with the Bidding Documents. Each request shall identify the specified product for which the substitution is requested, and shall clearly describe the product for which approval is requested. The burden shall be on the requester to demonstrate the proposed substitute product’s suitability for use in the Work and its equivalency or superiority in function, appearance, quality, and performance with the product named in the Bidding Documents.
- F. A description of any changes to the Bidding Documents that the proposed substitution will require shall be included with the request. The requester shall affirm that dimensions shown on the Drawings will not be affected by the substitute product, and that it will have no adverse effect on other trades, the construction schedule, or specified warranty requirements. The request for use of a substitute product shall be signed by an authorized representative of the firm submitting the request, who shall state that the firm will pay for any changes to the building design, including Design Professional’s design, detailing, and construction cost caused by the requested substitution if the substitution is approved for use in the Work.
- G. All such substitute products approved for use in the Work during the established period of time before receipt of Bids will be identified in a subsequent Addendum to the Bidding Documents.

##### 3.02 REQUEST FOR SUBSTITUTION FORM

- A. A Request for Substitution Form is attached following this page.
- B. Substitution requests shall be emailed to the Issuing Officer at the email address provided in Instructions to Bidders Section 1.04.

**END OF SECTION**

# SUBSTITUTION REQUEST FORM

---

Project: \_\_\_\_\_ Substitution Request Number: \_\_\_\_\_  
\_\_\_\_\_  
From: \_\_\_\_\_  
To: \_\_\_\_\_ Date: \_\_\_\_\_  
\_\_\_\_\_  
A/E Project Number: \_\_\_\_\_  
Re: \_\_\_\_\_

---

Specification Title: \_\_\_\_\_ Description: \_\_\_\_\_  
Section: \_\_\_\_\_ Page: \_\_\_\_\_ Article/Paragraph: \_\_\_\_\_

---

Proposed Substitution: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_ Address: \_\_\_\_\_ Phone: \_\_\_\_\_  
Trade Name: \_\_\_\_\_ Model No.: \_\_\_\_\_  
\_\_\_\_\_

History:  New product  2-5 years old  5-10 yrs old  More than 10 years old

Differences between proposed substitution and specified product: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Point-by-point comparative data prepared by contractor and attached - REQUIRED BY A/E

---

Reason for not providing specified item: \_\_\_\_\_  
\_\_\_\_\_

Similar Installation:  
Project: \_\_\_\_\_ Architect: \_\_\_\_\_  
Address: \_\_\_\_\_ Owner: \_\_\_\_\_  
\_\_\_\_\_ Date Installed: \_\_\_\_\_

Proposed substitution affects other parts of Work:  No  Yes; explain \_\_\_\_\_  
\_\_\_\_\_

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Supporting Data Attached:  Drawings  Product Data  Samples  Tests  Reports  \_\_\_\_\_

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# SUBSTITUTION REQUEST FORM

(Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: \_\_\_\_\_

Signed by: \_\_\_\_\_

Firm: \_\_\_\_\_

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

\_\_\_\_\_

Telephone: \_\_\_\_\_

Attachments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

---

## A/E's REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01 3300.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01 3300.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: \_\_\_\_\_

Date: \_\_\_\_\_

---

Additional Comments:     Contractor     Subcontractor     Supplier     Manufacturer     A/E     \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## SECTION 01 2600

### CONTRACT MODIFICATION PROCEDURES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Change procedures

##### 1.02 CHANGE PROCEDURES

- A. The Design Professional will advise of minor changes in the work not involving an adjustment to Contract Sum/Price or contract time as authorized.
- B. The Construction Manager may issue a Proposal Request that includes a detailed description of a proposed change with supplementary or revised drawings and specifications and a change in contract time for executing the change as provided by the Design Professional. The Trade Contractor will prepare and submit an estimate within 7 calendar days. Estimates shall be provided for the project at no cost, regardless of acceptance or rejection of proposal.
- C. The Trade Contractor may propose changes by submitting a Request for Information to the Construction Manager, describing the proposed change and its full effect on the work. Include a statement describing the reason for the change, and the effect on the Contract Sum/Price and contract time with full documentation and a statement describing the effect on work by separate or other contractors. Document any requested substitutions in accordance with the specifications. Construction Manager will forward the Request for Information on to the Design Professional for their official response.
- D. Stipulated Sum/Price Change Order: Based on executed Change Order and contractor's fixed price quotation.
- E. Unit Price Change Order: The change order will be executed on a fixed unit price basis for pre-determined unit prices and quantities. Changes in contract price or contract time will be computed as specified for time and material change orders.
- F. Time and Material Change Order: The change order will be executed on a not to exceed basis. Design professional and Construction Manager will determine the not to exceed estimated cost based on contractor's proposal for hourly rates and material costs. Maintain detailed records of work done on time and material basis. Time and Material tickets must be submitted daily to the Construction Manager for verification. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the work. Submit itemized account and supporting data after completion of change. A final deductive change order will be issued to reconcile final cost to the initial change order.
- G. Change Order Forms: CONSENSUSDOC Forms provided by Owner.
- H. Execution of Change Orders: The Construction Manager will issue change orders for signature of parties as provided in the Conditions of the Contract.
- I. With respect to pricing change orders, the percentage mark-up for overhead and profit is subject to the following limits:
  - 1. Fifteen (15) percent maximum for work directly performed by employees of the Constructor, Subcontractor or Sub-subcontractor.
  - 2. Five (5) percent maximum for work performed or passed through by a Subcontractor and passed through to the Owner by the Constructor.
  - 3. Five (5) percent maximum Subcontractor's mark-up for Work performed by a Sub-Subcontractor and passed through to the Owner by the Subcontractor and Constructor.
  - 4. The maximum allowable mark-up shall be twenty-five (25) percent passed through to the Owner by the Constructor under any circumstances. Overhead and profit shall be shown separately for the Constructor and each Subcontractor of any tier performing the Change Order Work.
- J. Contractor and subcontractor agree to provide and require all suppliers to provide a detailed breakdown of labor, labor burden, materials, installation, rental, and fuel costs.

K. Please refer to Article 8 of **CONSENSUSDOCS 802 – STANDARD FORM OR AGREEMENT BETWEEN OWNER AND TRADE CONTRACTOR** for additional Change Procedures.

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION – NOT USED**

**END OF SECTION**

## SECTION 01 2900

### PAYMENT PROCEDURES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Schedule of values
- B. Application for payment

##### 1.02 SCHEDULE OF VALUES

- A. Coordination: Trade Contractor will coordinate preparation of the Schedule of Values with preparation of the Construction Manager's Construction Schedule.
  - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Application for Payment forms with Continuation Sheets, Submittals Schedule, and Construction Manager's Construction Schedule.
  - 2. Submit original Schedule of Values in Procore within 14 days after date of Owner-Trade Contractor Agreement. Schedule of Values must be approved by Owner prior to submission for first application for payment.
- B. Format: Utilize the Table of Contents of this project manual. Identify each line item with number and title of the major specification section. Each major specification section should be further itemized by materials cost, labor cost and subcontractor cost for each building separately for the base bid and all accepted alternates. Identify site mobilization, bonds and insurance and include a line item for closeout paperwork for a value of no less than 1% of the total contract value or \$1,000, whichever is greater.
  - 1. Identification: Include the following Project identification on the Schedule of Values:
    - a. Project name and location.
    - b. Name and address of Owner, Trade Contractor, Construction Manager and Design Team.
    - c. DAS Project Number.
    - d. Date of Submittal.
  - 2. Revise the Schedule of Values to list approved Change Orders with each Application for Payment.

##### 1.03 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications for payments as certified by the Design Professional and paid for by Owner.
  - 1. Application for Payment at time of Substantial Completion and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement. Progress payments shall be submitted to the Construction Manager. Any request for payment for work completed prior to June 30<sup>th</sup> of any year needs to be submitted by July 15<sup>th</sup> of the same calendar year.
- C. Payment Application Forms: Use AIA form G702 and G703 as the form for the Application for Payment or an equivalent approved by the owner.
- D. Include lien waiver forms required by the owner when applicable.
- E. Application Preparation: Complete every entry on form. Construction Manager will return incomplete applications without action.
  - 1. Include amounts of Change Orders issued before last day of construction period covered by application.

- F. Waivers of Mechanic's Lien: If requested by Owner with each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment when applicable.
  - 1. Owner reserves the right to designate which entities involved in the Work must submit waivers.
  - 2. Submit waivers of lien on forms, executed in a manner acceptable to Owner.
- G. Initial Application for Payment: Administrative actions and submittals that must precede submittal of first Application for Payment include the following:
  - 1. Schedule of Values
  - 2. Certificates of insurance and insurance policies.
  - 3. Lists of vendors and any subcontractors.
- H. Application for Payment at Substantial Completion: After the Certificate of Substantial Completion has been fully executed, submit an Application for Payment showing 100 percent completion for the portion of the Work claimed as substantially complete, not including the closeout paperwork line item.
  - 1. Include documentation supporting the claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  - 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
  - 1. Evidence of completion of Project closeout requirements.
  - 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  - 3. Updated final statement, accounting for final changes to the Contract Sum.
  - 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  - 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  - 6. AIA Document G707, "Consent of Surety to Final Payment."
  - 7. Letter of Notification to all sub-contractors and suppliers of application for release of retainage.
  - 8. Evidence that claims have been settled.
- J. Payments will be made to the extent of the value of the work performed in the previous month less a retainage amount of 3% of the value of the work performed. Upon substantial completion for the entire work, a sum sufficient to decrease the total retained to 3% of the contract sum, plus the full amount of the line item for closeout paperwork, plus such other retainage as the engineer shall determine for all incomplete work and unsettled claims will be authorized. The closeout paperwork line item may only be billed once the certificate of final completion has been fully executed.

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION – NOT USED**

**END OF SECTION**

## SECTION 01 3100

### PROJECT MANAGEMENT AND COORDINATION

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Coordination
- B. Pre-construction meeting
- C. Progress meetings
- D. Coordination Meetings
- E. Requests for Interpretation (RFIs)
- F. Utility Locates/Ground Penetrations

##### 1.02 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the project manual to ensure efficient and orderly sequence of installation of interdependent construction elements.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Administrative procedures: The Trade Contractor will coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Trade Contractor's Construction Schedule.
  - 2. Provide updated information for Construction Manager's Construction Schedule.
  - 3. Preparation of Schedule of Values.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.
  - 6. Pre-installation conferences.
  - 7. Project closeout activities
- C. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical work, which are indicated diagrammatically on drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated conceal pipes and wiring within the construction. Coordinate locations of piping with finish elements.
- F. Coordinate completion and cleanup of work of separate sections in preparation for Substantial Completion.
- G. After owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of owner's activities.
- H. During construction coordinate use of site and facilities through Construction Manager.
- I. Comply with Construction Manager and Owner's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- J. Make the following types of submittal to Architect through the Construction Manager via Procure:

1. Request for Information/Interpretation.
2. Request for substitution.
3. Shop drawings, product data, and samples.
4. Test and inspection reports.
5. Design data.
6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Correction punch list and final correction punch list for substantial completion
11. Closeout submittals

**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION**

**3.01 PRE-CONSTRUCTION MEETING**

- A. The Construction Manager and Owner will schedule a meeting after Notice of Award.
- B. Required: Design Professional, Owner, Construction Manager, Trade Contractor and any Sub Contractors.
- C. Agenda:
  1. Execution of Owner-Contractor Agreement.
  2. Submission of executed bonds and insurance certificates.
  3. Distribution of Contract Documents.
  4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
  5. Designation of personnel representing the parties in Contract.
  6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, change orders, RFIs and contract closeout procedures
  7. Tentative construction schedule.
  8. Critical work sequencing and long-lead items.
  9. Procedures for testing and inspecting.
  10. Preparation of Record Documents.
  11. Safety Procedures.
  12. Owner's requirements.
  13. Security and housekeeping procedures.
  14. Background Checks.
  15. Responsibility for temporary facilities and controls.
  16. Construction waste management.
  17. Logistics (use of premise, parking, work restrictions, maintain egress, etc.)
- D. The Construction Manager is to record minutes and distribute copies within two days after meeting to participants, with one copy to owner, participants, and those affected by decisions made.

**3.02 PROGRESS MEETINGS**

- A. The Construction Manager shall schedule and administer meetings throughout progress of the work at bi-weekly intervals.
- B. The Construction Manager is to make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings, record minutes and distribute copies within two days to those affected by decisions made.
- C. Attendees may include: Project superintendent, major subcontractors and suppliers, Owner, Construction Manager, Architect/Engineer, as appropriate to agenda topics for each meeting. All participants at the conference call shall be familiar with the Project and authorized to conclude matters relating to the Work.

- D. Agenda:
1. Review minutes of previous meetings.
  2. Review the Construction Manager's Construction Schedule.
  3. Field observations, problems, and decisions.
  4. Identification of problems that impede planned progress.
  5. Review of submittals schedule and status of submittals.
  6. Review of RFI's.
  7. Review of off-site fabrication and delivery schedules.
  8. Corrective measures to regain projected schedules.
  9. Planned progress during succeeding work period.
  10. Coordination of projected progress.
  11. Maintenance of quality and work standards.
  12. Effect of proposed changes on progress schedule and coordination.
  13. Other business relating to work.
  14. Access, temporary facilities and controls, housekeeping and progress cleaning.
  15. Safety.
  16. Status of proposal requests, pending changes, official Change Orders.
- E. Minutes:
1. Following the meeting, the meeting minutes will be published in Procore by the Construction Manager for all parties.

### **3.03 COORDINATION MEETINGS**

- A. Coordination meetings will be held at the discretion of the construction manager.

### **3.04 REQUESTS FOR INTERPRETATION (RFIs)**

- A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, prepare and submit an RFI in Procore.
1. RFIs shall originate with Trade Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in the Work.
- B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
1. Specification Section number and title and related paragraphs, as appropriate.
  2. Drawing number and detail references, as appropriate.
  3. Field dimensions and conditions, as appropriate.
  4. Trade Contractor's suggested solution(s). If Trade Contractor's solution(s) impact the Contract Time or the Contract Sum, Trade Contractor shall state impact in the RFI.
  5. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
- C. Design Professional's Action: Design Professional will review each RFI, determine action required, and return it. Allow seven (7) working days for Design Professional's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day. The following RFIs will be returned without action:
1. Requests for approval of submittals.
  2. Requests for approval of substitutions.
  3. Requests for coordination information already indicated in the Contract Documents.
  4. Requests for adjustments in the Contract Time or the Contract Sum.
  5. Requests for interpretation of Design Professional's actions on submittals.
  6. Incomplete RFIs or RFIs with numerous errors.
  7. Design Professional's action may include a request for additional information, in which case Design Professional's time for response will start again.
- D. Design Professional's action on RFIs that may result in a change to the Contract Time or the Contract Sum/Price.

1. If Trade Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Construction Manager in writing within ten (10) days of receipt of the RFI response.
- E. On receipt of Design Professional's response in Procore, review the response and notify Design Professional within seven (7) days if Trade Contractor disagrees with response.

### **3.05 UTILITY LOCATES/GROUND PENETRATIONS**

- A. Call Iowa One Call at 800-292-8989 to request a locate
1. Requests must be at least five (5) working days prior to ground penetration.

**END OF SECTION**

## SECTION 01 3100.01

### WEB BASED CONSTRUCTION MANAGEMENT

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. The Owner and Contractor shall utilize **Procore Technologies, Inc. Procore** system for electronic submittal of all data and documents (unless specified otherwise by the owner's representative) throughout the duration of the Contract. **Procore** is a web-based electronic media site that is hosted by **Procore Technologies, Inc.**, utilizing their **Procore** web solution. **Procore** will be made available to all contractors' project personnel, subcontractor personnel, suppliers, consultants and the Designer of Record. The joint use of this system is to facilitate; electronic exchange of information, automation of key processes, and overall management of the contract. **Procore** shall be the primary means of project information submission and management. When required by the Owners representative, paper documents will also be provided. In the event of discrepancy between the electronic version and paper documents, the paper documents will govern. **Procore** is a registered trademark of **Procore Technologies, Inc.**

##### 1.02 USER ACCESS LIMITATIONS

- A. The Owner's Representative/Construction Manager will control the Contractor's access to **Procore** by allowing access and assigning user profiles to accepted Contractor personnel. User profiles will define levels of access into the system, determine assigned function-based authorizations (determines what can be seen) and user privileges (determines what they can do). Sub-contractors and suppliers will be given access to **Procore** through the Contractor. Entry of information exchanged and transferred between the Contractor and its sub-contractors and suppliers on **Procore** shall be the responsibility of the Contractor.
1. Joint Ownership of Data: Data entered in a collaborative mode (entered with the intent to share as determined by permissions and workflows within the **Procore** system) by the Owner's Representative and the Contractor will be jointly owned.

##### 1.03 AUTOMATED SYSTEM NOTIFICATION AND AUDIT LOG TRACKING

- A. Review comments made (or lack thereof) by the Owner on Contractor submitted documentation shall not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for managing, tracking, and documenting the Work to comply with the requirements of the Contract Documents. Owner's acceptance via automated system notifications or audit logs extends only to the face value of the submitted documentation and does not constitute validation of the Contractor's submitted information.

##### 1.04 SUBMITTALS

- A. See Section 01 3300 SUBMITTAL PROCEDURES:
- B. Preconstruction Submittals
1. List of Contractor's key **Procore** personnel. Include descriptions of key personnel's roles and responsibilities for this project. Contractor should also identify their organization's administrator on the list.

##### 1.05 COMPUTER REQUIREMENTS

- A. The Contractor shall use computer hardware and software that meets the requirements of the **Procore** system as recommended by **Procore Technologies, Inc.** to access and utilize

**Procore.** As recommendations are modified by **Procore**, the Contractor will upgrade their system(s) to meet the recommendations or better. Upgrading of the Contractor's computer systems will not be justification for a cost or time modification to the Contract. The contractor will ensure that connectivity to the **Procore** system (whether at the home office or job site) is accomplished through DSL, cable, T-1 or wireless communications systems. The minimum bandwidth requirement for using the system is 128kb/s. It is recommended a faster connection be used when uploading pictures and files into the system. **Procore** supports the current and prior two major versions of Chrome, Firefox, Internet Explorer, and Safari.

- B. The Contractor shall be responsible for the validity of their information placed in **Procore** and for the abilities of their personnel. Accepted users shall be knowledgeable in the use of computers, including Internet Browsers, email programs, cad drawing applications, and Adobe Portable Document Format (PDF) document distribution program. The Contractor shall utilize the existing forms in **Procore** to the maximum extent possible. If a form does not exist in **Procore** the Contractor must include a form of their own or provided by the Owner representative as an attachment to a submittal. Adobe PDF documents will be created through electronic conversion rather than optically scanned whenever possible. The Contractor is responsible for the training of their personnel in the use of **Procore** (outside what is provided by the owner) and the other programs indicated above as needed.
- C. User Access Administration: Provide a list of Contractor's key **Procore** personnel for the Owner's Representative acceptance. Contractor is responsible for adding and removing users from the system. The Owners Representative reserves the right to perform a security check on all potential users. The Contractor will be allowed to add additional personnel and sub-contractors to **Procore**.

#### 1.06 CONNECTIVITY PROBLEMS

- A. **Procore** is a web-based environment and therefore subject to the inherent speed and connectivity problems of the Internet. The Contractor is responsible for its own connectivity to the Internet. **Procore** response time is dependent on the Contractor's equipment, including processor speed, Internet access speed, etc. and current traffic on the Internet. The Owner will not be liable for any delays associated from the usage of **Procore** including, but not limited to: slow response time, down time periods, connectivity problems, or loss of information. The contractor will ensure that connectivity to the **Procore** system (whether at the home office or job site) is accomplished through DSL, cable, T-1 or wireless communications systems. The minimum bandwidth requirement for using the system is 128kb/s. It is recommended a faster connection be used when uploading pictures and files into the system. Under no circumstances shall the usage of the **Procore** be grounds for a time extension or cost adjustment to the contract.

#### 1.07 TRAINING

- A. The Construction Manager shall provide the necessary training to the Prime Contractor.

### PART 2 - PRODUCTS

#### 2.01 DESCRIPTION

- A. **Procore** project management application (no equal) Provided by Procore Technologies, Inc. [www.Procore.com](http://www.Procore.com)

## PART 3 - EXECUTION

### 3.01 PROCORE UTILIZATION

- A. **Procore** shall be utilized in connection with submittal preparation and information management required by Sections:
1. PROJECT MANAGEMENT AND COORDINATION
  2. CONSTRUCTION PROGRESS DOCUMENTATION
  3. SUBMITTAL PROCEDURES
  4. QUALITY REQUIREMENTS
  5. Other Division One sections.
  6. Requirements of this section are in addition to requirements of all other sections of the specifications.
- B. Design Document Submittals
1. All design drawings and specifications shall be submitted as cad .dwg files or PDF attachments to the **Procore** submittal work flow process and form.
- C. Shop Drawings
1. Shop drawing and design data documents shall be submitted as cad .dwg files or PDF attachments to the **Procore** submittal work flow process and form. Examples of shop drawings include, but are not limited to:
  2. Standard manufacturer installation drawings.
  3. Drawings prepared to illustrate portions of the work designed or developed by the Contractor.
  4. Steel fabrication, piece, and erection drawings.
- D. Product Data
1. Product catalog data and manufacturer's instructions shall be submitted as
  2. PDF attachments to the **Procore** submittal work flow process and form. Examples of product data include, but are not limited to:
  3. Manufacturer's printed literature.
  4. Preprinted product specification data and installation instructions.
- E. Samples
1. Sample submittals shall be physically submitted as specified in Section 01 3300 SUBMITTAL PROCEDURES. Contractor shall enter submittal data information into **Procore** with a copy of the submittal form(s) attached to the sample. Examples of samples include, but are not limited to:
  2. Product finishes and color selection samples.
  3. Product finishes and color verification samples.
  4. Finish/color boards.
  5. Physical samples of materials.
- F. Administrative Submittals
1. All correspondence and pre-construction submittals shall be submitted using **Procore**. Examples of administrative submittals include, but are not limited to:
  2. Digging permits and notices for excavation.
  3. List of product substitutions
  4. List of contact personnel.
  5. Notices for roadway interruption, work outside regular hours, and utility cut overs.
  6. Requests for Information (RFI).
  7. Construction progress Schedules and associated reports and updates.
    - a. Each schedule submittal specified in CONSTRUCTION PROGRESS DOCUMENTATION shall be submitted as a native backed-up file (.PRX or .STX) of the scheduling program being used. The schedule will also be posted as a PDF

- file in the format.
8. Plans for safety, demolition, environmental protection, and similar activities.
  9. Quality Control Plan(s), Testing Plan and Log, Quality Control Reports, Production Reports, Quality Control Specialist Reports, Preparatory Phase Checklist, Initial Phase Checklist, Field Test reports, Summary reports, Rework Items List, etc.
  10. Meeting minutes for quality control meetings, progress meetings, pre-installation meetings, etc.
  11. Any general correspondence submitted.
- G. Compliance Submittals
1. Test reports, certificates, and manufacture field report submittals shall be submitted on **Procore** as PDF attachments. Examples of compliance submittals include, but are not limited to:
    - a. Field test reports.
    - b. Quality Control certifications.
    - c. Manufacturer's documentation and certifications for quality of products and materials provided.
- H. Record and Closeout Submittals
1. Operation and maintenance data and closeout submittals shall be submitted on **Procore** as PDF documents during the approval and review stage as specified, with actual set of documents submitted for final. Examples of record submittals include, but are not limited to:
    - a. Operation and Maintenance Manuals: Final documents shall be submitted as specified.
    - b. As-built Drawings: Final documents shall be submitted as specified.
    - c. Extra Materials, Spare Stock, etc.: Submittal forms shall indicate when actual materials are submitted.
- I. Financial Submittals
1. Schedule of Value, Pay Applications and Change Request Proposals shall be submitted on **Procore**. Supporting material for Pay Applications and Change Requests shall be submitted on **Procore** as PDF attachments. Examples of compliance submittals include, but are not limited to:
    - a. Contractors Schedule of Values
    - b. Contractors Monthly Progress Payment Requests
    - c. Contract Change proposals requested by the project owner

**END OF SECTION**

## SECTION 01 3200

### CONSTRUCTION PROGRESS DOCUMENTATION

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Construction Progress Schedule
- B. Construction Manager's Construction Schedule
- C. Submittal Schedule
- D. Daily Construction Reports
- E. Progress Photographs

#### PART 2 - PRODUCTS – NOT USED

#### PART 3 - EXECUTION

##### 3.01 CONSTRUCTION MANAGER'S MASTER CONSTRUCTION SCHEDULE

- A. Upon award of package, Contractor agrees to accept and meet or improve upon the schedule proposed in section **00 3113 PRELIMINARY SCHEDULE** with intermediate handoffs. Each package contractor will be required to participate in schedule coordination meetings with the Construction Manager.
- B. If the bid package contractor does not meet the handoff milestones in the master construction schedule, the bid package contractor shall take measures to increase work forces, increase work hours, initiate revisions to means and methods of construction, and/or other similar measures as required to make up lost time and complete the work in accordance with the construction schedule and remain consistent with project progress and overall construction schedule. Such measures shall be at no additional cost to the Owner. The Construction Manager shall have sole discretion on decisions to accelerate work.
- C. Updating the master construction schedule – Contractors are required to attend and participate in schedule coordination update meetings with the Construction Manager. This will be an opportunity for contractors to further define their scheduled scope of work in conjunction with other trades on site.
- D. Acceptance of revised master construction schedule – After an updated master construction schedule has been issued via Procore, Contractors will have 48 hours to dispute the new schedule. All contractors will be held to the last fully accepted master construction schedule.

##### 3.02 CONSTRUCTION PROGRESS SCHEDULE

- A. Submit preliminary outline to the Construction Manager no later than 48 hours prior to the pre-construction meeting for coordination with Owner's requirements.
- B. Submit revised progress schedule with each application for payment.
- C. Schedules will be electronically submitted through Procore.
- D. Distribute copies of reviewed schedules to project site file, subcontractors, suppliers, and other concerned parties.
- E. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.
- F. Submit computer generated horizontal bar chart with separate line for each major portion of work or operation, identifying the first day of each week.
- G. Show complete sequence of construction activity, identifying work of separate stages and other

logically grouped activities. Indicate early and late start, early and late finish, float dates, and duration.

- H. Indicate estimated percentage of completion for each item of work at each submission.
- I. Participate in joint review and evaluation of schedule with Construction Manager.
- J. Revisions to schedules:
  - 1. Indicate progress of each activity to date of submittal and projected completion date of each activity.
  - 2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
  - 3. Prepare narrative report to define problem areas, anticipate delays, and impact on schedule. Report corrective action taken, or proposed, and its effect including effect of changes on schedules of separate contractors.

### 3.03 **SUBMITTAL SCHEDULE**

- A. Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrications, and delivery when establishing dates.
  - 1. Coordinate submittal schedule with list of subcontractors, the schedule of values, and construction schedule.
  - 2. Submit concurrently with first complete submittal of contractor's construction schedule.

### 3.04 **DAILY CONSTRUCTION REPORTS**

- A. Daily Construction Reports: Submitted at weekly intervals.
  - 1. Daily Construction Reports will be submitted to Construction Manager.
- B. Prepare a daily construction report recording the following information concerning events at project site:
  - 1. Count of personnel at Project site
  - 2. Equipment at Project site
  - 3. Material Deliveries
  - 4. High and low temperatures and general weather conditions, including presence of rain or snow
  - 5. Accidents
  - 6. Meetings and significant decisions
  - 7. Unusual events
  - 8. Stoppages, delays, shortages, and losses
  - 9. Meter readings and similar recordings
  - 10. Emergency procedures
  - 11. Orders and requests of authorities having jurisdiction
  - 12. Change orders received and implemented
  - 13. Services connected and disconnected
  - 14. Equipment or system tests and startups
  - 15. Partial completions and occupancies
  - 16. Substantial completions authorized

### 3.05 **PROGRESS PHOTOGRAPHS**

- A. Progress photographs will be electronically submitted through Procore.
- B. Preconstruction Photographs: Before starting construction, take photographs of project site and surrounding properties, including existing items to remain during construction, from different

vantage points, as directed by Construction manager.

1. Take additional photographs as required to record existing damage to site, structure, equipment, or finishes.
- C. Periodic Construction Photographs: Take photographs at regular intervals. Select vantage points to show status of construction and progress since last photographs were taken.
- D. Field Completion Construction Photographs: Take photographs after date of Substantial Completion for submission as project record documents. Construction manager will inform of desired vantage points.

**END OF SECTION**

## SECTION 01 3300

### SUBMITTAL PROCEDURES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Submittals for Review
- B. Submittals for Information
- C. Submittal Procedures
- D. Samples

#### PART 2 - PRODUCTS – NOT USED

#### PART 3 - EXECUTION

##### 3.01 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
  - 1. Product Data
  - 2. Shop Drawings
  - 3. Samples for Selection
  - 4. Samples for Verification
- B. Submit to Construction Manager to forward to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
- C. Samples will be reviewed only for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record document purposes.

##### 3.02 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
  - 1. Design data.
  - 2. Certificates.
  - 3. Test reports.
  - 4. Inspection reports.
  - 5. Manufacturer's instructions.
  - 6. Manufacturer's field reports.
  - 7. Other types indicated.
- B. Submit for Construction Manager, Architect, and Owner's knowledge. No action will be taken.

##### 3.03 SUBMITTAL PROCEDURES

- A. Submittals will be electronically submitted through Procore. Contractor will be invited to join web based program after issue of Notice of Intent to award.
- B. Shop Drawing Procedures:
  - 1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related Work.
  - 2. Do not reproduce the Contract Documents to create shop drawings.

3. Generic, non-project specific information submitted as shop drawings do not meet the requirements for shop drawings.
- C. Transmit each submittal with a copy of approved submittal form.
- D. Sequentially number the submittal form. Revise submittals with original number and a sequential numeric suffix.
- E. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
- F. Apply Contractor's stamp, signed or initialed certifying that review, approval, 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.
- G. Schedule submittals to expedite the project and coordinate submission of related items.
- H. For each submittal review, allow 15 days excluding delivery time to and from the contractor.
- I. Identify variations from the Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
- J. When revised for resubmission, identify all changes made since previous submission.
- K. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- L. Submittals not requested will not be recognized or processed.

#### 3.04 **SAMPLES**

- A. Submit to Construction Manager to forward to Architect/Engineer for review for limited purpose for checking conformance with information given and design concept expressed in the Contract Documents.
- B. Samples for selection as specified in product sections:
  1. Submit to Construction Manager to forward to Architect/Engineer for aesthetic, color, or finish selections.
  2. Submit samples of finishes from full range of manufacturer's standard colors, textures, and patterns to Construction Manager to forward to Architect/Engineer for selection.
- C. Submit samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- D. Include identification on each sample, with full project information.
- E. Submit number of samples specified in individual specification sections.
- F. Photograph of submitted samples, along with transmittal sheet, shall be uploaded as a submittal in Procore.

**END OF SECTION**

## SECTION 01 4000

### QUALITY REQUIREMENTS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. References
- B. Quality assurance and control of installation
- C. Tolerances
- D. Defect Assessment
- E. Inspection and testing laboratory services
- F. Manufacturer's field services and reports

##### 1.02 REFERENCES

- A. Conform to reference standard in effect at date of contract.
- B. When required by contract documents, obtain copies of standards.
- C. Should specified reference standards conflict with contract documents request clarification from engineer before proceeding.
- D. The contractual relationship of the parties to the contract shall not be altered from the contract documents by mention or inference otherwise in any reference document.

#### PART 2 - PRODUCTS – NOT USED

#### PART 3 - EXECUTION

##### 3.01 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 fully with manufacturer's instructions, including each step in sequence.
- C. Should manufacturer's instructions conflict with contract documents, request clarification from the engineer prior to proceeding.
- D. Comply with specified standards as a minimum quality for the work except when 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. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stress, vibration, physical distortion, or disfiguration.

##### 3.02 TOLERANCES

- A. Monitor fabrication and installation tolerance control of 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 Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

##### 3.03 DEFECT ASSESSMENT

- A. Replace work or portions of work not conforming to specified requirements.

- B. If, in the option of the Owner, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or recommend adjusted payment.

### **3.04 INSPECTION AND TESTING**

- A. Owner shall include and pay for all required special inspections and testing required by IBC Section 1705, if applicable. This does not include inspections and testing required by other specification sections in this Project Manual. Copies of all testing and inspection reports shall be submitted to the Construction Manager and Design Professional by the testing and inspection agency.
- B. Testing Agency Duties:
  - 1. Provide qualified personnel at site. Cooperate with Architect, Construction Manager, and contractor in performance of services.
  - 2. Perform specified sampling and testing of products in accordance with specified standards.
  - 3. Ascertain compliance of materials and mixes with requirements of contract documents.
  - 4. Immediately notify the Construction Manager and contractor of observed irregularities or non-conformance of work or products.
  - 5. Perform additional testing and inspections required by the Owner
- C. Limits on Testing Agency/Inspection Agency Authority:
  - 1. Agency may not release, revoke, alter, or enlarge on requirement of contract documents.
  - 2. Agency may not approve or accept any portion of the work.
  - 3. Agency may not assume any duties of the contractor.
  - 4. Agency has no authority to stop the work.
- D. Contractor responsibilities:
  - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
  - 2. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.
  - 3. Provide incidental labor and facilities:
    - a. To provide access to work to be tested/inspected.
    - b. To obtain and handle samples at the site or at source of products to be tested/inspected.
    - c. To facilitate test/inspections.
    - d. To provide storage and curing of test samples.
  - 4. Notify Construction Manager and laboratory 24 hours prior to expected time for operations requiring testing/inspection.
- E. Re-testing required because of non-conformance to specified requirements shall be performed by the same testing agency on instruction by Architect/Construction Manager.
- F. Re-testing required because of non-conformance to specified requirements shall be paid for by the Contractor.

### **3.05 MANUFACTURER'S 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, start up of equipment, test, adjust and balance of equipment as applicable and to initiate instructions when necessary.
- B. Individuals are to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to the manufacturers' written instructions.
- C. Submit report in duplicate within 30 days of observation to Construction Manager for review.

**END OF SECTION**

## SECTION 01 5000

### TEMPORARY FACILITIES AND CONTROLS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Temporary Utilities
- B. Temporary Sanitary Facilities
- C. Telephone Service
- D. Removal of Utilities, Facilities, and Controls
- E. Temporary Facilities
- F. Equipment
- G. Vehicular Access and Parking
- H. Traffic Regulation
- I. Barriers
- J. Enclosures and Fencing
- K. Waste Removal

##### 1.02 TEMPORARY UTILITIES

- A. Owner will provide the following:
  - 1. Electrical Power, consisting of connection to existing facilities.
  - 2. Water Supply, consisting of connection to existing facilities.
- B. The Contractor shall pay for installation, maintenance, and removal of temporary utilities. Temporary utilities shall not disrupt the Facility's need for continuous service.

##### 1.03 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Maintain daily in clean and sanitary condition.

##### 1.04 TELEPHONE SERVICE

- A. Provide, maintain, and pay for telephone service to field or use a cellular telephone.

##### 1.05 REMOVAL OF UTILITIES, FACILITIES AND CONTROLS

- A. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

#### PART 2 - PRODUCTS

##### 2.01 TEMPORARY FACILITIES

- A. Field Offices: Coordinate with Construction Manager and Owner if applicable.

##### 2.02 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated, with class and extinguishing agent as required by locations and classes of fire exposures.

#### PART 3 - EXECUTION

##### 3.01 VEHICULAR ACCESS AND PARKING

- A. Use designated existing on-site roads for construction traffic.
- B. Parking is as directed by Owner.
- C. When site space is not adequate, provide additional off-site parking.
- D. Use of designated existing on-site streets and driveways used for construction traffic is permitted. Track vehicles not allowed on paved areas.
- E. Use of designated areas of existing parking facilities used by construction personnel as permitted.
- F. Do not allow heavy vehicles or construction equipment in parking areas.
- G. Provide and maintain access to fire hydrants, free of obstructions.
- H. Provide means of removing mud from vehicle wheels before entering streets.

### **3.02 TRAFFIC REGULATION**

- A. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.
- B. Flares and lights: Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.
- C. Haul Routes:
  - 1. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.
- D. Removal:
  - 1. Remove equipment and devices when no longer required.
  - 2. Repair damage caused by demolition.

### **3.03 BARRIERS**

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for Owner's use of site and to protect existing facilities and adjacent properties from damage during construction operations.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

### **3.04 ENCLOSURES AND FENCING**

- A. Provide temporary enclosure and fences as necessary to protect the public and secure the site.
- B. Provide four-foot-high fence around construction site. See Project Documents for location.
- C. Provide security and facilities to protect work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

### **3.05 WASTE REMOVAL**

- A. Except for items or materials to be salvaged, recycled or otherwise reused, remove waste materials from project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
  - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Waste Disposal Facilities: Provide waste collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

**END OF SECTION**

## SECTION 01 6000

### PRODUCT REQUIREMENTS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. General product requirements
- B. Product options
- C. Maintenance materials
- D. Transportation and handling
- E. Storage and protections

#### PART 2 - PRODUCTS

##### 2.01 GENERAL PRODUCT REQUIREMENTS

- A. Provide new products unless specifically required or permitted by the contract documents.
- B. Do not use products having any of the following characteristics:
  - 1. Made using or containing CFC's or HCFC's
  - 2. Made of wood from newly cut old growth timber.
- C. Where all other criteria are met, contractor shall give preference to products that:
  - 1. If used on interior, have lower emissions
  - 2. If wet-applied, have lower VOC content
  - 3. Are extracted, harvested, and/or manufactured closer to the location of the project
  - 4. Have longer documented life span under normal used
  - 5. Result in less construction waste
  - 6. Are made of vegetable materials that are rapidly renewable

##### 2.02 PRODUCT OPTIONS

- 1. Products specified by reference standards or by description only: Use of any product meeting those standards or description.
- 2. Products specified by naming one or more manufacturers, with or without a provision for substitutions: Use a product of one of the manufacturers named and meeting specifications or submit a request for substitution for any manufacturer not named by the date specified in this project manual. Substitution requests shall be emailed to the Issuing Officer at the email address provided in Instructions to Bidders Section 1.04.

##### 2.03 MAINTENANCE MATERIALS

- 1. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- 2. Deliver to project site; obtain receipt prior to final payment.

#### PART 3 - EXECUTION

##### 3.01 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

### **3.02 STORAGE AND PROTECTIONS**

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to the product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- G. Comply with manufacturers' warranty conditions, if any.
- H. Cover product subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- I. Prevent contact with material that may cause corrosion, discoloration, or staining.
- J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

**END OF SECTION**

## SECTION 01 7300

### EXECUTION

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures
- B. Alteration project procedures
- C. Cutting and patching
- D. Cleaning and protection
- E. Adjusting

#### PART 2 - PRODUCTS – NOT USED

#### PART 3 - EXECUTION

##### 3.01 EXAMINATION, PREPARATION, AND GENERAL INSTALLATION PROCEDURES

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misproduction.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to cutting: Examine existing conditions prior to commencing work; include elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.
- G. Clean substrate surfaces prior to applying next material or substance.
- H. Seal cracks or openings of substrate prior to applying next material or substance.
- I. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.
- J. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- K. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- L. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- M. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- N. Make neat transitions between different surfaces, maintaining texture and appearance.

##### 3.02 ALTERATION PROJECT PROCEDURES

- A. Materials: As specified in product sections match existing products and work for patching and extending work.
- B. Employ skilled and experienced installer to perform alteration work.
- C. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
- D. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished work.
- E. Remove, cut and patch work in a manner to minimize damage and to provide a means of restoring products and finished to original condition.

- F. Remove debris and abandoned items from area and from concealed spaces.
- G. Refinish visible existing surfaces to remain in renovated rooms and spaces to specified condition for each material with a neat transition to adjacent finishes.
- H. Where new work abuts or aligns with existing, perform a smooth and even transition. Patched work to match existing adjacent work in texture and appearance.
- I. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line of division and make recommendation to the Construction Manager. Prior to cutting get the Owner's approval.
- J. Where change of plane of ¼ inch or more occurs, submit recommendation for providing smooth transition to the Construction Manager for review.

### **3.03 CUTTING AND PATCHING**

- A. Employ skilled and experienced installer to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements which affect:
  - 1. Structural integrity of element.
  - 2. Integrity of weather-exposed or moisture-resistant elements.
  - 3. Efficiency, maintenance, or safety of element.
  - 4. Visual qualities of sight exposed elements.
  - 5. Work of owner or separate contractor.
- C. Execute cutting, fitting, and patching to complete work, and to:
  - 1. Fit the several parts together, to integrate with other work.
  - 2. Uncover work to install or correct ill-timed work.
  - 3. Remove and replace defective and non-conforming work.
  - 4. Remove samples of installed work for testing.
  - 5. Provide openings in elements of work for penetrations of mechanical and electrical work.
- D. Execute work by methods to avoid damage to other work and which will provide proper surfaces to receive patching and finishing.
- E. Cut rigid materials using masonry saw or core drill.
- F. Cut masonry and concrete materials using masonry saw or core drill.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work tight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
- I. Maintain integrity of wall, ceiling or floor construction; completely seal voids.
- J. Refinish surfaces to match adjacent finishes. Refinish to nearest intersection for continuous surfaces. Refinish entire unit for continuous surfaces for an assembly.
- K. Identify hazardous substances or conditions exposed during the work to the engineer for decision or remedy.

### **3.04 CLEANING AND PROTECTION**

- A. Progress cleaning
  - 1. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
  - 2. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.
- B. Protection of installed work
  - 1. Protect installed work from damage by construction operations.
  - 2. Provide special protection where specified in individual specification sections.
  - 3. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
  - 4. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.
  - 5. Prohibit traffic from landscaped areas.

**3.05 ADJUSTING**

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

**END OF SECTION**

## SECTION 01 7329 - CUTTING AND PATCHING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. See Division 3 for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

#### 1.2 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

#### 1.3 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
  - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
  - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Provide temporary dust enclosures where needed before beginning any cutting and patching work.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

### 3.3 PERFORMANCE

- A. General: In general, the trade installing the work shall be the responsible party for cut and patch of existing construction as it work relates to their installation. Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces.

- a. If cutting concrete floors that will remain as exposed finished surfaces, do not over cut openings or leave run-on cut marks in finished floor.
  2. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  3. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Provide materials and comply with installation requirements specified in other Sections.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  1. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. When patching concrete floors that will remain as exposed finished surfaces, provide test area of patched floor for approval before continuing work. See Division 3 Maintenance of Cast in Place Concrete for additional requirements.
  2. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  3. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 01 7329

## SECTION 01 7700

### CLOSEOUT PROCEDURES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Inspections
- B. Substantial Completion
- C. Project Record Documents
- D. Warranties
- E. Operations and Maintenance Manuals
- F. Operations and Maintenance Data for Materials and Finishes
- G. Operations and Maintenance Data for Equipment and Systems
- H. Training
- I. Final Completion
- J. Maintenance

#### PART 2 - PRODUCTS – NOT USED

#### PART 3 - EXECUTION

##### 3.01 INSPECTIONS

- A. Ensure all state inspections have been completed by the authority having jurisdiction.
- B. Upload documentation of all test/inspections to Procore.
- C. Submit a written request for inspection of Substantial Completion. On receipt of request, The Design Professional will either proceed with inspection or notify contractor of unfulfilled requirements. The Design Professional will prepare the Certificate of Substantial Completion after inspection or will notify contractor of items, either on contractor's list or additional items identified by architect that must be completed or corrected before certificate will be issued.
  - 1. Re-inspection: Request re inspection when the work identified in previous inspections as incomplete is completed or corrected.
  - 2. Results of completed inspection will form the basis of requirements for Final Completion.

##### 3.02 SUBSTANTIAL COMPLETION

- A. A substantial completion checklist is attached for reference following this specification section.
- B. Make submittals that are required by governing or other authorities.
  - 1. Provide copies to the Construction Manager through upload to Procore.
- C. Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
  - 1. Submit written certification that contract documents have been reviewed, work has been inspected, and that work is completed in accordance with contract documents and ready for review
  - 2. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the work has not been completed.
  - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Make final changeover of permanent locks and deliver key to the owner. Advise owner's personnel of changeover in security provisions.
  - 5. Complete startup testing of systems.
  - 6. Submit test/adjust, balance records.
  - 7. Terminate and remove temporary facilities from project site, along with mockups, construction tools, and similar elements.

8. Advise owner of changeover in heat and other utilities.
9. Submit changeover information related to owner's occupancy, use, operation, and maintenance.
10. Complete final cleaning requirements, including touch up painting.
11. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

### **3.03 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
- 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 alterations utilized.
  3. Changes made by Addenda and modifications.
- F. Record Drawings:
  1. Measured depths of foundations in relation to finish first floor datum.
  2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the work.
  4. Field changes of dimension and detail.
  5. Details not on original contract drawings.
- G. Record Drawings shall be uploaded to Procore in pdf format.

### **3.04 WARRANTIES**

- A. Submit written warranties for designated portions of the work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Submit properly executed warranties in Procore prior to Final Completion.
- C. Verify that documents are in proper form, contain full information, and are notarized.
- D. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- E. Include warranties in operation and maintenance manuals.
- F. Items of work delayed beyond date of Substantial Completion, provide updated submittal after acceptance by Owner, listing date of acceptance as start of warranty period

### **3.05 OPERATIONS AND MAINTENANCE MANUALS**

- A. Format: Submit operations and maintenance manuals in the following format:
  1. Portable Document Format (PDF) electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Owner and upload to Procore.
    - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.

2. Assemble with data arranged in the same sequence as, and identified by the specification sections. Where systems involve more than one specification section, provide separate index for each system.
  3. Include project directory listing title and address of project, names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.
  4. Include Table of Contents listing every item separated by index and specification section.
- B. Source Data: For each product or system, list names, addresses, and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
  - C. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
  - D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use project record documents as maintenance drawings.
  - E. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

### **3.06 OPERATIONS AND MAINTENANCE DATA FOR MATERIALS AND FINISHES**

- A. For each product, applied material, and finish:
  1. Product data, with catalog number, size, composition, and color and texture designations.
  2. Information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specified products.

### **3.07 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS**

- A. For each item of equipment and each system:
  1. Description of unit or system, and component parts
  2. Identify function, normal operating characteristics, and limiting conditions
  3. Include performance curves, with engineering data and tests
  4. Complete nomenclature and model number of replacement parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specified products.
- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- D. Include color coded wiring diagrams as installed.
- E. Operating procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- F. Maintenance requirements: Include routine procedure and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- G. Provide servicing and lubrication schedule and list of lubricants required.
- H. Include manufacturer's printed operation and maintenance instructions.
- I. Include sequence of operation by controls manufacturer.

- J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- K. Provide control diagrams by controls manufacturer as installed.
- L. Provide contractor's coordination drawings, with color coded piping diagrams as installed.
- M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- O. Include test and balancing reports.
- P. Additional requirements: As specified in individual specification sections.

### **3.08 TRAINING**

- A. Demonstrate operations of systems, subsystems, and equipment.
- B. Train in operation and maintenance of systems, subsystems, and equipment
- C. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- D. Submit written agenda to Construction Manager for approval prior to scheduling training.
- E. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

### **3.09 FINAL COMPLETION**

- A. A final completion checklist is attached for reference following this specification section.
- B. Before requesting final inspection for determining date of Final Completion, complete the following:
  - 1. Complete punch list items.
  - 2. Prepare and submit project record documents, operation and maintenance manuals, damage or settlement surveys, and similar final record information.
  - 3. Deliver tools, spare parts, extra materials, and similar items to location designated by owner. Label with manufacturer's name and model number where applicable.
  - 4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
  - 5. All trailers, construction signs, unused, broken or demolition materials have been removed from the site and the premises returned to the original condition in the opinion of the Owner and Design Professional.
  - 6. Submit a final Application for Payment (retainage).
- C. Upon receipt of final payment complete final completion certificate in Procore.

**END OF SECTION**

# Substantial Completion Project Checklist

Date: \_\_\_\_\_

DAS Project Number: 9487.00

Project Title: DVA IVH Loftus and Malloy Water Infiltration-Flooding (29C20)

Location: 1301 Summit St Marshalltown, IA 50158

Contractor: \_\_\_\_\_

In order to process the 99% payment (100% pay app less closeout and retainage) on a Capital Project, the Department of Administrative Services needs the following information. Please complete this form and obtain the necessary documents.

**Have all state inspections been completed and documentation uploaded to Procore?**  
*(Including but not limited to the following inspections)*

- Boiler Inspection  Yes  No  N/A
- Water Heater Inspection  Yes  No  N/A
- Energy Code Inspection  Yes  No  N/A
- Building Code Inspection  Yes  No  N/A
- Electrical Inspection  Yes  No  N/A
- Elevator Inspection  Yes  No  N/A
- Other: \_\_\_\_\_  Yes  No  N/A

Occupancy Permit if applicable

Test and Balance has been performed

Certificate of Substantial Completion in Procore (Consensus Docs 814)

Are there any disputes with the above mentioned vendor which need resolution?

Yes (provide description below)  No

\_\_\_\_\_  
\_\_\_\_\_

Can payment (less closeout and retainage) be released?  Yes  No

## Final Completion Project Checklist

Date: \_\_\_\_\_

DAS Project Number: \_\_\_\_\_

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

Location: \_\_\_\_\_

Contractor: \_\_\_\_\_

In order to process the 100% payment and Retainage payment on a Capital Project, the Department of Administrative Services needs the following information. Please complete this form and obtain the necessary documents.

Have all Warranties been received?  Yes  No

Have the Operations and Maintenance Manuals been received?  Yes  No

Who is in possession of the O & M Manuals? \_\_\_\_\_

Has all training been completed?  Yes  No

Have all as-built drawings been scanned and uploaded into Procore?  Yes  No

Have electronic drawing/specification files been transferred to DAS?  Yes  No

Have all Test & Balance reports been received?  Yes  No

Have all punchlist items been corrected?  Yes  No

**573 Notification** (*To be obtained from the general contractor*): Copy of general contractor's notification of application for retainage to all subcontractors and suppliers. General contractor must follow IAC 26 section 23.13.2.

**AIA Form G706 – Contractor's Affidavit of Payment of Debts and Claims**

**AIA Form G706A – Contractor's Affidavit of Release of Liens**

**AIA Form G707 – Consent of Surety Company to Final Payment**

**Certificate of Final Completion in Procore (Consensus Docs 815)**

Are there any disputes with the above mentioned vendor which need resolution?

Yes (provide description below)  No

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Can 100% payment and retainage payment be released?  Yes  No

## SECTION 02 4119 - SELECTIVE STRUCTURE DEMOLITION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes demolition and removal of selected portions of building or structure.

#### 1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

#### 1.3 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Pre-demolition Conference: Conduct conference at Project site.

#### 1.4 PROJECT CONDITIONS

- A. Owner will occupy buildings immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: Hazardous materials are present in construction to be selectively demolished. Testing for lead paint and asbestos containing materials was done on the building. A report on the presence of hazardous materials is included for review and use. Examine report to become aware of locations where hazardous materials are present.
  - 1. Asbestos containing materials will be removed by Owner under a separate contract before start of the Work.

2. If other materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.
- E. Storage or sale of removed items or materials on or off site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
  1. Maintain fire-protection facilities in service during selective demolition operations.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

### 3.2 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

### 3.3 SELECTIVE DEMOLITION

- A. General: Do not demolish building elements beyond what is indicated on Drawings without Architect's approval. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.

Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches or spark producing equipment unless coordinated with Owner and facility prior.
4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
5. Dispose of demolished items and materials promptly.

B. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition.

### 3.4 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.
1. Do not allow demolished materials to accumulate on-site.

### 3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused or reinstalled; remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
- B. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

END OF SECTION 02 4119

## SECTION 03 0137 - REHABILITATION OF CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section includes:

1. Concrete patching compounds with a non-sag polymer-modified, concrete repair mortar for repairing vertical and overhead concrete surfaces.
2. Concrete crack repair with a fast setting, one component, repair mortar for vertical and overhead concrete surfaces.
3. Crack repair sealant for small cracks using a 2-component two-component, low viscosity, high strength, multi-purpose liquid epoxy injection resin for pressure injection on horizontal surfaces
4. Cement-based waterproofing coating concrete for horizontal and vertical surfaces.

#### 1.2 DESCRIPTION

A. Perform and provide all labor, products, and equipment required for repairing all defects on exterior cast-in-place concrete.

B. Work includes, but is not limited to:

1. Pressure wash cleaning prior to examination of all concrete surfaces.
2. Removal and cut-out of all delaminated, scaled, and spall damaged areas of existing concrete.
3. Preparation, cleaning, priming and application of all repair surfaces to receive patching compound.
4. Preparation and application of epoxy injection repairs.
5. Finishing and curing of patches and repairs.
6. Application of cement based waterproofing coating.

#### 1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include manufacturer's info on preparation for patching and repair products, manufacturer's installation instructions, and curing requirements.

B. Submit substitutions for pre-approval during bidding.

#### 1.4 QUALITY ASSURANCE

A. Source of Materials: Obtain materials for patching, coating, sealing and crack repair from a single source manufacturer to ensure match quality, color, texture and detailing.

## 1.5 MOCK UPS

- A. Concrete Patching: Prepare a sample area for each type of construction to be patched, rebuilt and/or replaced (e.g. one horizontal surface and one vertical surface). Patching shall demonstrate methods and quality of workmanship expected of repair work. Coordinate with Construction Manager and/or Architect for review.
  - 1. Size: Minimum of 6" x 6" area or multiple smaller holes.
- B. Concrete Crack Repair: Prepare a sample area for each type of crack repair required for concrete (i.e. cracks and voids larger than 1/8"). Repair shall demonstrate methods and quality of workmanship expected for crack repair. Coordinate with Construction Manager and/or Architect for review.
  - 1. Size: Minimum of 24" length.
- C. Acceptable completed mock ups can remain as a part of the final work. Mock ups that are not acceptable are to be corrected and reworked for review.

## 1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

## 1.7 PROJECT CONDITIONS

- A. Do not apply below 40° F or above 90° or when rain, fog or mist is anticipated within twelve hours after application. Protect from conditions that may cause early water loss: high winds, low humidity, high temperature, and direct sunlight.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Provide products from a single source manufacturer to ensure product compatibility.

### 2.2 REPAIR MORTAR: (Foundation Patching at Spalls and Abandoned Pipe Holes)

- A. A trowel-grade, lightweight, polymer-modified, fiber reinforced, non-sag concrete repair mortar for repairing vertical and overhead concrete surfaces.
- B. Manufacturers: Basis of Design – SikaQuick VOH Patch Repair Mortar by Sika Corp. (vertical and overhead surfaces)

1. Acceptable Products:
    - a. MeadowCrete GPS by W. R. Meadows
    - b. Others as pre-approved.
  2. Product Properties:
    - a. Compressive Strength, ASTM C109. 2500 psi at 1 day, 6000 psi at 7 days, and 7000 psi @ 28 days.
    - b. Bond Strength, ASTM C882 1300 psi at 1 day, 2000 psi at 7 days, and 2200 psi at 28 days.
    - c. Modulus of Elasticity, ASTM C469.,  $4.30 \times 10^6$  psi ( $2.96 \times 10^4$  MPa) at 28 days.
    - d. Drying Shrinkage, ASTM C157. -0.1 % (1000  $\mu$  strain)
    - e. Flexural Strength, ASTM C348. 800 psi at 1 day, 950 psi at 7 days, 1100 psi at 28 days.
    - f. Freeze-Thaw Resistance, ASTM C666. 99 % RDM at 300 cycles.
- C. Bonding Agent: Apply bonding agents to enhance bonding between repair mortar to existing concrete where recommended by manufacturer.

### 2.3 CONCRETE CRACK REPAIR: (Concrete Foundation and Patio Deck Cracks)

- A. A two-component low viscosity, high strength, multi-purpose liquid epoxy injection resin for pressure injection or gravity feeding applications.
- B. Basis of Design – Sikadur 31 and 35 by Sika Corp. (horizontal and vertical surfaces)
  1. Acceptable Products:
    - a. Flexi-Seal 510 by Edison Coatings.
    - b. Rezi-Weld LV State by W. R. Meadows.
    - c. Others as pre-approved.

### 2.4 CEMENT WATERPROOF COATING

- A. Water-based, high-build, silicone elastomeric waterproof coating used above-grade on horizontal and vertical exterior concrete surfaces. Basis of Design – Sika Thorocoat 400 by Sika Corp.
  1. Acceptable Products:
    - a. Gem-Crete TWM Plus by W. R. Meadows
    - b. Tamoseal by Euclid Chemical Co.
    - c. Others as pre-approved.
  2. Texture: Medium texture finish.

## PART 3 - EXECUTION

### 3.1 SURFACE PREPARATION

- A. Protect adjacent Work areas and finish surfaces from damage during mortar system application.
- B. Concrete:
  - 1. Remove unsound or delaminated concrete.
  - 2. For patches, saw-cut straight edges along repair area perimeters minimum of 1/4 inch deep (or per manufacturer) to eliminate featheredges. Do not cut reinforcement.
  - 3. Report cracks that appear in interface area of patch or overlay to Architect, and repair as directed.
  - 4. Power wash clean to remove area of sand, grit and dust.

### 3.2 CONCRETE PATCHING (Foundation Patching at Spalls & Pipe Holes)

- A. Saw-cut edges along repair area perimeters minimum of 1/4 inch deep (or per manufacturer) to eliminate featheredges. Do not cut reinforcement.
- B. Prior to patching, all repair areas to be patched shall be kept continuously wet for at least 20 minutes prior to application of patching compound. Before placing patch, excess water shall be removed from the surface, leaving the surface damp or saturated/surface dry.
- C. If bonding agents are recommended by the manufacturer for the system, apply bonding agent into all cavity surfaces. Apply bonding agent undiluted by brush, roller or garden-type sprayer on to prepared surface or in accordance with manufacturer's instructions if different.
- D. While bonding agent is still wet, mix and place patching compound in accordance with manufacturer's instructions.
- E. Mix the precisely measured quantity of water specified by the manufacturer with full bags of patching compound only. Mix per the manufacturer's instructions. Mix to a uniform consistency, free of lumps or dry material. Do not over mix or whip air into the mix.
- F. Hand Placement:
  - 1. Compact mortar into properly prepared substrate prior to bulk placement.
  - 2. Apply mortar in lifts up to 3" horizontally dependent on patch size and configuration.
  - 3. Finish surface with a wood or steel trowel, or a sponge float.
  - 4. Do not re-temper or over-work.
- G. Do not open to traffic or expose to weather until adequate strength has been reached, as affected by Working and curing conditions.

### 3.3 CONCRETE CRACK REPAIR (Concrete Foundation and Patio Deck Cracks)

- A. All surfaces to be bonded must be free of standing water and completely clean of dirt, rust, curing compounds, grease, oil, paint, waxes, and other materials which would prevent an optimal bond.
- B. Cracks should be v-notched and then mechanical abrading or high pressure water jetting to a sound surface.
- C. Seal underside of slab and provide dams as needed prior to filling if cracks reflect through.
- D. Mix per the manufacturer's written instructions. Mix with properly colored sand for cracks over 1/4 inch wide. If mixing with sand, mix in ratios per manufacturer's recommendations.
- E. Pressure Injection of Cracks:
  - 1. Seal ports and cracks with an appropriate paste epoxy.
  - 2. When paste is cured, inject adhesive using standard pressure-injection equipment or by gravity feed.
  - 3. For injection with side-by-side dispenser, hold in upright position and use continuous pressure to avoid an improper mixing ratio.
- F. Gravity Feeding: Pour neat into v-notched crack. Continue placement until completely filled.
- G. For larger patching areas follow manufacturer's instructions.
- H. Clean tools immediately after use with xylene or mineral spirits. Remove cured materials with commercial epoxy or paint stripper solvents.

### 3.4 CEMENT WATERPROOF COATING

- A. Surfaces should be structurally sound, clean, and free from loose particles, oil, grease, or any other contaminants.
- B. Repair any holes, cracks and spalls on concrete surface prior to application. Allow repairs to properly cure before proceeding.
- C. Mix product per the manufacturer's written instructions. Mix with a slow speed drill and mixing paddle to ensure uniform color and aggregate disbursement.
- D. Apply product evenly with a stiff brush or by spray, onto the prepared surface, to give a continuous film and then backroll.
- E. Apply two coats, achieving a total dry-film thickness (DFT) of 12–16 mils.
- F. Drying Time: To touch: 1–2 hours; to recoat: minimum of 6 hours. Lower surface or air temperatures and higher relative humidity will extend the drying time.

3.5 CURING

- A. Cure all concrete repair products accordance with manufacturer's instructions.

3.6 CLEANING

- A. Clean wet mortar material from tools and equipment with water. Remove cured materials mechanically.
- B. Clean up and properly dispose of any debris remaining on Project site related to application.
- C. Do not use storm inlets, floor drains, or facility sinks for cleaning. Coordinate with Owner for appropriate wash out locations.

END OF SECTION 03 0137

## SECTION 03 1513 - WATERSTOPS

### PART 1 - GENERAL

#### SUMMARY

A. Section includes:

1. Swellable (hydrophilic) strip waterstops embedded in non-moving concrete construction joints creating a continuous barrier to water migration.
2. Post-applied corner retrofit waterstops for below grade surface to wall sealing.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Provide manufacturer's instructions on preparation for patching and installation instructions, use limitations and recommendations.
- B. Shop Drawings: Provide shop drawings to indicate locations and extent of waterstop, quantity or lineal feet of product, fasteners, and accessories for complete installation.
- C. Submit substitutions for pre-approval during bidding.

#### 1.3 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at the project site.
- B. Mockups: Build mockup to demonstrate installation.
  1. Build mockups to demonstrate each waterstop product, attachments, and accessories.
  2. Size and Quantity:
    - a. Swellstops: Minimum 2 openings.
    - b. Retrofit Corner Stops: Minimum of 10 feet long.
  3. Coordinate review of mock up with Architect. Proceed with work after acceptance.
  4. Acceptable mock up roof area can remain as a part of the completed work.

#### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer with directions for storage and use.
- B. Store waterstop under cover to protect from moisture that may cause premature waterstop swelling.

## 1.5 PROJECT CONDITIONS

- A. Prepare site by excavation to expose installation locations.

## PART 2 - PRODUCTS

### 2.1 HYDROPHILIC SWELLABLE WATERSTOPS

- A. Swellable (hydrophilic) strip waterstops embedded in non-moving concrete construction joints creating a continuous barrier to water migration. Strip-applied waterstop for non-moving joints in concrete. Bentonite or non-bentonite based water activated swellable joint sealing fabricated of hydrophilic materials into a rubber base, to create a controlled, moisture-activated, compression seal.
- B. Manufacturers: Basis of Design - SwellStop by Sika Corp.
  - 1. Acceptable Products:
    - a. ADCOR 500S by GCP Saint-Gobain.
    - b. NB190 by J P Specialties Inc.
    - c. SwellStop by Sika Corp.
    - d. Waterstop EC BY W.R. Meadows.
    - e. Others as pre-approved.
  - 2. Product Properties:
    - a. Width: 3/4 - 1 inch.
    - b. Thickness: 3/8 -1/2 -3/4 inch. Verify thickness for each application.

### 2.2 POST-APPLIED CORNER RETROFIT WATERSTOPS

- A. A retrofit waterstop designed to provide a fluid-tight seal between existing and new concrete construction. Waterstop embedded in epoxy adhesive concrete including contraction, expansion and construction joints creating a continuous diaphragm to prevent the passage of fluid.
- B. Product options include tapes made of Modified flexible polyolefin (FPO), chemical-resistant thermoplastic vulcanizate (TPV) or elastomeric thermoplastic polyolefin (TPE).
- C. Manufacturers: Basis of Design: Sikadur Combiflex SG-20 by Sika Corp.
- D. Acceptable Products:
  - a. JP540L TPV by JP Specialties.
  - b. Mapeband TPE by Mapei.
  - c. Sikadur Combiflex SG-20.
  - d. Others as pre-approved.
- E. Size: 4.5" x 4.5" (at corners) or 8" overall.
- F. Thickness: Per manufacturer.

- G. Color: Light Gray.

### PART 3 - EXECUTION

#### 3.1 SURFACE PREPARATION

- A. Prepare surfaces to be dry, smooth, free of depressions, voids, protrusions, clean and free of unapproved curing compounds, form release agents and other surface contaminants. Remove unsound or delaminated concrete.
  - 1. Mechanically remove prior mastics, epoxies, sealants and paint down to bare concrete.
  - 2. Power wash clean to remove area of sand, grit and dust.
  - 3. Clean and prime surfaces in accordance with manufacturer's instructions.

#### 3.2 HYDROPHILIC SWELLABLE WATERSTOP INSTALLATION

- A. Ensure pipe or utility penetrations have an appropriate gap around the perimeter to fully recess the waterstop between the pipe wall and adjacent concrete.
- B. Protect waterstop from moisture, dirt, oil, and sunlight during the progress of the installation.
- C. Apply primer adhesive to dry concrete surface, 2 inches wide continuously along the joint, maintaining a minimum of 2 inches clear cover to concrete face.
- D. Primer adhesive shall be allowed to "dry to the touch" (typically 30 minutes to several hours; dependent on-site conditions) prior to application of waterstop.
- E. Continuously adhere waterstop to concrete utilizing primer adhesive and maintaining a minimum of 2 inches clear cover to concrete face.
- F. Remove release paper from waterstop immediately prior to concrete placement.
- G. Waterstop shall be butt spliced pressing ends together ensuring no separation or air pockets.
- H. Inspect waterstop for premature swelling, discontinuity, and debris contamination prior to setting and curing.

#### 3.3 POST-APPLIED CORNER RETROFIT WATERSTOP INSTALLATION

- A. Install corner retrofit waterstops at the locations shown on the Drawings to form a continuous fluid-tight diaphragm. Adequate provision shall be made to support and completely protect the waterstops during the progress of the work.
- B. Splicing straight lengths of tape shall be done by squaring or overlapping the ends (per manufacturer) to be joined and using manufacturer's waterstop splicing tool utilizing either a cold weld or thermoplastic splicing iron (per manufacturer) with a non-stick surface specifically designed for waterstop welding.

- C. Uncoil waterstop 24 hours prior to installation for ease of handling and fabrication.
- D. Center waterstop on joint, with approximately one-half of waterstop width to be embedded in adhesive on each side of the joint.
- E. Provide end terminations, splices and corner intersections per manufacturer's instructions. Overlap on to footings or floors minimum of 4 inches.
- F. Apply termination bars with fasteners spaced per manufacturer where required. Size and length of fasteners as recommended by manufacturer.
- G. Any waterstop displaying punctures, damage, improper bond, bubbles, or separation shall be repaired or replaced.

3.4 CURING:

- A. Cure all waterstop products accordance with manufacturer's instructions.

3.5 CLEANING

- A. Clean up and properly dispose of any debris remaining on Project site related to application.

END OF SECTION 03 1513

## SECTION 03 3053 - MISCELLANEOUS CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section specifies the following work:
  - 1. Cast-in place concrete, including reinforcement. (Drainage Flumes and Trench Drains)
  - 2. See Civil for exterior concrete slabs and sidewalks.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Ready-Mix batch tickets.

#### 1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- C. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
  - 1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5.
  - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- D. Pre-installation Conference: Conduct conference at Project site.
- E. Installer Qualifications: An experienced installer who has completed concrete work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- F. Contact Construction Manager minimum of 3 days prior to pouring concrete to coordinate visually inspection of steel reinforcement.

## PART 2 - PRODUCTS

### 2.1 FORM-FACING MATERIALS

- A. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- B. Form- Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

### 2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 galvanized reinforcing bars deformed.
- B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or according to CRSI's "Manual of Standard Practice."

### 2.3 CONCRETE MATERIALS

- A. Mix Material: Use the following materials, of the same type, brand, and source, throughout Project:
  - 1. Portland Cement: ASTM C 150, Type I. Contractor may supplement with the following at a rate not to exceed 15%:
    - a. Fly Ash: ASTM C 618, Class C.
    - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
  - 2. Normal-Weight Aggregates: (For Exterior Concrete) ASTM C 33, graded, 3/4-inch nominal maximum coarse-aggregate size.
    - a. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement and coal/chert impurities that cause pop-outs.
    - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
  - 3. Light-Weight Aggregate: ASTM C 330/C 330M, up to 3/4-inch nominal maximum aggregate size.
  - 4. Water: ASTM C 94/C 94M and potable.
  - 5. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding

those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.

## 2.4 CONCRETE MIXTURES

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
- B. Proportion Normal Weight Concrete mixture as follows:
  1. Minimum Compressive Strength:
    - a. 5000 ps. at 28 days. (for drainage flumes)
    - b. 3000 ps. at 28 days. (for interior floor patching)
  2. Maximum Water-Cementitious Materials Ratio: 0.45.
  3. Slump Limit: 4 inches for concrete with verified slump of 2 to 4 inches before adding high range water reducing admixture or plasticizing admixture, plus or minus 1 inch.
  4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size for exterior concrete. (3 percent max. for interior floor patching)

## 2.5 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.
  1. When air temperature is between 85 and 90 deg F reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F reduce mixing and delivery time to 60 minutes.

## 2.6 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

## 2.7 ACCESSORIES

- A. Extruded Polystyrene Board, Type IV, ASTM C 578, Type IV, 25-psi minimum compressive strength; unfaced; per ASTM E 84.
  1. For compressible form fill, thickness as indicated in Drawings.

## 2.8 RELATED MATERIALS

- A. Vapor Retarder: Plastic sheet, ASTM E 1745, Class A or B.

- B. Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 10 mils (0.25 mm) thick; or plastic sheet, ASTM E 1745, Class C.
- C. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

### PART 3 - EXECUTION

#### 3.1 PROTECTION OF WORK AND ADJACENT AREAS

- A. Protect adjacent slabs during construction. Any broken, cracked or damaged areas of adjacent slabs shall be removed and replaced at no cost to the Owner.
- B. Provide suitable barricades to protect sidewalks from traffic. Pedestrian sidewalks shall be closed to traffic for at least 48 hours. All barricades and barricading shall be approved by the Owner.

#### 3.2 FORMWORK

- A. Design, construct, erect, brace, and maintain formwork according to ACI 301 (ACI 301M).
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

#### 3.3 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

#### 3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

#### 3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a full depth bond break.
  - 1. Extend reinforcing through joints as indicated.

- C. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
  - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

### 3.6 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  - 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
- C. The maximum deviation of the top surface of any section shall not exceed one-eighth inch 1/8" or the inside face not more than one-fourth inch 1/4" from a straight line.
- D. Hot-Weather Placement: Comply with ACI 301.

### 3.7 FINISHING FORMED SURFACES

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand trowel. Continue troweling passes and restraighen until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

### 3.8 VAPOR-RETARDER INSTALLATION

- A. Install, protect, and repair vapor retarders according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.
  - 1. Lap joints 6 inches and seal with manufacturer's recommended adhesive or joint tape.
  - 2. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

### 3.9 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying. Comply with ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating concrete, but before float finishing.
- C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
  - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

### 3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Tests: Perform according to ACI 301 (ACI 301M).
  - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd.

### 3.11 FINAL CLEANING

- A. Concrete trucks are not allowed to deposit "washout" on any of the streets, sidewalks, driveways, or storm sewers of the facility. Coordinate wash out location with Owner.

END OF SECTION 03 3053

## SECTION 03 5416 - HYDRAULIC CEMENT

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes polymer-modified, hydraulic cement patching and surface preparation.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product. Preparation instructions and installation methods.

#### 1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Installer who is approved by manufacturer for application of underlayment products required for this Project.

#### 1.4 FIELD CONDITIONS

- A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ventilation, ambient temperature and humidity, and other conditions affecting underlayment performance.
  - 1. Place hydraulic cement only when ambient temperature and temperature of substrates are between 50 and 80 deg F.

### PART 2 - PRODUCTS

#### 2.1 HYDRAULIC CEMENT PATCHING

- A. Hydraulic Cement Patching: One component polymer-modified, hydraulic cement product that can be applied in minimum uniform thickness of 1/8 inch to 1 inch and that can be feathered at edges to match adjacent floor elevations.
  - 1. Acceptable Manufacturers:
    - a. Ardex.
    - b. Euclid Chemical Co.
    - c. Laticrete.
    - d. MAPEI Corp.
    - e. SikaSet Waterplug by Sika Corp.
    - f. Others as pre-approved.

2. Cement Binder: ASTM C 150/C 150M, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C 219.
  3. Compressive Strength: Not less than 4000 psi at 28 days when tested according to ASTM C 109/C 109M.
  4. Underlayment Additive: Resilient-emulsion product of underlayment manufacturer, formulated for use with underlayment when applied to substrate and conditions indicated.
- B. Aggregate: Well-graded, coarse sand as recommended by underlayment manufacturer.
1. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.
- C. Water: Potable and at a temperature of not more than 70 deg F.
- D. Primer: Product as recommended by manufacturer for substrate, conditions, and application indicated.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. General: Prepare and clean substrate according to manufacturer's written instructions.
1. Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.
  2. Fill substrate voids to prevent underlayment from leaking.
- B. Concrete Substrates: Mechanically remove, according to manufacturer's written instructions, laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.
1. Moisture Testing: Perform per manufacturer's recommendations. Proceed with installation only after substrates are within tolerance.
- C. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

#### 3.2 APPLICATION

- A. General: Mix and apply underlayment components according to manufacturer's written instructions.
1. Close areas to traffic during underlayment application and for time period after application recommended in writing by manufacturer.
  2. Coordinate application of components to provide optimum adhesion to substrate and between coats.
- B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.

- C. Apply patching cement to produce uniform, level surface.
  - 1. Apply a final layer without aggregate to product surface.
  - 2. Feather edges to match adjacent floor elevations.
- D. Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes.
- E. Do not install coverings over product until after time period recommended in writing by the manufacturer.
- F. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

END OF SECTION 03 5416

## SECTION 05 5000 - METAL FABRICATIONS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes Fixed Metal ladders.

#### 1.2 SUBMITTALS

- A. Shop Drawings: Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

### PART 2 - PRODUCTS

#### 2.1 FIXED LADDERS

- A. Modular Vertical Aluminum Fixed Ladder for safe access to elevated areas.
- B. Acceptable Manufacturers:
  - 1. Alaco Ladder Company.
  - 2. CAI Safety Systems, Inc.
  - 3. Diversified Fall Protection.
  - 4. Kattsafe.
  - 5. O'Keeffe's Inc.
  - 6. Precision Ladders, LLC.
- C. Basis of Design: Kattsafe Model RL34 or equal: Standard fixed ladder with stile extensions.
  - 1. Material: High tensile 6106-T6 aluminum, mill finish.
  - 2. Ladder Width: 16 inches.
  - 3. Siderails: Continuous extruded-aluminum channels or tubes, not less than 2-1/2 inches deep, 3/4 inch wide, and 1/8 inch thick.
  - 4. Rungs: Extruded-aluminum tubes, not less than 1 1/4 inch square and not less than 1/8 inch thick, with ribbed tread surfaces.
  - 5. Capacity: Unit shall support a 1000 lbs loading without failure, and individual treads shall withstand a 1000 lbs loading without failure.
  - 6. Performance Standard: Units designed and manufactured to meet or exceed OSHA 1910.23.
  - 7. Provide with base plate to avoid penetration attachment to floor.
- D. Ladder-Assist Post: Fixed ladder manufacturer's standard device for attachment to ladder. Provide as an alternative to stile extensions.

1. Operation: Post locks in place on full extension; release mechanism returns post to closed position.
2. Height: 42 inches above finished access hatch.
3. Material: Aluminum or steel tube.
4. Post: 1-5/8-inch diameter pipe.
5. Finish: Manufacturer's standard baked enamel or powder coat.
  - a. Color: Safety Yellow.

E. Metal Floor Plate: Fabricate from rolled-aluminum-alloy tread plate of thickness indicated below:

1. Thickness: 3/16 inch thick.

F. Provide aluminum angle supports as indicated.

## 2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Aluminium Extrusions : ASTM B 221 (ASTM B 221M), Alloy 6063-T6.
- C. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

## 2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, separators, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Accessories: Provide all accessories as furnished by the manufacturer for a complete system installation.
- C. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to withstand design loads.

## 2.4 FABRICATION

- A. General: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.
  1. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
  2. Field cut ladder sections to fit from stock sections furnished by manufacturer.
- B. Metal Ladders: Comply with ANSI A14.3, unless otherwise indicated.

1. Aluminum Ladder Construction: Extruded aluminum channel with tube siderails, as indicated and fastened by welding or with stainless-steel fasteners or brackets and aluminum rivets. Provide rungs with ribbed tread surfaces.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. General: Perform cutting, drilling, and fitting required for installing metal fabrications.
- B. Verify dimensions of openings and height for fixed ladders. Install fixed ladders according to manufacturer's written instructions.
- C. Install fixed ladders level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
- D. Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.
- E. Anchor fixed ladders securely in place so they are capable of resisting indicated loads.

END OF SECTION 05 5000

## SECTION 05 5600 - TRENCH DRAIN GRATES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes:
  - 1. Trench Drain Grates.
  - 2. Trench Grate Frames.

#### 1.2 SUBMITTALS

- A. Product Data: Manufacturer's product literature, specifications, and installation instructions for trench grates and frames.
- B. Shop Drawings: Include plans, sections, details, and attachments to other work. Indicate details of each type and size of grate, frame supports, anchorages, perimeter construction details, and tolerances.

#### 1.3 QUALITY ASSURANCE

- A. ADA Compliance: Openings shall be no more than 1/2 inch wide perpendicular to the direction of travel.
- B. Heel-Proof: Grates with small openings to prevent high heels from catching, frequently required in pedestrian areas.
- C. Structural Performance: Gratings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Trench Drain Grate Load Classifications (DIN/EN 1433).
    - a. Load Class C-250 (up to 56,200 lbs / 250 kN): Used for commercial parking lots, curb-side drainage, and heavy-duty pneumatic tire forklifts.

### PART 2 - PRODUCTS

#### 2.1 TRENCH DRAIN GRATES

- A. 12" wide galvanized ductile iron slotted trench grate that is heel proof and ADA compliant. Maximum opening size no wider than 1/2 inch to ensure pedestrian safety and accessibility.
- B. Acceptable Manufacturers:

1. DuraTrench, 12" Wide ADA/Heel Proof Systems (12SLHC24DGD).
2. MIFAB, Inc. (T300-PGC-4-HP).
3. Zurn Drainage Systems (P12-GADA-USA).
4. Others as pre-approved.

C. Properties:

1. Type: Fabricated 12-inch Wide Longitudinal Slotted Grate (ADA & Heel-Proof).
2. Material: Cast Ductile Iron, conforming to meet Class C load requirements.
3. Dimensions: 12-inch nominal width, 24 or 36 inch nominal length, 1.5-inch thick.
4. ADA Compliance: Openings to be 1/2" or less, with long dimension perpendicular to the direction of travel.
5. Finish: Hot dipped galvanized.

## 2.2 GRATING FRAMES

- A. Frames and Supports: Fabricate from metal shapes, plates, and bars of welded construction to sizes, shapes, and profiles indicated and as necessary to receive gratings. Cut, drill, and tap units to receive hardware and similar items. Frames are commonly anchored steel or cast iron, designed for easy installation into a 12-1/8 inch minimum trench opening.

1. Unless otherwise indicated, fabricate from same basic metal as gratings.
2. Equip units indicated to be cast into concrete with integrally welded anchors. Unless otherwise indicated, space anchors 24 inches o.c.

B. Properties:

1. Type: Heavy Duty Angle Iron Frame Assembly.
2. Material: Structural Steel with anchors, or Ductile Iron to match grate. ASTM A36, hot-dip galvanized after fabrication per ASTM A123.
3. Features: Integrated anchor tabs/leveling devices for securement into concrete.
4. Finish: hot-dipped galvanized

## 2.3 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M. Galvanized Coating designation G60.

## 2.4 STEEL FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

## 2.5 FASTENERS

- A. General: Unless otherwise indicated, for exterior use provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M).

## 2.6 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

## 2.7 FABRICATION

- A. Provide fabricated unit sections.
- B. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing gratings. Set units accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
- B. Fit exposed connections accurately together to form hairline joints.
  - 1. Do not weld, cut, or abrade the surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

### 3.2 INSTALLING METAL TRENCH GRATES

- A. General: Comply with manufacturer's written instructions for installing gratings. Use manufacturer's standard anchor clips and hold-down devices for bolted connections.
- B. Install frames ensuring they are level and aligned to the final concrete surface.
- C. Attach removable units to supporting members by bolting at every point of contact.

### 3.3 ADJUSTING AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.
- B. Clean the trench drain frame and remove all concrete splatter, debris, and dirt from the frame and grate after the concrete has set.

END OF SECTION 05 5600

## SECTION 06 1053 - MISCELLANEOUS ROUGH CARPENTRY

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Framing and wood blocking.

### PART 2 - PRODUCTS

#### 2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.

#### 2.2 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - 1. Framing
  - 2. Blocking.
- B. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
  - 1. Douglas fir-larch; WCLIB or WWPA.

#### 2.3 FASTENERS

- A. General: Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Self Tapping Screw Fasteners: Complying with IBC 2107.1.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Do not splice structural members between supports, unless otherwise indicated. Do not attach or anchor with fasteners at locations between blocking or supports.
  - 1. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
  - 2. For attachment of wood blocking at roof edges where wind uplift requires secure anchoring, attach with fasteners in flat nailers 2x8 or larger by alternating sides with screw fasteners.

END OF SECTION 06 1053

## SECTION 06 1600 - SHEATHING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes:
  - 1. Roof sheathing.

#### 1.2 DELIVERY, STORAGE, AND HANDLING

- A. Stack plywood flat with blocking to keep off ground. Cover to protect from weather.

### PART 2 - PRODUCTS

#### 2.1 WOOD PRODUCTS, GENERAL

- A. General: Provide kiln-dried finished (surfaced) material without finger-jointing, unless otherwise indicated.

#### 2.2 WOOD PANEL PRODUCTS, GENERAL

- A. Plywood: DOC Standards or APA standards, DOC PS 1 Exterior, with C grade veneers. Provide exterior grade sheathing in thicknesses as indicated in the drawings.

#### 2.3 ROOF SHEATHING

- A. Plywood Roof Sheathing: CDX or Exterior grade plywood sheathing
  - 1. Thickness: 3/4 inch.

#### 2.4 FASTENERS

- A. General: Where carpentry is exposed to weather, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION, GENERAL

- A. Securely attach to substrate by fastening per Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."

#### 3.2 WOOD BOARD SHEATHING INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial."
- B. Fastening Methods: Fasten panels as indicated below:
  - 1. Roof Sheathing:
    - a. Nail to wood rafter framing.
    - b. Space panels 1/8 inch apart at edges and ends.
- C. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- D. Do not splice structural members between supports, unless otherwise indicated. Do not attach or anchor with fasteners at locations between blocking or supports.
  - 1. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

#### 3.3 PROTECTION

- A. Cover sheathing permanently by covering exposed exterior surface with vapor barrier underlayment immediately after sheathing is installed.

END OF SECTION 06 1600

## SECTION 07 0150 - PREPARATION FOR RE-ROOFING

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. This Section includes the following:

1. Roof tear-off.
2. Roofing preparation.

#### 1.2 SUBMITTALS

A. Roofing Schedule. Immediately upon award of contract, submit a copy of proposed roofing schedule indicating separate areas and total number of days scheduled for each roof or section of roof. Revise and distribute at Pre-Installation Conference for discussion, coordination and approval.

#### 1.3 QUALITY ASSURANCE

A. Verify Existing Conditions: Immediately verify existing conditions as called out in the contract drawings. Contact Architect if any existing conditions vary or any variations in existing conditions that may affect the work as called out in the Contract Documents.

B. Pre-installation Conference: Conduct conference at Project site.

C. The Construction Manager will be responsible for coordinating pre-roofing conference at least one week prior to initiation of roofing work. The Construction Manager, the foreman for roofing contractor, the owner's representative, and the sheet metal contractor are recommended to be present to discuss the execution of the work. Discussion topics will include the following:

1. Schedule for each building or section of roof.
2. Roof access.
3. Demolition clean up
4. Protection of grounds and landscaping.
5. Deck observations.
6. Coordination and timing of other subcontractors.
7. Demolition disposal.

#### 1.4 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately adjacent to the reroofing area. Conduct reroofing so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.

1. Coordinate work activities daily with Owner so Owner can place protective dust or water leakage covers over sensitive equipment or furnishings, shut down HVAC and fire-alarm or detection equipment if needed.
- B. Protect building to be reroofed, adjacent site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- C. Limit construction loads on roof.
- D. Weather Limitations: Proceed with reroofing preparation and work only when existing and forecasted weather conditions permit Work to proceed without water entering into existing roofing system or building.

## PART 2 - PRODUCTS

### 2.1 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with components of new membrane roofing system.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect existing adjacent areas that are indicated not to be reroofed.
- B. Coordinate with Owner to shut down air intake equipment in the vicinity of the Work.
- C. Verify that any rooftop utilities and service piping have been shut off before commencing Work.

### 3.2 ROOF TEAR-OFF

- A. General: Prepare schedule for Owner indicating each day of extent of roof tear-off proposed and obtain authorization to proceed.
- B. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.
- C. Full Roof Tear-Off: Remove existing roofing membrane and other membrane roofing system components down to the deck.
  1. Remove plywood and metal roofing.
  2. Remove perimeter edge flashings and counter flashings..
  3. Remove flashings at pipes, curbs, mechanical equipment, and other penetrations.
  4. Remove fasteners and any loose debris from framing.
  5. Remove wood blocking and nailers as indicated.

### 3.3 DECK PREPARATION

- A. Inspect roof framing after tear-off of roofing system.
- B. If any framing is found not suitable for receiving new roofing, or if structural integrity of deck is suspect, immediately notify Architect. Do not proceed with installation until directed by Architect.

### 3.4 ROOF RE-COVER PREPARATION

- A. Remove any attached roofing fastener buttons projecting above roofing, and other substrate irregularities from existing roofing that inhibit new roofing from conforming to substrate.
  - 1. Broom clean existing substrate.
  - 2. Verify that existing substrate is dry.

### 3.5 BASE FLASHING REMOVAL

- A. Remove existing flashings and trim around parapets, curbs, walls, and penetrations.
  - 1. Clean substrates of contaminants such as asphalt, sheet materials, dirt, and debris.

### 3.6 DISPOSAL

- A. Contractor will be responsible for cleaning up and disposing of any loose debris, trash, or other materials at the end of each work day. Contractor is to maintain a clean work area and site.
- B. Collect and place demolished materials in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- C. Transport demolished materials off Owner's property and legally dispose of them.

END OF SECTION 07 0150

## SECTION 07 1413 - HOT FLUID-APPLIED RUBBERIZED ASPHALT WATERPROOFING

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Hot fluid applied rubberized asphalt waterproofing membrane.

#### 1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins to adjoining waterproofing, and other termination conditions.
- C. Sample warranty.

#### 1.4 QUALITY ASSURANCE

- A. Source Limitations: Provide all waterproofing system components, products, and accessories as offered from single source manufacturer for warranty purposes.

#### 1.5 FIELD CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures as recommended by waterproofing manufacturer.
- B. System components contain petroleum distillates and are extremely flammable. Do not breathe vapors or use near an open fire. Do not store materials inside or near the building.

#### 1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace waterproofing and sheet flashings that do not comply with requirements or that fail to remain watertight within specified warranty period.
1. Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 WATERPROOFING MEMBRANE

- A. Hot Fluid-Applied, Rubberized-Asphalt Waterproofing Membrane: Single component; 100 percent solids; hot fluid-applied, rubberized asphalt.
- B. Furnish and install a complete vertical and horizontal waterproofing system including surface conditioner, membrane, reinforcing fabric, related flashings, and protection course and all accessories as required by the manufacturer to meet the designated warranty.
  - 1. Manufacturers:
    - a. Hydrotech Monolithic Membrane 6125 by American Hydrotech Inc.
    - b. TREMproof 6100 by Tremco, Inc.
    - c. Others as pre-approved.
  - 2. Properties:
    - a. VOC Content: Less than 160 g/L, trowel detailing grade.
    - b. Elongation: Minimum of 800 percent.
    - c. Vapor Permeance, ASTM E 96/E96M: Maximum 0.03 perms.
    - d. Low Temperature Crack Bridging, CAN/CGSB 37.50-M89; Section 4.11: Pass.

### 2.2 AUXILIARY MATERIALS

- A. General: Accessory materials as described in manufacturer's written installation instructions, recommended to produce complete waterproofing system meeting performance requirements, and compatible with waterproofing material and adjacent materials and capable of meeting warranty requirements.
- B. Primer: ASTM D 41/D 41M, asphaltic primer as recommended for substrate by waterproofing manufacturer.
- C. Flashing: Elastomeric Sheet: 60-mil minimum, uncured sheet uncured neoprene heavy duty reinforcing sheet.
- D. Reinforcing Fabric: Waterproofing manufacturer's standard spun-bonded polyester fabric sheet.
- E. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum termination bars; approximately 1 by 1/8 inch thick; with stainless-steel anchors.
- F. Sealants, Adhesives, and Accessories: Manufacturer's recommended sealants and accessories.

### 2.3 PROTECTION COURSE

- A. Protection Course: Rubberized asphalt core, reinforced with a non-woven fiberglass mat and sandwiched between two protective polypropylene layers.

- B. Protection Course will absorb the impact of aggregate shock and normal jobsite foot traffic. It also protects the membrane waterproofing from penetration by sharp aggregate during backfilling and later settlement.
- C. Do not provide drainage type protection boards that will trap moisture in or around the system below grade.
- D. Thickness: Minimum 1/8 inch thick for vertical applications; 1/4 inch nominal, elsewhere.

## 2.4 DRAINAGE MAT

- A. Semi-rigid sheets of raised dimpled molded polystyrene with a non-woven, filter fabric designed to retain soil or sand particles and provide high flow capacity to reduce hydrostatic pressure build up around waterproofing membranes.
- B. Do not provide drainage type protection boards that will trap moisture in or around the system below grade.
- C. Manufacturers: Basis of Design: HydroDrain 400 by American Hydrotech Inc.
  - 1. Mel-Drain by W.R. Meadows.
  - 2. TremDrain NW by Tremco.
  - 3. Others as pre-approved.
- D. Properties:
  - 1. Thickness: 1/4 inch minimum, for vertical applications.
  - 2. Adhesive: Rubber-based solvent type as recommended by waterproofing manufacturer.
  - 3. Thickness: 0.25 inches.
  - 4. Compressive Strength: 11,000 psf.
  - 5. Dimple Height: 5/16" (8mm).
  - 6. Dimple Spacing: 1860 per m<sup>2</sup>.
  - 7. Drainage Capacity (approx): 6 - 12 gal/min/ft.
  - 8. Roll size: 4 x 50 ft.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Clean and prepare substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for waterproofing application.
- B. Scarify existing surfaces to remove any existing waterproofing, mastics, or other foreign materials that may affect proper bonding. Scarify by mechanical means, do not pressure spray with water or use chemicals. Scarify to expose existing concrete surfaces to ensure proper priming and bonding.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, acid residues, and other penetrating contaminants or film-forming coatings from concrete.

- D. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and over run on to other construction.
- E. Remove fins, ridges, and other projections, and fill honeycomb, aggregate pockets, holes, and other voids.
- F. Remove and patch any concrete form ties, exposed metal fasteners or other non-structural exposed metal.
- G. Prepare, treat, rout, and fill joints and cracks in substrate according to waterproofing manufacturer's written instructions and to recommendations in ASTM C 898/C 898M and ASTM C 1471/C 1471M. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.
- H. Prepare surfaces at terminations and penetrations through waterproofing and at expansion joints, drains, sleeves, and corners according to waterproofing manufacturer's written instructions and to recommendations in ASTM C 898/C 898M and ASTM C 1471/C 1471M.
- I. Substrate shall also be blown clean using an air compressor to remove any remaining loose debris.
- J. Surface conditioner or primer: Apply primer to substrates as required by manufacturer, at required rate, using roller, brush, or airless spray.
  - 1. Apply the surface conditioner to the concrete using a hand held sprayer evenly at rate recommended by the manufacturer.
  - 2. Allow sufficient time for the surface conditioner to thoroughly dry prior to the membrane application.

### 3.2 JOINTS, CRACKS, AND TERMINATIONS

- A. Prepare and treat substrates to receive waterproofing membrane, including joints and cracks, corners, and penetrations according to manufacturer's written instructions.

### 3.3 FLASHING INSTALLATION

- A. Install elastomeric sheets at terminations of waterproofing membrane according to manufacturer's written instructions.
- B. All detailing and flashing shall be completed before installing the membrane over the field of the substrate.

### 3.4 EQUIPMENT

- A. Heating of membrane material shall be heated in double jacketed, oil bath or hot air melter with mechanical agitation, specifically designed for the preparation of a rubberized asphalt membrane.

### 3.5 MEMBRANE APPLICATION

- A. Apply primer, at manufacturer's recommended rate, over prepared substrate and allow it to dry.
- B. Heat and apply rubberized asphalt according to manufacturer's written instructions. Heat membrane material until it can be drawn-free flowing at temperature range as recommended by the manufacturer.
- C. Reinforced Hot Fluid-Applied Rubberized Asphalt Waterproofing: Apply waterproofing in total wet film thickness recommended in writing by waterproofing manufacturer, but not less than 215-mils total wet film thickness, applied in two or more equal coats applied using methods recommended by waterproofing manufacturer, as follows:
  - 1. Apply first coat at minimum thickness of 90 mils.
  - 2. Thoroughly embed reinforcing fabric in first coat while still liquid, with slight overlap of fabric edges. Overlap fabric reinforcing sheet 1-2 inches with membrane between sheets.
  - 3. Apply second coat at not less than 125 mils and as required to achieve total thickness of not less than 215 mils.
- D. Terminations: Install terminations of waterproofing membrane in accordance with ASTM C 898 and ASTM C 1471, as applicable to application, over prepared joints and up wall terminations and vertical surfaces to heights recommended by waterproofing manufacturer.
- E. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates and reapply waterproofing components.

### 3.6 PROTECTION COURSE INSTALLATION

- A. Install protection board with butted joints over waterproofing.
  - 1. For vertical applications, set protection course in nominally cured membrane, which will act as an adhesive. If membrane cures before application of protection course, use adhesive.
  - 2. Butt joint edges per manufacturer's instructions.
  - 3. Install protection board according to manufacturer's written instructions.

### 3.7 DRAINAGE COURSE INSTALLATION

- A. Install protection mat with overlapping joints over protection board before backfilling operations.
  - 1. Place protection mat with dimples facing the wall, and fit full depth to top of footings.
  - 2. Overlap edges per manufacturer's instructions by cutting mat and overlapping fabric.
  - 3. Cut top edge and fold back filter fabric so that the top edge is covered to prevent backfill or debris from entering the drainage area. Secure top edge per manufacturer's instructions.

3.8 CLEANING AND PROTECTION

- A. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.
- B. The completed membrane/protection assembly shall be covered with subsequent topping materials as soon as possible, using care to avoid damaging waterproofing membrane system.
- C. Protect waterproofing from damage and wear during remainder of construction period.
- D. Correct deficiencies in or remove waterproofing that does not comply with warranty requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- E. Contractor and a representative of the membrane manufacturer shall inspect the waterproofing assembly per warranty requirements and notify the contractor of any defects. All defects shall be corrected.

END OF SECTION 07 1413

## SECTION 07 1800 - TRAFFIC COATINGS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes deck coatings for exterior pedestrian traffic.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Show extent of each traffic coating. Include details for treating substrate joints and cracks, flashings, deck penetrations, and other termination conditions. Include Manufacturer's current recommended installation procedures and maintenance data.
- C. Color Samples: For each type of finish indicated.

#### 1.3 QUALITY ASSURANCE

- A. Source Limitations:
  - 1. Obtain all products for traffic coating systems from a sole source, single manufacturer.
  - 2. Obtain primary traffic coating materials, including primers, from traffic coating manufacturer. Obtain secondary materials including aggregates, sheet flashings, joint sealants, and substrate repair materials of type and from source recommended in writing by primary material manufacturer.
- B. Field Adhesion Test Method: Use manufacturer's standard field adhesion test methods and methods to verify proper priming and surface preparation techniques required to obtain optimum adhesion.
- C. Delivery, Storage and Handling: Deliver materials to the job site in the manufacturer's unopened containers with all labels intact and legible at time of use. Record all product lot numbers and expiration dates. Handle and store materials in accordance with manufacturer's recommendations with proper precautions to ensure fitness of material when installed.

#### 1.4 WARRANTY

- A. Provide Manufacturer's standard warranty for each type of product.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Traffic Coatings: Complying with ASTM C 957.
- B. Material Compatibility: Provide primers; base, intermediate, and topcoats; and miscellaneous materials that are compatible with one another and with substrate under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

### 2.2 TRAFFIC COATING

- A. Traffic Coating: A one-component, moisture-curing polyurethane membrane traffic system with integral texture, applied in a single step application.
- B. Acceptable Manufacturers: Basis of Design: Sikalastic 1500 by Sika Corporation.  
(Sikalastic M 200 base coat with Sikalastic TC 225 top coat.)
  - 1. Sikalastic 1500 by Sika Corp.
  - 2. Hydralastic 836 by W.R. Meadows. (2 component)
  - 3. Vulkem 350/351 by Tremco.
  - 4. Others as pre-approved.
- C. Properties:
  - 1. Total Volume Solids (ASTM D2697) 95%
  - 2. VOC Content (ASTM D2369) 20.9 g/l
  - 3. Tensile Strength (ASTM D2240) 2400 +/- 100 psi
  - 4. Elongation at Break (ASTM D412) 800 +/- 50%
  - 5. Tear Resistance (Die C, ASTM D624) 300 +/- 25 pli
- D. Primer: Manufacturer's recommended primer for existing concrete deck conditions.
- E. Base and Top Coat: Product is a two-coat application; apply a base coat and top coats as recommended by manufacturer for the application.
- F. Component Coat Thicknesses: Minimum system total thickness shall be 50 mils. Base coat application to 25 mils wet (WFT), top coat application to 25 mils wet (WFT), or per manufacturer.
- G. Aggregate: Top coat product has aggregate either integral or broadcast applied as a texture for slip resistance. If aggregate is broadcast, back roll top coat to embed.
- H. Color: Manufacturer's standard Gray color.

### 2.3 MISCELLANEOUS MATERIALS

- A. Joint Sealants: As specified in Division 07 Section "Joint Sealants."

- B. Provide any adhesives, flashings or other accessories as recommended in writing by traffic coating manufacturer for a complete and warrantable installation.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates for compliance with requirements and for other conditions affecting performance of traffic coatings.
  - 1. Verify compatibility with and suitability of substrates.
  - 2. Proceed with topping and coating application only after unsatisfactory conditions have been corrected, and after surfaces are dry.
  - 3. Verify that substrates are visibly dry and free of moisture.
    - a. Test for moisture content by measuring with an electronic moisture meter or by method recommended by manufacturer.
    - b. Do not apply to damp, wet, or contaminated surfaces.
  - 4. Application of coating indicates acceptance of surfaces and conditions.

#### 3.2 PREPARATION

- A. Clean and prepare substrates according to ASTM C 1127 and manufacturer's written recommendations to produce clean, dust-free, dry substrate for traffic coating application.
- B. Mask adjoining surfaces not receiving traffic coatings and edges to prevent drip runs or migration of coatings.
- C. Preparation of Concrete Substrate: Substrates shall be clean, dry, sound and free of surface contaminants, with an open texture. Shot blast or abrade existing concrete deck surface to remove previous coatings, sealants, paint, laitance and all miscellaneous surface contamination. Remove all traces of laitance, grease, oils, curing compounds, form release agents and foreign particles by mechanical means, such as shot blast, milling, grinding or scarifying as acceptable to the Architect. Blow surface free of all dust. If using compressed air, ensure compressor is equipped with an oil and moisture trap. All projections, depressions and rough spots should be removed or dressed off to achieve a level surface prior to the application.

#### 3.1 PRIMER:

- A. Concrete: (4% to 6% moisture content by weight, as measured per manufacturer's recommendations):
  - 1. For concrete substrates with 5% maximum moisture content by weight, apply Sikalastic MT primer at 175 sf/gal. with a flat squeegee or roller and work well into the substrate to ensure adequate penetration and sealing.
  - 2. For concrete substrates with >5% up to 6% maximum moisture content by weight, apply a second coat of primer per manufacturer's recommendations.

- B. Mix, apply, and cure primer in accordance with manufacturer's instructions.

### 3.2 TERMINATIONS AND PENETRATIONS

- A. Terminate vertical and horizontal surfaces and expansion joints through traffic coatings according to manufacturer's recommendations.

### 3.3 JOINT AND CRACK TREATMENT

- A. Detailing Non-Structural Cracks up to 1/16 inch: Apply a detail coat of Sikalastic 1500 at 23 mils wet 4" wide and centered over the crack. Allow detail coat to become tack free before overcoating.
- B. Cracks and Joints over 1/16 inch: Rout and seal with Sikaflex 2c Sealant and allow to skin over and cure minimum of 24 hrs. Apply a detail coat of Sikalastic 1500 at 23 mils wet, 4" wide and centered over crack/sealant. Allow detail coat to become tack free before overcoating.
- C. Existing Slab Control Joints Cracks: Apply sealant per manufacturer's recommendations and embed a 4" mesh strip into base coat.

### 3.4 TRAFFIC COATING APPLICATION

- A. Apply traffic coating material according to ASTM C 1127 and manufacturer's written recommendations.
  - 1. Apply traffic coatings for each subsequent coating at the rate recommended by the manufacturer for substrate and service conditions indicated.
  - 2. Verify that wet film thickness of each component coat complies with requirements every 100 sq. ft.
- B. Apply traffic coatings within the temperatures ranges recommended by the manufacturer. Do not apply when inclement weather is present or imminent.
- C. Mix two component products in accordance with manufacturer's instructions. Mix the combined material thoroughly until a homogenous mixture and uniform color is obtained. Prevent whipping air into the material while mixing - use a slow and methodical mixing approach.
- D. Apply a single coat of the mixed traffic coating with a 3/8" notched squeegee or trowel at the recommended coverage rate of 33 sf/gal and backroll using a phenolic resin core roller. Extend single coat over entire area including previously detailed cracks and control joints. Coverage rate of 33 sf/gal should provide a wet film thickness yield of 48 mils.
- E. Apply traffic coatings to prepared wall terminations and vertical surfaces to height indicated.
- F. Terminate the traffic coatings in accordance with the manufacturer's installation requirements.

- G. Cure traffic coatings according to manufacturer's written recommendations. Manufacturer recommends a minimum of 36 hours before opening to traffic. Prevent contamination and damage during application and curing stages.

### 3.5 PROTECTING AND CLEANING

- A. Protect adjacent areas from drips and spills from during traffic coating applications.
- B. Remove uncured materials from tools or other surfaces with an approved solvent. Remove cured materials by mechanical means.
- C. Protect traffic coatings from damage and wear during remainder of construction period.

END OF SECTION 07 1800

## SECTION 07 2500 - WEATHER BARRIERS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes Vapor Barriers.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

### PART 2 - PRODUCTS

#### 2.1 VAPOR BARRIER

- A. Rubberized-Asphalt Flashing: Rubberized Ice and Water Shield Sheet. Slip-resistant polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, self-adhering with release-paper backing; cold applied. Provide primer according to written recommendations of underlayment manufacturer.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.
    - a. Grace Ice & Water Shield – HT, by W.R. Grace.
    - b. Air-Shield HT by W.R. Meadows.
    - c. Others as pre-approved.
  - 2. Thickness: 40 mils minimum.
  - 3. Exposed Face Color: Grey-black.
  - 4. Physical Properties: Permeance: 0.05 Perms.
  - 5. Elongation: 250%.
  - 6. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C) or higher.
  - 7. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C) or lower.

### PART 3 - EXECUTION

#### 3.1 VAPOR BARRIER INSTALLATION

- A. Apply self-adhering vapor barrier where indicated to comply with manufacturer's written instructions.

- B. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply over entire roof in shingle fashion to shed water.
1. Provide a double layer at eaves extending down over the face of the wall minimum of 4 inches and up the roof slope a minimum of 24 inches.
  2. Provide end laps of not less than 6 inches staggered 24 inches between courses. Overlap edges not less than 3-1/2 inches. Roll laps with roller.
  3. Lap seams and junctures with other materials at least 4 inches.
  4. Lap flashing over edges of roof deck at bottom and sides.
  5. Turn up edges of flashing at wall intersections and at all penetrations.

END OF SECTION 07 2500

## SECTION 07 6100 – STANDING SEAM METAL ROOFING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes custom-fabricated or prefabricated, standing-seam metal roofing sheet metal roofing.

#### 1.2 SUBMITTALS

- A. Product Data: Manufacturer's product data for each type of product in the roof system.
- B. Shop Drawings: Show roof plan layouts of sheet metal roofing.
  - 1. Provide roof plan with keyed details show installation layouts. Distinguish between shop- and field-assembled work.
  - 2. Include details for forming, joining, and securing sheet metal roofing, including pattern of seams, termination points, fixed points, expansion joints, roof penetrations, edge conditions, flashing conditions, special conditions, connections to adjoining work, and details of accessory items.
- C. Samples: For each exposed product and for each finish specified.
- D. Warranties: Sample of special warranties.

#### 1.3 QUALITY ASSURANCE

- A. Engage an experienced metal roofing contractor (erector) to install standing seam system who has experience specializing in the installation of structural standing seam metal roof systems.
- B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing roofing panels for sheet metal roofing assemblies that comply with UL 580 for wind-uplift resistance as indicated in Performance Requirements. Maintain UL certification of portable roll-forming equipment for duration of sheet metal roofing work.
- C. Sheet Metal Roofing Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.
- D. Preinstallation Conference: Conduct conference at the project site.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Sheet metal roofing system including, but not limited to, metal roof panels, cleats, anchors and fasteners, sheet metal flashing integral with sheet metal roofing,

fascia panels, trim, underlayment, and accessories, shall comply with requirements without failure due to defective manufacture, fabrication, or installation, or due to other defects in construction. Sheet metal roofing shall remain watertight.

- B. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
  - 1. Wind Loads:
    - a. Basic Design Wind Speed of 115 mph.
    - b. Allowable Stress Design Wind Speed of 90 mph.
  - 2. Other Design Loads: Snow load of 25 psf.
  - 3. Deflection Limits: For wind loads, no greater than 1/240 of the span.
- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 1646 or ASTM E 33. Test-pressure differences as provided by the manufacturer.
- D. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
  - 1. Uplift Rating: Risk Category III, Exposure B.
- E. FM Global Listing: Provide metal roof panels and component materials that are based on the requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Global's "Approval Guide" for Class 1 or noncombustible construction, as applicable.
  - 1. Hail Resistance: VSH; Very Severe Hail.
- F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects.
  - 1. Temperature Change: 120 deg F ambient; 180 deg F material surfaces.

## 1.5 WARRANTY

- A. Installer's Warranty:
  - 1. Warranty form in which Installer agrees to repair or replace components of sheet metal roofing that fail in materials or workmanship within specified warranty period.
  - 2. Warranty Period: One year from date of Substantial Completion.
- B. Special Warranty on Finishes:
  - 1. Manufacturer agrees to repair finish or replace sheet metal roofing that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 ROOFING SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Roof Panel System: Provide 16" metal roof panel system and waterproofing materials by the following manufacturers:
  - 1. Maxima system by McElroy Metals Inc.
  - 2. TremLock VP system, by TREMCO.
  - 3. Or pre-approved equal.
- C. Materials:
  - 1. Panel material: 24 ga., Galvalume steel, type AZ-55, smooth as per ASTM A792-96.
  - 2. Flashing and flat stock material: Fabricate in profiles indicated on drawings of the same material, thickness, and finish as roof system, unless indicated otherwise.
- D. Finishes on surfaces:
  - 1. Finish: Two coat coil applied, baked-on full-strength (70% resin) fluorocarbon coating system (Kynar 500), applied by manufacturer's approved applicator.
  - 2. Texture: Smooth.
  - 3. Color: Medium Bronze.

### 2.2 STANDING-SEAM METAL ROOF PANELS

- A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.
- B. Vertical-Rib, Seamed-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and mechanically seaming panels together.
  - 1. Provide standing seam panels incorporating mechanically interlocked, concealed anchor clips allowing unlimited thermal movement, and of configuration which will prevent entrance or passage of water.
    - a. Provide panels that will seal and flash for a low slope roof: 1:12 slope.
    - b. Provide panels in continuous lengths from ridge to eave with no overlap joints.

- c. Seams: Seams shall be manufactured in the factory with two rows of integral factory hot applied sealant.
  - d. Concealed Standard Anchor Clips: Clips must be sixteen (16) gauge Galvalume steel, one piece clip with protecting legs for additional panel alignment and provision for unlimited thermal movement in each direction along the longitudinal dimension. Two-piece clips are not acceptable.
  - e. Clip must maintain a clearance of a minimum of three-eighths (3/8) inches between panel and substrate for proper ventilation to help prevent condensation on underside of panel and eliminate the contact of panel fastener to head panel.
2. Standing Seam Panel Width: 16”.
  3. Panel Height: 1 1/2”.
  4. Panel Profile: Plank and Pencil or Minor Ribs.
  5. Standing Seam Profile: Asymmetrical shape, with directional panel installation across roof.

### 2.3 ACCESSORIES

- A. Panel Clip Screws: Screws required in wind uplift rating requirements and design specification for application, with corrosion-resistant coating, in length necessary to penetrate substrate minimum 3/4 inch, as supplied by roof panel manufacturer.
- B. Panel Clips:
  1. Intermittent Clip: 16 gauge galvanized steel, one-piece, designed to allow roof panel thermal movement and not contact roof panel cap, as supplied by roof panel manufacturer, meeting wind uplift requirements and design criteria of this section.
  2. Intermittent Clip Bearing Plate: If required, in gauge, size and finish as supplied by and approved by roof panel manufacturer for use in roof panel manufacturer’s full assembly warranted systems.
- C. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
  1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
  2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
  3. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges,

fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

5. Panel Fasteners: Self-tapping screws designed to withstand design loads.
6. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
7. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing; 1/2 inch wide and 1/8 inch thick.
8. Joint Sealant: ASTM C 920; as recommended in writing by metal panel manufacturer.

D. Roof Curbs: See Section 07 7200 Roof Accessories.

## 2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for a complete roofing system and as recommended by primary sheet metal manufacturer unless otherwise indicated.

B. Fasteners: Wood screws, annular-threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

1. General:

- a. Exposed Fasteners: Exposed fasteners with in the panel are not allowed. Exposed fasteners with heads matching color of sheet metal roofing using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of roofing.
- b. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
- c. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.

2. Fasteners for Zinc-Coated Steel Sheet: Hot-dip galvanize steel according to ASTM A 153/A 153M, ASTM F 2329, or Series 300 stainless steel.

C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

D. Elastomeric Sealant: ASTM C 920 non-sag, elastomeric polymer sealant as recommended by portable roll-forming equipment manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal roofing and remain watertight.

## 2.5 FABRICATION

A. General: Custom fabricate sheet metal roofing to comply with details shown and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions (panel width and seam height), geometry, metal thickness, and other

characteristics of installation indicated. Fabricate sheet metal roofing and accessories at the shop to greatest extent possible.

- B. Provide the same panel profile from a single manufacturer for all standing seam roof areas.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- E. Form exposed sheet metal work to fit substrates without excessive oil canning, buckling, and tool marks; true to line and levels indicated; and with exposed edges folded back to form hems.
  - 1. Form and fabricate sheets, seams, strips, cleats, valleys, ridges, edge treatments, integral flashings, and other components of metal roofing to profiles, patterns, and drainage arrangements shown on Drawings and as required for water tight construction.
- F. Metal Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with bituminous coating, by applying self-adhering sheet underlayment to each contact surface, or by other permanent separation as recommended by fabricator of sheet metal roofing or manufacturers of the metals in contact.
- G. Sheet Metal Accessories: Custom fabricate flashings and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Obtain field measurements for accurate fit before shop fabrication.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION AND PREPARATION

- A. Sloped Roof Decks: Examine solid roof deck to verify that the surface is flush without high or low areas. Provide shims under clips as recommended by manufacturer.

#### 3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal roofing and other components of the Work securely in place, with provisions for thermal and structural movement. Install fasteners, protective coatings, separators, sealants, and other miscellaneous items as required for a complete roofing system and as recommended by fabricator for sheet metal roofing.
  - 1. Install sheet metal roofing true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant. Apply full length sheets.
  - 2. Anchor sheet metal roofing and other components of the Work securely in place, with provisions for thermal and structural movement.

3. Field cutting of sheet metal roofing by torch is not permitted.
  4. Provide metal closures with closed cell foam at peaks, rake edges, eaves and each side of ridge and hip caps.
  5. Flash and seal sheet metal roofing with closure strips at eaves, rakes, and perimeter of all openings. Fasten with self-tapping screws.
  6. Locate and space fastenings in uniform vertical and horizontal alignment. Predrill panels for fasteners.
  7. Install ridge and hip caps as sheet metal roofing work proceeds.
  8. Install sealant tape in locations as recommended by manufacturer.
  9. Lap metal flashing over sheet metal roofing to allow moisture to run over and off the material.
- B. Thermal Movement. Rigidly fasten metal roof panels to structure at only one location for each panel. Allow remainder of panel to move freely for thermal expansion and contraction.
1. Point of Fixity: Fasten each panel along a single line of fixing located at eaves.
  2. Avoid attaching accessories through roof panels in a manner that will inhibit thermal movement.
- C. Fasteners: Install clips using self-tapping fasteners. Use fasteners of sizes that will penetrate roof deck substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- D. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying self-adhering sheet underlayment to each contact surface, or by other permanent separation as recommended by SMACNA.
1. Coat back side of sheet metal roofing with bituminous coating where roofing will contact wood, ferrous metal, or cementitious construction.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

### 3.3 METAL PANEL INSTALLATION

- A. Fabricate and install work with lines and corners of exposed units true and accurate. Form exposed faces flat and free of buckles, excessive waves, and avoidable tool marks, considering temper and reflectivity of metal. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant. Fold back sheet metal to form a hem on concealed side of exposed edges unless otherwise indicated.
1. Install cleats or purlins to hold sheet metal panels in position. Attach each cleat with two fasteners to prevent rotation.
  2. Fasten cleats not more than 12 inches o.c. Bend tabs over fastener head.
  3. Provide expansion-type cleats and clips for roof panels that exceed 30 feet in length.
- B. Standing-Seam Roofing: Attach standing-seam metal panels to substrate with cleats or purlins, spaced as required by manufacturer. Install panels reaching from eave to ridge before

moving to adjacent panels. Before panels are interlocked, apply continuous sealant to top of flange of lower panel. Lock standing seams by mechanically roll crimping seam caps so cleat and panel edges are completely engaged.

1. Lock each panel to panel below with sealed transverse seam.
  2. Fold over seam cap ends after locking at ridges and hips.
- C. Watertight Installation: Seal joints as shown in the Drawings and per manufacturer as required for watertight construction.
1. Panel sealant shall be factory applied continuous hot melt sealant beads to seal joints of metal panels under a mechanically crimped seam cap as recommended by manufacturer to make panels watertight.
  2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
  3. Provide sealant or tape in hemmed edges and vertical in standing seams at eaves, at interlocks on valleys, in wall flashings, and other terminations.

### 3.4 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete sheet metal roofing assembly including trim, copings, seam covers, flashings, sealants, gaskets, fillers, metal closures, closure strips, and similar items.
  2. Install accessories integral to sheet metal roofing that are specified in Division 07 Section "Sheet Metal Flashing and Trim" to comply with that Section's requirements.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and install units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

### 3.5 CLEANING AND PROTECTION

- A. Clean exposed surfaces of work promptly after completion of installation. Clean mud, dirt, sealants and construction-related debris from panels.
- B. Remove temporary protective coverings and strippable films as sheet metal roofing is installed unless otherwise indicated in manufacturer's written installation instructions.
- C. Maintain in a clean condition during construction.

END OF SECTION 07 6100

## SECTION 07 6200 - SHEET METAL FLASHING AND TRIM

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Formed roof drainage sheet metal fabrications.
2. Formed low-slope roof sheet metal fabrications.

#### 1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.

1. Include details for forming, joining, supporting, and securing sheet metal flashing and trim, including pattern of seams, termination points, fixed points, expansion joints, expansion-joint covers, edge conditions, special conditions, and connections to adjoining work.

C. Samples: Submit color samples to Architect for selection of each exposed product and finish specified.

D. Warranty: Sample of special warranty.

#### 1.3 QUALITY ASSURANCE

A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

B. Flashings and fasteners shall be designed and installed for maximum wind speed peak gusts of 100 mph measured at 30 meters above ground level.

#### 1.4 WARRANTY

A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Provide products for the following approved manufacturers:

1. Available Products:

- a. ColorKlad by Vincent Materials.
- b. PAC-Clad by Peterson Aluminum.
- c. UNA-Clad by Copper Sales/Elevate. (Formerly Firestone)
- d. Others as pre-approved.

### 2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality. 24 gauge sheet metal, primed on both sides with an acrylic wash coat on the back side. Pre-finished face side shall have a factory installed strippable film for protection during fabrication and installation.

- a. Two-Coat Fluoropolymer: AAMA 621. Kynar 500 or equivalent fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat.

1. Color: Medium Bronze.

### 2.3 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

B. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.

### 2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners: Provide suitable fasteners designed to withstand I-90 design loads and as recommended by manufacturer of primary sheet metal.

1. General: Fasteners or self-drilling screws, gasketed, with hex-washer head.

- a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
2. Concealed fasteners for Zinc-Coated or Galvanized Steel: Provide zinc coated or hot-dip galvanized steel roofing nails according to ASTM A 153/A 153M or ASTM F 2329.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- D. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

## 2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
  1. Obtain field measurements for accurate fit before shop fabrication.
  2. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
  3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.
- C. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
- D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- E. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

## 2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Fascia: Fabricate in minimum 96-inch long, but not exceeding 10-foot long sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and pre-drilled holes for fasteners on interior leg. Miter corners, seal, and solder or weld watertight. Fabricate from the following materials.

1. Fabricate from the following materials: Pre-finished Galvanized Steel: 24 gauge thick.
  2. Fabricate seam covers 8 inches wide with a matching profile.
- B. Counterflashing: Fabricate from the following materials:
1. Fabricate from the following materials: Pre-finished Galvanized Steel: 24 gauge thick.

### PART 3 - EXECUTION

#### 3.1 UNDERLAYMENT INSTALLATION

- A. Vapor Barrier Underlayment: See Section 07 2500 Weather Barriers.

#### 3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement so that completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
  2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  3. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
  4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
  5. Install sealant tape where indicated.
  6. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action with felt paper, or by other permanent separation as recommended by SMACNA.
1. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

- D. Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws as recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal joints as shown and as required for watertight construction.

### 3.3 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate.
- C. Fascia: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated.
  - 1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 16-inch centers.
  - 2. Anchor interior leg of coping with washers and screw fasteners at 12-inch centers.
  - 3. Splice Covers: Provide 8 inch wide snug fitting covers to snap over butt ends of copings, allowing for expansion. Provide two rows of sealant under each side of the splicing caps to keep water out.
- D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with sealant.

### 3.4 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
- C. Clean off excess sealants.

END OF SECTION 07 6200

## SECTION 07 7200 - ROOF ACCESSORIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Roof curbs.
2. Roof hatches.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory.
- B. Shop Drawings: Provide plans, sections and details for installation. Include connections and accessories.
- C. Samples: For each exposed product and for each color and texture specified.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Sample warranties.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

#### 1.5 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 ROOF CURBS

- A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings, bearing continuously on roof structure, and capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, straight sides raised the thickness of roof insulation and roofing system and integrally formed deck-mounting flange at perimeter bottom.

1. Acceptable manufacturers:

- a. Dayton Co.
- b. Greenheck Corp.
- c. Pate Curbs Inc.
- d. Roof Products and Systems (RPS)
- e. Thybar Corporation.
- f. Others as pre-approved.

B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.

C. Material: Zinc-coated galvanized steel sheet, 0.064 inch (1.63 mm) or standard thickness.

1. Finish: Factory prime coating with two-coat fluoropolymer finish.
2. Color: As selected by Architect from manufacturer's full range. Match roof metal color.

D. Construction:

1. Curb Profile: Manufacturer's standard profile to match size indicated on Drawings compatible with roofing system.
2. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
3. Fabricate curbs to minimum height of 4 inches above roofing surface unless otherwise indicated.
4. Top Surface: Top of curb to match roof slope.
5. Sloping Roofs: Equip unit with water diverter or cricket on side that obstructs water flow.
6. Insulation: Not required.
7. Liner: Same material as curb, of manufacturer's standard thickness and finish.
8. Nailer: Factory-installed wood nailer continuous around curb perimeter.
9. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as curb.

## 2.2 ROOF HATCH

A. Roof Hatches: Metal roof-hatch units with lids and single walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, straight sides, and integrally formed deck-mounting flange at perimeter bottom.

1. Acceptable manufacturers:

- a. Acudor Access Panels.
- b. Babcock Davis
- c. Bilco Corp.
- d. Global Industrial.
- e. Others as pre-approved.

B. Type and Size: Single-leaf lid, 30 by 36 inches.

C. Hatch Material: Zinc-coated galvanized steel sheet.

1. Thickness: Manufacturer's standard thickness for hatch size indicated.
2. Finish: Factory prime coating with two-coat fluoropolymer finish.
1. Color: Color to match roof metal color.

D. Construction:

1. Nailer: Factory-installed wood nailer continuous around hatch perimeter.
2. Hatch Lid: Opaque and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
3. Hatch Lid: Double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
4. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
5. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
6. Fabricate curbs to minimum height of 4 inches above roofing surface unless otherwise indicated.

E. Hardware: Spring operators, hold-open arm, galvanized steel spring latch with turn handles, galvanized or stainless-steel butt- or pintle-type hinge system.

1. Lock: Rotating handle with key lock or padlock hasps inside and outside.

## 2.3 METAL MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation.

1. Exposed Coil-Coated Finish: Prepainted by the coil-coating process to comply with ASTM A 755/A 755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  - a. Two-Coat Fluoropolymer Finish: AAMA 621. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.
2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil (0.013 mm).

## 2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, and complying with AWPA C2; not less than 1-1/2 inches thick.
- C. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened.

- D. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. General: Verify dimensions of roof openings for roof accessories. Install roof accessories according to manufacturer's written instructions.
  - 1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
  - 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
  - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
  - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
  - 1. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
- C. Seal joints with elastomeric sealant as required by roof accessory manufacturer.

#### 3.2 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780/A 780M.
- B. Clean exposed surfaces according to manufacturer's written instructions.
- C. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 07 7200

## SECTION 07 9200 - JOINT SEALANTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes joint sealants for the following applications:
  - 1. Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

#### 1.2 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

#### 1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.

#### 1.4 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.

#### 1.5 QUALITY ASSURANCE

- A. Preconstruction Compatibility and Adhesion Testing: Submit samples of materials that will contact or affect joint sealants to joint-sealant manufacturers for testing according to manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

- B. VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Colors of Exposed Joint Sealants: From manufacturer's full range of colors. Match adjacent material colors.

## 2.2 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- C. Single-Component Nonsag Polyurethane Sealant:
  - 1. Products:
    - a. Bostik Findley.
    - b. Pecora Corporation; Dynatrol I-XL.
    - c. Polymeric Systems Inc.
    - d. Sika Corporation, Inc.; Sikaflex 15LMg
    - e. MasterSeal Sonneborn: NP-1.
    - f. Tremco; DyMonic.
    - g. Tremco; Vulkem 116.
    - h. Others as pre-approved.
  - 2. Type and Grade: S (single component) and NS (nonsag).
  - 3. Class: 100/50.
  - 4. Use Related to Exposure: NT (nontraffic).

## 2.3 SOLVENT-RELEASE-CURING JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealant: ASTM C 1311.
- B. Available Products:
  - a. Bostik, Inc.
  - b. DAP Products, Inc.
  - c. Pecora Corporation.
  - d. Tremco Incorporated.
  - e. Others as pre-approved.

## 2.4 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

## 2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.
    - a. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
- B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses in each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealant from surfaces adjacent to joints.
  - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  - 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
- F. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

### 3.3 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior perimeter joints between pre-finished sheet metal trim and adjacent materials.
  - 1. Joint Sealant: Single-component nonsag urethane sealant.
  - 2. Joint-Sealant Color: Match pre-finished metal.
- B. Joint-Sealant Application: Exterior roofing terminations.

1. Joint Sealant: Butyl-Rubber-Based Joint Sealant
2. Joint-Sealant Color: Black.

END OF SECTION 07 9200

## SECTION 07 9500 - EXPANSION CONTROL

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes pre-compressed horizontal expansion joint systems for building exteriors.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of joint product indicated.
- B. Shop Drawings: Provide placement drawings, including line diagrams and details. Submit typical expansion joint cross-section(s) indicating pertinent dimensioning of opening, profile recess and adjacent construction.
- C. Samples: Provide samples for approval on each finish and color.

#### 1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site in Manufacturer's original, intact, labeled containers. Handle and protect as necessary to prevent damage or deterioration during shipment, handling and storage. Store off the ground, protect from weather and construction activities. Store in accordance with manufacturer's installation instructions.

#### 1.4 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to furnish materials to repair or replace those that fail within the warranty period.

### PART 2 - PRODUCTS

#### 2.1 ARCHITECTURAL JOINT SYSTEMS, GENERAL

- A. General: Provide joint systems of design indicated.
  - 1. Furnish in longest practicable lengths to minimize splicing. Install with hairline mitered corners where joint changes direction.
  - 2. Include factory-fabricated closure materials and transition pieces to provide continuous joint systems.
- B. Design architectural joint systems for the following size and movement characteristics:
  - 1. Nominal Joint Width: As indicated on Drawings.

## 2.2 PRE-COMPRESSED BUILDING EXPANSION JOINT SYSTEMS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the products specified below as basis-of-design products or a comparable product by one of the following:
1. Emseal DSM 0075 by Emseal Joint Systems, Ltd.
  2. WaboHSeal, by Watson Bowman Acme Corp.
  3. WillSeal 250, by TREMCO.
  4. Others as pre-approved.
- B. Joint Systems for Exterior Concrete Slabs. Preformed, pre-compressed, self-expanding, sealant system with silicone or STPE impregnated-foam hybrid for non-traffic surfaces, high movement, primary seal for horizontal joints.
1. Basis-of-Design Product: Emseal DSM 0075 by Emseal Joint Systems, Ltd.
  2. Type: Expansion control for sealing horizontal and below-grade joints in decks.
- C. Seal Material: Pre-formed sealant shall be silicone pre-coated, preformed, pre-compressed, self-expanding, sealant system. Expanding foam to be cellular foam impregnated with a water-based, non-drying, 100% acrylic dispersion. Seal shall combine factory-applied, low-m foam seals. Install with adhesive recommended by manufacturer.
- a. Modulus silicone and a backing of acrylic-impregnated expanding foam into a unified hybrid sealant system.
  - b. Material shall be capable of movements of +50%, -50% (100% total) of nominal material size.
  - c. Product shall be mildew resistant, non-staining and non-bleeding.
  - d. Size and Model: DSM 0075, 3/4" wide by 2 1/4" deep.
  - e. Color: Manufacturer's standard Gray color.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions.
- B. Repair concrete slabs and blockouts using manufacturer's recommended repair grout.
- C. Coordinate and furnish anchorages, setting drawings, and instructions for installing joint systems. Provide fasteners of metal, type, and size to suit type of construction.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions for storing, handling, and installing architectural joint assemblies and materials unless more stringent requirements are indicated.
- B. Ensure the joint width matches the product to be applied. Cut joints in concrete as necessary for width.
- C. Clean the joint opening of all contaminants immediately prior to installation of expansion joint system. Repair spalled, irregular or unsound joint surfaces using accepted industry practices for repair of the substrates in question. Remove protruding roughness to ensure joint sides are smooth.
- D. Inspect joint opening for any deficiencies such as spalled edges or protrusions. Repair joint opening deficiencies prior to installation of joint material.

### 3.3 INSTALLATION

- A. Where indicated and noted on the contract drawings, install seal profiles in a neat workmanlike manner. All surfaces to receive seals shall be free from dirt, water, frost and any loose foreign debris that may be detrimental to effective joint sealing.
- B. Carefully unpackage pre-compressed joint material the shipping forms. Do not cut or puncture the silicone face membrane on top of the joint material. Set material quickly into joint before it expands.
- C. Tape off edges of joint substrate to prevent epoxy adhesive exposure.
- D. Install with adhesive recommended by manufacturer. Preformed sealant to be installed using manufacturer's standard field-applied 2 component epoxy adhesive on both sides of joint. Mix and apply the epoxy adhesive per manufacturer's recommendations. Apply seal onto the joint faces as soon as possible as epoxy is fast curing. Epoxy must be uncured during installation. See manufacturer's pot life warning.
- E. Preformed sealant to be installed slightly recessed from the surface such that when the field-applied injection band of silicone is installed between the substrates and the foam-and-silicone-bellows, the system will be flush with the substrate surface.
- F. Provide a 45 deg. miter at "L" shaped corner transitions. Provide a 90 deg. butt joint at "T" shaped transitions.

### 3.4 PROTECTION

- A. Do not remove protective covering until finish work in adjacent areas is complete.
- B. Protect the installation from damage by work of other Sections.

END OF SECTION 07 9500

## SECTION 09 5113 - ACOUSTICAL PANEL CEILINGS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes acoustical panels for ceilings.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For each exposed finish.

#### 1.3 QUALITY ASSURANCE

- A. Acoustical Testing Agency Qualifications: An independent testing laboratory or an NVLAP-accredited laboratory.
- B. Fire-Test-Response Characteristics:
  - 1. Surface-Burning Characteristics: Acoustical panels complying with ASTM E 1264 for Class A materials, when tested per ASTM E 84.

### PART 2 - PRODUCTS

#### 2.1 ACOUSTICAL PANEL CEILINGS, GENERAL

- A. Acoustical Panel Standard: Comply with ASTM E 1264.
  - 1. For existing water damaged ceiling panels that are to be replaced in existing metal suspension grid.
- B. Metal Suspension System: Existing.
- C. Wire Hangers, Braces, and Ties: Existing.
- D. Metal Edge Moldings and Trim: Existing wall angle profile.

#### 2.2 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

- B. Manufacturers: Subject to compliance with requirements, provide one of the following:
1. Armstrong World Industries, Inc.
  2. Certainteed, St. Gobain.
  3. USG Interiors, Inc.
  4. Others as pre-approved.
- C. PRODUCTS: CEILING TILE TYPE A. (Loftus Basement)
1. Product: Field verify and match existing.
  2. Edge/Joint Detail: Square edge.
  3. Thickness: 5/8 inch.
  4. Modular Size: 24 by 24 inches.
- D. PRODUCTS: CEILING TILE TYPE B. (Malloy Basement)
1. Basis-of-Design Product: Certainteed St. Gobain; Ecophon Focus A, Model # 3540-4607.
  1. Classification: Panels complying with ASTM E 1264.
  2. Type and Form: Fiberglass smooth panel.
  3. Color: White.
  4. Noise Reduction Coefficient, NRC: Not less than 0.95.
  5. Ceiling Attenuation Class, CAC: Not less than 21 min.
  6. Edge/Joint Detail: Square edge.
  7. Thickness: 5/8 inch.
  8. Modular Size: 24 by 24 inches.
  9. Accessories: Connect Edge Sealant, White. Fore resealing cut edges.
  10. Features: Sag resistant, mold/mildew resistant, washable.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Comply with ASTM C 636 and seismic design requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling.
- C. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

END OF SECTION 09 5113

## SECTION 09 9100 - PAINTING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes surface preparation and the application of paint systems on the following interior and exterior substrates:
  - 1. Steel or galvanized metal.
  - 2. Concrete.
  - 3. Gypsum board.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of paint product indicated.
- B. Samples: Provide paint draw-down samples for approval on each finish and color.

#### 1.3 QUALITY ASSURANCE

- A. MPI Standards:
  - 1. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.
- B. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Acceptable mock ups can remain as a part of the completed work.

### PART 2 - PRODUCTS

#### 2.1 PAINT, GENERAL

#### 2.2 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products by the following:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.
    - a. Behr Paint Company.

- b. Benjamin Moore & Co.
- c. Diamond Vogel.
- d. PPG Paints.
- e. Pratt & Lambert.
- f. Rust-Oleum Corp.
- g. Sherwin-Williams Company.
- h. Others as pre-approved.

B. Material Compatibility:

- 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- 2. For each coat in a paint system, provide products recommended in writing by manufacturers of top coat for use in paint system and on substrate indicated.

C. Colors: As selected or pre-selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  - 1. Wood: 15 percent.
  - 2. Concrete: 12 percent.
  - 3. Gypsum Board: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
  - 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION AND APPLICATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.
- C. New surfaces should be fully primed, and previously painted surfaces may be primed or spot primed as necessary.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections.
- E. Painting Mechanical and Electrical Work: Unless noted otherwise, paint items exposed in occupied public spaces.
- F. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- G. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

### 3.3 INTERIOR PAINTING SCHEDULE

#### A. Gypsum Board Substrates:

1. Latex System: MPI INT 9.2A.
  - a. Prime Coat: Interior latex primer/sealer. MPI #39.
  - b. Intermediate Coat: Interior latex matching topcoat.
  - c. Topcoat: Interior latex (eggshell). MPI #52.

#### B. Concrete Substrates:

1. Latex System: MPI INT 9.2A.
  - a. Prime Coat: Interior latex matching topcoat.
  - b. Intermediate Coat: Interior latex matching topcoat.
  - c. Topcoat: Interior latex (eggshell).

- C. Other Substrates: Provide primer and topcoats in accordance with manufacturer's recommendations.

### 3.4 EXTERIOR PAINTING SCHEDULE

#### A. Steel Substrates:

1. Alkyd Enamel System:
  - a. Prime Coat: Alkyd anticorrosive metal primer. MPI #79.
  - b. Intermediate Coat: Exterior alkyd enamel matching topcoat.

- c. Topcoat: Exterior alkyd enamel (satin gloss). MPI #94.
- B. Galvanized-Metal Substrates:
  - 1. Alkyd Enamel System:
    - a. Prime Coat: Cementitious galvanized-metal primer.
    - b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
    - c. Topcoat: Exterior alkyd enamel (semi-gloss). MPI #94.
- C. Other Substrates: Provide primer and topcoats in accordance with manufacturer's recommendations.

END OF SECTION 09 9100

**SECTION 220553  
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Nameplates.

**1.02 REFERENCE STANDARDS**

- A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.
- B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2025.

**PART 2 PRODUCTS**

**2.01 PLUMBING COMPONENT IDENTIFICATION GUIDELINE**

- A. Nameplates:
  - 1. Control panels, transducers, and other related control equipment products.
  - 2. Pumps, tanks, filters, water treatment devices, and other plumbing equipment products.

**2.02 NAMEPLATES**

- A. Description: Laminated piece with up to three lines of text.
  - 1. Letter Color: White.
  - 2. Letter Height: 1/4 inch.
  - 3. Background Color: Black.
  - 4. Nameplate Height: 3/4 inch.
  - 5. Nameplate Material:
    - a. Flexible: Vinyl with adhesive backing per ASTM D709.
    - b. Metal: Brass with center-side holes for screw fastening.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

- A. Install flexible nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.

**END OF SECTION**

**SECTION 221005  
PLUMBING PIPING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Storm drainage piping, buried beyond 5 feet of building.
- B. Storm drainage piping, buried within 5 feet of building.
- C. Storm drainage piping, above grade.
- D. Pipe hangers and supports.
- E. Pipe sleeve-seal systems.

**1.02 REFERENCE STANDARDS**

- A. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020 (Reapproved 2024).
- B. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2025.
- C. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets; 2020 (Reapproved 2024).
- D. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2024, with Editorial Revision (2025).
- E. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2017, with Editorial Revision (2020).
- F. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2025.

**1.03 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Project Record Documents: Record actual locations of pipe routing.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- B. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

**PART 2 PRODUCTS**

**2.01 GENERAL REQUIREMENTS**

**2.02 STORM DRAINAGE PIPING, BURIED BEYOND 5 FEET OF BUILDING**

**2.03 STORM DRAINAGE PIPING, BURIED WITHIN 5 FEET OF BUILDING**

- A. PVC Pipe: ASTM D2665 or ASTM D3034.
  - 1. Fittings: PVC.
  - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

**2.04 STORM DRAINAGE PIPING, ABOVE GRADE**

- A. PVC Pipe: ASTM D2665.
  - 1. Fittings: PVC.
  - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

## 2.05 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
  - 1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
  - 2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
  - 3. Trapeze Hangers: Welded steel channel frames attached to structure.
  - 4. Vertical Pipe Support: Steel riser clamp.
- B. Plumbing Piping - Drain, Waste, and Vent:
  - 1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
  - 2. Hangers for Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
- C. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
  - 1. Concrete Wedge Expansion Anchors: Comply with ICC-ES AC193.
  - 2. Other Types: As required.

## 2.06 PIPE SLEEVE-SEAL SYSTEMS

- A. Manufacturers:
  - 1. Garlock, an Enrpo Inc. Company: <https://www.garlock.com>.
  - 2. The Metraflex Company; MetraSeal: [www.metraflex.com](http://www.metraflex.com).
  - 3. Substitutions: See Section 016000 - Product Requirements.
- B. Modular Mechanical Seals:
  - 1. Elastomer-based interlocking links continuously fill annular space between pipe and wall-sleeve, wall or casing opening.
  - 2. Watertight seal between pipe and wall-sleeve, wall or casing opening.
  - 3. Size and select seal component materials in accordance to service requirements.
  - 4. Service Requirements:
    - a. Underground, buried, and wet conditions.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that excavations are to required grade, dry, and not over-excavated.

### 3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- C. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- D. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
- E. Pipe Hangers and Supports:
  - 1. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
  - 2. Place hangers within 12 inches of each horizontal elbow.
  - 3. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.

- F. Pipe Sleeve-Seal Systems:
  - 1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
  - 2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
  - 3. Locate piping in center of sleeve or penetration.
  - 4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
  - 5. Tighten bolting for a watertight seal.
  - 6. Install in accordance with manufacturer's recommendations.

### **3.03 SCHEDULES**

- A. Pipe Hanger Spacing:
  - 1. Plastic Piping:
    - a. All Sizes:
      - 1) Maximum Hanger Spacing: 6 ft.
      - 2) Hanger Rod Diameter: 3/8 inch.

**END OF SECTION**

**SECTION 221006  
PLUMBING PIPING SPECIALTIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Drains.

**1.02 REFERENCE STANDARDS**

- A. ASME A112.6.4 - Roof, Deck, and Balcony Drains; 2022.
- B. NSF 61 - Drinking Water System Components - Health Effects; 2024.
- C. NSF 372 - Drinking Water System Components - Lead Content; 2024.

**1.03 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
- C. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- D. Project Record Documents: Record actual locations of equipment, cleanouts, backflow preventers, and water hammer arrestors.

**PART 2 PRODUCTS**

**2.01 GENERAL REQUIREMENTS**

- A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

**2.02 DRAINS**

- A. Roof Drains:
  - 1. Assembly: ASME A112.6.4.
  - 2. Body: Lacquered cast iron with sump.
  - 3. Strainer: Removable cast aluminum dome.
  - 4. Accessories: Coordinate with roofing type:
    - a. Membrane flange and membrane clamp with integral gravel stop.
    - b. Perforated stainless steel ballast guard extension.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.

**END OF SECTION**

**SECTION 221429  
SUMP PUMPS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Submersible sump pumps.
- B. Sump basins and pits.

**1.02 REFERENCE STANDARDS**

- A. ICC (IPC) - International Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

**1.03 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide certified pump chart or curve with duty point marked over.
- C. Operation and Maintenance Data: Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.
- D. Executed warranty.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

**1.05 WARRANTY**

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty for pumps and related components. Complete forms in Owner's name and register with manufacturer.
- C. Submit warranty with related forms completed in Owner's name and registered with manufacturer.

**PART 2 PRODUCTS**

**2.01 SUBMERSIBLE SUMP PUMPS**

- A. Manufacturers:
  - 1. Grundfos Pumps Corporation: [www.grundfos.com](http://www.grundfos.com).
  - 2. Zoeller Company: [www.zoeller.com](http://www.zoeller.com).
  - 3. Substitutions: See Section 016000 - Product Requirements.
- B. General: Cast iron housing and base with oil-filled motor chamber, ball bearings, and mechanical seal.
- C. Impeller: Cast iron; open nonclog, corrosion resistant alloy steel shaft.
- D. Motor: Base mount, enclosed, lubricated oil-free, thermal-overload protected, continuous duty, permanent split capacitor with oil-resistant, three-prong connector, 10 foot power cord.
- E. Controls: Integral, chemically-resistant, vertical plated-steel rod float switch. Cycle pump Off/On between 2.5 and 9 inch heights from bottom of pump.
- F. Solids Handling Capacity: Pass lint and other small solids up to 1/2 inch in size.
- G. Discharge Pipe Size: 1-1/2 inch, NPT, female.
- H. Maximum Water-Based Effluent Temperature: 120 degrees F.
- I. Accessories: Provide full flow swing-type discharge check valve and high-level audio/visual alarm system.

## **2.02 SUMP BASINS AND PITS**

- A. Sump Basin:
  - 1. Manufacturers:
    - a. Topp Industries, Inc: [www.toppindustries.com](http://www.toppindustries.com).
    - b. Zoeller Company: [www.zoeller.com](http://www.zoeller.com).
    - c. Substitutions: See Section 016000 - Product Requirements.
  - 2. Basin Volume Holding Capacity: 20 gal.
  - 3. Below Ground Pipe Inlet: Molded or predrilled with seal, 4 inch.
  - 4. Basin Dimensions: 18 inch diameter, 22 inch deep.
  - 5. Basin Material: Polyethylene structural foam, heavy duty injection molded.
  - 6. Molded-Finish Requirements: Hard bottom, watertight, gas-tight and radon-tight molding.
  - 7. Maximum Effluent Temperature: Match or exceed maximum pump service temperature.
  - 8. Basin Riser Extension: Diameter matched, 6 inch with hardware.
  - 9. Basin Cover:
    - a. Material: One-piece flat lid made of polyethylene with seal gasket.
    - b. Openings: 1-1/2 inch discharge, 1-1/2 inch inlet, and cord grommet with hubs.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install products with related fittings and accessories according to manufacturer instructions.
- B. Observe and provide incidentals required to complete installation in compliance with ICC (IPC).

**END OF SECTION**

**SECTION 260505  
SELECTIVE DEMOLITION FOR ELECTRICAL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Electrical demolition.

**PART 2 PRODUCTS**

**2.01 MATERIALS AND EQUIPMENT**

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

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify field measurements and circuiting arrangements are as indicated.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition drawings are based on casual field observation and existing record documents.
- D. Report discrepancies to Architect before disturbing existing installation.
- E. Beginning of demolition means installer accepts existing conditions.

**3.02 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK**

- A. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations. Applicable equipment and materials include, but are not limited to:
  - 1. Mercury-containing lamps and tubes, including fluorescent lamps, high intensity discharge (HID), arc lamps, ultra-violet, high pressure sodium, mercury vapor, ignitron tubes, neon, and incandescent.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. Remove abandoned wiring to source of supply.
- D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
- F. Disconnect and remove abandoned panelboards and distribution equipment.
- G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- H. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.
- I. Repair adjacent construction and finishes damaged during demolition and extension work.
- J. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
- K. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

**3.03 CLEANING AND REPAIR**

- A. See Section 017419 - Construction Waste Management and Disposal for additional requirements.
- B. Clean and repair existing materials and equipment that remain or that are to be reused.

**END OF SECTION**

**SECTION 260519**  
**LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Single conductor building wire.
- B. Wiring connectors.
- C. Electrical tape.
- D. Oxide inhibiting compound.
- E. Wire pulling lubricant.
- F. Cable ties.

**1.02 RELATED REQUIREMENTS**

- A. Section 078400 - Firestopping.

**1.03 REFERENCE STANDARDS**

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2018).
- B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2023.
- C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010, with Editorial Revision (2020).
- D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2020).
- E. ASTM B800 - Standard Specification for 8000 Series Aluminum Alloy Wire for Electrical Purposes - Annealed and Intermediate Tempers; 2005 (Reapproved 2021).
- F. ASTM B801 - Standard Specification for Concentric-Lay-Stranded Conductors of 8000 Series Aluminum Alloy for Subsequent Covering or Insulation; 2018 (Reapproved 2023).
- G. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2017.
- H. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- I. NECA 104 - Standard for Installing Aluminum Building Wire and Cable; 2012.
- J. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2021.
- K. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems; 2021.
- L. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- M. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.
- N. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.
- O. UL 267 - Outline of Investigation for Wire-Pulling Compounds; Current Edition, Including All Revisions.
- P. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.
- Q. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.
- R. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
  - 2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
  - 3. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

#### **1.05 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing for underground circuits.

#### **1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

### **PART 2 PRODUCTS**

#### **2.01 CONDUCTOR AND CABLE APPLICATIONS**

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
- C. Nonmetallic-sheathed cable is not permitted.
- D. Underground feeder and branch-circuit cable is not permitted.
- E. Service entrance cable is not permitted.
- F. Armored cable is not permitted.
- G. Metal-clad cable is not permitted.

#### **2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS**

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Provide new conductors and cables manufactured not more than one year prior to installation.
- D. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- E. Comply with NEMA WC 70.
- F. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- G. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- H. Conductor Material:
  - 1. Provide copper conductors except where aluminum conductors are specifically indicated. Substitution of aluminum conductors for copper is not permitted. Conductor sizes indicated are based on copper unless specifically indicated as aluminum. Conductors designated with the abbreviation "AL" indicate aluminum.
  - 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
  - 3. Tinned Copper Conductors: Comply with ASTM B33.

4. Aluminum Conductors (only where specifically indicated or permitted for substitution): AA-8000 series aluminum alloy conductors recognized by ASTM B800 and compact stranded in accordance with ASTM B801 unless otherwise indicated.
- I. Minimum Conductor Size:
  1. Branch Circuits: 12 AWG.
    - a. Exceptions:
      - 1) 20 A, 120 V circuits longer than 75 feet: 10 AWG, for voltage drop.
      - 2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.
  2. Control Circuits: 14 AWG.
- J. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- K. Conductor Color Coding:
  1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
  2. Color Coding Method: Integrally colored insulation.
  3. Color Code:
    - a. 208Y/120 V, 3 Phase, 4 Wire System:
      - 1) Phase A: Black.
      - 2) Phase B: Red.
      - 3) Phase C: Blue.
      - 4) Neutral/Grounded: White.
    - b. Equipment Ground, All Systems: Green.
    - c. Travelers for 3-Way and 4-Way Switching: Pink.
    - d. For modifications or additions to existing wiring systems, comply with existing color code when existing code complies with NFPA 70 and is approved by the authority having jurisdiction.

### **2.03 SINGLE CONDUCTOR BUILDING WIRE**

- A. Description: Single conductor insulated wire.
- B. Conductor Stranding:
  1. Feeders and Branch Circuits:
    - a. Size 10 AWG and Smaller: Solid.
    - b. Size 8 AWG and Larger: Stranded.
- C. Insulation Voltage Rating: 600 V.
- D. Insulation:
  1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
    - a. Size 4 AWG and Larger: Type XHHW-2.
    - b. Installed Underground: Type XHHW-2.
  2. Aluminum Building Wire (only where specifically indicated or permitted for substitution): Type XHHW-2.

### **2.04 WIRING CONNECTORS**

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
- B. Wiring Connectors for Terminations:
  1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
  2. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.

3. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.
  4. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors where connectors are required.
  5. Aluminum Conductors: Use mechanical connectors for all connections.
- C. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.
- D. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.
- E. Mechanical Connectors: Provide bolted type.

## **2.05 ACCESSORIES**

- A. Electrical Tape:
1. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
- B. Oxide Inhibiting Compound: Listed; suitable for use with the conductors or cables to be installed.
- C. Wire Pulling Lubricant:
1. Listed and labeled as complying with UL 267.
  2. Suitable for use with conductors/cables and associated insulation/jackets to be installed.
  3. Suitable for use at installation temperature.
- D. Cable Ties: Material and tensile strength rating suitable for application.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire and cable has been completed.
- C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
- D. Verify that field measurements are as indicated.
- E. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 PREPARATION**

- A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

### **3.03 INSTALLATION**

- A. Circuiting Requirements:
1. Unless dimensioned, circuit routing indicated is diagrammatic.
  2. When circuit destination is indicated without specific routing, determine exact routing required.
  3. Arrange circuiting to minimize splices.
  4. Include circuit lengths required to install connected devices within 10 ft of location indicated.
  5. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.
- B. Install products in accordance with manufacturer's instructions.
- C. Perform work in accordance with NECA 1 (general workmanship).

- D. Install aluminum conductors in accordance with NECA 104.
- E. Installation in Raceway:
  - 1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
  - 2. Pull all conductors and cables together into raceway at same time.
  - 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
  - 4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.
- F. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.
- G. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
- H. Install conductors with a minimum of 12 inches of slack at each outlet.
- I. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- J. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
- K. Make wiring connections using specified wiring connectors.
  - 1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
  - 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
  - 3. Do not remove conductor strands to facilitate insertion into connector.
  - 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminants. Do not use wire brush on plated connector surfaces.
  - 5. Connections for Aluminum Conductors: Fill connectors with oxide inhibiting compound where not pre-filled by manufacturer.
  - 6. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
- L. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
  - 1. Dry Locations: Use insulating covers specifically designed for the connectors.
- M. Insulate ends of spare conductors using vinyl insulating electrical tape.
- N. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.
- O. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

#### **3.04 FIELD QUALITY CONTROL**

- A. See Section 014000 - Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.
- D. Correct deficiencies and replace damaged or defective conductors and cables.

**END OF SECTION**

**SECTION 260533.13**  
**CONDUIT FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Galvanized steel rigid metal conduit (RMC).
- B. Flexible metal conduit (FMC).
- C. Galvanized steel electrical metallic tubing (EMT).
- D. Rigid polyvinyl chloride (PVC) conduit.

**1.02 RELATED REQUIREMENTS**

- A. Section 078400 - Firestopping.
- B. Section 260526 - Grounding and Bonding for Electrical Systems.
- C. Section 260529 - Hangers and Supports for Electrical Systems.
- D. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

**1.03 REFERENCE STANDARDS**

- A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2020.
- B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2020.
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2020.
- E. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2017.
- F. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
- G. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2020.
- H. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2021.
- I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.
- K. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.
- L. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.
- M. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.
- N. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.
- O. UL 2419 - Outline of Investigation for Electrically Conductive Corrosion Resistant Compounds; Current Edition, Including All Revisions.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate minimum sizes of conduits with actual type and quantity of conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
  - 2. Coordinate arrangement of conduits with structural members, ductwork, piping, equipment, and other potential conflicts.
  - 3. Verify exact conduit termination locations required for boxes, enclosures, and equipment.
  - 4. Coordinate work to provide roof penetrations that preserve integrity of roofing system and do not void roof warranty.
  - 5. Notify Architect of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
  - 1. Do not begin installation of conductors and cables until installation of conduit between termination points is complete.

#### **1.05 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittals procedures.
- B. Project Record Documents: Record actual routing for conduits installed underground and conduits 2-inch (53 mm) trade size and larger.

### **PART 2 PRODUCTS**

#### **2.01 CONDUIT APPLICATIONS**

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70, manufacturer's instructions, and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most restrictive requirements. Where conduit type for particular application is not specified, use galvanized steel rigid metal conduit.
- C. Underground:
  - 1. Exterior, Direct-Buried: Use rigid PVC conduit.
- D. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel electrical metallic tubing (EMT).
- E. Concealed, Exterior, Not Embedded in Concrete or in Contact With Earth: Use galvanized steel rigid metal conduit (RMC).
- F. Flexible Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit (FMC).
  - 1. Maximum Length: 6 feet.

#### **2.02 CONDUIT - GENERAL REQUIREMENTS**

- A. Comply with NFPA 70.
- B. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling mandrel through them.
- C. Provide conduit, fittings, supports, and accessories required for complete raceway system.
- D. Provide products listed, classified, and labeled as suitable for purpose intended.
- E. Minimum Conduit Size, Unless Otherwise Indicated:
  - 1. Branch Circuits: 3/4-inch trade size.
  - 2. Branch Circuit Homeruns: 3/4-inch trade size.
  - 3. Control Circuits: 1/2-inch trade size.
- F. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

### **2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)**

- A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
- B. Fittings:
  - 1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6.
  - 2. Material: Use steel.
    - a. Do not use die cast zinc fittings.
  - 3. Connectors and Couplings: Use threaded or threadless type fittings.

### **2.04 FLEXIBLE METAL CONDUIT (FMC)**

- A. Description: NFPA 70, Type FMC standard-wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems.
- B. Fittings:
  - 1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
  - 2. Material: Use steel or malleable iron.
    - a. Do not use die cast zinc fittings.

### **2.05 GALVANIZED STEEL ELECTRICAL METALLIC TUBING (EMT)**

- A. Description: NFPA 70, Type EMT galvanized steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.
- B. Fittings:
  - 1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
  - 2. Material: Use steel.
    - a. Do not use die cast zinc fittings.
  - 3. Connectors and Couplings: Use compression/gland or set-screw type.
    - a. Do not use indenter type connectors and couplings.

### **2.06 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT**

- A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.
- B. Fittings:
  - 1. Manufacturer: Same as manufacturer of conduit to be connected.
  - 2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

### **2.07 ACCESSORIES**

- A. Conduit Joint Compound: Corrosion-resistant, electrically conductive compound listed as complying with UL 2419; suitable for use with conduit to be installed.
- B. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.
- C. Pull Strings: Use nylon or polyester tape with average breaking strength of not less than 1,250 lbf.
- D. Sealing Systems for Concrete Penetrations:
  - 1. Sleeves: Provide water stop ring or cement coating that bonds to concrete to prevent water infiltration.
  - 2. Rate for minimum of 40 psig; suitable for sealing around conduits to be installed.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive conduits.
- C. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Install conduit in accordance with NECA 1.
- C. Galvanized Steel Rigid Metal Conduit (RMC): Install in accordance with NECA 101.
- D. Rigid Polyvinyl Chloride (PVC) Conduit: Install in accordance with NECA 111.
- E. Conduit Routing:
  - 1. Unless dimensioned, conduit routing indicated is diagrammatic.
  - 2. When conduit destination is indicated without specific routing, determine exact routing required.
  - 3. Conceal conduits unless specifically indicated to be exposed.
  - 4. Conduits in the following areas may be exposed, unless otherwise indicated:
    - a. Electrical rooms.
    - b. Mechanical equipment rooms.
  - 5. Arrange conduit to maintain adequate headroom, clearances, and access.
  - 6. Arrange conduit to provide no more than equivalent of four 90-degree bends between pull points.
  - 7. Arrange conduit to provide no more than 150 feet between pull points.
  - 8. Route conduits above water and drain piping where possible.
  - 9. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
  - 10. Maintain minimum clearance of 6 inches between conduits and piping for other systems.
  - 11. Maintain minimum clearance of 12 inches between conduits and hot surfaces. This includes, but is not limited to:
    - a. Hot water piping.
  - 12. Group parallel conduits in same area on common rack.
- F. Conduit Support:
  - 1. Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by authorities having jurisdiction; see Section 260529.
  - 2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
  - 3. Use conduit strap to support single surface-mounted conduit.
    - a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
  - 4. Use metal channel/strut with accessory conduit clamps to support multiple parallel surface-mounted conduits.
  - 5. Use conduit clamp to support single conduit from beam clamp or threaded rod.
  - 6. Use of spring steel conduit clips for support of conduits is not permitted.
  - 7. Use of wire for support of conduits is not permitted.
  - 8. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with most stringent requirements.
- G. Connections and Terminations:
  - 1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
  - 2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.

3. Use suitable adapters where required to transition from one type of conduit to another.
  4. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
  5. Provide insulating bushings, insulated throats, or listed metal fittings with smooth, rounded edges at conduit terminations to protect conductors.
  6. Secure joints and connections to provide mechanical strength and electrical continuity.
- H. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
  2. Make penetrations perpendicular to surfaces unless otherwise indicated.
  3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
  4. Conceal bends for conduit risers emerging above ground.
  5. Provide suitable sealing system where conduits penetrate exterior wall below grade.
  6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
  7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty.
  8. Install firestopping to preserve fire resistance rating of partitions and other elements; see Section 078400.
- I. Underground Installation:
1. Minimum Cover, Unless Otherwise Indicated or Required:
    - a. Underground, Exterior: 18 inches.
    - b. Under Slab on Grade: 12 inches to bottom of slab.
  2. Provide underground warning tape along entire conduit length; see Section 260553.
- J. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
  2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
  3. Where conduits are subject to earth movement by settlement or frost.
- K. Conduit Sealing:
1. Use foam conduit sealant to prevent entry of moisture and gases. This includes, but is not limited to:
    - a. Where conduits enter building from outside.
    - b. Where service conduits enter building from underground distribution system.
    - c. Where conduits enter building from underground.
    - d. Where conduits may transport moisture to contact live parts.
  2. Where conduits cross barriers between areas of potential substantial temperature differential, use foam conduit sealant at accessible point near penetration to prevent condensation. This includes, but is not limited to:
    - a. Where conduits pass from outdoors into conditioned interior spaces.
    - b. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
- L. Provide pull string in each empty conduit and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.
- M. Provide grounding and bonding; see Section 260526.

**3.03 FIELD QUALITY CONTROL**

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- C. Correct deficiencies and replace damaged or defective conduits.

**3.04 CLEANING**

- A. Clean interior of conduits to remove moisture and foreign matter.

**3.05 PROTECTION**

- A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

**END OF SECTION**

**SECTION 260533.16**  
**BOXES FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.
- B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.

**1.02 RELATED REQUIREMENTS**

- A. Section 083100 - Access Doors and Panels: Panels for maintaining access to concealed boxes.
- B. Section 260529 - Hangers and Supports for Electrical Systems.
- C. Section 260533.13 - Conduit for Electrical Systems:
  - 1. Conduit bodies and other fittings.
  - 2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.
- D. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
- E. Section 262726 - Wiring Devices:
  - 1. Wall plates.

**1.03 REFERENCE STANDARDS**

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.
- C. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
- D. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
- E. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013 (Reaffirmed 2020).
- F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
- H. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
- I. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.
- J. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
  - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
  - 3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
  - 4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.

5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
6. Coordinate the work with other trades to preserve insulation integrity.
7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
8. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

### **1.05 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

## **PART 2 PRODUCTS**

### **2.01 BOXES**

- A. General Requirements:
  1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
  2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
  3. Provide products listed, classified, and labeled as suitable for the purpose intended.
  4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
  5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
- B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
  1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
  2. Use cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
  3. Use cast iron boxes where exposed galvanized steel rigid metal conduit is used.
  4. Use suitable concrete type boxes where flush-mounted in concrete.
  5. Use suitable masonry type boxes where flush-mounted in masonry walls.
  6. Use raised covers suitable for the type of wall construction and device configuration where required.
  7. Use shallow boxes where required by the type of wall construction.
  8. Do not use "through-wall" boxes designed for access from both sides of wall.
  9. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
  10. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
  11. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
  12. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
  13. Minimum Box Size, Unless Otherwise Indicated:
    - a. Wiring Devices (Other Than Communications Systems Outlets): 4 inch square by 1-1/2 inch deep (100 by 38 mm) trade size.
  14. Wall Plates: Comply with Section 262726.

- C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
  - 1. Comply with NEMA EN 10250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
  - 2. NEMA EN 10250 Environment Type, Unless Otherwise Indicated:
    - a. Indoor Clean, Dry Locations: Type 1, painted steel.
  - 3. Junction and Pull Boxes Larger Than 100 cubic inches:
    - a. Provide screw-cover enclosures unless otherwise indicated.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive boxes.
- C. Verify that conditions are satisfactory for installation prior to starting work.

#### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.
- E. Box Locations:
  - 1. Locate boxes to be accessible. Provide access panels in accordance with Section 083100 as required where approved by the Architect.
  - 2. Unless dimensioned, box locations indicated are approximate.
  - 3. Locate boxes as required for devices installed under other sections or by others.
  - 4. Locate boxes so that wall plates do not span different building finishes.
  - 5. Locate boxes so that wall plates do not cross masonry joints.
  - 6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
  - 7. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 260533.13.
- F. Box Supports:
  - 1. Secure and support boxes in accordance with NFPA 70 and Section 260529 using suitable supports and methods approved by the authority having jurisdiction.
  - 2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
- G. Install boxes plumb and level.
- H. Flush-Mounted Boxes:
  - 1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
  - 2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
  - 3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.

- I. Install boxes as required to preserve insulation integrity.
- J. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- K. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.
- L. Close unused box openings.
- M. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
- N. Provide grounding and bonding in accordance with Section 260526.
- O. Identify boxes in accordance with Section 260553.

**3.03 CLEANING**

- A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

**3.04 PROTECTION**

- A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

**END OF SECTION**

**SECTION 260536**  
**CABLE TRAYS FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Metal cable tray systems:
  - 1. Metal ladder cable tray.

**1.02 REFERENCE STANDARDS**

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- B. NEMA BI-50016 - Cable Tray Installation Guidelines; 2024.
- C. NEMA BI 50015 - Metal Cable Tray Systems; 2024.
- D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate arrangement of cable tray with structural members, ductwork, piping, equipment and other potential conflicts. Coordinate work to avoid installation of obstructions within cable tray required clearances.
  - 2. Coordinate arrangement of cable tray with dimensions and clearance requirements of actual products to be installed.
  - 3. Coordinate work with placement of supports and anchors required for mounting.
  - 4. Notify of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Preinstallation Meeting: Convene one week prior to commencing work of this section; require attendance of affected installers. Review proposed routing, sequence of installation, and protection requirements for installed cable tray.
- C. Sequencing:
  - 1. Do not begin installation of cables until installation of associated cable tray run is complete.

**1.04 QUALITY ASSURANCE**

- A. Comply with NFPA 70.

**PART 2 PRODUCTS**

**2.01 CABLE TRAY SYSTEM - GENERAL REQUIREMENTS**

- A. Provide new cable tray system consisting of required components, fittings, supports, and accessories, as necessary for complete system.
- B. Provide products listed, classified, and labeled as suitable for purpose intended.
- C. Do not use cable tray for applications other than as permitted by NFPA 70 and product listing/classification.
- D. Provide cable tray system and associated components suitable for use at indicated span/load ratings under service conditions at installed location.
- E. Unless otherwise indicated, specified span/load ratings are based on safety factor of 1.5 and working load only (i.e., no additional concentrated static load), with ratings for metal cable tray systems in accordance with NEMA BI 50015.
- F. Unless otherwise indicated, specified load/fill depths and inside widths are nominal values, with values for metal cable tray systems in accordance with NEMA BI 50015 including applicable allowable tolerances.

## 2.02 METAL CABLE TRAY SYSTEMS

- A. Comply with NEMA BI 50015.
- B. Metal Ladder Cable Tray:
  - 1. Material: Aluminum.
  - 2. Side Rail Construction: C-channel flange out.
  - 3. Load/Fill Depth: As indicated on drawings.
  - 4. Span/Load Rating: As indicated on drawings.
  - 5. Rung Spacing: 9 inches on center for straight lengths.
  - 6. Inside Width: As indicated on drawings.
  - 7. Inside Radius of Fittings: 12 inches.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that work likely to damage cable tray system has been completed.
- B. Verify field measurements.
- C. Verify dimensions and span/load ratings of cable tray system components.
- D. Verify that mounting surfaces are ready to receive cable tray and associated supports.
- E. Verify that conditions are satisfactory for installation prior to starting work.

### 3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install cable tray in accordance with NECA 1 (general workmanship) and NEMA BI-50016.
- C. Unless otherwise indicated, arrange cable tray to be parallel or perpendicular to building lines.
- D. Arrange cable tray to provide required clearances and maintain cable access.
  - 1. Minimum Clearance Above and Adjacent to Cable Tray: 12 inches.
- E. Install cable tray plumb and level, with sections aligned and with horizontal runs at specified elevation.
- F. Cable Tray Movement Provisions:
  - 1. Provide expansion fittings where cable tray is subject to movement, including but not limited to:
    - a. Where cable tray crosses structural joints intended for expansion.
    - b. Long straight cable tray runs in accordance with NEMA BI-50016.
  - 2. Use expansion guides in lieu of hold-down clamps where prescribed in NEMA BI-50016.
  - 3. Set gaps for expansion fittings in accordance with NEMA BI-50016.
- G. Cable and Conductors:
  - 1. Ampacity: As determined by applications listed in NFPA 70.
- H. Cable Provisions:
  - 1. Use fixed barrier strips to maintain separation of cables as indicated and as required by NFPA 70.
  - 2. Use drop-out fittings or bushings where cables exit cable tray as required to maintain minimum cable bending radius.
  - 3. Use cable support fittings for long vertical cable tray runs with heavy cables.
- I. Provide end closures at unconnected ends of cable tray runs.

- J. Cable Tray Support:
  - 1. Use manufacturer's recommended hangers and supports, located in accordance with NEMA BI-50016 and manufacturer's requirements, but not exceeding specified span unless otherwise approved by Engineer. Provide required support and attachment where not furnished by cable tray manufacturer.
  - 2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- K. Grounding and Bonding Requirements:
  - 1. Comply with grounding and bonding requirements of NEMA BI-50016.
  - 2. Metal Cable Tray Systems: Use suitable bonding jumpers or classified cable tray connectors to provide electrical continuity. Do not use classified cable tray connectors where cable tray sections have been modified, such as being bent, cut, or reshaped.
- L. Penetrations: Install firestopping to preserve fire resistance rating of building elements.
- M. Identification Requirements:
  - 1. Use warning labels to identify cable tray containing service-entrance conductors with word message "SERVICE-ENTRANCE CONDUCTORS" at maximum intervals of 10 ft.
  - 2. Use warning labels to identify cable tray with word message "WARNING! Do Not Use As A Walkway, Ladder, Or Support For Personnel. Use Only As A Mechanical Support For Cables, Tubing and Raceways." at maximum intervals of 20 ft.
- N. Install cable tray covers where indicated.

### **3.03 FIELD QUALITY CONTROL**

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Inspect cable tray system for damage and defects.
- C. Correct deficiencies and replace damaged or defective cable tray system components.

### **3.04 ADJUSTING**

- A. Adjust tightness of mechanical connections to manufacturer's recommended torque settings.

### **3.05 CLEANING**

- A. Remove dirt and debris from cable tray.
- B. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

### **3.06 PROTECTION**

- A. Protect cable tray system from subsequent construction operations.

**END OF SECTION**

**SECTION 260553**  
**IDENTIFICATION FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Electrical identification requirements.
- B. Identification nameplates and labels.
- C. Wire and cable markers.
- D. Warning signs and labels.

**1.02 RELATED REQUIREMENTS**

- A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.

**1.03 REFERENCE STANDARDS**

- A. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
- B. Sequencing:
  - 1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
  - 2. Do not install identification products until final surface finishes and painting are complete.

**PART 2 PRODUCTS**

**2.01 IDENTIFICATION REQUIREMENTS**

- A. Identification for Equipment:
  - 1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
    - a. Transfer Switches:
      - 1) Identify power source and circuit number for both normal power source and standby power source. Include location when not within sight of equipment.
      - 2) Identify short circuit current rating based on the specific overcurrent protective device type and settings protecting the transfer switch.
- B. Identification for Conductors and Cables:
  - 1. Color Coding for Power Conductors 600 V and Less: Comply with Section 260519.
  - 2. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
    - a. At each source and load connection.
    - b. Within boxes when more than one circuit is present.
    - c. In cable tray, at maximum intervals of 20 feet.
- C. Identification for Boxes:
  - 1. Use identification labels to identify circuits enclosed.
    - a. For exposed boxes in public areas, use only identification labels.
- D. Identification for Devices:
  - 1. Use identification label to identify serving branch circuit for all receptacles.
    - a. For receptacles in public areas or in areas as directed by Architect, provide identification on inside surface of wallplate.
  - 2. Use identification label or engraved wallplate to identify load controlled.

## 2.02 IDENTIFICATION NAMEPLATES AND LABELS

- A. Identification Nameplates:
  - 1. Manufacturers:
    - a. Brimar Industries, Inc: [www.brimar.com](http://www.brimar.com).
    - b. Kolbi Pipe Marker Co: [www.kolbipipemarkers.com](http://www.kolbipipemarkers.com).
    - c. Seton Identification Products: [www.seton.com](http://www.seton.com).
    - d. Substitutions: See Section 016000 - Product Requirements.
  - 2. Materials:
    - a. Indoor Clean, Dry Locations: Use plastic nameplates.
  - 3. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
    - a. Exception: Provide minimum thickness of 1/8 inch when any dimension is greater than 4 inches.
  - 4. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.
- B. Identification Labels:
  - 1. Manufacturers:
    - a. Brady Corporation: [www.bradyid.com](http://www.bradyid.com).
    - b. Brother International Corporation: [www.brother-usa.com](http://www.brother-usa.com).
    - c. Substitutions: See Section 016000 - Product Requirements.
  - 2. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
  - 3. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.
- C. Format for Equipment Identification:
  - 1. Minimum Size: 1 inch by 2.5 inches.
  - 2. Legend:
    - a. Equipment designation or other approved description.
  - 3. Text: All capitalized unless otherwise indicated.
  - 4. Minimum Text Height:
    - a. Equipment Designation: 1/2 inch.
  - 5. Color:
    - a. Normal Power System: White text on black background.
- D. Format for Receptacle Identification:
  - 1. Minimum Size: 3/8 inch by 1.5 inches.
  - 2. Legend: Power source and circuit number or other designation indicated.
  - 3. Text: All capitalized unless otherwise indicated.
  - 4. Minimum Text Height: 3/16 inch.
  - 5. Color: Black text on clear background.

## 2.03 WIRE AND CABLE MARKERS

- A. Manufacturers:
  - 1. Brady Corporation: [www.bradyid.com](http://www.bradyid.com).
  - 2. Substitutions: See Section 016000 - Product Requirements.
- B. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl self-laminating type markers suitable for the conductor or cable to be identified.
- C. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.
- D. Legend: Power source and circuit number or other designation indicated.
- E. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
  - 1. Do not use handwritten text.

- F. Minimum Text Height: 1/8 inch.
- G. Color: Black text on white background unless otherwise indicated.

## **2.04 WARNING SIGNS AND LABELS**

- A. Manufacturers:
  - 1. Brimar Industries, Inc: [www.brimar.com](http://www.brimar.com).
  - 2. Seton Identification Products: [www.seton.com](http://www.seton.com).
  - 3. Substitutions: See Section 016000 - Product Requirements.
- B. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.
- C. Warning Signs:
  - 1. Materials:
    - a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic or self-adhesive vinyl signs.
  - 2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners.
  - 3. Minimum Size: 7 by 10 inches unless otherwise indicated.
- D. Warning Labels:
  - 1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
    - a. Do not use labels designed to be completed using handwritten text.
  - 2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
  - 3. Minimum Size: 2 by 4 inches unless otherwise indicated.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

### **3.02 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
  - 1. Surface-Mounted Equipment: Enclosure front.
  - 2. Flush-Mounted Equipment: Inside of equipment door.
  - 3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
  - 4. Elevated Equipment: Legible from the floor or working platform.
  - 5. Interior Components: Legible from the point of access.
  - 6. Boxes: Outside face of cover.
  - 7. Conductors and Cables: Legible from the point of access.
  - 8. Devices: Outside face of cover.
- C. Install identification products centered, level, and parallel with lines of item being identified.
- D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.
- E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.
- F. Secure rigid signs using stainless steel screws.

**3.03 FIELD QUALITY CONTROL**

- A. See Section 014000 - Quality Requirements, for additional requirements.
- B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

**END OF SECTION**

**SECTION 262726  
WIRING DEVICES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Receptacles.
- B. Wall plates and covers.

**1.02 RELATED REQUIREMENTS**

- A. Section 260533.16 - Boxes for Electrical Systems.
- B. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

**1.03 REFERENCE STANDARDS**

- A. FS W-C-596 - Connector, Electrical, Power, General Specification for; 2014h (Validated 2022).
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- C. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.
- D. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2020).
- E. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2021.
- F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.
- H. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
  - 2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
  - 3. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
  - 4. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

**1.05 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.
- C. Project Record Documents: Record actual installed locations of wiring devices.

**1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.
- B. Products: Listed, classified, and labeled as suitable for the purpose intended.

**PART 2 PRODUCTS**

**2.01 WIRING DEVICES - GENERAL REQUIREMENTS**

- A. Provide wiring devices suitable for intended use with ratings adequate for load served.
- B. Wiring Device Finishes:
  - 1. Provide wiring device finishes as described below, unless otherwise indicated.
  - 2. Wiring Devices, Unless Otherwise Indicated: Gray with galvanized steel wall plate.

## **2.02 RECEPTACLES**

- A. Manufacturers:
  - 1. Hubbell Incorporated: [www.hubbell.com](http://www.hubbell.com).
  - 2. Leviton Manufacturing Company, Inc: [www.leviton.com](http://www.leviton.com).
  - 3. Pass & Seymour, a brand of Legrand North America, Inc: [www.legrand.us](http://www.legrand.us).
  - 4. Substitutions: See Section 016000 - Product Requirements.
- B. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
  - 1. Wiring Provisions: Terminal screws for side wiring with separate ground terminal screw.
  - 2. NEMA configurations specified are according to NEMA WD 6.
- C. Convenience Receptacles:
  - 1. Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.

## **2.03 WALL PLATES AND COVERS**

- A. Manufacturers:
  - 1. Hubbell Incorporated: [www.hubbell-wiring.com](http://www.hubbell-wiring.com).
  - 2. Leviton Manufacturing Company, Inc: [www.leviton.com](http://www.leviton.com).
  - 3. Pass & Seymour, a brand of Legrand North America, Inc: [www.legrand.us](http://www.legrand.us).
  - 4. Substitutions: See Section 016000 - Product Requirements.
- B. Wall Plates: Comply with UL 514D.
  - 1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
  - 2. Size: Standard.
  - 3. Screws: Metal with slotted heads finished to match wall plate finish.
- C. Galvanized Steel Wall Plates: Rounded corners and edges, with corrosion resistant screws.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- F. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 PREPARATION**

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

### **3.03 INSTALLATION**

- A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of wiring devices provided under this section.
  - 1. Mounting Heights: Unless otherwise indicated, as follows:
    - a. Receptacles: 18 inches above finished floor or 6 inches above counter.
  - 2. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
  - 3. Locate wall switches on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Architect to obtain direction prior to proceeding with work.
- C. Install wiring devices in accordance with manufacturer's instructions.
- D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.
- F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.
- G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
- H. Install wiring devices plumb and level with mounting yoke held rigidly in place.
- I. Install wall switches with OFF position down.
- J. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.
- K. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
- L. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.
- M. Identify wiring devices in accordance with Section 260553.

### **3.04 FIELD QUALITY CONTROL**

- A. See Section 014000 - Quality Requirements, for additional requirements.
- B. Inspect each wiring device for damage and defects.
- C. Operate each wall switch with circuit energized to verify proper operation.
- D. Test each receptacle to verify operation and proper polarity.
- E. Correct wiring deficiencies and replace damaged or defective wiring devices.

### **3.05 ADJUSTING**

- A. Adjust devices and wall plates to be flush and level.

### **3.06 CLEANING**

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

**END OF SECTION**

**SECTION 262811.13**

**LOW-VOLTAGE POWER CIRCUIT BREAKERS - SCHNEIDER ELECTRIC SQUARE D MASTERPACT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Low-voltage power circuit breakers.

**1.02 ABBREVIATIONS AND ACRONYMS**

- A. LVPCB: Low-voltage power circuit breakers.
- B. ERMS: Energy reduction maintenance setting.

**1.03 DEFINITIONS**

- A. Operator Interface Terminal (OIT): Locally mounted HMI device that provides remote monitoring and functions of connected equipment.

**1.04 REFERENCE STANDARDS**

- A. ISO 9001 - Quality Management Systems — Requirements; 2015, with Amendment (2024).
- B. ISO 14001 - Environmental Management Systems — Requirements with Guidance for Use; 2015, with Amendment (2024).
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. UL 1066 - Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures; Current Edition, Including All Revisions.

**1.05 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for circuit breakers, enclosures, and other installed components and accessories.
- C. Operation and Maintenance Data:
  - 1. Provide detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.

**1.06 QUALITY ASSURANCE**

- A. Comply with the following:
  - 1. NFPA 70.
  - 2. Requirements of local authorities having jurisdiction.
  - 3. Applicable local codes.
- B. Manufacturer Qualifications:
  - 1. Firm engaged in manufacture of specified products of types and sizes required, and whose products have been in satisfactory use in similar service for minimum of 10 years.
  - 2. Certified in accordance with ISO 9001 with applicable quality assurance system regularly reviewed and audited by third-party registrar. Develop and control manufacturing, inspection, and testing procedures under guidelines of quality assurance system.
  - 3. Service, repair, and technical support services available 24 hours per day, 7 days per week from manufacturer or their representative.
  - 4. Certified in accordance with ISO 14001, with product environmental profiles (PEPs) for specified products.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Prior to delivery to project site, verify suitable storage space is available to store materials in well-ventilated area protected from weather, moisture, soiling, extreme temperatures, humidity, and corrosive atmospheres.
- B. Protect materials during delivery and storage and maintain within manufacturer's written storage requirements. At minimum, store indoors in clean, dry space with uniform temperature to prevent condensation and protect electronics from potential damage from electrical and magnetic energy.
- C. Deliver materials to project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and equipment tag number or service name as identified in Contract Documents.
- D. Inspect products and report concealed damage or violation of delivery, storage, and handling requirements to Engineer.

### **1.08 FIELD CONDITIONS**

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

### **1.09 WARRANTY**

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. General Electric: [ge.com](http://ge.com).
- B. Source Limitations: Furnish products produced by same manufacturer as other electrical distribution equipment for project and obtained from single supplier.

### **2.02 LOW-VOLTAGE POWER CIRCUIT BREAKERS**

- A. Basis of Design: Schneider Electric; Square D Circuit Breakers; [www.se.com](http://www.se.com).
- B. Listed as complying with UL 1066.
- C. Provide sealed low-voltage power circuit breaker (LVPCB), manually operated, with integrally mounted electronic trip units.
- D. Provide fixed mounted circuit breakers.
- E. Circuit Breaker Rating: 100 percent rated.
- F. Interrupting Rating: Available up to 130 kAIR RMS at 635 V, 200 kAIR RMS at 508 V, and 200 kAIR RMS at 254 V without fuses.
- G. Thirty-Cycle Withstand Ratings: Comply with application requirements.
- H. Close-and-Latch Rating: Up to 150 kA peak current.
- I. Maximum Closing Time:
  - 1. Provide maximum 5-cycle closing time.
  - 2. Ratings Less than 800 A: 50 milliseconds.
  - 3. Ratings Between 800 A and 4,000 A: 70 milliseconds.
  - 4. Ratings Greater than 4,000 A: 80 milliseconds.
- J. Service Life:
  - 1. Frame Size of 3,200 A or Less: Certified for 10,000 operations without maintenance.
  - 2. Frame Size Greater than 3,200 A: Certified for 5,000 operations without maintenance.
  - 3. Provide visual contact wear indicator.

K. Operation:

1. Provide two-step, fully-stored energy devices for quick-make, quick-break operation.
  - a. Capable of open-close-open cycle without recharging.
  - b. Automatically charge motor operator when breaker is closed.
  - c. Step One: Actuation of operating handle or operation cycle of circuit breaker motor charges closing springs.
  - d. Step Two: Operation of local close button closes circuit breaker contact, automatically charging opening springs.
2. Anti-Pumping Function: Remains in open position if opening/closing commands occur simultaneously; after fault tripping or intentional opening using manual or electrical controls, requires closing order to be discontinued and reactivated.
3. Provide OPEN and CLOSE buttons.
4. Provide breaker contact and close spring status indicators; indicate "charged-not OK to close" if closing springs are charged but circuit breaker is not ready to close.
5. Locking Provisions: For locking in connected, test, or disconnected position.
  - a. Pad-Lock Provisions: One to three.
  - b. Key-Lock Provisions: One to two.
6. Support auxiliary status contacts for open/close (ON/OFF), tripped, ready to close, ready to open, and spring mechanism is charged to provide local or remote indications of proper breaker system functionality.
7. Provide safety interlock to keep circuit breaker open if trip unit is not installed.
8. Shunt Trip and Shunt Close Coils: Continuous-duty rated; intermittent duty rated coils dependent on coil clearing contact may be used where spare coil is provided for each breaker.

L. Construction:

1. Case: Polyester thermoset material with high dielectric strength.
2. Current-Carrying Components: Isolated from accessory mounting area and double-insulated from operator with accessory cover in place.
3. Isolate each phase and ground.
4. Equipped with metal filters to reduce effects of interruption on surfaces surrounding circuit breaker.
5. Secondary Wiring: Front accessible with cage clamp connections.
6. Comply with Registration Evaluation and Authorization and Restriction of Chemicals (REACH) and Restriction of Hazardous Substances (RoHS).

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Examine equipment exterior and interior for damage, including but not limited to, structure, moisture, and mildew.
- B. Examine for conditions detrimental to completion of work.

**3.02 INSTALLATION**

- A. Install circuit breakers in accordance with manufacturer's written instructions.

**END OF SECTION**

**SECTION 265100  
INTERIOR LIGHTING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Interior luminaires.

**1.02 RELATED REQUIREMENTS**

- A. Section 260529 - Hangers and Supports for Electrical Systems.
- B. Section 260533.16 - Boxes for Electrical Systems.

**1.03 REFERENCE STANDARDS**

- A. IES LM-79 - Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products; 2019.
- B. IES LM-80 - Approved Method: Measuring Maintenance of Light Output Characteristics of Solid-State Light Sources; 2021.
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- D. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems; 2025.
- E. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems; 2006.
- F. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; 2023.
- G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 1598 - Luminaires; Current Edition, Including All Revisions.
- I. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination:
  - 1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
  - 2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
  - 3. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

**1.05 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
  - 1. LED Luminaires:
    - a. Include estimated useful life, calculated based on IES LM-80 test data.
- C. Operation and Maintenance Data: Instructions for each product including information on replacement parts.
- D. Project Record Documents: Record actual connections and locations of luminaires and any associated remote components.

### **1.06 QUALITY ASSURANCE**

- A. Comply with requirements of NFPA 70.

### **1.07 WARRANTY**

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Provide 3-year manufacturer warranty for LED luminaires, including drivers.

## **PART 2 PRODUCTS**

### **2.01 LUMINAIRE TYPES**

- A. Furnish products as indicated in luminaire schedule included on the drawings.

### **2.02 LUMINAIRES**

- A. Manufacturers:
  - 1. Acuity Brands, Inc: [www.acuitybrands.com](http://www.acuitybrands.com).
  - 2. Cooper Lighting, a division of Cooper Industries: [www.cooperindustries.com](http://www.cooperindustries.com).
  - 3. Current Lighting: <https://www.currentlighting.com>.
  - 4. Substitutions: See Section 016000 - Product Requirements.
- B. Provide products that comply with requirements of NFPA 70.
- C. Provide products that are listed and labeled as complying with UL 1598, where applicable.
- D. Provide products listed, classified, and labeled as suitable for the purpose intended.
- E. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
- F. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.
- G. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.
- H. Recessed Luminaires:
  - 1. Ceiling Compatibility: Comply with NEMA LE 4.
- I. LED Luminaires:
  - 1. Components: UL 8750 recognized or listed as applicable.
  - 2. Tested in accordance with IES LM-79 and IES LM-80.
  - 3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
- C. Verify that suitable support frames are installed where required.
- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- E. Verify that conditions are satisfactory for installation prior to starting work.

### **3.02 PREPARATION**

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

### **3.03 INSTALLATION**

- A. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of luminaires provided under this section.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Install products in accordance with manufacturer's instructions.
- D. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).
- E. Provide required support and attachment in accordance with Section 260529.
- F. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- G. Suspended Ceiling Mounted Luminaires:
  - 1. Do not use ceiling tiles to bear weight of luminaires.
  - 2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
  - 3. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.
- H. Suspended Luminaires:
  - 1. Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.
  - 2. Install canopies tight to mounting surface.
  - 3. Unless otherwise indicated, support pendants from swivel hangers.
- I. Install accessories furnished with each luminaire.
- J. Bond products and metal accessories to branch circuit equipment grounding conductor.

### **3.04 FIELD QUALITY CONTROL**

- A. See Section 014000 - Quality Requirements, for additional requirements.
- B. Inspect each product for damage and defects.
- C. Operate each luminaire after installation and connection to verify proper operation.
- D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

### **3.05 CLEANING**

- A. Clean surfaces according to NECA 500 (commercial lighting) and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

### **3.06 PROTECTION**

- A. Protect installed luminaires from subsequent construction operations.

**END OF SECTION**

## **SECTION 31 10 00 SITE CLEARING**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS:**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specifications, apply to this Section.

#### **1.02 SUMMARY:**

- A. This section includes the following:
  1. Protection of existing trees.
  2. Removal of Trees and other Vegetation.
  3. Clearing and Grubbing.
  4. Removing above-grade improvements.
  5. Removing below grade improvements.

#### **1.03 RELATED WORK SPECIFIED ELSEWHERE:**

- A. Section 31 20 00 Earthwork

#### **1.04 SUBMITTALS**

- A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specifications Section.
- B. Schedule indicating proposed sequence of operations for selective demolition work to Owner's Representative for review prior to start of work.

#### **1.05 PROJECT CONDITIONS:**

- A. Traffic: Conduct site demolition operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.
- B. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary fencing to protect trees and vegetation as instructed on drawings.
- C. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.
- D. Environmental Controls: Comply with governing regulations pertaining to environmental protection.
  1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
- E. If unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure both nature and extent of conflict. Submit report to Owner's Representative, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

- F. Salvageable Improvements: Carefully remove items indicated to be salvaged, and store on owners premises where indicated or directed.

## **PART 2 PRODUCTS (Not Applicable)**

## **PART 3 EXECUTION**

### **3.01 DEMOLITION:**

- A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
  - 1. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

### **3.02 SITE CLEARING:**

- A. General: Remove trees, shrubs, grass, and other vegetation, improvements or obstructions as required to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated.
  - 1. Removal includes digging out and off-site disposing of stumps and roots.
  - 2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner , where such roots and branches obstruct installation of new construction.
- B. Clearing and Grubbing: Clear sites of trees, shrubs and other vegetation, as indicated on the plans.
  - 1. Completely remove stumps, roots, and other debris protruding through ground surface.
  - 2. Use only hand methods for grubbing inside drip line of trees indicated to remain.
  - 3. Fill depressions caused by clearing and grubbing operations with satisfactory soil materials, unless further excavation of earthwork is indicated.
    - a. Compact fill material in accordance with requirements of Section 31 20 00 Earthwork.
- C. Removal of Improvements: Remove existing above-grade and below-grade improvements as indicated on drawings.

### **3.03 DISPOSAL OF DEMOLISHED MATERIALS**

- A. Remove from site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose of off site.
  - 1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
  - 2. Burning of removed materials is not permitted on project site.

### **3.04 CLEAN UP AND REPAIR:**

- A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections:
  - 1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start of operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

IOWA DEPT. OF ADMINISTRATIVE SERVICES  
DVA IVH LOFTUS & MALLOY WATER INFILTRATION

DAS PROJ: 9487.00  
GENESIS PROJ: 2515

END OF SECTION

## **SECTION 31 20 00 EARTHWORK**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS:**

- A. Drawings and General Provisions of Contract, including General and Supplementary conditions and Division 1 Specification Sections, apply to work specified in this Section.

#### **1.02 DESCRIPTION OF WORK:**

- A. Extent of Earthwork is indicated on Drawings.
- B. Work includes:
  - 1. Stripping, topsoil stockpiling.
  - 2. Excavation.
  - 3. Fill.
  - 4. Compaction.
  - 5. Preparation of subgrade for walls, parking and drives, and steps and walks.
  - 6. Grading.
  - 7. Reserved
  - 8. Reserved
  - 9. Topsoil placement.
  - 10. Finish grading.
  - 11. Erosion Control

#### **1.03 RELATED WORK SPECIFIED ELSEWHERE:**

- A. Erosion Control: Section 31 35 00.
- B. Site Clearing: Section 31 10 00.
- C. Landscape Grading, Section 32 91 19.

#### **1.04 QUALITY ASSURANCE:**

- A. Codes and Standards:
  - 1. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.
  - 2. The entire installation shall fully comply with all local and state laws and ordinances, and with all established codes applicable thereto.
- B. Testing and Inspection Service:
  - 1. Cost of field and laboratory testing will be borne by the Owner. Testing by laboratory approved by the Owner and Engineer.
  - 2. Contractor will cooperate with testing laboratory and geotechnical Engineer in coordinating compaction testing, installation and protection of settlement monitoring devices.

#### **1.05 SUBMITTALS:**

- A. Testing Reports - Excavating: Submit the following reports directly to the Engineer from the testing services, with copies to the Contractor and the Owner.
  - 1 Test reports on borrow material/lab analysis of fill materials.

2. Verification of each footing subgrade (material and unconfined compressive strength).
3. Field density test reports.
4. One optimum moisture-maximum density curve for each type of soil encountered. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.

**1.06 JOB CONDITIONS:**

- A. Soil Borings:
1. Soil borings have been made for this site and can be found in Soils Report for project site.
  2. Test borings and other exploratory operations may be made by Contractor at no cost to Owner with Owner approval.
- B. Existing Utilities:
1. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.
  2. Underground utilities shown on the drawings have been taken from existing public records, Owner's records and available as-built drawings and are correct to the best of our knowledge and provided for information only.
  3. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities caused by Contractor's negligence to the satisfaction of utility owner at no cost to the Project Owner.
  4. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, during occupied hours, except when permitted in writing by Engineer and then only after acceptable temporary utility services have been provided.
  5. Provide minimum of 48-hour notice to Owner and Engineer and receive written notice to proceed before interrupting any utility.
  6. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.
- C. Protection of Persons and Property:
1. Barricade open excavations occurring as part of this work and post with warning lights.
  2. Operate warning lights as recommended by authorities having jurisdiction.
  3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
- D. Survey:
1. The topographic survey of the site is provided for informational purposes only. The contractor is responsible for verifying topography of the site prior to construction. No change orders or drawing revisions will be executed or issued for any contractor claims that the survey is wrong. This includes but isn't limited to frost heave or farming activity claims.

**PART 2 PRODUCTS**

**2.01 SOIL MATERIALS/DEFINITIONS:**

- A. Satisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups CL, GC, GW, CP, GM, ML, SC, SM, SW, and SP.
- B. Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups MG, DH, OL, OH, PT and any bedrock material.
- C. Subbase material (granular fill): Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, natural or crushed sand.
- D. Fill materials:
  - 1. The fill material type shall be cohesive, non-expansive soil having a "CL" or "CL-ML" classification in accordance with the Unified Soil Classification System and shall have a maximum laboratory dry density (100%) of 100 pounds per cubic foot or more as determined by ASTM D698 (Standard Proctor).
  - 2. No organic dark colored soils or plastic and potentially expansive soils, such as clay shale, are considered suitable engineered fill materials. Topsoils should be sorted and stockpiled for landscaping purposes.
  - 3. When fill material includes rock, the maximum rock size acceptable shall be three inches (3"). No large rocks shall be allowed to nest and all voids must be carefully filled with small stones or earth, properly compacted. No large rocks will be permitted within twelve inches (12") of the finished grade.
- E. Topsoil: Secure and stockpile from naturally well drained areas during stripping operations; use satisfactory soil materials free of admixture of subsoil, reasonably free from clay lumps, stone or other debris a greater than 3/4" in diameter.
  - 1. Should also comply with all NPDES and Iowa DNR requirements, if these requirements are more stringent than project specifications.
- F. Flyash: For chemical stabilization, add Flyash or Cement. Products all must meet Iowa DOT standard specifications.

### **PART 3 EXECUTION**

#### **3.01 EXCAVATION:**

- A. Excavation is unclassified, and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.
- B. Unauthorized Excavation:
  - 1. Consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Engineer.
  - 2. Unauthorized excavation, as well as remedial work directed by Engineer shall be at Contractor's expense.
  - 3. Backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Engineer.
- C. Additional Excavation:
  - 1. When excavation has reached required subgrade elevations, notify Engineer who will make an inspection of conditions. Engineer shall evaluate and advise if bearing material is suitable and shall provide unconfined compressive strength tests.
  - 2. If unsuitable bearing materials are encountered at required elevations, carry excavations deeper and replace excavated material with engineered compacted backfill as directed state in soils/ geotechnical report.
  - 3. Reference Geotechnical/ Soils Report for all possible over excavation.

4. No additional compensation will be provided for over excavation/ reworking of soil and should all be included in base project bid.
- D. Stability of Excavations:
1. Slope sides of excavations to comply with local codes and ordinances having jurisdiction.
    - a. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
    - b. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- E. Dewatering:
1. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.
  2. Do not allow water to accumulate in excavations.
  3. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations.
  4. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
  5. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavations to collecting or run-off areas.
  6. Do not use trench excavations as temporary drainage ditches.
  7. All dewatering necessary to complete project including but not limited to earthwork, pipe installation, footing or building construction are part of contractor's responsibility. No change orders will be issued for dewatering during construction.
- F. Material Storage:
1. Stockpile satisfactory excavated materials where directed, until required for backfill or fill.
  2. Place, grade and shape stockpiles for proper drainage.
  3. Locate and retain soil materials away from edge of excavations.
  4. Do not store within drip line of trees indicated to remain.
  5. Dispose of excess soil material and waste materials as herein specified.
- G. Subgrade Preparation: Paving systems:
1. Provide a minimum 12" compacted depth subgrade (2-6" lifts) for paving, plus fill as required.
  2. Scarify, mix and recompact materials to provide uniform composition at least 12" below top of subgrade for paving for full width of subgrade plus 2'-0" on each side of paving.
  3. Construct 12" thick uniform subgrade by excavating top 6" of subgrade, scarifying, mixing, and recompact next 6" of subgrade and then replacing top 6" of subgrade and recompact.
  4. Proof roll existing soils prior to placing fill to determine location of unsuitable bearing materials. Notify Engineer if unsuitable conditions are encountered for direction. Proof roll truck requirements (axles, wheels and weight) per Iowa DOT specifications.
    - a. Perform proof rolling with a truck loaded to the maximum single legal axle gross weight of 20,000 pounds or the maximum tandem axle gross weight of 34,000 pounds. Operate trucks at less than 10 mph. Make multiple passes for every lane. The subgrade will be considered to be unstable if, under the operation of the loaded truck, the surface shows yielding (soil wave in front of the loaded tires) or

rutting of more than 2 inches, measured from the top to the bottom of the rut at the outside edges.

5. If proof roll does not pass specification as determined by the owner's geotechnical engineer, contractor shall rework subgrade, replace bad soils, increase thickness of subgrade prep beyond 12" until subgrade passes the proof roll requirements. No additional compensation will be provided for this work. If geotechnical engineer and project civil engineer recommend adding flyash or other chemical treatment as the only way to fix the poor soils, that work would be eligible for a change order or shall abide by the unit price, if one was asked for during bidding.

6. If rain exceeding 0.1", frost occurs or more than 48 hours passes after subgrade has passed all required testing but before paving, all test results are invalid and must be retested.

7. Compact as per Paragraph 3.02 Compaction requirements.

H. Topsoil Stripping

1. Strip and stockpile a minimum of the top 8" of soil on all disturbed areas. Additional depth of stripping may be necessary as stated in soils report, on the detailed plans or to make earthwork balance at contractor's discretion.

**3.02 COMPACTION:**

- A. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below.
- B. Compaction Requirements: Compact top 12" of subgrade and each layer of backfill or fill material to not less than the following percentages of maximum density:

Construction Type	Standard Proctor ASTM D698 Cohesive Soils
Building, foundation, recreation field subgrade walls, roadway, parking lot and critical backfill area beneath same; e.g. trenches	95%
Backfill adjacent to structures not supporting other structures - minor subsidence possible.	95%
Lawn areas. Non-critical areas -	85-90%

moderate subsidence  
possible.

\*Use relative density technique (ASTM D4253 and D4254) where standard proctor technique (ASTM D698) does not result in a definable maximum dry density and optimum moisture content.

C. Moisture Control and Content:

1. When subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.
2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
3. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by disking, harrowing or pulverizing until moisture content is reduced to a satisfactory value.
4. The fill material shall be compacted at a moisture content typically within a range of minus two percent to plus four percent (-2% to +4%) of optimum moisture content as determined by ASTM D698 (Standard Proctor). Other acceptable moisture content ranges determined by the Engineer may be necessary to produce desirable results with specific soils.

**3.03 BACKFILL AND FILL:**

A. General: Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below.

1. In excavations, use satisfactory excavated or borrow material. Site strippings (per soils report) are not to be used as satisfactory excavated material.
2. Under grassed areas, use satisfactory excavated or borrow material.
3. Under walks and pavements, use subbase material or satisfactory scarified and recompacted subgrade or borrow material, or combination of these.
4. Under steps, use subbase material.
5. Under piping and conduit, use subbase material where subbase is indicated under piping or conduit; shape to fit bottom 90 degrees of cylinder.

B. Ground Surface Preparation:

1. Clearing area to be filled: All timber, logs, trees, brush and rubbish shall be removed or otherwise acceptably disposed of.
2. Scarifying area to be filled:
  - a. All vegetable matter and dark colored organic soil shall be removed from the surface upon which the fill is to be placed (per soils report) and the surface shall be plowed or scarified to a depth of at least 12 inches and until the surface is free from ruts, hummocks or other uneven features which would tend to prevent uniform compaction by the equipment to be used.
  - b. Where fills are made on hillsides or slopes, the slope of the original ground upon which the fill is to be placed shall be plowed or scarified deeply or where the slope ratio of the original ground is steeper than 5 horizontal to 1 vertical, the bank shall be stepped or benched. Ground slopes which are flatter than 5 to 1 shall be benched when considered necessary by the Engineer.
3. Compaction area to be filled: After the foundation for the fill has been cleared and plowed or scarified, it shall be disked or bladed until it is uniform and free from large clods, brought to within the specified moisture content range and compacted to not less than ninety-five percent (95%) of maximum dry density in accordance with current ASTM D698 (Standard Proctor).

- C. Placement and Compaction:
1. Depth and Mixing of Fill Layers: The selected fill material shall be placed in level, uniform layers which, when compacted, shall have a density conforming to a minimum of ninety-five percent (95%) of maximum dry density in accordance with ASTM D698 (Standard Proctor). Each layer shall be thoroughly blade mixed during the spreading to insure uniformity of material in each layer. Compacted layer thickness will be compatible with the demonstrated compatibility of the compaction equipment being used, with a compacted layer thickness of 6" considered typical.
  2. Amount of Compaction: After each layer (lift) has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of ninety-five percent (95%) of the material's maximum dry density as determined by ASTM D698 (Standard Proctor) for areas supporting building foundations and floor slabs. Grassed areas or areas not supporting buildings or slabs-on-grade should be compacted to a minimum of ninety percent (90%).
  3. Compaction of Fill Layer: Compaction equipment shall be of such design to be able to compact the fill to the specified density. Compaction shall be accomplished while the fill material is within the specified moisture content range. Compaction of each layer shall be continuous over its entire area and the compaction equipment shall make sufficient trips to insure that the required density has been obtained.
  4. Compaction of Slopes: Fill slopes shall be compacted. Compacting operations shall be continued until the slopes are stable but not too dense for planting on the slopes. Compacting of the slopes may be done progressively in increments of three to five feet (3' to 5') in fill height or after the fill is brought to its total height.
  5. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

### 3.04 GRADING:

- A. General:
1. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas.
  2. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.
- B. Grading Outside Paving Lines:
1. Grade areas to adjacent to paving lines to drain away from structures and to prevent ponding.
  2. Finish surfaces free from irregular surface changes, and as follows:
    - a. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10' above or below required subgrade elevations.
    - b. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10' above or below required subgrade elevation.
- C. Grading Surface of Fill Under Paving:
1. Grade smooth and even, free of voids, compacted as specified, and to required elevation.
  2. Provide final grades within a tolerance of 1/2" when tested with a 10' straightedge.

- e. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

**3.05 CHEMICAL SOIL STABILIZATION:**

- A. Where flyash or other chemical stabilization is required by either the contract documents or the geotechnical report, incorporate by percentage specified. Measure the percentage by weight of the soil, not by volume.
- B. Flyash or other chemical stabilization shall be incorporated using a mechanical soil stabilization machine or pulvimixer. Mixing in with road grader, farm field disc or excavator is not acceptable.

**3.06 EMBANKMENTS:**

- A. General: Prepare site, place and compact excavated materials to required elevation and cross section.
- B. Construction:
  - i. Construct embankment in horizontal layers not more than 6" in loose thickness.
  - ii. Deposit each layer over full width of embankment as separate and distinct operation.
  - iii. After layer is deposited, smooth to uniform depth by means of suitable motor patrol or bulldozer.
  - iv. Compact layer by rolling with tamping type roller until full weight of roller is supported by tamping feet, but with not less than one pass per inch of loose thickness of layer.
  - v. Roller will be considered to be supported entirely on its tamping feet when feet do not penetrate more than 3" into material being compacted.
  - vi. If soil is wet so that it will not sufficiently compact by one passing of roller per inch of loose thickness, provide one disking per 2" of loose thickness.
    - 1. Cut and stir full depth of layer.
    - 2. Allow interval of not less than two hours between successive diskings, or as directed by Engineer.
    - 3. After disking is completed compact layer by specified rolling.
  - vii. If soil is dry so that it will not satisfactorily compact by rolling, moisten material before compaction; manipulate material to secure proper distribution of moisture before compaction.
  - viii. Whenever operations are suspended during periods rain is likely to occur, smooth and compact surface to shed water readily.
  - ix. Compact to not less than 95% maximum density with moisture content not more than three percentage points above or below optimum; maximum density determined by ASTM D698.
  - x.

**3.07 TOPSOIL SPREADING:**

See Section 32 91 19 Landscape Grading.

**3.08 FINISH GRADING:**

See Section 32 91 19 Landscape Grading.

**3.09 MAINTENANCE:**

- A. Protection of Graded Areas:
  - 1. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
  - 2. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
  - 3. Keep public streets clean from soil, soil tracking and debris at all times.
- B. Reconditioning Compacted Areas: Where completed graded areas are disturbed by subsequent construction operations, erosion or adverse weather, scarify surface, re-shape and compact to required density prior to further construction.
- C. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

### **3.10 EROSION PROTECTION:**

See Section 31 35 00 Erosion Control.

### **3.11 FIELD QUALITY CONTROL:**

- A. Quality Control Testing During Construction:
  - 1. Allow testing service to inspect and approve subgrades and fill layers before further construction work is performed.
  - 2. Perform field density tests in accordance with ASTM D2922 (nuclear method) or ASTM D1556 (sand cone method), as applicable.
  - 3. Footing Subgrade: For each strata of soil on which footings will be placed, conduct at least one test every 50 lineal feet to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to Engineer.
  - 4. Paved Areas and Building Slab Subgrade: Make at least one field density test of subgrade for every 2000 sq. ft. of paved area, but in no case less than 3 tests. In each compacted fill layer, make one field density test for every 2000 sq. ft. of overlaying building slab or paved area, but in no case less than 3 tests.
  - 5. If, in opinion of Engineer, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense.

### **3.12 NATURAL AND ARTIFICIAL DRAINAGE:**

- A. If necessary during the progress of the work to interrupt the natural drainage of the surface water, Contractor shall provide approved temporary drainage facilities.
- B. If necessary to interrupt any field tile drains that might be encountered in this work, the Contractor shall restore or extend drains as necessary. Payment for this work will be on the basis of contract conditions relative to changes in work.

### **3.13 DISPOSAL OF EXCESS AND WASTE MATERIALS:**

- A. Removal from Owner's Property: Remove waste materials, including unacceptable excavated material, trash and debris from site to an approved location for disposal by Contractor.
- B. All excess excavation shall be removed from the site unless otherwise stated on plans or directed by the owner.

**END OF SECTION**

## **SECTION 31 23 33 TRENCHING AND BACKFILLING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Trench excavation for pipe systems, manholes, intakes and other structures.
- B. Trench bedding and foundation stabilization.
- C. Pipe and structure placement and backfill.

#### **1.02 DESCRIPTION OF WORK**

- A. Perform all excavations required to complete the work shown on the plans.
- B. Prepare trench excavations and shoring for new work, and install the utility lines, structures, and system components, including bedding and foundation stabilization.
- C. Complete specified backfill operation.
- D. Reference is made to the Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2001, and all current General Supplemental Specifications and Materials Instructional Memorandum by the term "Iowa DOT Specifications" and/or "Iowa DOT I.M."

#### **1.03 SUBMITTALS**

- A. Submit under provisions of Division 1.
- B. Results of Proctor and In-Place Density Tests on backfill.
- C. Contractor will provide Material Certifications to the Engineer.

#### **1.04 SUBSTITUTIONS**

- A. Use only materials conforming to these specifications unless permitted otherwise by Engineer.
- B. Obtain approval of Engineer for all substitutions prior to use.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver only materials that fully conform to these specifications or for which submittals have been provided to Engineer and approved for use.
- B. Store delivered materials and excavated materials in locations that will not interfere with operations and minimize environmental damage.
- C. Grade and shape stockpiles for drainage and protect adjacent areas from runoff. Provide erosion control around stockpiles.
- D. Remove unsuitable and excess materials from the site.

#### **1.06 SCHEDULING AND CONFLICTS**

- A. Construction Sequence:
  - 1. Attend a preconstruction meeting if required by Engineer.
  - 2. Submit plan for construction sequence and schedule prior to commencing construction.
- B. Conflict Avoidance:
  - 1. Expose possible conflicts in advance of construction, such as utility lines and drainage structures. Verify elevations and locations of each and verify clearance for proposed construction.
  - 2. Complete other elements of the work that can affect line and grade in advance of other open cut construction unless noted on the plans.
  - 3. Notify Engineer of conflicts discovered or changes needed to accommodate unknown or changed conditions.

## 1.07 SPECIAL REQUIREMENTS

- A. Stop Work: Stop work and notify Engineer immediately if contaminated soils, historical artifacts, or other environmental or historic items are encountered.
- B. Conform to local, state, and federal requirements.
- C. Abandoned Utilities: Remove and dispose of abandoned utility lines including gas mains, water mains, sewer mains, telephone conduits, service lines, etc. required to complete the work. Said work shall be incidental to the project unless otherwise specified.

## PART 2 - PRODUCTS

### 2.01 EXCAVATED MATERIALS

- A. Unclassified Excavation: Excavation of all materials encountered, except rock and over-excavation.
- B. Rock Excavation: Boulders or sedimentary deposits that cannot be removed without continuous use of pneumatic tools or blasting.
- C. Over-excavation: Excavation of soil or rock in trenches below the pipe zone.
- D. Suitable Excavated Materials for Backfill:
  - 1. Soil, clay, silt, sand, and gravel with moisture content suitable to achieve required compaction. ASTM D 2321, Class II through IVA (see 2.01, E).
  - 2. Fine-grained soils according to ASTM D 2321 Class IVB (inorganic) (see 2.01, E) may be used in the final backfill upon approval of the Engineer.
  - 3. Adjust moisture content of excessively wet, but otherwise acceptable, material by spreading, turning, aerating, and otherwise working material as necessary to achieve required moisture range.
  - 4. Adjust moisture content of excessively dry, but otherwise acceptable material by adding water, then turning, mixing, and otherwise blending the water uniformly throughout the material until the required moisture range is achieved.
  - 5. Lime or fly ash may be added to soils to produce a suitable backfill material. Uniformly mix soil and additive. Determine Standard Proctor maximum density and optimum moisture content of the modified material. Amount of additive applied is subject to Engineer's approval.
- E. Non-Manufactured (Excavated) Backfill Materials: (See Sections 2.03 and 2.04 for manufactured backfill)

Class	Type	Soil Group Symbol D 2487	Description	Percentage Passing Sieve Sizes			Atterberg Limits		Coefficients	
				1½ in. (40 mm)	No. 4 (4.75 mm)	No. 200 (0.075 mm)	LL	PI	Uniformity C <sub>u</sub>	Curvature C <sub>c</sub>
II	Coarse-Grained Soils, clean	GW	Well-graded gravels and gravel-sand mixtures; little or no fines	100 %	<50% of "Coarse Fraction"	<5%	Non Plastic		>4	1 to 3
		GP	Poorly-graded gravels and gravel-sand mixtures; little or no fines.						<4	<1 or >3
		SW	Well-graded sands and gravelly sands; little or no fines.		>50% of "Coarse Fraction"				>6	1 to 3
		SP	Poorly-graded sands and gravelly sands; little or no fines.		<6				<1 or >3	
	Coarse-Grained Soils, borderline clean to w/fines	e.g. GW-GC, SP-SM	Sands and gravels which are borderline between clean and with fines.	100 %	Varies	5% to 12%	Non Plastic		Same as for GW, GP, SW and SP	
III	Coarse-Grained Soils, with Fines	GM	Silty gravels, gravel-sand-silt mixtures.	100 %	<50% of "Coarse Fraction"	12% to 50%			<4 or <"A" Line	
		GC	Clayey gravels, gravel-sand-clay mixtures.						<7 and >"A" Line	
		SM	Silty sands, sand-silt mixtures.		>50% of "Coarse Fraction"				>4 or <"A" Line	
		SC	Clayey sands, sand-clay mixtures.		>7 and >"A" Line					
IVA	Fine-Grained Soils (inorganic)	ML	Inorganic silts and very fine sands, rock flour,	100 %	100%	>50%	<50	<4 or <"A"		

			silty or clayey fine sands, silts with slight plasticity.					Line		
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clay, lean clays.					>7 and <"A" Line		
IVB (1)	Fine-Grained Soils (inorganic)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	100 %	100%	>50%	>50	<"A" Line		
		CH	Inorganic clays of high plasticity, fat clays.					<"A" Line		
V	Organic Soils (Unsuitable for backfill)	OL	Organic silts and organic silty clays of low plasticity.	100 %	100%	>50%	<50	<4 or <"A" Line		
		OH	Organic Clays of Medium to high plasticity, organic silts.					<"A" Line		
	Highly Organic (Unsuitable for backfill)	PT	Peat and other high organic soils.							

(1) See section 2.01, F, 2 for restrictive use.

- F. Unsuitable Material: Remove unsuitable materials from the site, including, but not limited to, the following:
1. Rock with gradation not meeting the stated gradation for stabilization material.
  2. Individual stones or concrete chunks larger than 6 inches, and averaging more than one per each cubic foot of soil.
  3. Frozen materials.
  4. Stumps, logs, branches, and brush.
  5. Trash, metal, or construction waste.
  6. Soil in clumps or clods larger than 6 inches, and without sufficient fine materials to fill voids during placement.
  7. Unsuitable soils, as defined in Section 2010, 2.03, excluding material used as topsoil.
  8. Class V Material (ASTM D 2321), as defined in Section 3010, 2.08.
  9. Environmentally-contaminated soils.
- G. Replacement of Unsuitable Soils:
1. If the excavated material is determined by the Engineer to be unsuitable and cannot be conditioned so that it becomes suitable, furnish all necessary backfill material.
  2. Remove and dispose of unsuitable material from the site.

**2.02 STABILIZATION (FOUNDATION) MATERIALS**

- A. Clean 2-1/2 inch crushed stone or crushed portland cement concrete (PCC) material, with the following gradation:

Sieve	Percent Passing
2-1/2"	100
2"	90 to 100
1-1/2"	35 to 70
1"	0 to 15
1/2"	0 to 5

- B. Engineer may authorize a change in gradation subject to materials available locally at time of construction. Subject to the Engineer's approval, crushed concrete may be used if it is within plus or minus 5% of the gradation for each size of material.

**2.03 CLASS I GRANULAR BEDDING AND BACKFILL MATERIAL (Storm Sewers and Sanitary Sewers)**

- A. Use gravel or crushed stone for granular bedding, complying with the following gradation:

Sieve	Percent Passing
1-1/2"	100
1"	95 to 100
1/2"	25 to 60
No. 4	0 to 10
No. 8	0 to 5

Note: Engineer may authorize the use of crushed PCC, for pipe sizes up to 12 inches, or a change in gradation subject to materials available locally at time of construction.

- B. Compaction: See Section 3.06.

**2.04 CLASS II BACKFILL MATERIAL (Storm Sewers, Sanitary Sewers, and Water Mains)**

- A. Class II material is manufactured and non-manufactured open graded (clean) or dense graded (clean) processed aggregate, clean sand, or coarse-grained natural soils (clean) with little or no fines.

- B. Class II material is non-plastic soil less than 1-1/2 inches in size and consists of the following:

SOIL TYPE	DESCRIPTION OF MATERIAL CLASSIFICATION	REMARKS SECTION

GW	Well-graded gravels and gravel-sand mixtures, little or no fines. 50% or more retained on No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.	Where hydraulic gradient exists check gradation to minimize migration. Clean groups suitable for use as drainage blanket and underdrain.
GP	Poorly graded gravels and gravel sand mixtures, little or no fines. 50% or more retained on No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.	
SW	Well-graded sands and gravelly sands, little or no fines. More than 50% passes No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.	
SP	Poorly graded sands and gravelly sands, little or no fines. More than 50% passes No. 4 sieve. More than 95% retained on No. 200 sieve. Clean.	

- C. Compaction: See Section 3.06.
- D. Class II material may be specified in the contract documents by the Engineer between the pipe embedment zone and the top 2 feet of final backfill when the trench is under the pavement.

**2.05 CLASS III BACKFILL MATERIAL (Storm Sewer, Sanitary Sewer, and Water Mains)**

- A. Class III material is natural coarse-grained soils with fines.
- B. Class III material follows Section 2.01, G and consists of the following:

SOIL TYPE	DESCRIPTION OF MATERIAL CLASSIFICATION	REMARKS SECTION
GM	Silty gravels, gravel-sand-silt mixtures. 50% or more retained on No. 4 sieve. More than 50% retained on No. 200 sieve.	Do not use where water condition in trench may cause instability.
GC	Clayey gravels, gravel-sand-clay mixtures. 50% or more retained on No. 4 sieve. More than 50% retained on No. 200 sieve.	
SM	Silty sands, sand-silt mixtures. More than 50% passes No. 4 sieve. More than 50% retained on No. 200 sieve.	
SC	Clayey sands, sand-clay mixtures. More than 50% passes No. 4 sieve. More than 50% retained on No. 200 sieve.	

- C. Compaction: See Section 3.06.

**2.06 CLASS IVA BACKFILL MATERIAL (Storm Sewer, Sanitary Sewer, and Water Mains)**

- A. Class IVA material is natural fine grained inorganic soils.
- B. Class IVA material follows Section 2.01, G and consists of the following:

SOIL TYPE	DESCRIPTION OF MATERIAL CLASSIFICATION	REMARKS SECTION
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ML	Inorganic silts, very fine sands, rockflous, silty or clayey fine sands. Liquid limit 50% or less. 50% or more passes No. 200 sieve.	Obtain geotechnical evaluation of proposed material. May not be suitable under deep fills, surface applied wheel loads, and under heavy vibratory compactors and tampers. Do not use where water conditions in trench may cause instability.
CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. Liquid limit 50% or less. 50% or more passes No. 200 sieve.	

C. Compaction: See Section 3010, 3.06.

D. Suitable only in dry trench conditions.

**2.07 CLASS IVB BACKFILL MATERIAL (Storm Sewer, Sanitary Sewer and Water Mains)**

A. Class IVB material is natural fine-grained inorganic (high elastic silts and plastic clays - fat clay) with a liquid limit greater than 50%.

B. Class IVB material follows Section 3010, 2.01 and consists of the following:

SOIL TYPE	DESCRIPTION OF MATERIAL CLASSIFICATION	REMARKS SECTION
MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts. Liquid limit greater than 50%. 50% or more passes No. 200 sieve.	Not to be used in pipe embedment zone.
CH	Inorganic clays of high plasticity, fat clays. Liquid limit greater than 50%. 50% or more passes No. 200 sieve.	

C. Compaction: See Section 3.06.

D. When approved by the Engineer, Class IVB material may be used as final trench backfill in a dry trench.

E. Do not use in the pipe embedment zone.

**2.08 CLASS V BACKFILL MATERIAL (Topsoil)**

A. Class V Material is natural highly organic soils with a liquid limit greater than 50%. See Section 2.01.

B. Use Class V Material only as topsoil outside of the pavement, unless otherwise specified

or allowed by the Engineer.

- C. Do not use Class V Material in the pipe embedment zone.

**2.09 BEDDING AND BACKFILL MATERIALS FOR PIPE CULVERTS**

- A. Bedding:
  - 1. Use minimum Type C embedment.
  - 2. Install water stop or curtain wall at culvert inlet, as specified in the contract documents.
- B. Backfill Material:
  - 1. Use all suitable material excavated for pipe culvert work, as specified in Section 2.01, for backfill material.
  - 2. Dry suitable material that has excessive moisture prior to placement.
  - 3. Remove unsuitable material, as specified in Section 2.01, from the project site.

**2.10 BEDDING AND BACKFILL MATERIALS FOR SUBDRAINS**

- A. Drainable Bedding and Backfill Materials Include:
  - 1. Porous backfill material.
  - 2. Pea gravel.
  - 3. Use as shown on the plans or on the detailed drawings.
- B. Porous Backfill Material:
  - 1. Crushed stone or gravel with the following gradation:

Sieve	Percent Passing
3/4"	100
1/2"	95 to 100
3/8"	50 to 100
No. 4	10 to 50
No. 8	0 to 8

Iowa DOT Gradation No. 29.

- C. Coarse Aggregate: Use Stabilization Materials, per Section 3010.
- D. Pea Gravel: Use commercially available pea gravel.
- E. Impervious Bedding: Use least permeable on-site materials.
- F. Engineering Fabric: Use Iowa DOT 4196.

**2.11 SPECIAL PIPE EMBEDMENT MATERIAL**

- A. Concrete Supports: Where specified in the contract documents, construct concrete support systems.
- B. Concrete Bedding, Arch, or Encasement:
  - 1. Concrete: commercial, 4,000 psi compressive strength.
  - 2. Unreinforced, unless otherwise shown on the plans.
  - 3. Minimum concrete thickness: 6 inches or as shown on the plans.
- C. Flowable Mortar:
  - 1. Approximate quantities per cubic yard:

- a. Cement 100 pounds
  - b. Fly ash 300 pounds
  - c. Fine aggregate 2,600 pounds
  - d. Water, approximate 70 gallons
2. Compressive strength at 28 days; 100 psi to 200 psi.
- D. Controlled Low Strength Material (CLSM):
1. Approximate quantities per cubic yard:
    - a. Cement 50 pounds
    - b. Fly ash 250 pounds
    - c. Fine aggregate 2910 pounds
    - d. Water, approximate 60 gallons
  2. Compressive strength at 28 days 50 psi.

### **PART 3 - EXECUTION**

#### **3.01 PREPARATION**

- A. When natural soils for Class II, III, and IV backfill material is required as specified in Figure 3010.1, provide written certification from a testing laboratory that the material meets the class specified if so requested by the Engineer.
- B. Locate, mark, and protect existing utilities and facilities in the work area.
- C. Provide access to utility service locations, such as valves, manholes, and utility poles.
- D. Identify owners of utilities on or near the site, and notify them of operations to occur.
- E. Protect existing facilities and landscaping features, or replace as shown on the plans.
- F. Protect bench marks, control points and land survey monumentation, or replace at Contractor's expense.

#### **3.02 TRENCH EXCAVATION**

- A. Notify the Engineer prior to the start of excavation activities.
- B. Remove and stockpile a minimum of 6" of topsoil for subsequent reuse.
- C. Place excavated material away from trench. Grade spoil piles to drain. Do not allow spoil piles to obstruct drainage.
- D. Remove rock, rubbish, boulders, debris, and other unsuitable materials at least 6 inches below, and on each side of the pipe. Restore grade using soil suitable for backfill.
- E. Correct unauthorized excavation at no cost to Jurisdiction, using bedding or stabilization materials.
- F. Provide protective fences and barricades around open excavations, appropriate to the surrounding area.
- G. Provide weight tickets for stabilization material to the Engineer at the time of delivery.
- H. Provide safety fence around open excavations.

- I. Trench Excavation for Sanitary Sewers, Storm Sewers, Water Mains, and Pipe Culverts:
  - 1. Maximum and minimum pipe trench width:  $\text{Min.} = \text{Pipe Dia.} + 1.5'$ ;  $\text{Max.} = 1.25 * \text{Pipe Dia.}$  or 54", whichever is greater.
  - 2. Flat trench bottom, conduit bearing directly on trench bottom (not applicable for rock excavation) for water main pipe only with bell hole shaping:
    - a. Shape trench bottom to support pipe around 1/4 of perimeter for the full length of the pipe barrel.
    - b. Provide bell holes.
  - 3. Trench bottom, conduit supported by bedding material:
    - a. Excavate trench as shown on the detailed drawings.
    - b. Install bedding material to support the full length of the pipe barrel.
  - 4. Trench depth:
    - a. Flow Line plus  $\text{Pipe Dia}/8$ , or 4" min.
  - 5. Conform all trench operations to current OSHA regulations.
- J. Structure Excavation:
  - 1. For concrete structures and parts of structures without footings, 18 inches outside the horizontal projection of the structure.
  - 2. For concrete structures with footings, 18 inches outside the footings.
  - 3. For anchor rods, 12 inches on each side of the rod.
  - 4. For buried anchors, the face of the buried anchor on one side and 24 inches outside the buried anchor on the other face.

### **3.03 ROCK OR UNSTABLE SOILS IN TRENCH BOTTOM**

- A. Notify the Engineer prior to over-excavation.
- B. Engineer will determine the need for trench bottom stabilization prior to installation of pipes and structures.
- C. See Figure 3010.1 for over-excavation of rock and wet or soft foundations.
- D. Provide weight tickets for the stabilization material to the Engineer at the time of delivery.

### **3.04 SHEETING, SHORING, AND BRACING**

- A. Conform sheeting and bracing of all excavations to the latest state and federal regulations governing safety of workers in the construction industry.
- B. Leave in place all temporary sheeting below 2 feet over top of pipe unless sheeting removal plan is approved by Engineer. Conform all trench operations to current OSHA regulations.
- C. Move trench boxes carefully to avoid excavated wall displacement or damage.
- D. When necessary or required, install adequate sheeting and bracing to prevent ground movement that may cause damage or settlement to adjacent structures, pipelines, and utilities.
- E. Any damage due to settlement because of failure to use sheeting or because of inadequate bracing, or through negligence or fault of the Contractor in any other manner, shall be repaired at the Contractor's expense.
- F. For sides of trenches in unsuitable, loose, or soft material, shore, sheet, brace, slope, or otherwise support by means of sufficient strength to protect employees working within them.

- G. Where excavations are made with vertical sides that require supporting, use sufficient strength for sheeting and bracing to sustain the sides of the excavations and to prevent movement that could in any way injure the work or adjacent structures, or diminish the working space sufficiently to delay the work.
- H. Select sheeting and bracing material of sufficient dimensions and strength to adequately support the sides of trenches and excavations, which will not split when driving and will be free of imperfections that may impair its strength or durability.
- I. Drive sheeting to true alignment and ensure contact of adjacent pieces.
- J. In wet excavation, use grooved sheeting to prevent passage of soil. Fill any voids between sheeting and face of excavation with suitable material.
- K. Do not remove sheeting and bracing before the completion of the work, unless otherwise directed by the Engineer.
- L. For sheeting left in place, cut off 18 inches for clearance below the bottom of the pavement in streets/highways and 18 inches below the original ground surface, unless otherwise required by the contract documents or the Engineer. Leave in place all temporary sheeting below 2 feet over top of pipe, unless a sheeting removal plan is approved by Engineer.

### **3.05 DEWATERING**

- A. Do all work in dry conditions; do not install pipes on excessively wet soil.
- B. Perform the dewatering operation according to the dewatering plan submitted to the Engineer. Dewatering operations may be modified from the plan for actual field conditions, with approval of the Engineer.
- C. Adequate dewatering is the Contractor's responsibility unless otherwise stated in the contract documents.
- D. Install dewatering system appropriate for the soil conditions.
- E. Maintain water levels sufficiently below the bottom of trench excavation, (typically 2 feet) to prevent upward seepage.
- F. Provide for handling water encountered during construction:
  - 1. Prevent surface water from flowing into excavation. Remove water as it accumulates.
  - 2. Do not use sanitary sewers for disposal of trench water. Discharging water into storm sewers requires Engineer's approval.
  - 3. Do not discharge water onto adjacent property.
  - 4. Maintain and control water discharge as necessary to prevent a safety hazard for vehicular and pedestrian traffic.
  - 5. Direct water discharge away from electrical facilities or equipment and intersections.
  - 6. Use noise and fume reducing dewatering equipment to minimize disturbance.
  - 7. Provide at least two operating pumps for each trench opened in wet ground, and at the same time have one pump in reserve.
- G. Place backfill in trenches prior to stopping dewatering operations.
- H. Protect trench water discharge points from erosion.

- I. Operate dewatering systems to prevent damage to adjoining structures and facilities.
- J. Monitor adjoining structures and facilities during dewatering operations. Cease dewatering operations and notify the Engineer if damage is observed.

### 3.06 PIPE INSTALLATION

- A. Pipe Bedding:
  - 1. Shape pipe bed to evenly support pipe at the proper line and grade, with full contact under the bottom of the pipe.
  - 2. Install pipe and system components.
  - 3. Place bedding simultaneously on both sides of the pipe. Correct any pipe displacements before proceeding.
  - 4. Place bedding in lifts no greater than 6 inches thick and consolidate.
  - 5. Concrete encasement: Install where shown on the plans.
  - 6. If required in the contract documents or if approved by the Engineer, flowable mortar or controlled low strength material may be used in lieu of other bedding material types.
  - 7. Secure pipe against displacement or flotation prior to placing flowable mortar or concrete encasement.
- B. Haunch Support:
  - 1. Place granular haunch material in lifts no greater than 6 inches thick and consolidate by slicing with a shovel or using other approved techniques.
  - 2. If required in the contract documents, or if approved by the Engineer, concrete, flowable mortar, or controlled low strength material may be used instead of other haunch material types. Secure pipe against displacement or flotation prior to placing flowable mortar, controlled low strength material, or concrete encasement.
- C. Primary and Secondary Backfill (Pipe Cover):
  - 1. Place pipe cover material in 6-inch lifts and compact to densities required according to class of material.
  - 2. If required in the contract documents or if approved by the Engineer, flowable mortar or controlled low strength material may be used in lieu of other cover material types. Secure pipe against displacement or flotation prior to placing flowable mortar or concrete encasement.
  - 3. Special pipe support: If required, provide special pipe support as shown on the plans.
- D. Final Trench Backfill:
  - 1. Place backfill in the trench immediately after recording locations of connections and appurtenances or at Engineer's direction.
  - 2. Place backfill adjacent to structures immediately after concrete has reached design strength and connecting work has been completed.
  - 3. Allow no more than 100 feet of trench to be open overnight or when work is not in progress except as provided on the plans.
  - 4. Place suitable excavated backfill:
    - a. Carefully place backfill over top of pipe and around structures.
    - b. Compact as required.
  - 5. Compaction:
    - a. Within street right-of-way and under pavement, compact each lift to at least 95% of maximum Standard Proctor Density, otherwise compact to at least 90%.
    - b. In areas more than 3 feet below pavement structure, place backfill in lifts no thicker than 8 inches.

- c. In areas less than 3 feet below pavement structure, place backfill in lifts no thicker than 6 inches. Terminate backfill at 8 inches below finish grade in areas to remain unpaved, and to subgrade elevation in areas to be paved. Place 8 inches of topsoil in unpaved areas.
  - d. When crossing under levees, railroads, and State or Federal highways, comply with the compaction requirements of these jurisdictions, if more stringent than these requirements.
  - e. For Vitrified Clay Pipe (VCP), keep all heavy compaction equipment 5 feet above the top of the pipe. In the area less than 5 feet, use hand held compactors. Do not allow the compactor to come in contact with the pipe.
6. Moisture Range: Obtain required compaction within a soil moisture range of optimum moisture to 4% above optimum moisture content.
  7. Dispose of surplus and unsuitable materials unless otherwise directed by owner.
  8. Hydraulic compaction is not allowed unless authorized by the Engineer.

### **3.07 PIPE INSTALLATION IN CONSTRUCTED EMBANKMENTS**

- A. Install all pipes in trenches according to Section 3.06. When allowed by the contract documents, pipes may be constructed in embankments as follows:
- B. Placing Backfill for Pipes:
  1. Thoroughly tamp backfill under and around the pipe and in layers not to exceed 8 inches for the full length and width of the pipe.
  2. Place backfill and thoroughly tamp around and over the pipe for its full length.
  3. Extend the completed embankment on both sides of the pipe from the original ground line to at least 1 foot above the top of the pipe with a slope as shown in the contract documents. Construct the embankment over the pipe with a width no less than the outside diameter of the pipe and centered over the pipe. If necessary to accommodate construction traffic, increase the height of fill to the nominal diameter of the pipe or 3 feet, whichever is greater.
  4. When pipe are laid wholly or partly in a trench, granular backfill material may be required for backfill. Compact the remainder of the fill to at least 1 foot above the top of the pipe with slopes as outlined above.
  5. If the trench has been cut wide enough to permit use of a roller, after the pipe is bedded, thoroughly tamp the backfill material under and alongside the pipe with a mechanical tamper to the mid-height elevation of the pipe.
  6. The contract documents may require placement of pipe with moisture control. When not required, place roadway pipe after construction of an embankment by methods that will produce results equivalent to those required for construction of the embankment, except that moisture determinations will be waived for placing backfill completed within 48 hours after excavation.
  7. In addition to the normal backfill material requirements, when directed by the Engineer, build such approach fills to provide a roadway 10 feet in width over the pipe with grades no steeper than 10%.

### **3.08 STRUCTURE BEDDING**

- A. Bedding for Structures Bearing on Undisturbed Soils:
  1. Shape the bottom to accurate grade and size.
  2. Remove loose material, large clods, stones, and foreign materials.
  3. In unstable soils or rock conditions, see Section 3.03 for stabilization requirements.
- B. Bedding for Structures Bearing on Bedding Material:
  1. Over excavate to minimum of 8 inches or as specified in the contract documents.
  2. Place bedding material for structures according to the contract documents. A

### 3.09 STRUCTURE BACKFILL

- A. Removal of Forms and Falsework: See Section 6010, 3.06.
- B. Placement of Backfill: Place backfill after structure concrete has reached at least 80% of the design strength and connecting work has been completed, unless otherwise specified. Determine strengths under comparable conditions. If strength is not determined, place backfill after 14 days.
- C. Backfill Against Walls and Around Structures:
  - 1. Where backfill is required on both sides of a concrete wall and around all sides of monolithic structures, proceed with filling operations simultaneously on all sides of walls and structures so the fill is kept at approximately the same elevation at all times. Consider concrete box, arch, and circular culvert monolithic structures.
  - 2. Compact the 3 feet closest to all walls or wing faces by pneumatic or hand tampers only.
- D. Placing Backfill with Excavated Material:  
Unless otherwise specified, see Section 3.06, D for suitable excavated materials for backfill.

### 3.10 OPEN CUT CASING PIPE INSTALLATION

- A. Casing Pipe: Install casing pipe according to Section 3.01 to 3.07, as appropriate.

### 3.11 TRACER SYSTEM

- A. Tracer wire shall be provided on all site utilities, including but not limited to:
  - 1. Telecommunication/copper.
  - 2. Empty conduits.
  - 3. Storm
  - 4. Sanitary.
  - 5. Gas.
  - 6. Water.
  - 7. Exceptions:
    - a Straight storm runs with daylight each end do not require tracer wire.
    - b Underground electrical lines do not require tracer wire.
- B. Tracer wire: Solid, AWG #12, blue insulated, direct bury, Type TWHN. Install in trench attached directly to, parallel with, and centered above or below the utility.
- C. Underground splices: Use Scotchcast splicing kits, 3M Company or approved equal.
- D. Engineer shall provide specific details for tracer wire termination at each condition. Avoid receptacle boxes on posts in lawn areas (Install receptacle boxes on face of building or in flush ground boxes).
- E. Test tracer wire for continuity after installation (see comment under "Specifications - Project Close-Out" above); All tracer wire which fails continuity testing shall be repaired or replaced as required until passing continuity testing. Provide Owner 48 hour notice of this activity.
- F. In addition to tracer wire, Contractor shall install underground pipe markers: bright colored continuously printed plastic ribbon tape, 6" wide by 3.5 mils thick, manufactured for direct burial, with aluminum foil core for location by non-ferric metal detectors and bold lettering identifying buried item. Install 8" to 10" below grade directly above buried utilities.

### 3.12 FIELD QUALITY CONTROL

- A. References:
1. ASTM C 136; Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
  2. ASTM D 698; Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Moisture Using 5.5 pound (4.54 kg) Rammer and 12 inch (305 mm) Drop. (Standard Proctor Method)
  3. ASTM D 1556; Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
  4. ASTM D 2216; Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
  5. ASTM D 2922 and D 3017; Test Methods for Density of Soil and Soil-Aggregate in Place and Water Content of Soil and Rock by Nuclear Methods (Shallow Depth).
  6. ASTM D 4253 and D 4254, Test Methods for Maximum Index Density of Soils using a Vibratory Table and Minimum Index Density of Soils and Calculation of Relative Density.
- B. Compaction Testing: Compaction testing of backfill, cooperate and coordinate with an independent testing laboratory selected by the Owner. Cost of initial compaction testing will be paid for by the Owner. Cost of retesting of failed test areas shall be paid for by the Contractor. Refer to Section 014000, 1.5, Test and Inspection Services, and this Section 3.12, G. below for additional requirements.
- C. Schedule Testing: Notify the Owner's Representative and the independent testing laboratory when work is prepared for testing.
- D. Soil Testing:
1. Cohesive soils: Determine moisture-density relationships by ASTM D 698 (Standard Proctor). Perform at least one test for each type of cohesive soil used.
  2. Cohesive soils: Determine in-place density and moisture content using ASTM D 1556 (sand-cone method) and D 2216 or ASTM D 2922 and D 3017 (nuclear).
  3. Non-cohesive soils: Determine maximum and minimum index density and calculate relative density using ASTM D 4253 and D 4254 (cohesionless soils).
  4. Gradation: Test according to ASTM C 136.
- E. Testing Frequency and Locations: Perform testing of the final trench backfill, beginning at a depth of 2 feet above the top of the pipe, as follows:
1. Contractor provided:
    - a. Make one test per each 2 vertical feet of consolidated fill at each street crossing.
    - b. Make one test per each 2 vertical feet of consolidated fill for each 200 horizontal feet of trench.
    - c. Additional testing may be required by Engineer if non-compliance or a change in conditions occur.
    - d. Coordinate the timing of testing with the Engineer.
    - e. The Engineer will determine the location of testing.
    - f. If necessary, excavate to the depth and size as required by the Engineer to allow compaction tests. Place backfill and recompact.
  2. Owner provided:

- a. Coordinate the timing of testing with the Engineer.
  - b. The Engineer will determine the location of testing.
  - c. Test frequency will not exceed one test per each 2 vertical feet of consolidated fill for each 200 horizontal feet of trench.
- F. Test Failure: Rework, recompact, and retest as necessary until specific compaction is achieved in all areas of the trench.
- G. Retesting: In event of failed tests, rework the failed area and retest. Costs of such retesting shall be paid by the Contractor, at no additional cost to the owner.

END OF SECTION

## **SECTION 31 35 00 EROSION AND SEDIMENT CONTROL**

### **PART 1 -GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Iowa DNR NPDES General Permit No. 2
- B. Stormwater Pollution Prevention Plan (SWPPP)
- C. Erosion Control Measures
- D. Velocity and Flow Control Measures
- E. Sediment Control Measures
- F. Application/Installation of Measures
- G. Removal/Replacement of Measures

#### **1.02 DESCRIPTION OF WORK**

- A. Furnish all materials; install, construct, maintain, and remove specified erosion control devices; at locations specified in the contract documents, or where specified by the Engineer, Owner and City.
- B. Complete the required construction work on this project, while minimizing soil erosion and controlling water pollution from storm water runoff. Maintain these features as specified, from initial construction stages to final stabilization and completion of the project.

#### **1.03 SUBMITTALS**

Comply with Division 1 -General Provisions and Covenants, as well as the following:

Upon request, provide copies of all records and documentation related to compliance with the Iowa DNR NPDES General Permit No. 2.

#### **1.04 SUBSTITUTIONS**

Comply with Division 1 -General Provisions and Covenants.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

Comply with Division 1 -General Provisions and Covenants.

## 1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 -General Provisions and Covenants, as well as the following:

- A. Implement erosion and sediment control measures at the appropriate time(s) defined by the Iowa DNR General Permit No. 2.
- B. Coordinate construction to minimize damage to erosion and sediment control devices.

## 1.07 SPECIAL REQUIREMENTS

### A. Permit:

1. When applicable, comply with the requirements of the Iowa Department of Natural Resources, *NPDES (National Pollutant Discharge Elimination System) General Permit No. 2 for Stormwater Discharge Associated with Industrial Activity for Construction Activities*, and the Stormwater Pollution Prevention Plan.
2. For projects covered under the Iowa DNR General Permit No. 2, sign on as a co-permittee with the owner and any other contractors or subcontractors.
3. When applicable, comply with the local jurisdiction's permitting requirements.

**B. Protection of Property:** Prevent accumulation of soil, sediment, or debris from project site onto adjoining public or private property. Remove any accumulation of soil or debris immediately, and take remedial actions for prevention.

Protect Existing Facilities At The Site Against Damage Including The Following:

1. The Contractor shall take precautions to insure that equipment, vehicles, and construction operations do not disturb or damage existing grades, walls, drives, pavement, utilities, plants, lawns, and other facilities.
2. Verify locations and depths of all underground utilities prior to excavation and report any conflicts with new work to the Engineer.
3. Any damage to existing trees or shrubs branches and root systems to remain and be protected shall be repaired and/or pruned by an experienced arborist.
4. Repair, replace, and/or return to original condition any damaged item, without additional compensation.

**C. Permit Compliance:** When applicable, conduct all operations in compliance with the Iowa DNR NPDES General Permit No. 2. Labor, equipment, or materials not included as a bid item, but necessary to prevent stormwater contamination from construction related sources, are considered incidental. Incidental work related to compliance with the permit may include, but is not limited to: hazardous materials protection, fuel containment, waste disposal, and providing employee sanitary facilities.

**D. Project Staging:** Replacing erosion and sediment control practices that are damaged or removed by the contractor in a manner that is inconsistent with the current project staging or

SWPPP is the Contractor's responsibility and will be at the Contractor's expense.

## **PART 2 -PRODUCTS**

### **2.01 COMPOST BLANKETS**

Comply with Section 32 92 19, Seeding, 2.07, C for compost material requirements for compost blankets.

### **2.02 COMPOST BLANKET AND FILTER BERM TACKIFIER**

- A. Use a biodegradable, organic binding agent or polyacrylamide that can be mixed with, or injected into, compost or filter material as it is placed, which is not detrimental to the establishment of vegetation.
- B. Use in filter berms or compost blankets when specified in the contract documents.
- C. Apply at the rate recommended by the manufacturer.

### **2.03 FILTER MATERIAL**

Material for use in filter socks, filter berms, and other areas, as specified in the contract documents.

<b>Sieve Size</b>	<b>Percent Passing<sup>1</sup></b>
2"	100
1"	90-100
3/8"	0-30

- A. Use material derived from wood, bark, or other, non-toxic vegetative feedstocks.
- B. Use material with no visible admixture of refuse or other physical contaminants, nor any material toxic to plant growth.
- C. Use material meeting the following particle sizes:

<sup>1</sup>  
The target flow rate of in-place material is 10 gal/min/lf. The Engineer may approve use of alternate materials meeting the target flow rate.

### **2.04 FILTER SOCK**

- A. For slope and sediment control applications, use a continuous, tubular, knitted, mesh netting with 3/8 inch openings, constructed of 5 mil thickness, photodegradable HDPE.
- B. For inlet protection, use a continuous, tubular, knitted, mesh netting with 3/8 inch openings, constructed of 500 denier polypropylene.
- C. Use 1 inch by 2 inch (minimum) hardwood stakes or stakes of equivalent strength.

## 2.05 TEMPORARY ROLLED EROSION CONTROL PRODUCTS (RECP)

Use temporary rolled erosion control products that are classified and have material properties according to the Erosion Control Technology Council's (ECTC) guidelines as follows:

### A. Material Classification:

- 1. RECP Type 1 (Ultra Short-term):** Functional longevity of 3 months or less and classified as follows:
  - a. RECP Type 1.A:** Mulch control net, consisting of a photodegradable synthetic mesh or woven biodegradable natural fiber netting.
  - b. RECP Type 1.B:** Netless rolled erosion control blankets, consisting of natural and/or polymer fibers, mechanically interlocked and/or chemically adhered together to form a RECP.
  - c. RECP Type 1.C:** Single-net erosion control blankets and open weave textiles, consisting of processed degradable natural and/or polymer fibers, mechanically bound together by a single rapidly-degrading, synthetic or natural fiber netting, or an open weave textile of processed rapidly-degrading natural or polymer yarns or twines woven into a continuous matrix.
  - d. RECP Type 1.D:** Double-net erosion control blankets, consisting of processed degradable natural and/or polymer fibers, mechanically bound together between two rapidly-degrading, synthetic or natural fiber nettings.
- 2. RECP Type 2 (Short-term):** Functional longevity between 3 and 12 months and classified as follows:
  - a. RECP Type 2.A:** Mulch control net, consisting of a photodegradable synthetic mesh or woven biodegradable natural fiber netting.
  - b. RECP Type 2.B:** Netless rolled erosion control blankets, consisting of natural and/or polymer fibers, mechanically interlocked and/or chemically adhered together to form a RECP.
  - c. RECP Type 2.C:** Single-net erosion control blankets and open weave textiles, consisting of an erosion control blanket composed of processed degradable natural or polymer fibers, mechanically bound together by a single degradable synthetic or natural fiber netting to form a continuous matrix, or an open weave textile composed of processed degradable natural or polymer yarns or twines woven into a continuous matrix.
  - d. RECP Type 2.D:** Double-net erosion control blanket, consisting of processed degradable natural and/or polymer fibers, mechanically bound together between two degradable synthetic or natural fiber nettings.
- 3. RECP Type 3 (Extended Term):** Functional longevity between 12 and 24 months and classified as follows:
  - a. RECP Type 3.A:** Mulch control nets, consisting of a slow-degrading synthetic mesh or woven natural fiber netting.
  - b. RECP Type 3.B:** Erosion control blankets and open weave textiles, consisting of processed slow-degrading natural or polymer fibers, mechanically bound together between two slow-degrading synthetic or natural fiber nettings to form a continuous matrix, or an open weave textile composed of processed slow-degrading natural or polymer yarns or twines woven into a continuous matrix.
- 4. RECP Type 4 (Long Term):** Functional longevity of 36 months and classified as follows:

Erosion control blankets and open weave textiles, consisting of processed slow-degrading natural or polymer fibers, mechanically bound together between two slow degrading synthetic or natural fiber nettings to form a continuous matrix, or an open

Classification	Slope Application	Channel Application	Min. Tensile Strength
	Max. Grade*	Permissible Shear Stress	
RECP Type 1.A	5:1 (H:V)	0.25 lb/ft <sup>2</sup>	5 lb/ft
RECP Type 1.B	4:1 (H:V)	0.50 lb/ft <sup>2</sup>	5 lb/ft
RECP Type 1.C	3:1 (H:V)	1.50 lb/ft <sup>2</sup>	50 lb/ft
RECP Type 1.D	2:1 (H:V)	1.75 lb/ft <sup>2</sup>	75 lb/ft
RECP Type 2.A	5:1 (H:V)	0.25 lb/ft <sup>2</sup>	5 lb/ft
RECP Type 2.B	4:1 (H:V)	0.50 lb/ft <sup>2</sup>	5 lb/ft
RECP Type 2.C	3:1 (H:V)	1.50 lb/ft <sup>2</sup>	50 lb/ft
RECP Type 2.D	2:1 (H:V)	1.75 lb/ft <sup>2</sup>	75 lb/ft
RECP Type 3.A	5:1 (H:V)	0.25 lb/ft <sup>2</sup>	25 lb/ft
RECP Type 3.B	1.5:1 (H:V)	2.00 lb/ft <sup>2</sup>	100 lb/ft
RECP Type 4	1:1 (H:V)	2.25 lb/ft <sup>2</sup>	125 lb/ft

weave textile composed of processed slow-degrading natural or polymer yarns or twines woven into a continuous matrix.

**B. Properties and Performance:**

1. Testing performed according to the ECTC’s Testing Procedures for Rolled Erosion Control Products. Verify manufacturer’s test results by independent testing.
2. Material properties meeting the Erosion Control Technology Council’s (ECTC) Standard Specifications for Rolled Erosion Control Products as follows:

\*Product tested according to ECTC Test Method No. 2 and meeting the ECTC Standard Specifications for “C” factor.

**C. RECP Anchors:** Stakes or staples as recommended by manufacturer, with a minimum length of 6 inches.

**2.06 WATTLES**

**A. Netting:** Open weave, degradable netting. Nominal diameter of 9-12 inches, or as specified.

**B. Fill Material:** Straw, wood excelsior, coir, or other natural materials approved by the

Engineer.

**C. Stakes:** 1 inch by 2 inch (minimum) wooden stakes, or stakes of equivalent strength.

## 2.07 CHECK DAMS

### A. Synthetic Permeable Check Dam (HDPE):

#### 1. Ditch Berm:

- a. Installed height of 9 to 10 inches.
- b. Manufactured check dam constructed from sheets of perforated, UV-stabilized High Density Polyethylene (HDPE).
- c. Perforations of 30 to 40% open area.

**2. RECP for Permeable Check Dam (when specified):** RECP Type 4, 4 feet wide.

**3. Anchors:** As recommended by the manufacturer.

**B. Triangular Foam Check Dam:** Triangular-shaped device with a height of 8 to 10 inches and a base of 16 to 20 inches.

**1. Inner Support Material:** Urethane foam.

**2. Outer Cover:** Woven geotextile material shaped to fit around the inner support material, extending 2 to 3 feet beyond the bottom edge of the triangular-shaped inner support.

**3. Length:** 7 feet.

### C. Rock Check Dam:

**1. Aggregate:** Erosion stone complying with Iowa DOT Article 4130.04.

**2. Engineering Fabric:** Comply with Section 2.20.

## 2.08 LEVEL SPREADERS

A. Provide 2 inch by 8 inch (minimum) pressure-treated timber of the length specified.

B. Use timbers that are relatively straight and have a minimum length of 5 feet each.

## 2.09 RIP RAP

**A. Class A Revetment:** Comply with Iowa DOT Section 4130.

**B. Class B Revetment:** Comply with Iowa DOT Section 4130.

**C. Class D and E Revetment:** Comply with Iowa DOT Section 4130.

**D. Erosion Stone:** Comply with Iowa DOT Section 4130.

## 2.10 TEMPORARY PIPE SLOPE DRAINS

- A. PVC, HDPE, and metal pipes as specified in Section 33 40 00, Storm Sewer, 2.01.
- B. HDPE, Type C (corrugated interior).
- C. All pipes listed are allowed for use within the right-of-way.

## **2.11 SEDIMENT BASIN OUTLET STRUCTURES**

- A. Base:** Class C concrete unless otherwise specified in the contract documents.
  - B. Riser:** CMP complying with Section 33 40 00, Storm Sewer; diameter as specified in the contract documents.
  - C. Dewatering Device:**
    - 1. Drill holes in the riser of the number, diameter, and at the elevation specified in the contract documents.
    - 2. 1/4 inch by 1/4 inch or 1/2 inch by 1/2 inch wire mesh for hardware cloth.
  - D. Barrel:** CMP complying with Section 33 40 00, Storm Sewer; diameter as specified in the contract documents.
  - E. Anti-Vortex Device:** CMP complying with Section 33 40 00, Storm Sewer; diameter and riser diameter as specified in the contract documents.
  - F. Anti-Seep Collar:** Corrugated metal sheet of same material and gage as barrel section.
- Size according to plans.

## **2.12 SEDIMENT TRAPS**

- A. Erosion Stone:** Comply with Section 2.09
- B. Engineering Fabric:** Comply with Section 2.20.

## **2.13 SILT FENCE**

- A. Fabric:** Comply with Iowa DOT Article 4196.01.
- B. Posts:** 4 foot minimum steel (T-section) weighing at least 1.25 pounds per foot, exclusive of anchor plate. Painted posts are not required.
- C. Fastener:** Wire or plastic ties with a minimum tensile strength of 50 pounds.

## **2.14 STABILIZED CONSTRUCTION ENTRANCE**

- A. Entrance Stone:** Comply with Iowa DOT Section 4122, Gradation 13, Macadam crushed stone.

- B. Subgrade Stabilization Material:** Use woven, UV-stabilized geotextile with a minimum tensile strength of 135 lb/ft.

## 2.15 DUST CONTROL

- A. Water:** Use potable water or water from a source approved by the engineer.
- B. Calcium Chloride:** Comply with Iowa DOT Article 4194.01.
- C. (Not Used)**
- D. Soapstock (Soybean Oil):**
1. Use a commercially-available, undiluted, soybean oil soapstock emulsion.
  2. Comply with manufacturer's recommendations for storage, transportation, temperature, and application equipment requirements.

## 2.16 EROSION CONTROL MULCH

### A. Conventional Mulch:

1. Use dry cereal straw (oats, wheat, barley, or rye) or native grass straw.
2. Use material that is free of noxious weeds, seed-bearing stalks, or roots, and will be inspected and approved by the Engineer prior to use.
3. Other materials, subject to the approval of the Engineer, may be used.

### B. Hydromulch:

#### 1. Wood Cellulose Mulch:

- a. Use material that is a natural or cooked cellulose fiber processed from whole wood chips, or a combination of up to 50% of cellulose fiber produced from whole wood chips, recycled fiber from sawdust, or recycled paper (by volume).
- b. Product contains a colloidal polysaccharide tackifier adhered to the fiber to prevent separation during shipment and avoid chemical co-agglomeration during mixing.
- c. Form a homogeneous slurry of material, tackifier, and water.
- d. Use a slurry that can be applied with standard hydraulic mulching equipment.
- e. Dye the slurry green to facilitate visual metering during application.
- f. Do not use materials that have growth or germination-inhibiting factors or any toxic effect on plant or animal life when combined with seed or fertilizer.

#### 2. Bonded Fiber Matrix (BFM):

- a. Produced from long-strand wood fibers, held together by organic tackifiers and bonding agents that, when dry, become insoluble and non-dispersible.

b. Upon curing 24 to 48 hours, form a continuous, 100% coverage, flexible, absorbent, erosion-resistant blanket that encourages seed germination.

c. Manufactured to be applied hydraulically.

d. Physical Properties:

- 1) Fibers: Virgin wood, greater than 88% of total volume.
- 2) Organic Material: Greater than 96% of total volume.
- 3) Tackifier: 8-10%.
- 4) pH: 4.8 minimum.
- 5) Moisture Content: 12% +/- 3%.
- 6) Water-holding Capacity: 1.2 gal/lb.

e. Dyed green to facilitate visual metering.

**3. Mechanically Bonded Fiber Matrix (MBFM):** See Section 32 92 19, Seeding.

a. Produced from long-strand wood fibers and crimped, interlocking synthetic fibers.\

b. Within two hours of application, form a continuous, 100% coverage, flexible, absorbent, porous, erosion-resistant blanket that encourages seed germination.

c. Manufactured to be applied hydraulically.

d. Physical Properties:

- 1) Wood Fibers: 73% minimum.
- 2) Tackifier: 10% +/- 1%.
- 3) Crimped, Interlocking Synthetic Fibers: 5% +/- 1%.
- 4) Moisture Content: 12% +/- 3%.
- 5) Water holding capacity: 1.2 gal/lb.
- 6) Minimum pH: 4.8.

e. Dyed green to facilitate visual metering.

**2.17 TURF REINFORCEMENT MATS (TRM)**

**A. Material Classification:**

**1. TRM Type 1:** Use a TRM that is constructed of a web of mechanically or melt-bonded polymer netting, monofilaments, or fibers that are entangled to form a strong and dimensionally stable mat. Bonding methods include polymer welding, thermal or polymer fusion, or the placement of synthetic fibers between two high-strength, biaxially-oriented nets, mechanically bound by parallel stitching with polyolefin thread. Products may contain a degradable component.

**2. TRM Type 2 and 3:** Use a TRM that is constructed of a web of mechanically or melt-bonded polymer netting, monofilaments, or fibers that are entangled or woven to form a strong and dimensionally stable mat. Non-woven bonding methods include polymer welding, thermal or polymer fusion, or the placement of fibers between two high-strength, biaxially oriented nets, mechanically bound by parallel stitching with polyolefin thread. Use only components that are 100% synthetic and resistant to biological, chemical, and ultraviolet degradation.

**3. TRM Type 4:** Use a high performance/survivability TRM that is composed of monofilament yarns woven into a resilient uniform configuration. Use a mat that has a matrix that exhibits very high interlock and reinforcement capacities with both soil and root systems and demonstrate a high tensile modulus. TRMs manufactured from discontinuous or loosely held together by stitched or glued, netting, or composites are not allowed in this category. Use only components that are 100% synthetic and resistant to biological, chemical, and ultraviolet degradation. Use this category when field conditions exist with high loading and/or high survivability requirements.

**B. Properties and Performance:** Meet the minimum material and performance requirements contained in the following table:

Property <sup>1</sup>		Test Method	Type 1	Type 2	Type 3	Type 4
Material	Thickness	ASTM D 6525	0.25 in	0.25 in	0.25 in	0.25 in
	Tensile Strength <sup>2</sup>	ASTM D 6818	125 lb/ft	240 lb/ft	750 lb/ft	3,000 lb/ft
	UV Resistance <sup>3</sup>	ASTM D 4355	80% @ 500 hrs	80% @ 1,000 hrs	80% @ 1,000 hrs	90% @ 3,000 hrs
Performance	Maximum Shear Stress <sup>4</sup> (Channel Applications)	ASTM D 6460	7 lb/ft <sup>2</sup>	10 lb/ft <sup>2</sup>	12 lb/ft <sup>2</sup>	15 lb/ft <sup>2</sup>
	Maximum Slope Gradient (Slope Applications)	N/A	1:1 (H:V) or flatter	1:1 (H:V) or flatter	1:1 (H:V) or greater	1:1 (H:V) or greater

1 For TRMs containing degradable components, all values must be obtained on the non-degradable portion of the matting.

2 Minimum Average Roll Values, machine direction only.

3 Tensile strength of structural components retained after UV exposure.

4 Minimum shear stress that fully-vegetated TRM can sustain without physical damage or excess erosion (0.5 in soil loss) during a 30 minute flow event in large scale testing. Acceptable large scale testing protocol includes ASTM D 6460 or independent testing conducted by the Texas Transportation Institute, Colorado State University, Utah State University, or other approved testing facility. Bench scale testing is not acceptable.

## 2.18 INLET PROTECTION

### A. Drop-in Intake Protection:

1. Use a manufactured device that is inserted into the intake and is capable of trapping or filtering sediment from runoff prior to entering the storm sewer.
2. All components must be contained entirely below the surface of the intake grate.
3. Incorporate means of emergency outflow to prevent flooding if plugged with sediment.

### B. Surface-applied Intake Protection:

1. Use devices or filter socks, placed around or over the intake, that are capable of trapping or filtering sediment from runoff without undercutting prior to entering the storm sewer.

2. Do not allow the device to completely block or plug the intake, preventing inflow.

### **2.19 FLOW TRANSITION MATS**

- A. UV-stabilized HDPE plastic sheet with openings for vegetation growth and energy dissipation.
- B. Use a nominal sheet size of 4 feet by 4 feet by 1/2 inch.
- C. Use duckbill style anchors, as specified by the mat manufacturer.

### **2.20 ENGINEERING FABRIC**

Comply with Iowa DOT Article 4196.01, B (Embankment Erosion Control) and Iowa DOT Materials I.M. 496.01, Appendix G.

## **PART 3 -EXECUTION**

### **3.01 SWPPP PREPARATION**

- A. Prepare a SWPPP according to the requirements of the Iowa DNR NPDES General Permit No. 2.
- B. Have the SWPPP prepared by an individual experienced in erosion and sediment control, it recommended that an EIT, PE, or ICCSPPI certified individual prepare the SWPPP.
- C. Ensure that controls utilized in the SWPPP conform to the type and quantity of erosion and sediment controls specified in the contract documents.
- D. Submit the completed SWPPP to the Engineer for review and approval prior to filing the Notice of Intent.
- E. Upon approval of the Engineer, file public notices, as required by the NPDES General Permit No. 2.
- F. File the Notice of Intent and fee, as required by the NPDES General Permit No. 2.

### **3.02 SWPPP MANAGEMENT**

Coordinate and carry out all requirements of Iowa DNR NPDES General Permit No. 2 and any local ordinance requirements, including:

- A. Update the SWPPP according to the requirements of the NPDES General Permit No. 2, and at a minimum of every seven (7) calendar days.
- B. Revise the SWPPP and implement changes, as necessary, to prevent sediment or hazardous materials from being transported off the site.
- C. Submit all SWPPP revisions to the Engineer for review and approval within twenty-four (24) hours of inspection.
- D. Perform and maintain records of erosion and sediment control site inspections within every seven (7) calendar days.
- E. Maintain records of transfer of responsibility under the Iowa DNR NPDES General Permit No.

2.

- F. Retain all records on-site, or as required by the Iowa DNR NPDES General Permit No. 2.
- G. After final stabilization, file a Notice of Discontinuation, according to the Iowa DNR NPDES General Permit No. 2.
- H. Provide all records and documentation to the Engineer upon completion of the project. Retain a copy of all records for the period required under the Permit.
- I. Continue to perform the work required under this item throughout the duration of the project, and until final stabilization is achieved and a Notice of Discontinuation is filed
- J. SWPPP "book", defined as all materials required per Iowa DNR General Permit No. 2, hardcopy to be kept on-site at all times; or if SWPPP "book" to be held electronically with the SWPPP Management team offsite, a sign with contact information is to be posted on-site at all times.

### **3.03 EROSION AND SEDIMENT CONTROL INSPECTION**

- A. Perform inspections according to and at frequency required by the Iowa DNR NPDES General Permit No. 2 and to be no less than seven (7) calendar days between inspections.
- B. Schedule necessary maintenance or improvements for items that are included in the contract documents.
- C. Notify the Engineer immediately of situations requiring attention beyond that provided for in the contract documents.
- D. Provide copies of the inspection reports to the Engineer.

### **3.04 EQUIPMENT**

Comply with Iowa DOT Article 2601.03.

### **3.05 COMPOST BLANKETS**

- A. Loosen the ground surface to a minimum depth of 1 inch.
- B. Evenly spread compost, as specified in the contract documents, or as directed by the Engineer.
- C. Divert concentrated flows away from the slope.
- D. Do not operate heavy equipment over the compost blanket after placement, or throughout the required period of protection.
- E. Inspect the ground under the blanket at time of each site inspection for signs of erosion.

### **3.06 FILTER BERMS**

- A. Install filter berm along the contour as specified in the contract documents, or as directed by the Engineer.

- B. Turn the ends of the filter berm uphill to prevent runoff from flowing around the end of the berm.
- C. When a vegetated berm is specified, apply seed to the surface of the berm.
- D. Replace the berm when sediment accumulation reaches one-half of the height of the berm.

### 3.07 FILTER SOCKS

#### **A. Installation:**

1. Pneumatically fill mesh filter sock of size and length specified in the contract documents, or as directed by the Engineer. Alternative methods of filling the sock may be allowed upon approval of the Engineer.
2. Fill socks with filter material.
3. Place the filter sock along the contour as specified in the contract documents, or as directed by the Engineer.
4. Place additional filter material or soil from the site, on the upstream side of the sock, in the seam between the tube and the ground.
5. Construct a "J-hook" at each end of a continuous run of filter sock, by turning the end of the sock uphill, as necessary to prevent runoff from flowing around the ends when water behind the sock ponds up to a level even with the top of the sock.
6. Drive stakes into the ground through the sock at a maximum spacing of 10 feet, and as required securing the sock and preventing movement or undercutting.
7. Repair or replace non-functioning filter socks that allow water to undercut the sock, are torn, are 50% full or greater of material, or are otherwise damaged, due to inadequate installation.
8. Remove filter material from damaged socks that are located along streambanks, around intakes, in ditches, or in other locations where the material may be carried to surface waters.

**B. Removal:** When specified in the contract documents, or as directed by the Engineer; remove the filter sock upon completion of the project, and after final stabilization is achieved; or as indicated in the SWPPP, if applicable.

1. Upon completion of the project, completely remove socks and filter material that are located along streambanks, around intakes, in ditches, or in other locations where the filter material may be carried to surface waters if the sock degrades and/or tears.
2. Slice the sock longitudinally. Remove and dispose of the filter sock material and stakes.
3. Spread the filter material and accumulated sediment to match finished grade and to ensure proper drainage.

4. If the site has been brought to finished grade and prepared for permanent seeding, spread and incorporate the filter material into the surface by tilling, or as required to break up any large particles and provide a finished surface suitable for permanent seeding.

**C. Replacement:**

1. When accumulated material reaches a level of no more than one-half the height of the sock, or when the sock becomes clogged with material and no longer allows runoff to flow through, remove the sock as described above, and replace according to the installation instructions above.

2. At the Engineer's option, the existing filter sock and accumulated sediment may be left in place, and a new filter sock installed up-slope from the existing filter sock.

**3.08 TEMPORARY ROLLED EROSION CONTROL PRODUCTS (RECP)**

Install temporary RECPs according to the manufacturer's published installation recommendations, subject to the following minimum requirements:

**A. Slope Application:**

1. Grade and smooth surface. Remove all rocks, clods, vegetation, or other obstructions that will prevent direct contact between the RECP and the soil surface.
2. When specified, prepare seedbed and place seed and fertilizer according to Section 32 92 19, Seeding prior to placing RECP.
3. Install anchor trench at top of slope. Seed and fertilize trench after backfill and compaction, if seeding is specified.
4. Unroll the RECP down or horizontally across the slope.
5. Place consecutive blankets down the slope end-over-end, shingle style.
6. Overlap ends of consecutive rolls a minimum of 3 inches, and install anchors at a maximum spacing of 18 inches along all overlaps.
7. Overlap edges of adjacent rolls a minimum of 2 inches.
8. Install anchors at edge seams between rows.

**B. Channel/Ditch Application:**

1. When specified, prepare seedbed and place seed and fertilizer according to Section 32 92 19, Seeding, prior to placing RECP.
2. Place end of first roll in the anchor slot at the center of the upstream channel and secure with anchors.
3. Position adjacent rolls in the anchor slot, overlapping adjacent rolls a minimum of 3 inches.
4. Place backfill material in anchor slot and compact. Unroll RECP over compacted slot and secure with anchors.

5. Unroll RECP downstream. Maintain a minimum 3 inch overlap between adjacent rolls. Secure edge lap with anchors.
6. Install intermittent staple check slots every 30 feet.
7. Construct end lap at end of roll and beginning of new roll. Overlap roll ends with upstream RECP on top.
8. Excavate longitudinal trench along both sides of the channel at the outside edges of installation. Place outer edges of RECP into longitudinal slot. Install anchors, place backfill material, and compact.
9. Terminate installation at downstream end with staple check.
10. Install anchors in a regular pattern over entire area covered according to manufacturer's published recommendations (minimum three anchors per square yard).

### **3.09 WATTLES**

#### **A. Installation:**

1. Construct a shallow trench, 2 to 4 inches deep, matching the width and contour of the wattle.
2. Install wattle along contour of slope.
3. Turn ends of wattle uphill creating "J-Hooks" to prevent water from flowing around ends.
4. Place and compact excavated soil against the wattle, on the uphill side.
5. Drive stakes through the center of the wattle, into the ground at a maximum spacing of 4 feet along the length of the wattle, and as needed to secure the wattle and prevent movement.
6. Overlap ends of Wattles in series. Wrap joint with a 36 inch wide section of silt fence and secure with stakes.

**B. Removal:** When specified in the contract documents, or as directed by the Engineer, remove the wattle upon completion of the project, and after final stabilization is achieved; or as indicated in the SWPPP, if applicable.

1. Completely remove the wattle netting, filler material, and stakes.
2. Spread the accumulated sediment to match finished grade and to ensure proper drainage.
3. When allowed by the Engineer, the wattle netting may be sliced open and the filler material spread out over the ground. Removal of netting and stakes and spreading of sediment is still required.

#### **C. Replacement:**

1. When accumulated material reaches a level of no more than one-half the height of the wattle, or when the wattle becomes clogged with material and no longer allows runoff to flow through, remove the wattle as described above, and replace according to the installation instructions above.
2. At the Engineer's option, the existing wattle and accumulated sediment may be left in place, and

a new wattle installed up-slope from the existing wattle.

### **3.10 CHECK DAMS**

#### **A. Synthetic Permeable Check Dam (HDPE):**

1. Install according to the manufacturer's recommendations.
2. When specified, provide an RECP under the check dam, installed according to the manufacturer's recommendations.

**B. Triangular Foam Check Dam:** Install according to the manufacturer's recommendations.

**C. Rock Check Dam:** Construct according to plans.

**D. Removal:** When specified in the contract documents, or as directed by the Engineer, remove check dams upon completion of the project, and after final stabilization is achieved; or as indicated in the SWPPP, if applicable.

1. Remove the check dam and dispose of materials, or salvage to the contractor.
2. Remove the accumulated sediment or spread to match finished grade; ensure proper drainage.
3. Stabilize the area disturbed by removal operations.

### **3.11 TEMPORARY EARTH DIVERSION STRUCTURES**

A. Ensure positive drainage along the diversion toward the outlet area.

B. Adequately compact fill to prevent failures or seepage.

C. Outlet the diversion to undisturbed and/or stabilized areas only.

D. Stabilize the surface of the earth diversion with temporary erosion control seeding, as specified in Section 32 92 19, Seeding.

### **3.12 LEVEL SPREADERS**

A. Butt multiple timbers together, as necessary to provide the required length.

B. Ensure the spreader is installed level in all directions. Adjust as necessary during construction to maintain spreader in a level condition.

C. Excavate a depression behind the spreader to the depth specified in the contract documents. The depression may be over-excavated up to 1 foot to provide an area for sediment accumulation.

D. Grade as required to prevent flow around the ends of spreader.

E. Remove the accumulated sediment from the depression when the depth is reduced below that specified in the contract documents.

### **3.13 RIP RAP**

Install the quantity of rip rap (revetment stone or erosion stone) as specified in the contract

documents.

### 3.14 TEMPORARY PIPE SLOPE DRAINS

- A. Place slope drain on undisturbed soil or well compacted fill.
- B. Carefully compact cohesive soils around inlet ends of the drain in 6 inch lifts.
- C. Discharge slope drain to a stable outlet or to a sediment retention device.

### 3.15 SEDIMENT BASIN OUTLET STRUCTURES

**A. Concrete Base:** Construct the concrete base and anchor riser section, as shown on plans.

**B. Dewatering Device:**

1. Drill holes in the riser section. The number, diameter, and configuration will be specified in the contract documents.

2. Wrap the perforated section of the riser pipe with metal hardware cloth.

**C. Anti-vortex Device:** If required by the contract documents, firmly attach the cylinder to the top of the riser by welding or other means. Comply with plan details for fabrication.

### 3.16 ANTI-SEEP COLLAR

**A. General:** Place backfill material and compact overexcavation areas to a minimum of 95% Standard Proctor Density per Section 31 23 33 Trenching and Backfilling.

**B. Concrete Collar:**

1. Place collars a minimum of 2 feet from pipe joints.

2. Provide Class C concrete per Section 33 49 00 Storm Drainage Structures.

**C. CMP Collar:**

1. Provide collar of same gage as the pipe barrel on which it is used.

2. Paint or tag unassembled collars to identify matching pairs.

3. Furnish each collar with two 1/2 inch diameter rods with tank lugs for connecting collars to pipe.

4. Install collar with corrugations vertical.

5. Seal the tap between the two half sections and between the pipe and connecting band with a bituminous jointing compound at the time of installation.

### 3.17 SEDIMENT TRAPS

Construct the storage area to the size and elevations specified in the contract documents.

### 3.18 SILT FENCES

**A. Installation:**

1. Install material along the contour of the ground, as specified in the contract documents, or as directed by the Engineer.
2. Install silt fence with a mechanical soil slicing machine that creates a slit in the ground while simultaneously installing the fabric. The trenching method may be used when situations will not allow soil slicing, as determined by the Engineer.
3. Construct a "J-hook" at each end of a continuous run of silt fence, by turning the end of the silt fence uphill, as necessary to prevent runoff from flowing around ends when water behind the fence ponds to a level even with the top of the fence.
4. Insert 12 inches of fabric to a minimum depth of 6 inches (fabric may be folded below the ground line).
5. Compact installation by driving along each side of the silt fence, or by other means, as necessary to adequately secure the fabric in the ground, to prevent pullout and water flow under the fence.
6. Drive steel posts into the ground alongside the silt fence, to a minimum depth of 20 inches, unless otherwise specified by the Engineer. Space posts at 5 feet on-center maximum, or as required to adequately support silt fence.

**B. Maintenance:** Repair or replace non-functioning silt fence that allows water to flow under the fence, is torn, or is otherwise damaged, due to inadequate installation, at no additional cost to the Contracting Authority. When accumulated material reaches a level of no more than one-half the height of the Silt Fence, maintenance should be performed or fence should be replaced.

**C. Removal:**

1. Remove the silt fence upon final stabilization of the project area, or according to the staging indicated in the SWPPP.
2. Remove and dispose of silt fence and posts.
3. Remove sediment or spread to match finished grade; ensure proper drainage.
4. Stabilize the area disturbed by removal operations.

**D. Replacement:**

1. When accumulated sediment reaches a level one-half the height of the fence, remove the silt fence as described above, and replace according to the installation instructions above.
2. At the Engineer's option, the existing silt fence and accumulated sediment may be left in place, and a new silt fence installed up-slope from the existing silt fence.
3. When allowed by the Engineer, the existing silt fence may be left in place and the accumulated sediment removed to the original ground line and within 6 inches of the silt fence. Carefully inspect the existing silt fence for structural integrity and signs of undermining. Make any necessary repairs.

**3.19 STABILIZED CONSTRUCTION ENTRANCE**

- A. Install a stabilized construction entrance at all locations where construction traffic leaving the site presents the potential for sediment track-out.
- B. Remove vegetation and excavate soft soils from entrance area. Thoroughly compact subgrade prior to placing stone.
- C. Install culvert under entrance if necessary to maintain drainage.
- D. Grade entrance to prevent runoff from flowing onto street. Direct all runoff from entrance to a sediment retention device.
- E. When specified, install subgrade stabilization fabric prior to placing crushed stone.
- F. Install layer of crushed stone to the thickness (6 inches minimum) and dimensions specified in the contract documents (minimum length of 50 feet).
- G. Remove the accumulated sediment and install new stone, as required to prevent track-out.

### 3.20 DUST CONTROL

**A. Water:** Apply frequent light watering to ground surface, as required to control dust.

**B. Calcium Chloride:** Apply according to Iowa DOT Section 2314.

**C.** (Not Used)

**D. Soapstock (Soybean Oil):**

- 1. Loosen the top 1 to 2 inches of the roadway surface.
- 2. Apply undiluted soapstock at a rate of 0.70 gal/yd<sup>2</sup>.
- 3. Allow product to penetrate through the loosened material.
- 4. Tight-blade road surface.

### 3.21 EROSION CONTROL MULCHING

**A. Conventional Mulching:**

- 1. Use conventional mulching when the surface cannot be stabilized by seeding, due to season or ground conditions.
- 2. Uniformly distribute mulch over the required areas, at a rate of 2 tons/acre for dry cereal straw, or 2.5 tons/acre for prairie hay.
- 3. Work the mulch into the soil with a mulch tucker, designed to anchor or drill the mulch into the soil, by means of dull blades or disks.

**B. Hydromulching:**

- 1. Place mulch and tackifier (if applicable) in equipment specifically manufactured for hydraulic mulching.

2. Mix materials with fresh, potable water using a combination of re-circulation through the equipment's pump and mechanical agitation to form a homogeneous slurry.
3. If necessary, dampen any dry, dusty soil as required to prevent balling of the material during application.
4. Apply hydromulch in multiple layers from opposing directions, where possible.
5. Apply the slurry evenly over all specified areas, at the minimum component material rates specified:
  - a. Wood Cellulose Mulch: 1) Mulch: 2,600 lb/acre dry weight. 2) Tackifier: 50 lb/acre.
  - b. Bonded Fiber Matrix: 3,600 lb/acre dry weight.
  - c. Mechanically Bonded Fiber Matrix: 3,600 lb/acre dry weight.
6. Retain and count empty bags of mulch to ensure final application rate.

### **3.22 TURF REINFORCEMENT MATS**

Install according to the manufacturer's published installation literature for the product specified and application (slope or channel).

### **3.23 SURFACE ROUGHENING**

#### **A. Directional Tracking:**

1. Do not use on slopes steeper than 3:1.
2. Operate tracked equipment up and down exposed slope to create ridges perpendicular to the slope.
3. Continue operation until the entire surface has been tracked.

#### **B. Grooving/Furrowing:**

1. May be used on all slopes.
2. Use rippers, disks, harrows, chisel plows, or other equipment capable of operating on the slope and creating grooves a maximum of 15 inches apart and 3 inches deep.
3. Operate equipment along the contour of the slope to create grooves that are perpendicular to the slope.
4. Perform over all exposed slopes as specified.

### **3.24 INLET PROTECTION**

- A. Install inlet protection devices according to the manufacturer's recommendations.
- B. Remove the accumulated sediment, as required to maintain the inlet protection device in working order. Remove any accumulated sediment from streets open to traffic if it encroaches into the traveled roadway.

### **3.25 FLOW TRANSITION MATS**

Install according to the manufacturer's published recommendations.

**3.26 TEMPORARY EROSION CONTROL SEEDING**

Comply with Section 32 92 19, Seeding.

**END OF SECTION**

## SECTION 31 4000 – SHORING AND UNDERPINNING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes shoring and underpinning.

#### 1.2 RELATED SECTIONS

- A. Section 31 5000 - Excavation Support and Protection.

#### 1.3 DEFINITIONS

- A. Shoring: Props or posts of timber or steel in compression or bending, used for temporary support of excavations, formwork, or unsafe structures.
- B. Underpinning: Permanent construction, as indicated, which directly transmits existing structure foundation loads to a lower bearing elevation or strata, and which preserves the structures being underpinned.
- D. Support: Facilities required to prevent movement of existing structures until the completion of the underpinning.
- E. Lagging: A temporary or permanent excavation support structure consisting of heavy timber planking or steel plates secured in place by steel H-piles.
- F. Restoration: Reconstruction by repair or replacement of portions of structures removed or altered by underpinning and support operations.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product to be used to include all steel member sizes and shapes along with wood plank or steel plate sizes and thicknesses. Include proposed equipment that will be utilized during the installation.
- B. Shop Drawings: Submit a written description, along with detailed drawings, of the proposed excavations, shoring, and underpinning work for Engineer review. Shop Drawings are to describe the method, staging, and necessary details for construction of underpinning and support for each structure on which work is to be performed. Show proposed sections and details for each proposed assembly. Shop Drawings and calculations submitted for excavations, shoring, and underpinning shall be prepared, sealed, and signed by a professional civil or structural engineer that is currently registered in Iowa.

## 1.5 SITE CONDITIONS

- A. Access: Coordinate with the Owner's Construction Manager at least 14 days in advance of the date on which the Contractor requires access.
- B. Staging and Working Space: Working areas for shoring and underpinning are shown on the Contract Drawings. If additional working areas beyond those indicated are necessary, notify the Architect or the Construction Manager in advance.
- C. Temporary Barriers: Where indicated or required, build closed temporary barriers of suitable materials to isolate the work site from the portions of the structure not occupied by the Contractor.
- D. Maintenance of Services: Locate, protect, support, and maintain uninterrupted all utilities, equipment, and services within the limits of the underpinning work, or relocate same as indicated or required.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed similar work in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Concrete Testing Service: Owner will engage a qualified independent testing agency to perform material evaluation tests and concrete mixtures.
- C. Pre-installation Conference: Conduct conference at Project site.

## PART 2 - PRODUCTS

### 2.1 STRUCTURAL STEEL MATERIALS (Verify or submit as required per engineering)

- A. H- Shapes: High-Strength, Low-Alloy, Structural Steel: ASTM A 588/A 588M.
- B. Steel Plates: ASTM A 36/A 36M, Grade 36.

### 2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.

### 2.3 CONCRETE

- A. Refer to Section 03 3053 – Miscellaneous Cast-In-Place Concrete for requirements. Concrete for underpinning shall be regular concrete weighing not less than 145 pounds per cubic foot, with a minimum compressive strength at 28 days of 4,000 psi.

## 2.4 FABRICATION

- A. Structural Steel: Fabricate assemble, and cut to length in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- B. Provide full-length H-piles to eliminate splicing during installation, with ends square.

## 2.5 ALTERNATIVE DESIGNS

- A. Products, materials and methods indicated are based on standard systems for shoring and underpinning based on project specific conditions. Alternative means and methods for shoring and underpinning are acceptable as long as they meet the indicated project parameters and site conditions as outlined in the Drawings. Rammed or vibratory shoring is not allowed. Contractor assumes responsibility for providing an engineered design that will achieve the intended goals for excavation, shoring, and underpinning work.
- B. Contractor's option to provide Aluminum Trench Boxes constructed in modular design with spreader panels and sheet panel inserts. Aluminum trench boxes can be used for excavation retention with reduced beam drilling depth and reduced weight upon retrieval. Submit a complete written description, along with detailed engineered drawings, for the proposed excavations, shoring, and underpinning.
- C. Products, materials, and design engineering are available from the following:
  - 1. United Rentals Trench Safety Division, 4010 SE Capitol Circle, Grimes, Iowa 50111. Phone: 515-986-5944.
  - 2. Others as pre-approved.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Contractor shall furnish all materials, tools, equipment, facilities, and services as required for providing the necessary shoring and underpinning work.

### 3.2 PROTECTION OF WORK AND ADJACENT AREAS

- A. Provide suitable barricades to protect sidewalks from traffic.
- B. Protect adjacent sidewalks and slabs during construction. Any broken, cracked or damaged areas of adjacent slabs shall be removed and replaced at no cost to the Owner.
- C. If movement of existing structures is detected, stop work; notify the Construction Manager, and take immediate remedial action if movement of the existing structure occurs during performance of the work.

### 3.3 RETENTION PILES AND LAGGING

- A. Drill and set retention piles at locations indicated to elevations or penetration resistance depth as required by engineered shoring design. Establish and maintain axial alignment of leads and piles before and during installation.
- B. Shoring and Lagging Materials: Provide steel beams, planks, and accessories as required.
- C. Lagging planks shall be secured in place by steel H-piles, with planks inserted between the H-flanges.

### 3.4 UNDERPINNING PIERS AND WALLS

- A. As defined, an excavated pit, provided generally by manual excavation, which is carried to a pre-selected bearing surface and then filled with concrete to provide supplementary foundation support for the underpinned structure.
- B. Existing stoops, footings, grade beams, or retaining walls, which may be affected by excavation operations shall be shored or underpinned adequately or otherwise protected against settlement and shall be protected against lateral movement.
- C. Existing stoops, footings, grade beams, or retaining walls, which have been undermined by earthwork and pile installation operations shall be filled and supported with concrete extended to undisturbed bearing earth or bedrock.
- D. Install temporary supports where necessary to support structures to be underpinned and those that will be affected by underpinning and restoration work.
- E. Underpinning Formwork: Design, erect, shore, brace, and maintain underpinning formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

### 3.5 FILL AND BACKFILL

- A. Provide engineered fill and backfill in accordance with applicable requirements of Section 31 2333 – Trenching and Backfilling, after acceptance of the underpinning by the Engineer.
- B. Remove piles, lagging, and shoring evenly on all sides as trenches and other excavations are backfilled. In withdrawing piles and lagging, exercise care to ensure that all voids or holes left by shoring items are backfilled and thoroughly compacted in sections or lifts.

### 3.6 FIELD QUALITY CONTROL

- A. Special Testing Inspections: Provide test samples for concrete as directed to the Owner's testing agency to perform tests and inspections.
- B. Coordinate testing and inspection reports and submit to Owner.

3.7 RESTORATION

- A. Restore existing structures to conditions equivalent to those existing prior to the start of shoring and underpinning work, including repair of any settlement-related damage.

END OF SECTION 31 4000

## SECTION 31 5000 - EXCAVATION SUPPORT AND PROTECTION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes temporary excavation support and protection systems.

#### 1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

#### 1.3 SUBMITTALS

- A. Temporary Support Plan: Submit Support Plan indicating proposed locations, methods, materials and means for providing temporary support to include bracing and protection of utilities that are exposed and are to remain in place during excavation operations. Provide a complete list of materials that will be used to provide support and protection of utilities and other items temporarily supported and protected items.

#### 1.4 FIELD CONDITIONS

- A. Utility Services: Locate, protect, support, and maintain uninterrupted all utilities and services within the limits of the work area.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Provide, monitor, and maintain excavation support and protection systems capable of supporting excavated items and of resisting earth and hydrostatic pressures and superimposed and construction loads.
- B. Provide products and materials as required to properly maintain support and position of items exposed during excavation.

### PART 3 - EXECUTION

#### 3.1 TEMPORARY SUPPORTS

- A. Install temporary supports in all locations necessary to support exposed items and utilities during trenching and excavating.

- B. Bracing: Locate bracing to clear footings, existing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.
  - 1. Do not place bracing where it will interfere with other work unless otherwise approved by the Engineer.
- C. Maintain and monitor temporary supports and bracing until permanent construction is completed.

### 3.2 REMOVAL

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and earth and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, facilities, and utilities.
  - 1. Compact all voids under and around connections, transitions and elevation changes.

END OF SECTION 31 5000

## **SECTION 32 11 23 AGGREGATE BASE COURSES**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Aggregate base.

#### **1.02 RELATED SECTIONS**

- A. Section 31 20 00 - Earthwork.
- B. Section 32 13 13 - Concrete Paving.

#### **1.03 REFERENCES**

- A. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; 2001 (2004).
- B. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)); 2000a.
- C. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2000.
- D. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN m/m<sup>3</sup>)); 2002.
- E. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 1994(R 2001).
- F. ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2000.
- G. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 2005.
- H. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2005.

#### **1.04 SUBMITTALS**

- A. Materials Sources: Submit name of imported materials source and provide material certifications.

#### **1.05 PROJECT CONDITIONS**

- A. Verify that survey bench marks and intended elevations for the Work are as indicated.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

A. Aggregate Base Course for pavement: Conforming to State of Iowa Highway Department standard 4121.

B. Aggregate Stone – For Synthetic Playground Surfacing:

Iowa DOT 4120.01 – Class A Crushed Limestone

Stone shall be clean crushed stone, Gradation table below:

SIEVE	% PASSING
1"	95-100
1/2"	25-60
#4	0-7
#8	0-3

\*Playground Surfacing Manufacturer is required to sign off on the rock base material prior to installation.

B. Woven Polypropylene Geotextile Fabric Materials: Woven Polypropylene Geotextile

Approved Materials: See plans

### **2.02 SOURCE QUALITY CONTROL**

A. Where aggregate materials are specified using ASTM D 2487 classification, testing of samples for compliance will be provided before delivery to site.

B. If tests indicate materials do not meet specified requirements, change material and retest at Contractor's expense.

C. Provide materials of each type from same source throughout the Work.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

A. Verify substrate has been inspected, gradients and elevations are correct, and is dry.

### **3.02 PREPARATION**

A. Do not place aggregate on soft, muddy, or frozen surfaces.

### **3.03 INSTALLATION**

A. Under Paving:

1. Place aggregate base course to a total compacted thickness as specified on site plan.
  2. Compact to 95 percent of maximum dry density.
- B. Level and contour surfaces to elevations and gradients indicated.
- C. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
- D. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

### **3.04 TOLERANCES**

- A. Flatness: Maximum variation of 1/4 inch (6 mm) measured with 10 foot (3 m) straight edge.
- B. Variation From Design Elevation: Within 1/2 inch (12 mm).

### **3.05 FIELD QUALITY CONTROL**

- A. Compaction density testing will be performed on compacted aggregate base course in accordance with ASTM D1556.
- B. Results will be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("standard Proctor").
- C. If tests indicate work does not meet specified requirements, remove work, replace and retest at Contractor's expense.
- D. Contractor shall coordinate work with testing laboratory before proceeding with each phase or stage of work.

### **3.06 CLEAN-UP**

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

**END OF SECTION**

## **SECTION 32 13 13 CONCRETE PAVING**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS:**

- A. Drawings and General Provisions of Contract, including Bidding Requirements, General and Supplementary Conditions and Division I Specification Sections, apply to work specified in this Section.
- B. Comply with ACI 316 "Recommended Practice for Construction of Concrete Pavements and Concrete Bases" for all work.

#### **1.02 WORK INCLUDED:**

Provide all labor, materials, equipment and supervision required to construct concrete pavement, driveways, parking lots, curbs, walks, steps, edging, etc. including:

- A. Concrete.
- B. Stamped and Colored Concrete, Ashlar Finish
- B. Curing and sealing.
- C. Contraction and expansion joints and fillers.

#### **1.03 RELATED WORK SPECIFIED ELSEWHERE:**

- A. Earthwork: Section 31 20 00.
- B. Joint Sealant: Section 32 13 73.

#### **1.04 QUALITY ASSURANCE:**

- A. Cost of field and laboratory testing will be borne by the Owner. Testing by laboratory approved by the Owner. Lab reports shall be simultaneously forwarded to the Owner, Contractor and Engineer.
- B. Testing:
  - 1. Slump to be checked in accordance with ASTM C143. One test minimum per hour.
  - 2. Air content measured in accordance with ASTM C231, or C173. One test minimum daily.
  - 3. Strength tests:
    - a. Take one set of three (3) cylinders for each one hundred fifty (150) cubic yards or part thereof. Minimum one set of three (3) cylinders per each day's pour.
    - b. Each cylinder shall be plainly marked showing cylinder designation (1A, 1B, 1C).
    - c. Job cure each cylinder three (3) days.
    - d. After three (3) days, send cylinders A and B to the laboratory approved by the Engineer for testing at ages seven (7) days and twenty-eight (28) days. Cylinder C to remain at the job as a "spare" cured under same conditions as concrete in the area from which it was taken.
    - e. The date and location of each sample shall be marked on the Contractor's job set of plans.

- f. Load and core tests shall be required only if cylinder tests indicate concrete does not meet Specifications. Such tests, if deemed advisable by the Engineer, shall be arranged and paid for by the Contractor.
  
- 4. Pavement Smoothness: Evaluate pavement smoothness for all PCC pavement surfaces. Straightedge: The Engineer will check PCC pavement surfaces with a 10 foot straightedge placed parallel to the centerline. Areas showing high spots of more than 1/4 of an inch in 10 feet will be marked. Complete surface corrections according to the procedures in Iowa DOT Section 2316 to an elevation where the area or spot will not show surface deviations in excess of 1/8 inch when tested with a 10 foot straightedge. Surface corrections will be completed at the direction of the Engineer with no additional cost to the Owner.
  
- 5. Pavement Thickness:
  - a. At locations determined by the Engineer, cut samples from the pavement by drilling with a core bit that will provide samples with a 4 inch outside diameter. Restore the surface by tamping low slump concrete into the hole, finishing, and texturing. The Engineer will witness the core drilling, identify, and take possession of the cores. The Engineer will determine the core locations, measure the cores, and determine the thickness index according to Iowa DOT Materials I.M. 346 and 347, except as modified as follows:
    - i. For regular or irregular shaped areas, use a lot size of 1,000 square yards. Include remnants less than 500 square yards in the last lot and remnants greater than 500 square yards in a separate lot. Take a minimum of three cores per project.
    - ii. For any core with a deficiency greater than 0.15 inch, take two additional cores in that pavement lot and use the average of the three cores.
  
  - b. Coring of pavement or other work for thickness determination may be waived by mutual agreement for sections of the same design thickness less than 2,500 square yards.
  
  - c. Based on the thickness index determined by the Engineer, the pavement payment will be as shown below:

Pay Factor for PCC Pavement Thickness	
<u>Thickness Index Range (in.)</u>	<u>Percent Payment</u>
0 to -0.15	100
-0.16 to -0.25	95
-0.26 to -0.50	85
Greater than -0.51	As determined by the Engineer

- d. If the thickness index deficiency is greater than 0.51, the Engineer will study the extent and severity of the deficiency of the pavement areas. The Engineer will require one of the following:
  - i. Removal and replacement of the deficient areas with pavement complying with the contract documents at no additional cost to the Owner.
  - ii. Completion of an agreement that provides a combination of an extended guarantee period and payment penalty and allows the deficient pavement to be left in place.

**1.05 SUBMITTALS:**

- A. Certification of concrete C-4 design mix with Class 3 durability aggregate by a testing laboratory. Submit prior to placement.
- C. Submit plan for construction sequence and schedule prior to commencing construction.
- D. A sample of stamped and colored concrete shall be submitted to the owner for the owners keeping and use with the ashlar form pattern with trowel edge and include all necessary sealants, releases, curing etc. Any deviations from color or stamp style shall be submitted as sample for approval by owner.

**1.06 CODES, PERMITS AND FEES:**

- A. The entire installation shall fully comply with all local and state laws and ordinances, and with all established codes applicable thereto.

**1.07 SITE DISTURBANCES:**

- A. Take precautions to insure that equipment and vehicles do not disturb or damage existing site grading, walks, drives, utilities, plants, etc.
- B. Verify locations and depths of all underground utilities prior to excavation.
- C. Repair and/or return to original condition any damage caused by Contractor's negligence at no cost to Owner.
- D. Provide temporary barricades and warning lights as required for protection of project work and public safety.

**1.08 PAVEMENT PROTECTION**

- A. Weather Conditions: Do not place concrete when stormy or inclement weather or temperature prevents good workmanship. Temperature restrictions and protection requirements may be modified by the Engineer under unusual conditions. Pavement damaged by inclement weather shall be removed and replaced.

1. Cold Weather:

**a. Paving:** Do not place aggregates containing frozen lumps, and do not place concrete on a frozen subgrade or subbase. Take all necessary actions to prevent the pavement from freezing.

1) Concrete mixing and placement may be started, if weather conditions are favorable, when the air temperature is at least 34°F and rising. At the time of placement, concrete must have a temperature of at least 40°F.

2) Stop mixing and placing when the air temperature is 38°F or less and falling or if the temperature stops rising and does not reach 38°F.

**b. Protection:** Prior to applying protection, cure all concrete pavement and curb/gutters, including exposed edges of the pavement and curb. In addition, protect concrete less than 36 hours old as follows

Night Temperature Forecast	Type of Protection <sup>1</sup>
35°F to 32°F	One layer of burlap for concrete.

31°F to 25°F	Two layers of burlap or one layer of plastic on one layer of burlap.
Below 25°F	Four layers of burlap between layers of 4 mil (100 µm) plastic or equivalent commercial insulating material approved by the Engineer.
<sup>1</sup> The protection shall remain until one of the following conditions is met: a. The pavement is 5 calendar days old. b. Opening strength is attained. c. Forecasted low temperatures exceed 35°F for the next 48 hours. d. Forecasted high temperatures exceed 55°F for the next 24 hours and subgrade temperatures are above 40°F.	

- 1) Shut down paving operations in time to comply with protection requirements outlined above. During cold weather, allow more time for finishing and protection. Perform all finishing and covering operations prior to darkness. Temperature restrictions and protection requirements may be modified by the Engineer.
- 2) Equivalent commercial insulating material approved by the Engineer may be used. This material must be waterproof and have a minimum R value of 1.0. If initial set has not yet occurred, place a layer of burlap on top of concrete prior to placing insulating blankets.
- 3) Use a method of protection and materials that will maintain the concrete temperature above 40°F.

2. Hot Weather: Hot weather condition is defined as any combination of the following conditions that tend to impair the quality of plastic concrete by accelerating the rate of moisture loss and rate of cement hydration causing thermal shrinkage and resulting in plastic shrinkage cracking:

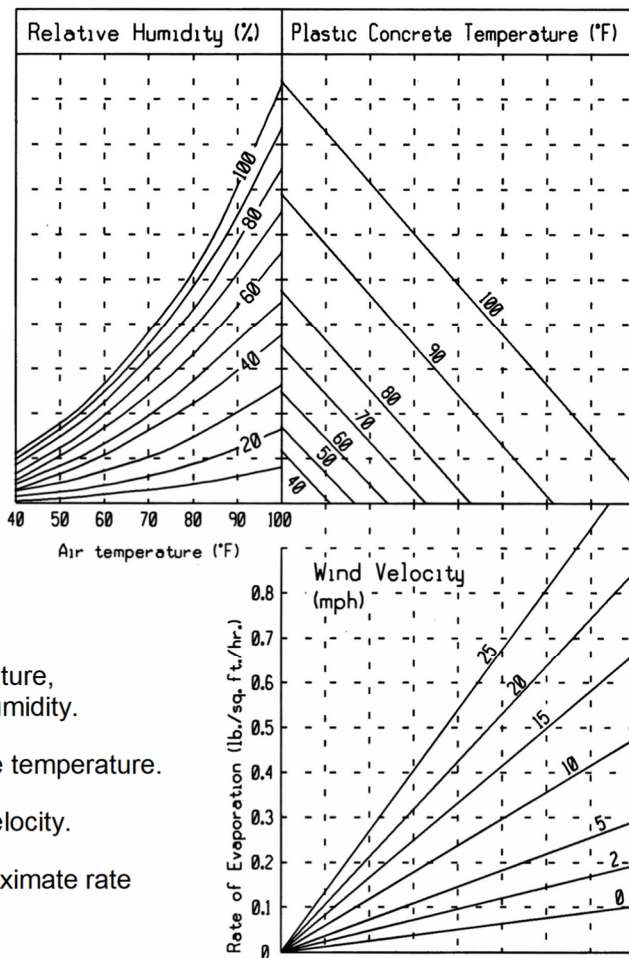
- High Ambient Temperature
- High Concrete Temperature
- Low Relative Humidity
- High Wind Velocity
- Solar Radiation

a. General:

- 1) During hot weather conditions, the Engineer may restrict concrete placement to early morning or evening hours.
- 2) During hot weather conditions, advise the Engineer of the results of the theoretical evaporation rate throughout paving operations.

b. Determine the Theoretical Rate of Evaporation: Use the following chart and the National Weather Service's predicted maximum air temperature, relative humidity, and maximum steady wind velocity without gusts, for the date and the location of the paving pour.

**Theoretical Rate of Evaporation Chart**



To Use this Chart:

1. Enter with air temperature, move up to relative humidity.
2. Move right to concrete temperature.
3. Move down to wind velocity.
4. Move left, read approximate rate of evaporation

c. If the evaporation rate exceeds 0.1 pounds per square foot per hour but is less than 0.3 pounds per

square foot per hour, provide the following concrete evaporation protection.

- 1) Immediately apply an approved evaporation retarder to the concrete pavement and curbs or increase the surface cure application to 1.5 times the standard specified rate.
  - 2) Take special precautions to ensure that the forms and subgrade are sufficiently moist or protected to avoid lowering the water content at the pavement/subgrade interface. In hot weather conditions, moisten the subgrade the evening before operations.
  - 3) Ensure that the time between placing and curing is minimized and eliminate delays.
  - 4) Moisten concrete aggregates that are dry and absorptive.
  - 5) Use a fog spray to raise the relative humidity of the ambient air if there is a delay in immediately applying the curing compound.
  - 6) Minimize solar heat by shading, wetting, or covering concrete chutes or other equipment that comes in contact with plastic concrete.
- d. If the evaporation rate is 0.3 pounds per square foot per hour or greater or if winds are greater than 25mph, discontinue placement of concrete.
3. Rain Protection:
- a. The Contractor shall have available, near the site of the work, materials for proper protection of the edges and surface of concrete. Protective material may consist of sheets of burlap, or plastic film. Planks or other material with suitable stakes that can be used as temporary forms shall also be on hand.
  - b. If initial set has not occurred, contractor shall take every precaution necessary to protect the surface texture of the concrete.
  - c. Failure to properly protect concrete shall constitute cause for removal and replacement of defective pavement, if so determined by the Engineer.

C. Protection from Traffic:

1. General:
  - a. Protect the new pavement and its appurtenances from traffic, both public and that caused by the Contractor's own employees and agents, at no additional cost to the Owner. This includes the erection and maintenance of warning signs, lights, barricades, watchmen to direct traffic, and pavement bridges or crossovers.
  - b. Do not operate equipment with metal tracks, metal bucket blades, or metal motor patrol blades directly on new paving. Do not unload soil or granular materials, including base rock for storage and future reloading directly onto new paving.
2. End of Day's Run:
  - a. At the end of each day's run and at all side streets, erect and maintain safety barriers and fencing as necessary to protect the pavement from damage.
  - b. Install safety fences within 1 hour of the completion of finishing and curing operations. Leave fences in place and maintained until the concrete has attained the minimum strength or age.
  - c. Intermediate safety fences may be required for the purpose of opening the pavement for access to a side road, side street, or entrance.
3. Repair of Damages: At the discretion of the Engineer, and at no additional cost to the Owner, repair or replace any part of the pavement damaged by traffic or other causes occurring prior to final acceptance of the pavement.

**1.09 USE OF PAVEMENT**

Time for opening pavement for use is determined by age and test results from cylinder or beams taken during placement.

Class of Mix	Minimum Age and Tested Strength of Pavement Before Opening			
	Type of Cement	Minimum Age For Opening (1)	Minimum Compressive Strength (psi)	Minimum Flexural Strength Center Point (psi)
C	Type I	7 Days (2)	3,000	500
M	Type I	48 Hours	3,000	500

(1) Opening without testing only allowed upon approval of Engineer  
(2) Five calendar days for concrete 9 inches thick or more.

**PART 2 PRODUCTS**

**2.01 CONCRETE STRENGTH:**

- A. Concrete mix for exterior slabs and steps:
  1. C-4 or M-4 Mix with minimum of 4,000 psi compressive strength at twenty-eight (28) days.
  2. Minimum air content of 6.0%. To allow for loss during placement, the air content of fresh, un-vibrated concrete shall be 7.0%.
  3. Maximum of 15% replacement of cement with fly ash will be permitted.
  4. Slump four inches (4") maximum.

**2.02 MIXING:**

- A. Except as otherwise specified, concrete shall be ready-mixed or job-mixed at the Contractor's option, and in accordance with requirements of ACI 318-77. Ready-mixed concrete shall be mixed and delivered to the project in accordance with ASTM C94. Maximum mixing time is one (1) hour.
- B. Mixing for stamped and colored concrete shall be in accordance with the manufacturer recommended procedures and recommendations.

**2.03 PORTLAND CEMENT:**

- A. ASTM C150, type I.

**2.04 SAND:**

- A. Clean, hard, washed and well graded. Sand shall conform with ASTM C33.

**2.05 COARSE AGGREGATE:**

- A. Aggregate shall conform to ASTM C33. Aggregate for footings and other unexposed concrete may be gravel. Aggregate for exterior concrete and surfaces shall be limestone (max. size 1"). No substitutions will be allowed. Evidence of staining due to impurities will be cause for rejection of work.

**2.06 MIXING WATER:**

- A. Clean and free from oil, acid and injurious amounts of vegetable matter, alkalis and other impurities.

**2.07 ADMIXTURES:**

- A. Air entrainment: 6%, + 1% or -0.5%.
- B. Air-entraining agents shall conform to ASTM C260.
- C. Calcium Chloride is not to be used. No other admixtures shall be used without the expressed, written consent of the Engineer.
- D. A water-reducing agent may be used as deemed necessary, to be in conformance with the latest ASTM requirements.
- E. and add mixtures required for stamped and colored concrete shall be added as required and recommended by manufacturer.

**2.08 EXPANSION JOINT FILLERS:**

- A. See Specification Section 32 13 73.

**2.09 EXPANSION JOINT SEALANT:**

- A. See Specification Section 32 13 73.

**2.10 CURE AND SEAL:**

- A. All standard concrete pavement shall be cured using Chem-Crete Pavix CCC 100 or approved equal. Apply per manufacturers recommendation.
- B. All colored concrete pavement shall be cured using material specified on detailed plans

**2.11 REINFORCING STEEL MATERIAL:**

- A. All reinforcing steel shall be epoxy coated and conform with Iowa DOT section 4151.

**PART 3 EXECUTION**

**3.01 SUBGRADE PREPARATION:**

- A. Excavate, fill, compact, grade and prepare subgrade as specified in Earthwork Section 31 20 00.
- B 1. Unless otherwise ordered by the Engineer, the subgrade, at time of placing concrete for Concrete Pavement, shall be in a uniformly moist but not muddy condition to a depth of not less than one inch.
- 2. Subgrade Loading:
  - a. Where concrete trucks must travel on a prepared soil-type subgrade to unload and, as approved by the Engineer, watering of the subgrade must be limited to just ahead of the paving machine.
  - b. Repetitive loading on the subgrade by concrete trucks shall be minimized by entering and exiting the subgrade on side streets.

- c. Loads in excess of the legal axle load shall not be allowed on the completed subgrade.
  - d. Partially loaded trucks may be required.
  - e. If subgrade/subbase failure occurs, the repair shall be coordinated with the Engineer.
3. Paving Suspended:
- a. The paving operation shall be suspended where subgrade stability has been lost.
  - b. No concrete shall be placed upon a subgrade which has become unstable, bears ruts or tire marks of Contractor's equipment or which is excessively softened by rain until such subgrade has been reconsolidated and replanned or reshaped to correct the objectionable condition.
  - c. If necessary, scarify to a minimum depth of 6 inches, aerating, and recompacting at the Contractor's expense. Recompaction shall meet requirements of Section 31 20 00.
4. Maintenance of Subgrade:
- a. The Contractor is responsible for maintenance of the completed subgrade during subsequent construction activities.
  - b. Before allowing hauling equipment to use the completed subgrade, the Contractor must be satisfied as to the effect this hauling equipment may have on the partially completed work.

### **3.02 SURFACE FIXTURE ADJUSTMENT**

- A. Adjust manhole frames and other fixtures within area to be paved to conform to finished surface.
- B. Clean outside of fixture to depth of pavement before concrete placement.
- C. Box out fixtures for later adjustment where allowed. Size and shape of box out for intakes as shown in Standard Drawings.

### **3.03 FORMS:**

- A. Set base of forms at or below subgrade elevation with top of forms at pavement surface elevation.
- C. Extra height forms with Engineer approval may be used to back up integral curb and paving slab; set base at or below subgrade elevation with top of form at top of curb elevation.
- D. Secure forms in place to required grade and alignment.
- E. If voids occur under forms, remove forms and rework subgrade to proper elevation and density; reinstall forms.
- F. If the soil supporting the form is softened by rain or standing water so that form is inadequately supported, remove forms and rework subgrade to proper elevation and density; reinstall forms.
- G. Coat forms with release agent before concrete is placed.
- H. Place forms true to alignment and free of latent concrete. Use wood or steel forms adequately staked and braced for all exposed slab edges.
- I. Leave forms in place not less than eight (8) hours after concrete is placed. If removal causes damage to concrete, leave forms on as long as necessary to prevent damage. Remove forms with care to prevent cracking, spalling or overstressing concrete.

- J. Stamped concrete forms shall be installed and left in place as required by manufacturers recommendations and requirements.

### 3.04 REINFORCING PLACEMENT

- A. Reinforcing metal shall be clean, straight, free from distortion and rust, and shall be firmly secured in position as detailed.
- B. All reinforcing metal shall be placed in approved storage to prevent damage; do not distribute along the work site except as needed to avoid delay in paving.
- C. Place reinforcing steel as shown on the detailed drawings or as specified; support and secure bars by approved chair and wire assemblies; bars to be checked by the Engineer upon notification from the Contractor.
- D. Place steel centered in the pavement reasonably in advance of the paving operations.
- E. Joint Steel:
1. LONGITUDINAL: All joints shall be constructed of the type, dimensions, and at the locations required by the plans or special provisions. All longitudinal joints in drive lanes and longitudinal joints in the outer most joint of all parking areas shall be L-1 or L-2 joints and have steel, unless specifically specified otherwise on plans. Interior, parking lot joints do not need steel, beyond the outer most exterior joint and shall be of type B.
  2. TRANSVERSE: All transverse joints shall be either type C or type DW with steel for a day's work joint.
  2. Tie bars for all longitudinal joints shall be installed so as to be in the intended position in the completed pavement. Tie bars for all longitudinal joints shall be positioned on chairs and secured against movement with metal stakes during placing and finishing of concrete unless otherwise approved by the Engineer. If approved by the Engineer, bars may be placed in position by a machine or other method. For tie steel that is placed mechanically in plastic concrete, the Engineer may:
    - a. Manually check locations and depth of the steel in the plastic concrete behind the slip form paver using the following frequencies:
      - once every 200 lineal feet for tangent roadway sections
      - in at least three locations within all horizontal curve sections
      - for each inspection, at least two tie steel locations within a panel
    - b. Using a magnetic locator, verify locations of tie steel in hardened concrete every day. Check out-of-tolerance tie steel to identify the extent of the problem for a retrofit correction.
  3. The Contractor shall provide adequate means to ensure that the load transfer devices and tie bars for key type joints are properly secured to maintain correct position and alignment during the placement of concrete.
  4. Other tie bars shall be placed in such a manner as to ensure that the bars are located in reasonably close conformity with the specifications.
  5. Care should be taken to prevent disturbance or damage of the joint assembly. Bars must be

supported by approved chairs or method approved by Engineer.

**3.05 JOINTS:**

- A. The Contractor shall submit a concrete jointing plan to the Owners Representative for approval 20 days prior to the start of paving. Joint design for concrete pavement shall be based on the current Guide for Design and Construction of Concrete Parking Lots published by the American Concrete Institute (ACI 330R-92). It is desired to have joint lines match edges of travel lanes. Joint locations shall be chalked with a string line before sawing.
  - a. **In parking areas, place longitudinal joints in the middle of the drive aisles, end of paint stripes, middle of paint stripes and at front of paint stripes where no curb exists.**
- B. Saw cut control joints. Joints to be 1/8" minimum and 1/4" maximum width. All transverse contraction joints shall be sawed at a maximum spacing of 30T, where T is the thickness of the pavement in feet. In sidewalks, space joints to create square panels unless a maximum spacing of 21T is exceeded, then use rectangular panels, unless shown on the plans. All walks 12' or more in width shall get a longitudinal centerline L-1 Joint with Steel and square panels, unless otherwise reinforced.
  - a. **Joint per plan where joints are shown on the plans. If any joints don't comply with spec, contractor shall contact Bishop Engineering for clarification.**

All joints shall be sawed to a depth shown below. Including colored and stamped concrete.

	Minimum Sawcut Depth	
	Conventional Saw	Early "Green" Saw
Transverse "C" Joint	T/4±1/4"	1 1/4"
Longitudinal Joint	T/3±1/4"	Not Allowed

- C. Timing:
  1. Begin transverse joint sawing as soon as the concrete has hardened sufficiently to allow sawing without raveling or moving of aggregate. Saw joints before uncontrolled cracking takes place.
  2. Saw all joints in a single cutting operation for a specific joint. Make saw cuts true to line and to the dimensions specified in the contract documents.
  3. Discontinue sawing a joint if a crack develops ahead of the saw.
  4. Saw longitudinal joints within 24 hours of the concrete being placed.
  5. If necessary, continue the sawing operations both day and night.
  6. The concrete must be capable of supporting the sawing operations to allow the use of an early green concrete saw.
  7. Replace pavement with uncontrolled or random cracking at no additional cost to the Owner. Replace complete panel sections by means used for Full Depth PCC Repair Patches. Thickness of repair shall be original design thickness plus 2 inches. Place RD joints as shown in SUDAS Detail 7040.10 for patch.
  8. All concrete sawing for dust and slurry control shall comply with OSHA, DNR and local requirements.

- D. Round outside edges of sidewalk with edging tool with approximately one quarter-inch (1/4") radius.
- E. Round edges of sidewalk or curbs adjacent to expansion joints with edging tool with approximately one-eighth inch (1/8") radius.
- F. Construction Joint - Keyed and tied joints shall be used at ends of all concrete pours. Bars to extend through joints a minimum of twenty-four (24) bar diameters.
- G. Expansion joints (isolation joints) shall be installed in concrete pavement slabs and sidewalks where the concrete meets other structures such as light pole bases, intakes, buildings and all other similar structures. Hold joint material down one-half inch (1/2") and fill with sealant. Also used where sidewalk meets concrete curb.
- H. Joints sawed with an early "green" concrete saw shall be washed out prior to sealing. The concrete must be capable of supporting the sawing operations to allow the use of an early green concrete saw.
- I. Construction Joints:
  - 1. Longitudinal or transverse construction joints shall be placed between adjacent lanes of concrete and at end-of-day header runs.
  - 2. Manhole boxouts shall be located and placed on grade prior to paving. Manhole boxouts are required for two piece castings for sanitary/storm manholes.
  - 3. The longitudinal construction joints shall be an approved key type joint with legs unless machine placed.
  - 4. Transverse construction joints shall employ load transfer devices (Header) and shall be placed whenever concrete placement is delayed for more than 30 minutes.

### 3.06 CONCRETE PAVEMENT PLACEMENT

- A. Set survey control stakes at 25 foot maximum spacing including high and low points. Additional staking may be required by the Engineer.
- B. The concrete shall be placed, consolidated, and finished to the widths and depths outlined in the plans.
- D. The concrete shall be deposited upon the supported reinforcement keeping segregation to a minimum.
- E. Concrete shall be deposited to the full depth of the pavement in a single operation.
- F. Necessary hand spading and spreading shall be done with shovels and not rakes.
- G. **All pavement sections shall use mechanical, gas powered laser screed for all uniform width slabs 8.5 feet or more in width and 50 feet or more in length including but not limited to the parking lot areas and drive/ drop off aisles.**

- H. **All 80<sup>th</sup> Street public pavement shall be placed with slip form paving machine in accordance with city and SUDAS requirements.**
- I. When pavement is constructed in separate lanes, the junction line in straight sections shall not deviate from the true line shown on the plans by more than ½ inch at any point and shall be tooled to the radius shown on the plans. A joint formed with a metal keyway shall be used between separately poured lanes.
- J. Place concrete to full depth in single operation. Keep a uniform pile of concrete in front of the paving machine, up to a maximum of 6 to 8 inches above the design surface elevation.
- K. The concrete shall be distributed and spread as soon as placed. A mechanical concrete spreader may be used.
- L. Concrete Screed:
  - 1. The concrete shall then be struck off and screed by mechanical means.
  - 2. The striking off or screeding shall conform to the crown and cross section shown on the plans.
  - 3. If, in the operation of subgrade or finishing equipment, it is necessary to operate one or both sets of wheels or tracks on previously placed concrete, the wheels or tracks shall be adjusted so that the bearing on the concrete will be not less than 3 inches from the edge of the pavement.
  - 4. When operating with two wheels on the previously placed concrete and two wheels on the form, the form wheels shall be double flanged.
  - 5. All wheels operating on the pavement shall be flangeless and rubber tired. All tracks operating on the pavement shall use rubber, wood, or belting pads.
- M. The top of the forms shall be kept clean from accumulations of concrete, and the travel of the finishing machine on the forms shall be maintained true without lift, wobbling, or other variations tending to affect precision of finish.
- N. When finishing by hand methods, concrete shall be consolidated by use of vibrating units operating in the concrete. Unless the vibrating apparatus is such that the full width of concrete is consolidated in a single passage, a definite system or pattern shall be used in the operation of the vibrator so the full width of concrete in each linear foot of lane will receive adequate and uniform consolidation. The system and methods of vibrating shall be subject to approval the Engineer. Vibrating equipment shall meet the requirements of IDOT Section 2301.07. Vibrating equipment shall, under no circumstances, be used as a tool for moving concrete laterally on the grade.

A.07 **FINISHING:**

- A. Screed, level and float all slabs to true, level and straight lines.
- B. Exterior slabs and platforms to be medium hair broom finish, with no coarse aggregate visible, unless otherwise specified on drawings.
- C. Stamped and colored concrete shall be finished as specified on plans.
- C. Tolerances on all surfaces not more than three-sixteenths inch (3/16") in ten foot zero inch (10'- 0").
- D. Formed surface finish:

1. Remove bulges, fins, form marks and roughness from exposed surfaces by grinding.
2. Subject to Engineer's approval, fill honeycombed and other defective areas by cutting out to solid concrete (minimum depth= 1") with straight edges and at right angles to the surface. Dampen area to be patched, brush on grout of equal parts Portland Cement and sand and follow immediately with patching mortar. Large or objectionable areas will require full removal and replacement at Engineer's discretion.
3. Patching mortar to be not richer than one (1) part Portland Cement to three (3) parts sand. Color of patching mortar shall match the adjacent concrete. (Substitute white Portland Cement for part of the grey cement as needed to provide color match.)
4. Trowel or burlap rub patched areas to match the surrounding concrete area. Clean all walls upon completion.
5. Exposed concrete wall faces and tops to have a uniform smooth rubbed finish. Moisten concrete surfaces and rub with Carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.

### **3.08 SURFACE CURING**

A. Apply liquid curing compound in a fine spray to form a continuous, uniform film on the horizontal surface and vertical edges of pavement, curbs and back of curbs immediately after surface moisture has disappeared, but no later than 30 minutes after finishing. With approval of the Engineer, the timing of cure application may be adjusted due to varying weather conditions and concrete mix properties to ensure acceptable macrotexture is achieved.

1. Use a white pigment liquid curing compound.

B. Surface curing for stamped and colored concrete shall be as required by required and recommended by the manufacturer.

C. Apply compound with power sprayer; rate of application not less than 0.067 gallon per square yard (15 square yards per gallon); do not dilute compound.

E. If forms are used, apply to pavement edges and back of curbs within 30 minutes after forms are removed.

F. Ensure liquid curing materials are well agitated in the supply drum or tank immediately before transfer to the sprayer. Keep curing materials well agitated during application.

G. Hand operated sprayers may be used for small and irregular areas.

G. If forms are used, apply to pavement edges and back of curbs within 30 minutes after forms are removed.

H. If, due to other operations, the coating is damaged within 72 hours after being applied, immediately re-coat the affected areas. Coating of the sawed surface with curing compound will not be allowed on joints that are to be sealed. When pavement is opened to traffic prior to 72 hours after application of the curing coating, a re-coating will not be required.

### **3.09 JOINT SEALING**

A. Timing:

1. Unless otherwise provided, before any portion of the pavement is opened to the Contractor's forces or

to general traffic, joints that require sealing shall be sealed.

2. The Engineer may limit the wheel loads and axle loads of equipment operating on the pavement during this operation, if prior to the age and strength specified in Section 1.08 above. Additional tests to determine the modulus of rupture may be required.

**B. Cleaning:**

1. For those joints that are not to be sealed, cleaning is not required.
2. Within 3 hours after a joint has been wet sawed to the finished dimension, flush the wet sawing residue away from the sawed faces using a high pressure water blast operating with a minimum pressure of 1,000 pounds per square inch. Within 3 hours after a joint has been dry sawed to the finished dimension, blow the dry sawing residue from the joint using air compressors that provide moisture and oil free compressed air.
3. Immediately prior to installation of sealant, clean joints with an air blast. Do not perform sealing until visual examination verifies the joint surfaces appear dry, in addition to being clear of dust and contamination.

**C. Sealing:**

1. Prepare and install joint sealer in the joint and to the proper level specified in the contract documents and as recommended by the manufacturer.
2. Prepare and seal joints for stamped and colored concrete as required in contract documents and as by required and recommended by the manufacturer
2. Heat hot-poured sealers in a thermostatically controlled heating kettle; heat the material to the temperature required for use, but not above that recommended by the manufacturer. After sealing, remove excess sealer from the pavement surface.
3. Seal joints the same day they are cleaned. Apply sealant only when the joint surfaces appear dry by visual examination.
4. Place joint sealer only when the pavement and ambient air temperatures are 40°F or above. When near this minimum, additional air blasting or drying time, or both, may be necessary to ensure a satisfactory bond to the joint faces. When this sealer cannot be properly placed due to late fall work, submit a joint construction plan and sealing details to the Engineer for approval before commencing paving. Delay the cleaning, sealing, and, if required, resawing of joints until the following spring. This delay requires the Engineer's approval.
5. When surface correction is required, repair seals damaged from the corrective work. Joint preparation, cleaning, and sealing may be delayed until after corrective work, provided the pavement is not opened to traffic before corrective work is performed.
6. For all expansion joint in sidewalks, plazas, at stoops, around fence posts and bottom of turned-down-walks, seal expansion joint with grey, mastic joint sealer conforming with IDOT specifications.

**3.10 DEFECTS OR DEFICIENCIES**

Pavement containing cracks, fractures, spalls, or other defects shall be removed and replaced at no cost to Owner. Any concrete panel with 1 or more crack will require full replacement of panel. Any panels with separated cracked will require full replacement of panel. Any other cracks will be examined and inspected by engineer/owner to determine if replacement is necessary. Remedy to be determined by Engineer/Owner. In lieu of the above, the Engineer/Owner may approve an extended warranty or price adjustment.

**Replace pavement with cracking at no additional cost to the Owner and shall include stamped and colored concrete.** Replace complete panel sections by means used for Full Depth PCC Repair Patches. Thickness of repair shall be original design thickness plus 2 inches. All matches must conform to Iowa SUDAS 2021 Detail 7040.101 for patches.

**END OF SECTION**

## **SECTION 32 13 73 PAVEMENT JOINT SEALANTS**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

- A. This Section includes the following:
  - 1. Expansion and contraction joints within cement concrete pavement.
  - 2. Joints between cement concrete and asphalt pavement.

#### **1.02 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Samples: For each type and color of joint sealant required.
- C. Product test reports.
- D. Compatibility and Adhesion Test Reports: From sealant manufacturer.

#### **1.03 QUALITY ASSURANCE**

- A. Preconstruction Compatibility and Adhesion Testing: Submit samples of materials that will contact or affect joint sealants to joint-sealant manufacturers for testing according to ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

#### **1.04 WARRANTY**

- A. Provide two year warranty for polyurethane sealants. Include coverage for installed sealants which fail to achieve watertight seal, exhibit loss of adhesion or cohesion, and sealants which do not cure.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.
- B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

#### **2.02 MATERIALS, GENERAL**

- A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

1. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Colors of Exposed Joint Sealants: gray, unless selected by Architect from manufacturer's full range.

### 2.03 POURED JOINT SEALANTS

- A. Parking Lot Pavement, Longitudinal and Transverse Joints:
  1. Products:
    - a. Bemac, Div. of McAsphalt; Beram 195/195LM.
    - b. CRAFCO; ROAD SAVER 231.
    - c. Koch Pavement Solutions; Koch Product #9030
    - d. Maxwell Products, Inc.; Elastoflex 71.
    - e. P.T.Products; DURA FILL 3405 LM.
    - f. W.R.Meadows; 3405 Modified (Hot Pour)
    - g. WRM SOF SEAL (2Comp. Cold Pour)
    - h. Or equal specifically approved by engineer.
  - B. Expansion Joints in Walks and Parking
    2. Products:
      - a. Sonneborn Products; Sonolastic SL-1. Color gray.
      - b. Or equal specifically approved by engineer.

### 2.04 BACKER RODS

- A. Conform to Iowa DOT section 4136, backer rods.
  - a. Industrial Thermo Polymers, ITP Standard
  - b. Industrial Thermo Polymers, Hot Rod XL
  - c. W.R. Meadows, Cera-Rod
  - d. Construction Foam Products, HBR
  - e. Or equal specifically approved by engineer.

### 2.05 EXPANSION JOINT FILLERS

- A. Polyethylene closed cell foam expansion joint filler. BASF, Sonoflex F.
- B. Or equal specifically approved by engineer.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Timing: Unless otherwise provided, before any portion of the pavement is opened to the Contractor's forces or to general traffic, expansion joints and sawn joints shall be sealed.
- B. Cleaning:
  1. Before sealing joints narrower than 3/8 inch, the residue from sawing shall be cleaned from the crack. Dry sawing residue shall be blown from the joint. Wet sawing residue shall be flushed away by high pressure water blast cleaning.
  2. For joints 3/8 inch wide or wider, sand cleaning shall be used. When the joint surfaces appear dry by visual examination, the upper 3/4 inch of each joint face

shall be cleaned by sand blast methods, followed by joint cleaning with air blasting. Air compressor shall provide moisture and oil-free compressed air. The angle of approach of the sand blast nozzle to each vertical face of the reservoir shall be approximately 30 degrees and the sand blast nozzle must have a guide which inserts in the joint and assures positive location and directional control of the nozzle.

3. Joint Sealer:
  - a. Joint sealer shall be prepared and installed in the joint and to the proper level as shown in the contract documents and as recommended by the manufacturer.
  - b. Hot-poured sealers shall be heated in a thermostatically controlled heating kettle; the material shall be heated to the temperature required for use, but not above that recommended by the manufacturer. After sealing, excess sealer shall be removed from the pavement surface.
  - c. Joint sealer shall be placed only when the pavement and ambient air temperatures are 40 degrees Fahrenheit or higher. When near this minimum, additional air blasting or drying time or both may be necessary to assure a satisfactory bond to the joint surfaces.
  - d. When this sealer cannot be properly placed due to late fall work, the Contractor shall submit a joint construction plan and sealing details to the Jurisdictional Engineer for approval before paving can begin.
  - e. Joints shall be sealed the same day they are cleaned. Sealing shall be done only when the joint surfaces appear dry by visual examination.
  - f. Where a curb does not exist, the joint opening at the pavement edges shall be sealed with tape.
  - g. If surface correction required the joints may need to be recleaned and resealed.
- C. Install backer materials to support sealants during application and at position required to produce optimum sealant movement capability. Do not leave gaps between ends of backer materials. Do not stretch, twist, puncture, or tear backer materials. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.
- D. Install sealants at the same time backings are installed to completely fill recesses provided for each joint configuration and to produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

**END OF SECTION**

## **SECTION 32 17 23 PAVEMENT MARKINGS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Pavement Markings.

#### **1.02 DESCRIPTION OF WORK**

- A. For marking of completed pavement surfaces.

#### **1.03 SUBMITTALS**

- A. Minimum of two weeks prior to commencing any pavement marking operations, the Contractor shall submit a manufacture's catalogue sheet for each type of pavement marking paint used for review and approval by the Engineer.

#### **1.04 SCHEDULING AND CONFLICTS**

- A. Construction Sequence:
  - 1. Submit plan for construction sequence and schedule prior to commencing construction.
- B. Conflict Avoidance:
  - 1. Notify Engineer of conflicts discovered or changes needed to accommodate unknown or changed conditions.
- C. Conform to Local, State and Federal Requirements.

#### **1.05 RESTRICTIONS ON OPERATIONS**

- A. Surface Temperature Restrictions: Pavement markings shall not be placed when the temperature of the pavement surface is less than 50 degrees Fahrenheit, or between October 15<sup>th</sup> and April 15<sup>th</sup>.
- B. When physical signs of moisture on pavement in mornings from dew, pavement must be dry from minimum of 2 hours after dew is gone.
- C. When physical signs of moisture on pavement in mornings from frost coming out of the ground or condensation on cold surfacing, pavement paint cannot proceed for minimum 24 hours until condition is no longer seen.

### **PART 2 PRODUCTS**

#### **2.01 Waterborne Paint**

- A. Must comply with Iowa DOT Specification 4183.03.

- B. The paint shall be capable of being heated and sprayed applied up to a temperature of 140° F without damaging the formulation or serviceability of the paint. The paint shall be free from heavy metals as defined by the U.S. EPA.
- C. Pigment Content: The percent pigment by weight of the finished product shall be from 45% to 55% by weight for white and 55% to 58% for yellow paint as tested by ASTM D 3723.
- D. Resin Solids shall be composed of 100% acrylic emulsion polymer.
- E. Nonvolatile Vehicle: The nonvolatile vehicle shall not be less than 43% by weight for white paint and not less than 45% by weight for yellow paint.
- F. Volatile Organic Compounds: Volatile organic compounds shall not exceed 1.25 pounds per gallon excluding water and VOC exempt solids. ASTM D 3960 shall be used to determine the levels of VOCs.
- G. Density: The density shall be a minimum of 12 pounds per gallon and the density of the production batches shall not vary more than +/- 0.2 pounds.
- H. No-Pick-Up Time: The no-pick-up time for the paint shall be less than 5 minutes.

### **PART 3 EXECUTION**

#### **3.01 CLEANING AND PREPARATION OF PAVEMENT**

- A. The pavement surface shall be dry and free from dirt, dust, oil and other contaminants which may interfere with the paint from properly bonding to the surface. The clean surface shall be at least 1 inch wider than the anticipated marking. An air blast shall occur immediately prior to the new marking being placed. The air blast is not intended to remove large amounts of dust or dirt, but only a small amount of residue that might be left after the cleaning operation.
- B. When pavement markings are placed on newly constructed PCC pavements that have never been painted before, remove the existing curing compound film from horizontal surfaces in these locations. Curing compound film need not be removed from curbs or other vertical surfaces. Remove the curing compound by sandblasting 1" beyond the edge of the respective paint stripe or in another manner that does not damage the underlying pavement.**

#### **3.02 UNIFORM APPLICATION**

- A. All painted markings shall have uniform thickness and width. The width of the lines shall be as specified with a tolerance of +/- ¼ inch for 4-inch lines and +/- ½ inch for wider lines.
- B. The wet film thickness of the paint shall be 14 mils, used at a rate of 305.5 ft. of solid 4" line per gallon of paint.

### 3.03 TRAFFIC CONTROL

- A. Traffic control shall remain in place from the time cleaning operations have started through the completed curing time of the newly applied paint markings.

### 3.04 MARKING REQUIREMENTS

- A. **Parking Stalls:**  
Solid lines, color per plan, 4 inches wide by length dimensioned on plans and shall be placed for each parking stall as shown in the plans. The spacing shall be nominally 9 feet on center, or as otherwise specified on plans.
- B. **Symbols and Stop Bars:**  
Symbols, directional arrows, and stop bars shall be painted color per plan. Size and shape shall follow the Manual of Uniform Traffic Control Devices. Locations as shown in the plans.
- C. **Handicap Access Symbols and Aisles:**  
Symbols, painted color per plan, a minimum of 5 feet in height, shall be placed as shown in the plans. Access aisles shall be painted color per plan with a diagonal stripe pattern, lines placed 2 feet apart on center.
- D. **Loading Zones:**  
Solid yellow lines 4" wide shall be placed as shown in the plans for loading zones. The lines shall be placed diagonally, spaced 2 feet on center. A solid yellow line shall outline the area on the pavement and on the curb.
- E. **Same direction of travel centerline and longitudinal stripes:**  
Solid or dashed lines as shown on plans, white, 4 inches wide by length dimensioned on plans and shall be placed as shown.
- F. **Opposing direction of travel centerline stripes:**  
Solid or double solid lines as shown on plans, color yellow, 4 inches wide by length dimensioned on plans and shall be placed as shown.
- G. **Opposing direction of travel centerline stripes:**  
Solid or double solid lines as shown on plans, color yellow, 4 inches wide by length dimensioned on plans and shall be placed as shown.
- H. **Fire lane stripes:**  
Solid, color red complying with local jurisdictional requirements. Where fire lane painting is shown on plans, paint entire vertical surface of the curb and the top of the curb extending 4 inches wide. In areas where there is no curb, paint fire lane 4" wide with no vertical element. Do not paint fire lanes through designated crosswalks.

**END OF SECTION**

## **SECTION 32 91 19 LANDSCAPE GRADING**

### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES:**

- A. Final grade topsoil for finish landscaping shown on Landscape Drawings.

#### **1.2 RELATED SECTIONS:**

- A. EARTHWORK: SECTION 31 20 00

### **PART 2 PRODUCTS**

#### **2.1 MATERIALS:**

- A. Topsoil: Fertile, friable loam, capable of sustaining vigorous plant growth, from well drained site free from flooding, not in frozen or muddy conditions; reasonably free from subsoil, clay lumps, roots, grass, weeds, stones larger than three-quarter (3/4) inch (19 mm) diameter, and foreign matter; acidity range (pH) of 5.5 to 7.5; containing minimum 4 percent and maximum 20 percent organic matter.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION:**

- A. Verify building and trench backfilling has been inspected.
- B. Verify subsoil base has been contoured and compacted.

#### **3.2 SUBSOIL PREPARATION:**

- A. Eliminate uneven areas and low spots.
- B. Remove debris, roots, branches, and stones in excess of 1/2 inch (13 mm) in size. Remove subsoil contaminated with petroleum products.
- C. Scarify subgrade to depth of 3 inches (75 mm), where topsoil is to be placed. Scarify areas where equipment used for hauling and spreading topsoil has compacted subsoil.

#### **3.3 PLACING TOPSOIL:**

- A. Place topsoil in areas to be seeded or sodded and planted, to thickness as shown on plans.
- B. Use topsoil in relatively dry state. Place during dry weather.
- C. Fine grade topsoil eliminating rough and low areas. Maintain levels, profiles, and contours of subgrade.
- D. Remove roots, weeds, and foreign material while spreading.

- E. Manually spread topsoil close to building to prevent damage.
- F. Lightly compact placed topsoil.
- H. Leave site clean and raked, ready to receive seeding or sodding and landscape planting.

**3.4 TOLERANCES:**

- A. Top of Topsoil: Plus or minus 1/4 inch (6 mm).

**3.5 PROTECTION:**

- A. Protect landscaping and other features remaining as final work.
- B. Protect existing structures, walls, sidewalks, and paving.

**3.6 IMPORTING TOPSOIL:**

- A. Use topsoil stockpiled during site stripping for respread.
- B. If contractor finds stockpiles have insufficient quantity for respreads requirements, topsoil must be imported to site and included in bid.

**3.7 SCHEDULE OF TOPSOIL DEPTHS:**

- A. The following paragraphs identify compacted topsoil thickness for various locations.
  - 1. See plans for topsoil thicknesses.

**END OF SECTION**

## **SECTION 32 92 19 TURF SEEDING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Seeding.
- B. Erosion-control material(s).

#### **1.02 RELATED SECTIONS**

- A. Section 31 10 00 - Site Clearing
- B. Section 31 20 00 - Earthwork
- C. Section 32 92 23 - Sodding
- D. Section 32 93 00 – Trees, Shrubs, and Groundcover

#### **1.03 REFERENCE STANDARDS**

- A. Iowa Statewide Urban Design and Specifications (SUDAS) (<http://www.iowasudas.org/>)
- B. American Nursery and Landscape Association (ANLA) "American Standard for Nursery Stock", (ANSI Z60.1-2004)

#### **1.04 DEFINITIONS**

- A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- B. Finish Grade: Elevation of finished surface of planting soil.
- C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- F. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or a soil mixture best for plant growth.
- G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete or top surface of a fill or backfill area before planting soil is placed.

- H. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- I. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

### 1.05 SUBMITTALS

- A. See Section 01 33 23 – Submittals, for submittal procedures.
- B. Product Data: For each type of product indicated.
  - 1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.
  - 2. Hydromulch materials and composition.
- C. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
  - 1. Certification of each seed mixture. Include identification of source and name and telephone number of supplier.
  - 2. All seed must be **Certified Blue Tag**
- D. Qualification Data: For qualified landscape Installer.
  - i. Installer must have completed 5 similar projects with the last two years. Project information, location, can contact information for the client of each project must be submitted for verification.
- E. Product Certificates: For soil amendments and fertilizers, from manufacturer.
- F. Material Test Reports: For existing in-place surface soil.
- G. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of turf and meadows during a calendar year. Submit before expiration of required initial maintenance periods.
- H. At the pre-construction meeting, and/or prior to any contract work commencing, submit a written watering plan detailing the equipment to be used, the water source, and the manpower to be used toward meeting the specified watering requirements.

### 1.06 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf and meadow establishment.
  - 1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
  - 2. Experience: Two years' experience in turf installation in addition to requirements in Division 01 Section "Quality Requirements."
  - 3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
  - 4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:
    - a. Certified Landscape Technician.

- b. Certified Turfgrass Professional, designated CTP.
    - c. Certified Turfgrass Professional of Cool Season Lawns, designated CTP-CSL.
  5. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.
  6. Pesticide Applicator: State licensed, commercial.
- B. Soil-Testing Laboratory Qualifications: An independent laboratory or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cat ion exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of the soil.
  1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
  2. The soil-testing laboratory shall oversee soil sampling, with depth, location, and number of samples to be taken per instructions from Landscape Architect. A minimum of three representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
  3. Report suitability of tested soil for turf growth.
    - a. Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
    - b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.
- B. Bulk Materials:
  1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
  2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
  3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.

#### **1.08 PROJECT CONDITIONS**

- A. Planting Restrictions: The preferred planting time is during one of the following periods:
  1. Spring Planting: April 15 - May 30.
  2. Fall Planting: August 15 - September 30.If planting can't happen during these seeding dates for any reason including weather, contractor may plant outside of these dates except where specified otherwise on the detailed plans. If planting occurs outside of these dates, contractor still responsible for meeting all warranty, establishment and final inspection requirements of this section.

### **1.09 MAINTENANCE SERVICE**

- A. Begin maintenance immediately after each area is seeded and continue until acceptable seeding is established.
- B. To include:
  - 1. Repair of eroded areas prior to acceptance.
  - 2. Maintenance of a uniform mulch cover until acceptance.
- C. Until final acceptance and approval is received, reseed or overseed, using seed mix originally specified, all seeded areas to produce uniformity.
- E. After owner acceptance of the seeded areas, the contractor won't be responsible for maintenance procedures, except under warranty only.
- F. Contractor should note that some of these seeding areas are near the building while others are more remote. It should be bid that we will have two separate maintenance periods placed at different times of the year or most likely even a year apart.

### **1.10 WARRANTY**

- A. Provide guaranteed germination as specified by seeding manufacturer.
  - 1. Warranty period for Seeding: Two (2) years from the date of Substantial Completion.
- B. Provide seed emergence.
- C. Reseed and remulch bare spots as specified in this Section for original seeding and mulching; maintain these areas as specified until acceptance by Owner.
  - 1. At the end of the second full growing season, the seeding areas shall be established such that a full stand of the representative seeding mix is alive and in a healthy growing condition.

### **1.11 FINAL INSPECTION AND ACCEPTANCE:**

- A. Conditions for seeding acceptance:
  - 1. Guaranteed germination is achieved.
  - 2. Grass plants have emerged.
  - 3. Scattered bare spots do not exceed one (1) square foot in area.
  - 4. Scattered bare spots do not exceed three percent (3%) of total lawn areas.
- B. Upon completion of the work and fulfillment of the requirements of this Section, notify the Owner in writing that the work is ready for final inspection.
  - 1. The final inspection of the seeded areas shall be based off requirements of section 3.06.
  - 2. Before final acceptance shall be issued, the terms of the warranty maintenance period shall be met.
  - 3. At six-month intervals, from the time of initial seeding, the Owner, Engineer, and Contractor will inspect and evaluate the growth and success of the seeding. If, during these intermediate inspections, it is determined that the seeding is more than 25% dead or in an unhealthy, full of weeds or unsightly condition, the Contractor shall reseed the area immediately, or as soon as is allowed during specified planting periods.
- C. Request a definite date for final inspection.
- D. Notify the Owner five (5) days prior to the requested final inspection date.

- E. Reseed and maintain all seeded areas which do not meet the requirements of this Section at the time of final inspection.
- F. Replacement work (reseeding, maintenance, etc.) shall be as specified in this Section for original seeding.
- G. Replacement work shall be reinspected before acceptance.
- H. Furnish detailed written recommended maintenance program to the Owner with a copy to the Construction Manager, prior to final inspection of the seeding.

## **PART 2 PRODUCTS**

### **2.01 SEED**

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species: See drawings for locations.

#### **Seed Type #1 – Lawn Seeding**

Product: Super Turf II LS  
Supplier: United Seeds  
1800 Dixon Avenue, Suite A  
Des Moines, IA 50316  
Phone (515) 282-1750  
Seeding Rate: 440 lbs / Acre – Must be drill seeded  
Mulch Type: Hydromulch required on all seeded areas.

#### **Seed Type #3 - Temp Seeding**

Product: SUDAS Type 5  
Supplier: United Seeds (or approved equal)  
1800 Dixon Avenue, Suite A  
Des Moines, IA 50316  
Phone (515) 282-1750  
Seeding Rate: 105 lbs / Acre – Must be drill seeded  
Mulch Type: Straw Mulch  
Installation: Install as required by the SWPPP, DNR, EPA, and the City of Adel.

Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:

### **2.02 FERTILIZERS**

- A. See Section 3.03 (A) for preparatory fertilization of the Type 1 Seeding areas.
- B. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.
- C. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

- D. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
  - 1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
  - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.
- E. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
  - 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
  - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

### 2.03 PLANTING SOILS

- A. Planting Soil: ASTM D 5268 topsoil, with pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

### 2.04 WATERING

- A. Watering is not required for seeded areas but is left up the contractor to determine if watering is necessary depending on weather conditions and when seed was placed.
- B. Contractor shall be responsible for meeting all acceptance requirements of this section no matter if contractor chooses to water seed/ seeded areas or not.

### 2.05 MULCHES

- A. Straw Mulch: Not allowed for seeding.
- B. Hydro-Mulch:
  - a. **Place all seed with a grass drill seeder prior to Hydraulic Mulching.**
  - b. Immediately upon seeding, cover with wood cellulose Hydraulic Mulch at a rate of 2500 lbs / Acre for Type #1 Seeding

### 2.06 PESTICIDES

- A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.
- B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
- C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

## **2.07 EROSION-CONTROL MATERIALS**

- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long. (See Drawings)
- B. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long. (See Drawings)

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.
  - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
  - 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
  - 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
  - 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.

### **3.02 PREPARATION**

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
  - 1. Protect adjacent and adjoining areas from hydro seeding and hydro mulching overspray.
  - 2. Protect grade stakes set by others until directed to remove them.
- B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

### **3.03 TURF AREA PREPARATION**

- A. For all Type #1 Seeding: Apply pre-plant fertilizer (6-24-24) at a rate of 4.5 lbs. per 1000 SF and incorporate to a depth of 1 to 2 inches. Pre-plant fertilizer should be applied to surface and watered with two (2) passes of an irrigation head. Pre-plant fertilizer should not be applied more than seven (7) days before grassing operations.
- B. Limit turf subgrade preparation to areas to be planted.
- B. Verify area has been constructed in accordance with Section 31 20 00, 3.11.
  - 1. Apply fertilizer.

- C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- D. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- E. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

#### **3.04 PREPARATION FOR EROSION-CONTROL MATERIALS**

- A. Prepare area as specified in "Turf Area Preparation" Article.
- B. For erosion-control mats, install planting soil in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.
- C. Fill cells of erosion-control mat with planting soil and compact before planting.
- D. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.
- E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

#### **3.05 SEEDING**

- A. Sow seed with seeding machine. Broadcasting seed is only allowed in areas with extreme slopes exceeding 2:1. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
  - 1. Do not use wet seed or seed that is moldy or otherwise damaged.
- B. Sow seed at rates indicated within this specification.
- C. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.
- D. During seeding, protect bioretention areas from construction traffic and over compaction.
  - 1. Repair rutting, over-compaction, clogging, or other damage to bioretention areas to required grades and tolerances at no cost to Owner.
- E. Protect seeded areas with slopes exceeding 1:4 with erosion-control blankets and 1:6 with erosion-control fiber mesh installed and stapled according to manufacturer's written instructions.
- F. Protect seeded areas with erosion-control mats where shown on Drawings; install and anchor according to manufacturer's written instructions.
- G. Straw mulching is not allowed for Seed Type 1, hydromulch is required.

- H. Protect temp seeded areas by spreading straw mulch or a cover crop. Spread straw mulch uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.
  - 1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.

### **3.06 SATISFACTORY TURF**

- A. Turf installations shall meet the following criteria as determined by Landscape Architect:
  - 1. Satisfactory Seeded Turf: A healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 95 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
- B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

### **3.07 PESTICIDE APPLICATION**

- A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.
- C. Protect adjacent plant material not intended to receive pesticides or herbicides

### **3.08 CLEANUP AND PROTECTION**

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.
- C. Remove non-degradable erosion-control measures after grass establishment period.

**END OF SECTION**

**SECTION 32 92 23 SODDING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. Drawings and General Provisions of Contract, including Bidding Requirements, General and Supplementary Conditions and Division I Specification Sections, apply to work specified in this Section.

**1.2 WORK INCLUDED:**

- A. Provide all labor, materials, equipment and supervision required to furnish and install sodding including:
  - 1. Fertilizer.
  - 2. Sod.
  - 3. Watering.

**1.3 RELATED WORK SPECIFIED ELSEWHERE:**

- A. Section 32 92 19 – Turf Seeding
- B. Section 32 93 00 - Trees, Shrubs, and Groundcover

**1.4 QUALITY ASSURANCE:**

- A. All materials described and specified herein shall be subject to inspection and approval by the Owner's Representative.
- B. Materials may be inspected by the Owner's Representative at source of supply.
- C. This inspection does not waive the right to reject any material after it has been delivered to the site and/or installed.

**1.5 SUBMITTALS:**

- A. Sod Growers Certification.
- B. Certification of turf species comprising sod.
- C. Bills of Lading and/or certification of formulation for fertilizer.

**1.6 CODES, PERMITS AND FEES:**

- A. Obtain any necessary permits for this Section of Work and pay any fees required for permits.
- B. The entire installation shall fully comply with all local and state laws and ordinances, and with all established codes applicable thereto.

**1.7 JOB CONDITIONS:**

A. Existing Utilities:

1. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.
2. Underground utilities shown on the drawings have been taken from existing public records, Owner's records available as-built drawings and are correct to the best of our knowledge, provided for information only.
3. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult Utility Owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities caused by Contractors negligence to the satisfaction of Utility Owner at no cost to the Project Owner.
4. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, during occupied hours, except when permitted in writing by Landscape Architect and then only after acceptable temporary utility services have been provided.
5. Provide minimum of 48-hour notice to Owner and Landscape Architect and receive written notice to proceed before interrupting any utility.

B. Protection of Persons and Property:

1. Barricade open excavations occurring as part of this work and post with warning lights.
2. Operate warning lights as recommended by authorities having jurisdiction.
3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by this work.
4. Perform excavation within drip-line of large trees to remain by hand, and protect the root system from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with burlap. Paint root cuts of ill diameter and larger with emulsified asphalt tree paint.

1.8 **SITE DISTURBANCES:**

- A. Take precautions to insure that equipment and vehicles do not disturb or damage existing site grading, walks, drives, utilities, plants, etc.
- B. Verify locations and depths of all underground utilities prior to excavation.
- C. Repair and/or return to original condition any damage caused by Contractor 's negligence at no cost to Owner.

1.9 **DELIVERY, HANDLING AND STORAGE:**

- A. Protect sod from dehydration, contamination and heating during transportation, delivery and storage.
- B. Sod shall be harvested, delivered and transplanted within a period of thirty-six (36) hours unless a suitable preservation method is approved.
- C. Keep stored sod moist and under shade or covered with moistened burlap.
- D. Sod showing visible signs of heating will be rejected.
- E. Do not tear, stretch or drop sod.

- F. Deliver fertilizer to site in original, unopened containers, each bearing manufacturer's guaranteed analysis.
- G. Store packaged materials off ground and protect from moisture.

**1.10 GUARANTEE:**

- A. Guarantee all sodded areas until final acceptance.
- B. Acceptance criteria is as defined in this Section.
- C. Sodded lawn areas which do not meet the requirements of acceptance at time of inspection shall be re-sodded and maintained as originally specified at no additional cost to Owner.

**PART 2 - PRODUCTS**

**2.1 SOD:**

- A. Well established, nursery grown sod consisting of three (3) to four (4) improved Kentucky Bluegrass cultivars selected from the following list:
  - 1. Argyle Kentucky Bluegrass.
  - 2. Baron Kentucky Bluegrass.
  - 3. Liberty Kentucky Bluegrass.
  - 4. Majestic Kentucky Bluegrass.
  - 5. Merit Kentucky Bluegrass.
  - 6. Midnight Kentucky Bluegrass.
  - 7. Monopoly Kentucky Bluegrass.
  - 8. Nausau Kentucky Bluegrass.
  - 9. Parade Kentucky Bluegrass
  - 10. Ram I Kentucky Bluegrass.
  - 11. Touchdown Kentucky Bluegrass.
  - 12. Victa Kentucky Bluegrass.
- B. Free from weeds, crabgrass, stone and other foreign materials.
- C. Mow at a height of two inches (2.5") prior to cutting.
- D. Machine cut at a minimum uniform soil thickness of one-half inch (1/2"); thickness measurement to exclude top growth and thatch.
- E. Free of objectionable grassy and broadleaf weeds; allowable tolerance: Less than five (5) weed plants per one hundred (100) square feet of area.
- F. Approved by Owner's Representative prior to placement.

**2.2 FERTILIZER:**

- A. Commercial grade.
- B. Formulation: 8 -32 -16 or a comparable formulation with a plant food ratio of 1:4:2.

**2.3 WATER:**

- A. Water is available on site. Cost of water, electricity, and labor for watering paid for by contractor until the sod is accepted by the owner.

- B. Contractor must provide temporary irrigation system until the sod has been accepted by the owner. Cost of water, electricity, and labor for watering paid for by contractor until the sod is accepted by the owner.
- C. Contractor will furnish all equipment required to execute watering.
- D. DO NOT OVER WATER SOD.
- E. All temporary irrigation shall be removed from site as soon as sod is accepted by the owner.

### **PART 3 - EXECUTION**

#### **3.1 COMMENCEMENT DATE:**

- A. Commence sodding of lawn areas at the earliest possible date that site conditions permit.

#### **3.2 SODDING SEASONS:**

- A. Sodding may be done during the following periods: April 15 - June 15 and August 1 - November 1.
- B. Sodding may be done at other times when weather permits, with consent of the Owner's Representative. Sod is ultimately the responsibility of contractor no matter when sod is placed
- C. Sodding is prohibited when the ground is frozen or soil temps below 40 degrees.

#### **3.3 SITE PREPARATION:**

- A. Finish grading and topsoil shall be placed as directed on the grading plan. (Must be at least 8" of topsoil on all sodded areas)
- B. Scarify topsoil to a minimum depth of 12", and lightly rake to provide a smooth, uniform and fine surface texture. Remove ridges and fill depressions as required to drain. Once the sod bed has been prepared all vehicle traffic shall be kept off of entire area. The owner reserves the right to take compaction tests if this traffic occurs.
- C. Remove stones over ill in any dimension and sticks, roots and rubbish.
- F. Top of finish grade shall be below adjacent curbs, walks, drains and seeded areas approximately 1-1/2" so that after sod is installed it will be flush or slightly below curbs, walks, drains and seeded areas.

#### **3.4 FERTILIZING:**

- A. Apply fertilizer to the soil surface before laying sod.
- B. Application rate: One-half (1/2) pound of actual Nitrogen per one thousand (1000) square feet.
- C. Owner's Representative to be notified forty-eight (48) hours in advance by Contractor when this operation is to take place.

#### **3.5 LAYING:**

- A. Lay sod uniformly, evenly and parallel to the finished contour.

- B. Begin sodding at bottom of slopes.
- C. Lay each roll snugly against the next leaving no void areas.
- D. Butt side and end joints.
- E. Stagger end joints in adjacent rows.
- F. Do not stretch or overlap sod.

**3.6 SOD PATCHING/FITTING:**

- A. Trim existing sod at edge to allow neat fit for new sod.
- B. Neatly trim new sod to allow tight fit at edges.
- C. Remove or add soil to patch area as necessary to permit patched area to match surrounding grades. Scarify patch area to 3" depth and smooth, ready for sod.

**3.7 STAKING:**

- A. On grades 3:1 or greater, stake each roll with at least three (3) flat wood stakes to prevent movement under normal rainfall conditions. Use additional stakes on steeper grades.

**3.8 WATERING:**

- A. Not more than one (1) hour shall elapse between the laying and the initial watering of the sod.
- B. Initial watering shall be such that the underside of all sod and the sod bed shall be thoroughly wet.
- C. Sod must be installed within 24 hours of sod placement and hoses and other measures are acceptable.
- D. The contractor must coordinate access and be responsible for the cost of all water and will provide the water through a city issued irrigation meter or through other means under the general contractor.

**3.9 ROLLING:**

- A. After all sod is laid and thoroughly watered, roll all sodded areas (except pegged sod), either with a small mechanical or hand roller, sufficiently to set or press sod into soil.

**3.10 MAINTENANCE:**

- A. Maintenance period: Maintain all sodded lawn areas until sod has rooted into topsoil. Maintenance to include watering and mowing as necessary.
- B. Sod acceptance shall be based upon following criteria:
  - 1. Terms of the maintenance period, as defined in this paragraph, have been executed.
  - 2. Sod is weed free, healthy and in a flourishing condition.
  - 3. Scattered bare spots do not exceed one (1) square foot in area.
  - 4. Scattered bare spots do not exceed three percent (3%) of the total lawn area.
  - 5. Grass shall not exceed 3" in height at final acceptance. Mowing is the responsibility of the contractor until acceptance.

6. Sod is routed and can't be lifted up when pulled with hands.

**3.11 FINAL, INSPECTION AND ACCEPTANCE:**

- A. Upon completion of the work and fulfillment of the requirements of this Section, notify the Owner's Representative in writing that the work is ready for final inspection.
- B. Request a definite date for final inspection.
- C. Notify the Owner's Representative five (5) days prior to the requested final inspection date.
- D. Re-sod and maintain all sodded lawn areas which do not meet the requirements of this Section at the time of final inspection.
- E. Replacement work (re-sodding, maintenance, etc.) shall be as specified in this Section for original sodding.
- F. Replacement work shall be re-inspected before acceptance.
- G. Furnish detailed written recommended maintenance program to the Owner with a copy to the Owner's Representative, prior to final inspection of the sodding.

**3.12 CLEAN UP:**

- A. Remove from the site all debris resulting from the sodding.

**END OF SECTION 32 92 23**

## **SECTION 32 93 00 TREES, SHRUBS, AND GROUNDCOVERS**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS:**

- A. Drawings and General Provisions of Contract, including Bidding Requirements, General and Supplementary Conditions and Division I Specification Sections, apply to work specified in this Section.

#### **1.02 WORK INCLUDED:**

- A. Provide all labor, materials, equipment and supervision required for the installation of all proposed woody and herbaceous nursery stock, and machined moved plant material, mulch and edger.

#### **1.03 RELATED WORK SPECIFIED ELSEWHERE:**

- A. EARTHWORK: SECTION 31 20 00.
- B. SEEDING: SECTION 32 92 19.
- C. NATIVE SEEDING: SECTION 32 92 20
- D. SODDING: SECTION 32 92 23.
- E. LANDSCAPE GRADING: SECTION 32 91 19.

#### **1.04 AVAILABILITY:**

- A. Before submitting his bid, the Contractor shall have investigated the sources of supply and satisfied himself that he can supply the listed plants in the size, variety and quality listed and specified. Failure to take this precaution will not relieve the Contractor from his responsibility for furnishing and installing all plant materials in strict accordance with the Contract Documents without additional cost to the Owner.

#### **1.05 SUBMITTALS**

- A. Product Samples and Data: For each type of product indicated.
- B. Photos of Representative tree at mature foliage
- C. Product certificates.
- D. Planting Schedule: Indicating anticipated planting dates.

#### **1.06 QUALITY ASSURANCE:**

- A. All plant materials, grading, sizes, methods, etc., are to conform to the Standards of the American Association of Nurserymen, Inc., as contained in their current publication "American Standard for Nursery Stock", (ANSI Z60.1). In the event there is a

discrepancy between these standards and this Specification, the most restrictive requirement shall govern.

- B. All materials described and specified herein shall be subject to acceptance and approval by the Engineer.
- C. This acceptance does not waive the right to reject any material after it has been delivered to the site and/or installed.

**1.07 DELIVERY, HANDLING AND TEMPORARY STORAGE:**

- A. Install plant material on the day of delivery to the site; in the event this is not possible, protect that stock not planted.
- B. Keep plant material that cannot be planted immediately after delivery in the shade, well protected with soil, wet moss or other acceptable material and well watered.
- C. Do not bind plants with wire or rope at any time so as to damage the bark or break branches.
- D. Lift and handle plants from the bottom of the ball only.
- E. Plants moved with a ball will not be accepted if the ball is cracked, loose or broken before or during planting operations.
- F. Deliver fertilizer to site in original, unopened containers, each bearing manufacturer's guaranteed analysis.
- G. Store packaged materials off ground and protect from moisture.

**1.08 CODES, PERMITS AND FEES:**

- A. Obtain any necessary permits for this Section of Work and pay any fees required for permits.
- B. The entire installation shall fully comply with all local and state laws and ordinances, and with all established codes applicable thereto.

**1.09 JOB CONDITIONS:**

- A. Existing Utilities:
  - 1. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during this work.
  - 2. Underground utilities shown on the drawings have been taken from existing public records, Owner's records available as-built drawings and are correct to the best of our knowledge, provided for information only.
  - 3. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult Utility Owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities caused by Contractor's negligence to the satisfaction of Utility Owner at no cost to the Project Owner.

4. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, during occupied hours, except when permitted in writing by Engineer and then only after acceptable temporary utility services have been provided.
5. Provide minimum of 48-hour notice to Engineer and receive written notice to proceed before interrupting any utility.

**B. Protection of Persons and Property:**

1. Barricade open excavations occurring as part of this work and post with warning lights.
2. Operate warning lights as recommended by authorities having jurisdiction.
3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by this work.
4. Perform excavation within drip-line of large trees to remain by hand, and protect the root system from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

**1.10 INITIAL ACCEPTANCE AND APPROVAL:**

- A. No plants shall be planted until approved by Engineer.
- B. All materials described and specified herein are subject to inspection and approval by Engineer.
- C. Materials may be inspected by the Engineer at source of supply or the Engineer may require the Contractor to submit color slides and/or photographs which illustrate the specified plant material at the source of supply.
- D. This inspection does not waive the right to reject any material after it has been delivered to the site and/or installed.

**1.11 FINAL INSPECTION:**

- A. Final inspection of the planting to determine completion of contract work, exclusive of possible replacement of plants, will be made by the Engineer upon completion of the work.
- B. Final inspection will not be conducted unless all items of work as outlined in 3. EXECUTION have been completed.
- C. Ten (10) days prior to the anticipated date of acceptance submit written notice requesting inspection to Engineer.
- D. After final inspection, the Contractor will be notified in writing, by the Engineer, of initial acceptance of inspected work exclusive of the possible replacement of plants and correction of deficiencies in the requirements for completion of the work.
- E. Maintain, as specified, areas not acceptable until corrections are completed and reinspection is conducted.
- F. If a significant time delay (sixty to ninety days) is encountered, through no fault of the Landscape Contractor, inspection and initial acceptance of a major portion of

the plantings may be granted.

- G. All plants shall be alive and healthy at the time of final acceptance.
- H. Replacement of rejected plants before initial acceptance to meet the terms of initial acceptance shall not be considered a part of the guaranty and replacement requirement of this Specification.

**1.12 GUARANTEE, REPLACEMENT AND FINAL ACCEPTANCE:**

- A. Guarantee plants for the duration of one (1) full year after they are initially accepted as defined herein.
- B. Plants shall be alive and in good, healthy and flourishing condition of growth at the end of the guaranty period.
- C. At the end of the guaranty period, final acceptance will be made by Engineer upon written notice requesting such acceptance; submit notice to Engineer at least ten (10) days before the anticipated date of acceptance.
- D. Any plant, required under this Contract, that is dead or not in a vigorous, thriving condition, as determined by Engineer at the time of Final Acceptance, will be removed from the site.
- E. Plants that are missing at the time of Final Acceptance are to be installed during the specified planting season when weather and site conditions permit.
- F. In case of any questions regarding the condition and satisfactory establishment of a rejected plant, the Landscape Contractor may elect to allow such plant to remain through another complete growing season. If at that time the rejected plant is found to be dead, in an unhealthy or badly impaired condition, it shall be replaced.
- G. After Initial Acceptance, replace plants (once during or at the end of the guaranty period) that are observed to be dead or in a badly impaired condition.
- H. One replacement after initial acceptance shall constitute fulfillment of Contractor's guaranty for the particular plant replaced.
- I. Replacement Plants: Plants of the same kind and size as specified in the Plant Schedule; furnished and planted as specified herein.
- J. Replacement Plants: Guyed or staked, mulched, wrapped, fertilized, pruned and restored to original condition as originally specified at no cost to Owner.
- K. Make all necessary repairs to grades, lawns and paving required because of plant replacements, at no cost to the Owner.
- L. Plant Replacement Cost: Borne by Contractor except for possible replacements resulting from removal, loss or damage due to occupancy of project in any part, vandalism, civil disobedience, or acts of neglect on the part of others, physical damage by animals, vehicles, fire, etc., or losses due to curtailment of water by local authority, or to "Acts of God". Floods, tornadoes, wind of hurricane force, and hail are not normal and the damage they do cannot be calculated in a bid.

## PART 2 PRODUCTS

### 2.1 PLANT MATERIALS:

- A. Plant Schedule: A list of plant materials is scheduled on the Drawing. In the event of any discrepancy between this schedule and the Plan Drawing showing the plants, the Plan Drawing shall govern.
- B. Certification of inspection of plant materials required by Federal, State or other governmental agencies to accompany all shipments to be furnished to the Engineer.
- C. Nomenclature: The names of plants required under this Contract conform to those given in the "Standardized Plant Names", 1942 Edition, prepared by the American Joint Committee on Horticultural Nomenclature. Names of varieties not included therein conform generally with names accepted in the nursery trade.
- D. Standards: All plant materials, grading, sizes, methods, etc., are to conform to the Standards of the American Association of Nurserymen, Inc., as contained in their current publication "American Standard for Nursery Stock". In the event there is a discrepancy between these standards and this Specification, the most restrictive requirement shall govern.
- E. Labeling: Legibly tag all plants as to name and size prior to initial inspection. Tags to remain on plant until final acceptance.
- F. Species and Variety: True to name as specified. Plants approved as true to name at time of initial acceptance which, during the guaranty period, exhibit characteristics indicating they are not true to name will be replaced at no cost to the Owner.
- G. Availability: Before submitting his bid, the Contractor shall have investigated the sources of supply and satisfied himself that he can supply the listed plants in the size, variety and quality listed and specified. Failure to take this precaution will not relieve the Contractor from his responsibility for furnishing and installing all plant materials in strict accordance with the Contract Documents without additional cost to the Owner.
- H. Quality:
  - 1. Growth habit typical for species and as indicated on the Plant Schedule.
  - 2. Sound, healthy, vigorous and free from insect pests, plant diseases and injuries.
  - 3. One sided plants or plants taken from tightly planted nursery rows will be rejected.
- I. Size and Form:
  - 1. Equal or exceed measurements specified in the Plant Schedule.
  - 2. Measured before pruning with branches in normal position. Height and spread specified refers to main body of plant and not from tip to tip of branches or roots.
  - 3. Caliper of trees less than four inches (4") - taken six inches (6") above ground level. Trees four inches (4") and over - measured one foot (1') above ground level.
  - 4. Specified trunk height can be obtained by pruning lower branches of a plant after the plant has been installed; however, pruning to achieve specified trunk height is

to occur only after Engineer has inspected plant and directed Contractor as to the amount of pruning required.

5. Where specified by caliper, no one stem of a specific multi-stemmed plant shall be smaller than the caliper size specified.

J. Balled and Burlapped Plants:

1. Designated as "B&B"; dug with firm, natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery of the plant.
2. In compliance with CURRENT PUBLICATION "AMERICAN STANDARD FOR NURSERY STOCK."
3. Balls: Firmly wrapped with burlap or similar biodegradable material and bound with twine, cord, or wire mesh.
4. Where necessary to prevent breaking or cracking of the ball during the process of planting, the ball may be secured to a platform. Broken or loose balls will not be accepted.
5. A container grown plant, in lieu of a "B&B" plant, will be accepted provided it meets specified sizes and complies with CURRENT PUBLICATION "AMERICAN STANDARD FOR NURSERY STOCK."
6. A machine moved plant, in lieu of a "B&B" plant, will be accepted provided it meets specified sizes and complies with CURRENT PUBLICATION "AMERICAN STANDARD FOR NURSERY STOCK."

K. Container Grown Plants:

1. Container size as specified in Plant Schedule.
2. In compliance with CURRENT PUBLICATION "AMERICAN STANDARD FOR NURSERY STOCK."

**2.2 PLANTING SOIL:**

- A. Soil excavated from planting pits that is similar in nature to topsoil and is determined to be suitable for planting soil shall be thoroughly mixed with one (1) part of peat to five (5) parts of existing soil.
- B. Very poor soils of clay, gumbo, gravel, hard-pan, or other soils injurious to plants shall not be used.
- C. If quantity of soil excavated from planting pits is not adequate for planting, furnish planting soil consisting of partially decomposed vegetable matter of natural occurrence; black, clean, low in content of mineral or woody material, mildly acid, fertile and friable. Mix with one (1) part of peat to five (5) parts of soil.
- D. Dispose of soil excavated from planting hole that is determined not to be of quality required or is not needed to be used for planting soil.

**2.3 PEAT:**

- A. A domestic product consisting of partially decomposed vegetable matter of natural occurrence; black, clean, granulated or shredded.

**2.4 FERTILIZER:**

- A. Similar or equal to Milorganite (6-3-0).
- B. Uniform in composition, dry and free flowing.
- C. Fertilizer which becomes caked or otherwise damaged making it not suitable for use, will not be accepted.

**2.5 MULCH:**

- A. Type as specified on plans.
- B. Depth and locations as shown on drawings.
- C. Furnish in bags or bulk.
- D. Submit sample for approval by Engineer.

**2.6 GEOTEXTILE LANDSCAPE FABRIC :**

- A. Typar 3301 Geofabric or approved equal, available through:  
US Fabrics, Inc.  
3904 Virginia Ave.  
Cincinnati, Ohio 45227  
Phone (513) 271-6000  
Fax (513) 271-4420  
or equivalent.

**2.7 STAKING, GUYING AND WRAPPING MATERIALS:**

- A. Stakes: Similar or equal to steel farm fence posts, green vinyl coated or painted black with a rust inhibiting paint. All stakes the same color.
- B. Wire: No. 11 gauge pliable galvanized wire.
- C. Hose: New green or black 2-ply one-half inch (1/2") diameter reinforced rubber garden hose; all hose the same color.
- D. Guying cable: Five-strand, three-sixteenth inch (3/16") diameter, steel cable. Attach wire cable clamps and turnbuckles (galvanized or aluminum).
- E. Steel auger type screw anchor with twenty-four inch (24") rod length and three inch (3") plate.
- F. Wrapping material: Heavy crinkle crepe tree wrapping paper in strips four to ten inches (4-10") wide.

**2.8 EDGING:**

- A. Natural Limestone edging: 6" wide x 4" thick x 36" lengths.
- B. Saw cut ends for a tight joint with adjacent stone or concrete.

- C. As supplied by Weber Stone Company, or approved equal.

### **PART 3 - EXECUTION**

#### **3.1 COMMENCEMENT DATE:**

- A. At the earliest possible date site conditions permit.
- B. Coordinate with Engineer.

#### **3.2 PLANTING SEASON FOR BARE ROOT PLANTS:**

- A. Commence as soon as weather and site conditions permit in early Spring.
- B. Spring planting season to end on or before May 30.
- C. Fall planting season: approximately September 15 to November 1.

#### **3.3 PLANTING SEASON FOR BALLED AND BURLAPPED, CONTAINER GROWN AND MACHINE MOVED PLANTS:**

- A. Deciduous trees and shrubs: April 1 to June 1 and August 15 to November 1.
- B. Evergreen trees and shrubs: April 1 to June 1 and August 15 to October 15.

#### **3.4 PREPARATION:**

- A. Stake out on the ground the locations of all plants and obtain approval of the Engineer before excavation is begun.
- B. Relocate incorrectly located plants at no expense to the Owner.

#### **3.5 EXCAVATION:**

- A. Excavate the plant pit, centered at the location stake.
- B. Planting soil for backfilling shall be kept separate from excavated subsoil.
- C. Excavate the plant pit large enough to provide for at least six inches (6") of planting soil backfill around and beneath the root system.
- D. Where surface or subsurface conditions prevent digging a plant pit to specified dimensions, obtain approval from Engineer to modify location of pit dimensions.

#### **3.6 DRAINAGE TEST:**

- A. Randomly select a representative number of shrub plant pits in each shrub planting area and test for drainage prior to planting.
- B. Test all tree plant pits for drainage.
- C. Fill each selected plant pit with water and let stand for twenty-four (24) hours.
- D. Do not proceed with planting where drainage problems are apparent.
- E. Report to the Engineer areas which do not drain within twenty-four (24) hours. A solution will be determined at that time. If additional work is required, the contractor shall submit proposal for this additional work according to the request for proposal.

### **3.7 PLANTING:**

- A. Groundcover:
  - 1. Cultivate groundcover areas six inches (6") deep and grade smooth immediately before planting groundcover plants.
  - 2. Before planting, spread commercial fertilizer at the rate of one-eighth (1/8) pound per plant over entire groundcover area, and cultivate into top six inches (6") of soil.
  - 3. Plant groundcover to within one foot (1') of trunk of tree or shrub planted within the area unless noted otherwise on the Drawings.
  - 4. After planting and before mulching, spread weed preventer over plant bed soil surface as per manufacturer's recommendation.
  - 5. Install mulch to depth of three inches (3") over entire groundcover bed.
- B. Balled and Burlapped and Container Grown Plants:
  - 1. Center the root ball in the plant pit resting on six inches (6") of well tamped planting soil.
  - 2. Backfill the plant hole with planting soil placed in layers around the root ball.
  - 3. Carefully tamp each layer in place in a manner to avoid injury to roots or ball.
  - 4. When approximately two-thirds (2/3) of the plant hole has been backfilled, fill the hole with water and allow the soil to settle around the roots.
  - 5. Set top of root ball level with the surrounding grade as shown in the Planting Details.
  - 6. Place mulch as indicated in the Plans and Details.
  - 7. Cut cord or wire securing burlap at base of tree.
- C. Machine Moved Plants:
  - 1. Set plant in position as shown in Plans and Details.
  - 2. Place mulch as indicated in the Plans and Details.

### **3.8 FERTILIZING BARE ROOT PLANTS:**

- A. Trees: One-half (1/2) pound per plant; mix with backfill.
- B. Shrubs: One-quarter (1/4) pound per plant; mix with backfill.

### **3.9 FERTILIZING B&B AND CONTAINER GROWN PLANTS:**

- A. Trees and Shrubs: Mix with backfill.

- B. Large shade trees: Two (2) pounds per inch of caliper.
- C. Small trees: One (1) pound per inch of caliper.
- D. Shrubs: One-quarter (1/4) pound per foot height.
- E. Evergreens: One-eighth (1/8) pound per foot height or spread.
- F. Vines and groundcover: One-eighth (1/8) pound per plant; place in bottom of plant pit.
- G. Herbaceous plants: One-eighth (1/8) pound per plant.

**3.10 FERTILIZING MACHINE MOVED PLANTS:**

- A. Plants moved with tree spade: Spread ten (10) pound Milorganite or equal in plant pit prior to planting.
- B. Plants moved with tree mover: Spread fifty (50) pound Milorganite or equal in plant pit prior to planting.

**3.11 STAKING:**

- A. Stake evergreen trees eight feet (8') in height and less and deciduous trees having a trunk caliper of three inches (3") or less.
- B. Use two (2) stakes driven vertically to depth to provide a firm structure.
- C. Attach wire to the stake at a point approximately four feet (4') from the ground and attach to the tree at the same height.
- D. Encase the wire in rubber hose to avoid direct contact between wire and bark of tree.
- E. Place stakes opposite each other in an east-west direction and drive with a slight tilt away from each at the top so that slight tension can be placed on the wires when attached.
- F. All staking material may be salvaged by the Landscape Contractor twelve to eighteen (12-18) months after planting.

**3.12 GUYING:**

- A. Anchor and guy evergreen trees over eight feet (8') in height and deciduous trees having a trunk caliper of more than two and one-half inches (2 1/2") with three (3) guying cables, unless shown otherwise on the Drawings, Plant Schedule or Planting Details.
- B. Space three (3) guys equally about each tree.
- C. Each guy will consist of three-sixteenth inch (3/16") cable attached to the tree trunk at an angle of thirty (30) to forty-five (45) degrees at about two-thirds (2/3) of the height of the tree and anchored at the ground to earth anchors as specified.
- D. Make all cable fastenings with an approved cable clamp and turnbuckle.

- E. All guying materials may be salvaged by the Landscape Contractor twelve to eighteen (12-18) months after planting.

**3.13 PRUNING AND REPAIR:**

- A. Prior to initial acceptance, prune all trees and shrubs and repair any injuries.
- B. Limit the amount of pruning to the minimum necessary to remove dead or injured branches and twigs.
- C. Maintain the natural habit, shape and specified size of the plant.
- D. Make all cuts flush; leave no stubs.
- E. On all cuts over three-quarters inch (3/4") in diameter and bruises or scars on the bark, trace the injured cambium back to living tissue and remove; smooth and shape wounds so as not to retain water and coat the treated area with an approved antiseptic tree paint.

**3.14 MULCH:**

- A. Install at consistent depth as shown on drawings.
- B. Sub-grade surface of areas to receive mulch shall be sloped to drain, smooth and free of ruts and clods.

**3.15 EDGING:**

- A. Install at locations, type and configurations as shown on drawings.
- B. Top of edger to be flush with finish grade..

**3.16 CLEAN UP:**

- A. Remove any soil, peat or similar material that has been brought onto paved areas by planting operations keeping those areas clean at all times.
- B. Upon completion of the planting, dispose of all excess soil and stones resulting from the planting operation.
- C. Remove all debris, resulting from planting operations, from the site.

**3.17 MAINTENANCE:**

- A. Begin immediately following installation of plants and continue until initial acceptance.

- B. Include watering, weeding, cultivating, mulching, removal of dead material, resetting plants to proper grades or upright position and restoration of the planting saucer, and other necessary operations.
- C. If any planting is done after lawn preparation, provide proper protection to lawn areas and repair any damage resulting from planting operation promptly at no cost to the Owner.
- D. Maintenance after initial acceptance of the planting will be performed by the Owner.
- E. Furnish detailed written recommended maintenance program to the Owner with a copy to Engineers, prior to initial acceptance of the various planting areas.
- F. Maintenance performed by the Owner in accordance with recommended program will not affect the Landscape Contractor's obligation to guarantee and replace defective plants as herein described.

**END OF SECTION**

**SECTION 33 40 00**  
**STORM SEWER AND DRAINAGE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Storm Sewers.
- B. Subdrains.
- C. Footing Drain Sewer Collectors.
- D. Storm Sewer Service.

**1.02 DESCRIPTION OF WORK**

- A. Construct storm sewers, subdrains, and footing drain collectors.
- B. Construct storm sewer service and connections.
- C. Reference is made to the Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2012, and all current General Supplemental Specifications and Materials Instructional Memorandum by the term "Iowa DOT Specifications" and/or "Iowa DOT I.M."

**1.03 SUBMITTALS**

- A. Submit under provisions of Division 1.
- B. Manufacturer's instructions for installation of pipe and appurtenances.
- C. Construction sequence.
- D. Catalog cuts, samples, manufacturer's data, and listing of applicable standards for special, unique, or proposed substitute materials if requested by Engineer.
- E. Certification that materials being provided meet the requirements of these specifications or that alternate materials or substitutions have received written approval of the Engineer.
- F. Project Record Documents.
- G. Upon requests the Contractor will provide Material Certifications to the Engineer.

**1.04 SUBSTITUTIONS**

- A. Use only materials conforming to these specifications unless permitted otherwise by Engineer.
- B. Obtain written approval of Engineer for all substitutions prior to use.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver only materials that fully conform to these specifications or for which submittals

have been provided to Engineer and approved for use.

- B. Store materials and handle to avoid damage. Replace any damaged materials. Remove damaged materials from site.

#### **1.06 SCHEDULING AND CONFLICTS**

- A. Construction Sequence:
  - 1. Attend a preconstruction meeting if required by Engineer.
  - 2. Submit plan for construction sequence and schedule prior to commencing construction.
- B. Conflict Avoidance:
  - 1. Expose potential conflicts such as utility lines and drainage structures in advance of construction. Verify elevations and locations, and verify clearance for proposed construction.
  - 2. Complete elements of work that can affect line and grade in advance of storm sewer construction unless noted on plans.
  - 3. Notify Engineer of conflicts discovered or changes needed to accommodate unknown conditions.

#### **1.07 SPECIAL REQUIREMENTS**

- A. Stop Work: Stop work and notify Engineer immediately if contaminated soils, historical artifacts or other environmental or historic items are encountered.
- B. Conform to local, state and federal requirements.

#### **1.08 MEASUREMENT FOR PAYMENT**

- A. All measurements for payments will be made by the Engineer or authorized representative.
- B. Storm Sewers and Subdrains:
  - 1. Measurement of pipe, except aprons, will be in linear feet along centerline of pipe in place.
  - 2. Measurement of each size and type of pipe installed will be from end of pipe to end of pipe.
  - 3. Payment will be made at the unit bid price for each size and type installed.
- C. Incidental Items:
  - 1. Items that are not listed as specific bid items, but are required for proper completion of the work, are incidental to construction. Pipe testing is incidental.
  - 2. Incidental items may or may not be shown on plans.
  - 3. No payment shall be made for incidental items.

### **PART 2 - PRODUCTS**

#### **2.01 STORM SEWERS**

- A. Reinforced Concrete Pipe (RCP):
  - 1. Conform to ASTM C 76.
  - 2. Minimum Class III, Wall B.
  - 3. Tongue and groove joints.

- a. Use cold applied bituminous jointing materials, unless otherwise specified.
  - b. If specified, use rubber O-ring flexible joint conforming to ASTM C 443.
  4. If specified, wrap exterior of each joint with engineering fabric.
- B. Polyvinyl Chloride Pipe (PVC):
1. Use pipe conforming to the following:
    - a. Minimum pipe stiffness of 46 psi.
    - b. ASTM F 949, corrugated exterior, smooth interior; ASTM D 3034, solid wall PVC; ASTM F 679, solid wall PVC (up to 27 inches).
    - c. Gasketed integral bell and spigot joints per ASTM D 3212 and ASTM F 477.
  2. Do not use in right-of-way.
  3. Use only outside of right-of-way in public utility easement areas where no utilities exist or are proposed (running parallel or crossing) or where the trench for the PVC pipe will not be disturbed, and where the Engineer allows.
- C. High Density Polyethylene (HDPE): N-12 PIPE: PIPE SHALL BE ADS N-12 MEGA GREEN.
1. Pipe shall consist of smooth interior and annular exterior corrugations.
  2. 4- through 10-inch (100 to 250 mm) shall meet ASTM F2648(virgin/recycled material) ,  
Type S.
  3. 12- through 60-inch (300 to 1500 mm) shall meet ASTM F2648 (virgin/recycled resins),  
Type S.
  4. Use only fittings supplied or recommended by pipe manufacturer for soil tight service.
  5. Only use outside of Public Right of Way where allowed by jurisdiction and where shown on plans.
- D. Bituminous Jointing Material:
1. Use with RCP, RCAP, and RCEP, unless indicated otherwise on plans.
  2. Use a cold applied mastic sewer joint sealing compound recommended by the manufacturer for the intended use and approved by the Engineer. Supply in either rope form or flat type form or suitable for trowel application. Meet the requirements of AASHTO M 198.
- E. Bituminous Joint Primer: Meet the requirements of ASTM D 41, which is intended for use in priming concrete pipe joints prior to application of bituminous jointing material.
- F. Engineering Fabric:
1. Use for wrapping exterior of storm sewer pipe joints where indicated on plans.
  2. Use Iowa DOT 4196.01B fabric for use in subsurface drains.
- G. Reinforced Concrete Apron:
1. Use where indicated on plans.
  2. Use pipe conforming to ASTM C 76.
  3. Strength not less than adjoining pipe sections.
- H. Apron Guard:
1. Use where indicated on plans.

## 2.02 SUBDRAINS

- A. Polyvinyl Chloride Pipe and Fittings (Solid Wall PVC):
  - 1. Conform to ASTM D 3034, minimum thickness SDR 35, 46 psi minimum pipe stiffness.
  - 2. PVC plastic according to ASTM D 1784, Cell Classification 12454.
  - 3. Integral bell and spigot type rubber gasket joint conforming to ASTM D 3212 and ASTM F 477.
  - 4. Fabricated or preformed saddle wye or saddle tee for service tap conforming to AASHTO M 252 or M 294.
  - 5. Slot subdrain pipe according to ASTM F 949 or perforate with four rows of 1/4 inch to 3/8 inch diameter holes along the bottom of the pipe.
  
- B. Polyvinyl Chloride Corrugated Pipe and Fittings (Corrugated PVC):
  - 1. Corrugated exterior, smooth interior, PVC.
  - 2. Conform to ASTM F 949, minimum pipe stiffness, 46 psi.
  - 3. PVC plastic according to ASTM D 1784, Cell Classification 12454.
  - 4. Integral bell and spigot type rubber gasket joint conforming to ASTM D 3212 and ASTM F 477.
  - 5. Slot subdrain pipe according to ASTM F 949.
  
- C. Polyethylene Corrugated Tubing (Corrugated PE):
  - 1. Conform to AASHTO M 252, Type C, corrugated interior and exterior or Type S, corrugated exterior, smooth interior.
  - 2. Use only fittings supplied or recommended by pipe manufacturer for soil tight service.
  - 3. Perforated with slots conforming to AASHTO M 252, Type CP, or Type SP.
  
- D. Aggregate Backfill: Conform to State of Iowa Department of Transportation Standard 4131, Porous Backfill Material; Crushed stone or gravel meeting Iowa DOT Gradation No.29.
  
- E. Engineering Fabric: Use fabric conforming to Iowa DOT 4196.01B.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Verify measurements at site; make necessary field measurements to accurately determine pipe makeup lengths or closures.
  
- B. Examine site conditions to ensure construction operations do not pose hazards to adjacent structures or facilities.

### 3.02 LINE AND GRADE

- A. Install pipe to line and grade shown on plans. Set field grades to invert of pipes or culverts.
  
- B. Notify Engineer immediately if discrepancies or irregularities are discovered in line or grade shown by grade stakes.
  
- C. Make detailed measurements as required to construct work to line and grade established

by line and grade hubs.

- D. Batter Boards:
  - 1. Set grade points at 25-foot intervals at convenient offset from centerline of pipe or culvert.
  - 2. Set batter boards as necessary to construct to design line and grade.
  - 3. Provide at least three batter boards at all pipe laying areas during construction as check on accuracy of grades.
  - 4. Check line and grade of each pipe length with grade rod and plumb bob.
- E. Laser Beam:
  - 1. Set laser equipment to proper line and grade from line and grade hubs.
  - 2. Check line and grade of laser at 25-foot intervals for first 100 feet and then at 50-foot intervals for each setup.
  - 3. Check line and grade of each pipe length.
- F. Correct Misalignment: Correct misalignment, displacement, or otherwise defective pipe by removing, relaying, or replacing pipe at Contractor's expense.

### 3.03 PIPE INSTALLATION

- A. Provide trench excavation, pipe bedding, and backfill as specified in Section 31 23 33.
- B. Provide proper facilities for lowering the sections into place without damaging the pipe.
- C. Begin at lowest point in line. Lay groove or bell end point upstream unless specifically noted otherwise.
- D. Prepare trench bottom to design line and grade so only minor movement of pipe is necessary after installation.
- E. Inspect pipe for defects before carefully lowering into trench. Do not install damaged or defective pipe.
- F. Clean pipe interior and joints prior to lowering into trench. Keep pipe clean during construction.
- G. Do not lay pipe in water or on saturated soil or bedding. Do not allow water to rise in trench around pipe.
- H. Place pipe with lifting holes at the top of the pipe and fill lift hole with non-shrink grout or manufactured plugs.
- I. Lay pipe to design line and grade.
- J. Provide uniform bearing for full pipe barrel length.
  - 1. Excavate bell holes as necessary for uniform support of pipe barrel on bedding material.
  - 2. Do not block pipe above bedding.
- K. Assemble joints as specified.
- L. Protect exposed upstream ends of pipe to prevent soil sediment from entering storm sewer system with the watertight stopper, cap, or plug.

- M. Do not disturb installed pipe and bedding when using movable trench boxes and shields. Block or anchor pipe as necessary to prevent joint displacement.
- N. Saw cut ends of pipe at manholes, intakes, and structures. Do not hammer cut or break pipe.
- O. Provide manholes and intakes where indicated on plans and as specified.

### 3.04 PIPE JOINTING

- A. Joint Cleaning: Clean joint surfaces with wire brush to remove soil or foreign material prior to jointing pipe.
- B. Assemble Joints According to Pipe Manufacturer's Recommendations:
  - 1. Use equipment that does not apply damaging forces to pipe joints.
  - 2. Use bar and block or internal or external jointing devices or other methods recommended by pipe manufacturers.
- C. RCP, RCAP, and RCEP:
  - 1. Use cold applied bituminous jointing materials unless otherwise specified.
    - a. Apply joint material to entire tongue or to top half of tongue and bottom half of groove, in sufficient quantity to fill joint; close joint between pipes.
    - b. Fill remaining voids in joint both inside and outside of pipe with joint material; smooth joint material on inside of pipe 24 inches and larger.
  - 2. If rubber O ring is specified, coat rubber ring gasket and joint with soap based lubricant immediately prior to closing joint.
  - 3. If wrapped pipe joint is specified,
    - a. Secure engineering fabric in place to prevent displacement during backfill operations.
    - b. For combination storm sewer/subdrain or Type II subdrain, do not use joint sealant.
  - 4. Joint openings on the outside or inside of the pipe that do not exceed 1/8 inch at the bottom and 5/8 inch at the top are acceptable.
  - 5. Fully encase large joint openings, unless required for camber, with a Type II concrete collar (see Figure 4020.1A). Use Class C structural concrete.
- D. RCPP: Coat rubber ring gasket and joint with soap based lubricant immediately prior to closing joint.
- E. CMP and CMAP:
  - 1. Install coupling bands that match ends of pipes.
  - 2. End of coupling bands must lap or be fabricated to form tightly closed joint upon installation.
- F. PVC Pipe and Corrugated PVC Pipe: Coat rubber gasket and joint with soap based lubricant immediately prior to closing joint.
- G. High Density Polyethylene (HDPE): Coat rubber gasket and joint with soap based lubricant immediately prior to closing joint.
- H. High Density Polyethylene (HDPE): N-12 MEGA GREEN PIPE:
  - 1. Fittings shall conform to ASTM F2648.
  - 2. Joints shall be N12 ST IB (Soil Tight)
    - a. Join pipes with bell & spigot joint meeting ATSM F2648.
    - b. Soil Tight gaskets shall meet the requirements of ASTM F477.

- c. Gaskets shall be installed by pipe manufacturer and covered with removable wrap to ensure gasket is free of debris.
- d. Joint lubricant available from manufacture shall be used on the gasket and bell during assembly

- I. Connections between Dissimilar Pipes:
  - 1. Use manufactured adapters or couplings approved by Engineer.
  - 2. Where adapters or couplings are not available, Engineer may authorize use of concrete collar.

### **3.05 PIPE END SECTIONS**

- A. Provide reinforced concrete or metal pipe aprons where indicated on plans.
- B. Install footings with aprons according to figure, if required.
- C. Anchor last three pipe sections and aprons together with two pipe connections per joint.
- D. Install apron guard where indicated on plans.

### **3.06 SUBDRAINS AND TRENCH DRAINS**

- A. Provide subdrain where indicated on plans.
- B. Provide trench drains where indicated on plans.
- C. If specified, install engineering fabric.

### **3.07 FOOTING DRAIN COLLECTOR**

- A. Install footing drain collector per Section 31 23 33.
- B. If specified, install engineering fabric.
- C. Provide cleanouts and connections.
  - 1. Connect footing drain sewer collectors to storm sewer manhole or intake.
  - 2. Provide fabricated or preformed wye or tee service fitting for each platted lot or building.
- C. Provide manholes, if specified.

### **3.08 STORM SEWER SERVICE STUBS**

- A. Provide storm sewer service connection and line from storm sewer or footing drain sewer for each platted lot or building as shown on plans.
- B. Use fabricated or preformed saddle wye or saddle tee for service tap to storm sewers. Clamp with two stainless steel clamps and install according to the manufacturer's recommendations.

- C. Extend storm sewer service from storm sewer or footing drain collector to 10 feet outside of the right-of-way line or as shown on the plans.
- D. Place watertight stopper or plug in end of storm sewer service.

### **3.09 TOLERANCES**

- A. Horizontal and vertical alignment of gravity sewer lines shall not vary from design line and grade at any point along the pipe by more than 1% of the inside diameter of the pipe or 1/4 inch, whichever is larger.
- B. Tolerance allowed only if design line and grade is sufficient to prevent backslope when tolerance limits are reached.
- C. Reverse slope on pipe is prohibited.

### **3.10 CONFLICTS**

- A. Provide temporary support for existing water, gas, telephone, power, and other utilities or services that cross trench.
- B. Compact backfill under existing utility crossing as specified in 3123 33 or construct utility line supports where indicated on plans or as directed by Engineer.

### **3.11 STORM SEWER ABANDONMENT**

- A. When sewers are to be abandoned, standard sewer plugs shall be placed. Prior to placing the plug, ensure the line is not in use. If noted on the plans, fill the line with gravity flow or pump the line full of flowable mortar or controlled low strength material.

### **3.12 CLEANING**

- A. Clean all storm sewers by flushing with water and by removing sheeting, bracing, shoring, forms, soil sediment, concrete, or other debris as directed by Engineer prior to final acceptance.
- B. Do not discharge soil sediment or debris to drainage channels or existing storm sewer or sanitary sewer systems.

## **PART 4 - TESTING**

### **4.01 DESCRIPTION OF WORK**

- A. Test and inspect storm sewers, culverts, footing drain sewers and building storm sewers.

### **4.02 SCHEDULING**

- A. Notify Owner's Representative when installation is complete and ready for testing.

- B. Notify Owner's Representative at least 24 hours prior to performing testing.
- C. Owner's Representative must be present to review testing procedures and to record results.

#### **4.03 TESTING EQUIPMENT**

- A. Conform with applicable sections of ASTM.
- B. Conform to other applicable industry standards and codes.

#### **4.04 VISUAL INSPECTION**

- A. Check each section of storm sewer by lamping.
- B. Light should be visible through section of pipe lamped.
- C. Visually inspect each section of pipe.
- D. Repair or replace defective pipe or joints or remove and relay pipe not meeting alignment tolerances as directed by Engineer.

#### **4.05 DEFLECTION TESTING**

- A. Perform deflection tests on all HDPE storm sewer pipe 12" diameter or greater.
- B. Perform deflection tests after backfill has been in place at least 30 days and before paving activity takes place or as per appropriate sections of these specifications.
- C. Pipe deflection shall not exceed 5% of average inside diameter as established by ASTM Standards.
- D. Pull approved 9-arm deflection mandrel through sewer by hand.
- E. Approved mandrel must conform to applicable ASTM Standards.
- F. Remove and replace pipe exceeding deflection limits.
- G. Handle and divert existing flows during deflection testing.

END OF SECTION

## SECTION 33 4600 - SUBDRAINAGE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes subdrainage systems for storm drainage outside the building, with the following components:
  - 1. Perforated and solid wall pipe and fittings.
  - 2. Geotextile Fabric.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of drainage panel indicated.

#### 1.3 REFERENCE STANDARDS

- A. Comply with applicable provisions of State codes, specifications, standards, and recommended practices.

### PART 2 - PRODUCTS

#### 2.1 PERFORATED-WALL PIPES AND FITTINGS

- A. Perforated HDPE Pipe and Fittings: ASTM F 405 or AASHTO M 252, Type CP; corrugated, for coupled joints.
  - 1. Size: 4" diameter.
  - 2. Couplings: Manufacturer's standard, band type.
  - 3. For exterior drainage.

#### 2.2 SOLID-WALL PIPES AND FITTINGS

- A. HDPE Drainage Tubing and Fittings: AASHTO M 252, Type S, corrugated, with smooth waterway, for coupled joints.
  - 1. Size: 4" diameter.
  - 2. Couplings: AASHTO M 252, corrugated, band type, matching tubing and fittings.
  - 3. For interior drainage.

## 2.3 SOIL MATERIALS

- A. Backfill, drainage course, impervious fill, and satisfactory soil materials are specified in Section 31 2333 - Trenching And Backfilling.

## 2.4 GEOTEXTILE FILTER FABRICS

- A. Description: Fabric of PP or polyester fibers or combination of both, with flow rate range from 110 to 330 gpm/sq. ft. when tested according to ASTM D 4491.
  - 1. Structure Type: Nonwoven, needle-punched continuous filament or woven, monofilament or multifilament.
  - 2. Style(s): Flat and sock.

## PART 3 - EXECUTION

### 3.1 PIPING APPLICATIONS

- A. Underground Subdrainage Piping:
  - 1. Perforated PE pipe and fittings, couplings, and coupled joints.
  - 2. Solid wall PE Drainage Tubing and Fittings.

### 3.2 CLEANOUT APPLICATIONS

- 1. Install cleanouts and riser extensions from sub-drainage piping to flush cleanouts at grade. Install piping so cleanouts open in direction of flow in sewer pipe.

### 3.3 FOUNDATION DRAINAGE INSTALLATION

- A. Place impervious fill material on subgrade adjacent to bottom of footing. Place and compact impervious fill to dimensions indicated, but not less than 4 inches deep and 12 inches wide.
- B. Lay flat-style geotextile filter fabric in trench and overlap trench sides.
- C. Place supporting layer of drainage course over compacted subgrade and geotextile filter fabric, to compacted depth of not less than 4 inches.
- D. Encase pipe with sock-style geotextile filter fabric before installing pipe. Connect sock sections with adhesive or tape.
- E. Add drainage course to width of at least 6 inches on side away from wall and to top of pipe.
- F. After satisfactory testing, cover drainage piping to width of at least 6 inches on side away from footing and above top of pipe to minimum of 12 inches.

- G. Install drainage course and wrap top of drainage course with flat-style geotextile filter fabric.
- H. Place layer of flat-style geotextile filter fabric over top of drainage course, overlapping edges at least 4 inches.
- I. Place backfill material over compacted drainage course. Place material in loose-depth layered lifts not exceeding 6 inches. Thoroughly compact each layer. Final backfill to finish elevations and slope away from building.

### 3.4 UNDERSLAB DRAINAGE INSTALLATION

- A. Excavate for underslab drainage system after subgrade material has been compacted but before drainage course has been placed. Include horizontal distance of at least 6 inches between drainage pipe and trench walls. Grade bottom of trench excavations to required slope, and compact to firm, solid bed for drainage system.
- B. Place supporting layer of bedding course over compacted subgrade and to compacted depth of not less than 4 inches.
- C. After satisfactory testing, cover drainage piping with drainage course to elevation of bottom of slab, and compact.
- D. Seal penetrations through foundation or footings where piping enters the building on both the interior and the exterior trench side of the foundation wall.
  - 1. Seal penetrations with hydrophilic expansion waterstop so that trench water is not able drain into building under slab trenches. See Section 03 1513 Waterstops.

### 3.5 PIPING INSTALLATION

- A. Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.
  - 1. Foundation Subdrainage: Install piping level and with a minimum cover of 36 inches or as indicated in the Drawings.
  - 2. Lay perforated pipe with perforations down.
  - 3. Excavate recesses in trench bottom for bell ends of pipe. Lay pipe with bells facing upslope and with spigot end entered fully into adjacent bell.
- B. Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.

### 3.6 PIPE JOINT CONSTRUCTION

- A. Join perforated and solid wall HDPE pipe and fittings with couplings for soil-tight joints according to ASTM D 3212 with loose banded, coupled, or push-on joints.

- B. Special Pipe Couplings: Join piping made of different materials and dimensions with special couplings made for this application. Use couplings that are compatible with and fit materials and dimensions of both pipes.

### 3.7 CLEANOUT INSTALLATION

#### A. Cleanouts for Foundation Subdrainage:

1. Install cleanouts from piping to grade. Locate cleanouts at beginning of piping run and at changes in direction as shown on the Drawings. Install fittings so cleanouts open in direction of flow in piping.
2. In nonvehicular-traffic areas, use NPS 4 PVC pipe and fittings for piping branch fittings and riser extensions to cleanout.
3. Set cleanout frames and covers in a cast-in-place concrete anchor, 12 by 12 by 4 inches deep. Set top of cleanouts 1 inch above grade.

### 3.8 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties. Connect low elevations of subdrainage system to solid-wall underslab piping and sump pits. Comply with requirements for sump pumps as specified in Division 22.

### 3.9 FIELD QUALITY CONTROL

- A. Testing: After installing drainage course to top of piping, test drain piping with water to ensure free flow before backfilling. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

### 3.10 CLEANING

- A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION 33 4600

## **SECTION 33 49 00**

### **STORM DRAINAGE STRUCTURES**

#### **SUBPARTS:**

- A. MANHOLES
- B. INTAKES
- C. CAST-IN-PLACE STRUCTURES
- D. NYPLOPLAST INTAKES

#### **A. MANHOLES**

##### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Manholes for storm sewers.
- B. Adjustment of existing manholes.
- C. Connection to existing manholes.
- D. Abandonment of manholes.

##### **1.02 DESCRIPTION OF WORK**

- A. Construct storm sewer manholes, modify existing manholes, and abandon manholes where shown in the Plans.

##### **1.03 SUBMITTALS**

- A. Submit under provisions of Division 1.
- B. Shop drawings showing compliance with this Specification.
- C. Shop drawing schedule of new manholes showing total depth, relative elevations of all connecting sanitary or storm sewer lines, all drops, and orientation of connecting lines.
- D. Catalog cuts of iron castings and sewer line connection gaskets.
- E. Upon requests the Contractor will provide Material Certifications to the Engineer.

##### **1.04 SUBSTITUTIONS**

- A. Use only materials conforming to these specifications unless permitted otherwise by Engineer.
- B. Obtain written approval of Engineer for all substitutions prior to use in accordance with requirements of front end documents.
- C. Precast sections meeting the requirements of ASTM C 478.

##### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver only materials that fully conform to these specifications or for which submittals have been provided to Engineer and approved for use.
- B. Store and handle materials to avoid damage. Replace any damaged materials. Remove damaged materials from the site.

**1.06 SCHEDULING AND CONFLICTS**

- A. Construction Sequence:
  1. Attend a preconstruction meeting if required by Engineer.
  2. Submit plan for construction sequence and schedule prior to commencing construction.
- B. Conflict Avoidance:
  1. Expose possible conflicts in advance of construction, such as utility lines and drainage structures. Verify elevations and locations of each and verify clearance for proposed construction.
  2. Complete elements of the work which can affect line and grade in advance of other open cut construction unless noted on plans.
  3. Notify Engineer of conflicts discovered or changes needed to accommodate unknown or changed conditions.

**1.07 SPECIAL REQUIREMENTS**

- A. Stop work and notify Engineer immediately if contaminated soils, historical artifacts or other environmental or historic items are encountered.
- B. Conform to local, state, and Federal requirements.
- C. Storm Sewer Manholes :
  1. Manhole Types:

Type	Description	Main Pipe Size	Typical Depth	Figure No.
SW-501	48" Min. Dia. Short Cone or Flat Top with Poured or Precast Base	See Table 1 for Max. Dia. Pipe	7' Min.	
SW-502	Precast or Poured-in-Place Box with Precast or Poured-in-Place Base	24" or Greater	8' Max.	
SW-503	Poured-in-Place Box with Poured-in-Place Base	12" Dia. or Greater	6' - 12'	
SW-505	Combination 48" Dia. Short Cone with Poured-in-Place Barrel and Poured-in-Place Base	12" Dia. or Greater	12' - 22'	
SW-506	48" Dia. Short Cone with T-Section	42" Dia. or Greater eccentric reducer required for 42"	8.5' Min.	

2. Ring and Cover Types:

Type	Ring & Cover	No. of Pieces	Bolted Frame	Bolt Cover	Gasketed	Figure No.
E*	Standard	2	Yes	No	No	
F**	Adjustable	3	No	No	No	
G*	Machined Bearing Surfaces	2	No	No	No	

- \* Use when placed in earth fill, asphalt pavement, or ACC manhole boxout.
- \*\* Use when placed in PCC pavement or PCC manhole boxout.

## 1.08 MEASUREMENT FOR PAYMENT

- A. All measurements for payments will be made by the Engineer or authorized representative.
- B. Manhole: For each type and size of manhole required and furnished, measure manhole vertical dimension in feet from the flow line to the top of the ring casting. Payment shall be at the unit bid price for each type and size of manhole properly installed. The unit bid price for manholes shall include all bedding, backfill, compaction and all appurtenances including castings and lids necessary for the proper installation.

## PART 2 PRODUCTS

### 2.01 MANHOLES

- A. Placement: Conform to elevations, locations and connection orientations shown on the Plans and detailed drawings.
- B. Barrel Diameter, Inside: For sewers up to 24-inch size with two connections use 48 inches diameter barrel or as shown in the contract documents. For larger sewers or more connections, see Plans and detailed drawings.
- C. Wall Thickness: See Detailed plans and Iowa SUDAS plans .
- D. Top Configuration: Eccentric top except as noted on the Plans or detailed drawings. Total manhole depth 6 feet or more use cone top section. Total manhole depth less than 6 feet use minimum 9" thick flat top.
- F. Joints, Barrel: Male and female ends with Mastic seal
- G. Concrete: Precast: Comply with ASTM C 478. Cast in place: Refer to Cast-In-Place Storm Sewer Structure Section.
- H. Base: Precast manhole: Separate base from riser section; use with precast base or poured base. Cast in place manhole: Use with precast base or poured base.
- I. Pipe Connection:
  - 1. New Storm Sewer Manhole:
    - a. Precast manholes: factory fabricated openings.
    - b. Poured in place structures: structure wall poured around pipe stub.
  - 2. Existing Storm Sewer Manhole:
    - a. Cored or drilled opening: Provide a flexible, watertight connection that meets and/or exceeds ASTM C 923.
    - b. Knock out opening:
      - 1) Provide a watertight connection (waterstop or other method), meeting the material requirements of ASTM C 923, that is securely attached to the pipe with stainless steel bands or other means.
      - 2) Grout opening in manhole wall with non-shrink grout.
      - 3) Pour concrete collar around pipe and outside manhole opening.

4) Provide flexible pipe joint or flexible connector within 2' of collar.

J. Manhole Steps: None, unless required on the Plans. If required, space steps at 12 to 16 inches, comply with ASTM C 478. Align with vertical side of eccentric cone top section.

**2.02 MANHOLE ADJUSTMENT RINGS (Grade rings)**

- A. All grade adjustments of manhole frame and cover assemblies shall be completed utilizing one of the following:
1. Reinforced Concrete Grade Adjustment Rings: Comply with ASTM C 478 and be free from cracks, voids and other defects. Concrete rings will be set with asphalt mastic.
  2. High Density Polyethylene Grade Adjustment Rings: Comply with ASTM D 1248 for recycled plastic.
    - a. Material properties shall be tested and certified for usage by the following ASTM methods:

Property	Test Method	Acceptable Value
Melt Flow Index	ASTM D 1238	0.3 to 30 g / 10 min.
Density	ASTM D 792	0.94 to 0.98 g / cm <sup>3</sup>
Tensile Strength	ASTM D 638	2.00 to 5 x 10 <sup>3</sup> lb / in <sup>2</sup>

- b. Polyethylene adjusting rings shall not be used when they are exposed to heated hot mix asphalt pavement.
  - c. Tapered configuration: When used in a single configuration tapered adjusting ring thickness will range from 0.5 inch to 3.0 inch.
  - d. Grade adjustment rings are to be installed on clean flat surfaces according to the manufacturer's recommendations with the proper Butyl Rubber sealant/adhesives.
- B. The inside diameter of the adjustment ring shall not be less than the inside diameter of the manhole frame.
- C. Manholes shall be constructed with at least two adjustment rings.
- D. Maximum height of adjustment ring stack: 12 inches max. for new manholes and 16 inches max. on existing manholes.

**2.03 CASTINGS (Ring and Cover)**

- A. Gray Cast Iron: ASTM A 48, Class 35.
- B. Storm Sewer Manhole Ring and Covers:
1. Grassed areas: Type E.
  2. Paved areas, sidewalks, areas subject to vehicular traffic and sloped surfaces: Type F.
  3. For installation directly into concrete pipe riser manhole, Type G.
  4. Bolt all castings set above grade.
  5. Storm sewer manhole lids shall not be bolted.

**2.04 CEMENT MORTAR** - Refer to Cast-In-Place Storm Sewer Structure Section.

**2.05 REINFORCING STEEL** - Refer to Cast-In-Place Storm Sewer Structure Section.

**2.06 INVERT:**

- A. Poured in place concrete. Shape to provide a smooth transition between pipe inverts. Bring manhole invert up to one half of pipe diameter to produce a half pipe shape. Slope invert bench toward pipe 1/4 inch per foot perpendicular to flow line.

### **PART 3 - EXECUTION**

#### **3.01 MANHOLE INSTALLATION**

- A. Subgrade Preparation:
  - 1. Undisturbed soil: Hand grade to accurate elevation.
  - 2. Disturbed soil: Machine compact to 95 percent of Standard Proctor Density and hand grade to accurate elevation or install stabilization material as directed by Engineer.
- B. Installation of Poured In Place Base: Bed base riser section in Class C concrete. Assure proper vertical and horizontal alignment of base riser section.
- C. Installation of Precast Base with Base Riser: Assure proper vertical and horizontal alignment of base riser section.
- D. Additional Risers: Install additional riser sections as required. Grout inside face of joints.
- E. Repair: Repair any honeycomb areas or damaged areas as directed by Engineer.
- F. Backfill up to pipe grades. Connect and bed pipes using bedding material up to one foot above top of pipes.
- G. Install manhole invert. Remove any projections and repair any voids to assure a hydraulically smooth channel between pipe ends.
- H. Install manhole top slab or cone.
- I. Install manhole adjustment rings. Bed each ring with cold-applied bituminous jointing compound. Do not install more than total ring stack height of 12 inches. For greater adjustment, modify barrel riser section(s).
- J. Install manhole ring and cover. Adjust accurately to proper grade. Where manhole is to be in a paved area, adjust slope to match finished surface.
- K. Backfill and compact. Refer to Section 31 23 33. Use extra care to assure proper and uniform compaction of backfill around structure.

**3.02 MANHOLE TESTING - Refer to Section 33 40 00.**

#### **B. INTAKES**

#### **PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Intakes for storm sewers.
- B. Special structures for storm sewers.

**1.02 DESCRIPTION OF WORK**

- A. Construct intakes and special structures for storm sewers.
- B. Modify existing intakes
- C. Abandon intakes.
- D. Reference is made to the Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2001, and all current General Supplemental Specifications and Materials Instructional Memorandum by the term "Iowa DOT Specifications" and/or "Iowa DOT I.M."

**1.03 SUBMITTALS**

- A. Submit under provisions of Division 1.
- B. Shop drawings showing compliance with this Specification.
- C. Schedule of new intakes showing total depth, and relative elevations and orientations of all connecting storm sewer lines.
- D. Catalog cuts of iron castings.
- E. Upon requests the Contractor will provide Material Certifications to the Engineer.

**1.04 SUBSTITUTIONS**

- A. Use only materials conforming to these specifications unless permitted otherwise by Engineer.
- B. Obtain written approval of Engineer for all substitutions prior to use.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver only materials that fully conform to these specifications or for which submittals have been provided to Engineer and approved for use.
- B. Store and handle materials to avoid damage. Replace any damaged materials. Remove damaged materials from the site.

**1.06 SCHEDULING AND CONFLICTS**

- A. Construction Sequence:
  - 1. Attend a preconstruction meeting if required by Engineer.
  - 2. Submit plan for construction sequence and schedule prior to commencing construction.

- B. Conflict Avoidance:
  - 1. Expose possible conflicts in advance of construction, such as utility lines and drainage structures. Verify elevations and locations of each and verify clearance for proposed construction.
  - 2. Complete elements of the work which can affect line and grade in advance of other open cut construction unless noted on plans.
  - 3. Notify Engineer of conflicts discovered or changes needed to accommodate unknown or changed conditions.

#### **1.07 SPECIAL REQUIREMENTS**

- A. Stop Work: Stop work and notify Engineer immediately if contaminated soils, historical artifacts or other environmental or historic items are encountered.
- B. Conform to local, state, and Federal requirements.

#### **1.08 MEASUREMENT FOR PAYMENT**

- A. All measurements for payments will be made by the Engineer or authorized representative.
- B. Intake: Measure the number of all properly completed intakes. Payment shall be at the unit bid price for each size and type, and shall include all bedding, backfill, compaction, grates and appurtenances for proper installation.
- C. Intake Adjustment: Count each item as a completed individual unit, as identified in the Bid Schedule. Payment shall be at the unit bid price for each adjustment as per plan.
- D. Special Structure: Count each item as a completed individual unit, as identified in the Bid Schedule.

### **PART 2 - PRODUCTS**

#### **2.01 INTAKES**

- A. Conform to elevations, locations and connection orientations shown on the Plans.
- B. Intake type; Refer to Plans.
- C. Configuration and Dimensions; Refer to Detailed Drawings.
- D. Top Configuration:
  - 1. As noted on Detailed Drawings.
  - 2. Number of grate sections; Refer to Plans.
- E. Joints, Wall:
  - 1. Precast; Male and female ends, mastic seal.
  - 2. Poured in place; construction joints.
- F. Concrete:
  - 1. Precast: Precast concrete intakes constructed in accordance with the requirements of following Cast In Place Section, and with the dimensions and reinforcement shown in standard detailed drawings.
  - 2. Cast in place;

- a. Refer to following Cast-In-Place Section.
  - b. Minimum concrete reinforcing cover 2 inches.
  - c. Minimum total section thickness; see Standard Detailed Drawings.
- G. Base:
- 1. Separate. Use with base riser section with square bottom edge.
  - 2. Precast may have surface finish block outs on one side only.
- H. Pipe Connection:
- 1. Precast intake; factory fabricated openings.
  - 2. Poured in place structures; structure wall poured around pipe stub.
- I. Manhole Steps: None, unless required on the Plans. If required, space steps at 12 to 16 inches, comply with ASTM C 478.

**2.02 INTAKE ADJUSTMENT RINGS (Grade rings)**

- A. All grade adjustments of intake frame and cover assemblies shall be completed utilizing one of the following:
- 1. Reinforced Concrete Grade Adjustment Rings: Comply with ASTM C 478 and be free from cracks, voids and other defects. Concrete rings will be set with asphalt mastic.
  - 2. High Density Polyethylene Grade Adjustment Rings: Comply with ASTM D 1248 for recycled plastic.
    - a. Material properties shall be tested and certified for usage by the following ASTM methods:

Property	Test Method	Acceptable Value
Melt Flow Index	ASTM D 1238	0.3 to 30 g/10 min.
Density	ASTM D 792	0.94 to 0.98 g/cm <sup>3</sup>
Tensile Strength	ASTM D 638	2.00 to 5 x 10 <sup>3</sup> lb/in <sup>2</sup>

- b. Polyethylene adjusting rings shall not be used when they are exposed to heated hot mix asphalt pavement.
  - c. Tapered configuration: When used in a single configuration tapered adjusting ring thickness will range from 0.5 inch to 3.0 inch.
  - d. Grade adjustment rings are to be installed on clean flat surfaces according to the manufacturer's recommendations with the proper Butyl Rubber sealant/adhesives.
- B. The inside dimension of the adjustment ring shall not be less than the inside dimension of the intake grate opening.
- C. Intakes shall be constructed with at least two adjustment rings.
- D. Maximum height of adjustment ring stack: 12 inches for new and existing intakes.

**2.03 CASTINGS (Covers and Grates)**

- A. Gray Cast Iron: ASTM A 48, Class 35.
- B. Type: Refer to Detailed Drawings and Plans.

**2.04 CEMENT MORTAR - Refer to following Cast In Place Section.**

**2.05 REINFORCING STEEL - Refer to following Cast In Place Section.**

**2.06 INVERT**

- A. Poured in place concrete. Establish a full seal between base and base riser section.
- B. Shape to provide a smooth transition between pipe inverts.
- C. Bring intake invert up to one half of pipe diameter to produce a half pipe shape.

**PART 3 EXECUTION**

**3.01 INTAKE INSTALLATION**

- A. Subgrade Preparation:
  - 1. Undisturbed soil: Hand grade to accurate elevation.
  - 2. Disturbed soil: Machine compact to 95 percent of Standard Proctor Density and hand grade to accurate elevation, or install Stabilization Material as directed by Engineer.
  - 3. Unstable soil: Install Stabilization Material as directed by Engineer.
- B. Concrete Intakes:
  - 1. Install Stabilization Material if unstable base exists.
  - 2. Install Granular Bedding Material if required by Detailed Drawings.
  - 3. Install base; assure proper vertical and horizontal alignment of base riser section.
  - 4. Install additional riser section as required. Seal all joints.
  - 5. Repair any honeycomb areas or damaged areas.
  - 6. Compact backfill up to connecting pipes.
  - 7. Connect and bed pipes per Section 3010. Grout inside pipe/riser joint.
  - 8. Install intake invert. Remove any projections and repair any voids to assure a hydraulically smooth channel through intake.
  - 9. Install top.
  - 10. Install adjustment rings. Install at least two rings. Bed each ring with cold-applied bituminous jointing compound. Do not install more than total ring stack height of 12 inches. For greater adjustment, modify riser section(s).
  - 11. Install top casting. Adjust accurately to proper line and grade.
  - 12. Backfill and compact. Refer to Section 3010. Use extra care to assure proper and uniform compaction of backfill around structure.
- C. Anchoring Castings: All castings not encased in concrete shall be bolted down.

**3.02 CONCRETE, REINFORCEMENT, AND PLACEMENT. Refer to Cast In Place Section.**

**3.03 SPECIAL STRUCTURES**

- A. Construct in accordance with this Section, as applicable.
- B. Refer to Plans for locations, dimensions and special details and provisions.

**3.04 ABANDONED INTAKES**

- A. Remove entire structure to a minimum of 10 feet below subgrade in paved areas or 6 feet below finish grade in other areas.

- B. Plug all pipes in structure.
- C. Fill remaining structure using flowable mortar.
- D. Place compacted earth fill over structure as required for embankment or compacted backfill.

### **C. CAST-IN-PLACE CONCRETE**

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Structural Portland cement concrete and reinforcing for manholes and intakes for sanitary and storm sewer systems, and other structures such as concrete thrust blocks and sewage air release pits as designated by the Engineer.

##### **1.02 DESCRIPTION OF WORK**

- A. Construct Portland cement concrete structures for sanitary and storm sewers.
- B. Reference is made to the Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2001, and all current General Supplemental Specifications and Materials Instructional Memorandum by the term "Iowa DOT Specifications" and/or "Iowa DOT I.M."

##### **1.03 SUBMITTALS**

- A. Submit under provisions of Division 1.
- B. Shop drawings of steel reinforcement, showing sizes, lengths, bends, and counts, if required.
- C. Concrete mix design, if required by Engineer.
- D. Sample test results and certifications.
- E. Certification that materials being provided meet the requirements of these specifications or that alternate materials or substitutions have received written approval of the Engineer.
- F. Project Record Documents.
- G. Upon requests the Contractor will provide Material Certifications to the Engineer.

##### **1.04 SUBSTITUTIONS**

- A. Use only materials conforming to these specifications unless permitted otherwise by Engineer.
- B. Obtain written approval of Engineer for all substitutions prior to use.

##### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver only materials that fully conform to these specifications and for which submittals

have been provided to Engineer and approved for use.

- B. Store and handle materials to avoid damage. Store reinforcing steel only on pallets or lagging. Replace any damaged materials. Remove damaged materials from the site.
- C. Aggregate storage and concrete transport shall follow Section 7010, 1.05.

#### **1.06 SCHEDULING**

- A. Construction Sequence:
  - 1. Schedule concrete placement to coordinate with other work, such that trenching, backfilling and other work can proceed in an orderly manner and to provide the greatest protection for new work.
- B. Conflict Avoidance:
  - 1. Expose potential conflicts such as utility lines and drainage structures in advance of construction. Verify elevations and locations and verify clearance for proposed construction.
  - 2. Complete elements of work which can affect line and grade in advance of pipe construction unless noted on plans.
  - 3. Notify Engineer of conflicts discovered or changes needed to accommodate unknown conditions.

#### **1.07 SPECIAL REQUIREMENTS**

- A. Stop Work: Stop work and notify Engineer immediately if contaminated soils, historical artifacts or other environmental or historic items are encountered.
- B. Conform to local, state, and federal requirements.
- C. Restrictions: Restriction on operations shall follow Section 7010, 1.07.

#### **1.08 MEASUREMENT FOR PAYMENT**

- A. The cost for concrete and reinforcing in the construction of manholes and intakes for storm sewer systems, or other special structures, will not be measured separately but will be considered incidental to intakes and manholes or other concrete structures as described in this specification document, including sampling and testing.

### **PART 2 PRODUCTS**

#### **2.01 CONCRETE MATERIALS**

- A. Portland Cement:
  - 1. ASTM C 150, Type I or Type III when specified.
  - 2. Air entrained per ASTM C 260.
  - 3. Iowa DOT Class C concrete unless otherwise specified in the contract documents.
- B. Aggregates:
  - 1. Per ASTM C 33.
  - 2. Coarse and fine aggregate shall follow Section 7010, 2.02.
- C. Water: Follow Section 7010 2.02 E
- D. Liquid Admixtures for Portland Cement Concrete:

1. Description
  - a. Meet requirements of AASHTO M 154 for air entraining mixtures.
  - b. Meet requirements of AASHTO M 194 for other liquid admixtures.
  - c. Submit tests by a recognized laboratory for Engineer approval.
  - d. Admixtures containing more than 1% chloride ions shall not be allowed unless approved by Engineer.
  - e. Inspection and acceptance of liquid admixtures will be in accordance with Iowa DOT Materials I.M. 403
2. Air Entraining Admixtures: Provisions shall be made to stir, agitate, or circulate air entraining admixtures prior to use to insure a uniform and homogeneous mixture.
3. Retarding and Water Reducing Admixtures
  - a. Shall be compatible with air entraining agent.
  - b. Shall be introduced into the mixer after all other ingredients
  - c. Agitate prior to and during use in accordance with Iowa DOT Materials I.M. 403
  - d. Dosage rate shall be applied to both cement and fly ash when used.
4. Other Admixtures: Other admixtures may be used with the approval of the Engineer in accordance with the manufacturer's recommendations.

## 2.02 CONCRETE QUALITY

- A. Compressive Strength: Minimum 4,000 psi at 28 days.
- B. Water-Cement Ratio: Follow Section 7010, 2.03.
- C. Air Content: The intended air entrainment is 6.0%. To allow for loss during placement, the air content of fresh, unvibrated structural concrete shall be 6.5%, as a target value, with a maximum variation of plus or minus 1.0%.
- D. Slump: Structural concrete shall be placed with a slump between 1 inch and 3 inches as a target range, allowing a maximum of 4 inches unless specifically modified by the Engineer.
- E. Admixtures: Per manufacturer's recommendations.

## 2.03 REINFORCEMENT

- A. Reinforcing Steel:
  1. Use deformed bars.
  2. Epoxy coated deformed bars apply only when specified.
  3. Billet steel; ASTM A 615, Grade 60.
  4. Fabricate and bend, per approved submittals or Plans.
  5. Fabricate all bars prior to delivery to site unless field bends are required.
- B. Wire Fabric:
  1. Per ASTM A 185.
  2. Size and mesh; as shown on Detailed Drawings or on Plans.
  3. Placement; as shown on Detailed Drawings or on Plans.
  4. Joints; lap not less than 6 inches.

## 2.04 CEMENT MORTAR: Mix in the following portions:

- A. Portland Cement: Type I; 10 Parts

- B. Mortar Sand: 20 Parts
- C. Lime, Hydrated: 3/4 to 1 Part

### **PART 3 EXECUTION**

#### **3.01 FORMING**

- A. All cast in place manholes and structures shall be formed on both the inside and the outside face above the base. No earth excavation next to the proposed manhole shall be used as forming.
- B. Use metal or plywood-lined forms for exposed surfaces.
- C. Erect and secure forms to true line and grade.
- D. Coat forms with non-staining mineral oil before placing reinforcing. Do not apply oil to surfaces to which concrete must be bonded.
- E. Use 3/4 inch bevel for exposed corners, unless otherwise required.

#### **3.02 REINFORCING STEEL**

- A. Remove dirt, scale and other materials that might impair concrete bond.
- B. Place reinforcement where shown. Space bars properly and secure in position.
- C. Reinforcement for slabs; support with chairs or bolsters. Do not use wood, bricks, stones or other foreign materials.
- D. Lap bars 36 diameters, except as otherwise shown.

#### **3.03 MIXING: (IOWA DOT 2403)**

- A. Provide accurate control for measuring materials.
- B. Concrete, as discharged from the mixer, shall be uniform in composition and consistency. Each batch of concrete shall be thoroughly discharged from the mixer before the next batch is introduced. Upon cessation of mixing for any considerable length of tie, the mixer shall be thoroughly cleaned and flushed with water.
- C. Ready-Mixed Concrete: conform to ASTM C 94.

#### **3.04 PLACING**

- A. Clean and dampen forms, reinforcing steel and embedded items.
- B. Prevent segregation during placement. Do not allow concrete to fall more than 4 feet from placement chute to final position.
- C. Place concrete continuously in each section until complete. Do not allow more than 30 minutes between depositing adjacent layers of concrete within each section.
- D. Thoroughly compact, puddle and vibrate concrete into corners and around reinforcing

and embedded items. Vibrate sufficiently to work concrete into crevices and around steel. Refer to Iowa DOT 2403.09.

- E. Place sections of concrete in a sequence which eliminates the effect of shrinkage to the greatest extent practicable.
- F. Concrete shall not be placed when the air temperature is less than 40 degrees Fahrenheit without the approval of the Engineer. Refer to Iowa DOT 2403.11.

### **3.05 FINISHING**

- A. Refer to Iowa DOT 2403.21.
- B. Use rough form finish to areas not visible to the public.
- C. Use smooth form finish for areas visible to the public.
- D. Use broomed finish for slabs, except as noted on Plans or Detailed Drawings.

### **3.06 STRIPPING AND CLEANING**

- A. Remove forms for manhole and intake walls and tops according to Iowa DOT 2403.18.
  - 1. References to culverts shall include all sanitary and storm structures.
  - 2. When allowed by the Engineer, compressive strengths at six times the stated flexural strengths may be used in determining concrete strength of structure roofs.
- B. Chip out and repair any honeycomb areas per direction of Engineer.
- C. Break back form ties and fill holes with portland cement mortar.
- D. Remove flashing and thin webs.

### **3.07 CURING**

- A. Refer to Iowa DOT 2403.10.
- B. Apply curing system immediately after finishing or stripping of forms, as applicable.
- C. Slabs on grade, visible to the public; use only curing compounds meeting ASTM C 309, Type 1-D or Type 2.

### **3.08 EXTERIOR LOADING**

- A. Restrict loads on concrete, other than the load caused by the weight of the concrete itself, according to Iowa DOT Section 2403.19.
- B. When allowed by the Engineer, compressive strengths at six times the stated flexural strengths may be used.

### **3.09 TESTING**

- A. Provide required testing by a testing service approved by Engineer, unless such services are provided by Jurisdiction.

- B. Review and test proposed mix design when required by Engineer.
- C. Obtain production samples of job-delivered concrete mix after any needed water has been added and the concrete remixed.
- D. Mold and cure three specimens per ASTM C 31.
- E. Strength Testing: Unless otherwise specified in the contract documents strength testing will be the responsibility of the Contractor by a certified testing service.
  - 1. Test specimens in accordance with ASTM C 39. Test one sample at 7 days for information. Test two samples at 28 days. The acceptance test results shall be the average of the compressive strength of the two specimens tested at 28 days. If one of the 28 day samples manifests evidence of improper sampling, molding or testing, it shall be discarded and the strength of the remaining sample shall be considered the test result.
  - 2. Make at least one strength test for each 100 cubic yards or fraction thereof, and at least one test for each structure. When the total quantity is less than 50 cubic yards the strength tests may be waived by the Engineer.
- F. Slump Testing: Unless otherwise specified in the contract documents testing will be by the Engineer. Determine slump of concrete sample for each strength test and whenever consistency of concrete mix appears to vary, using ASTM C 143.
- G. Air Testing: Unless otherwise specified in the contract documents testing will be by the Engineer. Determine air content of concrete sample for each strength test in accordance with either ASTM C 231, ASTM C 173, or ASTM C 138.

#### **D. NYLOPLAST INTAKES**

##### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Nyloplast Intakes or approved equal during bidding process.

##### **1.02 DESCRIPTION OF WORK**

- A. Nyloplast structures as shown to be installed on the details plans.
- B. Nyloplast structures are not a substitute for concrete structures called out on the plans.

##### **1.03 SUBMITTALS**

- A. Shop drawings of Nyloplast structure prior to fabrication.
- B. Certification that materials being provided meet the requirements of these specifications or that alternate materials or substitutions have received written approval of the Engineer.
- C. Project Record Documents.

##### **1.04 SUBSTITUTIONS**

- A. Use only materials conforming to these specifications unless permitted otherwise by

Engineer.

- B. Obtain written approval of Engineer for all substitutions prior to use.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver only materials that fully conform to these specifications and for which submittals have been provided to Engineer and approved for use.
- B. Store and handle materials to avoid damage. Replace any damaged materials. Remove damaged materials from the site.
- C. Aggregate storage shall follow Section 7010, 1.05.

#### **1.06 SCHEDULING**

- A. Construction Sequence:
  - 1. Schedule intake placement to coordinate with other work, such that trenching, backfilling and other work can proceed in an orderly manner and to provide the greatest protection for new work.
- B. Conflict Avoidance:
  - 1. Expose potential conflicts such as utility lines and drainage structures in advance of construction. Verify elevations and locations and verify clearance for proposed construction.
  - 2. Complete elements of work which can affect line and grade in advance of pipe construction unless noted on plans.
  - 3. Notify Engineer of conflicts discovered or changes needed to accommodate unknown conditions.

#### **1.07 SPECIAL REQUIREMENTS**

- A. Stop Work: Stop work and notify Engineer immediately if contaminated soils, historical artifacts or other environmental or historic items are encountered.
- B. Conform to local, state, and federal requirements.
- C. Restrictions: Restriction on operations shall follow Section 7010, 1.07.

#### **1.08 MEASUREMENT FOR PAYMENT**

- A. The cost for granular backfill and intake castings for storm sewer systems, or other special structures, will not be measured separately but will be considered incidental to intakes and manholes.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS**

- A. Intake:
  - 1. PVC Stock Pipe, utilizing a thermo-molding process to reform the pipe stock to the specified configuration.
  - 2. Drainage pipe connection stubs shall be PVC pipe stock and formed to provide watertight connection with the specified pipe system sizes and angles.
  - 3. The raw material used to manufacture the pipe stock that is used to manufacture the main body and pipe stubs shall conform to ASTM D1784 cell class 12454.

- B. Joints:
  - 1. Joint tightness shall conform to ASTM D3212 for drain and sewer plastic pipe using flexible elastomeric seals.
  - 2. Flexible elastomeric seals shall conform to ASTM F477.
  - 3. The pipe bell spigot shall be joined to the main body of the drain basin or catch basin.
  
- C. SW-512 grates for Nyloplast structures:
  - 1. Grates and frames furnished for all Nyloplast intake structures shall be ductile iron and the same size as the intake stack.
  - 2. Intake grates shall be capable of handling H-20 loads for all structures placed into paving.  
All other structures shall comply with H-10 loading.
  - 3. Metal used in manufacture of the castings shall conform to ASTM A536 grade 70-50-05 ductile iron.
  - 4. Grates shall be natural and contain no paint.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

- A. All intakes shall be staked by a licensed land surveyor.
  
- B. Intakes shall be placed in accordance with stakes provided by surveyor. In the event of a discrepancy between stakes and plans, contractor shall contact engineer and/ or land surveyor prior to intake placement.
  
- C. Granular backfill for base and intakes shall comply with manufacture recommendations. All backfill material shall conform with IOWA SUDAS backfill specifications for concrete intakes. Sand is NOT a permitted backfill material and backfill shall be Class 2 material defined in ASTM D2321.
  
- D. Intakes shall be designed and placed approximately 12" over height. Upon completion of final grading, Intakes shall be cut to the grade as specified on the approved construction plans. If intake stack is either manufactured too short or cut too short in the field, intake shall be completely replaced at contractor/ manufacture's expense.
  
- E. All intakes installed in paved areas (H-20 loaded structures), a concrete ring shall be poured under and around the grate and frame. The concrete slab must be designed for local soil conditions, traffic loading, among any other applicable design factors.
  
- F. For any other installation considerations such as migration of fines, ground water and soft foundations, refer to ASTM D2321 guidelines.

END OF SECTION



LOFTUS BUILDING - WEST WALL NORTH HALF



LOFTUS BUILDING - WEST WALL SOUTH HALF



LOFTUS BUILDING - WEST WALL NORTH HALF



LOFTUS BUILDING - NORTH END WEST WALL



LOFTUS BUILDING - MIDDLE WEST WALL



LOFTUS BUILDING - SOUTH END WEST WALL



LOFTUS BUILDING - WEST WALL NORTH END OF TRENCH



LOFTUS BUILDING - NORTH END WEST WALL - TRENCH AREA



LOFTUS BUILDING - WEST WALL NORTH END - TRENCH AREA NEAR PATIO DECK



LOFTUS BUILDING - NORTH END WEST WALL - EXISTING STORM INLETS



LOFTUS BUILDING - NORTH WALL - EAST SIDE - SHORING AREA AT TUNNEL



LOFTUS BUILDING - NORTH WALL - CURB DEMO AND AWNING POST AT TUNNEL



LOFTUS BUILDING - SOUTH WALL - TRENCH AREA



LOFTUS BUILDING - SOUTH WALL - NORTH END OF METAL ROOF AT ROOF HATCH



LOFTUS BUILDING - SOUTH WALL - ROOF HATCH AT NORTH END



LOFTUS BUILDING - SOUTH WALL - TRANSFORMER AT SOUTH END



LOFTUS BUILDING - NORTH WALL - METAL ROOF AND PATIO DECK



LOFTUS BUILDING - NORTH WALL - TRENCH DRAIN AND HANDRAIL WORK



LOFTUS BUILDING - NORTH WALL - METAL ROOF FRONT FASCIA



LOFTUS BUILDING - NORTH WALL - METAL ROOF BACK FLASHING TRIM



LOFTUS BUILDING - NORTH WALL - METAL ROOF EXPLORATORY DEMO



LOFTUS BUILDING - NORTH WALL - METAL ROOF ROTTED PLYWOOD



LOFTUS BUILDING - SOUTH WALL - HYDROVAC AT MAIN ELECTRICAL CONDUITS



LOFTUS BUILDING - NORTH WALL - HYDROVAC AT MAIN ELECTRICAL CONDUITS



LOFTUS BUILDING - NORTH TUNNEL - PREVIOUS EXCAVATION WATERPROOFING



LOFTUS BUILDING - NORTH TUNNEL - INSIDE LEAKS



LOFTUS BUILDING - NORTH TUNNEL - INSIDE LEAKS & PATCHING



LOFTUS BUILDING - NORTH AIR HANDLING PIT - MEMBRANE PIT



LOFTUS BUILDING - SOUTH AIR HANDLING PIT - PIPE PENETRATIONS TO BE PATCHED



LOFTUS BUILDING - BASEMENT BAND ROOM - LEAKS ABOVE CEILING



LOFTUS BUILDING - BASEMENT ELECTRICAL RM - ELECTRIC MDP & SUMP PIT #2 LOCATION



LOFTUS BUILDING - BASEMENT ELECTRIC RM - EXISTING CONDUITS IN MDP



MALLOY BUILDING - NORTH KITCHEN TRENCH & ROOF DRAIN PIPING LOCATION



MALLOY BUILDING - NORTH KITCHEN GAS METER & ROOF DRAIN PIPING



MALLOY BUILDING - NORTH KITCHEN ROOF DRAIN PIPING TO GO UNDERGROUND



MALLOY BUILDING - NORTH KITCHEN GAS METER, EPDM TERM BAR & PRECAST JOINT



MALLOY BUILDING - NORTH KITCHEN TUNNEL - LEAKS ABOVE CEILING